



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

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Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

April 23, 2015

VIA ELECTRONIC MAIL

Mr. Jay Stewart
Environmental Manager
Radford Army Ammunition Plant
4050 Pepper's Ferry Road
Radford, Virginia 24141

**Re: Radford Army Ammunition Plant, Radford, VA
EPA ID No.VA1210020730, Open Burning Ground (OBG) Soil Removal Work Plan
Approval - in Conjunction with the 2014 Annual Soil Monitoring Event – by the
Virginia Department of Environmental Quality**

Dear Mr. Stewart:

The Virginia Department of Environmental Quality (DEQ) is in receipt of the Radford Army Ammunition Plant's (RAAP), letter dated March 9, 2015, from the Radford, Virginia, facility.

The letter requested the DEQ's concurrence of the RAAP's letter inclusive of the included **Soil Removal Work Plan**. This letter is to advise that the DEQ approves the **Soil Removal Work Plan** addressing nitroglycerin (NG) in surface soils associated with Pad 3, where the NG concentration exceeded the Hazardous Waste Permit allowable Action Level of 62 mg/kg (November 2013 - Regional Screening Level Summary Table – Industrial Soil).

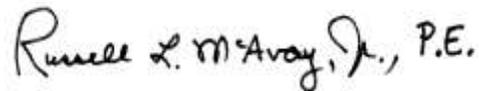
This letter is also to advise that the DEQ also intends to respond to RAAP's letter dated March 26, 2015, by next week pending internal review.

The **Soil Removal Work Plan** details the procedure to remove a 6 inch layer of soil within the 5 foot radius of the NG hot spot, and perform confirmation soil sampling of the sides and bottom of the excavation in accordance with the Open Burning Ground, Hazardous Waste Permit, *Section 8 – Interim Measures*. It was developed in response to sampling results (July 31, 2014, September 18, 2014, October 22, 2014 and December 8, 2014) as required by the **Annual Soil Monitoring Event (2014)** in accordance with the permit.

Please submit a gridded, to-scale diagram depicting the locations/depths of the samples including locations utilized to form composite samples with the final report to be submitted within 30 days of the completion of the removal effort.

If you have any questions or comments concerning this matter, please contact me at (804) 698-4194 or by e-mail at Russell.mcavoy@deq.virginia.gov.

Sincerely,

Handwritten signature of Russell L. McAvoy, Jr., P.E.

Russell McAvoy, PE
Environmental Engineer Senior
Office of Waste Permitting and Compliance

cc: Andrea Barbieri, EPA, Region III (3LC50)
Aziz Farahmand, DEQ, Blue Ridge Regional Office
Leslie Romanchik, DEQ, CO
Ashby Scott, DEQ, CO
Sonal Iyer, DEQ, CO
Pat McMurray, DEQ, CO
Hasan Keceli, DEQ, CO
Julia King-Collins, DEQ, CO
Central Hazardous Waste Files

ORDNANCE SYSTEMS INC.
 Radford Army Ammunition Plant
 4050 Pepper's Ferry Road
 Radford Virginia 24141

September 9, 2014

Mr. Russell McAvoy, P.E.
 Hazardous Waste Permitting
 Virginia Department of Environmental Quality
 629 East Main Street
 Richmond, Virginia 23219

**Subject: July 31, 2014 - Annual Soil Monitoring Event
 Soil Monitoring Program - Open Burning Ground (OBG)
 Radford Army Ammunition Plant, Radford, Virginia
 EPA ID#: VA1210020730**

Dear Mr. McAvoy:

During July 2014, Radford Army Ammunition Plant (RFAAP), located in Radford, Virginia, completed the annual soil sampling event at the Open Burning Ground (OBG). Laboratory results indicated the following constituents were detected at concentrations greater than their respective Permit-specified Action Levels (ALs).

Location/Analyte	Result mg/kg (1,2)	RL mg/kg (3)	Action Limit mg/kg	Action Limit Basis
2,4-Dinitrotoluene				
PAD-1	9.07	0.25	5.5	USEPA Region 3 - RSL Industrial Table- Nov 2013
PAD-4	13.4	1.23		
PAD-5	6.76	0.25	5.5	
Nitroglycerin				
PAD-3	174	2.5	62	USEPA Region 3 - RSL Industrial Table- Nov 2013
PAD-4	118	2.5	62	
Notes:				
(1) Event Date: July 31, 2014				
(2) Result reported on a dry weight basis				
(3) RL denotes Reporting Limit, reported on a dry weight basis. Also may be referenced as Quantitation Limit (QL) or Limit of Quantitation (LOQ).				

