

Introduction

For almost six decades, ammunition and shot shell manufacturing and beverage packaging and distribution activities took place at the Peters Cartridge Factory Superfund site. Today, following cleanup, the site is home to Cartridge Brewing and will soon host mixed uses, including housing, shops and office space.

The 71-acre site is located in Kings Mill, Hamilton Township, Warren County, Ohio. It is about 30 miles northeast of Cincinnati, and is close to Interstate 71. The site runs along the Little Miami River, a designated scenic river and regional bike trail. Kings Mills developed in the 19th century to provide housing and amenities for the Peters Cartridge Factory workforce. The site's historic factory buildings were vacant for decades, beginning in 1944. Today, site cleanup is complete and site reuse is underway. Parts of the site provide access to the Little Miami bike trail, and plans are in place to renovate the factory buildings to host loft-style housing with commercial amenities on the ground floor, including Cartridge Brewing, a local brewery and restaurant.

These development plans are also part of regional revitalization efforts focused on Warren County's Little Miami River corridor between Kings Mills and the city of South Lebanon. These efforts include utility upgrades and a bridge replacement project. Planning

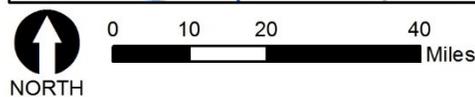
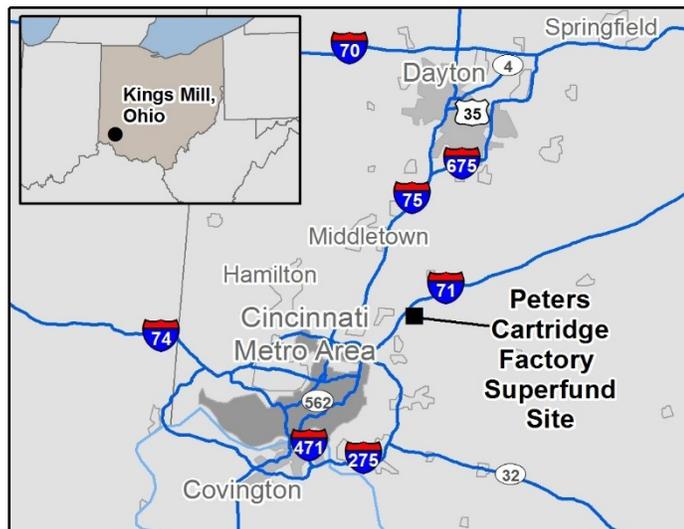


Aerial view of the site prior to cleanup.

for the redevelopment of the site's historic factory buildings, known as the Former Process Area, has been underway for almost a decade.

Proponents of the redevelopment plan -- the Bloomfield Schon + Partners team -- are well-known in southwest Ohio and include design, financial and technical partners. The team has worked closely with EPA, state agencies, and local governments on its plans to convert the FPA buildings into commercial space and residential areas. The team plans to restore the exterior of the factory buildings, including a shot tower and smokestack, preserving the site's rich history for future generations.

Cleanup with EPA oversight took place from March 2015 to June 2017. Coordination among EPA, Ohio EPA and the development resulted in the FPA's deletion from the Superfund program's National Priorities List (NPL) after cleanup, opening opportunities for redevelopment. Looking forward, additional cleanup and reuse will take place under the Ohio EPA Voluntary Action Program (VAP). The ongoing partnership among the development team, local governments, and federal and state agencies will maximize benefits for the community, bringing in new homes and businesses and enabling local infrastructure improvements.



Sources: Esri, DeLorme, AND, Tele Atlas, First American, UNEP-WCMC and USGS.

The Peters Cartridge Superfund site is northeast of the Cincinnati metropolitan area, and located close to regional transportation networks.

This case study explores the tools and partnerships that have led to successful cleanup and transformation at the site. The following pages trace the evolution of cleanup and reuse efforts, highlighting the project partnerships, interaction between government programs and coordination of remedy and reuse considerations. The case study provides information for parties interested in Superfund site reuse, historic preservation, and residential and commercial land revitalization.



SITE HISTORY, CONTAMINATION AND REMEDIATION

The Peters Cartridge Company's facility operated from 1887 to 1934. Remington Arms Company bought the company in 1934 and continued production for 10 more years. The long history of ammunition production at the site began in 1887. The factory produced ordnance, shot shell and cartridge ammunition until 1944. Built in the 1800s, the former facility buildings are listed on the National Register of Historic Places due to their significance in wartime munitions production during World Wars I and II. Site operations also resulted in environmental contamination with metals such as lead, mercury and copper. Site operations included primer mixing and wad production, cupping and drawing of shell heads and casing cartridges, and shell/cartridge packing and assembly. Metals likely used in the manufacturing process included lead for shot and slugs, mercury for the primary ignition powder and, to a lesser extent, copper and possibly nickel for plating casings.

