

**FINAL
DECISION DOCUMENT
FOR SOILS AND SEDIMENTS
TNT AREA B**

**PLUM BROOK ORDNANCE WORKS,
SANDUSKY, OHIO**

**DERP-FUDS SITE NUMBER
G05OH001814**

**ISSUED BY: U.S. ARMY CORPS OF ENGINEERS
LOUISVILLE DISTRICT**

September 2009

Final Decision Document
Routing Slip

Property Name: Plum Brook Ordnance Works

Property/Project Number: G05OH001814

Name	Division/Section	Comments Attached? Yes/No	Date Comments Approved
Mike Saffran	PM-M-E	No	9/16/09
Russ Boyd	PM-M	No	9/22/09
Janice Lengel	OC	NO	9/22/09
Darrell Nation <i>David Dale</i>	DPM	NO	9/22/09
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If you have questions *Call Cullen at ext 6798.*

Your prompt review of this Decision Document is greatly appreciated!

**FINAL
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Part 1: DECLARATION

Site Name and Location

This Decision Document (DD) presents the Selected Remedy for soils and sediments associated with TNT Area B (TNTB) of the former Plum Brook Ordnance Works (PBOW), Sandusky, Ohio (Figure 1).

Statement of Basis and Purpose

The remedy was selected in accordance with the Defense Environmental Restoration Act (DERA), the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, and to the extent practicable, the National Oil and Hazard Substances Pollution Contingency Plan (NCP). This decision is based on information contained in the Administrative Record (AR) for TNTB.

Description of Selected Remedy

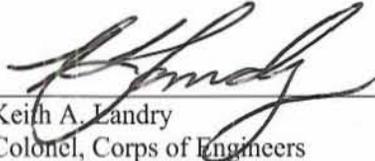
The USACE has determined that No Further Action is necessary for TNTB soils and sediments to protect human health and the environment.

Statutory Determinations

No Further Action is necessary to ensure the protection of human health and the environment at TNTB. A Non-Time Critical Removal Action (NTCRA) for soils eliminated the need to conduct additional remedial actions in soils, and the risks associated with sediments and surface water were determined to be *de minimus*. The foregoing represents a determination by the USACE that no remedial action is necessary under DERA and CERCLA.

Authorizing Signature

The undersigned acknowledges approval of the No Further Action Selected Remedy for TNTB Soil and Sediment.



Keith A. Landry
Colonel, Corps of Engineers
District Engineer

9/23/09
Date

Lead Regulator Concurrence

The Ohio Environmental Protection Agency is the lead regulator at the Plum Brook Ordnance Works FUDS property. Agency concurrence with the No Further Action Selected Remedy is provided by letter dated September 29, 2009. The Ohio EPA concurrence letter is provided in the Appendix at the end of this document.

Part 2: DECISION SUMMARY

Site Name, Location and Description

PBOW is located approximately 4 miles south of Sandusky, Ohio, and 59 miles west of Cleveland (see Figure 1). Although located primarily in Perkins and Oxford Townships, the eastern edge of the site extends into Huron and Milan Townships. PBOW is in general bounded on the north by Bogart Road, on the south by Mason Road, on the west by Patten Tract Road, and on the east by U.S. Highway 250. The area surrounding PBOW is mostly agricultural and residential (IT Corporation [IT], 2000a).

Site History

The 9,009-acre PBOW site (see Figure 2) was utilized in early 1941 and manufactured 2,4,6-trinitrotoluene (TNT), dinitrotoluene (DNT), and pentolite. Production of explosives began in December 1941 and continued until 1945. After the plant was shut down, decontamination of TNT, acid, pentolite, and DNT processing lines began; decontamination was completed by the Army during the last quarter of 1945. The property was under the supervision of the Army Ordnance Department. The War Assets Administration accepted custody of the property (3,230 acres) except for the retained area, which is known as the magazine area (2,800 acres), in 1946. The Department of the Army reacquired the 3,230 acres in 1954 and performed cleanup efforts during the 1950s through 1963. Two property use agreements were entered into by the National Advisory Committee of Aeronautics, the predecessor of the National Aeronautics and Space Administration (NASA), and the Army in 1956 and 1958, respectively. In 1963, accountability and custody of the entire PBOW property (6,030 acres) was transferred to NASA by the Department of the Army. NASA has operated and maintained PBOW since 1963, and it is currently the NASA Plum Brook Station of the Glenn Research Center at Lewis Field.

Further decontamination efforts occurred during 1963 to facilitate this transfer. The decontamination process included removing contaminated surface soil above the drain tiles, flumes, etc., destruction of all buildings by fire, then removal of all soil, debris, sumps and above-grade portions of concrete foundations. Portions of the concrete foundations located below grade were left buried, and some that had been previously slightly above grade were likewise buried. All materials, including the soil in those areas, were flashed; the area was then rough-graded. The decontamination process also included the burning of nitroaromatic-filled flumes that were excavated.

Most of the NASA aerospace testing facilities built in the 1960s at the site are presently in standby or inactive status. On April 18, 1978, NASA declared approximately 2,152 acres of PBOW as excess. The Perkins Township Board of Education acquired 46 acres of the excess acreage and uses this area as a bus transportation area. GSA retains ownership of the remaining excess acreage and currently has a use agreement with the Ohio National Guard for 604 acres of this land. The details of the land transactions are listed in the overall site management plan (International Consultants, Inc., 1995) and can be found in the PBOW AR (hard copy) and the Public Repository (electronic copy).

Community Participation

Community relations activities are required under the NCP and FUDS. The objective of this program is to provide a mechanism for the communication and exchange of information among Army agencies, government agencies, and residents of local communities and those adjacent to and downgradient from PBOW. In January 1997, a Restoration Advisory Board (RAB), composed of approximately 20 local citizens with varying backgrounds, was established to promote a two-way dialog to not only keep local citizens informed about site progress, but also to

facilitate the opportunity for them to provide input to site decisions. Since its inception, the RAB has been the basis for community involvement.

In compliance with CERCLA (Section 113), the USACE has developed the administrative record (AR) to provide documentation as to how and why decisions specific to the remediation of the site are made. TNTB documents and records are in the AR. The AR can be viewed online at the USACE Huntington District website: <http://www.lrh.usace.army.mil/projects/current/derp-fuds/pbow/documents>. The TNTB documents were made available to the public in the AR maintained at the Firelands Library, Bowling Green State University, Huron, Ohio. A public meeting was held on 16 July 2009 and was followed by a comment period ending 15 August 2009. Representatives from the community and the State of Ohio were present at the meeting and expressed approval for no further action at TNT Area B. No written comments were received.

A community relations plan (ICI, 1999) was prepared that outlines the procedures through which the community is involved with the restoration of PBOW. In addition to providing access to the AR, these procedures involve the following which are performed or initiated by the USACE Huntington District:

- AR maintenance
- Quarterly fact sheets and policy letters
- Bulletin boards for the RAB to post pertinent information within the community
- Project-specific exhibits for community functions
- Direct two-way communication with RAB members
- News releases
- Annual PBOW newsletter
- Exhibits at public activities

The PBOW RAB received a Technical Assistance for Public Participation (TAPP) grant from DoD on March 29, 2005. TAPP grants have a maximum of \$25,000 per year and a lifetime ceiling of \$100,000. The purpose of the TAPP grant is to provide a mechanism for the RAB to obtain professional technical assistance to help its members understand the restoration program. Also, the RAB holds quarterly meetings which are co-chaired by a representative of the community and the USACE point of contact. Through this communication process, the community had active involvement in the selection of the remedy for TNTB.

Scope and Role of Operable Unit or Response Action

Actual or threatened releases of contamination from this site do not present an imminent or substantial endangerment to public health, welfare and the environment. Unacceptable exposures to hazardous substances will not occur because the Non-Time Critical Removal Action (NTCRA) by the USACE in 2006 and 2007 removed unacceptable risk to human health and the environment. As a result the remedial action chosen for TNTB is No Action.

Site Characteristics

The TNTB manufacturing site (see Figure 3) consisted of widely scattered buildings of wood frame construction with asbestos and sheet metal coverings. It also included a series of buried and/or overhead flumes and pipes used to transport various liquids associated with the manufacturing process.

