United States
Environmental Protection
Agency

Reusing Superfund Sites

Table of Contents

Introduction — 2
A Little Background — 4
Are These Cleaned-up Sites Safe? — 6
Tools for Redevelopment — 8
Additional Help for Communities — 12
A Realistic Look at the Reuse Process — 14
Reuse Types — 18
Reuse Impacts on Communities — 19
Contacts and Sources of Information on Superfund Reuse — 20

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Introduction

Construction at the Tinkham Garage site. Source: EPA

The Tinkham Garage site in reuse. Source: EPA

Shoppers bustling up and down the aisles of the new Home Depot store in Londonderry, New Hampshire, may find it hard to imagine that the property was once part of the Tinkham Garage Superfund site. This was not a transformation that was easy or occurred overnight. Even after the property was cleaned up and made safe, much of it remained idle for many years. It took the creativity and dedication of many parties to make this success a reality. As Byron Mah, the U.S. Environmental Protection Agency (EPA) remedial project manager for the site says, "When EPA and the stakeholders work together in a spirit of partnership, good things can happen." In the end, the transformation of the Superfund site into a commercial center was a joint effort involving the citizens of two neighboring towns, the New Hampshire Department of Environmental Services (NHDES), EPA, the project developers and many others. This cooperation has paid off with increased tax revenue, locally based jobs, and new opportunities for the community.

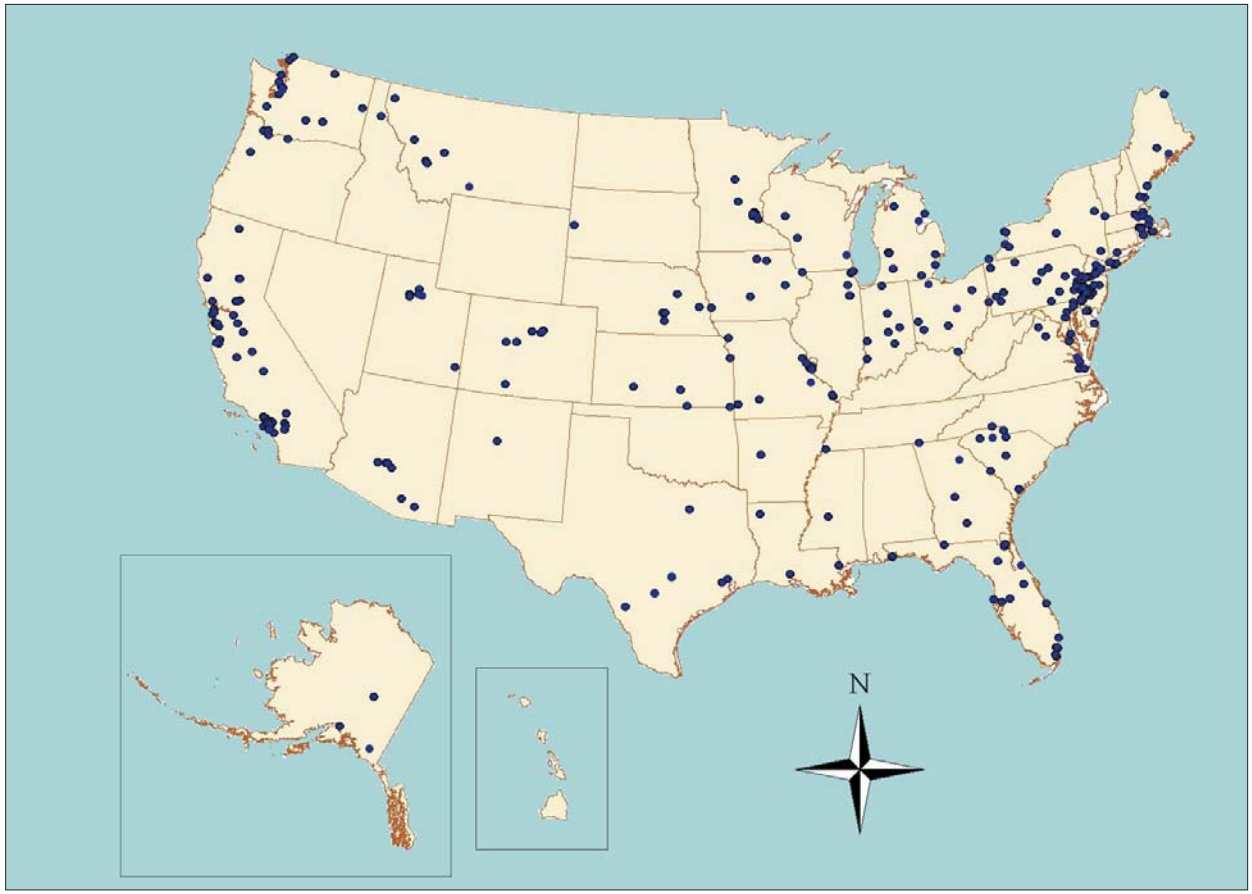
A suspicious-looking foam and an unusual smell coming from a burbling brook were the first hints neighbors had that something was wrong at the Tinkham Garage site. The Londonderry Health Department soon confirmed their fears: tank truck waste dumped at Tinkham Garage had polluted the brook, the land nearby and their drinking water. After an investigation, EPA listed Tinkham Garage in 1983 as one of the first high priority Superfund sites. Three years after putting the site on that list of the country's most hazardous sites—the National Priorities List (NPL)—EPA reached an agreement with some 600 responsible parties to clean up the site, but for about 15 years after that cleanup much of the site remained vacant. It wasn't until community members, developers and responsible parties began working with EPA to overcome misperceptions and other obstacles that the idea of redevelopment caught hold. Today, in addition to the Home Depot store, the Tinkham Garage site hosts a Staples office supply store, a Dunkin' Donuts shop, a restaurant and a newly built active senior community where, according to Mah, "people are gearing up to move in."

The original developer at the site, Reggie Ronzello, Sr., says that the redevelopment at Tinkham Garage ultimately brought together the two towns, despite a history of disagreements, and has resulted in benefits for all parties involved. The town of Londonderry now has substantially higher tax revenue and hundreds of new jobs. Redevelopment at Tinkham Garage is also leading to improvements in traffic patterns in the neighboring town of Derry, and citizens living near the site continue to benefit from redevelopment through restored property values. In addition, EPA benefited from the transformation at Tinkham Garage because a former Superfund site is now clean, safe and in responsible, private ownership. "It has been a very positive thing for everyone," says Ronzello.

Londonderry is just one community among hundreds that have discovered ways to transform a public eyesore into a source of civic pride. Areas that were once health hazards are now being cleaned up and turned into office parks, athletic fields, commercial centers, residential areas, tourist attractions and nature preserves. Sites that were abandoned have become valuable community resources. Instead of being a drag on the local economy, many are now generating tax revenues and spurring broader economic revitalization.

