The

BORIT ASBESTOS SUPERFUND SITE

Ambler, PA **January 2016**

A Story of

PROGRESS *and* PROMISE

A detailed look at the work of EPA's Superfund Removal Program

Above: *Aerial photograph of the BoRit site taken in 2009.* ***Top Right:*** *Before EPA began work at the site in 2008, visible asbestos-containing debris littered the site surface.* ***Bottom Right:*** *Slurry containing asbestos was also present in some areas of the site.*

ASSET OR BURDEN?

Today, a former asbestos waste dump located at the intersection of the Borough of Ambler and Whitpain and Upper Dublin Townships, in Montgomery County, Pennsylvania, is well on the way to becoming an attractive green space.

With expansive grassy fields, strewn with seasonal wildflowers, and an 11-acre reconstructed pond, the BoRit Asbestos Superfund Site is already welcoming migrating birds, and in the not-too-distant future, an 11-acre portion of the site may be re-established as a community park. Yet, some people say the site is just a dirt-covered mound of asbestos waste that threatens the welfare of surrounding communities and future recreational users.

Is the BoRit Asbestos Superfund Site just a pile of dirt-covered waste? Or is there more there than meets the eye? What is under all that grass and greenery? The U.S. Environmental Protection Agency (EPA) wants you to know about the work that has been done at the BoRit site to protect human health and the environment now and in the future.

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THE BOOM TO BUST CYCLE

There was a time when the Ambler area was primarily agricultural. The arrival of the railroads, however, not only expanded local farmers' access to larger markets, it attracted the attention of entrepreneurs whose initial pharmaceutical enterprise evolved into the lucrative emerging industry of asbestos products manufacturing. In Ambler, manufacturing facilities could take advantage of the abundance of available water resources provided by

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For decades, Ambler Borough prospered as the home of several manufacturing facilities that made asbestos-containing materials such as tiles, shingles, pipes, and fire-retardant textiles.The manufacturing processes, however, also generated asbestos-containing wastes that resulted in the creation of massive piles of discarded asbestos products and a thick, paste-like sludge consisting of calcium carbonate, magnesium, and asbestos fibers. The waste materials were left behind under a cover of soil when the facilities closed their doors in the latter half of the 20th century, as the harmful nature of asbestos became known.

At first, the soil covering the waste materials supported dense vegetation that helped to control erosion. But at the dump site now known as the BoRit Asbestos Superfund Site, time and weather, including rain and wind storms and reoccurring flooding, wore away at the base of the waste piles and portions of the slopes. By 2006, when EPA reassessed the site, asbestos-containing materials (ACM) were visible in Wissahickon Creek, Tannery Run, and Rose Valley Creek which border or intersect the BoRit site and run along the edge of the waste piles. Broken products were also exposed on some of the steeply sloped sides of the piles, In the portion of the site located in Ambler, contaminated sludge was also present.

When EPA reassessed the site in 2006, discarded and broken asbestos-containing materials (ACM) littered the creeks surrounding the BoRit site and the slopes of the waste piles. These pictures show portions of Wissahickon Creek and an adjacent slope of the former West Ambler community park which was closed in the 1980s because of asbestos concerns.

WHY DID EPA CONDUCT A REASSESSMENT?

While sampling conducted by EPA and the Pennsylvania Department of Environmental Protection (PADEP) confirmed the presence of asbestos in the waste piles at BoRit in the 1980s, the piles were covered by soil and vegetation which limited the risk of exposure. The site was fenced, and no asbestos was detected in surface water or groundwater samples taken at the site. As a result, the site was not a candidate for cleanup by EPA and it remained under the jurisdiction of the PADEP.