After plant operations ceased, the TNTB manufacturing lines were decontaminated by the War Department in late 1945. During decontamination, structures, equipment, and manufacturing debris were either removed and salvaged or removed and burned. After decontamination the

property was initially transferred to the Army Ordnance Department, then to the War Assets Administration after it was certified by the U.S. Army to be decontaminated. In 1963, to aid in the property transfer from the U.S. Army to the National Aeronautics and Space Administration (NASA), TNTB was further decontaminated.

TNTB currently consists of an area of approximately 55 acres in the south-central portion of PBOW immediately north of West Scheid Road (Figure 2). Significant evidence of former PBOW facilities exists at TNTB in the form of roads, hydrants, above-ground water valves, and ditches; all buildings and structures associated with the manufacturing process have been demolished and removed. Two NASA facilities are present at the site and are currently active for research purposes, the Hypersonic Tunnel Facility (HTF) and Nitrogen Dewar Tanks. The HTF is located in the northwest portion of TNTB and consists of a single building, above and below ground piping and utilities, and paved parking areas. The Nitrogen Dewar Tanks are located in the center of TNTB with aboveground piping and underground utilities leading to the northwest, toward HTF, and to the northeast, off site (Dames & Moore, Inc., 1997). Former and current site buildings, as well as other features, are shown on Figure 3.

Nitroaromatic compounds (i.e., explosives) are the major contaminants at TNTB with Polycyclic Aromatic Hydrocarbons (PAHs) and Polychlorinated Biphenyls (PCBs) as secondary contaminants. Nitroaromatic soil contamination was likely due to spills on the surface and leaks from holding areas, flumes and pipelines associated with former manufacturing operations.

Current and Potential Future Site and Resource Use

TNTB is currently open land within the confines of the Plum Brook Station (PBS), a satellite of the NASA Glenn Research Center (formerly known as NASA Lewis Research Center). The area surrounding PBOW is mostly agricultural and residential (IT Corporation [IT], 2000a). Presently there are no known plans to change the role and general use of TNTB. NASA has initiated some master planning actions but it is too early in the process to identify any changes to the role and use of TNTB. The near-by residential areas and the potential that the property could some day be used for residential development were used to determine what the potential risk to Human Health and the Environment were for the site.

Summary of the Non-Time Critical Removal Action (NTCRA)

No chemical specific or location specific ARARs were identified in the FS (IT, 2001). Action specific ARARs for TCLP and storage and disposal of hazardous waste were identified and summarized in the FS (FS Appendix A) and reprinted in this Decision Document Appendix A. The NTCRA complied with the action specific ARARs.

No nitroaromatics or other chemicals interpreted as potentially site-related were detected in any surface water samples associated with TNTB. One nitroaromatic, TNT, was detected in a 1993 sediment sample. No nitroaromatics or other chemicals interpreted as site-related were detected in the RI sediment samples. A lack of nitroaromatics detections in the surface water and RI sediment samples indicates that contaminants associated with TNTB are not appreciably impacting surface water and sediment.

TNTB had a non-time critical removal action (NTCRA) for contaminated soils as outlined in the Feasibility Study (FS) (IT, 2001) (which was used as an EECA) and Action Memorandum (USACE, 2003) that concluded July 2007. The Action Memorandum (USACE, 2003) identified 13 building areas requiring remediation at 30 excavation locations with each having at least one COC at a concentration exceeding its remedial goal (RG). The RGs for the COCs were defined based on human health unrestricted site use to prevent human exposure via ingestion, dermal and

inhalation exposure routes. The RGs were also balanced to ensure the reduction in the potential for adverse ecological effects. The RGs and the calculated reduction of potential for adverse ecological effect are summarized in Table 1.

The combination of the *Interim Soil Removal Action Report TNT B Soil Excavation and Ex-Situ Stabilization, PBOW, Sandusky, OH* dated May 2006 and the *Interim Soil Removal Action Continuation, Final Report, Sandusky, Ohio* dated July 2007 may be considered as the soil, surface water and sediment closeout report for TNTB.

There were a total of 13 former building locations consisting of 30 areas to be excavated in the NTCRA. During the 1st Interim Soil Removal Action (ISRA) which occurred 2002 through 2004, 12 former building locations were excavated for closure with 8 excavated to closure as documented in the *Interim Soil Removal Action Report TNT B Soil Excavation and Ex-Situ Stabilization, PBOW, Sandusky, OH* dated May 2006. During the 2nd ISRA which occurred from July 2006 until December 2006, the remaining five former building locations were excavated and contaminated soil removed as documented in the *Interim Soil Removal Action Continuation, Final Report, Sandusky, Ohio* dated July 2007. The actions associated with the excavation, treatment and disposal of contaminated soil are described in the Interim Removal Action Final Report (USACE, 2007). A total of 11,811 CY (increased from 2,945 CY) was excavated, treated (when necessary) and disposed of off-site during the removal action to achieve clean closure. The total cost for the removal action was \$3,710,900.

During the 1st interim soil removal action, the non-hazardous stockpiled soil and the non-hazardous soil from the compost pad/sediment pond were sent to Erie County Landfill for disposal. A total of 2630.24 tons of non-hazardous soil were sent to the Erie County Landfill during August and September 2004. A total of 214.62 tons of hazardous nitroaromatic-impacted soil were sent to Waste Management's hazardous waste landfill in Model City, New York in late September and early October, 2004 (USACE, 2006). During the 2nd interim soil removal action, for disposal between September 17 and October 19, 2006, the approximate volume of soil was 4,797 cubic yards, based upon the measured and visual estimation of soil removed and a conversion factor of 1.5 cubic yards per ton. A total of 3,535 tons of hazardous nitroaromatic-impacted soil was sent for disposal to EQ Company's Wayne County Landfill in Michigan between November 11 and 16, 2006. The estimated volume of hazardous soil was 2,200 cubic yards, approximated using a visual and measured volume of the excavated area and conversion factor of 1.75 cubic yards per ton. The conversion factor was greater for the hazardous soil due to the high moisture content (USACE, 2007).

Backfill soil was obtained from a borrow site located at Barnes Nursery property at 311 Cleveland Road, Huron, Ohio for the 1st interim soil removal action (USACE, 2006). The borrow material was analyzed and none of the COCs of nitroaromatics, PCBs, or PAHs were detected. During the 2nd interim soil removal action (USACE, 2007) there were two backfill soil borrow sites. Borrow Area ONE was behind Kalahari Water Park on Route 250, south of the NASA Plum Brook Station and Borrow Area TWO was Corso's Nursery at the intersection of Bogart and Brashard Roads, Sandusky, OH. The borrow area soils were analyzed and none of the seven samples contained detectable levels (over the laboratory PQL) for PAHs, PCBs and nitroaromatics. The PBOW Project Team determined that the borrow material would be suitable for backfill of the excavation areas at the PBOW.

Removal Action for PCBs: Confirmatory sampling of each of the excavation locations during the 1st interim soil removal action in 2002 through 2004 (USACE, May 2006) indicated that the PCBs COCs Aroclor 1254 and Aroclor 1260 were not detected, or detected infrequently below

RGs in excavation walls and floor except for Building 456 Excavation B. No further action based on PCBs was taken at all other excavations with non-detect or infrequent PCBs detections below RGs. At Building 456 Excavation B, 18 confirmation soil samples from the Building 456 Excavation B area were reported in the *Interim Soil Removal Action Report TNT B Soil Excavation and Ex-Situ Stabilization, PBOW, Sandusky, OH* dated May 2006. No PCBs were detected in any of the 18 confirmatory samples, except for Aroclor 1260. Four of 18 confirmatory sample results had Aroclor 1260 detected with only one sample result greater than the associated RGs. A single confirmatory sample, Sample 5879-246 was found to contain Aroclor 1260 at a level of 5.85 mg/kg, which is in excess of the RG of 2.87 mg/kg. Another sample (5879-266) was collected about 2 feet west from where sample 5879-246 had been collected as part of a re-sampling event for PCBs only. Analytical data revealed that sample 5879-266 did not contain any PCB above the laboratory's PQL. The average of the confirmatory samples, based on the four detections and 1/2 PQLs as a surrogate for non-detects, is 0.52 mg/kg, which is less than the RG of 2.87 mg/kg. Based upon the majority of PCBs non-detect results and upon over excavation, site average concentration being 1/5 of the RG, the next confirmatory sample being non-detect for PCBs, and non-detect backfill soil, no further action was taken for PCBs. Summary of PCB confirmatory samples and associated RGs may be seen in the *Interim Soil Removal Action Report TNT B Soil Excavation and Ex-Situ Stabilization, PBOW, Sandusky, OH* dated May 2006.

