United States Environmental Protection Agency

Petroleum Brownfields: Selecting A Reuse Option

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Foreword

The U.S. Environmental Protection Agency (EPA) Office of Underground Storage Tanks (OUST), in partnership with the EPA Office of Brownfields and Land Revitalization (OBLR) and local, state, tribal, federal, and other stakeholders, released the Petroleum Brownfields Action Plan: Promoting Revitalization And Sustainability (Action Plan) in October 2008 (www.epa.gov/oust/rags/petrobfactionplan.pdf). The Action Plan was developed to improve stakeholder communications; expand technical assistance to states, tribes, and local governments; explore potential policy changes; and build upon existing successes by expanding partnerships to address petroleum-contaminated properties. Since the release of the Action Plan, EPA developed Petroleum Brownfields: Developing Inventories (www.epa.gov/oust/pubs/pbfdevelopinventories.pdf) and expanded and updated the EPA OUST Web site (www.epa.gov/oust/petroleumbrownfields) to better assist stakeholders. Now EPA, with the support and input of experienced stakeholders, has developed this new redevelopment tool, Petroleum Brownfields: Selecting A Reuse Option, which is a catalogue of reuse ideas for petroleum-contaminated properties.

This catalogue was developed to assist state, tribal, and local public officials, communities, developers, and nonprofit organizations in envisioning the wide array of reuse options they have for petroleum-contaminated properties. It presents examples of successful reuse projects, identifies best practices, and describes what is possible, the benefits of reuse, and general lessons learned in each case. The catalogue was created by compiling information from a variety of successful redevelopment projects from across the country. It presents case studies for commercial, public, residential, greenspace, and mixed-use reuse options. The extent and diversity of these successful projects provide a wealth of information to inspire and guide others in transforming petroleum brownfields into vibrant community assets.

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Introduction

Communities across the country have learned to leverage the unique characteristics of brownfield properties contaminated with petroleum—such as former gas stations, auto body shops, industrial facilities, and commercial and residential properties—and convert these abandoned or blighted properties into beneficial new uses. Many of these characteristics, including property size, location, and prior use, give petroleum brownfields special appeal and flexibility.

The removal of an underground storage tank

One common feature among many petroleum brownfields is size: a majority of these properties are former gas stations occupying relatively small parcels of land and are typically distributed throughout communities, along major roadways, or at intersections in neighborhoods. Small properties can be used for neighborhood amenities, including pocket parks (small urban parks frequently created on a single parcel), restaurants, senior housing, community centers, and much more. Properties can also be combined with other parcels, or assembled, to enable larger projects. Additionally, petroleum brownfields are often close to community resources and services. Redeveloping these properties will eliminate blight and create valuable spaces in which a community may live, work, or play.

This catalogue provides examples of reuse and identifies strategies and tools that communities have found helpful in cleaning up and reusing petroleum brownfields. In the Types Of Redevelopment section, five reuse categories are outlined: commercial, public, residential, greenspace, and mixed-use. Case studies for each of these categories illustrate key components of redevelopment. Most case studies are brief and are intended primarily to introduce a new reuse option, but several are longer and include more details that users may find useful. In general, most of these redevelopment projects achieved success by:

- Developing a strong vision for reuse;
- Engaging the community to explore a property's reuse potential;
- Understanding and applying available financial and technical assistance resources; and
- Building strong partnerships among the project team, community members, and regulatory agencies throughout the entire life of the project.

In addition to these components, several trends proved useful in helping communities reduce costs, increase the value of properties, and be better stewards of the environment. These included:

- Assembling several small properties or appending a small petroleum property to a larger, neighboring parcel;
- Incorporating sustainable design into the redevelopment project; and
- Considering an interim reuse for a property while planning for its permanent or long-term reuse.

A former service garage redeveloped into a car dealership

Petroleum brownfield projects can benefit from a strong vision of the intended reuse. To ensure that the property reuse is consistent with environmental and cleanup requirements, communities are encouraged to work with their local, state, tribal, and federal regulatory partners. Outreach and collaboration can build support for a project and provide an avenue for ideas that can lead to new insights or designs that best suit local conditions.

Starting Redevelopment In Your Community

Petroleum brownfields present excellent redevelopment opportunities. The following themes are part of the redevelopment process and are highlighted in several of the case studies that are presented in the Types Of Redevelopment section. Each petroleum brownfield redevelopment project is unique and so may address these themes differently.

Abandoned gas station on tribal land in Santa Domingo, New Mexico

Identifying Properties

A list of petroleum brownfield properties, or an inventory, is an excellent place to begin evaluating petroleum-contaminated properties for cleanup and reuse. EPA's Petroleum Brownfields: Developing Inventories (www.epa.gov/oust/pubs/pbfdevelopinventories.pdf) provides a comprehensive look at how to develop an inventory of sites, which may include vacant properties potentially impacted by petroleum contamination. Several states and local governments have begun compiling brownfields inventories; for more information regarding existing inventories in your community or state, interested parties can contact their state response program to obtain petroleum brownfields property information.

Planning Preliminary Reuse Options

While petroleum brownfields may present challenges to redevelopment, they also can create opportunities. Careful planning and attention is needed when planning for a property's redevelopment. It is essential to make certain that the reuse vision meets the requirements of state and local regulatory programs. Individual property considerations such as parcel size, shape, and environmental conditions also need to be taken into account when determining the best reuse option.

Working With Partners

Partners are an invaluable component of redevelopment projects. Partners such as local, state, and tribal government agencies, business owners, community groups, and developers can help identify redevelopment opportunities to meet a community need or fill a private market niche. Opportunities to engage a variety of partners include: project planning and

outreach, neighborhood association meetings or newsletters, discussions with community leaders and community development corporations, interviews with residents and business owners of surrounding properties identified during an inventory process, or other mechanisms.

Involving The Community

Community celebration at the dedication of the Fruitvale Home and Family project

Community support is a critical factor and an ongoing process in the success of a project. Getting the community engaged and excited in the planning process can help build momentum for the reuse and expand the network of investors, such as businesses looking to relocate or expand. In addition, discussions with community members can reveal historical or past use information about the property that can help guide the cleanup and redevelopment. An understanding of community concerns can lead to design options that make the reuse more consistent with community needs, whether those are job creation, housing, commercial services, or public use.

Considering Redevelopment Early

The City of Flagstaff, Arizona, is finding ways to utilize abandoned gas stations for interim use throughout the city

Addressing redevelopment at the start of the process and considering reuse during the cleanup plan can be beneficial to the success of the project. It is important to work with state regulators early in the planning process to ensure that required cleanup levels will be achieved for the desired reuse. Understanding these goals will help address any problems in the planning phase and will allow for changes before the project is underway. For example, incorporating a vapor barrier and venting system as part of a building design and construction adds little to the overall development cost; however, recognizing the problem and installing such systems after construction is completed can be much more expensive.

Also, creative planning for a project can allow for interim uses for a property before it arrives at its permanent reuse. If a redevelopment cannot occur immediately—either due to time required for land assembly, financing, or other reasons—an interim use may be appropriate. This could be the leasing of a building for storage or commercial use or the development of the land as a park or parking lot. Often these interim developments provide an important service to the community and may not be recognized as interim until a more beneficial use is identified and completed. For example, community groups might see vacant lots as opportunities for recreational sports fields as an interim use before long-term reuse plans are developed.

Understanding Financing

Community members help construct a community gateway wildflower garden and rock wall as an interim use

It is important to budget for assessment, cleanup, and redevelopment costs and to review a comprehensive list of available financing options. This will help determine the most advantageous combination of incentives. Taking into account eligibility requirements and the timing of public funds is essential to a project's success. For instance, some grant programs require that a municipality own the property in order to be eligible for financing. Determining all cost categories will show which funding sources make sense, when they can be used in the project, and what reporting and documentation will be required.

Each petroleum brownfield project requires a different redevelopment blueprint. Each community and property is unique, and even properties in one community may be at different stages in the redevelopment process. Petroleum Brownfields: Selecting A Reuse Option aims to encourage community discussion, professional planning, and sound decision making while considering viable reuse options for petroleum brownfields.

Types Of Redevelopment

Petroleum brownfields constitute a significant part of the larger brownfields universe. Communities throughout the country are beginning to share their successes and approaches to assessing, cleaning up, and reusing these properties. While redevelopment costs and potential uses vary significantly based on property size and the local real estate market, properties can be redeveloped regardless of their location.

An abandoned gas station along Route 66 provides an opportunity for future redevelopment

A broad range of redevelopment options have been successful at petroleum brownfield properties. Properties have been reused as parks, retail shops, small businesses, schools, firehouses, condominiums, community gardens, and even as alternative fueling stations.