In 2005, the BoRit site was, again, brought to EPA's attention when community residents became concerned about plans for development on the 6-acre portion of the waste site located in Ambler

Borough. Initially, concerns focused on aesthetic and nuisance issues, such as building height and increased traffic congestion. But soon, concern shifted to the potential for construction activities to cause the release of asbestos fibers into the air where they could pose increased health risks. The concerns of residents led EPA and PADEP to plan a sampling event to establish baseline conditions at the site. EPA conducted sampling of the entire 32-acre site, in April 2006, and found that asbestos-containing materials were visible on the surface and in the three adjacent waterways. The visible wastes caused EPA to initiate a Removal Action at the BoRit site in July 2008.

WHAT IS SUPERFUND?

The EPA Superfund program is responsible for cleaning up some of the nation's most contaminated land and responding to environmental emergencies, oil spills, and natural disasters. To protect public health and the environment, the Superfund program focuses on making a visible and lasting difference in communities, ensuring that people can live and work in healthy, vibrant places.

EPA contractors picking up miscellaneous debris and asbestos-containing materials (ACM) from the streams and the site surface at the start of work at the site. The materials filled more than 288 shipping containers and were taken offsite to a permitted disposal facility.

Aerial view of site, taken in November 2015, shows work in progress on the park parcel and work completed on the pile parcel and the former reservoir now called the pond. Improvements made to the pond include a 1/2-acre island for nesting migratory birds and a viewing area and trails along Maple Avenue.

CLEANUP ACTIONS TAKEN UNDER SUPERFUND LAW

The U.S. EPA is authorized to take actions under a number of environmental laws including the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), commonly known as the Superfund law. Initially, the law provided for a tax on chemical and petroleum industries. The tax went into a trust fund that was used to investigate and cleanup abandoned or uncontrolled hazardous waste sites across the country. Although the taxing authority expired in the mid -1990s, the name Superfund is still used to refer to the Removal and Remedial programs established under CERCLA. It is CERCLA that provides EPA the authority to conduct the investigation and cleanup activities now occurring at BoRit.

THE SUPERFUND REMOVAL ACTION

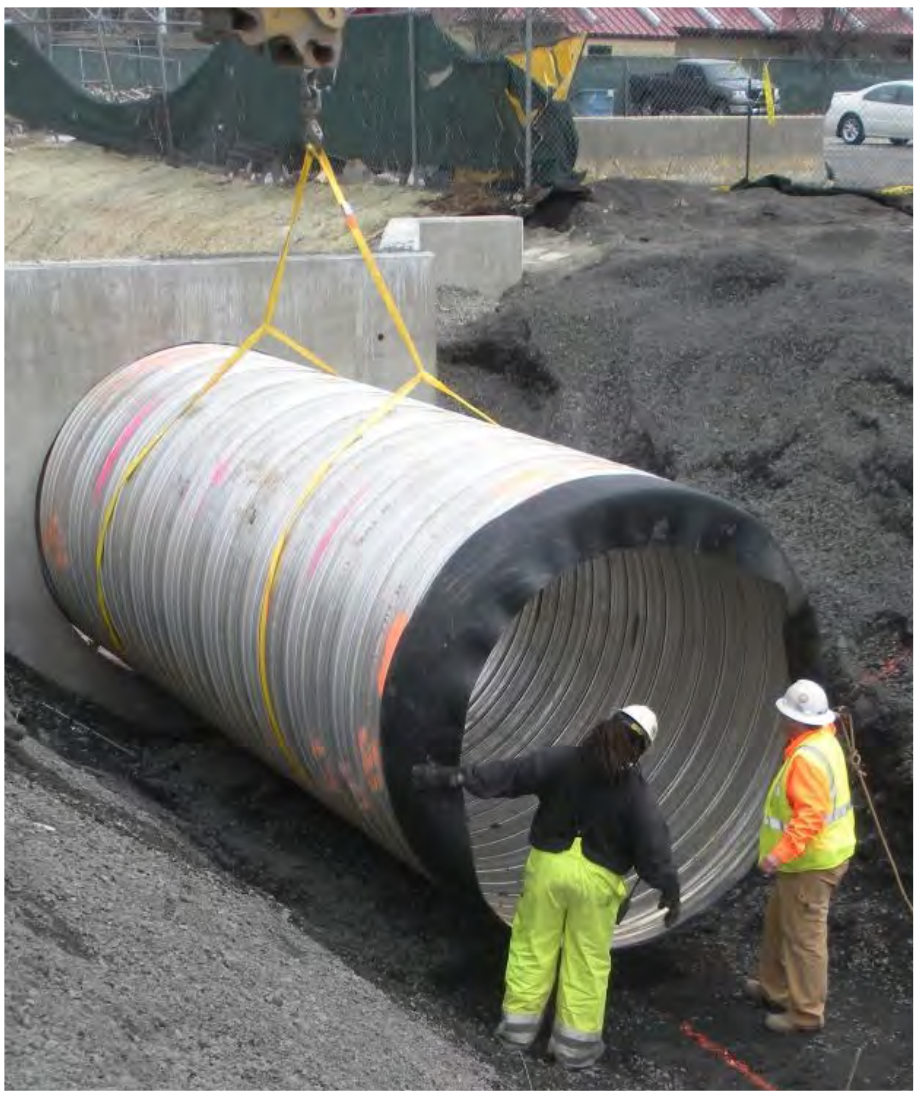
Since July 2008, EPA's Removal Program has been conducting major construction activities at BoRit. When the Removal Program initiated action, its primary goal was to eliminate the exposure pathways that could allow asbestos fibers to move in the environment. The most significant pathways were surface water, which was exposing asbestos waste by eroding the soil cover along the stream banks, and wind, which was eroding the surface of the waste piles and other areas where vegetation was sparse. Because asbestos is most damaging to human health when it is inhaled, EPA's primary objective became preventing water and wind from eroding the waste piles and exposing asbestos-containing materials which might become friable (crumbly) and release asbestos fibers into the environment.