Removal Action for PAHs: Confirmatory sampling of each of the excavation locations during the 1st interim soil removal action in 2002 through 2004 (USACE, 2006) indicated that PAH COCs were not detected or detected infrequently below associated RGs in all but two excavations. The two excavations having detections of BaP greater than the associated RGs are Building 456 Excavation B and Building 436. DahA was detected once higher than the RG in Building 436. The rest of the PAH COCs were not detected, or detected infrequently below their respective RGs.

Building 456 Excavation B had two detections of 18 confirmatory samples of BaP, 0.602 mg/kg and 1.6 mg/kg, and both were greater than the associated RG of 0.54 mg/kg. Using the two detected values and 1/2 of the PQL for non-detected results, the average BaP concentration for Building 456 Excavation B is 0.41 mg/kg which is less than the associated RG of 0.54 mg/kg. Because DahA was not detected, BaA (2/18 detections below RG 5.43 mg/kg), BbF (2/18 detections below RG 5.43 mg/kg) and I123cdP (1/18 detection below RG 5.43 mg/kg) were detected below their respective RGs and the average BaP (0.41 mg/kg below RG 0.54 mg/kg), no further excavation was conducted at Building 456 Excavation B beyond the 1st interim soil removal action.

Building 463 had one excavation with 36 confirmatory samples. Both BaP and DahA had at least one detection that exceeded the respective RG. Six of the seven detections of BaP (max 4.45 mg/kg) were above the associated RG of 0.54 mg/kg. Using the seven detected values and 1/2 of the PQL for the non-detected results, the average BaP concentration for Building 463 is 0.47 mg/kg which is less than the associated RG of 0.54 mg/kg. One of two detections of DahA (0.929 mg/kg) was above the associated RG of 0.65 mg/kg. Using the two detections and 1/2 of the PQL for the non-detected results, the average DahA concentration for Building 463 is 0.24 mg/kg which is below the associated RG of 0.65 mg/kg. Because BaA (6/36 detections below RG 5.43 mg/kg), BbF (6/36 detections below RG 5.43 mg/kg), and I123cdP (6/36 detections below RG 5.43 mg/kg) were detected less than 20% of the time and below the respective RGs, the average confirmatory sample results for BaP and DahA are below the respective RGs, no further excavation of Building 463 based on PAHs was conducted beyond the 1st interim soil removal action.

Removal Action for Nitroaromatics: Nitroaromatics were excavated from the 13 former building locations consisting of 30 areas to be excavated. During the 1st Interim soil removal action 8 former buildings, Building 417, 453, 462, 466, 472, 473, 476, and Northwest Nail House were excavated with confirmatory samples for nitroaromatics of excavation walls and floor resulting in non-detections or detections less than associated RGs, hazard indices less than 1 and calculated nitroaromatic residual risk less than 1E-5 (USACE, 2006). Five former building locations, Building 456, 452, 463, 412 and Northeast Nail House, were over-excavated or excavated for closure such that confirmatory sampling results were either non-detect, or hazard indices less than 1 and calculated nitroaromatic residual risk less than 1E-5 (USACE, 2007).

Summary of Site Risks

Because the unacceptable risks associated with TNTB soil contamination have been mitigated by the NTCRA and as documented in the NTCRA Reports (USACE 2006 and 2007), the only alternative considered in the proposed plan for TNTB soils is the No Further Action Alternative.

The No Further Action Alternative for soil is evaluated with respect to the following criteria, as required by the NCP at 40 Code of Federal Regulations 300.430 (e)(9)(iii). Criteria 1 and 2 are the threshold criteria, which must be met, criteria 3 through 7 are the primary balancing criteria, and criteria 8 and 9 are the modifying criteria.

1. Overall Protectiveness of Human Health and the Environment.
2. Compliance with Applicable or Relevant and Appropriate Requirements
3. Long-term Effectiveness and Permanence
4. Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment
5. Short-term Effectiveness
6. Implementability
7. Cost
8. State Support/Agency Acceptance
9. Community Acceptance

The No Further Action Alternative for soil meets the two threshold criteria of overall protectiveness of human health and the environment because the unacceptable risk has been mitigated through the NTCRA and compliance with applicable or relevant and appropriate requirements. The NTCRA is a permanent remedy that meets criteria 3, 4 and 5. Both the State and community have reviewed and accepted the NTCRA Remediation Report (USACE 2006 and 2007). The No Further Action Alternative is implementable by taking no action and has \$0 associated cost.

Documentation of Significant Changes from Preferred Alternative of Proposed Plan

A presentation of the TNT B Proposed Plan for Soils and Sediment was provided by the USACE to the community on 16 July 2009 at the TNTB Proposed Plan for Soils and Sediment public meeting. The TNTB Proposed Plan was made available to the public and Ohio EPA, the reviewing agency, starting on 16 July 2009 for the 30-day comment period that closed on 15 August 2009. There are no comments on the No Further Action TNTB Proposed Plan from the public or Ohio EPA and therefore no significant changes at this time.

Part 3: RESPONSIVENESS SUMMARY

Stakeholder Issues and Lead Agency Response

USACE held a public meeting on 16 July 2009 presenting the No Further Action Proposed Plan for TNTB Soils and Sediment to the public and Ohio EPA, the reviewing agency. USACE held a 30-day comment period that ended on 15 August 2009. No comments were submitted by the public or Ohio EPA. Because no comments were submitted, no responses are necessary.

Technical and Legal Issues

There are no known technical or legal issues with respect to implementing the TNTB No Further Action Alternative.

Primary Background Documents for TNTB

Dames & Moore, Inc., 1997, *TNT Areas Site Investigation Final Report, Plum Brook Ordnance Works, Plum Brook Station/NASA, Sandusky, Ohio*, prepared for the U.S. Army Corps of Engineers, Nashville District/Huntington District, April 1997.

International Consultants Incorporated (ICI), 1995, *Site Management Plan, Part B Areas of Concern, Plum Brook Ordnance Works, Sandusky, Ohio*, September 1995.

International Consultants Incorporated (ICI), 1995, *Community Relations Plan, Plum Brook Ordnance Works, Sandusky, Ohio*, July 1995.

IT Corporation (IT), 2001, *Final TNT Area B Remedial Investigation, Volume IV – Feasibility Study, Final, Former Plum Book Ordnance Works, Sandusky, Ohio*, July 2001.

IT Corporation (IT), 2000a, *Final TNT Area B Remedial Investigation, Volume I – Report of Findings, Final, Former Plum Book Ordnance Works, Sandusky, Ohio*, August.

IT Corporation (IT), 2000b, *Final TNT Area B Remedial Investigation, Volume II – Baseline Human Health Risk Assessment and Volume III – Ecological Risk Assessment, Final, Former Plum Book Ordnance Works, Sandusky, Ohio*, August 2000.

IT Corporation (IT), 1999, *Summary Report, Site-Wide Groundwater Monitoring (1997-1998), Final, Former Plum Brook Ordnance Works, Sandusky, Ohio*, June 1999.

IT Corporation (IT), 1997, *Site-Wide Groundwater Investigation Report, Plum Brook Ordnance Works, Sandusky, Ohio*, September 1997.

Morrison-Knudsen Ferguson Corporation, 1994, *Site Inspection Report*, Plum Brook Station, Sandusky, Ohio, January 1994.

Shaw Environmental, Inc., (Shaw), 2006, *Baseline Human Health Risk Assessment for Groundwater*, Former Plum Brook Ordnance Works, Sandusky, Ohio, September 2006.

