Final
Construction Completion Report

Time Critical Response Action for the Rocket Ridge Area of Open Demolition Area #2 (*RVAAP-004-R-01 Open Demolition Area #2 MRS*)
Military Munitions Response Program
Ravenna Army Ammunition Plant
Ravenna, Ohio

September 2008

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FINAL
CONSTRUCTION COMPLETION REPORT

TIME CRITICAL RESPONSE ACTION *for the*
ROCKET RIDGE AREA OF OPEN DEMOLITION AREA #2
(*RVAAP-004-R-01 Open Demolition Area #2 MRS*)

MILITARY MUNITIONS RESPONSE PROGRAM
RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO

Submitted To:

US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
CENWO-PM-HC
1616 Capitol Avenue, Suite 9000
OMAHA, NE 68102-4901

Prepared By:

engineering-environmental Management, Inc.
2751 Prosperity Avenue, Suite 200
Fairfax, Virginia 22031

Contract Number DACA-63-03-D0009
Task Order No.: DK01

September 2008

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Devin Scherer	e^2M/ Env. Scientist	1	0	0
Daniel Zugris	e^2M/ PM	1	0	1

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List of Appendices

Abbreviations and Acronyms	
CCR	Construction Completion Report
DMM	Discarded Military Munitions
e^2M	engineering-environmental Management, Inc.
MC	Munitions Constituents
MD	Munitions Debris
MEC	Munitions and Explosives of Concern
MMRP	Military Munitions Response Program
MRS	Munitions Response Site
ODA2	Open Demolition Area #2
OE	Ordnance and Explosives
OHARNG	Ohio Army National Guard
Ohio EPA	Ohio Environmental Protection Agency
O&M	Operations and Maintenance
PIKA	PIKA International
RAB	Restoration Advisory Board
RVAAP	Ravenna Army Ammunition Plant
SI	Site Inspection
TCRA	Time Critical Response Action
USACE	United States Army Corps of Engineers
USAEC	United States Army Environmental Command
UXO	Unexploded Ordnance

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1.0 INTRODUCTION

Ravenna Army Ammunition Plant (RVAAP), Federal Facility Identification number: OH213820736, is located in northeastern Ohio, within Portage and Trumbull Counties, approximately three miles east northeast of the city of Ravenna and approximately one mile northwest of the city of Newton Falls.

engineering-environmental Management, Inc. (e²M) has been performing work at RVAAP as part of the Military Munitions Response Program (MMRP), Contract Number DACA63-03-D0009, Task Order Number DK01, which investigates other than operational ranges and other sites with known or suspected unexploded ordnance (UXO), discarded military munitions (DMM), or munitions constituents (MC). The ongoing e²M work at RVAAP consists of a Site Inspection (SI) of 18 Munitions Response Sites (MRSs) and a Time Critical Response Action (TCRA) at the Rocket Ridge Area of the Open Demolition Area #2 (ODA2) MRS. For a detailed description of RVAAP, scope and methodology of the SI activities, Safety and Health procedures, and SI findings and conclusions, see the Final SI Work Plan and Final SI Report, both prepared by e2M and dated September 2007 and May 2008, respectively.

Rocket Ridge is a steep embankment approximately 500-feet long and 25-feet high located adjacent to Sand Creek within the ODA2 MRS (Army Environmental Database-Restoration Number RVAAP-004-R-01). The MRS was used for munitions demilitarization, including detonation of large caliber munitions and off-specification bulk explosives that could not be deactivated or demilitarized by any other means. The Rocket Ridge slope was likely used for the disposal of demilitarized munitions, although not all munitions appear to have been completely demilitarized. Munitions-related items that could be identified in June 2007 by PIKA International (PIKA), RVAAP's Ordnance and Explosives (OE) Subcontractor, included 75-millimeter and 105-millimeter rounds, booster cups, three 500-pound bombs, white phosphorus rifle grenades, fuzes, and burster tubes. It appears that the munitions were transported from the demolition site to the Rocket Ridge Area of ODA2 and dumped at the top of the slope. Sand Creek flows in an eastward direction along the northern boundary of Rocket Ridge, at the toe of the slope. Due to the steep slope of the disposal area and the

stream bank erosion resulting from high water events, some of the munitions materials have reached Sand Creek.

On 18 June 2007, a rifle grenade containing white phosphorus exploded on the slope of the Rocket Ridge Area of ODA2. The Incident Report attributed the cause of the explosion to a corroded white phosphorus grenade that might have been overturned by an animal, which exposed the white phosphorus to air, resulting in its auto-igniting, which heated the grenade until the internal burster exploded. No injuries resulted from the incident.

The purpose of the TCRA is to prevent the downstream movement of munitions and explosives of concern (MEC) and Munitions Debris (MD) within Sand Creek. This objective was met by the construction of Engineering Controls consisting of a barrier system within Sand Creek, at a location downgradient of the farthest visible piece of munitions-related material that may have migrated from Rocket Ridge. The location of the farthest visible piece of munitions-related material and the location of the barrier system were identified during a field survey conducted by e^2M, the Ohio Environmental Protection Agency (Ohio EPA), and the United States Army Corps of Engineers (USACE), Louisville District, on 5 and 6 November 2007.

The barrier system location is approximately 2,700 feet downstream of the Rocket Ridge Area of ODA2 and 42 feet upstream of George Road Bridge. The construction of the barrier system was performed in accordance with the approved plans included in the Final TCRA Plan, prepared by e^2M and dated March 2008. The barrier system was constructed between 8 and 16 July 2008. This Construction Completion Report (CCR) documents the construction activities and the as-built system.

