Siting Renewable Energy on Contaminated Land and Mining Sites

Description

EPA is encouraging renewable energy development on current and formerly contaminated land and mining sites. As concerns grow about the environmental impacts of burning fossil fuels, renewable energy technologies will play a greater role in meeting future electricity demand.

Renewable energy is energy obtained from sources that can be continually replenished. Use of renewable energy reduces greenhouse gas emissions, decreases dependence on foreign oil, and provides domestic economic development opportunities. Renewable energy technologies include biomass (biorefinery and biopower), solar (photovoltaic and concentrating solar power), and wind, which are discussed below. Other clean and renewable energy sources include hydropower, geothermal, tidal power, methane gas to energy, and biomass direct-combustion and other biomass to energy conversion technologies.

Biomass

Biomass energy is derived from plants and plant-based material, including wood, waste, and alcohol fuels. Energy from wood is the largest source of biomass energy today, and can result from directly burning wood or using the waste products of pulp and paper production, called "pulping liquor." Energy from waste can be derived from municipal solid waste (MSW), manufacturing waste, and landfill gas such as methane. Alcohol fuel, or ethanol, is currently derived almost exclusively from corn. Researchers are investigating the use of cellulosic biomass–plant matter made up of complex sugars–as an additional source for bioethanol production. Soybeans are also used as a component of biodiesel.

For more information on types of biomass and how biomass is collected and converted into energy consult the following webpages:

- Department of Energy's U.S. Energy Administration Biomass Basics: http://tonto.eia.doe.gov/kids/energy.cfm?page=biomass_home-basics
- Department of Energy's U.S. Energy Administration ABC's of Biofuels: www1.eere.energy.gov/biomass/abcs_biofuels.html
- National Renewable Energy Laboratory's Learning About Renewable Energy: Biomass Energy Basics: www.nrel.gov/learning/re_biomass.html

Solar

The power of the sun can be used to produce both thermal energy (heat) and electricity. Solar energy commonly is used to heat water and spaces inside homes, buildings, greenhouses, and even swimming pools. Solar thermal devices use direct heat from the sun, concentrating it in some manner to produce heat at useful temperatures. They are even used to create steam for electricity generation.

Photovoltaic (PV) devices and concentrating solar power plants convert solar power directly into electricity. PV devices, or "solar cells," use semiconducting materials to change sunlight directly into electricity. PV systems often are used in the sunniest parts of the country. Large groups of solar panels can be constructed together to form a solar array and can be arranged into utility-scale PV systems. Concentrating solar power plants use the heat from solar thermal collectors to heat a fluid. The heated fluid produces steam that is used to power the generator, creating electricity.

For more information on solar energy, consult the following webpages:

- Department of Energy's U.S. Energy Information Administration Renewable Solar Basics: http://tonto.eia.doe.gov/kids/energy.cfm?page=solar_home-basics
- National Renewable Energy Laboratory's Learning About Renewable Energy: Solar Energy Basics: www.nrel.gov/learning/re_solar.html
- Solar Electric Power Association: www.solarelectricpower.org
- Solar Energy Industries Association: www.seia.org

Wind

Windmills have produced energy from wind for hundreds of years. Wind turbines are used today to capture wind energy and convert it to electricity. The wind causes the propellers of the turbine to rotate, turning a shaft which spins a generator to make electricity. A single wind turbine can be used to produce small amounts of power, but large wind farms made up of many turbines can be connected to a utility power grid and produce power for many homes and businesses. Wind flow in an area is influenced by geography, terrain, weather conditions and other factors.

Researching Community Wind Projects

It may be beneficial to r esearch the possibility of a community wind pr oject, or partial community ownership in a commercial wind pr oject. The National Renewable Energy Laboratory (NREL) evaluated the economics of community wind pr ojects in the paper Economic Development Impacts of Community Wind Projects: A Review and Empirical Evaluation *(NREL/CP-500-45555)*

www.nrel.gov/docs/fy09osti/45555.pdf

For more information on wind power, types of turbines and how turbines work, consult the following webpages:

- Department of Energy's U.S. Energy Information Administration Renewable Wind Basics: http://tonto.eia.doe.gov/kids/energy.cfm?page=wind_home-basics
- National Renewable Energy Laboratory's Learning About Renewable Energy: Wind Energy Basics: www.nrel.gov/learning/re_wind.html
- American Wind Energy Association: www.awea.org

Required Activity?

No.

Making it Work

When to Use

According to the U.S. Energy Information Administration's *Annual Energy Outlook 2010* (www.eia.doe.gov/oiaf/aeo/), from 2008 to 2035 U.S. electricity production will need to increase by nearly 30% to meet growing demand, and renewable energy production is expected to increase nearly 100% between 2008 and 2035. Where will these new renewable energy facilities be built, and what will the demands be on green space?