To protect human health and the environment, a stormwater collection system was developed at McMinnville, Oregon, abandoned asphalt plant

When talking to communities about their petroleum brownfield redevelopment projects, it is clear that they are not deterred by the type of contamination, the size of the property, the location of the property, or the local real estate market. These petroleum brownfield stakeholders see blight in their community as a real opportunity to change the landscape. While these factors help identify the best reuse, none of them need to be considered barriers to success.

This catalogue presents five categories of reuse: commercial, public, residential, greenspace, and mixed-use. These categories recognize the main types of redevelopment that have been successful on cleaned up petroleum brownfields across the nation.

The remainder of this section focuses on each of the reuse categories. The discussion of each category includes important factors to consider, key components and lessons from similar petroleum brownfield reuse projects, and a summary of the benefits associated with the reuse category. Case studies aim to help petroleum brownfields stakeholders understand the variety of redevelopment options within a category. Each category contains several shorter additional project examples to illustrate the variety of projects possible. Redevelopment potential can be limited by specific property or regional characteristics, but focusing on the needs of the community, being creative, and being motivated are what made the projects presented successful.

Five Redevelopment Options – Category Definitions

Commercial – Property used for retail shops, offices, restaurants, and other businesses. This use of properties generates economic revenue for business and tax revenue and jobs for the community.

Public – Property used by a local, state, or tribal government agency or a non-profit group to serve citizen needs. This can include libraries and schools, government offices, public infrastructure, or other services for the general public.

Residential – Property used for residential purposes such as single-family homes, townhouses, condominiums, and apartments.

Greenspace – Property used for sports facilities and fields, community parks, walking trails, open space, and other leisure activities and land conservation efforts.

Mixed-use – Property used for multiple purposes. For example, a building with retail shops on the ground floor and condominiums on the upper floors.

Commercial

Service And Employment Opportunities For Your Community – Commercial Reuse Options

Examples Of Commercial Reuse Include:

- Bank
- Pharmacy
- Restaurant or coffee shop
- Shopping center
- Supermarket
- Office building
- Light manufacturing business

During the second half of the last century, many city centers and small-town downtown areas experienced a decline in population and core manufacturing activities. As populations shifted, downtown economic centers slipped into decline, and businesses, including gas stations, closed or relocated to undeveloped land along the interstate highways. The net result of this movement left neighborhoods in cities' central business districts without services such as banks, retail facilities, and grocery stores. For the people remaining in these areas, petroleum brownfields represent an opportunity to regain some of these critical services.

A former service station in Wood River, Nebraska, was redeveloped into a branch of Heritage Bank

Across the country, petroleum-contaminated properties are being cleaned up and reused for large and small businesses to accommodate the trend of populations moving back to city centers. Communities are developing plans and strategies for the commercial redevelopment of petroleum brownfields to benefit the entire community by providing services and employment opportunities. Small businesses might find an old gas station property a perfect fit for a new bank, pharmacy, or restaurant. In addition, larger commercial and retail redevelopment opportunities can occur on larger petroleum brownfield properties or through the assembly of several smaller properties.

Westminster, Colorado – Commercial Building

Westminster was settled by pioneers in the mid-19th century, thanks to the nearby discovery of gold, and evolved into an agricultural-based community. Since that time, Westminster's rich heritage led to the establishment of the Harris Park Historic District. Located within this district is the Neighborhood Building, a project viewed as the catalyst for future revitalization in the area.

The Neighborhood Building property was formerly used as a bowling alley, an ice cream shop, and then as an automotive service station from the 1950s until the early 1980s. Leaking underground storage tanks forced city officials to remediate a plume of petroleum contamination under the property. The property was assessed using EPA Brownfields Assessment funding, and cleanup was financed and conducted through the Colorado Division of Oil and Public Safety under the state Leaking Underground Storage Tank (LUST) Program. Remediation includes soil excavation as well as soil remediation that will be completed one to three years after the completion date of the redevelopment.

Continued...

Former automotive service property was redeveloped into commercial/office space in Westminster, Colorado

Prior to initiating redevelopment activities, a market study was conducted to determine the needs of the community. The market study indicated that a commercial building would help to revitalize the historic downtown area. Redevelopment activities were integrated with the cleanup and resulted in the opening of the 12,000-square-foot commercial Neighborhood Building in the summer of 2008.

The Neighborhood Building includes retail space on the first floor and office space on the second floor. Current tenants include the Colorado Rural Housing Development Corporation, a café, a massage therapist, a hair salon, and a real estate office. The entire project includes the assembly of three properties and offers a small courtyard area and seating areas for adjacent businesses and future adjacent residences. The redevelopment project spurred the development of 12 townhouses that are currently under construction.

Key Components And Lessons Learned:

- A market study to determine the most beneficial and feasible reuse was helpful to guide the redevelopment.
- The assembly of three parcels allowed more room for the redevelopment of a larger commercial building.
- The project was a gateway to redevelopment of the historic area of Westminster.

Eugene, Oregon – Alternative Fueling Station

New biofuels station in Eugene, Oregon

Located along McVay Highway in the City of Eugene, a 0.6-acre former gas station was unused and an eyesore and hazard to the community due to contaminated soil and groundwater. The successful cleanup of the property resulted in the sustainable redevelopment of an alternative fueling station. Completed in August 2006, it is the first station of its kind in the country. The station sells SeQuential biofuels (including ethanol and biodiesel blends) and features photovoltaic panels above the pump stations that provide as much as half the station's electricity needs. The convenience store has an "eco-roof" with soil and thousands of plants that help keep the store warm in the winter and cool during the summer. The property also features storm water retention "bioswales" in which plants filter rainwater before it runs off the site.

Albertville, Alabama – Retail Small Business

The City of Albertville, the Alabama Department of Environmental Management, EPA, and developers worked to turn the site of a former convenience store, gas station, and tractor sales business into a new Walgreens store. The commercial reuse demonstrates the viability of redevelopment opportunities in this small bedroom community outside of Huntsville.

A Walgreens was redeveloped on a former petroleum brownfields property

Kansas City, Missouri – Commercial Corridors

A former petroleum brownfields property was redeveloped into the Coffee Break along Troost Avenue in Kansas City, Missouri

In Kansas City, the city used EPA funding to develop a comprehensive inventory of petroleum brownfields along the Prospect and Troost commercial corridors. The city identified more than 250 petroleum brownfield properties within the targeted redevelopment areas. Using the inventory, the city was able to focus redevelopment efforts at prime locations. The successful redevelopment of former filling stations and garages provides hope to residents of depressed neighborhoods along Prospect and Troost avenues. For example, along Southwest Boulevard, now referred to as Restaurant Row, former gas stations have found new lives as restaurants that have bolstered economic development and job creation in the community.

Inglewood, California – Commercial Corridor And Retail Center

More than $1 million in assessment and cleanup funding from the California Orphan Site Cleanup Account was used at Village at Century

The Village at Century project in Inglewood assembled 16 acres of blighted and vacant properties into a 193,000-square-foot commercial development—the first of a two-phase, 51-acre redevelopment project to revitalize the Darby-Dixon neighborhood.

The Century Boulevard corridor serves as one of the major transportation corridors to Los Angeles International Airport. From 1950 to the early 1990s, the area was a high-density residential development; however, due to the increase in noise pollution from the airport and lack of local investment, the area became rundown and underutilized. The Inglewood City Council adopted the Century Redevelopment Project Area to eradicate blight and address issues related to lack of investment, dilapidated housing stock, high crime rates, and needed traffic and circulation improvements around the Century Corridor. One of the primary project goals was to work in partnership with residents, the business community, public agencies, and community organizations in the revitalization of the project area. A number of public meetings were held to hear the collective concerns and recommendations of the community. In a collaborative effort, the Inglewood Redevelopment Agency, Los Angeles World Airports, and the Federal Aviation Administration worked together with the community to improve conditions along Century Boulevard.

An assessment of the project area discovered that a portion of the property's soil was contaminated with high levels of volatile hydrocarbons from leaking underground storage tanks on several properties. The installation of a remediation system substantially reduced the contamination in the soil to levels below those established by the California Regional Water Quality Board.

The California Orphan Site Cleanup Account (OSCA) program's funding—more than $1 million in assessment and cleanup grants toward the $32 million project—influenced national retailers to contribute to and support the redevelopment project. The Village at Century includes eight major retail spaces as well as a number of smaller shops. It is estimated that the retail center area creates approximately 500 full- and part-time jobs and generates over $600,000 of tax income to the city annually.