2.0 SCOPE OF TIME CRITICAL RESPONSE ACTION ACTIVITIES

The TCRA for the Rocket Ridge Area of ODA2 consists of the following steps:

- **Scoping Meeting:** The Scoping Meeting was held on 20 September 2007 at RVAAP. The purpose of this meeting was to discuss the current conditions at the Rocket Ridge Area of ODA2, to visit Rocket Ridge, and to determine the short term measures necessary to minimize the risks associated with the site.
- **Sand Creek Survey Work Plan:** A stream survey was deemed necessary for the development of the TCRA Plan. The work plan supporting the survey was finalized and submitted on 24 October 2007.
- **Sand Creek Survey:** The stream survey was conducted on 5 and 6 November 2007. The survey determined the location of the farthest visible piece of munitions-related material that may have migrated from Rocket Ridge and identified a suitable location for the barrier system.
- **TCRA Plan**: The TCRA Plan included the design of the barrier system and the Operations and Maintenance (O&M) Plan. The Final TCRA Plan was submitted on 21 March 2008.
- **Barrier System Construction:** This step consisted of the actual construction of the barrier system. The construction was completed on 16 July 2008.
- **Construction Completion Report** (i.e., this document)**:** The CCR documents the construction activities and the as-built system.
- **Barrier System O&M Activities:** During the O&M phase, the barrier system will be regularly maintained following the schedule and methodology in the Final O&M Plan, Sand Creek Barrier System, prepared by e^2M in collaboration with PIKA.

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3.0 CONSTRUCTION ACTIVITIES

Construction of the barrier system took place over five days between 8 and 16 July, 2008. The barrier system materials were fabricated by Ametco at their Willoughby, Ohio plant. The construction was performed by Able Fence, a company located in Eastlake, Ohio. e^2M performed construction coordination and oversight. Installation of the barrier system followed the approved TCRA Plan drawings.

The construction operations were initiated on 8 July, 2008, with an onsite project and safety briefing attended by representatives of RVAAP, Ohio EPA, Ohio Army National Guard (OHARNG), Able Fence, PIKA, and e^2M. Prior to accessing the construction site, PIKA conducted a magnetometer-aided screening of the area to confirm the absence of any munitions-related materials.

The barrier system was constructed on 8, 11, 14, 15, and 16 July (no onsite work was conducted on 9 and 10 July due to rain and subsequent high water). An onsite construction completion briefing was held in the afternoon of 16 July. Representatives from RVAAP, Ohio EPA, OHARNG, Able Fence, PIKA, and e^2M participated in the briefing.

The barrier system is comprised of two parallel rigid screens crossing Sand Creek. The screens were installed at 42- and 66-feet upstream of George Road Bridge. The screen panels of the upstream barrier have 3-inch openings, while the panels of the downstream barrier have 1-inch openings. Each of the barriers consists of four solid steel square posts, with attached diagonal stay posts and base plates (see as-built details in **Appendix A**), and five screen panels (**Photograph 1**). All of the barrier materials are galvanized and polyester powder coated green. As depicted in the **Photograph 1**, the barriers were installed to the contour of the stream floor.

Photograph 1. Completed Barrier System

Prior to construction, the water flow was temporarily diverted using sand bags. Pneumatic rotary hammer equipment was used to drill holes for the barrier posts and diagonal stay posts. To securely attach the base plates to the stream floor, the rock surface was flattened at some locations (see **Photograph 2)**. The base plates were attached using one solid galvanized steel pin and two anchors. Each post and pin was set in an underwater grout (Euco Tremie Grout) and the anchors were set in epoxy (Hilti HIT-RE 500). Drawings of as-built construction details can be found in **Appendix A**.

A gas-powered chop saw was used to cut a 1.5-inch wide channel in the sandstone bedrock. The cut extended the width of the screen system to allow each screen panel to sit below the surface of the bedrock. The sides of the barriers were buried into the stream banks. This construction ensured that there are no gaps between the screen panels and the stream floor and stream banks. In addition, the screen panels were overlapped to increase the overall barrier rigidity and strength (**Photograph 3**).

Daily construction activities were documented in a Daily Quality Control Report; these reports are included in **Appendix B**. Each morning, a safety briefing was held at the site to discuss the planned activities and potential safety concerns. The daily tailgate safety meeting forms are included in **Appendix C**.

All of the changes to the TCRA Plan, such as the final barrier location and custom-made barrier materials, were summarized in a Field Change Request that was approved by Ohio EPA and USACE, Omaha District. The Field Change Request Form is included in **Appendix D**.

A photographic log detailing the construction activities can be found in **Appendix E**.

Appendix F lists the spare construction materials ordered by e^2M in support of the O&M activities. During the lifetime of the barrier system, some damage to the screens is expected. Because most of the materials are custom-made, their fabrication takes six to eight weeks. e^2M ordered the materials listed in **Appendix F** to shorten the time required for barrier repairs during the O&M of the system. The spare materials are stored at RVAAP in Building 1045.

Photograph 2. Diagonal Stay Post and Base Plate

Photograph 3. Overlapping Fence Panels

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4.0 REFERENCES

e²M, 2007 engineering-environmental Management, Inc. (e²M). Final SI Work Plan, Military Munitions Response Program, Ravenna Army Ammunition Plant, Ohio, September 2007.

e²M, 2007 engineering-environmental Management, Inc. (e²M). Final Work Plan for Sand Creek Survey, Rocket Ridge Area of Open Demolition Area #2, Military Munitions Response Program, Ravenna Army Ammunition Plant, Ohio, October 2007.

e²M, 2008 engineering-environmental Management, Inc. (e²M). Final Time Critical Response Action Plan, Rocket Ridge Area of Open Demolition Area #2, Military Munitions Response Program, Ravenna Army Ammunition Plant, Ohio, March 2008.

e²M, 2008 engineering-environmental Management, Inc. (e²M). Final SI Report, Military Munitions Response Program, Ravenna Army Ammunition Plant, Ohio, May 2008.