Since 1944, the facility has been divided into parcels and intermittently used by Columbia Records and Seagrams Distillers. Initial site investigations by Ohio EPA between 1994 and 1999 found copper, lead and mercury contamination. EPA then became the lead agency overseeing potentially responsible parties (DuPont) in cleaning up the site. EPA proposed the site for listing on the NPL in 2003 and selected the site's remedy in a 2009 Record of Decision (ROD). EPA finalized the site's listing on the NPL in 2012. After a subsequent investigation, EPA updated the site's remedy in a 2015 Explanation of Significant Differences (ESD).

Cleanup took place from March 2015 to June 2017. Cleanup activities included:

- Excavation of contaminated soil.
- Cleanout and removal of debris and erosional material at drainage culvert and outfall areas.
- Excavation and backfill of shoreline sediment areas with clean fill.
- Consolidation of impacted soil, sediment and erosional material in an on-site consolidation cell.
- Cell capping.
- Groundwater monitoring.
- Institutional controls.

In September 2018, EPA deleted part of the site, the FPA, from the NPL after cleanup goals were met, reducing the site's size from 71 acres to 56 acres. The site is in now the operation and maintenance phase of the Superfund process. As part of this phase, EPA conducts reviews of the site's remedy every five years to ensure its continued protectiveness for people and the environment.

Land Use Context

The site is well located for community-scale redevelopment opportunities. Kings Mills is only 30 miles from downtown Cincinnati and within a few miles of Interstate 71. It lies along a section of the Little Miami River Scenic Trail, a historic railroad right-of-way redeveloped as a bike and walking path, that is also an entrance corridor to the city of South Lebanon (pop. 4,115).

The site's facilities are recognized throughout southwest Ohio as historic icons. The factory buildings date back to the 1880s, and are listed on the National Register of Historic Places. The site also has excellent access to the Little Miami Scenic Trail, a bike path that draws visitors from across the region. The path winds past the site, along the river, and provides a convenient connection to the historic center of South Lebanon, a village in Hamilton Township. The restaurants and breweries planned for the FPA's ground-floor spaces will provide bike-trial amenities. In June 2018, Cartridge Brewing, the first tenant, signed a lease agreement for prime "trailside" retail space for its brewery and restaurant.

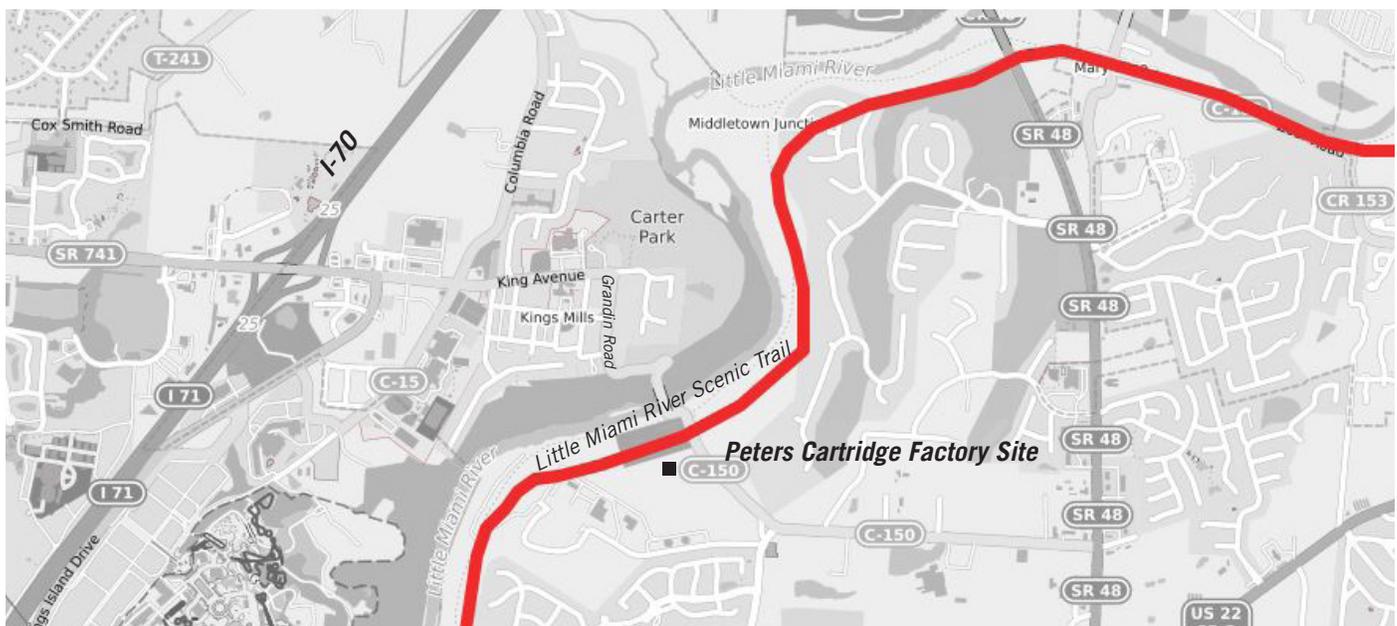
“ ...This bike trail is one of most popular recreational facilities in the area, so everybody has seen it, taken pictures of it...There is a lot of local interest in having it redeveloped as a site that preserves the history... ”

