

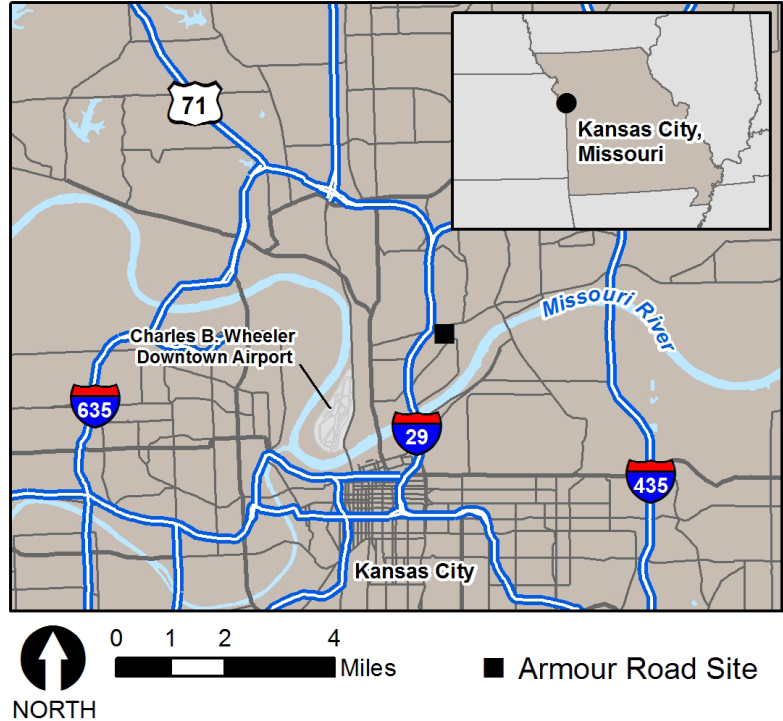
Introduction

Decades of herbicide mixing and packaging previously left the Armour Road Superfund site (the Site) in North Kansas City, Missouri, with arsenic contamination in soil and groundwater. Today, cleanup has enabled the reuse of the site property and opened the door to broader redevelopment opportunities that are revitalizing this former industrial area.

Close collaboration between EPA, the Missouri Department of Natural Resources (MDNR), the city of North Kansas City, responsible parties and other stakeholders throughout the cleanup process has positioned the Site for redevelopment. The city has worked diligently for more than 20 years to facilitate future economic revitalization and sustainable development efforts and to promote local efforts to transition away from historical industrial use in the area. In 2016, the city highlighted the 1.8-acre site as part of a planned high-density, mixed-use development area in its North Kansas City Master Plan. The site property was uniquely positioned to provide access to the larger, adjacent 58-acre One North Redevelopment Area, which had a separate redevelopment plan prepared in 2014 that was incorporated into the city’s broader Master Plan. Rail lines and an interstate highway limited other points of access to the area.

Today, soil cleanup has been completed, former facility infrastructure has been removed, and all parts of the site property are available for reuse. EPA enforcement and cleanup staff have collaborated on status letters for the site property and surrounding properties to inform the community’s land acquisition and development decisions. Zoned for commercial retail and mixed land uses, the site property is currently home to a restaurant. With soil cleanup complete, a temporary access road built through the site property to support cleanup efforts has been converted into a permanent extension of Vernon Avenue, establishing higher traffic volume access to the main spine road for the adjacent One North Redevelopment Area project. Future response actions will address any remaining contaminated groundwater at the Site. Area residents and businesses are connected to the municipal water supply. Groundwater at the Site and nearby areas is not being used for drinking water. Residents and businesses are not being exposed to groundwater contamination.

This case study explores the tools and partnerships that have led to the successful continued cleanup and transformation at the Armour Road Superfund site. The following pages trace the coordinated development of cleanup and reuse efforts, highlighting the city’s vision and leadership, project partnerships, and coordination of remedy and reuse considerations. The case study provides information for parties interested in Superfund site reuse, community-wide planning efforts and sustainable redevelopment.



The Armour Road Superfund site is located in North Kansas City, Missouri.

Site History, Contamination and Remediation

An herbicide mixing and packaging facility operated on site from the 1920s to 1986. Reade Manufacturing Company (Reade) owned the property from the 1920s until 1968. Reade was the owner and operator until 1963. From 1963 to 1968, Reade leased the property to U.S. Borax who operated at the facility. At that time, Horne and Boatright Company (HABCO) bought the facility and operated it until 1986. When the facility shut down, HABCO created an entity called K.C. 1986 to sell the property.

Former operations at the Site included shipping, mixing and repackaging of herbicides containing arsenic. Specialty railcars sprayed these herbicides along railroad tracks across the country. These operations led to soil and groundwater contamination with arsenic at the site property.

In 1989, an environmental site assessment for a potential purchaser of the property identified elevated levels of arsenic and other herbicide-related contaminants in soil and groundwater at the site property. The assessors reported the findings to MDNR, which entered into a Consent Decree with the property owner in 1993 to conduct preliminary soil sampling. Upon confirmation of the high levels of arsenic in site soils, MDNR referred the site to EPA in 1996.

To protect public health and the environment, EPA conducted a time-critical removal action. EPA covered the site property with geofabric and crushed rock and put a perimeter fence around the property in May 1996. EPA listed the site on the Superfund Program's National Priorities List (NPL) in June 1999.