A verification event to confirm or refute the initial results noted above is scheduled for on or before September 30, 2014.

Additionally, VDEQ requested notification if 3,3-dimethylbenzidine is detected less than the Reporting Limit (RL), since the RL for this analyte, 1 mg/kg, and detection limit (DL), 0.5 mg/kg are greater than the AL of 0.16 mg/kg. For sample locations PAD-3, PAD-4 and PAD-6, the RL and DL for 3,3-dimethylbenzidine were adjusted due to sample dilution required to accurately quantitate a result for another target analyte. For this event, 3,3-dimethylbenzidine was not detected at or above the RL, DL, or the adjusted RL or the adjusted DL. Soil samples will continue to be analyzed for 3,3-dimethylbenzidine during future events. A summary of the adjusted RLs and DLs for 3,3-dimethylbenzidine is provided below.

ORDNANCE SYSTEMS INC.
Radford Army Ammunition Plant
4050 Pepper's Ferry Road
Radford Virginia 24141

March 9, 2015

Mr. Russell McAvoy, P.E.
Hazardous Waste Permitting
Virginia Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23219

**Subject: Soil Removal Work Plan
Soil Monitoring Program - Open Burning Ground (OBG)
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730**

Dear Mr. McAvoy:

On December 8, 2014, Radford Facility Army Ammunition Plant (RFAAP) completed soil sampling activities at the Open Burning Ground (OBG) in support of the hot-spot evaluation for nitroglycerin detected in soil above the permit Action Level (AL) at sample location PAD-3. Review of analytical data as part of the assessment suggests that the nitroglycerin concentrations greater than the permit AL at sample location PAD-3 are localized to the surficial soil (0-6 inches depth) at the original sample location specified in the permit for annual monitoring. As required by Permit Attachment II.C, Section 8.1, RFAAP submits the proposed soil removal work plan to address the impacted soil in the vicinity of PAD-3, estimated at approximately 40 cubic feet of soil to be removed for disposal.

Background:

Based on the results of the July 31, 2014 annual soil monitoring event and additional verification monitoring collected on September 18 and October 22, 2014 and as required by the permit, RFAAP submitted a proposed interim measure corrective action work plan on November 24, 2014. As required by Permit Attachment II.C and as detailed in the November 24, 2014 interim measure corrective action work plan, additional samples were collected on December 8, 2014 within a five-foot radius of the sample collection point (PAD-3). The December 8, 2014 additional hot spot soil sampling was required to assess the horizontal and vertical extent of impact for nitroglycerin at PAD-3. Four randomly selected soil sample points were selected within the diameter of the grid. Each sample point was sampled to a terminal depth of 24-inches below ground surface with discrete soil samples collected every six-inches. The results of this hot spot sampling event were submitted to the Virginia Department of Environmental Quality (VDEQ) on January 14, 2015. Nitroglycerin was not detected above the AL in any of the hot spot samples collected on December 8, 2014. Nitroglycerin was detected at concentrations significantly below the AL in samples collected from 0 to 6 inches below the surface. All samples collected from depths greater than 6 inches did not yield concentrations of nitroglycerin above the detection limit. This additional data continues to suggest the previously elevated nitroglycerin concentrations detected in soil at sample location PAD-3 were localized to surficial soil at the original sample location. Nitroglycerin analytical results collected as part of this assessment are summarized below.

Summary of Soil Analytical Results for Nitroglycerin – July - October, 2014

Location/Analyte (*)	Initial Event Result (July 31, 2014) mg/kg ⁽¹⁾	Verification Event Result (September 18, 2014) mg/kg ⁽¹⁾	Verification Event Result (October 22, 2014) mg/kg ⁽¹⁾	Action Limit mg/kg	Action Limit Basis
Nitroglycerin					
PAD-3	174	123	210	62	USEPA Region 3 - RSL Industrial Table- Nov 2013
PAD-3 Duplicate			266		
PAD-3N (north)			29		
PAD-3S (south)			29.6		
PAD-3E (east)			9.64		
PAD-3W (west)			2.69		
Notes: (1) Result reported on a dry weight basis, (*) all samples collected (0-6 inches)					

Summary of Soil Analytical Results for Nitroglycerin -Hot Spot Sampling Event – December 8, 2014