Brad White, Owner, River Road Renewables



LITTLE MIAMI RIVER SCENIC TRAIL

The 78-mile Little Miami River Scenic Trail connects the southwest Ohio communities of Newtown (Hamilton County) and Springfield Clark County. Fifty miles of the trail are designed as Little Miami River State Park, including the part of the trail that passes through the site. The trail follows the former Little Miami River Railroad right of way and is part of the statewide Ohio-to-Erie Trail.



Local transportation routes in relation to the site.

Project History

2003 – 2014

INTERAGENCY COORDINATION, FUTURE LAND USE EVALUATION AND REMEDY SELECTION

Site Investigation and Characterization

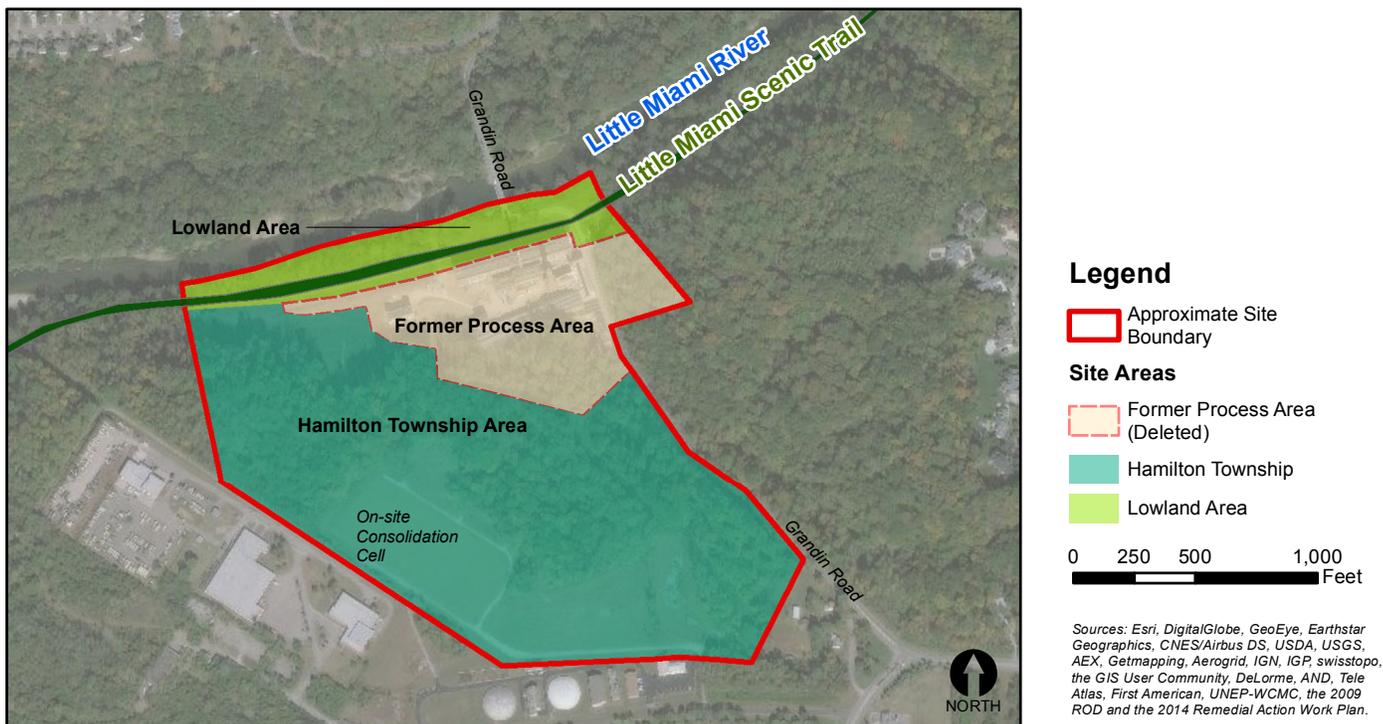
Investigations began at the Site in the 1990s. Ohio EPA first became involved in 1991 and completed Site investigations in 1999. EPA then proposed the Site for listing on NPL. As part of EPA's enforcement efforts, potentially responsible party DuPont entered into an agreement with EPA to perform Site investigation activities under the Superfund Alternative approach. During this time, EPA worked with Ohio EPA and additional sampling information from DuPont to characterize the Site.