Soil cleanup at the site property is complete. Two removal actions completed in 2004 and 2006 addressed demolition and disposal of the building, its contents and other remaining infrastructure and excavation of contaminated soil, respectively. After the completion of these removal actions in 2006, the site property was left as a grass field until final cleanup of the adjacent properties was completed in 2016. The result of completed response actions is that contaminated soil has been addressed. Contaminated groundwater will be addressed by a future remedial action.



Former HABCO building before demolition.



HABCO building demolition.



Removal of an underground mixing vat.

Timeline of Events

<i>1920s</i>	Reade acquired the property and operated an herbicide mixing and packaging facility.
<i>1963</i>	Reade leased the property to U.S. Borax, which continued facility operations.
<i>1968</i>	U.S. Borax discontinued its operations at the end of its lease from Reade, which filed for bankruptcy in 1968. HABCO purchased the property from Reade and focused on packaging operations.
<i>1986</i>	HABCO ceased operations at the site. KC 1986, an entity created by HABCO to sell the property, acquired site property title.
<i>1989</i>	Site discovery; a prospective purchaser performed an environmental assessment.
<i>July 1991</i>	MDNR proposed the Site for the State Registry of Confirmed Abandoned or Uncontrolled Hazardous Waste Disposal Sites.
<i>October 1993</i>	MDNR and KC 1986 entered into Consent Agreement to withdraw the site from the state registry, pending site investigation and remediation.
<i>April 1996</i>	MDNR referred the Site to EPA.
<i>May 1996</i>	EPA led a time-critical removal action.
<i>December 1996</i>	EPA and U.S. Borax entered an Administrative Order on Consent for U.S. Borax to perform engineering evaluation and cost analysis for source removal at the Site.
<i>May 1997</i>	MDNR added the site to the state registry after terms of the 1993 Consent Decree were not achieved.
<i>October 1998</i>	ATSDR issued a public health assessment for the site classifying it as posing an Urgent Public Health Hazard.
<i>January 1999</i>	EPA proposed the Site for listing on the NPL.
<i>June 1999</i>	EPA finalized the Site's NPL listing.
<i>March 2002</i>	U.S. Borax submitted engineering evaluation / cost analysis (EE/CA) to EPA.
<i>May 2002</i>	EPA selected response action with MDNR concurrence.
<i>August to October 2004</i>	U.S. Borax conducted a removal action (phase 1).
<i>March 2005 to April 2006</i>	U.S. Borax conducted a removal action (phase 2).
<i>April 2009</i>	EPA and U.S. Borax entered into a Consent Decree for the Site's remedial investigation and feasibility study (RI/FS).
<i>May 2013</i>	U.S. Borax completed the RI and began the FS.
<i>2015</i>	North Kansas City acquired the site property.
<i>September 2016 to January 2017</i>	Rio Tinto AuM, now the parent company of U.S. Borax, paused the FS to conduct a response action.
<i>January 2018</i>	EPA added the site to the Superfund Task Force Redevelopment Focus List.
<i>February 2018</i>	EPA Region 7 received inquiries from a medical group and the North Kansas City attorney for site status letters to support site redevelopment interests.
<i>September 2019</i>	The Missouri Department of Transportation completed road realignment efforts to support redevelopment. EPA presented its L.E.A.F.S. award to the city of North Kansas City, Rio Tinto AuM and MDNR.

CERCLA

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is the law passed by Congress in December 1980 that is commonly known as Superfund.

Project History

1996 – 2006

Characterizing Contamination, Leading Initial Cleanup Actions

When MDNR confirmed high levels of arsenic in site soil and referred the Site to EPA in April 1996, EPA led a time-critical removal action the following month to stabilize the area and address any potential exposures to contamination. EPA covered soil with a geofabric liner and crushed rock so that contaminated dust and dirt could not move off site via wind or stormwater, as well as placement of a fence around the site property.

EPA entered into an Administrative Order on Consent with U.S. Borax, the settling defendant for site cleanup, in December 1996. The document instructed U.S. Borax to begin an engineering evaluation and cost analysis (EE/CA) for removal of the contaminant source material. U.S. Borax worked on the EE/CA from 1997 to 2001 and submitted the final EE/CA Report to EPA in February 2002. Sampling during the EE/CA confirmed soil contamination with several inorganic and organic compounds as well as arsenic, which was the most widely distributed contaminant, as well as the one posing the most significant health risk. Sampling of site groundwater and materials from former facility buildings also found similar findings; arsenic was again the primary contaminant of concern. EPA placed the site on the NPL in June 1999.

U.S. Borax led two removal actions at the Site under EPA oversight to address short-term cleanup needs. The first one, from August to October 2004, involved the



Comfort/Status Letters

A comfort/status letter is intended to address liability concerns at a site by providing information about the cleanup status and likelihood of EPA involvement at a site. The “comfort” comes from hearing directly from the Agency, near the time of the property transaction. EPA may issue comfort/status letters to address the:

- Status of a site.
- Future anticipated actions at a site.
- Available liability protections.
- Reasonable steps that a purchaser should take to stop any ongoing releases and prevent future releases at sites where EPA has this information.
- Status of EPA liens.

decontamination, demolition and disposal of the remaining facility building, foundation and other infrastructure on site. About 1,000 cubic yards of construction debris were disposed of at a permitted landfill. The second removal action took place from March 2005 to April 2006. It removed and relocated utilities and excavated and treated arsenic-contaminated soils at the Site for off-site disposal, followed by site restoration. Excavation to a depth of up to 24 feet resulted in nearly 87,000 tons of contaminated soil for treatment and off-site disposal. The removal addressed an estimated 96% of the arsenic mass at the site. Following backfill with clean soil in 2006, the site property was a grass field.



