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# FORMER PLUM BROOK ORDNANCE WORKS

## Sandusky, Ohio (Currently NASA Plum Brook Station)

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Quarterly Fact Sheet

July-September 2015

**SITE DESCRIPTION** - PBOW is located approximately 4 miles south of Sandusky, Ohio, and 59 miles west of Cleveland. 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.

**SITE HISTORY** - The former Plum Brook Ordnance Works (PBOW) was established by the War Department as a government-owned, contractor-operated (GOCO) facility for the production of 2,4,6-trinitrotoluene (TNT), 2,4-dinitrotoluene (DNT), and pentolite during World War II. The PBOW site originally consisted of approximately 9,100 acres, approximately 3,500 acres of which was used as a buffer area outside the facility fence line. The property was acquired in the name of the United States of America in 1941. The government contractor, Trojan Powder Company, operated the production facility from December 1941 until 1945. It is estimated that during this period more than 1 billion pounds of nitroaromatic explosives were manufactured.

At the end of production in September 1945, PBOW was placed in standby operation status and the Army conducted decontamination and decommissioning activities. On December 17, 1945 the U.S. Army Ordnance Department (Ordnance Department) obtained physical control of the site. The Ordnance Department continued decontamination efforts until August 1946. In 1946 over 6,200 acres, 3,231 being located within the fenced area, were transferred to the War Assets Administration (WAA), and approximately 2,800 acres were transferred to the Ravenna Arsenal. This 2,800-acre parcel, transferred to Ravenna Arsenal and referred to as the Magazine Area (and also the Plum Brook Depot), was transferred again in July 1947 to the Erie Ordnance Depot, LeCarne, Ohio. The Magazine Area included approximately 2,300 acres inside the fence line and 500 acres of the buffer area, outside of the fence line.

In 1949, the GSA took control of WAA's portion of the PBOW property, which included an indeterminate amount of acreage outside of the fence line due to conveyances by WAA to private landowners during the late 1940s and early 1950s. It is believed that farmers were given the opportunity to buy back land in the buffer area, outside the fence line.

In June 1954, the Army reacquired the 3,231 acres within the PBOW fence line that was previously transferred to the WAA and subsequently to GSA. From August 1954 to sometime in 1958, further decontamination was performed by the Army. The decontamination included removal of and disposal of contaminated surface and subsurface soil around the buildings and wooden and ceramic waste disposal lines containing TNT. This included thousands of pounds of TNT which were discovered in catch basins that were removed and incinerated at the burning grounds.

Two property use agreements were entered into by the Army and the National Advisory Committee of Aeronautics (NACA), the predecessor of NASA, in March 1956 and January 1958, respectively. The first agreement was for approximately 500 acres on which NACA built a nuclear reactor. The second agreement gave NACA (NASA as of October 1958) use of an additional 2,700 acres within the fenced area but outside the Magazine Area, for a total of 3,231 acres under the two use agreements. At this time, NASA had use of all property inside the PBOW fence except the 2,300 acres in the Magazine Area. The Army declared this 3,231-acre property as excess in October 1958.

In September 1961, the Army declared the Magazine Area as excess, and NASA formally requested custody of the property in October 1961. On March 15, 1963, accountability and custody of the PBOW property (6,031 acres) were transferred from the Department of the Army to NASA.

However, prior to NASA's acceptance of the property in March 1963, Ravenna Arsenal performed additional decontamination and subsequently certified 500 acres of the former PBOW property was decontaminated and suitable for unrestricted future use. This decontamination certification was only for the 500 acres in the former pentolite manufacturing area (area where NASA built the nuclear reactor) under the first use agreement. NASA identified additional DoD-related contamination in 1963, after transfer of the property. NASA performed further decontamination efforts and the removal of structures in 1964.