In 2009, EPA and DuPont reached agreement regarding potential cleanup options for the Site and released a remedial investigation and feasibility study that explained the extent of Site contamination and various alternatives that could be used to address contamination impacts.

Taking into account 14 areas of concern identified during the remedial investigation study. EPA divided the Site into three areas on the basis of habitat cover types, current land use, land parcel ownership, and anticipated future redevelopment:

During the Site's remedial investigation and feasibility study (RI/FS), EPA divided the Site into three distinct exposure areas: the FPA, the Hamilton Township Property and the Lowland Area.

- **FPA** - This 15-acre area is where most manufacturing took place. Most of the FPA is occupied by former factory buildings and paved areas.
- **Hamilton Township Area** - This 56-acre area, acquired by Hamilton Township in 2007, includes steep bluffs between the Little Miami River, the FPA and adjacent commercial-industrial areas of Kings Mills to the south. It includes former facility features (bunkers, concrete supports, foundations, conveyance structures, and other facilities used by the Peters Cartridge Company), and a salvage area at the northwest part of the township property is unpaved and surrounded by fencing and mature vegetation. Buildings associated with the former salvage yard are located in this area.
- **Lowland Area** - This area extends along the Little Miami River floodplain between the FPA and the river. It includes the Little Miami River Scenic Trail, former facility drainage structures and the riverbank.



Site Areas Map.

TIMELINE OF EVENTS

1887	Peters Cartridge Company begins production of ordnance and shot shell ammunition on site
1934	Remington Arms Company purchased the Peters Cartridge Company and continued production of shot shell and cartridge ammunition at the facility
1944	Ammunition production at the facility ceases
1991	Ohio EPA became involved with the site
1992	Ohio EPA listed site as a discovery site and reported it to EPA
1993	Ohio EPA conducted a preliminary assessment
1994	Ohio EPA began site investigations
1999	Ohio EPA finished site investigations
April 2003	EPA proposed the site for listing on the NPL
July 2004	The DuPont Company signed an Administrative Order on Consent with EPA for an RI/FS
2007	The Lewis Property (now the Hamilton Township Property) is transferred to Hamilton Township
2009	EPA completed the site's RI/FS
September 2009	EPA issues ROD selecting the site's cleanup remedy
March 2012	After unsuccessful negotiations with site PRPs, EPA issued a Unilateral Administrative Order to the lead PRP DuPont for the site's remedial design and remedial action work
2012	EPA placed the site on the NPL
2012	DuPont began pre-design investigations
2013	DuPont completed pre-design investigations
2014	Bloomfield Schon + Partners acquired the FPA property
March 2015	Cleanup activities began
June 2015	EPA issued an ESD updating the site's remedy
June 2017	Cleanup finished
January 2018	Land use restrictions put in place
June 2018	Cartridge Brewing signed lease for space in old factory
September 2018	EPA deleted the FPA from the NPL
December 2019	First EPA Five-Year Review of the site's remedy underway
October 2020	The Cartridge Brewing facility opened on site



View of the Little Miami River Scenic Trail and the site.

Assessing Potential Future Land Uses

With comprehensive site investigation data and cleanup alternatives identified, EPA considered existing and potential future land uses for the site and documented them as part of the site's 2009 Record of Decision. Since the 1970s, no manufacturing activities had occurred at the site and various buildings were leased for storage and salvage operations. The site and surrounding areas remained zoned for industrial uses. Hamilton Township advised EPA regarding the scenic and recreational value of the Little Miami River and adjacent green-space areas, along with the locality's intent to maintain its property for recreation and open-space uses.

Reasonably Anticipated Future Land Use Scenarios

EPA considered the a range of potential future land uses for the three site areas.

- **FPA:** A hypothetical residential land use scenario as well as commercial and industrial uses.
- **Hamilton Township Area:** Anticipated recreation/open space uses on the township-owned property.
- **Lowland Area:** Anticipated recreation/open space uses on the state-owned river bank and rail trail areas.

In the site's 2009 Record of Decision, EPA determined that a commercial/industrial future use scenario would be most realistic but recognized the potential for conditions to change over time. "Given its close proximity to the Little Miami River, the Little Miami River Scenic Trail bike path, and the Hamilton Township greenspace area, the land use in the Former Process Area may change in the future," the document stated. Accordingly, EPA made sure that land use evaluations would be conducted as part of Five-Year Reviews in the future to make sure the site's cleanup remains compatible with current and future uses.