There are several reasons why contaminated lands and mining sites make exceptional locations for clean and renewable energy development. Those reasons include:

- Many EPA-tracked lands, such as large Superfund, RCRA, and mining sites offer thousands of acres of land with few site owners. These sites may be situated in areas where the presence of wind and solar structures are less likely to be met with aesthetic opposition.
- EPA-tracked sites often have critical infrastructure in place, including electric transmission lines, roads and water onsite, and are adequately zoned for such development. The avoided costs for new infrastructure capital and zoning can be significant.
- Renewable energy also is an economically viable reuse for sites with significant cleanup costs or low real estate development demand. Renewable energy development can provide job opportunities in urban and rural communities, particularly where factories, mining, and other manufacturing activities have ceased operations.
- Redevelopment of EPA-tracked sites prevents the development of greenfield sites, which serve as a critical carbon sink, protect watersheds and wetlands, and provide habitat and raw resources.

- Federal, state and local programs offer low-cost loans, loan guarantees, grants, tax incentives, and technical assistance to reduce renewable energy facility startup and operating costs. Other market drivers for renewable energy include special agreements such as feed-in-tariffs, which enable facilities to sell renewable energy directly to the utility without using any of the energy themselves.
- EPA tracks approximately 490,000 sites and 15 million acres of potentially contaminated land across the United States. Cleanup goals have been achieved and controls put in place to ensure long-term protection for more than 917,000 acres of this EPA-tracked land. Preliminary analysis has shown that there are at least 3.2 million acres of abandoned mine land tracked by EPA and other sources. This leaves open many potential opportunities to develop renewable energy facilities on these sites. Coordination and partnerships among federal, state, tribal and other government agencies, utilities, the private sector, and communities will only help advance renewable energy production.

EPA RE-Powering America's Land Initiative

What is RE-Powering America's Land Initiative?

With the RE-Powering America's Land Initiative (www.epa.gov/renewableenergyland/index.htm), EPA is taking a multi-pronged approach to encourage the reuse of potentially contaminated land and mining sites as renewable energy production facilities by.

- Working with the Department of Energy's National Renewable Energy Laboratory to identify Brownfields, RCRA, Superfund and mining sites with wind, solar, and biomass development potential
- Outlining state and federal incentives for developing renewable energy facilities and utilizing contaminated lands
- Supporting pilot projects that assess potential wind and solar generation potential at EPA contaminated lands and mining sites
- Estimating the greenhouse gas benefits from siting clean and renewable energy on contaminated lands and mining sites
- Seeking input from stakeholders to determine the need for additional site redevelopment and reuse tools such as liability release provisions
- Conducting outreach to highlight how EPA can support renewable energy development on contaminated land and mining sites

EPA Renewable Energy Maps and Data

What are the EPA Renewable Energy Maps and Data?

EPA has developed maps showing contaminated lands and mining sites with potential for siting renewable energy production facilities and for incorporating smaller-scale renewable energy production as part of another type of redevelopment, such as housing, commercial or industrial projects.

Both United States and state-specific maps of each renewable energy type are available on the Renewable Energy Mapping and Data webpage (www.epa.gov/renewableenergyland/maps.htm). The data used to make these maps also are available in an Excel spreadsheet from this webpage.

Site-specific information is available through an interactive *Google Earth tool* on the Renewable Energy Interactive Mapping Tool page (www.epa.gov/renewableenergyland/mapping_tool.htm). This Google Earth KMZ file makes it possible to view EPA's information about siting renewable energy on contaminated land and mining sites, alongside other information contained in Google Earth. It enables the user to search by renewable energy type or by contaminated land type. In addition to the site's location, it also provides: site name and identification information; EPA Region and program managing the site; a link to the site's cleanup status information; and specific acreage and renewable energy resource information.

What process did EPA use to develop these maps?

To develop the maps, EPA worked closely with the Department of Energy's NREL (www.nrel.gov). NREL and EPA collected renewable energy resource information and merged it with EPA and state data on contaminated lands and mining sites across the country. The mapping analysis applied basic screening criteria such as distance to electric transmission lines, distance to roads, renewable energy potential, and site acreage, in order to identify EPA tracked lands that might be good

candidates for solar, wind, or biomass energy production facilities. This is an important but high-level screening analysis, designed as an entry to those interested in conducting detailed site-specific evaluations of development potential.

The complete method behind this project is available on the Renewable Energy Mapping and Data page (www.epa.gov/renewableenergyland/maps.htm).

State and Federal Incentives for Siting Renewable Energy on Contaminated Lands

EPA's incentive fact sheets provide information about federal and state incentives available for renewable energy generation and contaminated land redevelopment in each state.