Though each community faces unique challenges, EPA is making success stories like the one at Tinkham Garage possible at Superfund sites from coast to coast. In Coalinga, California, citizens worked with EPA and the state Department of Health Services to redevelop former asbestos mines and storage facilities as a Kmart and a 43-unit apartment complex. The City of Coalinga intends to use the new revenue generated by the redevelopment to help fund a city-wide revitalization plan that includes a 30-acre wildlife management area. West Dallas, Texas, used to be polluted with high levels of lead from a smelter that released a cloud of toxic smog into the surrounding neighborhoods. Now, after EPA and the Dallas Public Housing Authority joined forces to clean the site, the area is experiencing a renaissance. People are moving back into the neighborhoods and a supermarket was recently built. Residents in Libertyville, Illinois, have a success story as well.

With help from local, state and federal agencies, they reclaimed an old gravel quarry and converted it into a vast forest preserve that includes a 115-acre lake for fishing and boating. Hundreds of other Superfund sites are now success stories waiting to happen. Indeed, every Superfund site—no matter how isolated—has potential for reuse.



Locations of Superfund sites that are in reuse. Source: EPA

A Little Background

A sports complex, including six baseball and soccer fields, was built over waste containment areas at the Lipari Landfill Superfund site in Mantua Township, New Jersey.
Source: EPA

During the 1970s, the dangers of abandoned industrial waste came to light in a dramatic way. A site called Love Canal, in New York, became emblematic of the crisis. Love Canal made national headlines when homeowners discovered, in their basements and playgrounds, pools of chemicals that can cause birth defects, miscarriages and a range of other health problems. In 1978, President Jimmy Carter approved emergency funding to relocate 239 Love Canal families, and the nation soon learned that Love Canal was not an isolated incident. Pockets of dangerous industrial wastes were being uncovered across the country. Once alerted to these dangers, lawmakers passed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, or Superfund) to protect Americans from health risks posed by contamination. In the decades since that time, the Superfund program has taken thousands of cleanup actions to reduce health threats to Americans and the environment. Cleanups have been completed at more than 900 NPL sites around the country. Even the infamous Love Canal site has now been deleted from the NPL.

As the number of cleanup-up sites grew, EPA saw that although these former Superfund sites were clean and safe, they were often left idle and abandoned. In some cases, the sites became eyesores and targets for vandalism. EPA recognized that as part of its mission to protect human health and the environment it should expand its efforts to make its cleanup activities consistent with community goals to reuse these sites. In 1999, EPA launched the Superfund Redevelopment Initiative (SRI), a coordinated national effort to facilitate the return of the country's most hazardous sites to productive use. Since its inception, the Superfund Redevelopment Initiative has helped communities reclaim and reuse thousands of acres of idle land. Through an array of tools and partnerships, SRI helps to provide local communities with new opportunities to grow and prosper. Towns and villages around the country are recovering idle properties as vibrant parts of community life.

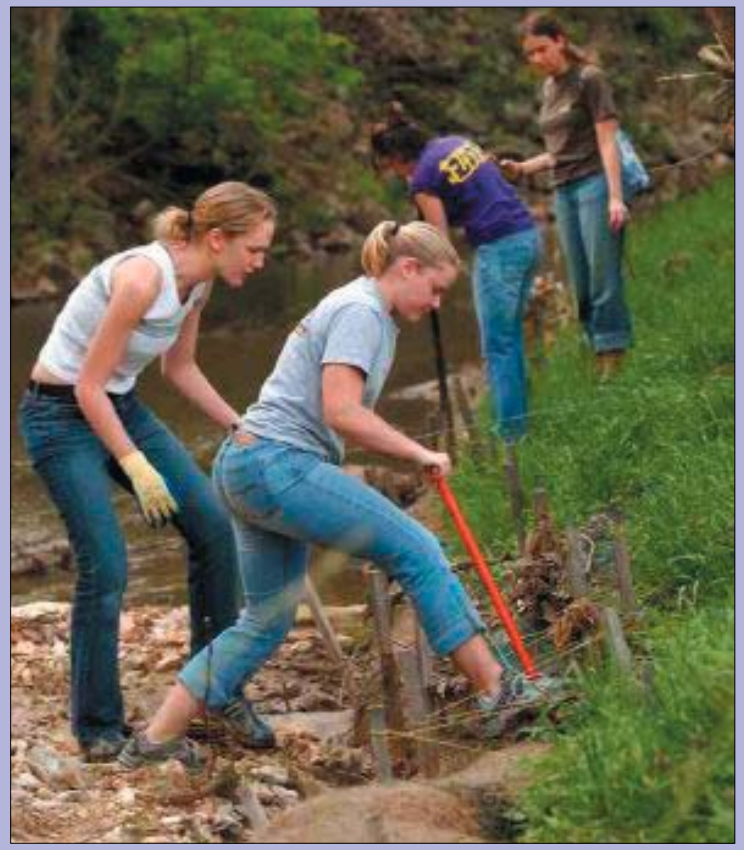
Although SRI is a discrete program, it works in the context of a larger EPA effort, the Land Revitalization Agenda (LRA). The LRA established reuse as an important part of all of the Agency's cleanup programs, including, in addition to Superfund, those dealing with Brownfields, Federal Facilities, and properties contaminated by waste management and handling facilities and leaking underground storage tanks. SRI's efforts complement this Agency-wide mission to support reuse, but focus on sites in the Superfund program.

Case Study
Superfund Redevelopment: Return to Use Initiative

As EPA gained experience in supporting reuse, it realized that certain barriers were unnecessarily delaying or limiting reuse at sites cleaned up before EPA began its focus on site reuse. In 2004, EPA launched the Return to Use (RTU) Initiative to help communities reclaim former Superfund sites where such barriers exist. The main purpose of the RTU Initiative is to remove barriers that are not necessary for the protection of human health, the environment, or the remedy, at those sites where remedies are already in place. Under the RTU Initiative EPA works with communities to identify steps they can take to return sites to use while still protecting human health and the environment. This might mean taking down barbed wire or restrictive signs that are no longer needed or installing a gate into a fence so that pedestrians and bicyclists can access a site in areas where only motorized traffic needs to be excluded.

One community's experience with a 212-acre site in Missouri provides an example of how the RTU Initiative works.