Location/Analyte	Hot Spot Event Result (December 8, 2014) mg/kg ⁽¹⁾	Action Limit mg/kg	Action Limit Basis
Nitroglycerin			
PAD-3 (0-6")	10.8	62	USEPA Region 3 - RSL Industrial Table- Nov 2013
PAD-3(0-6") Dup	17.0		
PAD-3 (6"-12")	ND		
PAD-3 (6"-12") Dup	ND		
PAD-3 (12"-18")	ND		
PAD-3 (12"-18") Dup	ND		
PAD-3 (18"-24")	ND		
PAD-3 (18"-24") Dup	ND		
Notes: (1) Result reported on a dry weight basis			

Soil removal work plan:

As summarized above, nitroglycerin concentrations above the permit AL for nitroglycerin were limited to the upper six inches of soil at the original sampling location for PAD-3 monitored under the permit. Due to the limited area of impact, a practical determination is made to remove all soil within the approximate five-foot radius investigated during the hot spot evaluation to a depth of six inches. This soil will be excavated using a mechanical backhoe under the supervision of an authorized representative of RFAAP. It is estimated approximately 40 cubic feet of soil will be removed for disposal. Soil excavated will be placed in a DOT approved covered roll-off container and staged pending waste characterization. The container will be labeled as hazardous waste and dated as a 90-day accumulation area, pending analytical results. A single composite sample will be collected by combining five aliquots of soil from different portions of the excavated soil. The sample will be analyzed for RCRA TCLP and 2,4-Dinitrotoluene. If the excavated soil is determined to be hazardous it will be manifested as such and transported to a permitted hazardous waste treatment or disposal facility. If the excavated soil is found to be non-hazardous it will be transported as industrial waste and disposed of at the First Piedmont Landfill.

Upon completion of the excavation, six aliquots of soil will be randomly collected from the excavation base and sidewalls to confirm removal of impacted media. Two soil aliquots will be collected from the sidewalls and four from the base of the excavation. All soil aliquots will be combined into a single composite soil sample. The soil sample will be submitted to Microbac Laboratories, Ohio Valley Division (Microbac), of Marietta, Ohio, under chain of custody for nitroglycerin analysis (SW-846 Method 8330B). Microbac is accredited under the Virginia Environmental Laboratory

Accreditation Program (VELAP) for the method, matrix and analyte specified. Sample collection efforts and laboratory analysis will be completed in accordance with the permit.

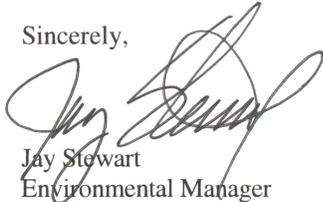
Remaining aliquots of soil following composition will be disposed with the excavated soil. All other investigation derived waste will be collected and disposed of in accordance with the permit. Excavation activities will commence pending VDEQ approval of this soil removal work plan.

Following collection of the confirmatory soil samples, the excavated area will be filled to the original grade using borrow sources available within RFAAP. If the confirmatory sample returns results above the permit AL for nitroglycerin, the borrow material will be removed and additional soil excavated. The process of excavation and confirmatory sampling will continue until the action levels for nitroglycerin are no longer exceeded or bedrock or groundwater is encountered.

A complete report of the removal actions will be prepared and submitted to the VDEQ within 30-days of completion of the removal activities.

If you have any questions or concerns, please contact Mr. Matt Alberts at (540)-639-8722 (matt.alberts@baesystems.com).

Sincerely,



Jay Stewart
Environmental Manager
BAE Systems, Ordnance Systems Inc

c: Aziz Farahmand, VDEQ-BRRO
Rebecca Wright, VDEQ-BRRO

bc: BAE Administrative File
J. McKenna, ACO Staff
Matt Alberts, BAE Staff
Mike Lawless, Draper Aden Associates
Env. File

Coordination:



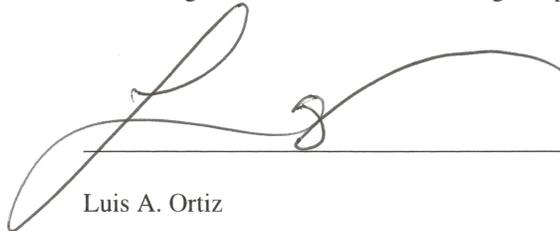
J. McKenna

Concerning the following:

Open Burning Ground (OBG) – Soil Monitoring Program
Soil Removal Work Plan
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730
Soil Removal Work Plan

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 fines and imprisonment for knowing violations.