STAKEHOLDER COORDINATION

After selecting the cleanup plan in 2009, EPA began negotiations with potentially responsible parties to reach agreements about implementing the cleanup plan and putting the site's remedy in place. After several years of negotiations, EPA placed the site on the NPL and entered into an administrative agreement with Dupont for the potentially responsible party to construct the remedy.

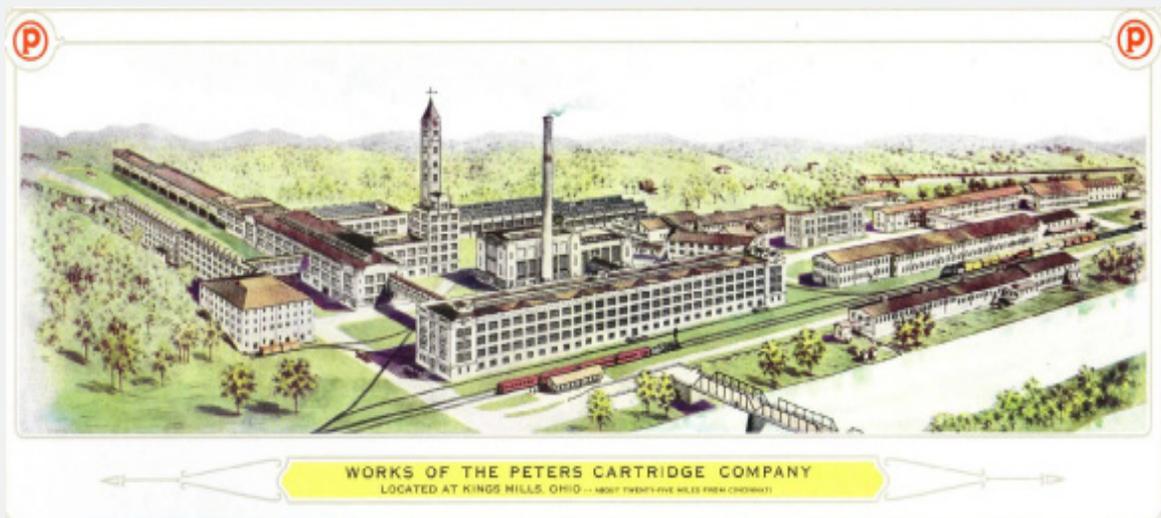
The Bloomfield Schon + Partners development team recognized the site's redevelopment potential, while acknowledging that significant work remained to be done. The development team had gained experience in adaptive reuse and redevelopment with historic structures and brownfield properties in areas closer to Cincinnati.



Clocktower and factory buildings at the site.

“Almost every city has a property or a site that is related to the founding of the city, typically industrial in nature, sometimes military. It’s an important thing for the community to be able to repurpose the site in such a way that you hang on to that history as opposed to just clearing the site and starting over from scratch.”

*Brad White, Owner, River Road Renewables
(environmental partner to the Bloomfield Schon
+ Partners development team)*



Archival illustration of the Peters Cartridge Factory complex.

INSTITUTIONAL CONTROLS

EPA worked and the property owners signed an environmental covenant that establishes the following institutional controls for the site:

Notifications require any excavation or disturbance of the ground surface to be conducted in accordance with the site's soil management plan. Land uses are limited to commercial and industrial uses unless additional cleanup activities are performed and the environmental covenant is amended or terminated. Groundwater use and extraction is prohibited unless approved by EPA.

2015 - 2018 WRAPPING UP CLEANUP AND INTEGRATING REDEVELOPMENT PLANS

The site's cleanup plan required cooperation among state and federal agencies, development partners, and local governments. To address contamination in the FPA, EPA's Site remedy required excavation of lead-contaminated soils above commercial/industrial standards and consolidation of the excavated materials in the on-Site consolidation cell.

Hamilton Township owned the property where the consolidation cell would be located. Soil excavation in the FPA and capping in the consolidation cell took place between 2015 and 2017, effectively removing the risk from soil for commercial users in the area.

At this time, Bloomfield Schon + Partners had advanced plans significantly and reached out to EPA, indicating that removing the FPA part of the Site from the NPL was likely key to making redevelopment possible.

To ensure the remedy in this area would remain protective over the long term, EPA required the implementation of institutional controls. This meant implementing an environmental covenant for the FPA that would prevent unacceptable land uses or exposure to contaminated groundwater or soil.

EPA then worked with Ohio EPA and Bloomfield Schon + Partners to develop and implement institutional controls. Once the cleanup was complete and institutional controls were in place, the Superfund remedial action was complete. EPA certified that DuPont had finished the required cleanup activities.