In the 1960s and '70s the two landfills at the Fulbright Landfill Superfund site were contaminated with industrial and residential wastes from the Springfield area. EPA remediated the heavy metal and cyanide contamination in the ground water and completed the cleanup in 1992, but developers and townspeople were reluctant to redevelop the site despite its prime location near the Little Sac and South Dry Sac rivers. Legal restrictions and the legacy of contamination associated with Superfund sites hampered its reuse potential; but where others saw daunting risks, the community saw an opportunity. Springfield citizens formed a stakeholder group. This group, known as the Sac River and Fulbright Landfill Stakeholders Committee, planned the site's reuse with the goal of integrating the Fulbright Landfill and the adjacent Sac River Landfill into their urban landscape in Springfield. In the course of six months, the Stakeholders Committee identified reuse preferences and priorities for both landfills, as well as goals and recommendations for the overall character of the area. In addition, Springfield residents created a plan for a greenway with a trail along the Little Sac River and trees have been planted along the Dry Sac River. Much work remains, and EPA will continue to consult with the Stakeholders Committee and with the City of Springfield as they revise and implement the reuse plan.



Students plant ward willows along the South Dry Sac near the Fulbright Landfill.
Source: *Springfield News-Leader*

The former Butterworth Landfill site in the City of Grand Rapids, Michigan. Source: EPA

Planned bike path at the former Butterworth Landfill. Source: EPA

"In five or ten years, I suspect no one will remember this was a Superfund site."

- Mayor George Heartwell, Grand Rapids, Michigan, where the former Butterworth Landfill will be used, in part, as a bike path.

Are These Cleaned-up Sites Safe?

Yes. The Environmental Protection Agency's highest priority at any Superfund site is to protect human health and the environment. EPA must ensure that a site protects human health and the environment before it can be reused. EPA takes careful and thorough measures to make sure that each site meets this standard before it is returned to use. However, not all sites are protective for all uses. An individual strategy is developed for each site to make certain that the cleanup, when complete, protects human health and the environment for the land uses that can be reasonably anticipated.

One of the actions EPA takes is a thorough investigation of the contamination at each site. The investigation tells EPA whether the contamination is a threat to human health or the environment and, if it is, describes the nature and extent of the contamination. After the investigation, EPA meets with the site owner, the community and other interested parties to identify the reasonably anticipated future uses of the site. A reuse assessment, which involves collecting and evaluating information pertinent to reuse, can be done to develop assumptions about reasonably anticipated land uses at Superfund sites. It may involve a review of available records; visual inspections of the site; and discussions about potential future land uses with local government officials, property owners and community members. Based on its investigations, EPA selects a cleanup strategy tailored to the individual site that takes into account these anticipated uses. Before proceeding, EPA asks the community to comment on this strategy. Then site cleanup begins, and cannot be considered complete until all cleanup goals are attained and all limitations are observed. After cleanup, EPA monitors the site to guard against any problems that may arise. EPA ensures that reuse in no way compromises safety. In fact, anecdotal evidence suggests that reusing Superfund sites helps to keep them safe over time. Research suggests that sites being reused are less prone to vandalism and other activities that could harm the remedy.

Some sites are cleaned up for unrestricted access and use, meaning there are no use limitations based on the environmental condition of the sites. Other sites are cleaned up to be protective for specific types of use. For example, sites with long histories of industrial use in areas that are expected to remain industrial are usually cleaned up to be protective for that use, but would not be suitable for other uses, such as housing. In all cases, EPA specifies any use or activity limitations for its sites, for example "no residential use," "no use of ground water for drinking water," or "no digging below a depth of four feet."

At a large number of Superfund sites, especially landfills, wastes are left buried on site with protective covers of soil and other materials, often many feet deep, to keep people from coming into contact with the wastes. As long as users do not dig into the cover, there is no exposure to wastes. At some of these sites there may be gas vents or monitoring wells, which also need protection. Each site must be evaluated individually to determine whether a particular use would interfere with its remedy components.

More than 550 Superfund sites are already being safely reused and are integrated into the fabric of their communities. In towns across America, the local supermarket or the high school soccer field may be located on a former Superfund site. These cleaned-up sites have a wide range of uses including commercial, governmental, ecological and recreational.

New jobs as well as shopping opportunities are the result of reuse at Cabot Carbon/Koppers Wood Treatment site in Gainsville, Florida. Source: EPA

Remediation Strategies:

EPA considers anticipated future use when deciding on a site's remedy. EPA then, to the extent practicable, chooses cleanup techniques and technologies that are consistent with the reasonable anticipated future use of the land. Below is a list of some cleanup techniques that EPA uses to make sure that human health and the environment will be protected when sites are appropriately used:

1. **Off-Site Disposal:** Moving contaminants away from the site to a facility that can safely handle them.
2. **Recycling:** Treating or converting toxic waste material to make it safe and reusing it for other purposes.
3. **Containment:** Placing covers over toxic waste deposits or installing barriers around them to prevent migration and to keep people from coming into contact with the waste.
4. **Treatment:** Processing the waste at the site to either remove the contaminants from soil, sediment or ground water or bind contaminants into soil or sediment.

   a. **Thermal Treatment:** Using heat to render contaminants harmless by increasing their volatility; immobilizing them; or destroying them through burning, decomposition or detonation.

   b. **Solidification:** Physically binding or enclosing contaminants within a solid mass like concrete.

   c. **Stabilization:** Inducing chemical reactions between a stabilizing agent (such as lime, Portland cement, fly ash or kiln dust) and the contaminants to reduce their mobility.

   d. **Bioremediation:** Breaking down toxic contaminants by using natural microorganisms.

   e. **Phytoremediation:** Using plants to help remediate sites. The plants draw up soil and water pollutants through their root systems and either immobilize the contamination or metabolize it.

   f. **Chemical Transformation:** Detoxifying contaminants by transforming their chemical structure.

   g. **Natural Attenuation:** Using natural biotransformation processes such as dilution, dispersion, volatilization, biodegradation, adsorption and chemical reactions to reduce contaminant concentrations over time to acceptable levels.

Tools for Redevelopment

Aerial photograph of the Allied Paper, Inc./Portage Creek/Kalamazoo River area. Source: Michigan Department of Environmental Quality

EPA can help communities in a number of ways as they consider reuse of Superfund sites. Through SRI, EPA continues to provide new, more effective tools for redevelopment. Communities can select the tools that fit their needs and can tailor them to the characteristics of individual Superfund sites. Following are examples of those tools and how communities have used them.

Enhanced Stakeholder Process

Planning for the revitalization of environmentally impaired properties is ideally a community-based process, relying on people and partnerships as well as information and analysis. EPA can support communities in this process by supplying teams of experts to work with them to gain a better understanding of reasonably anticipated future land use to incorporate into remedy selection decisions. Often communities find it helpful to create community-based Land Use Committees, which guide the projects from the planning stage through implementation of the redevelopment plan. With this approach, it is important to provide training and education for committee members to ensure that the community has the ability to pursue land revitalization opportunities over the long-term. EPA's expert team includes people with experience in facilitation, mediation and public outreach that can help communities devise effective land revitalization strategies, and bring together diverse local interests.