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APPENDIX A
SAND CREEK BARRIER SYSTEM AS-BUILT DETAILS

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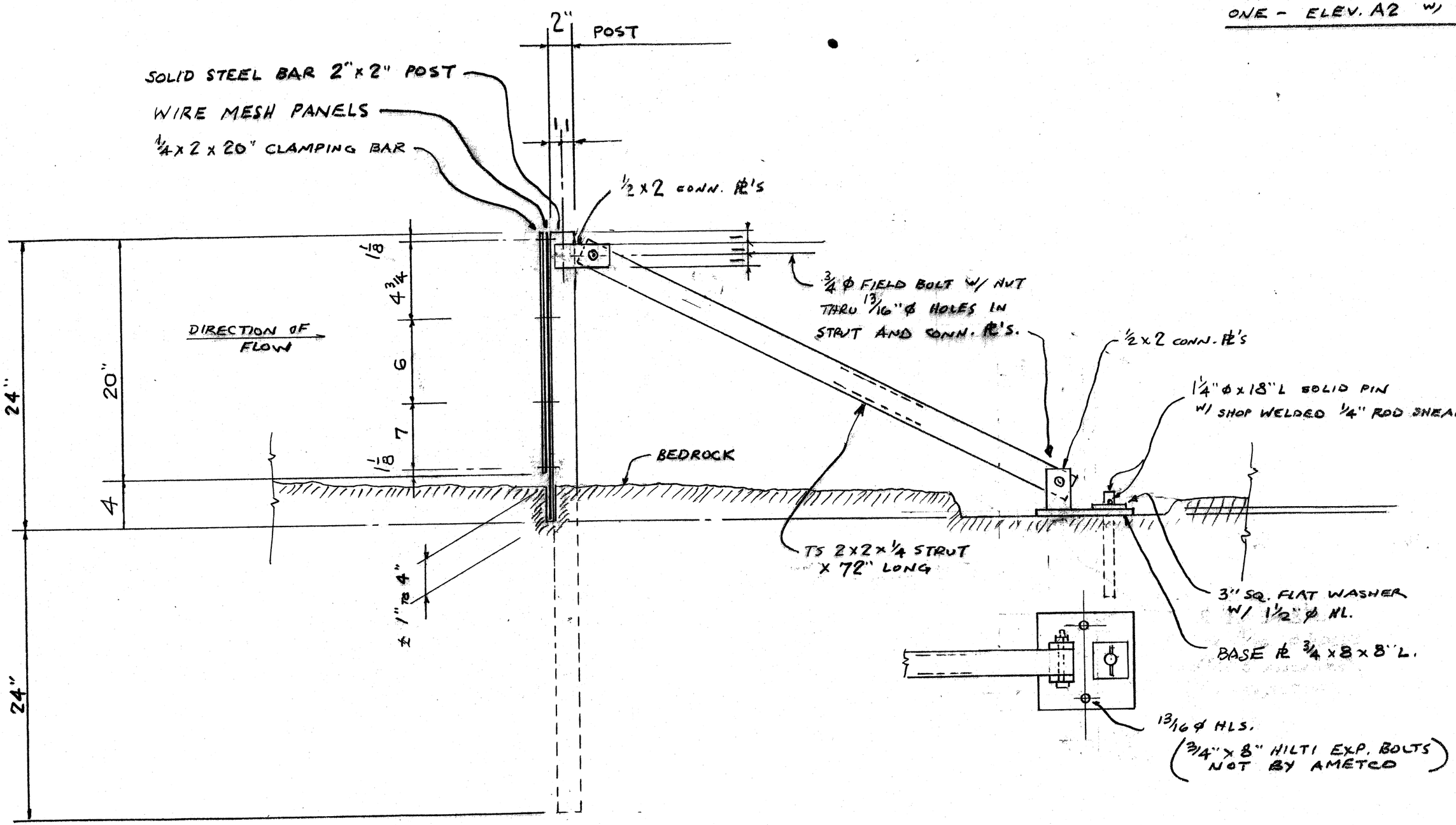
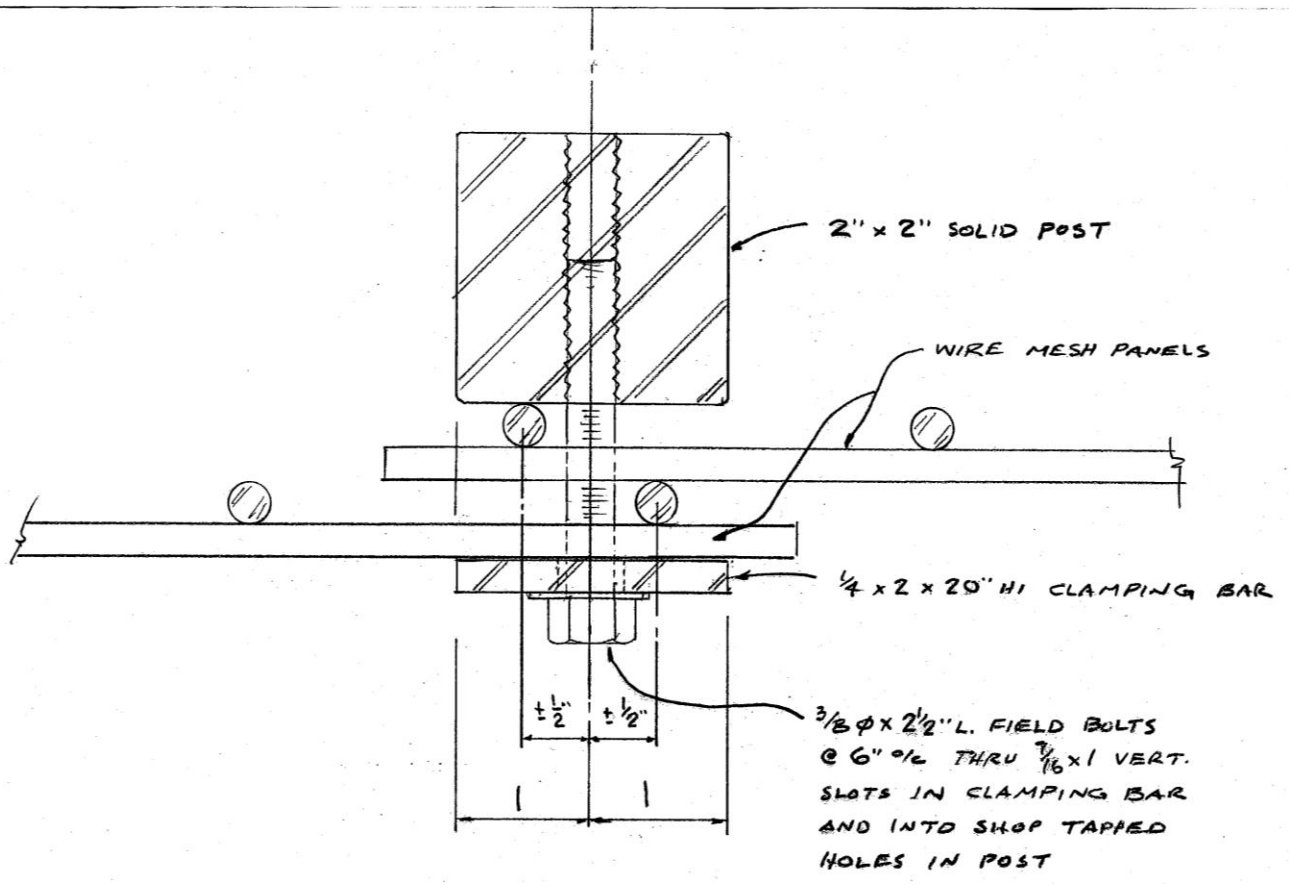
ONE - ELEV. A1 W/ 3x3 W