Shaw Environmental, Inc., (Shaw), 2004, *2004 Groundwater Data Summary and Evaluation Report*, Former Plum Brook Ordnance Works, Sandusky, Ohio, December 2004.

U.S. Army Corps of Engineers (USACE), 2003, *Final Action Memorandum for TNT Area B interim Removal Action at the Plum Brook Ordnance Works, Sandusky, Ohio*, prepared for the Huntington District, Huntington, West Virginia, June 2003.

U.S. Army Corps of Engineers (USACE) 2007, *Interim Soil Removal Action Continuation, Final Report, Sandusky, Ohio*, prepared for the Huntington District, Huntington, West Virginia, July 2007

WTI May 2006., *Interim Soil Removal Action Report TNT B Soil Excavation and Ex-Situ Stabilization, PBOW, Sandusky, OH*, prepared for the Huntington District, Huntington, West Virginia. May 2006.

ACRONYMS

Common acronyms and abbreviations used elsewhere in this document are defined below:

AR	Administrative Record file
ARAR	Applicable or Relevant and Appropriate
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (also referred to as "Superfund")
COC	chemical of concern
COPEC	chemical of potential ecological concern
DNT	dinitrotoluene
DERP-FUDS	Defense Environmental Restoration Program Formerly Used Defense Sites
DoD	U.S. Department of Defense
EECA	Engineering Evaluation/Cost Analysis
FS	feasibility study
GSA	General Services Administration
IT	IT Corporation
MDC	maximum detected concentration
mg/kg	milligrams per kilogram
NASA	National Aeronautics and Space Administration
NCP	EPA National Oil and Hazardous Substances Pollution Contingency Plan
Ohio EPA	Ohio Environmental Protection Agency
PAH	polycyclic aromatic hydrocarbon
PBOW	Plum Brook Ordnance Works
PCB	polychlorinated biphenyl
RAB	Restoration Advisory Board
RCRA	Resource Conservation and Recovery Act
RG	remedial goal
RI	remedial investigation
SARA	Superfund Amendments and Reauthorization Act of 1986
Shaw	Shaw Environmental, Inc.
TCLP	toxicity characteristic leaching procedure
TSDf	treatment, storage, and disposal facility
TNT	2,4,6-trinitrotoluene
TNTB	TNT Manufacturing Area B
USACE	U.S. Army Corps of Engineers
yd ³	cubic yards

FIGURES

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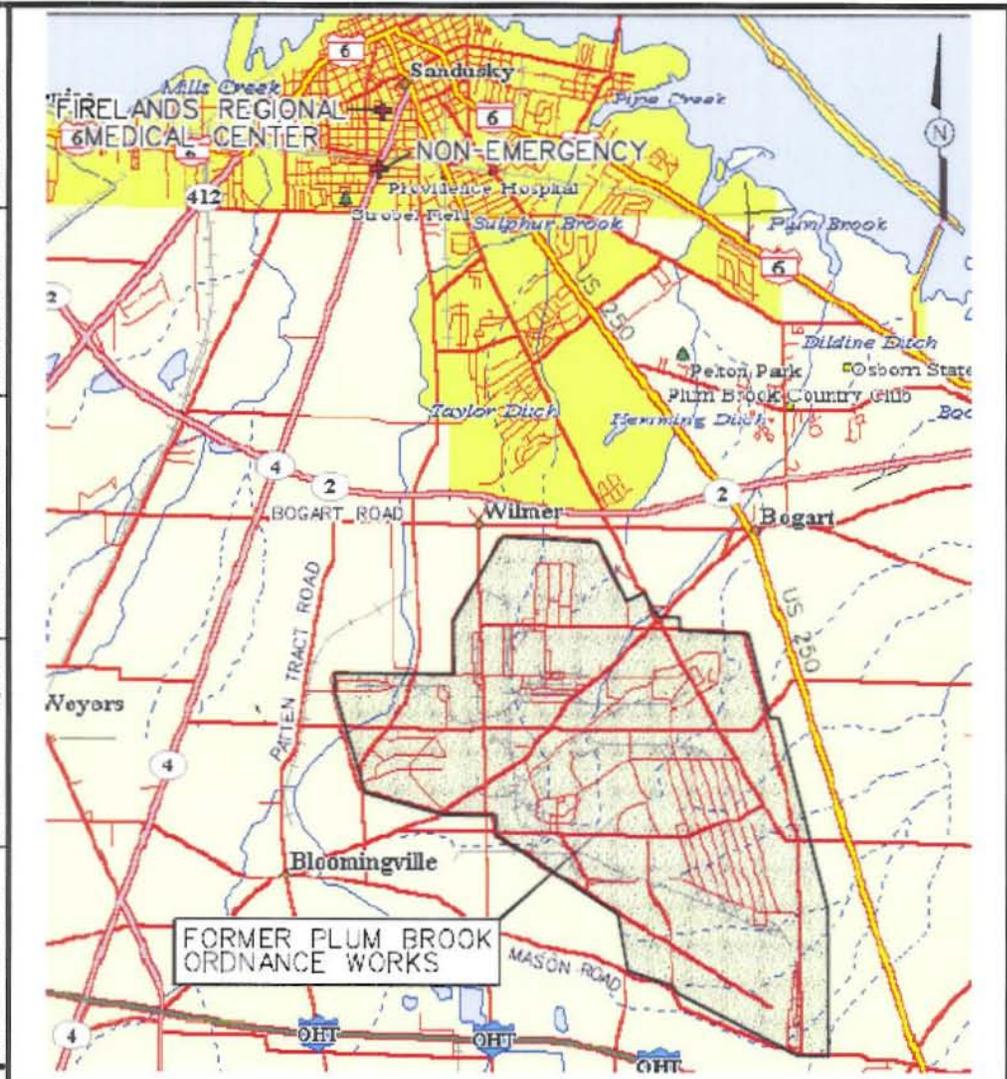
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 ENGR CKCK BY: T.SIARD

INITIATOR: T.SIARD
 PROJ. MGR: S. DOWNEY

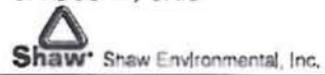
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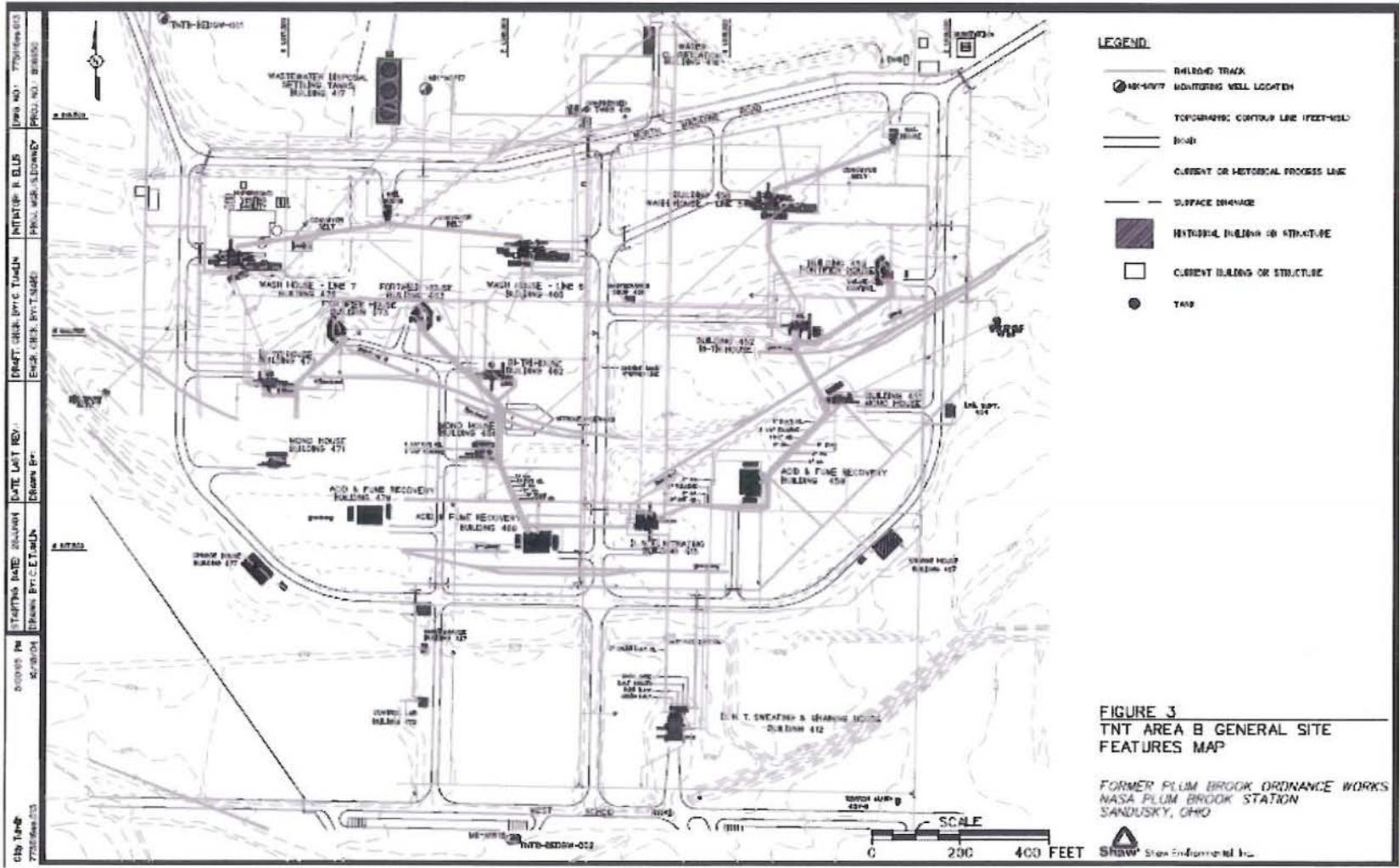