Gravel cover over an area of excavation at the end of phase 1 of the removal action in 2004 (left) and vegetated cover over an area of excavation at the end of phase 2 of the removal action in 2006 (right).

Throughout the removal action, the settling defendant tried to address as much of the arsenic contamination in soil as possible. Soil excavations were maximized, extending to the full legal extent of the property boundaries – to the wall of a local hardware store to the west, along the Railroad Avenue access road to the south and east, and up to Armour Road to the north. U.S. Borax also dug to down to the water table to address arsenic contamination at depths that could potentially impact groundwater.



Phase 2 removal excavation up to the wall of the hardware store next to the site.



Phase 2 removal excavation along Railroad Avenue.



Parties worked together to address unforeseen stormwater contamination as part of a flexible, timely response that built long-term capacities.

During phase 2 of the removal work, a large storm brought to light an issue with the storm sewers at the Site – they appeared to have been installed backwards. While it was unclear whether this was by design or reflected older, degraded infrastructure, the end result was that the storm sewers channeled stormwater toward the Site instead of carrying it away. Stormwater in the area of source material was now considered hazardous waste and needed to be pumped out for treatment and disposal. With no contingency plan in place, this situation could have halted the removal action. Instead, EPA worked with the settling defendant to find a solution that enabled the removal to continue. The effort helped build stakeholder communication and problem-solving capacities that would enable the parties to continue to collaborate and respond to unexpected challenges.

“It wasn’t very welcoming when we started acquiring property. We saw an opportunity for an attractive front door to people visiting Cerner and the hospital.”

- Sara Copeland, North Kansas City
Community Development Director

North Kansas City is a small municipality within the Greater Kansas City Metropolitan Area and has an area of 4.6 square miles. Although there are only about 4,400 residents, the daytime population increases to nearly 25,000 thanks to several major employers, pointing to a need for additional hospitality infrastructure as well as housing to encourage employees to live where they work. While removal actions were underway, the city of North Kansas City started working to acquire property bounded by Armour Road (Missouri Highway 210), Interstate 35 and railroad tracks. Development interest in the former industrial area was on the rise and aligned with the city’s economic revitalization and sustainable development objectives. The city worked with EPA and MDNR to better understand the Site’s cleanup plan and its implications for the Site’s redevelopment potential. EPA’s enforcement program and site team developed status letters for the city to use in its reuse planning processes and for all property transactions at the Site. EPA has also continued to keep the local community informed and aware of the site’s progress through ongoing engagement with local officials, fact sheets, flyers, mailouts, media advisories and community interviews.

Land north of the site property includes shops and restaurants; homes are located about a quarter mile from Armour Road. The site property extends along part of Armour Road, which is the main east-west road through North Kansas City. For traffic approaching the city from the east, the site property is part of the community gateway to North Kansas City, just before the highway interchange. The city saw an opportunity to help this former industrial area transition into a vibrant mixed-use hub, enticing workers and visitors to continue into downtown rather than getting on the interstate. The operations of several major employers, including Cerner Health Information Systems and North Kansas City Hospital, bring thousands of workers into North Kansas City every day.

However, the area did face one significant challenge – access limitations. The locality noted that the Superfund site property could provide a way to address these limitations, providing access to the area for mixed-use redevelopment. EPA continued to work closely with the city, providing ongoing updates and status letters to support the city’s longer-term redevelopment goals.