WHAT HAS THE REMOVAL ACTION ACCOMPLISHED?

The Removal Program is completing construction of a protective cap across the entire BoRit site, including the bottom and walls of the on-site pond. The cap will immobilize contaminants by preventing air and water from coming into contact with contaminated materials. EPA expects the cap to be completed in 2016.

There are several components to the cap. A heavy geotextile was placed over the entire 32-acre site. Next, the geotextile was covered by a minimum of two feet of clean soil. Because the site is bordered by Wissahickon Creek and Tannery Run and dissected by Rose Valley Creek -- three waterways which are prone to flooding -- it is important to protect the cap from the daily water flow, as well as from storm surges. So, the stream beds were widened to accommodate heavier storm-water flows. Then, they were lined with geotextile and cabled-concrete mats which were anchored to the soil with specialized construction anchors that were driven deep into the earth. When they are opened, the anchors function much like toggle bolts and can hold great weight. The cabled-concrete mats line the creek bottoms and extend up the stream banks to above the historic flood lines.

Top Left: Tannery Run before work began. Middle Left (2): Tannery Run was significantly widened to help reduce flooding. Geotextile and cabled concrete mats (CCMs), which are secured with specialized anchors that extend deep into the soil, line the open portion of the stream bed. Bottom Left: Gaps in the CCM were filled with soil and seeded. Top Right: Worker secures CCM. Bottom Right: By May 2011, plants had sprouted and held up well to heavy rains. Plants and their root systems play an important part in controlling erosion.



The 25-ft.-high embankment of Tannery Run, behind Butler Street businesses, was eroding and destabilizing parking lots. EPA enclosed a 325-foot portion of the stream to prevent collapse. ***Top Left:*** *Crew installs the headwall to anchor the 8-ft-diameter pipe through which the stream will flow.* ***Top Right:*** *Water will flow from the lined open channel into the 8-ft. diameter pipe at the headwall.* ***Bottom Left:*** *Workers install first section of 8-ft-diameter pipe.* ***Bottom Right:*** *Liner and pipe were covered with 2,640 cubic yards of stone; the enclosed area was finished with soil and seeded.*

In September 2011, Tropical Storm Lee damaged work that had been done at the BoRit site, but it also provided lessons for how to better protect the site against future severe weather events.