ONE - ELEV. A2 W/ 1x1 W



SECTION 1/1


2" x 2" SOLID POST
WIRE MESH PANELS
1/4 x 2 x 20" HI CLAMPING BAR
± 1/2"
± 1/2"
3/8 ϕ x 2 1/2" L. FIELD BOLTS @ 6" o/c THRU 9/16 x 1 VERT. SLOTS IN CLAMPING BAR AND INTO SHOP TAPPED HOLES IN POST

APPENDIX B

DAILY QUALITY CONTROL REPORTS

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Daily Quality Control Report

Date: 08 July 2008

Project Information	
Technical Project Manager:	Daniel Zugris
Project:	Sand Creek Barrier System Construction Ravenna Army Ammunition Plant, OH
Project Number:	4100-979

Environmental Conditions	
Weather Conditions (Bright Sun, Clear, Overcast, Rain, Snow):	Clear
Temperature:	75-80
Wind (Still, Moderate, High):	Still
Humidity (Dry, Moderate, Humid):	Moderate

Personnel (include title and affiliation)
e²M Personnel: Daniel Zugris (e²M, Technical Project Manger), Devin Scherer (e²M, Staff Scientist)
Visitors Present: Eileen Mohr & Todd Fisher (Ohio EPA), Katie Elgin (OHARNG)
Subcontractor Personnel: Don Zadorozny (Able Project Manger), Merle Bryson (Able Foreman, David Seiler (Able), Tim Roberts (Able), Mel Lau (Pika)
Others:

1. Work Activities. A health and safety meeting was conducted prior to commencement of work. Mel Lau (Pika) discussed how to identify munitions and munitions debris and their associated hazards. Katie Elgin (OHARNG) discussed the current use of the area as a range and the associated hazards. It was established that construction crew will not enter the range area past the parking/storage area at the top of the hill. If human remains are discovered Katie Elgin will be contacted. Other hazards covered slips, trips and falls and use of rotary/hammer equipment.

Daily Quality Control Report

Mel Lau surveyed the work area for munitions/debris including the stream and banks. No items were discovered.

Daniel Zugris (e²M), Devin Scherer (e²M), and Merle Bryson (Able) discussed the placement and installation of each barrier. The first barrier (3" panels) will be installed 66' from George Road Bridge and the second barrier (1" panels) will be installed at 42'.

Area on banks of the stream, where panels are to be dug into, was cleared of vegetation. Mel Lau watched to identify any munitions or debris was found.

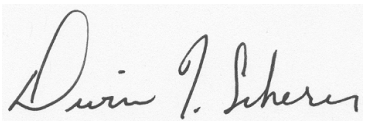
Sand bags were placed to divert water from work area in stream. Two post holes drilled.

Twelve photographs taken.