NASA has operated and maintained the property inside the fence line since 1963, and the facility currently located there is the NASA Glenn Research Center, Plum Brook Station. NASA operates the property as a space research facility in support of its John Glenn Research Center at Lewis Field, Cleveland, Ohio. Most of the aerospace testing facilities built in the 1960s at the site have been demolished, or are currently on standby or inactive status. During 1967 through 1971, NASA purchased approximately 2,000 acres outside of the fence line from local farmers as "buffer." On April 18, 1978, NASA declared approximately 2,152 acres of PBOW as excess. This excess included approximately 1,500 acres of farmland outside the fence, including those acres purchased from farmers beginning in 1967, and was sold as farmland. Also, 46 acres outside of the fence in the northeast corner of the PBOW facility near the guard house was conveyed to The Perkins Township Board of Education and is used as a bus transportation area. In addition, the 2,152 acres of PBOW declared excess included a 604-acre parcel in the western part of the fenced area known as "Parcel 59." This area, although previously declared excess, was not transferred and remains under NASA control. According to a NASA newsletter, NASA presently controls approximately 6,432 acres; this includes approximately 5,500 acres within the fence line and 900 acres outside of the fence which have been leased for agriculture.

## **PROJECT ACTIVITIES**

### **Project 1803 – RI/FS Low Scope**

#### *Phase Completion*

- Remedial Investigation/Feasibility Study (RI/FS) – Completed 30 September 1998
- Project Closeout (PCO) – Completed 30 September 2004

### **Project 1806 – ASR Complete NOFA OEW MMRP**

#### *Phase Completion*

- PCO – Completed 26 October 2009

### **Project 1809 – Site Management**

#### *Phase Completion*

- Site Investigation (SI) – Completed 30 September 2009
- PCO – Completed 30 September 2009

### **Project 1810 – Community Relations and Restoration Advisory Board**

#### *Phase Completion*

- No phase associated – On-going

#### *Quarterly Update*

- Quarterly Restoration Advisory Board (RAB) meetings
- Most recent RAB Meeting was held Thursday 24 September 2015 and consisted of an update of the projects currently under RI/FS and RA-C phase.
- Next scheduled meeting is Thursday, 10 December 2015 and will be an update of all projects.

### **Project 1811 – Additional BGs**

#### *Phase Completion*

- PCO – Completed 19 September 2009

### **Project 1812 - Reservoir No. 2 Burning Ground**

#### *Phase Completion*

- RI/FS – Completed May 2014
- Engineering Evaluation/Cost Analysis (EE/CA)
  - Left report in the draft-final stage (June 2008) per HQ determination of no immediate risk issue.
  - Picked back up in the RI/FS process to complete remediation under RD and RA-C phases.
- Removal Design (RmD) – Completed 11 May 2007
- Remedial Design (RD) – Completed 30 June 2014
- Remedial Action – Construction (RA-C) – on-going

### *Quarterly Update*

- Remedial Action – Construction (RA-C0)
  - All excavated non-haz soil from stockpile area has been taken to landfill. One small stockpile (not quite 300 cy) is currently left and will be hauled to landfill once Phase II starts (Fall 2015)
  - Of the 1,876 cy of remediated soil (now non-haz), 608 cy have been taken to the Erie County Landfill for use as daily cover and the remaining quantity will be hauled to landfill in October and/or November 2015. Continuing to do pad and sump maintenance.
  - Phase II (remaining excavation from 2' to 8' in the eastern portion (kidney bean shaped area) is scheduled to begin late Fall 2015.

### **Project 1813 - TNT Area A (Soils)**

#### *Phase Completion*

- RI/FS – Completed 29 June 2011
- RD – Completed 18 March 2013
- RA-C – Phase I completed 31 March 2013 and Phase 2 completed 31 May 2014
- PCO – Completed 6 March 2015

### **Project 1814 - TNT Area B (Soils)**

#### *Phase Completion*

- RI/FS – Completed 23 September 2009
- RmD – Completed 16 June 2006
- Removal Action-Construction (RmA-C) – Completed 5 June 2007
- PCO – Completed 31 March 2010

### **Project 1815 - TNT Area C (Soils)**

#### *Phase Completion*

- RI/FS – Completed 15 January 2010
- RD – Completed 22 January 2010
- RA-C – Completed 31 March 2013
- PCO – Completed 13 September 2013