NOT TO SCALE

FIGURE 1
 VICINITY MAP

FORMER PLUM BROOK ORDNANCE WORKS
 NASA PLUM BROOK STATION
 SANDUSKY, OHIO





TABLE

Table 1
Ecological Implications of Human Health Soil RGs
Feasibility Study
TNT Area B
Plum Brook Ordnance Works, Sandusky, Ohio

Human Health Chemical of Concern	Human Health RG (mg/kg)	Expected Residual EPC ^a (mg/kg)	Critical Ecological Hazard Quotient (and receptor) ^b	Original EPC for Critical Ecological Receptor (mg/kg)	Scaled ^c Ecological Hazard Quotient Using Expected Residual Conc.	Estimated Reduction in Ecological Hazard ^d
2-amino-4,6-Dinitrotoluene	0.4	< 0.25	13,600 wren	3.8	447	30
4-amino-2,6-Dinitrotoluene	0.4	0.35	24,800 wren	6.91	1,256	20
2,4-Dinitrotoluene	7.5	0.34	11.6 shrew	1.51	3	4
2,6-Dinitrotoluene	2.75	< 0.25	8.92 shrew	0.83	1	7
2-Nitrotoluene	74	--	(not in surface soil)	--	--	--
2,4,6-Trinitrotoluene	3.36	0.78	15,900 shrew	6,900	2	8,846
Aroclor 1254 ^e	1	< 0.037	510 shrew	0.53	18	29
Aroclor 1260 ^e	1	1.1	2.43 hawk	0.852	3	1
Benzo(a)anthracene ^f	5.43	0.049	124 shrew	2.4	3	49
Benzo(a)pyrene ^f	0.54	0.077	108 shrew	2	4	26
Benzo(b)fluoranthene ^f	5.43	0.1	97.6 shrew	1.8	5	18
Dibenzo(a,h)anthracene ^f	0.65	< 0.36	176 shrew	0.55	58	3
Indeno(1,2,3-cd)pyrene ^f	5.43	0.062	57.1 shrew	1	4	16

^a Residual EPCs in surface soil were estimated by removing the 25 validated SO samples from the data base that were within the proposal excavation footprint. Areas shown on Figure 8 are shown in detail on Feasibility Study (FS) figures (FS Figures 1-4, 1-6, 1-10, 1-11, 1-12, 1-13, 1-16, 1-17, 1-18, 1-19, 1-22, 1-23, and 1-24), and recalculating the exposure point concentration following the methodology used in the Remedial Investigation Report (Section 2.2.2 in Volume III - Ecological Risk Assessment [ERA] IT, 2000. Dilution from clean backfill not considered. Note: If the COC non detect, the lowest detection limit was used.

^b From: ERA.

^c Estimated using the following scaling relationship:

$$\text{Scaled HQ} = \text{Residual Conc.} \times (\text{pre-remediation HQ/pre-remediation EPC})$$

^d Estimated by dividing pre-remediation HQ by estimated post-remediation HQ (rounded to 1 significant figure).

^e Since completion of the FS, an RG of 1 mg/kg has been identified for combined polychlorinated biphenyls (PCBs).

which is the PCB soil level for unrestricted land use found at 40 CFR 761.61(a)(4)(:)(A). The expected residual EPC and the furthest two columns on the right have not been revised. However, a corresponding revision for these two compounds would have little effect on the values shown and no effect on estimated remediation volumes.

^f Since completion of the FS, an RG of 1 mg/kg has been identified for combined total carcinogenic polycyclic

aromatic hydrocarbons (PAH), based on discussions between USACE and OEPA. The expected EPC and the furthest two columns on the right have not been revised. However, a corresponding revision for these five compounds would have little effect on the values shown and no effect on estimated remediation volumes.

Notes:

EPC = Exposure point concentration (original EPC used in ERA for surface soil exposure).

mg/kg = Milligrams per kilogram.

RG = Remediation goal.

APPENDIX

Table A-1

**Location-Specific Applicable or Relevant and Appropriate Requirements
Feasibility Study
TNT Area B, Plum Brook Ordnance Works
Sandusky, Ohio**

(Page 1 of 3)

Location Characteristics	Requirement(s)	Prerequisite(s)	Federal Citation	Ohio Citation	Alternatives Applicable	Comments
Floodplains/Wetlands						
Presence of floodplain [as defined in 40 CFR 6, Appendix A, Section 4.0 (d)]	<p>Avoid, as practicable, the long- and short-term adverse effects associated with occupancy and modification of floodplains. Measures to mitigate adverse effects of actions in a floodplain include, but are not limited to: minimum grading requirements, runoff controls, design and construction constraints, and protection of ecologically sensitive areas.</p> <p>Potential effects of any action taken in a floodplain shall be evaluated. Identify, evaluate, and implement alternative actions that may avoid or mitigate adverse impacts on floodplains.</p> <p>Design or modify selected alternatives to minimize harm to or within floodplains and restore and preserve floodplain values.</p>	Federal actions with potential to impact or occur within flood plains - Applicable	<p>40 CFR 6, Appendix A</p> <p>40 CFR 6, Appendix A</p> <p>40 CFR 6, Appendix A</p>	NA	NA	No floodplains were identified near TNT Area B.
Presence of wetlands as defined in 40 CFR 6, Appendix A, Section 4.0(j).	<p>Avoid, to the extent possible, the long- and short-term adverse effects associated with destruction, occupancy and modification of wetlands. Measures to mitigate adverse effects or actions in a wetland include, but are not limited to: minimum grading requirements, runoff controls, design and construction constraints, and protection of ecology-sensitive areas.</p> <p>Take action, to the extent practicable, to minimize destruction, loss or degradation of wetlands, and to preserve, restore, and enhance the natural and beneficial values of wetlands.</p> <p>Potential effects of any new construction in wetlands that are not in a floodplain shall be evaluated. Identify, evaluate, and as appropriate, implement alternative actions that may avoid or mitigate adverse impacts on wetlands.</p>	Federal actions that involve potential impacts to, or take place within wetlands - Applicable	<p>40 CFR 6, Appendix A</p> <p>40 CFR 6, Appendix A</p> <p>10 CFR 1022.3(c) and (d)</p>	NA	NA	No wetlands were identified near TNT Area B.