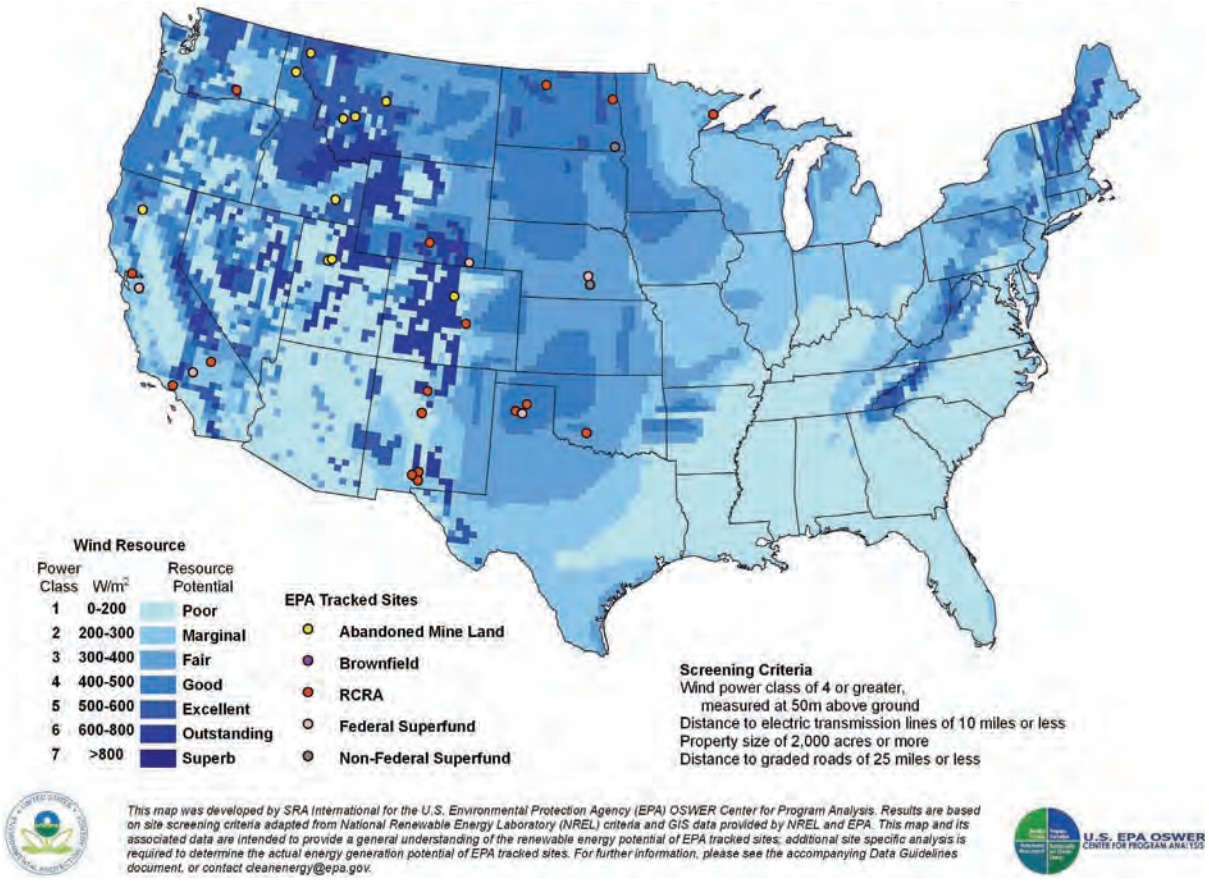
While the incentives are typically offered by separate programs, there may be sites at which multiple incentives may be combined to facilitate the development of contaminated lands for renewable energy.

Each fact sheet includes information on available grants, loans, bonds, and other funding; tax incentives such as abatements, deductions, and credits; technical assistance; and other incentives offered at the state level. In addition, you can find information on renewable portfolio standards, net metering, public benefits funds, electricity generation by energy source, limitations on liability, estimated number of contaminated properties, and points of contact as of November 2008.

The state incentive fact sheets for each state are available at www.epa.gov/renewableenergyland/incentives.htm, and the EPA fact sheet *Federal Incentives for Achieving Clean Energy Development on Contaminated Lands* is available at www.epa.gov/renewableenergyland/incentives/federal_incentives.pdf.

The U.S. Department of Energy maintains a database of state and Federal incentives for renewables and efficiency (DSIRE) at www.dsireusa.org/.

EPA Tracked Sites with Utility Scale Wind Energy Generation Potential



How to Use

Early community involvement, especially for large-scale renewable energy projects, is critical to the project's success and timeliness. Community support, understanding, and enthusiasm for a renewable energy project will help ease the process. Communities that promote renewable energy component manufacturing as part of their local economic development and job creation plans can reduce capital costs for renewable energy facilities by providing material and capital needs locally, increasing the likelihood of local renewable energy generation.