Construction of soccer fields at the Avtex Fibers site in Front Royal, Virginia. Source: EPA

Just such an expert team helped the citizens of Plainwell, Michigan develop their reuse framework for the Plainwell Paper Mill property, which is part of the larger Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund site. This Superfund site includes five disposal areas, five paper mill properties, an 80-mile stretch of the Kalamazoo River from Morrow Dam to Lake Michigan, and a three-mile stretch of Portage Creek. The five disposal areas are situated on the riverbanks and contain millions of cubic yards of waste contaminated with polychlorinated biphenyls (PCBs). It has been estimated that the river sediments contain more than 350,000 pounds of PCBs.

Through SRI, EPA supported local citizens in forming a stakeholders group. The Mill Committee was created to represent the community's priorities and perspectives regarding potential future land uses at the Plainwell Paper Mill portion of the Superfund site. The City of Plainwell served as the project's sponsor with support from SRI and EPA Region 5. For over seven months the Mill Committee managed the planning process. The 31-member committee met three times and hosted a public meeting to share the project's findings with the larger community. EPA's expert team organized public outreach efforts; provided research, analysis and design services; facilitated committee and public meetings; and developed and revised the project's site reuse framework. The committee created guidelines for future development proposals as the

City of Plainwell worked with interested parties, such as developers, to return the property to use. EPA will continue to consult with the committee and with the City of Plainwell as they move forward with the reuse plan to ensure that the site remedy will remain protective for future users.

Partnerships

SRI can form partnerships with groups and organizations interested in Superfund site redevelopment, which can help local communities realize reuse opportunities.

Partnerships with site owners, local businesses, large corporations, state governments and local officials are essential to the success of reuse projects. Owners of Superfund sites may have the financial resources and legal obligation to clean up a site and can set it on the road to reuse. Local developers may have the knowledge and financial interest to make certain that a site is reused in a way that is economically viable. And local officials have an interest in making sure that the new use fits the needs and desires of their communities.

Once EPA understands a community's concerns, it may be able to inform the community about potential partners. For example, the U.S. Soccer Foundation is interested in building soccer fields around the country to help promote the sport. Because many Superfund sites can safely support soccer fields (and plans for building the fields can be easily incorporated into cleanups), EPA has entered into a partnership with the U.S. Soccer Foundation. If a community is interested in reusing all or a portion of a site for soccer fields, EPA can assist in its contacts with the Foundation.

EPA has also formed a partnership with model airplane enthusiasts. On February 10, 2005, Joseph Beshar, of the Academy of Model Aeronautics (AMA), signed an agreement with Michael Cook, the director of EPA's Office of Superfund Remediation and Technology Innovation. The Academy's member clubs can offer services such as mowing and maintaining the landscaped surfaces and fences on the parts of Superfund sites that the Academy is using, at no cost to EPA or the local community. The agreement between the Academy and EPA can link Superfund communities interested in hosting model airplane activities on their Superfund sites with the expertise and resources of the Academy. This partnership will benefit communities interested in offering aeromodeling activities and will support the Academy's interest in promotion, development, education and general advancement of aeromodeling activities. This alliance between EPA and the AMA is already creating new opportunities. In 2005, Rae Fritz and the Northwest Florida Modelers Association (an AMA chapter) made the Fritz Field model airplane park on the capped northern portion of the Beulah Landfill Superfund site in Pensacola, Florida, their home for flying and regular competitions.

Michael Cook (left), Director of Superfund Remediation and Technology Innovation, EPA and Joseph Beshar (right), AMA. Source: EPA

"You can appreciate that having a place to fly is the heartbeat of model aviation. The Academy is on cloud nine that we have this potential."

- Joseph Beshar, Flying Sites Coordinator, Academy of Model Aeronautics

Case Study
Smoothing the Way for Outdoor Fun: Arlington, Tennessee

Arlington Blending & Packaging was once home to a pesticide formulation and packaging plant where leaks and spills contaminated the soil, sediment and ground water. In 1996, EPA and contractors excavated and treated 41,000 tons of contaminated soil. They then backfilled the area with clean soil. Although it was safe, the site remained unused due to the disincentive associated with the previous contamination. EPA stepped in to help local stakeholders who were interested in finding a new use for the site. In July 2004, EPA issued a letter to the town of Arlington, detailing the liability statutes that will protect the town's interests when they take ownership of the property because of unpaid taxes. To further reassure the residents of the site's safety, EPA issued an RfR Determination on October 16, 2004, declaring the site ready, the remedy protective, and clarifying what requirements had to be followed for the use to remain safe. Now local stakeholders are moving forward with a park that includes a playground, field space, walking and biking trails, exercise stations and a basketball court.

The Arlington Blending & Packaging site in Arlington, Tennessee and newly constructed playground. Source: EPA

Ready for Reuse (RfR) Determinations

Another tool in SRI's tool chest is the RfR Determination. This is an environmental status report written in plain language that tells how a site can be used so that it remains safe for people and the environment. EPA issues RfR Determinations to help the real estate market, local governments and local residents understand how a site can be reused and for what purposes. Often, RfR Determinations help remove doubts that developers or site owners have about reusing a former Superfund site, and give stakeholders confidence to move ahead with reuse. The 2.3-acre Arlington Blending & Packaging site in Arlington, Tennessee is a good example.

> "Without the Ready for Reuse Determination there was no way that we could have ever convinced … people that here's a property that was once a Superfund site, and we're going to put it to use. It enhanced the aesthetics of the community, upgraded the property value of surrounding properties and makes a better experience for the people and children in the area."
>
> - Ed Haley, Town of Arlington Superintendent