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The Village at Century commercial redevelopment

The Village at Century has dramatically improved the character of the area and continues to encourage new investment. The project resulted from the partnership of local, regional, and federal government entities and private developers. Perhaps most importantly, it displayed the ability of Inglewood citizens and their partners to create job opportunities, offer residents greater shopping diversity, reduce the overall crime rate, and enhance the economic viability and quality of life for those who live and/or work in Inglewood.

Key Components And Lessons Learned:

- A dedication to outreach by the city council helped to ensure community support for the project.
- It is estimated that the retail center will create approximately 500 full- and part-time jobs and is expected to generate over $600,000 of tax income to the city annually.
- The OSCA program's funding influenced national retailers to commit to the project.
- There are numerous benefits of public and private partnerships. They can promote the coordination of regulatory programs, the streamlining of administrative procedures, and a multi-stakeholder examination of cleanup solutions and risk sharing.

Reno-Sparks, Nevada – Tribal Commercial Development

Removal of petroleum-contaminated soil in Reno-Sparks, Nevada

The Reno-Sparks Indian Colony (RSIC) applied for a loan through the Nevada Division of Environmental Protection (NDEP) in order to address petroleum contamination on a 22-acre former industrial property. In November 2007, the NDEP loaned $950,000 from its EPA Revolving Loan Fund grant to the RSIC to address petroleum and lead contamination at the property. Cleanup included the removal of about 1,000 tons of contaminated soil and allowed RSIC to pursue a risk-based closure through NDEP. The property will be redeveloped into Three Nations Plaza, the future home of a Wal-Mart Super Center. It is expected to generate much needed jobs and revenue for the community. The project is estimated to produce about $5-6 million in tax revenue a year, which will be used to repay the bonds for a new Tribal Health Center, fund a new restitution center, and enhance essential government services such as public safety, education, human services, and community development.

Summary Of The Benefits Of Commercial Redevelopment

Commercial redevelopment projects are often the economic engines for a neighborhood or community. The reuse of former petroleum brownfields for retail and commercial businesses employs workers, increases the tax base for the community, and expands redevelopment to neighboring portions of the community that are in need of environmental and economic revival.

An abandoned property impacted by petroleum often has traits that can make it an excellent location for a small business. These traits include relatively small size properties that easily accommodate small businesses; prominent locations, often a corner lot on a busy thoroughfare; and existing infrastructure. In addition, state, local, and tribal governments have created incentives to foster the cleanup and reuse of these properties, including tax or other financial incentives. Retail and commercial redevelopment on former petroleum brownfields can create a positive economic impact on historic downtown areas, enabling cities to position themselves to take full advantage of future opportunities as redevelopment efforts expand to other portions of the community.

Public

Serving Your Community – Public Reuse Options

Examples Of Public Reuse Include:

- College campus buildings
- Intermodal train station
- Municipal buildings
- Firehouse
- School
- Health clinic
- Parking lots for state office buildings
- Library
- Public amphitheater
- Community center
- Nonprofit organization
- City-county government services complex

In Ogallala, Nebraska, a former gas station was redeveloped into the Spruce Street Visitors Center

Across the country, petroleum brownfields are being redeveloped for community or public reuse. The resources provided by community or public reuse often boost the quality of life for local citizens. In some instances, these reuses can become the cornerstone for a downtown redevelopment effort. In other cases, the reuse might supplement additional community and public services already established. Whatever the circumstances, reusing a petroleum brownfield property for a community or public use can transform the property, eliminate blight, and provide needed services to a community. Such projects help local governments create a sustainable and responsible approach to addressing property revitalization.

Redevelopment can include the creation of schools and youth centers to encourage education and physical activity; community centers that encourage citizen interaction; health clinics to increase accessibility to affordable health care; and public offices or facilities such as firehouses, police stations, or locations for motor pools—all ways to provide public services to the community. In addition to the restoration of blighted, idle land and the removal of contamination, residents gain improved access to services, new jobs, and local economic engines that leverage additional improvements and enhance the quality of life.

Greenville, South Carolina – Community Center And School

The A.J. Whittenburg Elementary School under construction in Greenville, South Carolina

In Greenville, residents know about the old corner intersection. This area is located close to the central business district and historically housed numerous gas stations in proximity to each other. While all six properties remained as single parcels for reuse, the City of Greenville recognized the value of ensuring these properties were available for redevelopment. Identifying all the parcels as available for reuse helped the city plan for the area comprehensively. Additionally, the city realized cost savings by creating a project that required one assessment and cleanup instead of doing multiple parcels individually.

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The Reedy Place residential units

The city developed a master plan for its downtown area that included the old corner intersection. The City Master Plan called for high-density residential development and helped inspire Reedy Place, the first redevelopment project in the area with multiple affordable housing units.

During redevelopment planning, the Salvation Army identified a parcel in the redevelopment area for the future site of a community center. As part of a $1.6 billion gift to the Salvation Army in 2003, Kroc Community Centers are to be developed coast-to-coast where each local facility is accessible and visible to various economic groups, with particular outreach to underserved families. The Kroc Center Foundation provided $52 million to the Greenville Salvation Army for the development of a future Kroc Community Center. Recognizing the benefit of the downtown location, the Greenville Salvation Army bought one of the former gas station properties for this purpose. The community raised $15 million in matching funds, and the Kroc Center development is underway. Redevelopment is scheduled to be completed in late 2010 or early 2011.

Reedy Place and the Kroc Community Center have already leveraged additional redevelopment in downtown Greenville. During the planning process, the Greenville school district was looking for a parcel of land to use for the development of a new elementary school. When the Greenville Salvation Army offered to sell a portion of its parcel to locate the elementary school next to the new Kroc Community Center, the school district finalized its plans. The A.J. Whittenburg Elementary School is now under construction, marking the first elementary school to be built downtown in 30 years. The addition of the new elementary school creates an enhanced learning environment and improves access to educational facilities for an underserved population.

The new public buildings in the downtown serve as an anchor development project that will help initiate more redevelopment in the area. Often, it is difficult to be the first redevelopment project, but reuse ventures such as the community center will help draw more projects into the area to both serve and benefit from the citizens utilizing the new facilities.

Key Components And Lessons Learned:

- By identifying and assessing multiple properties at the same time, the city saved money and was able to develop a comprehensive redevelopment Master Plan for the downtown area.
- Attracting a well known organization as a cornerstone of redevelopment helped catalyze other redevelopment projects.
- The redevelopment project creates an enhanced learning environment and improves access to educational facilities for an underserved population.

Belmont, New Hampshire – Commuter Parking Lot

The former Gulf gas station property in Belmont is located on NH Route 106, a busy commuter route. The one-acre former gas station operated from approximately 1965 until the mid-1980s. During cleanup, four gasoline tanks were removed. Belmont collaborated with the New Hampshire Department of Transportation (DOT) and the Lakes Region Planning Commission to reuse the property as a RideShare parking lot for commuters sharing car rides. RideShare is a free commuter service provided by DOT, which is dedicated to finding alternative ways for commuters to travel to and from work. The location of the Belmont RideShare also provides ample parking for visitors to the adjacent Belmont Town Forest.

Clearwater, Florida – Health Clinic

In one of Clearwater's poorest neighborhoods, EPA Brownfields Assessment grant funding was used to assess a former petroleum brownfield property. The project utilized $200,000 in state funding to remove underground storage tanks and clean up petroleum-contaminated soil. As part of the city's environmental justice plan, representatives of the North Greenwood community voted unanimously for the city to lease the property to the Greenwood Community Health Resource Center (now the Willa Carson Health Resource Center). The reuse met a critical need for access to a new health facility in the community and offers immunizations, physicals, tests and screenings, flu shots, and counseling to neighborhood residents.

The Willa Carson Health Resource Center open for business in Clearwater, Florida

McMinnville, Oregon – Sustainable Elementary School

The abandoned asphalt plant in McMinnville, Oregon

In McMinnville a former two-acre asphalt plant, which operated for more than 40 years on the edge of town, received a complete makeover. The plant was abandoned in the mid-1990s, leaving behind a petroleum-contaminated property with little to offer the community. After years of lying vacant, Yamill County acquired the property through tax foreclosure in 2003. By 2007, the property was cleaned up and several underground storage tanks and drums had been removed.

The cleanup and removal of several underground storage tanks

The adjacent 12-acre property was planned and already under design to host the new Sue Buel Elementary School, a replacement for the 79-year old elementary school in town. The community lobbied to develop a green building that would showcase several energy efficient elements. Specific features include ample windows and skylights to maximize exposure to daylight, dual flush toilets, dimmer switches and energy efficient lighting systems, rooftop solar panels, and a heat recovery system. These features decrease energy use by 30 percent. The former two-acre asphalt plant property was incorporated into the adjacent 12-acre school property to provide more area for the design plans. Because of environmental concerns associated with the former asphalt plant, the school redevelopment planned to use the two-acre property as a landscaped parking lot as well as a storm water retention pond. Each of these features improved the sustainable features associated with the redevelopment and helped the school qualify for the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED)® Gold certification. The school opened in 2008 and hosts more than 600 students.