Upper Left: *During Tropical Storm Lee, water and debris burst through the old sluice gate at Maple Ave., sweeping down Rose Valley Creek and destroying the recently installed cabled concrete mats (CCM). Although a setback, the experience helped EPA and the US Army Corps of Engineers to improve and strengthen the stream liner system.* ***Lower Left:*** *Contractor conducting CCM repair after the storm.* ***Upper Right:*** *Restored and strengthened stream liner at Rose Valley Creek headwall.* ***Lower Right:*** *A new swing-gate was installed at Maple Avenue/ Rose Valley Creek sluiceway. The gate is designed to release water slowly during future storm events.*

Large, heavy rocks, commonly called rip rap, are layered over the cabled concrete mats to help ensure that heavy storms, do not lift the mats or erode the stream banks.

In September 2011, Tropical Storm Lee did cause damage to earlier work that had been done at BoRit. But it also provided lessons for how to protect the site against future severe weather events. For example, storm water carried debris down Rose Valley Creek during the storm. When the debris reached the sluiceway under Maple Street in West Ambler, it collected until mounting water pressure caused an explosive release that endangered residents and damaged work done downstream at the Borit site. In addition to repairing the damage at the site, EPA made improvements to the Rose Valley Creek channel at Maple Street by adding a swing gate to gradually release water during future storms. EPA also added a guard rail upstream to prevent cars and large debris from entering the channel. Although the storm caused a set-back to the Removal Action, EPA and the U.S. Army Corps of Engineers (USACE) used the experience to fortify the repair work at the site and to strengthen the remaining work in the stream beds and the pond. USACE frequently is contracted by EPA to provide construction expertise on projects. Along the Wissahickon Creek, a honeycomb made of high-density polyethylene was anchored to the slopes of the waste piles and the outer walls of the onsite pond. The compartments of the honeycomb were filled and then covered with soil on the upper slopes and with rocks on the lower slopes. The honeycomb structure increases the stability of the site slopes and helps plants to take root. As sections of the cap were completed, workers hydro-seeded the soil with native grasses and wildflowers. Finally, the seeded areas were covered with erosion mats made of straw or, on steep slopes, woven, high-performance, turf mats, which allowed the seeds time to sprout. The seed mixture was selected for its suitability to the local climate and the terrain, and the stabilizing growth habits of the plants.

Top Left: *Temporary pumps and a sandbag dam were installed to create a dry work area for rebuilding Rose Valley Creek.* ***Upper Middle:*** *Stream water was re-routed through 700 feet of piping and discharged into Wissahickon Creek while Rose Valley was being widened and lined.* ***Lower Middle:*** *Before geotextile and cabled concrete mats (CCM) were laid, workers placed a layer of stone on the floor of Rose Valley Creek.* ***Bottom Left:*** *For added security, rip rap was placed over the CCM on the stream embankment.* ***Top Right:*** *Rose Valley Creek after being repaired and widened to reduce future flooding.*

Geotextile was laid over the entire 32-acre site. Additional components of the cap were layered over the textile. ***Top Left:*** *Workers secure high-density polyethylene geocells resembling a honeycomb over geotextile on a steep embankment of the Wissahickon.* ***Bottom Left:*** *A crane was used to fill geocells with stone. Soil was later placed over the geotextile and geocells and seeded.* ***Top Right:*** *Workers place geosynthetic clay-impregnated liner (GCL) on an inside section of the pond berm to increase structural stability.* ***Bottom Right:*** *Workers pore bentonite along the seams of the clay liner.* ***Center:*** *Workers hydro-seeding berm. Straw mats prevent erosion and help seeds to sprout.*

As they mature, the plants will help to sustain and shelter migrating birds and native wildlife. The seeds sprouted quickly, and the roots of the plants now form a living erosion barrier.