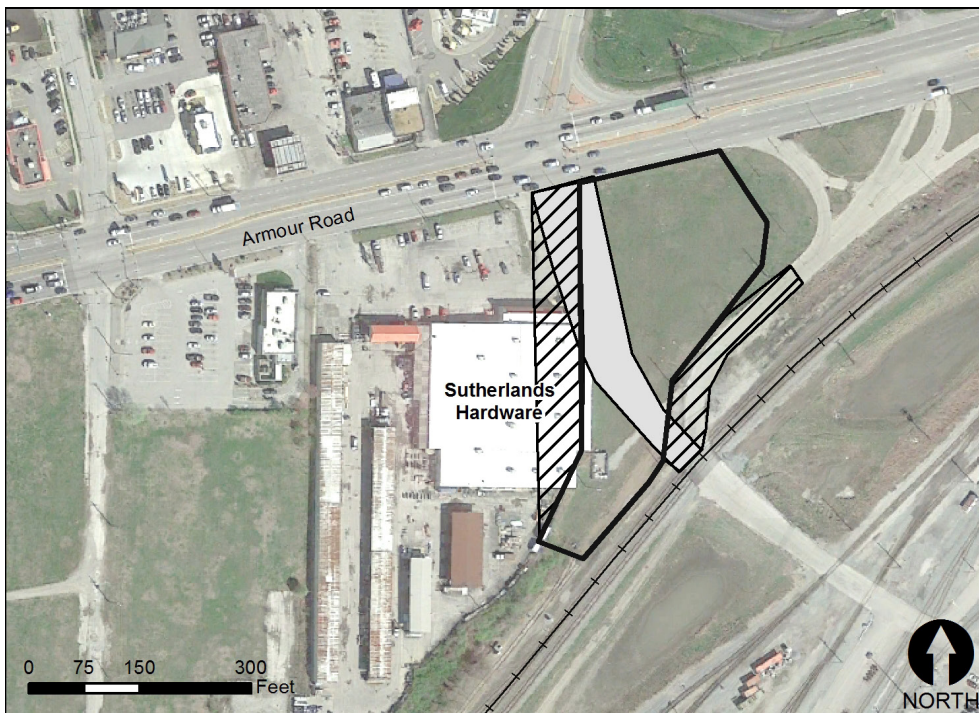
2009 – 2017

Laying the Groundwork for a Long-Term Remedy

In April 2009, EPA and U.S. Borax entered into a Consent Decree to conduct a remedial investigation and feasibility study for the Site, seamlessly transitioning the cleanup from EPA’s short-term removal program to EPA’s long-term remedial program. U.S. Borax completed the Remedial Investigation Report in May 2013 and began the feasibility study. During this time, corporate rebranding resulted in a change to the name of the settling defendant. Rio Tinto had acquired U.S. Borax in 1968 and the settling defendant was known as Rio Tinto Assets under Management, or Rio Tinto AuM. U.S. Borax continues to operate today as a wholly owned subsidiary of Rio Tinto. Fortunately, the change in name did not result in any changes to the team. The same group that had collaborated with EPA and MDNR on cleanup for over a decade continued as part of the partnership.

“We’re a small community surrounded by Kansas City and we’re mostly built out. This is an opportunity to re-imagine North Kansas City for new uses and bring amenities we didn’t have a place for.”

- Sara Copeland, North Kansas City Community Development Director



Legend

Site Boundary

Railroad

Site Areas

Vernon Street Extension

2016 Voluntary Soil Cleanup Areas

Hashed areas indicate locations addressed by Rio Tinto AuM as part of the voluntary soil cleanup. The grey box shows the approximate location of the access road constructed at the conclusion of the voluntary removal action.

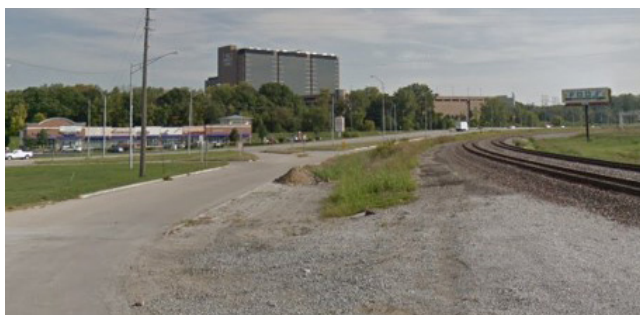
Staff from EPA, MDNR and the settling defendant met in August 2014 to discuss the primary considerations for developing and screening remedial alternatives at the Site in the Rio Tinto AuM-led feasibility study. Parties discussed eliminating the risk of future soil-to-groundwater contamination by removing remaining source material. Early findings from the remedial investigation suggested that separate long-term remedial actions to address soil and groundwater would be needed. While the prior removal actions had eliminated the risk of direct exposure to surface soils, high levels of arsenic remained at properties adjacent to the site property, specifically on the hardware store property to the west and along Railroad Avenue to the south and east. Arsenic levels in groundwater had decreased following the prior removal actions. The plume of groundwater contamination appeared stable and did not extend as far as the Missouri River.

However, it was important to address any remaining source contamination that could impact groundwater over the long term.

The group met again in November 2014 to discuss a path forward. Dividing the Site into two operable units – one to address soil source contamination and a second to address remaining groundwater contamination after source removal – could be time and resource intensive, with two separate records of decision and two consent decrees needed to implement two remedial actions. Building on years of collaboration, EPA, MDNR and the settling defendant discussed options that would enable an expedited cleanup timeline that would optimize resources and enable the Site to be returned to beneficial use. Rio Tinto AuM agreed to lead a response action to address remaining soil source contamination and resume the feasibility study for groundwater



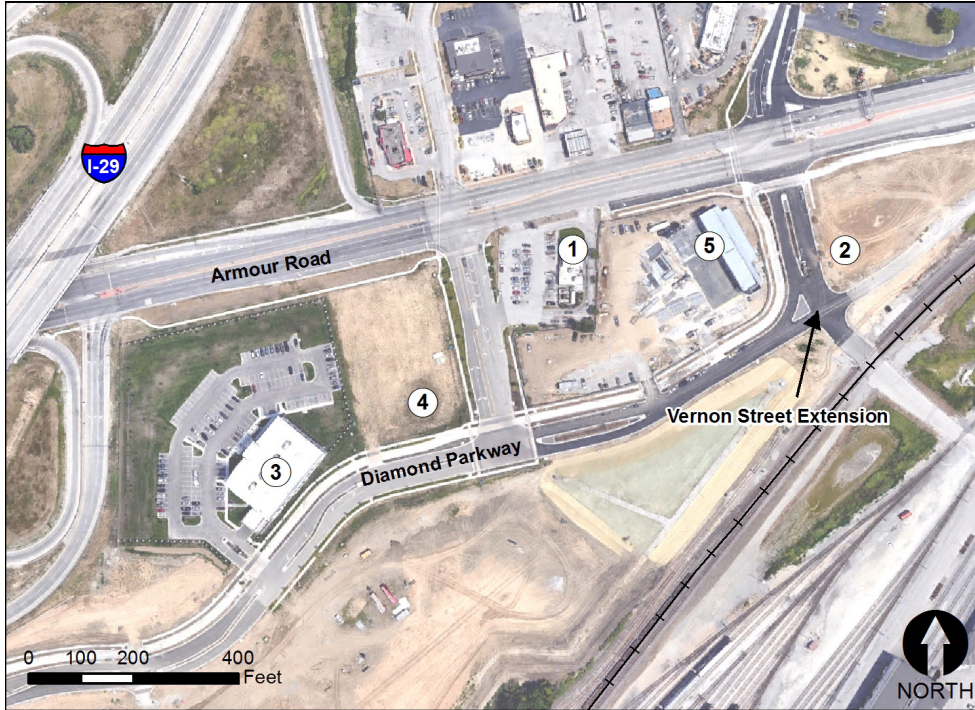
Voluntary soil removal at the former hardware store location, 2016 (left), and new access road following soil removal at the former hardware store property (right).