2. Deviations from the TCRA Plan: As stated in the TCRA Plan, the barriers were to be installed at 26' and 16' from George Road Bridge. Because the stream bottom is more level further upstream, it was decided to install the barriers at 66' and 42' from George Road Bridge. A Field Change Request form was submitted to USACE-Omaha.

Preparer:

Devin Scherer

Signature: 

Daily Quality Control Report

Date: 09 July 2008

Project Information	
Technical Project Manager:	Daniel Zugris
Project:	Sand Creek Barrier System Construction Ravenna Army Ammunition Plant, OH
Project Number:	4100-979

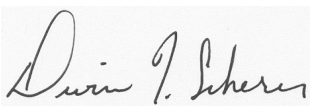
Environmental Conditions	
Weather Conditions (Bright Sun, Clear, Overcast, Rain, Snow):	Overcast/light rain
Temperature:	69
Wind (Still, Moderate, High):	Still
Humidity (Dry, Moderate, Humid):	Moderate

Personnel (include title and affiliation)
e²M Personnel: Daniel Zugris (e²M, Technical Project Manger), Devin Scherer (e²M, Staff Scientist)
Visitors Present: None
Subcontractor Personnel: Merle Bryson (Able Foreman, David Seiler (Able), Tim Roberts (Able)
Others:

1. Work Activities. Rain over the past night increased water level and flow. No work was performed today. Some sand bags were moved several feet from where they were placed the previous day. One photograph taken.

2. Deviations from the TCRA Plan: No work performed.

Preparer:
Devin Scherer

Signature: 

engineering-environmental Management, Inc.
2751 Prosperity Avenue, Fairfax VA 22042• (703) 752-7755 • Fax (703) 752-7754

Daily Quality Control Report

Date: 11 July 2008

Project Information	
Technical Project Manager:	Daniel Zugris
Project:	Sand Creek Barrier System Construction Ravenna Army Ammunition Plant, OH
Project Number:	4100-979

Environmental Conditions	
Weather Conditions (Bright Sun, Clear, Overcast, Rain, Snow):	Partial Clouds
Temperature:	75
Wind (Still, Moderate, High):	Still
Humidity (Dry, Moderate, Humid):	Moderate

Personnel (include title and affiliation)
e²M Personnel: Devin Scherer (e²M, Staff Scientist)
Visitors Present: Todd Fisher (Ohio EPA), Katie Elgin (OHARNG)
Subcontractor Personnel: Merle Bryson (Able Foreman), David Seiler (Able),
Others:

I. Work Activities. Health and safety topics covered safe equipment use; slips, trips and falls; first aid kit located in e²M vehicle, and fire extinguisher on Able truck.

Due to rain on 7/8, sand bags had to be placed back to divert water flow from work area.

A channel/trench, approximately 2.5” in depth and 1.5” wide was cut in to the stream for placement of barrier panels. Also, the panel going into the left bank (when looking from George Road Bridge) was installed approximately 2.5’ into the bank. Three posts and panels and two back braces were installed. Posts were grouted using an underwater water grout.

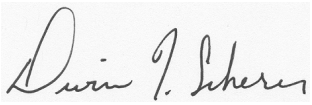
Daily Quality Control Report

Katie Elgin and Todd Fisher visited job site. We discussed progress and general construction techniques used to install barrier.

Seven photographs taken.

2. Deviations from the TCRA Plan: None

Preparer:
Devin Scherer

Signature: 

Daily Quality Control Report

Date: 14 July 2008

Project Information	
Technical Project Manager:	Daniel Zugris
Project:	Sand Creek Barrier System Construction Ravenna Army Ammunition Plant, OH
Project Number:	4100-979

Environmental Conditions	
Weather Conditions (Bright Sun, Clear, Overcast, Rain, Snow):	Partial Clouds
Temperature:	75
Wind (Still, Moderate, High):	Still
Humidity (Dry, Moderate, Humid):	Moderate

Personnel (include title and affiliation)
e²M Personnel: Devin Scherer (e²M, Staff Scientist)
Visitors Present: None
Subcontractor Personnel: Merle Bryson (Able Foreman), David Seiler (Able), Tim Roberts (Able)
Others:

I. Work Activities. Health and safety topics covered safe equipment use; slips, trips and falls; first aid kit located in e²M vehicle, and fire extinguisher on Able truck.

Continued from Friday, the channel/trench for the barrier panels was extended to the whole length of the barrier. The panel going into the right bank (when looking from George Road Bridge) was extended approximately 2.5' into the bank.

Some rock had to cut and chiseled in the area where the back bracing plate was attached in order to make the plate as level as possible for secure attachment.

First barrier system completed. In all, four posts with back bracing and five panels were installed. All post holes were filled with grout. Each of the back bracing

plates were attached to the bedrock with an 18" pin set in grout and two anchor bolts set in epoxy. Panels were placed in channel and bolted to posts using a clamping plate.

Rocks were placed in the area that was excavated for panels extending into the banks of the stream.

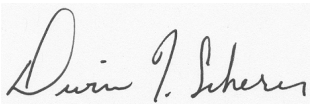
To the greatest extent possible, rocks in the stream were moved downstream of the barrier.

Sand bags were moved to divert water for second barrier.

Twelve photographs taken.