The 10-acre impoundment, now referred to as 'the pond', was also stabilized and improved. Its walls (aka berms), which were built of the same materials as the waste piles, were unstable in some areas when work began, especially along portions of the Wissahickon and Rose Valley Creeks. Working with the Army Corps of Engineers, EPA drained the pond of 31 million gallons of standing water and treated the water before releasing it into Wissahickon Creek. The pond bottom contained the remains of trees cut down and left in place when the impoundment was originally constructed. The tree stumps were removed, and the geotextile was laid. Then it was covered with a minimum of two feet of soil. In unstable areas of the berm and the pond bottom, lime was mixed into the soggy base materials and a clay-impregnated liner was laid on the inner surface of the berm to add stability. The outer walls of the berms were treated in the same manner as other areas of the site with various combinations of geotextile, soil, polyethylene honeycomb fabric or cabled concrete mats, and rip rap, as appropriate for each area. Additionally, an island was constructed in the pond to provide habitat for migratory birds.

Water from the Wissahickon is being pumped and filtered at a rate of about 300 gallons per minute, seven days a week.

On October 5, 2015, refilling the pond began. Water from the Wissahickon is being pumped and filtered at a rate of about 300 gallons per minute, seven days a week. EPA estimates it will take 25 million gallons of water to reach the desired surface water elevation for the pond, which may take up to four months of pumping to complete.

CAN CONSTRUCTION BE CONDUCTED SAFELY AT AN ASBESTOS SITE?

Throughout the work at the BoRit site, protecting the health of site workers and community members was, and continues to be, EPA's top priority. Whenever site work involved disturbing contaminated soil, water cannons were used to deeply saturate the soil to prevent the contaminants from becoming airborne. If a release of asbestos fibers were to occur, EPA personnel and contractors working on the site would be the first and most directly affected population. So, protecting onsite workers' health is of paramount importance, and it also ensures the protection of the surrounding communities. In addition to personal air monitors worn by site personnel, monitors were located along the fence-line to monitor ambient air for the presence of contaminants.

The construction of access roads throughout the site is another example of a protective measure taken by EPA to protect workers and community members. In order for trucks and heavy equipment to move about the site, gravel and clean fill were brought in to build roadways, all of which were underlain with geotextile like the rest of the cap. This ensured that trucks and other equipment did not drive through contaminated soils. Additionally, even though vehicles drive only on clean soil, equipment leaving the site is washed down to help limit the amount of nuisance dirt tracked through the neighborhood. While some dirt is still tracked onto local streets, EPA wants residents to know that when soil is tracked into the streets from the site it is clean fill.

Top Left: *Workers measure a section of Rose Valley Creek to prepare stream-bank stabilization plans.* ***Middle Left:*** *ACM, wetted, bagged and wrapped in plastic, is transported to Roll-Off shipping containers for disposal off-site.* ***Top Right:*** *Onsite access roads were built to ensure vehicles drove only on clean surfaces. Here, workers are placing geotextile and covering it with gravel.* ***Lower Right:*** *To suppress dust, water was used whenever contaminated materials were disturbed.*

Top Left: *Thirty-one million gallons of water were drained from the old reservoir through these holding tanks so that work on the pond could begin. Additional pumping was needed after each rain.* ***Upper Middle:*** *From the holding tanks, water went into these filtration units to be treated and sampled before being released into Wissahickon Creek. Throughout the project, more than 37 million gallons of water were treated.* ***Lower Middle:*** *When the water was drained, trunks of trees cut down decades ago were revealed and had to be removed.* ***Bottom Left:*** *Contractors work on the liner for the former reservoir which includes geotextile, GCL, and at least two feet of soil.* ***Top Right:*** *After the final soil cover was placed on the berm and seeded, straw mats were laid to ensure seeds had time to take root.* ***Bottom Right:*** *Water from the Wissahickon was pumped into the finished pond at 300 gallons/minute, 12 hours/day, 7 days/week. When the pond is filled, the stone piles will be submerged and will provide protection for fish and turtles.*

IS REDEVELOPMENT POSSIBLE?