### **Project 1816 – TNT Loading Area**

#### *Phase Completion*

- LSI – Completed 31 July 2000
- PCO – Completed 30 September 2002

### **Project 1817 - Waste Water Treatment Plants 1 and 3 with Wooden Sewer Lines**

#### *Phase Completion*

- LSI – Completed 30 September 2000
- RI/FS – On-going

### *Quarterly Update – WWTP#1 and #3 Site (including TNTA/TNTB to WWTP1 Wooden Sewer Lines)*

- CX Draft Decision Document issued 25 August 2015

## **Project 1818 - Waste Water Treatment Plant #2 with Sewer Lines**

### *Phase Completion*

- RI/FS – On-going
  - NASA has agreed to take future responsibility for the WWTP#2 Site, excluding the TNTC to WWTP#2 Sewer Line and the Steel Sewer Lines
  - Only limited DOD contamination was found (no risk drivers identified) associated with the TNTC to WWTP#2 Sewer Line and the Steel Sewer Lines; therefore the FS is not required and the project will proceed to a no further action Proposed Plan and Decision Document

### *Quarterly Update*

- Due to NASA's use of portions of the site, NASA assumed all future responsibility for the WWTP#2 Site (excluding THTNC to WWTP#2 Sewer Line and Steel Sewer Lines). Per Louisville District Office of Council, a Memorandum of Understanding (MOU) is not necessary and will not be developed. USACE is working with NASA in hopes of receiving a letter to support their verbal agreement stating they are responsible for the WWTP#2 area (excluding sewer lines) and are moving forward with their investigation and remediation of that area.
- CX Draft Proposed Plan submitted 17 July 2015
- Final Remedial Investigation Report issued 31 July 2015

## **Project 1819 – Pentolite Waste Area Lagoons (PAWL)**

### *Phase Completion*

- LSI – Completed 30 September 2000
- PCO – Completed 30 September 2002

## **Project 1820 - Red Water Ponds Area (Soils for PRRWP only)**

### *Phase Completion*

- RI/FS – On-going
- RmD – Completed 5 June 2007
- RmA-C – Completed 30 March 2009
  - Residual risk issues remain and further remediation will be conducted under the RA-C phase

### *Quarterly Update*

- CX Draft Decision Document issued 16 September 2015
- Wetlands delineation and surveying fieldwork completed the week of 10 August 2015. CBI is working with USACE Buffalo District to prepare maps overlaying wetland boundaries with AOC boundaries in anticipation of future RD and RA-C efforts.

## **Project 1821 - Ash Pits 1 and 3**

### *Phase Completion*

- LSI – Completed 30 September 2000
- RI/FS – On-going
  - Ash Pits 1 & 3 have separate schedules/reports for site characterization and risk assessment efforts, however, findings from each area will be addressed / evaluated under one Feasibility Study, Proposed Plan, and Decision Document.

*Quarterly Update – Ash Pit 1&3 (including Coal Yards 1&3)*

- CX Draft Decision Document issued 6 August 2015

**Project 1822 - Powerhouse 2 Ash Pits**

*Phase Completion*

- RI/FS – On-going

*Quarterly Update*

- CX Draft Decision Document issued 28 September 2015

**Project 1823 - Acid Area 1**

*Phase Completion*

- LSI – Completed 30 September 1999
- RI/FS – On-going

*Quarterly Update*

- Wetlands delineation and surveying fieldwork completed the week of 10 August 2015. CBI is working with USACE Buffalo District to prepare maps overlaying wetland boundaries with AOC boundaries in anticipation of future RD and RA-C efforts.
- CX Internal Draft Decision Document issued 22 September 2015

**Project 1824 – Lower Toluene Tanks (LTT)**

*Phase Completion*

- LSI – Completed 26 June 2006
- PCO – Completed 5 October 2006

**Project 1825 - Garage Maintenance (Locomotive Bldg, Wash House, Sellite and Unloading Areas)**

*Phase Completion*

- LSI – Completed 30 September 2000
- RI/FS – On-going

*Quarterly Update – Locomotive Building and Wash House Areas*

- CX Draft Feasibility Study issued 30 June 2015

*Quarterly Update – Sellite and Unloading Areas*

- CX Draft Feasibility Study issued 30 June 2015
- Final Site-Specific Safety and Health Plan for Wetlands Delineation and Survey issued 20 July 2015
- Final Treatability Study Work Plan submitted 24 August 2015
- Wetlands delineation and surveying fieldwork completed the week of 10 August 2015. CBI is working with USACE Buffalo District to prepare maps overlaying wetland boundaries with AOC boundaries.
- Treatability study fieldwork completed the week of 10 August 2015
- Final Site-Specific Safety and Health Plan for Monitoring Well Abandonment issued 17 September 2015