2. Deviations from the TCRA Plan: None

Preparer:
Devin Scherer

Signature: 

Daily Quality Control Report

Date: 15 July 2008

Project Information	
Technical Project Manager:	Daniel Zugris
Project:	Sand Creek Barrier System Construction Ravenna Army Ammunition Plant, OH
Project Number:	4100-979

Environmental Conditions	
Weather Conditions (Bright Sun, Clear, Overcast, Rain, Snow):	Partial Clouds
Temperature:	75
Wind (Still, Moderate, High):	Still
Humidity (Dry, Moderate, Humid):	Moderate

Personnel (include title and affiliation)
e²M Personnel: Devin Scherer (e²M, Staff Scientist)
Visitors Present: None
Subcontractor Personnel: Merle Bryson (Able Foreman), David Seiler (Able), Tim Roberts (Able)
Others:

I. Work Activities. Health and safety topics covered safe equipment use; slips, trips and falls; first aid kit located in e²M vehicle, and fire extinguisher on Able truck.

Began installation of 1-inch panel barrier. Panel system placement was delineated with line from one stream bank to the other.

Installation was conducted same as first barrier (e.g. rotary hammer drill for holes and chop saw with diamond blade for cutting trench).

Some rock had to cut and chiseled in the area where the back bracing plate was attached in order to make the plate as level as possible for secure attachment. Some of the bank was excavated for the first panel to be buried into the bank.

Daily Quality Control Report

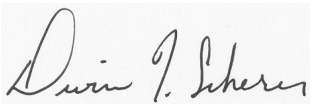
Rocks were placed in the area that was excavated.

First two panels, posts and back bracing installed. Post holes were filled with grout. Each of the back bracing plates were attached to the bedrock with an 18" pin set in grout and two anchor bolts set in epoxy. Panels were placed in trench and bolted to posts using a clamping plate.

One photograph taken.

2. Deviations from the TCRA Plan: None

Preparer:
Devin Scherer

Signature: 

Daily Quality Control Report

Date: 16 July 2008

Project Information	
Technical Project Manager:	Daniel Zugris
Project:	Sand Creek Barrier System Construction Ravenna Army Ammunition Plant, OH
Project Number:	4100-979

Environmental Conditions	
Weather Conditions (Bright Sun, Clear, Overcast, Rain, Snow):	Partial Clouds
Temperature:	75
Wind (Still, Moderate, High):	Still
Humidity (Dry, Moderate, Humid):	Moderate

Personnel (include title and affiliation)
e²M Personnel: Devin Scherer (e²M, Staff Scientist)
Visitors Present: Eileen Mohr, Todd Fisher, Brian Stockwell, Sue Boles, Mel Lau, Mark Patterson, Irv Venger
Subcontractor Personnel: Merle Bryson (Able Foreman), David Seiler (Able), Tim Roberts (Able)
Others:

I. Work Activities. Health and safety topics covered safe equipment use; slips, trips and falls; first aid kit located in e²M vehicle, and fire extinguisher on Able truck.

Continued installation of 1-inch panel barrier. Drilled last two post holes

Some rock had to cut and chiseled in the area where the back bracing plate was attached in order to make the plate as level as possible for secure attachment. Some of the bank was excavated for the last panel (on right) to be buried into the bank. Rocks were placed in the area around the panel that was excavated.

Last two panels, posts and back bracing installed. Post holes were filled with

grout. Each of the back bracing plates were attached to the bedrock with an 18" pin set in grout and two anchor bolts set in epoxy. Panels were placed in trench and bolted to posts using a clamping plate.

Both barriers have been completed. The 3-inch barrier measures 34 feet and the 1-inch barrier measures 35.25 feet.

A final on-site inspection was conducted. Present at the inspection was; Eileen Mohr and Todd Fisher (Ohio EPA); Mark Patterson and Irv Venger (RVAAP); Brian Stockwell, Sue Boles, and Mel Lau (PIKA). We discussed general construction details and materials used.

Twenty photographs taken.

2. Deviations from the TCRA Plan: None

Preparer:
Devin Scherer

Signature: Devin J. Scherer

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APPENDIX C
TAILGATE SAFETY MEETING FORMS

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TAILGATE SAFETY MEETING

PROJECT: RVAAP TCRA PROJECT NO. 4100-979
DATE: 7/8/08 TIME: 9:30 am
CLIENT: USACE Omaha District

SPECIFIC SITE LOCATION: Sand Creek, Approximately 50 feet upstream of George Road Bridge

TYPE OF WORK: Implementation of TCRA Plan. Installation of barrier system in Sand Creek.

SAFETY TOPICS PRESENTED

PPE	Modified Level D.
Physical Hazards	Slips, trips, and falls, electric shock, noise, manual lifting, improper use of equipment, working with metal that may be sharp
Health and Safety Plan	The Health and Safety Plan is kept in the e2M vehicle
Emergency Procedures	Stop operations, isolate area where hazard exists, keep fire extinguisher close for preventative purposes. Summon field project manager. Situation will be assessed. Injured persons will be treated at the place they suffered injury whenever possible. Care must taken to prevent further injury if it is necessary to move victim. First aid kit is kept in e2M vehicle. If injury requires more than first aid administered at site, victim will be taken to hospital. If injury is serious, the field project manager will summon emergency personnel.
Hospital	Robinson Memorial Hospital
Hospital Address	6847 North Chestnut Street, Ravenna OH 44266 330-297-0811 or 911
Special Equipment	
Other	

ATTENDEES

Name (Print)	Signature
Timothy G Roberts	
David Seiles	
Merle Bryson	
Daniel Zugris	
Melvin Lay	

Meeting Conducted by: Daniel Zugris

TAILGATE SAFETY MEETING

PROJECT: RVAAP TCRA PROJECT NO. 4100-979
DATE: 7/11/08 TIME: 0730
CLIENT: USACE Omaha District

SPECIFIC SITE LOCATION: Sand Creek, Approximately 50 feet upstream of George Road Bridge

TYPE OF WORK: Implementation of TCRA Plan. Installation of barrier system in Sand Creek.