As the Removal work progressed, the question of the BoRit site's future was raised by various members of the community. It is up to the property owners, not to EPA, to decide how sites may be reused, as long as redevelopment does not damage the protections that EPA put in place. From EPA's perspective, beneficial reuse or redevelopment could include a wide range of possibilities from open-space plans and improved natural habitat to economic redevelopment scenarios. Of the three parcels comprising the BoRit site, beneficial reuses are already planned by the owners of two properties.

The pond property is a bird sanctuary owned by the Wissahickon Waterfowl Preserve. It will continue to be a refuge for migrating birds. In fact, even in the midst of construction, the birds continued to come and nest undeterred by heavy equipment and busy workers. A small island now sits in the pond to provide nesting areas for waterfowl and protect them from predators. Several small rock formations also dot the pond and will provide sheltering habitat for small aquatic species. Additionally, a new earthen peninsula will allow community members to enjoy the beauty of the restored environment and observe the birds from a respectful distance. There are currently no plans for the smallest parcel which raised local concerns back in 2005 and is located in Ambler along Tannery Run and adjacent to the pond. However, the largest parcel, which is owned by Whitpain Township, is expected to become a community park. The Township plans to redevelop the West Ambler parcel to replace the park that closed in the 1980s because of asbestos contamination. To ensure that EPA's cap will not prevent such redevelopment in the future, EPA worked with Whitpain Township to locate the water and sewer lines that the park will require and to extend them to the top of the cap. (It must be noted that this work was completed by the township at the township's expense, as EPA does not fund the redevelopment of Superfund properties.) EPA is confident that with proper planning a community park can be compatible with the work EPA is completing at the BoRit site. Furthermore, the routine maintenance that a community park would require would provide an added layer of oversight to complement any oversight and operation and maintenance activities that will be required under Superfund.

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Left: *An eagle perches on one of several tree branches anchored in the pond to provide sanctuary for birds. The rock pile is one of many built to shelter fish and other aquatic animals. Temporary white flags help to keep birds from disturbing young plants before roots have matured.* ***Right:*** *Wildflowers covered finished areas of the site in Spring 2015.*

THE TRANSFORMATION OF BORIT

Re-engineering makes Superfund site safe for re-use

What's Going On?

The EPA is wrapping up it's 8-year Superfund removal action at a former asbestos waste dump. Long dominated by heavy equipment and scraped earth, the 32-acre site is once again a grassy expanse dotted by wildflowers.

3,000 TONS

tons of ACM and other waste were trucked off site (sprayed with water to prevent dust). Asbestos is a health risk when particles get into the air and are breathed into the lungs.

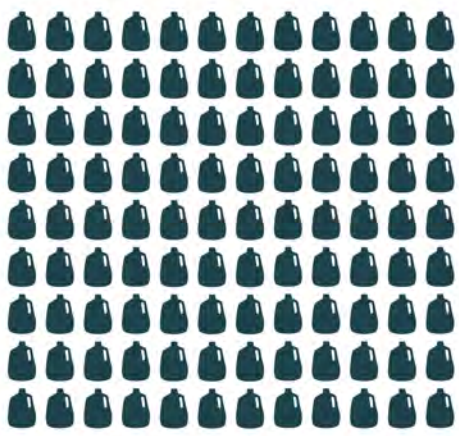
A PROTECTIVE CAP

Geotextile fabric was placed over the entire site, including the bottom of the pond and two creeks. Then the area was covered by two feet or more of clean soil and seeded with native grass and wildflowers to prevent erosion.