The Railroad Avenue area, prior to and during the voluntary removal action in 2016.



While remedial excavations were underway, the city was able to implement sewer upgrades, install new power poles and upgrade water lines to support new development.



Legend

—+— Railroad

Site Areas

- ① Previous Burger King
- ② Current Burger King
- ③ Meierotto Jewelers
- ④ Old Chicago Restaurant
- ⑤ Medical Building (under construction)

Aerial view of the site in 2018 shows the new interchange enabling access to the One North Development Area and construction underway at the medical building.

cleanup afterward. This work could be performed under the existing Consent Decree for implementation of the remedial investigation and feasibility study with EPA oversight.

In spring 2015, EPA and Rio Tinto AuM staff began to reach out to stakeholders in the areas where additional soil cleanup was required. These parties included the Missouri Department of Transportation, Norfolk Southern Railroad, BNSF Railroad, and Kansas City Power and Light Company. EPA and Rio Tinto AuM staff also met with the city of North Kansas City to discuss plans for the soil removal and explore how the cleanup could be integrated with the city’s 2014 Armour Road Redevelopment Area Framework Plan. The city acquired the property at auction in 2015.

The city of North Kansas City had acquired the hardware store property immediately west of the site and needed to end the lease for the building to be demolished so that soil contamination under the building and associated parking area could be addressed. The soil cleanup effort also required traffic plans for the area, utility relocation, and access to the railyard and utility relocation. In December 2015, Rio Tinto AuM shared a letter of intent with the city stating its plans to complete the project by the end of 2016. In 2016, the city of North Kansas City released its

broader North Kansas City Master Plan, which includes the Armour Road Redevelopment Area Framework Plan along with several other targeted redevelopment areas in the city.

With EPA and MDNR approval, Rio Tinto AuM paused the feasibility study from September 2016 to January 2017 to implement the response action. Rio Tinto AuM contractors excavated, treated and disposed of contaminated soil at a permitted landfill off site. The response action expanded on the prior removal action completed in 2006. It addressed remaining soil contamination beneath Railroad Avenue, an access road to the railyard, and under the former hardware store building and parking lot.

The response action resulted in the excavation, treatment and removal of over 44,000 tons of contaminated soil and 1,300 tons of concrete and asphalt. Rio Tinto AuM worked closely with the city on removal and rerouting of Railroad Avenue and Vernon Street as well as the disruption and relocation of utilities during field work. During excavation activities, Rio Tinto AuM also provided the city with access to the excavated area so that it could make needed infrastructure and utility improvements. The excavation made it easier for the city to access area water and sewer lines.

The collaboration between the city of North Kansas City and Rio Tinto AuM enabled synergies that optimized resources and time efficiencies for both parties. By piggybacking on the work Rio Tinto AuM already had underway, the city saved money across a range of activities needed to prepare the property for redevelopment. These cost savings covered:

- Engineering design costs for infrastructure improvements.
- Site preparation costs.
- Geotechnical sampling costs.
- Surveying.
- Disposal of contaminated materials.
- Use of the same remedial contractor (already operating on Site) to improve storm sewers and water lines and install a new road meant there was no need for a separate contractor with additional administrative costs, labor and specialized material handling training.

As the pieces began to fall into place for the larger mixed-use, high density One North Redevelopment Project to move forward, a traffic impact study for the area found a need for improvements to reduce excessive lines and wait times for cars near the proposed access to the larger development area. Given the area's proximity to the highway interchange and the opportunity to put in place an intersection that could handle the anticipated traffic volume generated by future visitors to the development area, the city determined that the site was in a vital location to support a critical road widening and realignment project. It was close to the highway interchange but not so close as to cause traffic backups, and it also provided ease of access for future patrons traveling west and south to the redevelopment area. At the conclusion of the soil response action, the areas addressed were left "build ready" with city-upgraded utility infrastructure. In 2017, the city also retained the same remedial contractors to construct a road extending Vernon Street through the site property to the new Diamond Parkway that connects to the One North Redevelopment Area. The work was performed with oversight from Missouri Department of Transportation and has set the area up to thrive under future traffic conditions when redevelopment is complete.

The feasibility study resumed in January 2017 and is currently evaluating the impact of the soil response action on groundwater quality. This will inform the selection of a final groundwater remedy at the Site following conclusion of the feasibility study. Soil cleanup for the Site is complete.