The primary contamination risk for soils at the Site was potential for people working or living at the Site to come into contact with lead contaminated soils. Commercial and industrial uses required at least 2 feet of cleanup soil, between open space areas, buildings

or asphalt and the lead-contaminated soils underground. In order for housing to be permitted at the site, lead-contaminated soils needed to be at least 4 feet below ground.

More cleanup work would be needed before the property would be ready for residential use. Further cleanup was possible under state cleanup programs, but for the property to be eligible for these programs, it had to be removed from the NPL. Institutional controls must be implemented before EPA can delete a Site from the NPL, if they are part of the required remedy.

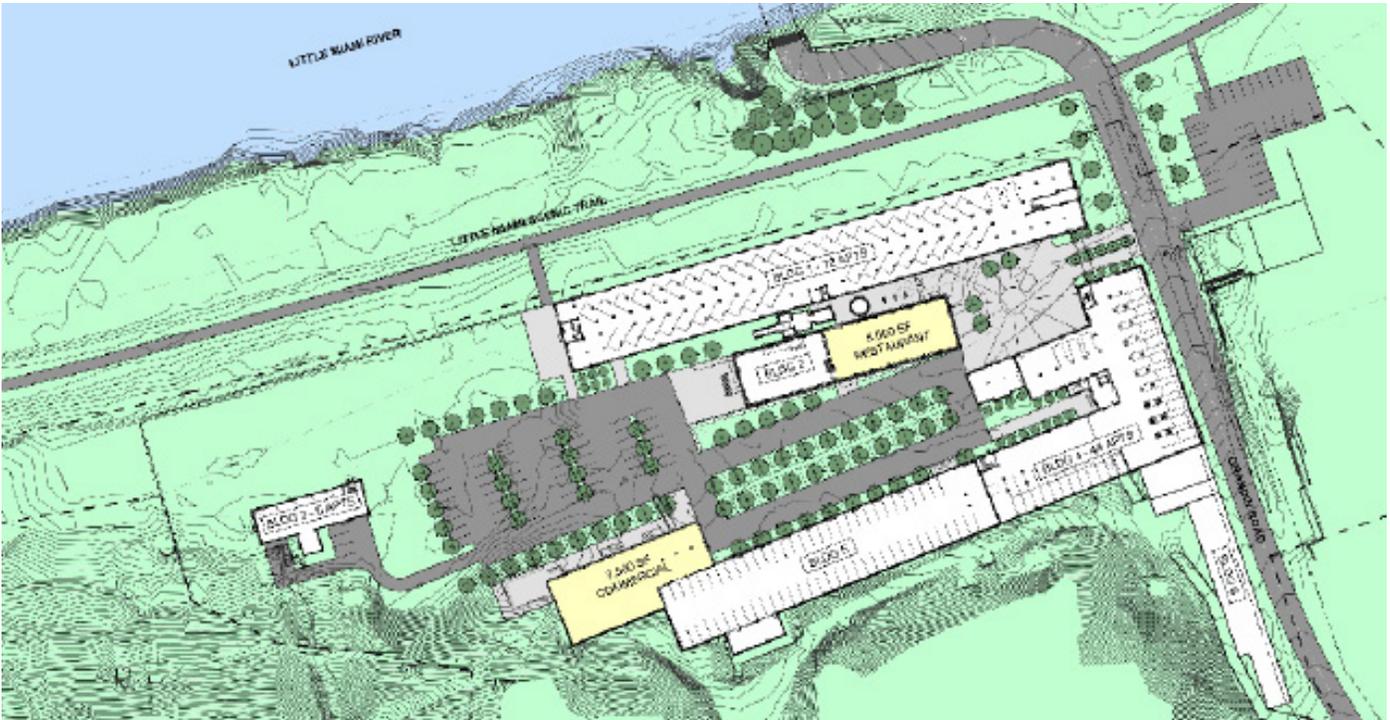
The institutional controls were a priority for both EPA and the development team. EPA needed to ensure that appropriate land use controls were in place at the end of Site cleanup activities conducted under the Superfund program to ensure the long-term protectiveness of the Site's remedy. Bloomfield Schon + Partners needed flexibility to conduct additional cleanup and achieve a higher cleanup standard in order to turn the Site's redevelopment plans into reality. In January 2018, EPA and the property owners signed an environmental covenant for the FPA parcels. It requires any excavation or disturbance of the ground surface to be conducted in accordance with the Site's soil management plan, limits land use to commercial and industrial uses unless additional cleanup activities are performed and the environmental covenant is amended or terminated, and prohibits groundwater extraction or use unless approved by EPA.

“You're preserving history, and yet you're building a future where people want to work, play and raise a family.”

*Scott Lipps,
House of Representatives,
State of Ohio, District 62*

Reflecting on this period in the cleanup, development team representative Steven Bloomfield acknowledged EPA's key role in the process. “They have tried very hard to get us to this point without any shortcuts so that today, it's like getting a Good Housekeeping seal of approval,” he noted. “We now have a safe, clean Site in which people can enjoy themselves.”