Written Guides

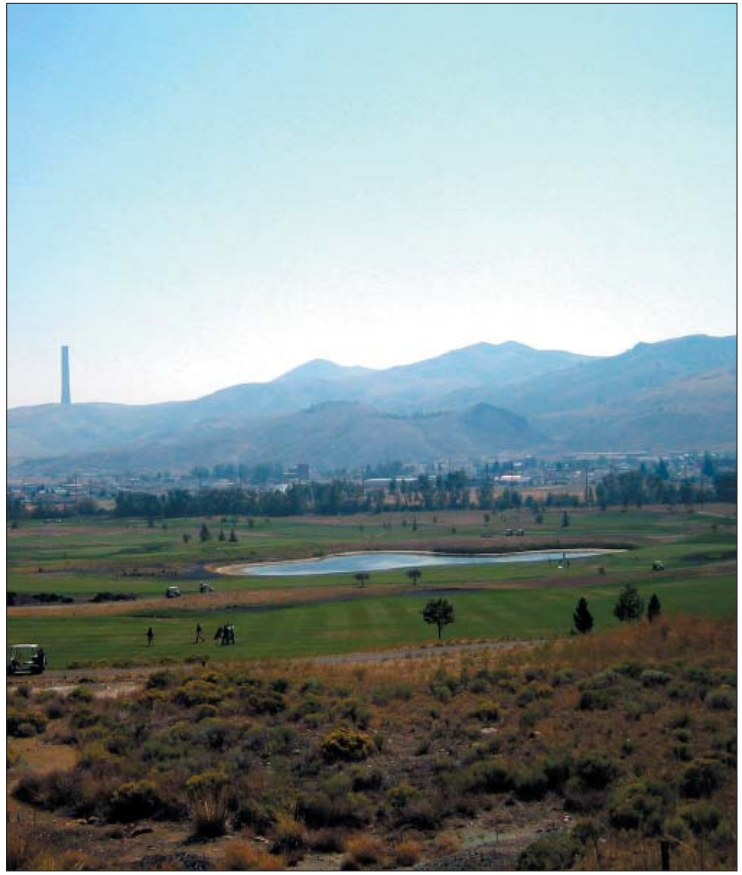
EPA has also developed a series of documents to serve as guides for communities grappling with the issues involved in reusing Superfund sites. The following guides are available to the public through EPA's Web site at http://www.epa.gov/superfund/programs/recycle/pubs.htm.

Reusing Superfund Sites: Commercial Use Where Waste is Left on Site – This document provides technical information on how sites with hazardous waste have been safely reused for commercial purposes while ensuring that the protectiveness of the remedy is maintained.

Reusing Superfund Sites: Recreational Opportunities at Abandoned Mine Lands – This document provides information about active and passive recreational redevelopment opportunities at abandoned mine lands.

Reusing Superfund Sites: Recreational Use of Land Above Hazardous Waste Containment Areas – This document provides technical information on how sites with hazardous waste have been safely reused for recreational purposes while ensuring that the protectiveness of the remedy is maintained.

Reusing Cleaned Up Superfund Sites: Golf Facilities Where Waste is Left on Site – This document provides information useful for planning, designing and implementing site cleanups that will safely support golf facilities at a remediated Superfund site. The report describes how redevelopment and remediation efforts can be coordinated to ensure successful golf facility projects at sites where some or all of the hazardous wastes will be, or have been, left on site. For example, situated on a portion of the Anaconda Smelter Superfund site is a unique, 21-hole golf course that combines beautiful landscaping with historic mining artifacts. That's how golfing legend Jack Nicklaus designed the golf course. Bunkers are made of slag and golfers play beside old smelting ladles and chip in sight of flues and smelting ovens. This unusual course is part of the dramatic transformation of the Anaconda Smelter Superfund site in Anaconda, Montana. What was once a hazardous waste site is now the centerpiece of the town's plans to change itself from a former mining town to a recreational hot spot.



The Old Works golf facility built on the Anaconda Smelter Superfund site, Anaconda, Montana. Source: EPA

How You Can Apply for a TAG:

EPA may award only one TAG per Superfund site. To make sure that all eligible groups have an equal opportunity to apply for the TAG, the application process follows these steps:

Step 1: Your group writes EPA a letter telling of its interest in a TAG. This "letter of intent" should include the name of the Superfund site or sites covered by the TAG. It should also include the name, daytime telephone number, and address of your group's contact person. EPA will send you the TAG Application Package.

Step 2: EPA informs the rest of the community that your group is interested in a TAG. EPA usually notifies the community by publishing an ad in a local newspaper. The notice also explains that other groups interested in a TAG may contact your group and join with you or may submit their own letter of intent.

Step 3: Other interested groups in your community then have 30 days to get in touch with your group to talk about working together to submit one application to EPA. If your group and other interested groups decide they don't want to form a coalition, other groups that intend to apply for the TAG must write EPA a letter of intent within this 30-day period.

Step 4: After the initial 30-day period, interested groups will have another 30 days to submit applications. If EPA receives more than one application, it will rank each applicant based on whether the group represents the affected community, the group's plans for using a technical adviser, and the group's ability and plans to inform other community members about site-related information provided by the technical adviser. EPA is available to provide help to all groups preparing TAG applications.

Additional Help for Communities

Technical Assistance Grants – Many Superfund sites present communities with issues that require expertise in chemistry, engineering, geology, toxicology, ecology, biology and law. Once communities begin to consider issues of site reuse, they may also need expertise in architecture, financing, construction and public planning. Through Technical Assistance Grants (TAGs) EPA's Superfund program makes it possible for communities to hire the experts they need to understand the complexities involved in site reuse. A TAG provides money for activities that help communities participate in decision-making at eligible Superfund sites. An initial grant of up to $50,000 is available to qualified community groups so they can contract with independent technical advisors to interpret and help the community understand and interpret technical information about its site.

Hudson River PCBs site in New York where the group Scenic Hudson, Inc. used TAG funds to keep the community in Ft. Edward informed through newsletters and a Web site about the river cleanup. Source: EPA

Technical Outreach Services for Communities – In addition to Technical Assistance Grants, EPA sponsors the Technical Outreach Services for Communities (TOSC) program to help communities cope with hazardous substance issues. TOSC is a no-cost, non-advocacy program run by EPA's five university-based Hazardous Substance Research Centers. Because of funding limitations, TOSC may not be available to every community.

The citizens of Hagerstown, Maryland relied heavily on the TOSC program during the reuse planning process for the Central Chemical Superfund site. The TOSC program provided a public health expert who attended reuse planning meetings and answered citizens' questions about site safety. The health expert helped find information on site contamination and translated site data to address health and safety concerns.

There are important factors that shape the selection process in favor of a particular community. These include:

- hazardous or toxic pollution, in the early stages of recognition;
- site nomination for TOSC by EPA (most often through the site's Community Involvement Coordinator), the state, a potentially responsible party (PRP), or another party;
- request for TOSC assistance by a citizens group;
- public interest issues, special circumstances or political concerns (such as environmental justice issues, human health protection, or environmental research);
- multiple sources of request for TOSC assistance;
- degree of community organization; and
- presence of, or willingness to form, a community group to work on this issue.

Hagerstown, Maryland Reuse Planning Meeting. Source: EPA

Community Advisory Groups – One way EPA helps communities develop partnerships for reuse is by supporting the formation of Community Advisory Groups (CAGs). CAGs are committees made up of citizens with diverse interests that provide a public forum for discussing community concerns about Superfund sites, including how the community wants to reuse a site.