Table A-1

**Location-Specific Applicable or Relevant and Appropriate Requirements
Feasibility Study
TNT Area B, Plum Brook Ordnance Works
Sandusky, Ohio**

(Page 2 of 3)

Location Characteristics	Requirement(s)	Prerequisite(s)	Federal Citation	Ohio Citation	Alternatives Applicable	Comments
Aquatic Resources						
Within area impacting stream or any other body of water - and -- presence of wildlife resources (e.g. fish)	The effects of water-related projects on fish and wildlife resources and their habitat should be considered with a view to the conservation of fish and wildlife resources by preventing loss of and damage to such resources.	Action that impounds, modifies, diverts, or controls waters including navigation and drainage activities - Relevant and appropriate	Fish and Wildlife Coordination Act (16 USC 661 et seq.)	NA	NA	Remedial activities are not anticipated to impact fish and wildlife resources.
Location encompassing aquatic ecosystem as defined in 40 CFR 230.3(c)	Except as provided under Section 404(b)2 of the Clean Water Act, no discharge of dredged or fill material into an aquatic ecosystem is permitted if there is a practicable alternative that would have less adverse impact. No discharge of dredged or fill material shall be permitted unless appropriate and practicable steps per 40 CFR 230.70 et seq. have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem.	Action that involves the discharge of dredged or fill material into "waters of the U.S.", including jurisdictional wetlands - Applicable	40 CFR 230.10(a) 40 CFR 230.10(d)		NA	No wetlands were identified at TNT Area B.
Cultural Resources						
Presence of archaeological resources	May not excavate, remove, damage, or otherwise alter or deface such resources unless by permit or exception.	Action that would impact archaeological resources on public land - Applicable	43 CFR 7.4(a)		NA	Cultural resources have not been discovered within PBOW.
	Must protect any such archaeological resources if discovered.	Excavation activities that inadvertently discover archaeological resources - Applicable	40 CFR 7.5(b)(1)		NA	Cultural resources have not been discovered within PBOW.

Table A-1

**Location-Specific Applicable or Relevant and Appropriate Requirements
Feasibility Study
TNT Area B, Plum Brook Ordnance Works
Sandusky, Ohio**

(Page 3 of 3)

Location Characteristics	Requirement(s)	Prerequisite(s)	Federal Citation	Ohio Citation	Alternatives Applicable	Comments
Presence of archaeological resources (continued)	Must stop activities in the area of discovery and make a reasonable effort to secure and protect the objects discovered.	Excavation activities that inadvertently discover such resources on federal lands or under federal control - Applicable	43 CFR 10.4(c)		NA	Cultural resources have not been discovered within PBOW.
	Must consult with Indian tribe likely to be affiliated with the objects to determine further disposition per 40 CFR 10.5(b)	Same as above - Applicable	43 CFR 10.4(d)		NA	Cultural resources have not been discovered within PBOW.
Within area where action may cause irreparable harm, loss, or destruction of significant artifacts.	Must take action to recover and preserve artifacts.	Alteration of terrain that threatens significant scientific, prehistoric, or archaeological data.	National Archaeological and Historical Preservation Act (16 USC Section 469); 35 CFR Part 65	NA	NA	Cultural resources have not been discovered within PBOW.
Endangered, threatened or rare species						
Areas harboring Endangered Species	Current conditions and potential remedial activities at PBOW must not destroy or adversely impact critical habitat	Threatened and endangered species were identified at PBOW, but not at TNT Area B.	16 USC 1531 et. seq., 50 CFR 17.21, 17.31, 17.61, 17.71, 17.94, 50 CFR 402.	NA	NA	No endangered species identified at TNT Area B.
	May not knowingly destroy the habitat of such wildlife species.	Same as above - Relevant and Appropriate		NA	NA	No endangered species identified at TNT Area B.
	Upon good cause shown and where necessary to protect human health or safety, endangered or threatened species may be removed, captured, or destroyed.	Same as above - Relevant and appropriate			NA	NA

Table A-2

**Action-Specific Applicable or Relevant and Appropriate Requirements
Feasibility Study
TNT Area B, Plum Brook Ordnance Works
Sandusky, Ohio**

(Page 1 of 7)

Action/Requirement	Requirement(s)	Prerequisite(s)	Federal Citation	Ohio Citation	Alternative Applicable	Comments
Waste generation/management						
Characterization of solid waste (e.g. contaminated PPE, equipment, wastewater)	Must determine if the waste is hazardous waste or if waste is excluded under 40 CFR 261.4; and	Generation of solid waste as defined in 40 CFR 261.2 - Applicable	40 CFR 262.11(a)	3745-52-11(a)	2-4	Remedial activities might generate hazardous waste.
	Must determine if waste is listed under 40 CFR Part 261; or		40 CFR 262.11(b)	3745-52-11(b)	2-4	Excavated contaminated soil is not classified as a listed hazardous waste because there is no definitive documentation regarding the dates of disposal.
	Must characterize waste by using prescribed testing methods or applying generator knowledge based on information regarding material or processes used. If waste is determined to be hazardous, it must be managed in accordance with pertinent provisions of 40 CFR 261 through 268.		40 CFR 262.11(c) and (d)	3745-52-11(c) through (e)	2-4	Remedial activities might generate hazardous waste.
Characterization of hazardous waste	Must obtain a detailed chemical and physical analysis of a representative sample of the waste(s) which at a minimum contains all of the information which must be known to treat, store, or dispose of the waste in accordance with 40 CFR 264 and 268.	Generation of RCRA hazardous waste for storage, treatment or disposal - Applicable	40 CFR 264.13(a)(1)	3745-54-13(a)(1)	2-4	Remedial activities might generate hazardous waste.
	Must determine if the waste is restricted from land disposal under 40 CFR 268 et seq. by testing in accordance with prescribed methods or use of generator knowledge of waste.		40 CFR 268.7	3745-59-07	2-4	Remedial activities might generate hazardous waste.
	Must determine alternative land disposal restrictions under 40 CFR 268.49 by treating soil to 10x UTS levels prior to land disposal.	Generation of RCRA hazardous waste for storage, treatment or disposal - Applicable	40 CFR 268.49		2-4	Remedial activities might generate hazardous waste.

Table A-2

**Action-Specific Applicable or Relevant and Appropriate Requirements
Feasibility Study
TNT Area B, Plum Brook Ordnance Works
Sandusky, Ohio**

(Page 2 of 7)

Action/Requirement	Requirement(s)	Prerequisite(s)	Federal Citation	Ohio Citation	Alternative Applicable	Comments
Storage						
Accumulation of hazardous waste in containers (e.g. PPE, rags, etc.)	<p>A generator may accumulate hazardous waste at the facility provided that:</p> <ul style="list-style-type: none"> Waste is placed in containers that comply with 40 CFR 265.171 through 173 (Subpart I); and container is marked with the words "hazardous waste" or; container may be marked with other words that identify the contents. 	<p>Accumulation of RCRA hazardous waste on site as defined in 40 CFR 260.10 - Applicable</p> <p>Accumulation of 55 gallons or less of RCRA hazardous waste at or near any point of generation - Applicable</p>	<p>40 CFR 262.34(a)</p> <p>40 CFR 262.34(c)(1)</p>	<p>3745-52-34(a)</p> <p>3745-52-34(c)(1)</p>	<p>2-4</p>	<p>This applies to accumulation in 55-gallon drums at or near the point of generation, before the drum is filled. Upon filling the drum, it must be moved within 3 days to a designated container storage area. Upon a drum's placement in the container storage area, if a temporary storage area, it must be disposed within allowed time frame.</p>
Temporary storage of hazardous waste in containers	<p>Except as noted below, a generator may accumulate (store) hazardous waste on-site for 90 days or less without a permit or without having interim status:</p> <ul style="list-style-type: none"> A generator who generates greater than 100 kg but less than 1000 kg of hazardous waste in a calendar month may accumulate hazardous waste onsite for 180 days or less without need to meet long-term storage requirements (40 CFR 262.34(d)). A generator who generates greater than 100 kg but less than 1000 kg of hazardous waste in a calendar month and who must transport his waste, or offer his waste for transportation, over a distance of 200 miles or more for off-site treatment, storage or disposal may accumulate hazardous waste on-site for 270 days without need to meet long-term storage requirements (40 CFR 262.34(d)). A generator who generates greater than 100 kg but less than 1000 kg of hazardous waste in a calendar month and who accumulates hazardous waste in a quantity less than 8000 kg or for fewer than 180 days (or for less than 270 days if he must transport his waste, or offer his waste for transportation, over a distance of 200 miles or more), is not required to meet long-term storage requirements (40 CFR 262.34(f)). 	<p>A generator providing temporary storage pending off-site treatment, storage, and disposal</p>	<p>40 CFR 262.34</p>	<p>3745-52-34</p>	<p>2-4</p>	<p>Remedial activities might generate hazardous waste. On-site storage prior to disposal/treatment might be necessary.</p>