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The LEED-certified Sue Buel Elementary School in McMinnville, Oregon

The redevelopment of this petroleum brownfield provides for an environmentally-friendly, energy-efficient, long lasting, and safe public resource for the local community. Conserving resources and lessening the environmental impact of the building improves the learning atmosphere for students and the quality of life for the surrounding community.

Key Components And Lessons Learned:

- Sustainable design ensured that the redevelopment was environmentally-friendly, energy-efficient, long-lasting, and safe for the local community.
- Assembling properties provided additional space for development of needed school grounds and facilities.
- Attention to the environmental restrictions during design can result in protection of human health. In this case, the petroleum brownfield was reused for parking and storm water retention instead of a building location.

Prineville, Oregon – City Hall And Community Plaza

Redevelopment occurring at the Prineville City Hall and Community Plaza property

The City of Prineville, a rural town of 9,000, faced the challenge of revitalizing its downtown after a decade of population growth. The city identified a critical need for additional building space to accommodate services including administration, planning and community development, police and emergency dispatch, and family services. The city used an EPA Brownfields Cleanup grant to address soil and groundwater petroleum contamination at a 0.25-acre former gas station property and to further minimize the migration of vapors. This parcel was developed in conjunction with adjacent properties, and more than 2,700 tons of petroleum-impacted soil were excavated. Cleanup was completed in June 2004, and the new City Hall and Community Plaza, which can host 500 visitors for concerts, speeches, and community events, opened in July 2005.

Summary Of The Benefits Of Public Redevelopment

Some of the most sensitive reuses for any type of brownfield include health facilities and schools—places where communities and children spend a lot of time that could create additional exposure. Stringent cleanup levels for petroleum brownfields protect residents from any former or residual contamination on the properties. Public reuse can provide new health care options for those in the community who might previously have had few available. In addition to health facilities and schools, local, state, tribal, and federal governments can also contribute to the reuse of petroleum brownfield properties. Old abandoned gas stations are often excellent locations for new government facilities such as firehouses, police stations, community centers, and libraries. These facilities can serve as an anchor and catalyst for area redevelopment and community pride.

Communities across the country have demonstrated that under the right circumstances, cleanup levels, and guidance, petroleum brownfields can be put back into productive reuse to benefit the community. Stakeholders that reuse petroleum brownfields for a public use encourage others not to limit the possibilities for reuse of a property. With thorough investigation, characterization, cleanup, and funding, there can be multiple reuse possibilities. If a community has public service needs, it pays to consider all aspects of the redevelopment project and investigate any property that might fit those needs.

Residential

Sheltering Your Community – Residential Reuse Options

Examples Of Residential Reuse Include:

- Apartments
- Condominiums
- Lofts
- Townhouses
- Multi-family housing
- Single-family housing
- Affordable housing
- Special needs housing
- Senior housing

Former gas station in Redwood City, California

Reuse of petroleum brownfields can also include housing or residential options. Ensuring that the reuse for the property is protective of human health is especially important when evaluating a property for residential reuse. It may be the case that environmental conditions on the property make cleaning for residential reuse prohibitively expensive or that the environmental conditions require specific redevelopment restrictions or controls on the property. For instance, depending on the contamination source and cleanup standards, a property might not support the development of a building that includes a basement due to potential vapor intrusion issues. However, the property might still be suitable for residential reuse, assuming all units are above ground.

Residential reuse often creates an opportunity to improve several aspects of a community. First, community leaders may want to determine if a residential reuse will adhere to specific zoning regulations within the community. If residential reuse is an option, the reuse can revitalize a downtown area, provide housing options for those that require proximity to specific amenities, improve the tax base for the community, and develop a neighborhood in a former commercial area. In addition, providing housing in a downtown area or near existing job centers can help to reduce household transportation costs and improve access to employment opportunities.

Arlington, Virginia – Apartment Building

Petroleum brownfields property in downtown Arlington, Virginia

For people in and around the Washington, DC area, Arlington, Virginia, has become a residential and commercial destination. As the population in the Washington metropolitan area increased, so did the need for residential units that were convenient for commuting. In the late 1990s, Arlington began to experience significant revitalization as a result of the growing economic market. The 1.5-acre Clarendon Triangle site remained one of the only vacant pieces of property available in 2000.

The parcel of land included several independent properties that historically hosted gas stations, a car wash, an automobile dealership, and an office building. At least four properties were assembled to form the Clarendon Triangle site. Because of a zoning requirement to offer commercial services on the ground level for all multi-unit residential development in Arlington County, a determination was made to redevelop the property as a planned community that would offer up to 257 residential units and approximately 14,000 square feet of retail space.

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The new 257-residential unit Clarendon Triangle apartment complex

The redevelopment process was driven by the market conditions in and around Arlington. The Clarendon Triangle site was overlooked for years because of concerns about environmental contamination; however, the prime location and partnership with the Virginia Department of Environmental Quality (VA DEQ) attracted the developer. Because of coordination among VA DEQ, the property owner, the environmental consultants, and the lending institution, the property was cleaned up to safe, residential levels that met the needs of the project. Despite identifying additional areas of petroleum contamination during redevelopment activities, the project stayed on schedule. All contamination was removed, which allowed for subsurface structures on the property. The property was completed in fall 2003, bringing additional residents to the Clarendon neighborhood.

Key Components And Lessons Learned:

- Project partners allowed the market to be the driver for the project's reuse.
- Cleanup requirements need to be evaluated for the final reuse—contamination can be revisited once a reuse option is selected.
- The assembly of four parcels allowed the developer to meet the needs of a large project.

Swanton, Vermont – Residential Duplex

Fully occupied Habitat for Humanity homes on the former gas and service station

This 0.9-acre property operated as a gasoline and service station until the early 1960s, after which the owner converted it to a duplex rental unit. The property changed hands several times but continued to operate as a residential rental until 2003. The existing structure was demolished and research about the property uncovered its former use as a service station and a lack of records indicating whether the property's fuel storage tanks had been removed. To resolve these contamination uncertainties, a series of assessments funded by the Northwest Regional Planning Commission's EPA Brownfields Assessment grants confirmed that only minor levels of petroleum contaminants were present at the property. These assessments also indicated that the contaminants were not migrating and that no underground storage tanks from the former gas station were present. Habitat for Humanity purchased the property in 2006 and leveraged more than $83,000 in donations and in-kind services to build a residential duplex on the property. These homes are now occupied by two families.

Salt Lake City, Utah – Apartment Complex

Jefferson School Apartment complex in Salt Lake City, Utah

Located in a largely commercial and light industrial area of Salt Lake City, this 2.57-acre property was once a tiling company, auto and lumber operation, and more recently, a wholesale produce company. EPA Brownfields Assessment grants were used to help define the extent of contamination from a 4,000-gallon underground storage tank discovered during preliminary construction activities: contamination included elevated levels of petroleum in the property's soil and groundwater. Cleanup was completed by March 2005 and included removal of the underground storage tank, excavation of contaminated soils, and remediation of the property's groundwater. A $5.4 million loan from U.S. Bank funded the construction of an 84-unit, mixed-income apartment complex on the property. The Jefferson School Apartments include affordable one- and two-bedroom units, a courtyard, a pool, and an exercise room. The apartments are conveniently accessible to the light-rail transit line, downtown, and the University of Utah, providing maximum benefit to working and student residents.

Chicago, Illinois – Low-Income Housing

Redevelopment site of low-income housing in Chicago, Illinois

From the 1960s through the mid-1990s, a property on West Washington Street in Chicago was home to a gas station and auto repair shop. The city determined that the property was a detriment and a threat to public health. The property was cleaned up to remove barriers to redevelopment. The city demolished a 12,000-square-foot building on the property and removed eight underground storage tanks. The city detected a petroleum release during the removal of the tanks and conducted tests on the soil that confirmed the presence of petroleum. The city then completed the site assessment, preliminary cleanup activity, and excavation and removal of contaminated soil. After cleanup activities were complete, a local developer built low-income housing on the property.

Emeryville, California – Sustainable Housing

The cleanup and redevelopment of a former petroleum-contaminated property in Emeryville, California

In the San Francisco Bay Area, housing is in high demand. This is certainly true in the City of Emeryville, whose population has more than doubled since 1980 and which is located almost directly across the bay from San Francisco. City officials typically let the market determine the best redevelopment use for most brownfield properties. In the case of a petroleum brownfield that was formerly used for paint manufacturing, the community wanted environmentally-sustainable housing.