Liability Tools – Sometimes real estate firms are afraid to develop a Superfund site because of the possibility that the firm could be found liable for the costs of cleanup – even for conditions that existed before anyone at the firm became involved with the site. Prior to the passage of the Small Business Liability Relief and Brownfields Revitalization Act in 2002, EPA used comfort letters and prospective purchaser agreements (PPAs) to clarify liability issues and assure purchasers of former Superfund sites that EPA would not sue them for existing contamination. Liability provisions in the 2002 Brownfields law have supplanted PPAs and comfort letters by providing an exemption for qualified "bona fide prospective purchasers." Under the 2002 Brownfields law, bona fide prospective purchasers are those who purchase property knowing that contamination is present, but who create significant benefits (such as jobs or removing blight). These landowners will not be held responsible for pre-existing contamination.

bona fide prospective purchasers: those who purchase property knowing that contamination is present, but who create significant benefits

A Realistic Look at the Reuse Process

Sharon Steel in the early 1900s. Source: U.S. Fish & Wildlife Service/Utah State Historical Society

Sharon Steel as it is today, ready for redevelopment. Source: EPA

Transforming a Superfund site from an eyesore to a point of community pride can be a complex and lengthy process. It sometimes takes many years for revitalization efforts to be fully realized. That certainly has been the case for the Sharon Steel Superfund site in Midvale, Utah.

For 65 years, the Sharon Steel site was home to smelting and mining activities that ultimately left behind 10 million cubic yards of mining waste. Wind and rain spread dust from the mining waste over a 571-acre area, contaminating homes and businesses throughout Midvale with lead, arsenic and cadmium. Runoff from the waste heaps also polluted wetlands, ground water and the nearby Jordan River. The site was so large that when EPA began considering cleanup, it divided the site into two distinct areas or "operable units" (OUs). Cleanup of the site took 20 years and was fraught with difficulty and delay. Intergovernmental disputes over cleanup decisions caused part of the delay. State and federal engineers designed a remedy that called for capping the site with a plastic membrane and one and a half feet of soil. Although that remedy made the site safe, it was not a good solution from Midvale's perspective because it severely limited the City's reuse options. Redevelopment of Sharon Steel was crucial to the City's future. Development requires utilities such as sewer and water and in Utah, sewer and water lines must be buried approximately 6 feet deep to avoid freezing. The proposed one-and-a-half-foot cap was simply not deep enough to accommodate the utilities. EPA moved ahead with its proposed remedy despite the City's objections. Because of this and other disagreements, relations among the regulatory agencies and the community were complicated and sometimes strained. The City of Midvale is home to a second large Superfund site, Midvale Slag, so citizens were already weary of dealing with complicated cleanup processes.

Finally, in 1999, the $31.5 million cleanup was complete, and the Sharon Steel site was ready to start anew. Because Sharon Steel and Midvale Slag are on the only developable land left in the city, citizens and public officials had a strong incentive to push forward with redevelopment on the Sharon Steel property. Nevertheless, the 260-acre OU1 remained vacant year after year. In an effort to encourage reuse, EPA issued "clean letters," saying that the cleanup was successful and the site was no longer hazardous. Unfortunately, those letters were not enough to change attitudes about reuse. The skepticism and stigma sometimes associated with Superfund sites were real obstacles to redevelopment at Sharon Steel, as were misunderstandings about the cleanup levels, a lack of public outreach and public education, and the physical limitations of the remedy. In fact, misinformation about the state of remediation among bankers, lawyers and citizens led to declining property values at areas near the site and reinforced the stigma. After dealing with a series of interested developers, the City realized that in order to move any development forward a solution to the problem of utilities and the cost of infrastructure was required. In

2003 Midvale City began pursuing changes in Utah state law that would allow the investment of specialized tax increment financing to improve the site so reuse would be possible. Eventually, working with a new residential developer, the City recreated a Redevelopment Area on the Sharon Steel site to pay for the $34 million in additional soil required to allow installation of utilities. The $34 million reimbursement is part of a $44 million incentive package Midvale City put together to make a new mixed use development on the Sharon Steel site financially feasible. In 2004, EPA issued an RfR Determination that explained in detail why the site was ready for reuse and determined that the site can support a mix of uses such as commercial and residential. In the same year, a Site Modification Plan for Redevelopment was issued, paving the way for a positive future at Sharon Steel. Now that redevelopment is becoming a reality, the relationship between Midvale officials and EPA has improved. Jordan Bluffs, Inc. bought the Sharon Steel site in January 2004 and is planning to redevelop it with a mix of uses, including a 2,500-unit residential development.

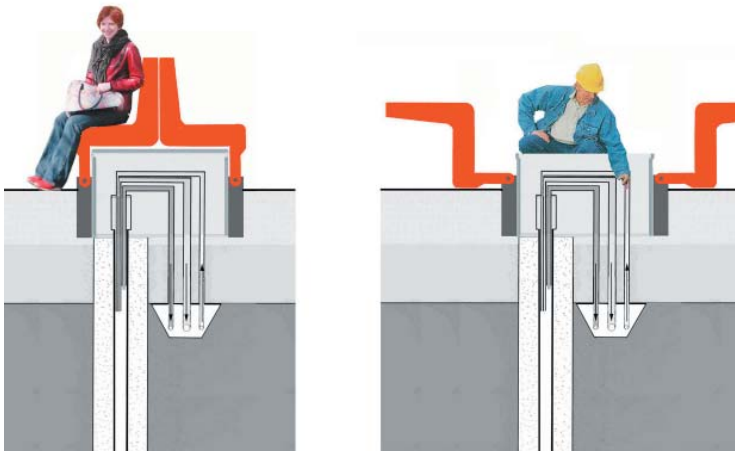
As the story of Sharon Steel illustrates, the process leading to reuse of a Superfund site can sometimes be arduous and contentious. Another example is the H.O.D. Landfill site in Antioch, Illinois, where the road toward reuse has also been long and rocky, but where citizens are now successfully turning the former landfill into a multi-use recreational and educational area. Bill Ahlers, who was heavily involved in developing reuse plans for the site, described his experience this way: "You need to look at the big picture – the long-term benefits – and be patient and recognize that it's going to be a slower process than you are probably used to, but the benefits are there at the end."

Other communities have highlighted their sites' history by installing plaques that tell the stories of the sites. Still other communities have chosen to focus on remediation education and have discovered ways to keep the community informed about the site's remediation. This technique offers the community a sense of ownership in the process and helps to remove any stigma associated with the site. In Antioch, Illinois, at the H.O.D. Landfill, the community even put the remediation infrastructure to good use; part of the redevelopment plan is to place benches atop wellheads.