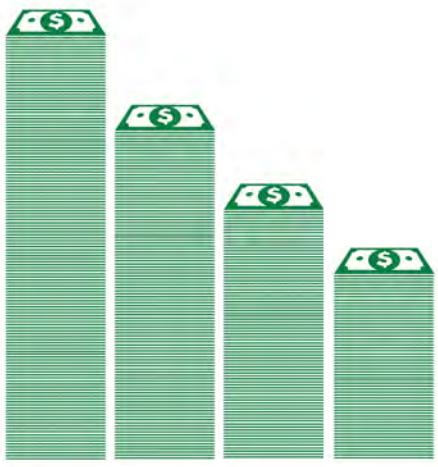
RE-ENGINEERED CREEKS

Rose Valley Creek and Tannery Run were widened to accommodate storm flows. Then the bottoms and sides were lined with cabled concrete mats and large rocks called rip rap.

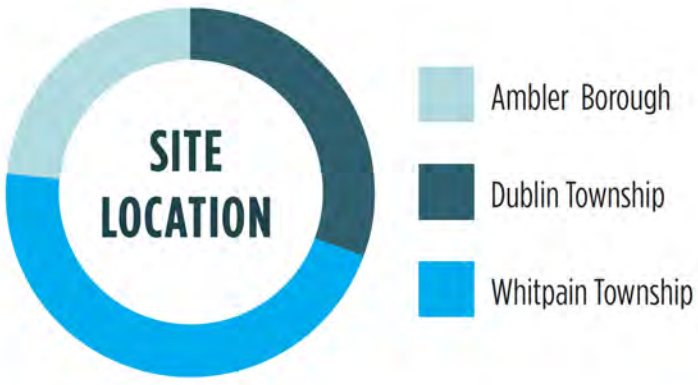
15,500
TRUCKLOADS OF CLEAN FILL DELIVERED



37.8 MILLION
GALLONS OF WATER TREATED ONSITE



$23.5 MILLION
SPENT ON RE-ENGINEERING THE SITE



The Wissahickon Waterfowl Preserve pond was restored to accommodate migrating birds and aquatic animals.

Whitpain Township plans to build a park that will serve the residents of West Ambler and surrounding neighborhoods.

What's Next

Early next year, EPA will release its **Proposed Remedial Action Plan**. Residents will have a minimum of 30 days to provide input in person, by email or by letter.

When all remedial work is finished, owners may redevelop the property as long as they don't damage any components of the EPA remedy.

A new trail juts into the pond at the waterfowl preserve.

WHEN WILL WORK AT THE SITE BE DONE?

The goal of the Removal Program is to complete the removal action in 2016, weather permitting. In addition to completing the Removal Action, EPA is also completing a long-term investigation at BoRit called a Remedial Investigation/Feasibility Study (RI/FS). The purpose of the RI/FS is to study the potential long-term effects the site may have on human health and the environment and to propose a final plan to address any identified risks. When the RI /FS is completed, it will be summarized in a Proposed Remedial Action Plan (Proposed Plan). The Proposed Plan will outline the options EPA evaluated to address contamination at the site, including the agency's preferred option.

EPA expects to release the Proposed Plan for BoRit in early 2016. At that time, the Proposed Plan will be made available to the public for review, and community members will be encouraged to provide their comments in one of the following ways:

1. *In person by joining members of EPA's BoRit site team at a public meeting which will be held during the public comment period;*
2. *By sending an email; or*
3. *By sending a letter to the EPA Remedial Project Manager for the BoRit site.*

When the Proposed Plan is released for review, EPA will announce its availability and the commenting options in local newspapers and by mail or email to those on EPA's mailing lists.

TO BE ADDED TO EPA'S MAILING AND/OR EMAIL LISTS, CONTACT:

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FOR MORE INFORMATION ABOUT EPA'S WORK AT BORIT AND TO SEE MORE PICTURES OF SITE PROGRESS, VISIT:

http://www.epaosc.org/site/site_profile.aspx?site_id=2475

http://www2.epa.gov/ambler