With the institutional controls in place, the remedy for the FPA was fully implemented and EPA had the assurance it needed that the Site remedy would remain protective over the long term. The Agency moved forward with deleting the FPA parcels from the NPL and completed the deletion in September 2018. For Bloomfield Schon + Partners, the implementation of institutional controls and the Site's partial deletion from the NPL gave the development team confidence that all EPA requirements for site cleanup had been met. The partial NPL deletion also meant that they could move forward with the next step in their plans: cleaning up the property to levels compatible with residential development.



Redevelopment concept plan for FPA buildings at the site.

“When you have the team that we put together - our senator, our state representatives, our county commissioners, the local village and the EPA...People thought we couldn’t do this, and yet a year later, here we are introducing the project.”

*Scott Lipps,
House of Representatives,
State of Ohio, District 62*

NPL DELETION

EPA recognizes that deletion of a site from the NPL can advance redevelopment for a variety of reasons, such as reducing stigma and improving access to financing, among others. With the contaminated soil excavation and capping work completed to commercial/industrial cleanup standards, only one step – the implementation of institutional controls – remained to complete EPA’s FPA remedy, after which the FPA could be deleted from the NPL. EPA’s Superfund program focuses on making a visible and lasting difference in communities, so whenever possible, EPA works with property owners, developers and prospective purchasers to reduce barriers to site reuse when a property can be used safely.

2018 - 2020

Voluntary Cleanup and Preparing the Site

Once EPA implemented institutional controls and deleted the FPA from the Superfund list, the historic core of the Site became eligible for further cleanup under state cleanup programs. At this point, the Site was enrolled in Ohio EPA’s Voluntary Action Program (VAP). One of the key components of the redevelopment at the site was the integration of future use plans with the site’s remedy. Brad White, a certified environmental professional, engineer and redevelopment expert joined the Bloomfield Schon + Partners team to oversee and manage the final remediation needed to prepare the Site for redevelopment.

The development plan for Peter’s Cartridge factory buildings was starting to take shape. The plan above features apartments, shops, restaurants and office space. Four of the historic manufacturing buildings are slated for renovation, with apartments on the upper level and commercial retail and office spaces on the lower levels. Restaurants and breweries for the ground floor spaces are part of the plan to provide bike trail amenities. The upper floors of the former manufacturing buildings will host 120 to 130 apartments. Strategic ground-floor locations will provide about 20,000 square feet of commercial space.

The redevelopment plan’s projected costs for stabilization, renovation and development are around \$25 million. From a financial perspective, the site’s historic status is a significant asset, enabling the project’s development team to help offset renovation costs with state and federal tax credits for historic preservation.



The work with Ohio’s VAP program needed to be carefully coordinated with the state agency in order to secure the necessary liability protections. So the partnership enrolled the 12-acre FPA in the Memorandum of Agreement track of the VAP program. This branch of the project ensured the highest level of coordination between the development partners’ cleanup team and the state’s remediation program overseeing the work. The team’s work plans were approved by the VAP program. Final cleanup approvals followed. Ohio EPA then issued a “No Further Action” letter to the project’s development team, certifying the completion of the cleanup. With this step completed, the partnership secured a waiver and release of liability, providing key protections needed for financing rehabilitation and construction activities for the historic factory buildings. The cleanup finished in 2019.

The VAP program provided an effective regulatory program for development partners to assess and oversee cleanup activities needed to bring the FPA from a property ready for commercial use to one that could also safely support residential redevelopment in the former factory buildings.

Coordinating Area Improvements with Local Government

Hamilton Township also purchased a 56-acre area of the Site, which includes the capped area containing excavated soils from the FPA and other Site areas. Most of the area is now a managed open-space area and a trailhead parking lot for the Little Miami River bike path.

Participation from the township in the acquisition of significant open-space areas at the site is part of the transformation of a key gateway to South Lebanon. The Little Miami River Scenic Trail and the open space resources surrounding the former Peters Cartridge buildings establish a gateway to South Lebanon from Hamilton Township and highway access to the east.

The redevelopment of the FPA is part of a broader Warren County plan to revitalize the Kings Mills and South Lebanon area. The village of South Lebanon has incorporated Site and surrounding area into its utility district and annexed the land from Hamilton Township’s jurisdiction. The local government and the development team are working together to coordinate transportation improvements and bridge construction in the near term.

2020 AND BEYOND

Phasing Development to Capitalize on Tourism Assets and Build a Community Gathering Place

The first phase of the overall reuse approach for the Site builds on the Little Miami Scenic Trail’s popularity as a destination, tourism and community asset. Cartridge Brewing, a brewery and restaurant venue, was the first business to lease space in the former factory buildings. The facility opened on site in 2020. For bikers, walkers and runners, Cartridge Brewing now provides trailside refreshments and sustenance from its ground-floor venue in the heart of the former Peters Cartridge factory.