This site, which straddles the border of Emeryville and Oakland, previously consisted of three properties that were combined to form a one-acre parcel. Site investigation activities concluded that the soil and groundwater were contaminated with petroleum hydrocarbons, including free-floating product. With a strong track record of effectively implementing EPA Brownfields grants, the City of Emeryville used $1.175 million in EPA Brownfields Revolving Loan funds to clean up the property. Additional cleanup and redevelopment funding was provided in the form of private equity and construction loans.

Planning for redevelopment began in 2001, at which time the developer learned that Emeryville and Oakland encouraged the sustainable reuse of properties. Although the project predated the U.S. Green Building Council's LEED® for Homes certification program, a team was formed to ensure the completion of environmentally-sustainable housing. The team included representatives from both cities as well as an architecture firm that was one of the first in the area to work on green infill housing.

Continued...

Green City Lofts completed on a former petroleum brownfields property

Following the completion of cleanup in December 2004, the property was redeveloped into Green City Lofts. There are 62 residential units, six of which are affordable housing units. The building incorporated green building technologies, including components like storm water runoff collection for landscape irrigation, Forest Stewardship Council-certified wood for all interior doors, and paints without volatile organic compounds (VOCs). The project's green elements create a pleasant and environmentally-friendly residential complex.

Key Components And Lessons Learned:

- Projects that straddle city boundaries can be completed, particularly if the communities or cities involved have similar goals.
- The demand for environmentally-sustainable housing determined the reuse of the property.
- Green buildings and sustainable development yield human health and environmental benefits to the local community.

Houston, Texas – Affordable Artist Lofts

Petroleum cleanup at the old hospital paved the way for the renovation of the old building into affordable apartment lofts

The former 1.6-acre Jefferson Davis Hospital property was used as a park in the 1920s, until the city built its first hospital for indigent care on it in 1924. After the hospital closed, the building had a variety of uses before being abandoned. In 2002, Jefferson Davis Artist Lofts (JDAL) purchased the property from the county for redevelopment. As part of the acquisition process, an environmental assessment revealed an underground storage tank that once contained gasoline used to fuel ambulances. The use of EPA Brownfields Cleanup grant funds to address and clean up the property helped JDAL leverage funding from diverse entities motivated by different aspects of the project, such as the need for affordable housing, support for the arts, and historical preservation. As a result, a new affordable loft-style apartment building opened in October 2005 and was fully leased by November. One unique feature of the apartment building is a "green" or vegetative roof system that conserves energy. The redevelopment also complements the revitalization of numerous historic buildings in Houston's central business district.

Summary Of The Benefits Of Residential Redevelopment

Citizens need to have a high level of confidence in the cleanup and redevelopment of petroleum brownfields when they will be calling them home. With many petroleum brownfields on corner lots along main streets or along high-density corridors, residential reuse is a growing option—especially when residents relocate to downtown areas. The proximity of these properties to other public amenities makes them attractive for residential reuse. While the size of the properties can limit redevelopment, assembling properties into a larger redevelopment project can provide adequate space for residential reuse. The extent, type, and cleanup of contamination can preclude certain aspects of new structures built on the property. For example, the former petroleum contamination at these properties may limit the building of sub-surface structures (for example, parking garage, basement) in order to reduce exposure. However, successful residential development can still be achieved. Other considerations include proper zoning requirements and conducting community outreach to better ensure safety and the protection of public health.

Greenspace

Greening Your Community – Greenspace Reuse Options

Examples Of Greenspace Reuse Include:

- City parks
- Promenades and walking trails
- Community gardens
- Outdoor theater
- Nature trails
- Riverfront and water access
- Educational facility
- Convention center
- Playground
- Basketball courts

Petroleum-contaminated properties are being cleaned up and reused in ways that both enhance the environment and enrich community living. Redevelopment can include greenspace that provides public spaces for leisure activities or land conservation efforts. These spaces can also encourage recreation, reduce the effects of urban heat islands, and improve storm water management—all ways to improve public health. A cleaned up petroleum brownfield can result in cleaner rivers and harbors while providing recreational facilities for the local community. Greenspace or open space reuse also can facilitate land conservation when development is set aside to protect and preserve land.

Recreational park space in many downtown areas is limited and does not always meet the needs of the local community. In an effort to address this problem, neighborhood and city residents are redeveloping smaller petroleum brownfield properties into city parks, community gardens, and other outdoor recreation areas. These parks are spurring additional investment and community improvements. Cities and towns are taking advantage of their waterfront amenities by turning petroleum brownfields, often larger tank farms that were located by rivers for transportation purposes, into waterfront recreational areas or promenades for the enjoyment of the community or as tourist destinations. Waterfront redevelopment also increases access to the water for recreational uses and educational opportunities, such as programs by Living Classrooms Foundation (www.livingclassrooms.org) and the National Maritime Heritage Foundation (www.nmhf.org). These programs use environmental and maritime resources as learning laboratories to create stronger communities that exercise environmental stewardship.

Seymour, Wisconsin – Memorial Park

A former service garage and gas station located in the heart of downtown Seymour was redeveloped into Veterans Memorial Park. The former petroleum brownfield had six leaking underground storage tanks and was abandoned for approximately 10 years. The responsible party was financially unable to clean up the property so the city acquired the property through tax delinquency. The city held community meetings to determine the most beneficial redevelopment option for the property—which was a community park and greenspace.

Continued...

The redeveloped Veterans Memorial Park in Seymour, Wisconsin

The city then obtained a local government liability exemption, which protected the city from future liability. The city also went through the site closure process with the Wisconsin Department of Natural Resources (DNR) to ensure that the remediation and redevelopment would progress in the correct and most efficient manner. The city was able to perform Phase I and Phase II environmental site assessments at the property and also conduct a full site investigation with funding from a DNR Brownfields Site Assessment grant.

In addition to the local government liability exemption, the city also received a general liability clarification letter from DNR's Remediation and Redevelopment (RR) Program. The city utilized funds from the Wisconsin Department of Commerce's Petroleum Environmental Cleanup Fund Awards (PECFA) Program to clean up the remaining leaking underground storage tank contamination. The grant was used to excavate and properly dispose of 525 tons of petroleum-contaminated soil, remove the six underground storage tanks, demolish buildings, and remove asbestos. Throughout the project, RR Program staff assisted with project plans and reports, oversaw remediation activities, and approved the site closure.

The park has attracted residents back to the downtown area by providing a space for the community to enjoy in the heart of town. Through working with the community and the state environmental agency, the City of Seymour reused a brownfield to serve as a place of remembrance, beauty, and recreation.

Key Components And Lessons Learned:

- The most beneficial redevelopment option was determined by the community's need for a public space. It is easier to gain community support when the project meets community needs.
- The property now provides the community with a place of remembrance, beauty, and recreation.

Oshkosh, Wisconsin – Riverfront Amphitheater

Aerial view of the Riverfront Amphitheater in Oshkosh, Wisconsin

On an eight-acre former manufactured gas plant facility, the City of Oshkosh seized an opportunity to design an inviting greenspace for recreation and entertainment that would draw residents and visitors to the downtown. Site cleanup activities included the removal of several underground storage tanks and the removal of petroleum-contaminated soils. More than 23,500 tons of material were treated and reused on the property. The city purchased the property from the former owner, Wisconsin Public Service, in December 2003 in order to develop the riverfront walkway and amphitheater. The facility also includes concession buildings, landscaping, and parking for the property.

Norwich, Connecticut – Community Park

Located along the Shetucket River, the five-acre property was formerly utilized by the City Textile Corporation for a textile finishing business. The mill complex was destroyed in 1986 by a fire, leaving only the foundation and a concrete building on the property. Cleanup included addressing and capping petroleum-contaminated soil. The city recognized the need for additional park space in order to meet the needs of local residents. Completed in June 2005, the new riverfront park offers a large, multi-use field in the center of a walking track, a basketball court, picnic tables, and a playground. The design also includes bench seating convenient to the riverfront and river access for small boats and canoes.

The former mill complex was cleaned up and transformed into a community park and river access

Jackson, South Carolina – Roadside Park

An abandoned petroleum-contaminated property along Main Street in Jackson, South Carolina

The Town of Jackson, located in Aiken County, has a population of 1,625. Campbell's Service Center was located on a corner parcel along Main Street for years but by 1995 was abandoned because of known environmental concerns, including five underground storage tanks. Because of these environmental issues, the mayor of Jackson requested support from the South Carolina Department of Health and Environmental Control (SCDHEC).