2017 – Present

Facilitating Redevelopment

With Rio Tinto AuM's soil response action and the feasibility study for addressing groundwater contamination underway, the city was in a position to talk to potential developers about implementing the Armour Road Redevelopment Area Framework Plan component of the 2016 North Kansas City Master Plan. For its part, to highlight the redevelopment potential of the property, EPA added the site to its Redevelopment Focus List in January 2018 and issued a fact sheet summarizing the Site's remedial status and readiness for reuse.

EPA has met with and provided additional information about the site property to interested parties through EPA's Prospective Purchaser Inquiry process. Based on the needs or concerns of the parties, EPA enforcement and cleanup

"It's location, location, location. In this case, it's Highway 210 (Armour Road) and Interstate 29. We're across from Cerner headquarters, North Kansas City Hospital and Harrah's casino."

- Rick Worner, National Realty Advisors

Prospective Purchaser Inquiry (PPI) Tool

EPA's PPI Tool is intended to provide prospective purchasers with as much site-related or liability protection information as possible in order for them to make timely business decisions about whether to purchase a site property.

EPA can provide this information through the following combination: conference call or email, comfort/status letter, and/or site-specific agreements.

The PPI Tool can provide information on:

- Site status and current/future site restrictions.
- Potential compatibility of the intended redevelopment with the cleanup.
- Potential liability protections.
- Status of current/future EPA liens.

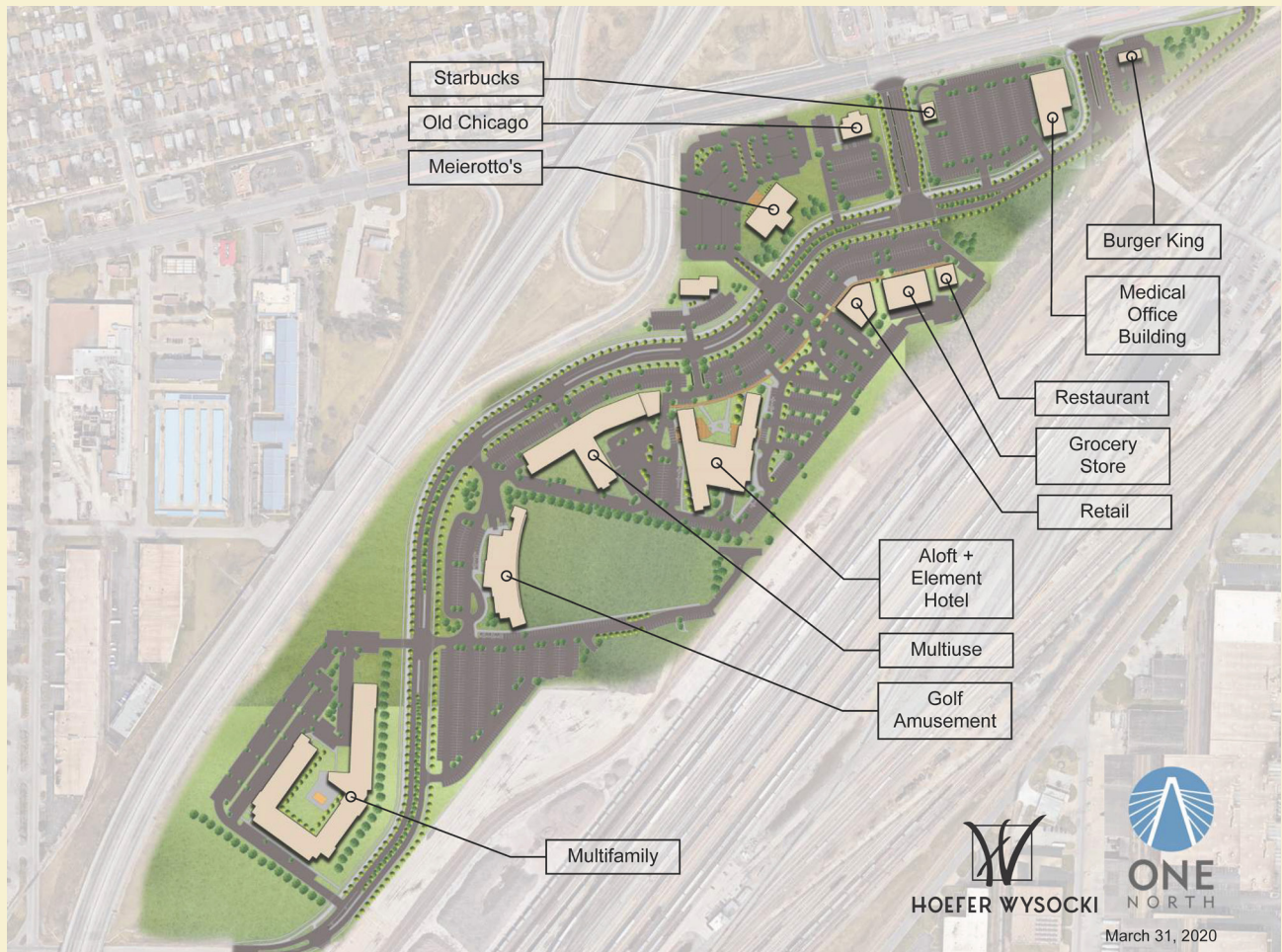
One North Redevelopment Area

Starting in the early 2000s, the North Kansas City government turned its attention to the property along Armour Road (Highway 210) bounded by Interstate 35 to the west and an active railyard to the east and south. The city steadily acquired property until 58 acres of land were ready for redevelopment. The Armour Road Redevelopment Area, which was later renamed the One North Redevelopment Area, will be a high-density, mixed-use hub. Land uses in the 2014 Armour Road Redevelopment Area Framework Plan included office space, stores, hospitality/hotel centers and residential areas.