Table A-2

**Action-Specific Applicable or Relevant and Appropriate Requirements
Feasibility Study
TNT Area B, Plum Brook Ordnance Works
Sandusky, Ohio**

(Page 3 of 7)

Action/Requirement	Requirement(s)	Prerequisite(s)	Federal Citation	Ohio Citation	Alternative Applicable	Comments
Requirements for temporary storage of hazardous waste in containers	Except as noted above, a generator may accumulate hazardous waste on-site for 90 days or less without the need to meet requirements for long-term storage, provided that:	Temporary storage of RCRA hazardous waste pending off-site treatment, storage, and disposal.	40 CFR 262.34(a)(1)(I)	3745-52-34(a)(1)(a)	2-4	Remedial activities might generate hazardous waste.
	<ul style="list-style-type: none"> The waste is placed in containers and the generator complies with Subpart I of 40 CFR Part 265. 		40 CFR 262.34(a)(1)(I)	3745-52-34(a)(1)(a)	2-4	Remedial activities might generate hazardous waste.
Requirements for temporary storage of hazardous waste in containers	<ul style="list-style-type: none"> The date upon which each period of accumulation begins is clearly marked and visible for inspection on each container. 		40 CFR 262.34(a)(2)	3745-52-34(a)(2)	2-4	Remedial activities might generate hazardous waste.
	<ul style="list-style-type: none"> While being accumulated on-site, each container and tank is labeled or marked clearly with the words, "Hazardous Waste"; and 		40 CFR 262.34(a)(3)	3745-52-34(a)(3)	2-4	Remedial activities might generate hazardous waste.
	<ul style="list-style-type: none"> The generator complies with the requirements for owners and operators in Subparts C (Emergency Preparedness), and Subpart D (Contingency Plan) in 40 CFR 265, with 265.16 (closure survey plat), and with 268.7(a)(4) [testing and documentation for disposal]. 		40 CFR 262.34(a)(4)	3745-52-34(a)(4)	2-4	Remedial activities might generate hazardous waste.
Use and management of hazardous waste in containers	If container is not in good condition (e.g. severe rusting, structural defects) or if it begins to leak, must transfer waste into container in good condition.	Storage of RCRA hazardous waste in containers - Applicable	40 CFR 264.171	3745-55-71	2-4	Remedial activities might generate hazardous waste.
	use container made or lined with materials compatible with waste to be stored so that the ability of the container is not impaired		40 CFR 264.172	3745-55-72	2-4	Remedial activities might generate hazardous waste.
	Keep containers closed during storage, except to add/remove waste.		40 CFR 264.173(a)	3745-55-73(a)	2-4	Remedial activities might generate hazardous waste.
	Open, handle and store containers in a manner that will not cause containers to rupture or leak		40 CFR 264,173(b)	3745-55-73(b)	2-4	Remedial activities might generate hazardous waste.
Design and operation of a RCRA container storage area (no free liquids)	Area must be sloped or otherwise designed and operated to drain liquid from precipitation, or containers must be elevated or otherwise protected from contact with accumulated liquid	Long-term storage of RCRA hazardous waste in containers that do not contain free liquids- Applicable	40 CFR 264.175(c)	3745-55-75(c)	2-4	Remedial activities might generate hazardous waste.

Table A-2

**Action-Specific Applicable or Relevant and Appropriate Requirements
Feasibility Study
TNT Area B, Plum Brook Ordnance Works
Sandusky, Ohio**

(Page 4 of 7)

Action/Requirement	Requirement(s)	Prerequisite(s)	Federal Citation	Ohio Citation	Alternative Applicable	Comments
Design and operation of a RCRA container storage area (contains free liquids)	Area must have a containment system designed and operated as follows	Long-term storage of RCRA hazardous waste with free liquids - Applicable	40 CFR 264.175(a)	3745-55-75(a)	2	Remedial activities might generate liquid hazardous waste.
	<ul style="list-style-type: none"> a base must underlie the containers which is free of cracks or gaps and is sufficiently impervious to contain leaks, spills and accumulated precipitation until the collected material is detected and removed. 				2	Remedial activities might generate liquid hazardous waste.
Design and operation of a RCRA container storage area (contains free liquids) (Continued)	<ul style="list-style-type: none"> base must be sloped or the containment system must be otherwise designed and operated to drain and remove liquids resulting from the leaks spills or precipitation, unless the containers are elevated or are otherwise protected from contact with accumulated liquids. 	-	-		2	Remedial activities might generate liquid hazardous waste.
	<ul style="list-style-type: none"> must have sufficient capacity to contain 10% of the volume of containers or the volume of the largest container, whichever is greater. 	-	-		2	Remedial activities might generate liquid hazardous waste.
	<ul style="list-style-type: none"> runoff into the system must be prevented unless the collection system has sufficient capacity to contain along with volume required for containers 	-	-		2	Remedial activities might generate liquid hazardous waste.
Waste Treatment						
Onsite treatment of RCRA hazardous waste in a NPDES treatment system	<p>Wastewater treatment units (WWTUs), as defined in 260.10, are exempt from the requirements for permitting and interim status treatment, storage, and disposal facilities, which are codified in 40 CFR Parts 264 and 265</p> <p>All applicable hazardous waste management standards apply to the waste prior to treatment in the WWTU and to any residue generated by the treatment of that waste. In other words, solid waste resulting from the treatment of a listed waste, and solid waste resulting from the treatment of a characteristic hazardous waste in an exempt wastewater treatment unit will remain hazardous as long as the solid waste continues to exhibit a characteristic as defined in 261.3 (3) and (d).</p>	Treatment of RCRA hazardous wastewater	40 CFR 264.1(g)(6), 265.1(c)(10), and 270.1(c)(2)(v)	3745-54(g)(5) and 3745-65(c)(8)	NA	Remedial activities are not expected to generate wastewater
Wastewater Treatment and Discharge						

Table A-2

**Action-Specific Applicable or Relevant and Appropriate Requirements
Feasibility Study
TNT Area B, Plum Brook Ordnance Works
Sandusky, Ohio**

(Page 5 of 7)