SAFETY TOPICS PRESENTED

PPE	Modified Level D.
Physical Hazards	Slips, trips, and falls, electric shock, noise, manual lifting, improper use of equipment, working with metal that may be sharp
Health and Safety Plan	The Health and Safety Plan is kept in the e2M vehicle
Emergency Procedures	Stop operations, isolate area where hazard exists, keep fire extinguisher close for preventative purposes. Summon field project manager. Situation will be assessed. Injured persons will be treated at the place they suffered injury whenever possible. Care must taken to prevent further injury if it is necessary to move victim. First aid kit is kept in e2M vehicle. If injury requires more than first aid administered at site, victim will be taken to hospital. If injury is serious, the field project manager will summon emergency personnel.
Hospital	Robinson Memorial Hospital
Hospital Address	6847 North Chestnut Street, Ravenna OH 44266 330-297-0811 or 911
Special Equipment	
Other	

ATTENDEES

Name (Print)	Signature
Devin Scherer	
Merle Bryson	
David Seiler	

Meeting Conducted by: Devin Scherer

TAILGATE SAFETY MEETING

PROJECT: RVAAP TCRA PROJECT NO. 4100-979

DATE: 7/14/08 TIME: 0745

CLIENT: USACE Omaha District

SPECIFIC SITE LOCATION: Sand Creek, Approximately 50 feet upstream of George Road Bridge

TYPE OF WORK: Implementation of TCRA Plan. Installation of barrier system in Sand Creek.

SAFETY TOPICS PRESENTED

PPE	Modified Level D.
Physical Hazards	Slips, trips, and falls, electric shock, noise, manual lifting, improper use of equipment, working with metal that may be sharp
Health and Safety Plan	The Health and Safety Plan is kept in the e2M vehicle
Emergency Procedures	Stop operations, isolate area where hazard exists, keep fire extinguisher close for preventative purposes. Summon field project manager. Situation will be assessed. Injured persons will be treated at the place they suffered injury whenever possible. Care must taken to prevent further injury if it is necessary to move victim. First aid kit is kept in e2M vehicle. If injury requires more than first aid administered at site, victim will be taken to hospital. If injury is serious, the field project manager will summon emergency personnel.
Hospital	Robinson Memorial Hospital
Hospital Address	6847 North Chestnut Street, Ravenna OH 44266 330-297-0811 or 911
Special Equipment	
Other	

ATTENDEES

Name (Print)	Signature
Devin Scherer	Devin Scherer
Merle Bryson	
David Seiles	
Tim Roberts	

Meeting Conducted by: Devin Scherer

TAILGATE SAFETY MEETING

PROJECT: RVAAP TCRA PROJECT NO. 4100-979

DATE: 7/15 TIME: 0740

CLIENT: USACE Omaha District

SPECIFIC SITE LOCATION: Sand Creek, Approximately 50 feet upstream of George Road Bridge

TYPE OF WORK: Implementation of TCRA Plan. Installation of barrier system in Sand Creek.

SAFETY TOPICS PRESENTED

PPE	Modified Level D.
Physical Hazards	Slips, trips, and falls, electric shock, noise, manual lifting, improper use of equipment, working with metal that may be sharp
Health and Safety Plan	The Health and Safety Plan is kept in the e2M vehicle
Emergency Procedures	Stop operations, isolate area where hazard exists, keep fire extinguisher close for preventative purposes. Summon field project manager. Situation will be assessed. Injured persons will be treated at the place they suffered injury whenever possible. Care must taken to prevent further injury if it is necessary to move victim. First aid kit is kept in e2M vehicle. If injury requires more than first aid administered at site, victim will be taken to hospital. If injury is serious, the field project manager will summon emergency personnel.
Hospital	Robinson Memorial Hospital
Hospital Address	6847 North Chestnut Street, Ravenna OH 44266 330-297-0811 or 911
Special Equipment	
Other	

ATTENDEES

Name (Print)	Signature
Devin Scherer	Devin Scherer
Merle Bryson	
David Seiles	
Tim Roberts	

Meeting Conducted by: Devin Scherer

TAILGATE SAFETY MEETING

PROJECT: RVAAP TCRA PROJECT NO. 4100-979

DATE: 7/16 TIME: 0730

CLIENT: USACE Omaha District

SPECIFIC SITE LOCATION: Sand Creek, Approximately 50 feet upstream of George Road Bridge

TYPE OF WORK: Implementation of TCRA Plan. Installation of barrier system in Sand Creek.

SAFETY TOPICS PRESENTED

PPE	Modified Level D.
Physical Hazards	Slips, trips, and falls, electric shock, noise, manual lifting, improper use of equipment, working with metal that may be sharp
Health and Safety Plan	The Health and Safety Plan is kept in the e2M vehicle
Emergency Procedures	Stop operations, isolate area where hazard exists, keep fire extinguisher close for preventative purposes. Summon field project manager. Situation will be assessed. Injured persons will be treated at the place they suffered injury whenever possible. Care must taken to prevent further injury if it is necessary to move victim. First aid kit is kept in e2M vehicle. If injury requires more than first aid administered at site, victim will be taken to hospital. If injury is serious, the field project manager will summon emergency personnel.
Hospital	Robinson Memorial Hospital
Hospital Address	6847 North Chestnut Street, Ravenna OH 44266 330-297-0811 or 911
Special Equipment	
Other	

ATTENDEES

Name (Print)	Signature
Devin Scherer	Devin Scherer
Merle Bryson	
David Seiler	David Seiler
Tim Roberts	

Meeting Conducted by: Devin Scherer

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APPENDIX D
FIELD CHANGE REQUEST

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Solutions Today for a Sustainable Tomorrow

Field Change Request

This is to be completed and approved prior to implementation of changes from the work plan. See the work plan for submittal process.