The 2016 North Kansas City Master Plan included the Armour Road Redevelopment Area Framework Plan as a targeted redevelopment area, noting it is “intended to create a vibrant urban setting that

includes a variety of uses within walking distance as well as transit options for adjacent surrounding areas.” The area is a gateway offering a unique opportunity to set the stage for revitalization efforts that are continuing into downtown North Kansas City. Redevelopment challenges identified by the Master Plan included the area’s physical disconnection from other areas of the city, limited access points and the confined geometry of the land bounded by both rail lines and an interstate highway.

Road realignment at the Superfund site, located on lots 10 and 9b (see below), opened access to remaining lots for redevelopment construction.



One North redevelopment plan overview.

(Source: One North Master Developer.)

staff have worked together to issue site status letters similar to the one issued to the city when it acquired the site property to help support redevelopment at the Site as well as at surrounding properties when requested. For example, in February 2018, EPA received a request for a site status letter regarding lot 9b, which includes part of the site property as well as land to the west along Armour Road. With the site status letter in hand, developers built a medical building at lot 9b. The facility includes solar carport structures over the parking area.

In addition to providing information and site status letters to interested parties, EPA ensures that all developers are put in contact with the city of North Kansas City, which leads master planning efforts for the One North Redevelopment Area.

Over the past 15 to 20 years, the city has spent tens of millions of dollars purchasing properties, demolishing buildings, and making utility and infrastructure improvements, including new and upgraded roadways and water line extensions. In 2016, the city entered into a Master Development Agreement with North Kansas City Destination Developers LLC for the One North Redevelopment Area. The developer plans to use incentive programs, including tax increment financing, a community improvement district, a hotel guest tax and a transportation development district, to help finance the redevelopment. Transformation of the area began in 2017 with the construction of a jewelry store. Construction of homes, restaurants and a hotel are underway.

In September 2019, EPA Region 7 presented its Leading Environmentalism and Forwarding Sustainability (L.E.A.F.S.) Award to the city of North Kansas City and Rio Tinto AuM and also recognized MDNR for its partnership at the Site. A medical center and restaurant are now located on the site property. The medical center opened in 2019, and a restaurant has been in operation since December 2019. The site property's new roadway is also a vital link to the nearby One North Redevelopment Area.

“The vision for North Kansas City is to support existing places and create unique and sustainable activity centers, with enhanced character that can be branded to grow economic development and support the community.”

- 2016 North Kansas City Master Plan

- Rick Worner, National Realty Advisors



EPA Region 7 Administrator Jim Gulliford speaking on the new roadway at the site that has enabled the One North Redevelopment Area project to move forward nearby.

Lessons Learned

EPA project manager Hoai Tran refers to the site as “an overnight success story, 20 years in the making.” Key factors that have made the project such a success include:

- A proactive local government had a long-term vision for the community and integrated the site and surrounding area as part of larger plans for a new “front door” to North Kansas City.
- The settling defendant at the Site showed initiative, innovation, flexibility and dedication in pursuing a cleanup that was compatible with the Site’s future use. This allowed site stakeholders to explore ways to integrate remedy and reuse considerations, saving time and money.
- The EPA site team and enforcement program worked closely with the city to clarify site status, supporting multiple property transactions over nearly 20 years as the city put together the land area needed to support its high-density, mixed-use vision for the community’s revitalized gateway.
- The relationships and trust established among EPA, MDNR, the city and the settling defendant during response action activities carried over to the long-term remedial work. The strength of these relationships made collaboration on an innovative cleanup approach possible, with remarkable results.



Before and after: the new gateway to North Kansas City.



Businesses at the Mount Vernon Avenue extension.

EPA Region 7 Leading Environmentalism and Forwarding Sustainability (L.E.A.F.S.) Award

EPA Region 7 established the L.E.A.F.S. award to recognize people who have supported Superfund Redevelopment through innovative thinking, sustainable practices and environmental stewardship. Region 7 is a mostly rural region with lots of available greenspace. Many opportunities exist to revitalize these sites through creative thinking and environmental awareness. Sites that are successfully reused can benefit communities, developers, site owners and local governments. These sites can also be redeveloped in a way that enhances the remedial actions taken and supports stewardship of the land. This award was established to recognize all of these outstanding efforts.

In September 2019, EPA Region 7 presented its L.E.A.F.S. Award to the city of North Kansas City and Rio Tinto AuM Company in recognition of responsible reuse through innovative thinking, sustainable practices and environmental stewardship at the Armour Road Superfund site. EPA Region 7 also recognized MDNR for its partnership at the site.



EPA staff and award recipients celebrating their work supporting the successful cleanup and reuse of the Armour Road Superfund site in North Kansas City, Missouri. From left to right: Mary Peterson, EPA; Hoai Tran, EPA; David Hoefler, EPA; Mayor Don Stielow, city of North Kansas City; Jim Gulliford, EPA; Pat Hawver, city of North Kansas City; Leland Roberts, Rio Tinto AuM company; Ross Overby, Rio Tinto AuM Company; Rick Worner, National Realty Advisors; Thomas E. Barzee Jr., city of North Kansas City; Dave Williams, EPA; Valerie Wilder, MDNR; and Katie Jo Wheeler, MDNR.