Also, listen and respond to community concerns and requests. Establish trust and credibility with the community by taking the time to listen to concerns and requests regarding the renewable energy site plans. Community members may have questions about whether the site will still be cleaned up to protective levels, whether the renewable energy facility will reduce community aesthetics, whether the wildlife could potentially be harmed, etc. Answers to these questions will vary with site conditions and should be acknowledged and addressed by someone with expertise and credibility on the subject. However, general responses to these questions are provided below to facilitate initial discussions.

Will siting a renewable energy facility on a contaminated property interfere with the cleanup and the reuse of site?

EPA does not lower its standards of protection for a site that will be reused, nor does it allow that reuse to affect the integrity or reduce the effectiveness of the cleanup measures taken at the site. The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) requires that Superfund clean-ups be protective of human health and the environment. EPA considers the reasonably anticipated future land use in carrying out protective cleanups.

EPA selects site remedies that meet cleanup standards for the current and reasonably anticipated future land use at the site. The remedy selection process for a site may evaluate various current and reasonably anticipated future land uses including, but not limited to, residential, commercial, industrial, agricultural, or recreational. Considering the reasonably anticipated future land use in the remedy selection process, including the baseline risk assessment and feasibility study, helps ensure site cleanup that is protective and cost effective in the long term. For example, a property cleaned up consistent with a commercial or industrial land use assumption may be sufficiently protective for uses such as manufacturing, renewable energy projects, shopping, or office complexes, but normally would not be protective for residential use. Many sites have land use restrictions (e.g., institutional controls) to protect the public and environment by limiting the site's future uses to activities that will not disturb the site's engineered cleanup.

At sites where protective measures are in place for waste that remains after the cleanup, EPA evaluates whether such measures will continue to provide protection in light of the potential use planned for the site (e.g., whether reuse might impair the cleanup). For example, at a landfill, the Agency may select an engineering control such as

Superfund Redevelopment Initiative

The EPA Superfund Redevelopment Initiative (SRI) website provides additional information to help communities return some of the nation's worst hazardous waste sites to safe and productive uses. Specifically under the SRI, EPA focuses on two fundamental areas to facilitate that outcome: (1) identifying reasonably anticipated future land use before the cleanup remedy is implemented to help ensure the long-term integrity of the cleanup; and (2) working with communities to avoid barriers to reuse at those sites where remedies are already in place.

Since its inception, the SRI has helped communities reclaim and reuse thousands of acres of formerly contaminated land. Through an array of tools, partnerships, and activities, Superfund Redevelopment continues to provide local communities with new opportunities to grow and prosper. Towns and villages around the country are recovering idle properties and returning them to productive use.

For more information on the SRI, please visit the following website: www.epa.gov/superfund/programs/recycle

a cap, together with a pump and treat system as the selected remedy. A detailed technical analysis, evaluating how to maintain the protectiveness of the selected remedy, typically would be needed if the community or a developer were interested in placing a commercial facility on top of this landfill. In addition, EPA may need to oversee those who reuse a Superfund site where contamination remains on site, to ensure that their activities do not affect the protectiveness of the cleanup. However, under the Superfund Redevelopment Initiative, EPA has and will continue to work with developers, communities, and other stakeholders to ensure that the reuse and redevelopment of Superfund sites can be done in a way that maintains the protectiveness of the selected remedy.

How will wind turbines affect community aesthetics and noise?

In general, careful design of the wind power plant can satisfy most aesthetic and noise concerns. Computer simulation can be helpful in evaluating visual and auditory impacts before construction begins.

The American Wind Energy Association (AWEA) is one source for further information. The AWEA website provides answers to many of the frequently asked questions that a community may have concerning a wind turbine project, as well as fact sheets on issues such as wind turbines and the environment, wildlife, and health and safety.

- Wind Turbines and Health: www.awea.org/pubs/factsheets/Wind_Turbines_and_Health.pdf
- Wind Energy and Wildlife: www.awea.org/pubs/factsheets/Wind_Energy_and_Wildlife_Mar09.pdf

Do wind turbines harm birds and bats?

While birds do collide with wind turbines at some sites, modern wind power plants are collectively far less harmful to birds than are radio towers, tall buildings, airplanes, vehicles, and numerous other manmade objects. According to the U.S. Fish and Wildlife Service (www.fws.gov/birds/mortality-fact-sheet.pdf), bird deaths due to wind development account for a very small fraction of those caused by other commonly-accepted human activities.