SIGNATURE:



PRINTED NAME:

Luis A. Ortiz

TITLE:

Lieutenant Colonel, US Army
Commanding

SIGNATURE:

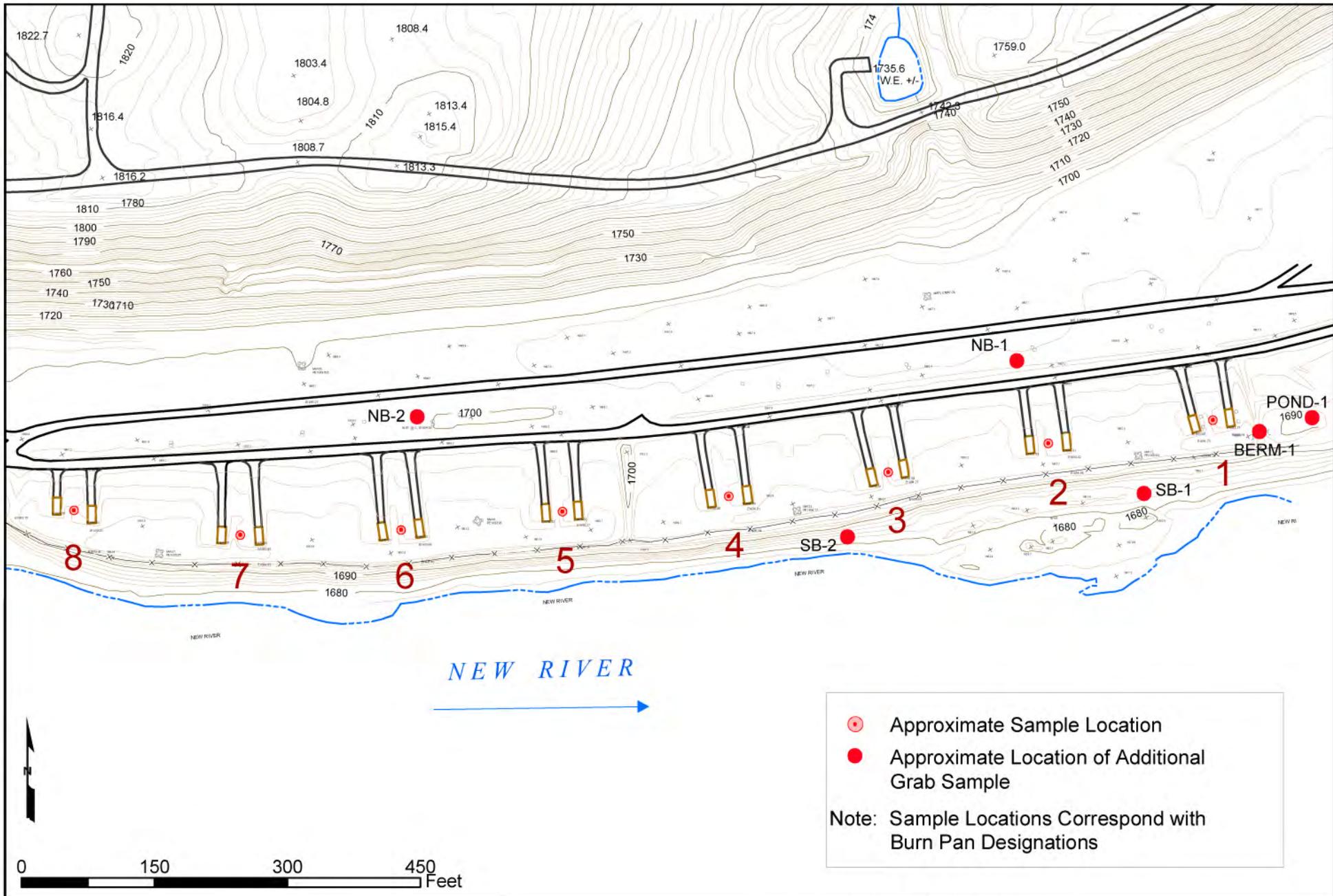


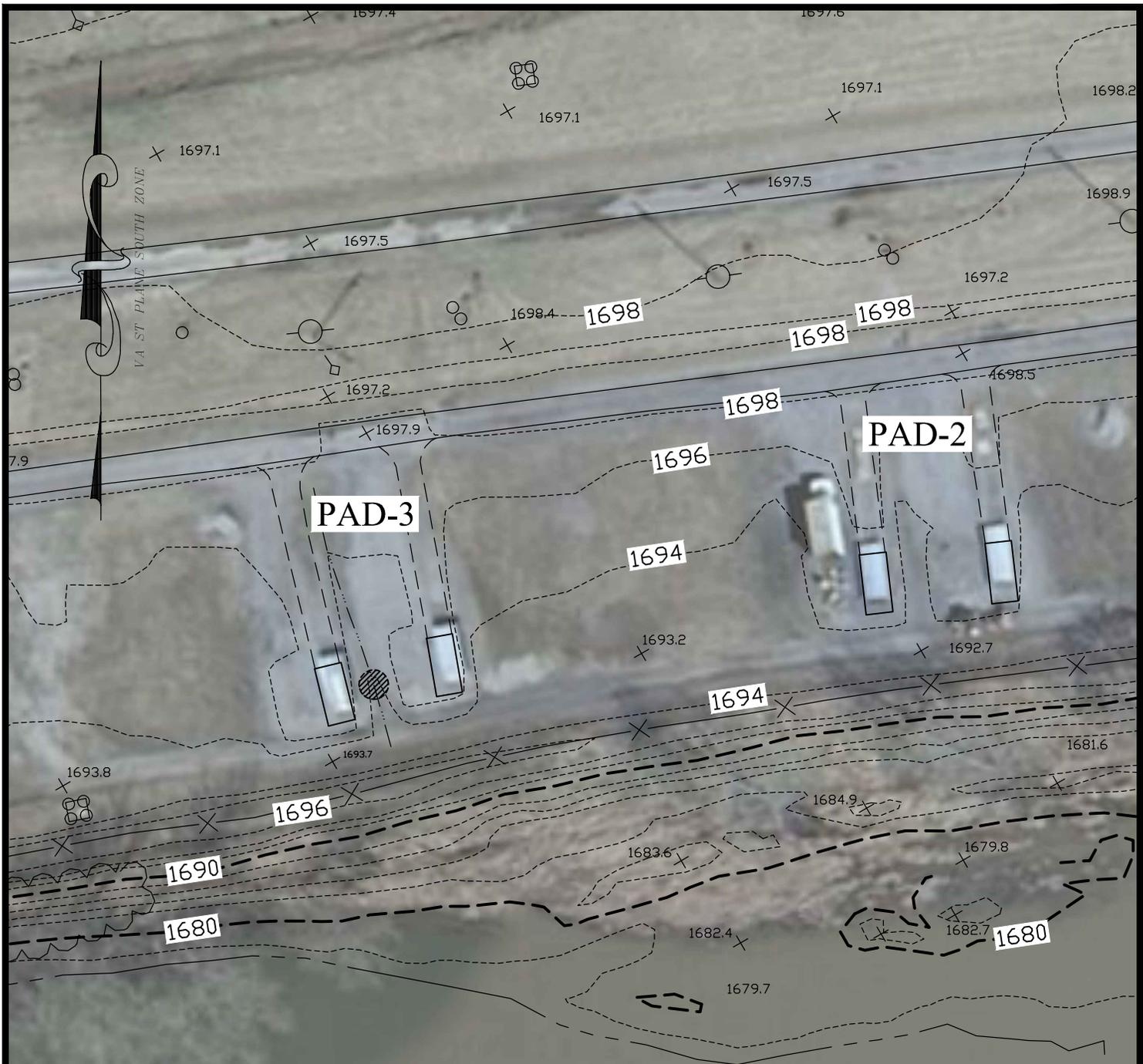
PRINTED NAME:

William M. Barnett

TITLE:

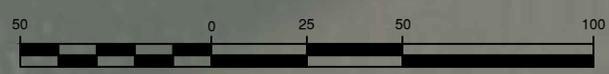
General Manager
BAE Systems





New River

GRAPHIC SCALE



(IN FEET)
1 inch = 50ft.