Action/Requirement	Requirement(s)	Prerequisite(s)	Federal Citation	Ohio Citation	Alternative Applicable	Comments
Classification of local water bodies for discharge of treated waters	Discharge quality of treated waters from the site must attain the criteria for which the segment of the water body is classified.	Point source discharge of treated wastewater - Applicable	NA	3745-1-01	NA	Remedial activities are not expected to generate wastewater
Discharge of Toxic Pollutants identified by the State of Ohio pursuant to Section 307(a)(1) of the Federal Water Pollution Control Act	Concentrations of identified toxic pollutants in Ohio waters shall not exceed the criteria indicated in this regulation	Point source discharge of treated wastewater - Applicable	NA	3745-1-07	NA	Remedial activities are not expected to generate wastewater
General Facility Requirements						
Emissions of hazardous air pollutants from TNT Area B operations	The steps necessary to indicate that the remediation systems are in compliance with the Ohio Environmental Protection Agency requirements are as follows: <ul style="list-style-type: none"> Model each new or modified source of an air toxic using the SCREEN 3 model. Compare predicted 1-hour concentrations against 1/40 of the Threshold Limit Value (TLV). The guidance specifically calls for evaluation against the time-weighted average (TWA), TLVs published by the American Conference of Governmental Industrial Hygienist (ACGIH) and Biological Exposure Indices; Threshold Limit Values and Biological Exposure Indices, ACGIH, 1998. If this comparison shows that the predicted 1-hour concentration is greater than 1/40 of the TLV, further assessment is required. Applies to controlled or uncontrolled sources. 	Emissions of potentially toxic air contaminants	Clean Air Act Amendments of 1990, Appendix G	3745-15 et. seq.	NA	Remedial activities are not expected to result in the emission of hazardous air pollutants.
Security System	Must prevent the unknowing entry and minimize the possibility for unauthorized entry of persons or livestock onto active portion of the facility or comply with provisions of 40 CFR 264.14(b) and (c).	Operation of long-term (>90) container storage – Relevant and Appropriate	40 CFR 264.14	3745-54-14	2-4	Land use restrictions will be implemented as part of remedial activities.
General Inspections	Must inspect facility for malfunctions and deterioration, operator errors, and discharges, often enough to identify and correct any problems.	Operation of long-term (>90 day) container storage - Relevant and Appropriate	40 CFR 264.15(a)	3745-54-15(a)	2-4	Inspections are part of O&M activities.

Table A-2

**Action-Specific Applicable or Relevant and Appropriate Requirements
Feasibility Study
TNT Area B, Plum Brook Ordnance Works
Sandusky, Ohio**

(Page 6 of 7)

Action/Requirement	Requirement(s)	Prerequisite(s)	Federal Citation	Ohio Citation	Alternative Applicable	Comments
Personnel Training	Must ensure personnel adequately trained in hazardous waste, emergency response, monitoring equipment maintenance, alarm system procedures, etc.	Operation of long-term (>90 day) container storage - Relevant and Appropriate	40 CFR 264.16	3745-54-16	2-4	
Contingency Plan	Must have a contingency plan, designed to minimize hazards to human health and the environment from fires, explosions or other unplanned sudden releases of hazardous waste to air, soil, or surface water in accordance with 40 CFR 264.52	Operation of long-term (>90 day) container storage - Relevant and Appropriate	40 CFR 264.51	3745-54-51	2-4	Requirement for both temporary and long-term storage.
	Must be at least one emergency coordinator on the facility premises responsible for coordinating emergency response measures in accordance with 40 CFR 264.56.	Operation of long-term (>90 day) container storage - Relevant and Appropriate	40 CFR 264.55	3745-54-55	2-4	Contingency plan can refer to PBOW site wide, not TNT Area B alone.
Preparedness and Prevention	Facilities must be designed, constructed, maintained, and operated to prevent any unplanned release of hazardous waste or hazardous waste constituents into the environment and minimize the possibility of fire or explosion. All facilities must be equipped with communication and fire suppression equipment and undertake additional measures as specified in 40 CFR 264.30 et seq.	Operation of long-term (>90 day) container storage - Relevant and Appropriate	40 CFR 264.30-264.37	3745-54-30 through 37	2-4	Requirement for both temporary and long-term storage of hazardous waste.
Closure of RCRA Container Storage						
Clean closure of RCRA container storage area	Must close the facility in a manner that: <ul style="list-style-type: none"> minimizes the need for further maintenance controls, minimizes or eliminates potential hazards to human health and the environment, post-closure escape of hazardous waste, hazardous constituents, contaminated runoff or hazardous waste decomposition products to ground or surface waters or to the atmosphere; and complies with closure requirements of 40 CFR 264.176, 	Management of RCRA hazardous waste in long-term storage (> 90 days) facility - Relevant and Appropriate	40 CFR 264.111	3745-66-11	2-4	
Monitoring and Extraction Wells						
Monitoring/Extraction Well Construction	Monitoring and extraction wells shall be constructed in accordance with EPA Region V Standard Operating Procedures.	Installation of groundwater monitoring or extraction wells	EPA Region V SOPs		NA	No additional monitoring wells or extraction wells are anticipated.
Monitoring/Extraction Well Abandonment	Monitoring and extraction wells shall be abandoned in accordance with requirements specified in EPA Region V Standard Operating Procedures.	Closure or abandonment of groundwater monitoring or extraction wells.	EPA Region V SOPs		NA	No action alternative results in monitoring well abandonment.

Table A-2

**Action-Specific Applicable or Relevant and Appropriate Requirements
Feasibility Study
TNT Area B, Plum Brook Ordnance Works
Sandusky, Ohio**

(Page 7 of 7)

Action/Requirement	Requirement(s)	Prerequisite(s)	Federal Citation	Ohio Citation	Alternative Applicable	Comments
Transportation of Hazardous Materials and Wastes						
Transportation of hazardous waste off-site	Must comply with the generator requirements of 40 CFR 262.20-23 for manifesting, Section 262.30 for packaging, Section 262.31 for labeling, Section 262.32 for marking, Section 262.33 for placarding, and Section 262.40, 262.41(a) for record keeping requirements and Section 262.12 to obtain EPA ID number.	Off-site transportation of RCRA hazardous waste - Applicable	40 CFR 262.10(h)	3745-52-10(f)	2-4	Off-site disposal of hazardous waste might be part of remedial alternative.
	Must comply with the requirements of 40 CFR 263.11-263.31.	Transportation of hazardous waste within United States requiring a manifest - Applicable	40 CFR 263.10(a)	3745-53-10(a)	2-4	Off-site disposal of hazardous waste might be part of remedial alternative.
	A transporter who meets all applicable requirements of 49 CFR 171-179 and the requirements of 40 CFR 263.11 and 263.31 will be deemed in compliance with 40 CFR 263.	Transportation of hazardous waste within United States requiring a manifest - Applicable	40 CFR 263.10(a)	3745-53-10(a)	2-4	Off-site disposal of hazardous waste might be part of remedial alternative.
Transportation of hazardous materials	Shall be subject to and must comply with all applicable provisions of the HMTA and HMR (49 CFR 171-180).	Any person, who under contract with a department or agency of the federal government, transports "in commerce", or causes to be transported or shipped, a hazardous material - Applicable	49 CFR 171.1(c)	NA	2-4	Transportation of hazardous waste might be part of remedial alternative.



State of Ohio Environmental Protection Agency

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September 29, 2009

Col. Keith A. Landry
District Engineer
U.S. Army Engineer District
Louisville District Corps of Engineers
P.O. Box 59
Louisville, KY 40201-0059

Re: Ohio EPA Concurrence on No Further Action Decision Document for Soils and Sediments, TNT Area B, Plum Brook Ordnance Works.

Dear Colonel Landry:

Ohio EPA has reviewed the No Further Action Decision Document for Soils and Sediments, TNT Area B, Plum Brook Ordnance Works. The site is located within The NASA Plumbrook Station, four miles south of Sandusky, Ohio.

Ohio EPA has been involved in the investigation and remediation of this Area of Concern, reviewing and concurring in work plans, analytical data, and investigation Reports for TNT Area B.

The TNT B manufacturing site consisted of an area approximately 55 acres in size and is currently open land with no structures. Nitroaromatic compounds were the major contaminants at TNT Area B, with PAHs and PCBs as secondary contaminants. Nitroaromatic soil contamination was likely due to spills on the surface and leaks from Former holding areas, flumes and pipelines associated with the historical manufacturing Operation.

Unacceptable risks associated with TNT Area B were addressed by a Non-Time Critical Removal Action, documented in USACE reports in 2006 and 2007. The NTCRA represents a permanent remedy which has been reviewed and accepted by both the State and community. Therefore, the Ohio Environmental Protection Agency concurs With the No Further Action decision for TNT Area B.

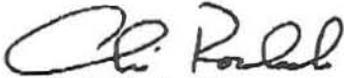
Ted Strickland, Governor
Lee Fisher, Lieutenant Governor
Chris Korleski, Director

Ohio EPA is an Equal Opportunity Employer

Col. Keith A. Landry
Page 2

If you have any questions regarding this letter, please contact Paul Jayko (DERR, NWDO) at (419) 373-3038.

Sincerely,



Chris Korleski
Director

AL/csl

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