The Bats & Wind Energy Cooperative (BWEC) was formed in late 2003 in response to data showing higher than normal rates of bat mortalities at a wind power plant in West Virginia. The BWEC includes AWEA, Bat Conservation International, the U.S. Fish and Wildlife Service and the U.S. Department of Energy's National Renewable Energy Laboratory. The BWEC is focused on finding site screening tools and testing mitigation measures, including ultrasonic deterrent devices to warn bats away from turbines.

More information on the research efforts of the Bats and Wind Energy Cooperative can be found on its website: www.batsandwind.org/.

Facilitate Collaborative Partnerships

Facilitating collaborative partnerships with stakeholders, including developers and local universities and businesses, can help advance community interests and promote public involvement in the decision process. For example, a developer may be able to integrate the community into the project through a training program that creates jobs at the site. This process will not only bolster the local economy, but also help to increase community support for the project.

Partnerships with universities may be a practical way to answer initial engineering and feasibility questions about the potential for renewable energy at a site. Renewable energy developers may want this initial information about the site prior to participating in a bidding process for a large-scale project. University research teams may qualify for grants to cover the cost of this work. Universities also have a credible role in society and initial research may help to solidify community relationships with the EPA and other federal facility teams at the site.

Attachments

- Attachment 1: Renewable Energy Success Stories
- Attachment 2: EPA fact sheet, *RE-Powering America's Land: Renewable Energy on Potentially Contaminated Land and Mine Sites*
- Attachment 3: EPA fact sheet, *Anywhere the Sun Shines: Developing Solar Energy on Contaminated Land*
- Attachment 4: Sample EPA state incentives fact sheet, *State Incentives for Achieving Clean and Renewable Energy on Contaminated Lands: Colorado*
- Attachment 5: EPA fact sheet for potential developers, *Top 10 Questions to Ask When Buying a Superfund Site*

Other Sources of Information

EPA CLU-IN Internet Seminar: The archived EPA Internet seminar, *"Updates on Renewable Energy Development on Contaminated Land: Community Involvement and Useful Information Tools,"* provides federal and state regulators, environmental consultants, site owners and community stakeholders with a quick overview accompanied by real world applications of renewable energy development on contaminated sites with a focus on community involvement on Superfund sites. www.clu-in.org/conf/tio/renewableenergyland_081009/

Catalog of Federal Domestic Assistance: This site provides a full listing of all Federal programs available to State and local governments (including the District of Columbia); federally-recognized Indian tribal governments; Territories (and possessions) of the United States; domestic public, quasi-public, and private profit and nonprofit organizations and institutions; specialized groups; and individuals. Enter "renewable energy" into the search engine. www.cfda.gov

A Breath of Fresh Air for America's Abandoned Mine Lands: Alternative Energy Provides a Second Wind: This EPA report provides information about the development of wind energy at former mining sites for communities, including local governments, residents, and organizations, interested in creating renewable energy resources and new economic opportunities at these sites. It describes the mechanics of wind energy, explores wind energy's environmental, economic, and social impacts at former mining sites, and provides case studies and next steps. www.epa.gov/superfund/programs/recycle/pdf/wind_energy.pdf The National Audubon Society's Position Paper on Wind Power is also a useful resource: www.audubon.org/campaign/windPowerQA.html

Attachment 1: Renewable Energy Success Stories

The following success stories provide examples of how local communities have played an active role in promoting the use of renewable energy on formerly contaminated land and have benefited from site reuse.

In addition, the Superfund Redevelopment Initiative (SRI) helps communities return some of the nation's worst hazardous waste sites to safe and productive uses. The SRI website (www.epa.gov/superfund/programs/recycle/activities/altenergy.html) gives further examples of how communities reclaim and reuse contaminated lands for a wide range of purposes, including renewable and alternative energy.

Steel Winds, Lackawanna, NY

The 30-acre former Bethlehem Steel Mill in Lackawanna, New York sat idle for 30 years. Situated on 2.2 miles of lakefront property on Lake Erie and approximately six miles south of Buffalo, the former steel mill was a symbol of economic downturn. Recently, with the help of New York State, EPA, the City of Lackawanna, and private wind energy development partners, the former brownfield site has become a promising symbol of economic development.

Initially, the Steel Winds project began with the nearby University of Buffalo. In 2001, urban planning students at the university conducted an urban planning study examining potentially beneficial sites for wind power in the Greater Buffalo area. A city environmental group, Green Gold, then formed a task force to further investigate wind potential and issued their own report in 2005 that identified the Lackawanna area as the premium location for wind power. Early community involvement activities, and the coordination between developer BQ Energy and the local government, were able to overcome initial community hesitation for the project through public meetings, individual conversations, and even a field trip to a nearby wind farm to ease noise and aesthetic concerns.