The Town of Jackson, Aiken County, and SCDHEC partnered to identify property concerns, which included soil and groundwater contamination, underground storage tanks, property ownership, tax liens, and an abandoned building. The partners then identified resources available to address each of these challenges. Assessment and cleanup activities were conducted with support from partners as well as the local community. During a public meeting, residents recognized the need for a park where cyclists from nearby Augusta, Georgia, could stop and take a break. The park would be in the downtown area of Jackson, allowing the community to utilize the space. Through a cooperative effort, the Jackson Roadside Park opened in September 2007 and includes a gazebo, brick patio on the former building foundation, and park benches.

The ribbon-cutting ceremony at the new community park and gazebo

Continued...

The new park and gazebo

Key Components And Lessons Learned:

- Having a local champion for the project was a key component in driving the project forward.
- Identify concerns, partnerships, and resources early in the planning and development process.
- Existing structures, in this case the building foundation slab, can be reused in new ways to reduce construction debris and costs.

Wilmington, Delaware – Downtown Park

Wilimington, Delaware, achieved three redevelopment goals with the completion of the downtown greenspace

The Hi-Tech gas station in downtown Wilmington sat abandoned since 1995. In 2001, city economic development officials evinced interest in reusing the property. Once the underground storage tanks were removed and the soil contamination was cleaned up, the city moved forward with the development of the Brandywine Park, which accomplished three redevelopment goals: meeting the needs of the Brandywine Village district, cleaning up the property, and keeping redevelopment costs low.

Columbia, Missouri – Community Park

The 2.5-acre former bulk oil terminal in Columbia was converted into a center for community activity. Cleanup was funded by a $200,000 EPA Brownfields Cleanup grant and included the removal of more than 7,500 cubic yards of contaminated soil and 12,000 gallons of contaminated water. The property is located in the heart of the Columbia business district and provides the community with access to a playground, picnic benches, an amphitheater, and a gazebo. The new park serves as a trailhead for the Missouri-Kansas-Texas Nature and Fitness Trail and is part of the American Discovery Trail that extends from Delaware to California.

The former bulk oil terminal was transformed into a community park

Summary Of The Benefits Of Greenspace Reuse

Greenspace redevelopment provides the opportunity to take a blighted property, previously unsuitable for recreation, and turn it into an easily accessible public gathering place. New city parks and recreational spaces improve the aesthetic appearance of derelict land and provide environmental improvements to both the property and the surrounding area. Planting trees and other vegetation on such properties offers air quality improvements and social benefits. Creating an inviting greenspace for leisure and recreation draws residents and visitors alike. In addition, public parks and recreation areas often serve as a catalyst for redevelopment activities in the surrounding area.

In most cases, the design of city parks is a collaborative effort that includes community involvement in every aspect of planning, cleanup, and redevelopment. Maximizing community input and support, utilizing creative financing methods, capitalizing on public-private partnerships when available, and overcoming project obstacles through dedicated leaders working within the political environment are keys to turning petroleum brownfields into greenspace. Furthermore, the emphasis on public-private partnerships and community involvement affirms that the inclusion of public interest is essential for development. Greenspace redevelopment promotes outdoor leisure and has the capacity to initiate a period of economic and aesthetic rebirth to the surrounding area.

Mixed-use

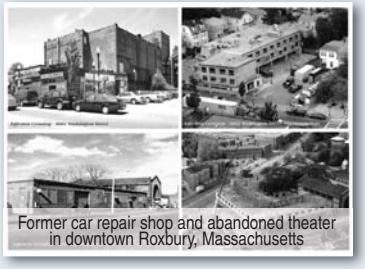
Creating A Space With Multiple Uses – Mixed-use Redevelopment Options

Examples Of Mixed-use Redevelopment Include:

- Coffee shop
- Restaurant
- Housing
- Offices
- Plaza space
- Retail
- Farmers market
- Grocery store
- Hotel
- Community park

Larger or assembled parcels lend themselves to redevelopment projects that can accommodate a number of reuses. These projects, which may include a single building development with two different types of reuses (for example, a building with retail shops on the ground floor and condominiums on the upper floors), are typically considered mixed-use redevelopment. Mixed-use projects serve a larger population base than single-use projects. Additionally, this type of redevelopment often combines commercial, residential, and greenspace reuse in order to accommodate a number of community needs and provide a better quality of life.

Roxbury, Massachusetts – Affordable Housing, Commercial Space



Former car repair shop and abandoned theater in downtown Roxbury, Massachusetts

The 2.2-acre Egleston Crossing redevelopment in the Roxbury and Jamaica Plain neighborhoods of Boston grew from the availability of two parcels. The parcels included a former car repair shop and an abandoned theater in a targeted redevelopment area identified by community stakeholders. Seeking to eliminate exposure to these contaminated and abandoned properties as well as improve the neighborhood center, the Urban Edge community development corporation purchased the properties and addressed the contamination and reuse of these parcels.

Once both parcels were acquired, the properties were combined to host a mixed-use project that features affordable housing on the upper floors and commercial space on the ground floor. Three environmental objectives of the finished project were to provide good indoor air quality, improve energy and water efficiency, and reduce waste. The redevelopment project consists of two buildings that include 64 new residential units for low-income residents, almost a quarter of which are reserved for formerly homeless individuals with disabilities. The project also includes 8,300 square feet of commercial space that contains a coffee shop, dental clinic, fish market, and a youth writing program.

Recognizing an opportunity to make an additional impact on the community, Urban Edge incorporated additional sustainable features into the building design. While the project addressed contamination at the property and improved

Continued...

The completed multi-use Egleston Crossing redevelopment project

the image of the neighborhood, it also worked to minimize the future environmental impact at the site. Sustainable design elements integrated into the project include: low-flow toilets, shower heads, and aerators; non-irrigated landscaping with native plants to reduce water use; photovoltaic panels; and the installation of Energy Star® rated appliances, insulation, windows, and heating systems. The project also recycled 90 percent of the construction waste and other debris from the property. The project received the 2005 Energy Star® Builder Achievement award for the energy efficiency achieved and the 2008 EPA National Award for Smart Growth Achievement Award for Built Projects.

Key Components And Lessons Learned:

- The two parcels would have been more expensive to clean up had they been redeveloped separately. Combining them resulted in a cost-effective project that was completed ahead of schedule.
- Environmental benefits do not have to end at cleanup. The new buildings minimize future impacts on the environment by integrating sustainable design elements into the project.

Project Funding Sources:		
Urban Edge compiled significant public and private funding sources for multiple property activities.		
Local Funding	– City of Boston HOME funds	– Fleet Bank of Massachusetts
	– City of Boston McKinney's Fund	– Local Initiatives Support Corporation (LISC)
	– City of Boston Neighborhood Housing Trust	
State and Federal Funding	– Mass Development	– Community Economic Development Assistance Corporation
	– Mass Technology Collaborative	– Property and Casualty Initiative
	– Massachusetts Housing Investment Corporation	– Mass Affordable Trust Fund
	– Massachusetts Housing Partnership Fund	– Massachusetts Department of Housing and Community Development
	– Massachusetts Home Improvement Contractors (HIC)	– Energy Star Homes Program
	– Mass Home Funders	– Federal Home Loan Bank
Private Funding	– Urban Edge	– Bank of America
	– Keyspan	

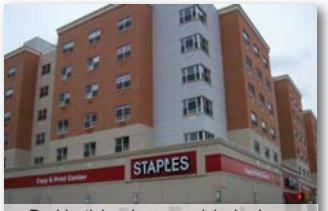
Oklahoma City, Oklahoma – Apartments, Commercial Space

Legacy at Art Quarter

A six-acre property covering a two-block area in downtown Oklahoma City was temporarily used as soccer fields during the property transfer and planning for the permanent mixed-use redevelopment project. The property was previously occupied by as many as three gasoline stations, an automobile service facility, an auto body repair and paint shop, and a dry cleaner. The property was abandoned in the 1970s, and the structures of the former businesses were removed. After the Oklahoma Petroleum Storage Tank Division issued a Ready for Reuse determination acknowledging that environmental conditions on the property were protective of human health and the environment, the property had an interim use as soccer fields by the Central Oklahoma Adult Soccer League. The property was later transformed into a mixed-use redevelopment that now includes the Legacy at Arts Quarter apartment residences, retail shops, and commercial office space. The interim use in this case was as a recreational space for the community.