Bigger Picture

There are also a range of broader lessons learned from the successful cleanup and redevelopment of the site that can help guide similar projects at contaminated lands across the country:

Always do your due diligence.

Site contamination was identified when a prospective purchaser considered locating a restaurant on site. Following an environmental assessment, the prospective purchaser declined to proceed with the project. However, awareness of environmental issues enabled the city to work with regulatory agencies and the settling defendant to transform a possible liability into a catalyst for the community's broader reuse vision.

Think long term, build trust.

The innovative approaches to clean up and prepare the site for reuse were the result of the long-term relationships among site parties. Collaboration to navigate earlier issues, such as unexpected stormwater contamination found during removal action activities in 2005, laid the groundwork for future discussions. The parties knew they had been able to work through site-related challenges in the past and this helped build the trust required to work through the complexities of integrating remedy and reuse considerations.

Ensure consistency across short-term and long-term cleanups.

EPA's removal program addressed immediate threats and possible exposures through a time-critical removal action and a two-phase source removal prior to transferring the cleanup to EPA's long-term remedial program. The trust built during the removal actions carried over into remedial work. The site team was able to synergize remedial and redevelopment efforts working in tandem toward a shared goal of supporting the site property's return to beneficial use.

Keep the big picture in mind, take one step at a time.

The city of North Kansas City has maintained a clear, steady vision for sustainable growth and economic revitalization. The city worked closely with EPA and MDNR on property acquisitions and development planning consistent with and appropriate for the Site's remedial status. While the site property itself is relatively small compared to the larger One North Redevelopment Area project, the city was keenly aware and forward thinking in planning for traffic impacts and factoring the site property's unique characteristics into the broader redevelopment vision for the area.

Conclusion

At the Armour Road Superfund site, an industrial past is making way for a new, vibrant mixed-use vision for the gateway to North Kansas City. Strong collaboration over many years built collaboration and partnerships among EPA, MDNR, the city of North Kansas City and settling defendant Rio Tinto AuM. These relationships facilitated the cleanup of the site and adjacent impacted properties, while also enabling on-site reuse as well as utility infrastructure upgrades and a roadway realignment that would set the stage for a thriving high-density, mixed-use development.

Today, soil cleanup is complete, a restaurant is located on site and an expanded road realignment project crosses the site, connecting Armour Road to the Diamond Parkway spine road through the One North Redevelopment Area. The roadway provides key access to the new development and mitigates traffic issues on the main roads feeding into the area. EPA continues to work with Rio Tinto AuM on development of the final groundwater remedy for the site and will continue to support the city with status letters and more information as needed to facilitate property transactions and construction planning. In the meantime, all area businesses and residences are connected to the municipal water supply.

North Kansas City has a new front door at the Armour Road Superfund site – won't you come visit?

EPA and Reuse: Lessons Learned

Since the inception of the Superfund program, EPA has been building on its expertise in conducting site characterization and remediation to ensure that contamination is not a barrier to the reuse of property. Today, consideration of future use is an integral part of EPA's cleanup programs from initial site investigations and remedy selection through to the design, implementation, and operation and maintenance of a site's remedy.

At older sites, EPA did not focus on considering reuse during the cleanup design process. At the Armour Road Superfund site, close collaboration between regulatory agencies, the settling defendant and the city of North Kansas City allowed for fast tracking of soil cleanup to ensure the property would be ready for reuse to support the One North Redevelopment Area project. Existing and planned residences and businesses will all be connected to the municipal water supply and remaining groundwater contamination at the site will be addressed by an upcoming final remedy.

EPA also works with site stakeholders to consider how future land use considerations can inform the implementation and long-term stewardship of site remedies as well as cleanup planning. At some sites, for example, reuse considerations can inform the future location of groundwater monitoring wells and other operation and maintenance equipment that might inadvertently hinder redevelopment efforts. At other sites, detailed site reuse plans have provided additional benefits that save time and reduce redevelopment costs. For example, future infrastructure corridors or building footers can be installed in coordination with site cleanup activities. At the Armour Road Superfund site, close coordination of necessary infrastructure updates to support future development was incorporated seamlessly with the voluntary soil cleanup efforts.

Armour Road Case Study

THE ARMOUR ROAD SUPERFUND SITE IN NORTH KANSAS CITY, MISSOURI

Sources and Resources

Images for this case study are provided courtesy of EPA Region 7.

Maps were created by EPA using data from Google Earth, Esri, Delorme, Digital Globe, GeoEye, Earthstar Geographics, CNES/ Airbus DS, USDA, USGS, AeroGrid and IGN.

EPA Site Webpage

www.epa.gov/superfund/armourroad

EPA OSC Website (Photos)

response.epa.gov/site/site_profile.aspx?site_id=1274

NPL Site Narrative

semsub.epa.gov/src/document/07/30296157

EPA Superfund Redevelopment Initiative

www.epa.gov/superfund-redevelopment-initiative

North Kansas City Economic Development Department's One North Redevelopment Area

nkc.org/departments/economic_development/one_north_redevelopment_area

With Flour Mills Razed, North Kansas City Digs into Armour Road Transformation

www.kcur.org/post/flour-mills-razed-north-kansas-city-digs-armour-road-transformation#stream/0



The front facade of the new medical center on Diamond Parkway.



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