The EPA fact sheet for this site: http://www.epa.gov/renewableenergyland/docs/success_steelwinds_ny.pdf.

H.O.D. Landfill-Methane Gas Extraction

The 121-acre H.O.D. Landfill Superfund site in Antioch, Illinois accepted municipal and industrial wastes from 1963 to 1984. When the Waste Management-operated landfill closed in 1984, the 51-acre landfill area was covered with a clay cap. Undeveloped, uncontaminated buffer land comprised the remaining 70 acres of the landfill property. In 1990, the site was added to the National Priorities List (NPL). The site's cleanup included repairs to the site's landfill cap and upgrades to the landfill's gas and leachate extraction system. Site groundwater is being monitored, and deed restrictions are in place to restrict its use. Initial site reuse discussions began in the community in 1998. Due to rapid population growth in the community and the site's location adjacent to the Antioch Community High School, the community selected multiple recreational land uses, including sports fields, to be located at the site for shared use by the high school and community sports leagues. Twelve tennis courts were completed in 2005, and construction of the site's soccer, field hockey and softball facilities is underway on a 30-acre portion of the site. In addition, a wetlands area located at the site is being used as an environmental education resource for area schools. Methane gas extracted from the capped landfill also currently supplies heat and electricity to the school, saving the school an estimated $100,000 per year in energy costs. The U.S. Soccer Foundation is donating equipment for the new soccer fields, and Waste Management donates the methane that supplies heat and electricity to Antioch Community High School.

Southside Sanitary Landfill-Methane Gas Extraction

The 160-acre Southside Sanitary Landfill in Indianapolis, Indiana was once considered a hazard to human health and the environment. Now the landfill is operating safely and serving as an important source of energy and green space for the nearby businesses and communities. In 1989, EPA learned that toxic chemicals were migrating from the landfill and added the site to the NPL. EPA required the owners of the landfill to take measures to prevent further migration of the chemicals and to collect and treat the chemicals. Following implementation of these measures, EPA determined that the site was safe and in 1997 deleted it from the NPL. Today, landfill gas recovery wells and an intricate pipeline system collect and transport methane gas produced by the landfill to businesses around the site. The Crossroads Greenhouse, a 6.5-acre glass greenhouse, which opened in April 1998, is the major consumer of landfill gas from the site and grows and supplies nearly 400,000 poinsettias and other plants annually. In addition, the Rolls Royce Allison Aircraft Engine Plant signed a multi-year contract in 1998 to obtain methane gas from the landfill. Because methane burns much more cleanly than other fuels, the use of this energy source has reduced nitrogen oxide emissions from the Allison plant by 22 tons per year. In 1999, a nine-hole golf course was opened on the site and in 2003, the landfill donated land on the site to be used by the Indianapolis School Board for outside environmental education.

Attachment 2

RE-Powering America's Land: Renewable Energy on Potentially Contaminated Land and Mine Sites

EPA United States Environmental Protection Agency

According to the U.S. Energy Information Administration's *Annual Energy Outlook 2008*, by 2030 U.S. electricity production will need to increase by nearly 30 percent to meet growing demand.[1] It is estimated that the equivalent of more than 320 mid-sized, coal-fired power plants would be needed to increase U.S. electricity production capacity to meet this rising electricity demand by 2030.[2]

As communities become more concerned about the environmental impacts of fossil fuels, renewable energy technologies will play a greater role in meeting future electricity demand. Currently, wind, solar and biomass facilities supply 2.3% of our nation's electricity.[3] While these renewable sources currently make up only a small fraction of energy production, renewable energy production is expected to increase by more than 70% between 2006 and 2030.[4] Identifying and using land located in areas with high quality renewable energy resources will be an essential component of developing more electricity from renewable energy sources.

Solar photovoltaic (PV) facility at a former landfill in Fort Carson, CO.

Contaminated Land Can Support Increasing Renewable Energy Demands

The U.S. Environmental Protection Agency (EPA) estimates that there are approximately 490,000 sites and almost 15 million acres of potentially contaminated properties across the United States that are tracked by EPA.[5] This estimate includes Superfund, Resource Conservation and Recovery Act (RCRA), Brownfields, and abandoned mine lands. Cleanup goals have been achieved and controls put in place to ensure long-term protection for more than 917,000 acres.[6] Through coordination and partnerships among federal, state, tribal and other government agencies, utilities, communities and the private sector, many new renewable energy facilities can be developed on these potentially contaminated properties.

The EPA Office of Solid Waste and Emergency Response (OSWER) Center for Program Analysis (CPA) is seeking opportunities to facilitate the reuse of contaminated properties and active and abandoned mine sites for renewable energy generation.