“The most unique thing about the project is that over 90% of the overall historical structure is staying and we are just kind of giving it a facelift. You know, they don’t build buildings like this. You’re looking at a long-standing history of local support. I hope what it brings to the community is a community gathering space again.”

Kyle Hackbarth, Cartridge Brewing

Kyle Hackbarth, the brewing company’s sole proprietor, rehabilitated the historic trailside venue. He hopes that it brings people together in the revitalized space and helps jumpstart other planned components of the project.

While rehabilitation and conversion of former factory spaces into residential loft-style apartments is still several years off - this next phase of development is pending ongoing infrastructure work and inter-municipal agreements - Hackbarth’s vision is to restore the Peters Cartridge Factory to glory as a gathering place for the Kings Mills Community.

Lessons Learned

One of the priorities at the Peters Cartridge Factory site was integrating cleanup and redevelopment considerations in ways that were both efficient and protective of human health and the environment.

Under EPA's oversight, responsible parties reached agreements with EPA to clean up the site so it would be protective for commercial or industrial uses. This cleanup satisfied the potentially responsible party's obligations at the site and met the requirements of EPA's cleanup plan. However, the community and development partners envisioned residential dwelling units. Making the site protective for the residential use elements of the site's redevelopment plan required private and public-sector cooperation involving development partners, local and state agencies, and EPA.



Former EPA Regional Administrator Cathy Stepp and developer Steven Bloomfield discuss revitalization plans during a July 2019 ceremony held in the Cartridge Brewing space prior to its renovation.

Institutional controls are an important component of the phased cleanup approach at the site. Land use restrictions were needed to ensure the site's safe and appropriate reuse, and they were implemented once the responsible parties implemented the first phase of cleanup. While cleanup was underway, the Bloomfield Shon + Partners development team purchased the FPA with the understanding that the vision for site reuse would require additional cleanup. EPA coordinated with the developers to establish the appropriate restrictions needed to limit future land use and development activities for the FPA in the near term, while providing flexibility for updating or modifying the limitations should additional cleanup activities occur in the future.

This phased approach required close coordination among private-sector and agency partners. Since the development team's redevelopment plans included residential use, Ohio's VAP program provided an effective way to assess and remediate certain areas around the former factory buildings where soils needed cleanup for compatibility with residential use. Enrollment in the program provided the Bloomfield Schon + Partners team with two key resources: a way to clean up the property to residential standards and protection from liability for past site contamination. The VAP gives private parties a way to voluntarily investigate possible environmental contamination, clean it up to Ohio EPA standards as necessary. Once those steps are complete, the applicant receives a "No Further Action" letter from the state certifying that no more cleanup is needed. The project's development team received this letter for the FPA in 2020, along with a covenant not to sue, which protects the property owner from being legally responsible to the state for further investigation and cleanup.

Local government support has also been a critical component of the redevelopment at the site. Hamilton Township's acquisition of open space areas at the site has helped to support the area as a destination and future stop along the Little Miami Scenic River. Looking forward, infrastructure improvements, including utilities and road connections, will be needed to support residential and commercial growth at the site. Inter-governmental agreements among utility authorities and taxing jurisdictions are being finalized that will make this possible.

"There are many facets where we're successful here: historic preservation of a plant that has contributed to our community for over 100 years, and saving that site, redeveloping it for residential and commercial uses, so we will have restaurants and businesses and we'll have 130 luxury apartments on the site."

*Scott Lipps, House of Representatives,
State of Ohio, District 62*

Trailside Amenities, Mixed-Uses and Historic Preservation

THE PETERS CARTRIDGE FACTORY SUPERFUND SITE IN KINGS MILLS, OHIO

Sources and Resources

Sources

Images and maps for this case study are provided courtesy of Brad White with River Road Renewables and the Bloomfield Schon + Partners development team.

Resources

EPA's site profile page:

cumulis.epa.gov/supercpad/CurSites/csinfo.cfm?id=0507087&msspp=med

EPA's Superfund Redevelopment Program

www.epa.gov/superfund-redevelopment

The Ohio Voluntary Action Program

epa.ohio.gov/divisions-and-offices/environmental-response-revitalization/derr-programs/voluntary-action-program

Hamilton Township

www.hamilton-township.org/home/

Village of South Lebanon

southlebanonohio.org

Warren County

www.co.warren.oh.us

Little Miami River Scenic Trail

www.miamivalleytrails.org/trails/little-miami-scenic-trail

Cartridge Brewing Company

cartridgebrewing.com



December 2020