New York, New York – Affordable Housing, Retail Space

The property was a former gas station located on White Plains Road in the Bronx. The New York State Department of Environmental Conservation certified White Plains Courtyard with the top "Track 1" cleanup ranking, meaning it met the most stringent environmental standards set by the state's Brownfield Cleanup Program and qualifying it for "unrestricted use." In addition, White Plains Courtyard was the first brownfield remediation in the borough as well as the first former-brownfield affordable-housing development in the state to achieve the highest cleanup rating. White Plains Courtyard is a seven-story, 120,000-square-foot apartment development that includes 16,500 square feet of ground floor retail space.



Residential and commercial mixed-use project in New York, New York

Rochester, New York – Townhouses, Commercial Space

The cleanup of the former car dealership and fuel station

The key to the redevelopment of one of Rochester's largest car dealerships came down to location. The 2.2-acre multi-parcel property situated in downtown Rochester operated for more than 60 years as a car dealership with multi-bay service and a repair garage as well as a gasoline station. When the facility closed in 1990, the buildings were abandoned and the property left vacant. While the property was under common ownership, it was comprised of multiple parcels. Recognizing the need to reinvent downtown Rochester, the city purchased the land in 1996 after conducting a market evaluation to determine the reuse potential of the property. The redevelopment of the property would ultimately take five years to complete. In the interim, the property was used to meet a need for public parking in the downtown area that allowed more patrons to support nearby downtown businesses.

The city contracted with a private real estate firm to conduct a market evaluation to help understand the possible reuse scenarios appropriate for the property and for the entire downtown image. In conjunction with a review of the environmental investigation, the most beneficial redevelopment option was the development of residential townhouses as well as the reuse of the old dealership showroom as a 24-hour coffee shop and restaurant. The showroom, which was designated historic, was integrated into the mixed-use property design allowing for commercial reuse on the property along with residential townhouses. The 77 new townhouses constructed on the property provided an opportunity to renew the population base within downtown Rochester and created a place to live, work, and play in the downtown area. The Chevy Place development was the first new downtown apartment complex built in 20 years.

Using experience on past brownfields redevelopment projects, the city leveraged financing opportunities to make the project feasible. Total cleanup project costs were approximately $750,000, with the city funding part of the cost using a U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant (CDBG) allocation and the developer funding additional cleanup costs. The city also assisted by providing direct reimbursement for certain disposal costs and provided a reduction on the purchase price of the property to help offset environmental cleanup costs. Additionally, the city helped provide a $2.35 million loan for the redevelopment project. Because a number of incentives were offered, the developer was willing to take on the risk of liability for the property. Another cost savings was the removal of planned basements from the redevelopment project, which also resulted in a greater level of protection for human health.

Within three months of completing the redevelopment, 97 percent of the units were filled with residents. The project acted as a catalyst for more than $100 million in private investment and development in the area. Additional projects included reusing an old auto body shop as a restaurant and removing an abandoned building to increase parking for new businesses. The Chevy Place redevelopment helped change the face of downtown Rochester by providing amenities and generating revenue for other local businesses.

Continued...

The new Chevy Place mixed-use development features the restoration of the car dealership's showroom

Key Components And Lessons Learned:

- Incorporating changes to the proposed redevelopment to accommodate the cleanup and protection of human health and the environment provided easy cost savings for all partners.
- Working with an experienced developer helped reduce the city's project work and oversight.
- Financial incentives help in overcoming risk aversion to petroleum brownfield projects.

Santa Fe, New Mexico – Residential, Commercial, Public, And Recreational

The former railyard is a prime example of blending multiple uses

After serving the community for most of the 20th century as an active center for transportation and business, the 50-acre Santa Fe Railyard spent the past few decades as a blighted, vacant property. The public expressed a strong desire to keep the railroad running to the historic depot, create a large park, enhance local business opportunities, and form an arts and cultural district within the Railyard. The city purchased the property and used an EPA Targeted Brownfields Assessment to characterize the contaminants in the soil and groundwater. Lead and other metals, petroleum, and petroleum product contamination were discovered on the property. The city cleaned up the property, and today the Railyard is a successful blend of live-in artist studios, galleries, museums, a farmers market, retail shops, office space, and over 13 acres that include a park, plaza, and pedestrian promenade. The city contracted with the nonprofit Santa Fe Railyard Community Corporation to manage sustainable revitalization in keeping with the community's vision. The Railyard grand opening was held in September 2008.

Moorhead, Minnesota – Residential, Commercial, And Public

The Central City Corridor mixed-use redevelopment project

Many structures in the Central City Corridor in Moorhead were over 100 years old and abandoned or underutilized. Using an EPA Brownfields Assessment grant, an area-wide assessment of the corridor revealed petroleum contamination from a former gas station in the soil and groundwater. The city used grants from the Minnesota Department of Employment and Economic Development, the Minnesota Dry Cleaners Fund, and the Minnesota Petrofund to help pay for the cleanup. A developer invested $18 million to redevelop the area in five phases. The first phase, completed in the spring of 2005, included a mixed-use structure with three commercial spaces and 17 apartments. Phase II added a second mixed-use structure and renovations of the corridor's two historic structures, preserving them for reuse. In the fall of 2006, an outdoor bridgehead plaza was completed at the base of the new Main Avenue Bridge, allowing pedestrians access to the river and to walking and bike trails. Phase III included a parking ramp for 135 cars and a 30-unit apartment building with underground parking. This new gateway to Moorhead welcomes travelers with a beautifully renovated, pedestrian-friendly downtown area.

Summary Of The Benefits Of Mixed-use Redevelopment

Considerations for mixed-use projects may include property size, building restrictions on the site, comparable real estate projects in the area, and community need. While property size is important, another key consideration is property layout. The layout and location of the property may influence the position of future buildings as well as the combinations of uses that can be situated on a property.

If land is available and there is financial incentive, communities can use mixed-use development to attract a population base to the redevelopment area. Mixed-use development brings people closer to shopping, jobs, and other community destinations and in the process often reduces the distance that people have to drive or gives them the choice of walking, bicycling, or using transit. One common practice includes zoning the first floor of a residential building for commercial use. This helps to attract retailers while providing goods and services to area residents. Nonresidents also benefit from the new space. Like most redevelopment projects, mixed-use projects often depend on an anchor development to attract users as well as other prospects for the property. Petroleum brownfields have been successfully used for these types of projects, which improve the target property and help leverage additional development in the area.

Successful Redevelopment Approaches

The preceding section highlighted the wide variety of reuse options that are possible at petroleum brownfields. But how do these properties get redeveloped? Each petroleum brownfield redevelopment project is different and may rely on a unique combination of tools and resources to complete. Understanding and having access to a variety of tools and resources can help make projects successful.

Engaging Communities And Partners

Former gas station redeveloped into a parking lot in support of the Pelican Landing Conference Center in Moss Point, Mississippi

It is important for developers to remember that redevelopment projects are successful when they are accepted and welcomed by the community. Engaging community residents and other project partners early in a property's cleanup and redevelopment process is critical to help promote more equitable development outcomes. It is helpful to integrate the community engagement process into the property identification and reuse selection process.

The community needs to be informed of the environmental conditions at the property, the proposed remediation, and of potential reuse options. Providing honest and complete information on the environmental issues and how they will be addressed helps generate credibility and confidence in the project. Regular communication with the community and project partners helps avoid potential misunderstandings. Listening to community concerns about environmental issues, property design, and reuse is fundamental to the success of the project. In addition, communities provide valuable input on preferred uses for a property. For example, in Jackson, South Carolina, it was community input that crafted the redevelopment vision for Jackson Park. In this example and in many of the other projects highlighted in this catalogue, civic and public leadership played an important role in redeveloping petroleum brownfield properties.

Information can be shared with the community through multiple formats to ensure as many people as possible receive needed information. Some mechanisms for information sharing include: public meetings; discussions with business and community groups; information on Web sites and in newspapers and newsletters; signs posted at the property; community visioning exercises; and design charrettes (intensive, hands-on workshop that bring people from different disciplines and backgrounds together to explore design options for a particular area). In areas where multiple languages are spoken, communications can be translated to be accessible to the impacted population.

In addition to the local community, engaging other project partners is another key to a property's redevelopment. Community groups, environmental professionals, regulatory agencies, financiers, local business groups, and developers can all be actively engaged throughout the redevelopment process. Some partners' skills and resources can be used to minimize costs; for example, local gardening clubs might offer free or low-cost landscaping for a pocket park redevelopment once the property has been remediated. For more information on partnerships, visit www.epa.gov/brownfields/partnr.htm.