1. What is the approved design?

(A) Screens located at 16' and 26' upstream of George Rd Bridge
(B) Posts made of hollow 11 gage galvanized steel
(C) Diagonal stay posts are 4' long and have to be installed at a fixed angle to the bedrock surface
(D) Screen panels use the Ametco Fiesta fencing design

2. What is the change/deviation from the work plan to be made?

(A) Screens will be installed at 42' and 66' upstream of George Rd. Bridge
(B) Posts made of solid galvanized steel
(C) Diagonal stay posts are 6' long and may be installed at variable angles
(D) Screen panels are custom welded 24" x 96" panels made of 5/16" wire vertical and 1/4" horizontal (3" opening) and 3/16" wire in both directions (1" opening)

3. What is the justification for the change?

(A) The creek rock bottom is more level at the new locations
(B) Increases barrier strength
(C) Increases construction flexibility and is better adapted to site conditions
(D) Manufacturer realized that the Fiesta panels could not be modified to 3" and 1" opening sizes and fabricated custom-made panels with the required dimensions

engineering-environmental Management, Inc.
2751 Prosperity Avenue, Fairfax VA 22042• (703) 752-7755 • Fax (703) 752-7754

Solutions Today for a Sustainable Tomorrow

Field Change Request

Requester:

Name	Signature	Organization	Date
DANIEL ZUGRUS	Daniel Zugrus	e²M	7/8/2008

Approver(s):

Name	Signature	Organization	Date
Todd R. Fisher	Todd R. Fisher	OHIO EPA	07/11/08
CHRISTOPHER A. BRYANT	Christopher A. Bryant	USACE	7/17/08

engineering-environmental Management, Inc.
2751 Prosperity Avenue, Fairfax VA 22042• (703) 752-7755 • Fax (703) 752-7754

APPENDIX E
PHOTOGRAPHIC LOG

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Photograph 1. Photograph taken from George Road Bridge. Prior to installation, the locations of the screens were delineated with yellow lines attached to stakes on each side of the stream. The arrows above help to distinguish the yellow lines in the picture. The upstream line is the location of the 3-inch barrier and the downstream line is the location of the 1-inch barrier.

Photograph 2. Water flow was temporarily diverted from the work area with sand bags. A pneumatic rotary hammer was used to drill each of the post holes into the sandstone. In this picture, Able Fence is drilling the second hole for the upstream system.

Photograph 3. Plastic chute in background was used to transport sand bags from road to work area. Daniel Zugris (e²M Program Manger) conferring with barrier systems installer.

Photograph 4. Installation of a panel of the upstream system. Work area in the right of the photograph was sand bagged to divert water. Bottom of photograph shows the channel cut into the stream floor.

Photograph 5. Shows close-up of post-hole and channel.

Photograph 6. A portion of the bank was excavated to allow for the panel to be buried into the bank.

Photograph 7. The panel was buried 2.5 feet into the bank.

Photograph 8. After the panel had been installed and buried into the bank, rocks were placed on the downstream side of the 3-inch panel. Each of the posts had an attached diagonal stay post and base plate.

Photograph 9. The barrier system was extended into both banks of Sand Creek.

Photograph 10. After the panel was installed, the excavated material was used to surround the panel.

Photograph 11. The panels were overlapped to add strength and rigidity. A clamping bar with four bolts secures the panels to the post.

Photograph 12. The barrier system was installed to follow the contour of the stream floor, which, in this picture, can be seen as one of the panels is diagonal to the other.

Photograph 13. The barrier system was installed to follow the contour of the stream floor. This photograph shows both barrier systems in place.

Photograph 14. This top view shows the two 3-inch panels clamped together.

Photograph 15. Each of the posts had an attached diagonal stay post.

Photograph 16. To allow the base plate to sit level on the stream floor, some material had to be removed.

Photograph 17. After the panel had been installed and buried into the bank, rocks were placed on both sides of the 1-inch panel. This was also done to the panel entering the opposite bank.

Photograph 18. Installation of the 1-inch panels was conducted identically to the 3-inch panels. Panels were overlapped to add strength and rigidity. A clamping bar with four bolts secures the panels to the post.

Photograph 19. This top view shows the two 1-inch panels clamped together..

Photograph 20. The 1-inch panels were installed into a channel cut into the stream floor.

Photograph 21. Each base plate was attached to the stream floor with two anchor bolts and one pin.

Photograph 22. Completed barrier system.

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APPENDIX F
SPARE CONSTRUCTION MATERIALS

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Sand Creek Barrier System
Spare Construction Materials Stored at RVAAP
Building 1045

Description	Quantity	Unit
Spare materials		
24" X 96" screen panels modified by welding additional wires to obtain approximately 3" x 3" opening size screens, galvanized and powder coated moss green.	2	Each
24" X 96" screen panels with approximately 1" X 1" opening size screens, galvanized and powder coated moss green.	2	Each
6' long, 11-gage, 2" steel square tube with base plates, pins, per attached drawing detail, galvanized and powder coated moss green.	2	Set (Brace assembly)
Clamping bars, bolts, per Ametco shop drawing, galvanized and powder coated moss green.	4	Set