Sometimes sites can be reused in phases if one area is ready for reuse but others are not. At the 256-acre Munisport Landfill site in North Miami, Florida, an estimated 6 million cubic yards of solid waste were dumped in an unsafe landfill. Rainfall percolating through the solid waste caused the release of elevated levels of ammonia into the underlying ground water and adjacent surface water. EPA decided to segment the remedy's design and construction process into four phases. As EPA completes each phase of the remedy, the community will begin implementing the reuse plan for that part of the site. Gradually, the Munisport Landfill will be transformed into a mixed-use development with approximately 100,000 square feet of commercial office and retail space, 2,800 to 5,000 residential units, a park and recreation facilities, and a hotel.

Some Considerations for Weighing Reuse Options

1. Size of the site
2. Populations close to the site
3. Community's needs and desires
4. Transportation corridors
5. Land uses and conditions around the site
6. Site contamination and cleanup status, based on EPA and state agency reports
7. Local regulatory frameworks, including zoning and comprehensive planning
8. Potential partnerships and resources



Wellhead seat bench design at H.O.D. Landfill. Source: EPA

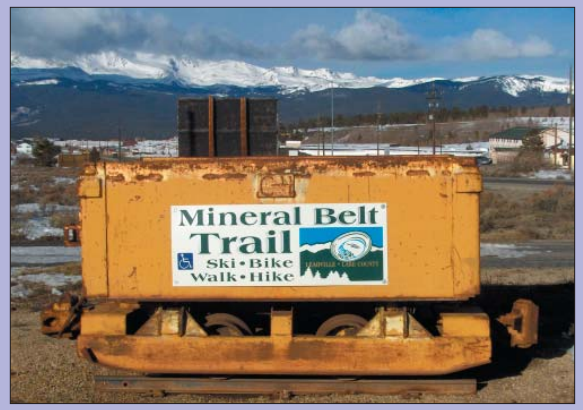
Case Study
Honoring Heritage: California Gulch, Leadville, Colorado

A little more than a century ago, Leadville, Colorado was the biggest city between San Francisco and St. Louis. With an elevation of 10,162 feet, it is still the highest incorporated town in the United States. After gold was discovered in 1859 along California Gulch, thousands of prospectors flocked to the Leadville mining district to seek their fortunes in gold, silver, copper and other metals. Leadville got its name from the rich silver-lead ores that had to be thrown out of mines by hand to get to the gold. With its rich, accessible deposits, the Leadville mining district produced great wealth, including the famous Guggenheim fortune.

Between 1859 and 1986, an estimated 26 million tons of ore were mined from the 16.5 square-mile Leadville district, but eventually the industry's fortunes began to fade. Though the community had weathered the capricious cycles of a mining economy for decades, by the mid-1980s it was clear that mining in the Leadville district was coming to an end. Leadville gradually lost half of its population and was faced with the reality that 140 years of mining had taken a heavy toll on the surrounding environment.

More than 2,000 mining waste piles dotted the landscape of the Leadville mining district and covered about 627 acres. The tailings, slag and dust from these dumps leached metals into the Arkansas River and its tributaries. Acid drainage in the mine tunnels and runoff from heavy rains caused an estimated 115,000 cubic yards of mine tailings to wash into the flood plain of the Arkansas River. The highly acidic mine drainage destroyed vegetation and wildlife habitat in the Arkansas River and threatened livestock, recreation, irrigation and public drinking water farther downstream. Lead in the soil and water became major health concerns, especially for young children.

In September 1983, EPA added California Gulch to the National Priorities List of Superfund sites. In 1988, EPA began remediation to minimize the effects of this mine drainage and launched removal actions to consolidate, contain and control more than 350,000 cubic yards of contaminated soils, sediments and mine-processing wastes.



Trail at California Gulch. Source: EPA

A survey in the mid-1990s showed that community residents wanted to reuse part of the Superfund site as a multi-purpose trail that would highlight Leadville's history as a mining center. Through creative planning and design, EPA was able to integrate the chosen reuse strategy with the site remedy. EPA used the trail as a way to consolidate and cap the contamination along the old transportation corridor. The ultimate design left some contaminated soil in place, but capped it to prevent any exposure, and shaped it into a platform with six inches of gravel and three inches of asphalt. Plaques that describe the area's mining history line the trail. The Mineral Belt Trail was dedicated in 2000 and two years later the National Park Service recognized it officially as part of the National Recreational Trail system. Community residents can now walk, bike and cross-country ski along the trail. Area school children take field trips to the trail where they can read the plaques and learn about the region's mining heritage.

Case Study

Recycling at a Superfund Site: Trans Circuits, Lake Park, Florida

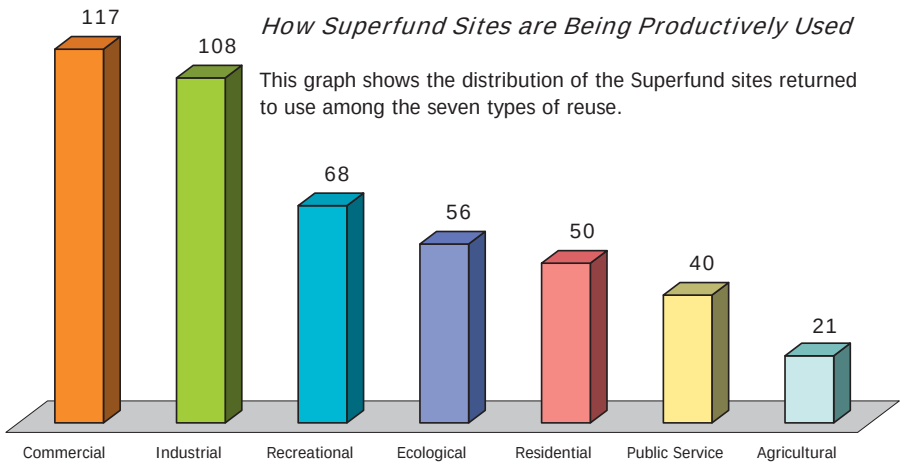
At the one-acre Trans Circuits Superfund site in Lake Park, Florida, an innovative recycling business is transforming discarded post-consumer materials like plastic bottles into clothing. At the same time, the business's operations represent the recycling of the site's acreage, which restored a former hazardous waste site to successful use. Since September 2001, Direct Access International has been creating and marketing 100% recycled-content clothing, tote-sport bags, accessories and safety products made from scraps of denim, newsprint, rubber, plastics and even retired dollar bills. The company's clients include local, state and federal recycling programs; government agencies; and corporations; including EPA, Ford Motor Company, General Motors and PepsiCo Inc. Located in a commercial and industrial area in southern Florida about seven miles north of West Palm Beach, the Trans Circuits Superfund site is partially asphalt-paved and includes one building, the 21,000-square-foot facility leased by Direct Access International. Between 1978 and 1988, the Trans Circuits Superfund site was the location of an electronic circuit board manufacturing facility. The facility disposed of liquid waste on site that resulted in the release of volatile organic compounds (VOCs) to the soil and ground water. Today, Direct Access International's warehousing, fabric cutting, screen printing, sewing and shipping operations employ 35 people at the site.