Working Through The Cleanup And Redevelopment Process

The redevelopment process begins with the identification of the project property. One tool communities use to identify petroleum brownfields for redevelopment is a petroleum brownfield site inventory. This inventory lists known properties that may require cleanup and provides excellent resources for identifying potential properties for redevelopment. An inventory also can be used to prioritize the redevelopment of multiple properties, assist in marketing properties for reuse, help track redevelopment progress, and increase awareness of petroleum brownfields. An inventory may be developed by a local government in conjunction with community groups, local business leaders, real estate professionals, and developers. EPA's Petroleum Brownfields: Developing Inventories (www.epa.gov/oust/pubs/pbfdevelopinventories.pdf) is a good resource for learning how to develop and use an inventory.

Prior to purchasing a property, it is essential to conduct All Appropriate Inquiries (AAI) to understand any potential environmental issues. AAI is the process of conducting due diligence or a Phase I Environmental Site Assessment to determine prior uses and ownership of a property and assess conditions at the property that may be indicative of releases or threatened releases of hazardous substances at, on, in, or to the property. AAI necessitates involving an environmental professional and the environmental regulatory agency, either local, state, tribal, or EPA. An environmental professional can assist with the appropriate inquiry process and also provide advice on reuse, make recommendations for potential remedial action, and aid communication with state and federal regulators. The environmental regulator also will assist in understanding the implications of environmental reports and help explain what remediation is necessary. More information can be found at www.epa.gov/brownfields/regneg.htm.

Once a property is identified for redevelopment, petroleum brownfield stakeholders can utilize state regulatory agencies and state response programs to facilitate the property's cleanup and reuse planning. States are key partners in terms of technical assistance, funding, liability issues, and selecting remediation and reuse options. Although liability remains an obstacle to reuse, state response programs are bringing a greater level of certainty to the cleanup and redevelopment process and establishing finality for cleanups with liability relief and "no further action" mechanisms. EPA's State Brownfields And Voluntary Response Programs: An Update From The States (www.epa.gov/brownfields/pubs/st_res_prog_report.htm) explores the evolving landscape of state environmental, financial, and technical programs, including the incentives designed to promote brownfields cleanup and redevelopment. This user-friendly tool looks at multiple components of state brownfields and voluntary response program(s) and provides a synopsis of each state's response program(s) and contact information.

In the cleanup stage of the redevelopment process, there are a variety of creative approaches that can be used to reduce costs and streamline redevelopment. An example of one such approach is using knowledge of a property's environmental and geophysical conditions to adjust cleanup and reuse plans. Ensuring that new buildings are located on the most sound areas of a property will reduce the costs associated with stabilization and compaction. For example, at the Chevy Place in Rochester, New York, environmental investigation results allowed the cleanup manager to identify ways to alter the cleanup plan, reduce offsite disposal, and minimize excavation for the new building footprints, resulting in an overall lower cost. Another example of a cost-saving approach is to use the redevelopment project to fulfill some of the cleanup requirements. For example, features of a redevelopment project such as slabs or parking lots can serve as caps to contaminated areas.

After cleanup, there may be challenges to implementing a planned reuse at a property, including time considerations, community issues, financing issues, and/or environmental issues. In such cases, an interim reuse may be appropriate at a property to provide near-term economic and social benefits before a more beneficial long-term reuse can be implemented. Another approach for property reuse is to consider parcel assembly. Because some petroleum brownfield properties are small and in locations that may have limited reuse potential as independent properties, parcel assembly may improve the viability and marketability of a property. If land assembly is an option, the area can support a larger reuse project and can help achieve economies of scale if the environmental work can be conducted as a single project.

Incorporating Environmental Sustainability

Petroleum brownfield projects have increasingly incorporated more environmentally-sustainable elements into project cleanup and reuse, such as recycling construction and demolition debris; conducting energy modeling to maximize efficiency in building placement and heating, ventilating, and air conditioning selection; tapping into renewable energy resources (e.g., solar); using building materials and paints with no VOCs; and incorporating native landscaping.

Sustainable Cleanup And Redevelopment Resources

- EPA Water Sense (www.epa.gov/WaterSense)
- EPA ENERGY STAR® (www.epa.gov/energystar)
- EPA Brownfields Sustainability Pilots (www.epa.gov/brownfields/sustain_plts/)
- U.S. Green Building Council LEED® (www.usgbc.org/LEED)
- Sustainable Sites Initiative (www.sustainablesites.org)
- Living Building Challenge (http://ilbi.org/the-standard)
- EcoTools (www.cluin.org/ecotools)
- Database of State Incentives for Renewables and Efficiency (www.dsireusa.org)

Incorporating sustainability into the planning, design, and implementation of redevelopment projects presents a number of benefits. Some of these benefits include improved energy efficiency, reduced carbon emissions, and savings in water consumption. Developing in existing communities and on infill properties, and promoting more compact, mixed-use development are critical factors in providing greater transportation choice and protecting open space, resource lands, and critical environmental areas. In addition, projects that incorporate sustainable elements are more marketable and offer lower operating costs than traditional developments. There are many organizations that can offer guidance, products, and resources for those interested in pursuing sustainable petroleum brownfield projects.

Finding Financing And Technical Assistance

Like many brownfields, petroleum brownfields may need to rely on public funding sources to make redevelopment feasible. A variety of financing sources to support the assessment, cleanup, and redevelopment of properties are available at various levels of government. Communities that reach out to local, state, tribal, and federal government programs to identify these potential sources of funding may facilitate the cleanup and reuse of a property that was previously unviable. EPA identifies partners and financing opportunities on its Web site at www.epa.gov/oust/petroleumbrownfields/pbfinance.htm and www.epa.gov/brownfields. Discussions with these partners can identify public and private funding sources that address environmental, demolition, or other costs associated with site preparation and redevelopment.

Examples of funding sources and tools that stakeholders utilize in support of petroleum brownfield projects may include but are not limited to:

- State petroleum cleanup funds
- EPA Brownfield Assessment, Cleanup, and Revolving Loan Fund grants, Section 128(a) State and Tribal Response Program funds
- U.S. Department of Housing and Urban Development (HUD) Community Development Block Grants (CDBG), Section 108 loans, HOME Funds
- U.S. Small Business Administration loans
- U.S. Department of Commerce Petroleum Environmental Cleanup Fund Awards (PECFA)
- State-specific economic and community development funds
- The National Park Service, U.S. Department of Interior, U.S. Department of Agriculture, Appalachian Regional Commission, U.S. Department of Energy, and the Economic Development Administration are examples of some of the federal agencies that can support activities on brownfields properties
- State financial tools; for example, Wisconsin's Financial Resource Guide For Cleanup And Redevelopment (http://dnr.wi.gov/org/aw/rr/archives/pubs/RR539.pdf)
- Tax credits or increment financing also can be a financial resource for projects
- Private funding streams, including construction loans, private Real Estate Investment Trusts (REITs), and developer equity bonds

EPA's Brownfields Federal Programs Guide lists funding specific to brownfields projects; see www.epa.gov/brownfields/partners/bf_fed_pr_gd.htm.

In addition to financial support, technical assistance is available from EPA and state regulatory agencies. Many state and tribal environmental agencies also provide direct assistance for environmental site investigation.

EPA's Technical Assistance to Brownfields communities (TAB) grants provide geographically-based technical assistance and training to communities and other stakeholders on brownfields issues with the goal of increasing a community's understanding and involvement in brownfield cleanup and revitalization. TAB grants serve as an independent source of information assisting communities with: community involvement; better understanding the health impacts of brownfield sites; the science and technology relating to brownfields site assessment, remediation, and site preparation activities; brownfields finance questions; and information on integrated approaches to brownfields cleanup and redevelopment. For more information regarding TAB assistance, see http://epa.gov/brownfields/tools/tab_bifold.pdf.

Moving Forward

Redeveloping petroleum brownfields, with their unique characteristics, requires creative solutions. EPA is committed to efforts that continue the success of assessing, cleaning up, and reusing petroleum brownfield properties. EPA is working with an array of external stakeholders to enhance communications, provide needed assistance to potential partners, explore policy improvements, and establish lasting relationships. Lessons learned through these efforts will result in new areas of emphasis, new approaches to overcome the barriers to wide-scale petroleum brownfields cleanup and revitalization, and further sustainability efforts.

A former gas station in Milwaukee, Wisconsin, prior to cleanup and redevelopment

In continuing to implement its Action Plan, EPA remains committed to pursuing specific redevelopment initiatives that support the economic revitalization of petroleum brownfields in economically-challenged communities. While EPA recognizes that tremendous redevelopment progress has been made across the country, much of the progress has focused on restoring larger urban areas. EPA is also committed to understanding the needs of rural economically-challenged regions and providing tools and resources specific to rural communities. While redevelopment projects can help change the face of a community and protect public health and the environment, it is also important to facilitate projects that can help restore economic viability and provide much needed amenities for local citizens.

After cleanup, Sherman Perk opened on the former gas station property

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