These lands are environmentally and economically beneficial for siting renewable energy facilities because they:

- Offer thousands of acres of land with few site owners;
- Often have critical infrastructure in place including electric transmission lines, roads and water on-site, and are adequately zoned for such development;
- Provide an economically viable reuse for sites with significant cleanup costs or low real estate development demand;
- Take the stress off undeveloped lands for construction of new energy facilities, preserving the land carbon sink; and
- Provide job opportunities in urban and rural communities.

Further, these projects advance cleaner and more cost effective energy technologies, and reduce the environmental impacts of energy systems (e.g., reduce greenhouse gas emissions).

Potential Partners and Stakeholders

- Renewable energy suppliers, including independent system operators
- Utilities
- Public utility commissions
- Developers
- Investors
- Public and private land owners
- Mining industry
- EPA Regions/Headquarters
- Other Federal agencies (e.g., Department of Agriculture, Department of Energy, Department of the Interior, Department of Defense, Federal Energy Regulatory Commission, and Nuclear Regulatory Commission)
- State entities (e.g., environmental, energy and economic development departments)
- Tribal governments and communities
- Communities, local governments and chambers of commerce
- Environmental organizations
- Other public and private partners

The former Bethlehem Steel plant in Lackawanna, NY is now home to the Steel Winds wind farm

U.S. EPA OSWER CENTER FOR PROGRAM ANALYSIS

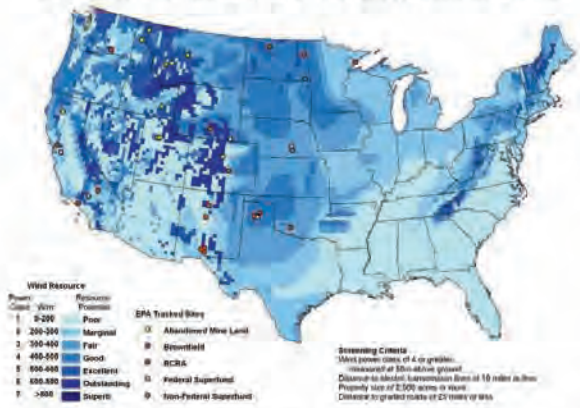
EPA
United States Environmental Protection Agency

EPA Initiatives Support Reuse of Contaminated Land for Renewable Energy

EPA's *RE-Powering America's Land: Siting Renewable Energy on Potentially Contaminated Land and Mine Sites* initiative takes a multi-pronged approach to site cleanup and development of renewable energy production facilities on contaminated land, by conducting activities including:

- Working with the Department of Energy's National Renewable Energy Lab (NREL) to identify Brownfields, RCRA, Superfund and abandoned mine lands with wind, solar, biomass and geothermal development potential and identifying sites with landfill gas energy development potential;
- Outlining state and federal incentives for developing renewable energy facilities and utilizing contaminated land;
- Supporting pilot projects that assess potential wind and solar generation potential at EPA tracked contaminated land and mine sites;
- Promoting success stories where renewable energy production facilities have been sited on contaminated land;
- Estimating the greenhouse gas benefits from siting renewable energy on contaminated land and mine sites;
- Seeking input from stakeholders to determine the need for additional site redevelopment and reuse tools such as liability release provisions; and
- Conducting outreach to highlight how EPA can support renewable energy development on contaminated properties and mine sites.

EPA Tracked Sites with Utility Scale Wind Energy Generation Potential



Renewable Energy Development on Contaminated Land

Steel Winds Wind Farm, Lackawanna, NY: Development of Wind Power Facility Helps Revitalize Rust Belt City

Eight wind turbines were installed on an old slag pile at the Bethlehem Steel site

Produces enough electricity to power 7,000 homes

Fort Carson Landfill Solar Development, Fort Carson, CO: Former Landfill Becomes Home to the Army's Largest Solar Array

2MW array built on 12 acres of a former landfill

Uses thin film photovoltaic technology to generate 3,200 MWh/year

New Rifle Mill Site, Colorado: Solar Energy to Power Wastewater Reclamation at Former Uranium Processing Site

2.3 MW combined PV solar system powers reclamation of contaminated wastewater

Rifle Energy Innovation Center adjacent to the site will foster research and entrepreneurship in solar, biomass and geothermal energy

Pemaco Superfund Site, Maywood, CA: Solar PV Powers Soil and Ground Water Treatment System at Superfund Site

Rooftop solar PV panels offset power costs of water pumping and treatment

$21,000 investment in solar energy saves nearly $3000 annually

For more information regarding RE-Powering America's Land: Renewable Energy on Potentially Contaminated Land and Mine Sites, please visit www.epa.gov/renewableenergyland or contact cleanenergy@epa.gov