T-shirts, bags and caps made from recycled materials at Direct Access International's manufacturing facility. Source: EPA

Reuse Types

Reuse Type	Examples of Sites Returned to Reuse
Agricultural	**Poer Farm** in Indiana – 7.1 acres reused as hay crop for livestock feed **Silver Mountain Mine** in Washington – 5 acres for grazing land
Commercial	**Hellertown Manufacturing Co.** in Pennsylvania – 9 acres for a small manufacturer of prefabricated buildings **Cannon Engineering Corp.** in Massachusetts – 6 acres for a propane distribution business
Ecological	**Wheeling Disposal Service Co., Inc., Landfill** in Missouri – 200 acres for a wildlife reserve **Cherokee County** in Kansas – 110 square miles for a wildlife enhancement area
Public Service	**Syosset Landfill** in New York – part of 33 acres is now in municipal use for parking, equipment storage and material storage **New Castle Spill** in Delaware – 6 acres for new headquarters for the New Castle Department of Public Works
Recreational	**Lexington County Landfill** in South Carolina – Golf driving range on 45 acres **French, Ltd.** in Texas – 23 acres of restored marshland for walking, bird-watching and fishing
Residential	**Ralph Trucking Co.** in California – 23 acres of residential homes **Toftdahl Drums** in Washington – 15 acres of residential homes
Mixed use	**East Helena** in Montana – 3 acres for a neighborhood park; a baseball field on a treated and capped area; 140 acres for agriculture; a school on a 20-acre parcel; some wetlands redevelopment; additional 30 acres will be used for mixed commercial and residential purposes **Petersen Sand and Gravel** in Illinois – 115-acre lake; 19,000 square-foot visitor center; recreation trails; a picnic/event pavilion; preserved and restored habitat; and swimming, boating and fishing areas

Superfund sites being reused often have multiple purposes and benefits for site owners, community members and others. At the time of publication, there were more than 550 Superfund sites returned to, or planned for, productive uses. The kinds of reuse that Superfund sites can support are as varied as the communities that design them. There is no one-size-fits all formula for site redevelopment. Generally, however, reuse falls into one of seven broad categories: commercial, industrial, ecological, recreational, public service, residential or agricultural purposes. Often more than one type of reuse occurs at a single site.



Reuse Impacts on Communities

EPA's primary objective in cleaning up hazardous waste sites is protecting people and the environment from harm, but cleaning up properties has also, in many cases, provided a catalyst for reuse. The productive reuse of formerly contaminated properties can have significant, positive economic, environmental and social impacts on local communities. More than 244,000 acres of land are in reuse or ready for reuse at Superfund sites. This reuse has resulted in nearly 80,000 on-site jobs with $2.7 billion in annual income so far.

For roughly fifteen years, a majority of the developable commercial and industrial land outside Boston at the 245-acre Industri-Plex Superfund site in Woburn, Massachusetts, stood idle due to soil and ground water contamination. The remedy at the Industri-Plex site primarily consisted of capping 110 acres of soils and sediments, implementing a ground water treatment system, and establishing institutional controls to protect the remedy. Today, thanks to successful collaboration between U.S. EPA, potentially responsible parties, the custodial trust (development advocate established under the remedy settlement), state and local governments, the local community, and private developers, this land is being reused. The site is now home to the Anderson Regional Transportation Center, a new Interstate 93 interchange, and many businesses, including a Target store and a Marriott luxury hotel. Seventy-five acres of the site are designated as open space and wetlands. About 750 on-site jobs created more than $19 million in income in 2003. Property values increased by almost $82 million on the site and property values within a half-mile of the site increased by $160 million from 1992 to 2003. The towns of Woburn, Reading and Wilmington have collected $4.4 million more in tax revenue since redevelopment of the site. Redevelopment improved regional public transportation and increased the protectiveness of the capping remedy. The redevelopment at Industri-Plex has transformed the site from a blight on the community to a symbol of reuse success.

Back at the Home Depot on the old Tinkham Garage site, store employees are helping local residents spruce up their homes and improve their quality of life. Not only does the retail plaza on the former Superfund site contribute jobs but, because of the new infrastructure, businesses are springing up on land adjacent to the site and are bringing even more jobs. Reggie Ronzello believes that redevelopment has had a tremendous economic impact not only on the town of Londonderry, but on the surrounding communities as well. Jack Dowd, the chairman of the town council in the neighboring town of Derry, agrees. "The project was a tremendous success and had a regional impact," he says. The retail plaza has brought at least 700 jobs to the area, but the benefits don't stop there. As Ronzello put it, Superfund reuse can be a "win-win-win." All parties involved can benefit when a Superfund site goes from abandonment to reuse. Not only does reuse protect human health and the environment, it also allows communities to increase their tax base, provide

Target at the Industri-Plex Superfund site. Source: EPA

"The transformation of this 245-acre site has restored Woburn's pride, hope and economic future."

- Robert Dever, Mayor of Woburn, Massachusetts

Contacts and Sources of Information on Superfund Reuse

Superfund Redevelopment Web site:
http://www.epa.gov/superfund/programs/recycle/index.htm
Melissa Friedland, National Program Manager for Superfund Redevelopment, reuse.info@epa.gov

Superfund Redevelopment Publications:
http://www.epa.gov/superfund/programs/recycle/pubs.htm

Abandoned Mine Lands Revitalization and Reuse:
http://www.epa.gov/superfund/programs/aml/revital/index.htm

Tools and Resources:
http://www.epa.gov/superfund/programs/recycle/tools/index.htm

Superfund Community Involvement with Links to TOSC and TAG Information:
http://www.epa.gov/superfund/action/community/index.htm

Regional Contacts:
http://www.epa.gov/superfund/programs/recycle/contact.htm

Phone Numbers:
National Response Center Hotline
Receives reports of oil and hazardous chemical, biological and radiological releases. Phone: (**800) 424-8802** or **(202) 267-2675**, 24 hours/day, 7 days/week.

RCRA/UST, Superfund, and Emergency Planning and Community Right-to-Know (EPCRA) Hotline
Answers your questions and provides useful documents about the Resource Conservation and Recovery Act (RCRA), Underground Storage Tanks (USTs), and the Superfund program. Phone: **(703) 412-9810**, **(800) 424-9346**, **TDD (800) 553-7672**, 9:00 am–6:00 pm Eastern, Monday–Friday, closed on federal holidays.

Environmental Justice Hotline
Provides assistance and information about equal protection from environmental hazards for people of all races, cultures and incomes. Phone: (800) 962-6215, 8:30 am–5:30 pm Eastern, Monday–Friday.