LEGEND
 "PAD-3" SAMPLE LOCATION (APPROXIMATE)

SAMPLE LOCATION PAD-3 VICINITY MAP
OBG - SOIL MONITORING PROGRAM
SOIL REMOVAL PROGRAM

SCALE: 1" = 50'
PLAN NO. B03204-208



Draper Aden Associates
Engineering • Surveying • Environmental Services
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 Blacksburg, VA 24060
 540-552-0444 Fax: 540-552-0291

Richmond, VA
 Charlottesville, VA
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 Coats, NC

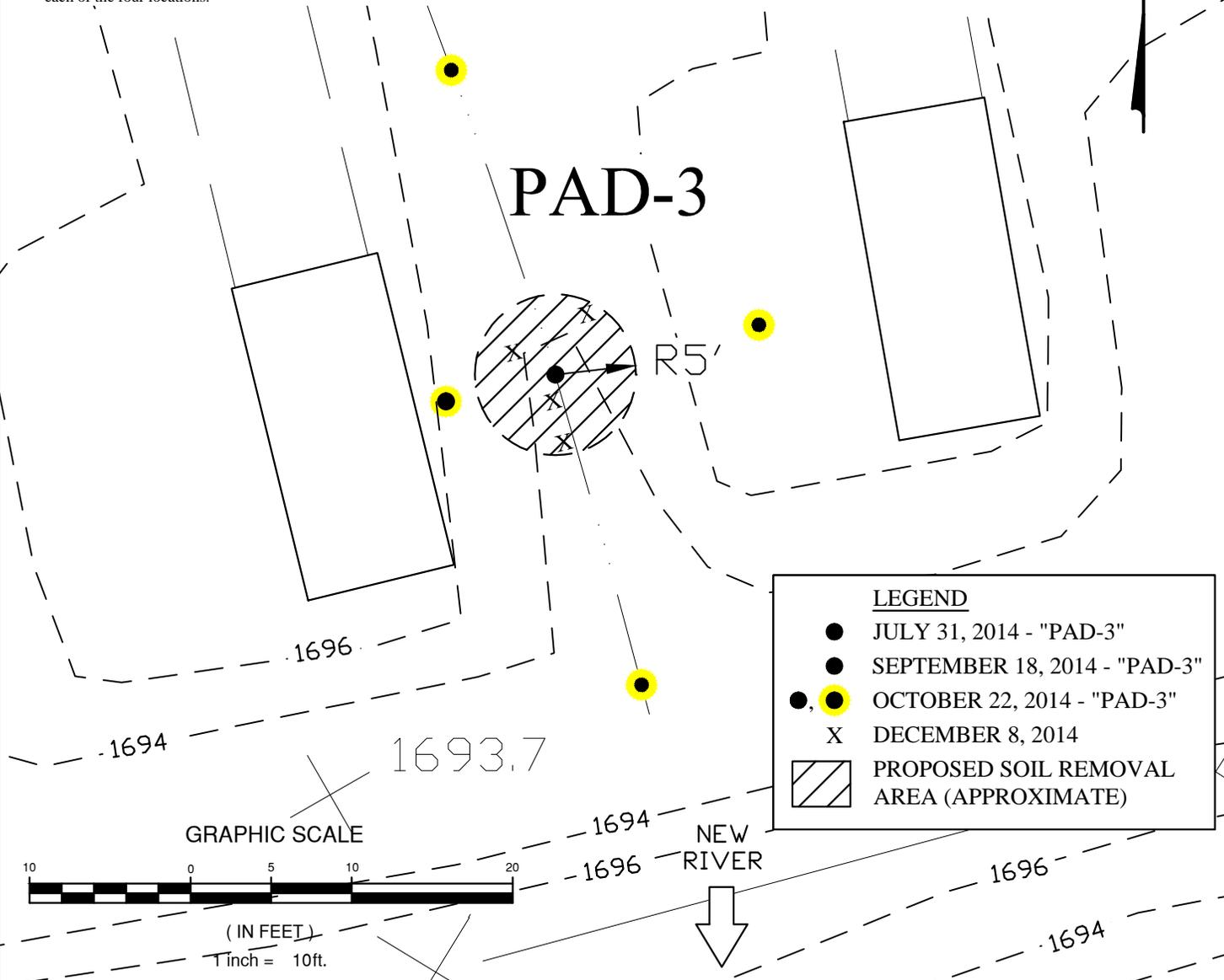
DESIGNED JCF
DRAWN DLD
CHECKED SN
DATE 04/14/15

FIGURE
 2

P:\B03200\B03204\B03204-208\CAD\B03204-139_Sample Location 3.dwg Apr 14, 2015 4:17pm

Sample Collection Notes:

- Designated soil sampling locations are approximate.
- Samples collected in accordance with *Final Permit for the Treatment of Hazardous Waste by Open Burning* (Final Permit; effective date October 28, 2005; modified September 27, 2011; and June 12, 2014) - Permit Attachment II.C - *Soil Monitoring Program for the Open Burning Ground*.
- Soil samples identified as "PAD-3" collected on July 31, 2014 (original sampling event), September 18, 2014 (verification event) and October 22, 2014 (additional verification event) were collected from approximately the same sample collection point and collected as a grab sample from a depth of 0-6 inches below ground surface. The sample collection point corresponds to an area of low topography of the erosion channel located between two burn pans situated in the area designated burn pad location 3 at the Open Burning Ground (OBG). Field confirmation of sample collection point "PAD-3" was based on observation of a depression in the soil remaining from the July 2014 sample collection. Subsequent sampling efforts were required due to a detection of nitroglycerin above the permit action limit at PAD-3
- The October 2014 additional sampling event also consisted of four soil samples collected approximately 20 feet in all directions (i.e., north, south, east, and west) of the original detection of nitroglycerin at PAD-3.
- The December 2014 Hot Spot evaluation sampling event also consisted of four soil samples randomly collected within a five-foot radius grid surrounding the original sample collection point, "PAD-3." Soil samples were collected at each location to a terminal depth of 24-inches below ground surface with a discrete aliquot collected every six inches. Aliquots from each six-inch interval (e.g., 0-6 inches) were composited with the same corresponding interval collected from each of the four locations.



LEGEND	
●	JULY 31, 2014 - "PAD-3"
●	SEPTEMBER 18, 2014 - "PAD-3"
● ●	OCTOBER 22, 2014 - "PAD-3"
X	DECEMBER 8, 2014
	PROPOSED SOIL REMOVAL AREA (APPROXIMATE)

SAMPLE LOCATION PAD-3
OBG - SOIL MONITORING PROGRAM
SOIL REMOVAL PROGRAM

SCALE: 1" = 10'
 PLAN NO. B03204-208



Draper Aden Associates
Engineering • Surveying • Environmental Services
 2206 South Main Street
 Blacksburg, VA 24060
 540-552-0444 Fax: 540-552-0291

Richmond, VA
 Charlottesville, VA
 Hampton Roads, VA
 Coats, NC

DESIGNED	JCF
DRAWN	DLD
CHECKED	SN
DATE	04/14/15

FIGURE
 3

Location	Result	Adjusted RL (mg/kg)	Adjusted Detection Limit (mg/kg)	Action Level (mg/kg)	Action level Basis
3,3-Dimethylbenzidine					
PAD-3	ND	10	5.3	0.16	Region III RSL Industrial (RSL Table dated Nov 2013)
PAD-4	ND	5.5	2.8		
PAD-6	ND	11	5.3		

Note: ND Denotes not detected

If you have any questions or concerns, please contact Mr. Matt Alberts at 540/639-8722 (matt.alberts@baesystems.com).

Sincerely,

L. Kaye Bland
for

Jay Stewart, Environmental Manager
BAE Systems, Ordnance Systems Inc.

c: Aziz Farahmand, VDEQ-BRRO (w/ enclosure)

bc: BAE Administrative File
J. McKenna, ACO Staff
Matt Alberts, BAE Staff
M. Lawless, Draper Aden Assoc.
Env. File

Coordination:

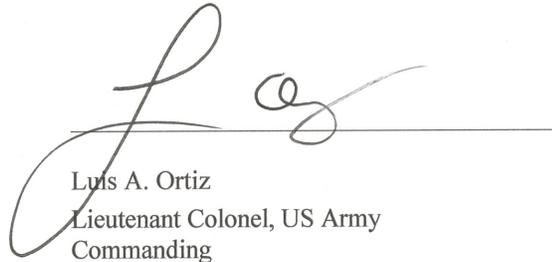
J. McKenna
J. McKenna

Concerning the following:

*Open Burning Ground (OBG) – Soil Monitoring Program
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730
For the July 31, 2014 Soil Monitoring Event*

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 fines and imprisonment for knowing violations.

SIGNATURE:



PRINTED NAME:

Luis A. Ortiz

TITLE:

Lieutenant Colonel, US Army
Commanding

SIGNATURE:



PRINTED NAME:

William M. Barnett

TITLE:

General Manager
BAE Systems