## **Project 1826 - Groundwater - TNT A, B and C & Red Water Ponds Areas**

### *Phase Completion*

- SI – Completed 30 September 1999
- Remedial Action-Operations (RA-O) – Completed 30 September 2005
  - The RA-O covered the well maintenance/monitoring portion of the project and LRD told us to include that under the current phase from then on.
- RI/FS – Completed 8 July 2015
- PCO – Completed 8 July 2015

## **Project 1827 – There has never been a project assigned to 1827**

## **Project 1828 - Acid Area 2**

### *Phase Completion*

- LSI – Completed 30 September 1999
- RI/FS – Completed 18 August 2014
- RD – Completed 16 September 2014
- RA-C – On-going

### *Quarterly Update*

- Remediation Action – Construction (RA-C)
  - Excavation on Area C was expanded from 18 to 24” in identified “hot spots” (both horizontally and vertically) and samples were submitted to lab for analyses.
  - Excavation on Area B to 24” is complete as well as confirmation sampling. Identified small hot spots on floor and along south wall. Expanded excavation vertically and horizontally in small “hot spot” areas and submitted samples to lab for analysis.
  - Excavation on Area A to 24” is complete. Confirmation sampling on walls and floor is complete and no additional horizontal or vertical excavation was needed. OTIE Risk Assessor confirmed compliance with RGs. Currently preparing Area A for backfill.
  - Backfill was sampled and analyzed and data was submitted to USACE for review.
  - Continuing to sample and dispose of stockpiles generated from the 3 areas to Erie County Landfill (ECL) as allowed (200 tons daily limit imposed by ECL).
  - Field efforts scheduled to be complete end of November 2015.

## **Projects 1829 - Acid Area 3**

### *Phase Completion*

- LSI – Completed 30 September 1999
- RI/FS – Completed 30 October 2014
- RD – Completed 8 January 2015
- RA-C – On-going

### *Quarterly Update*

- Remediation Action – Construction (RA-C)
  - USACE, Ohio EPA, and NASA review comments on the draft work plans (i.e., Quality Control Plan, Accident Prevention Plan, and Plan of Operations) were submitted to OTIE 28 August 2015. OTIE will review the comments and provide responses back to USACE for approval prior to completing final work plans.
  - Field efforts are anticipated to begin late fall following completion of AA2 field efforts.

## **PROJECT TEAM MEETINGS**

Team meetings are conducted prior to each RAB meeting to discuss project issues and review presentation material planned for the RAB meeting. A Full Team Meeting includes representatives from USACE, NASA, OEPA, and USACE contractors. The last team meeting was held on Thursday, 24 September 2015 at the PBOW field office trailer. The next team meeting is scheduled for Thursday, 10 December 2015 at the PBOW field office trailer.

## **PBOW WEBSITE**

USACE Huntington continues to maintain the website which is dedicated to keeping the public informed about the PBOW activities. This site is updated throughout the year. The PBOW Administrative Record is available at <http://lrh-apps.usace.army.mil/fuds/index.asp>. New documents are uploaded as they become available. The Public Repository (for public viewing) is maintained at the Firelands College Library Reference Desk and updated on a quarterly basis.

## **PBOW TOLL FREE NUMBER**

USACE Huntington has a toll-free number in place for your use. If you have any information such as personal knowledge, photographs, maps, newspaper articles of past activities or other information you would be willing to share, or if you have questions about current activities at the site, please feel free to use the toll free number. USACE is interested in hearing from you. You may call toll free (800) 822-8413 to speak with the USACE PBOW Technical Coordinator.

## **PROJECT CONTACT**

The PBOW Project Manager may be contacted at (304) 399-5388, fax (304) 399-5715 or via email at [PBOW@usace.army.mil](mailto:PBOW@usace.army.mil).