1. U.S. Department of Energy, Energy Information Administration. Annual Energy Outlook 2008. Table A8: Electricity Supply, Disposition, Prices, and Emissions. www.eia.doe.gov/oiaf/aeo/pdf/appa.pdf
2. Estimated using data from: 1) U.S. Department of Energy. Energy Information Administration. Annual Energy Outlook 2008. Table A8: Electricity Supply, Disposition, Prices, and Emissions. www.eia.doe.gov/oiaf/aeo/pdf/appa.pdf; 2) National Energy Technology Laboratory. Tracking New Coal-Fired Power Plants. http://www.netl.doe.gov/coal/refshelf/ncp.pdf
3. U.S. Department of Energy, Energy Information Administration. Renewable and Alternative Fuel, Table 4: 2007 U.S. Electric Net Summer Capacity. www.eia.doe.gov/cneaf/alternate/page/renew_energy_consump/table4.html
4. U.S. Department of Energy, Energy Information Administration. Annual Energy Outlook 2008. Table A8: Electricity Supply, Disposition, Prices, and Emissions. www.eia.doe.gov/oiaf/aeo/pdf/appa.pdf
5, 6. U.S. EPA OSWER. Draft Cross-Program Revitalization Measures Report, June 12, 2008.

U.S. EPA OSWER
CENTER FOR PROGRAM ANALYSIS

Attachment 3

Anywhere the Sun Shines: Developing Solar Energy on Contaminated Land

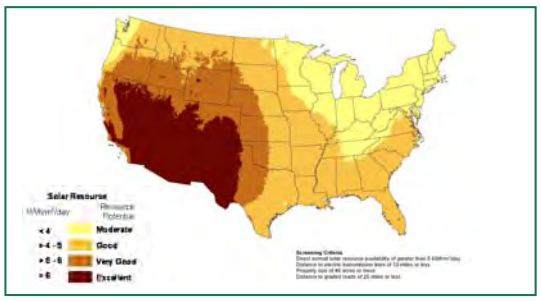
Solar electricity in the United States is developing in some unexpected places. Utility scale solar energy generation has recently undergone a growth spurt in areas with low and moderate solar resource levels, particularly in New England and the Mid-Atlantic region (e.g., New Jersey, Pennsylvania and Maryland.). Most often this development occurs in states that have a renewable portfolio standard (RPS), which requires a certain portion of electricity to be generated from renewable energy sources, and especially in states that specify what portion must come from solar resources. When coupled with incentive programs targeting solar development, solar electricity generation is projected to develop rapidly over the next 20 years. Solar projects that otherwise would not be built are now viable due to state policy and local market drivers.

Siting Solar Energy on Contaminated Land and Mining Sites

With increased demand for electricity generated from solar resources, the search is on for viable sites across the country. The U.S. Environmental Protection Agency (EPA), Office of Solid Waste and Emergency Response (OSWER) Center for Program Analysis (OCPA) is encouraging renewable energy development on potentially contaminated land and mining sites by identifying sites with solar, wind, biomass, geothermal and landfill gas energy potential.

Many contaminated sites are located in areas with excellent potential for the development of photovoltaic (PV) solar electricity generation. The viability of utility-scale solar energy at a site is typically linked to the area's solar resource, which is largely a function of latitude and weather. As such, at a national level, the southwestern United States is recognized as having excellent potential for the development of solar energy (see map). However, state policies and incentives specifically encouraging the development of a solar power industry make it a possibility anywhere, including lower solar resource areas like the Mid-Atlantic region.

Figure 1: U.S. Solar Resource Availability



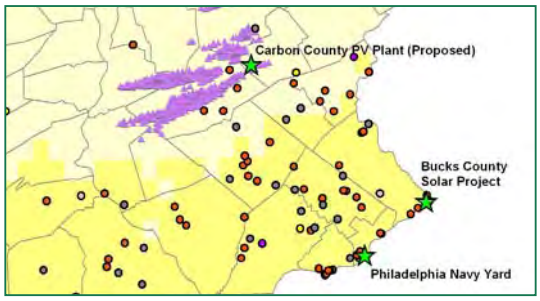
PV Solar Installation, Bucks County, PA

In EPA Region 3 (Delaware, Maryland, Pennsylvania, Virginia, Washington, D.C. and West Virginia), EPA has identified more than 5,000 sites and 1.2 million acres of potentially contaminated properties and abandoned mine sites with potential suitability for PV solar generation facilities.

The National Renewable Energy Laboratory estimates that PV solar development, which is the best-suited solar technology for low solar resource areas, requires two to 12 acres of land per megawatt of installed capacity. A study of RPS legislation by Berkeley National Laboratory estimates that in the 14 states with a current RPS, installed solar capacity is expected to grow from 550 to 6,700 megawatts between 2010 and 2025, requiring thousands of acres of land. Siting renewable energy facilities, including solar facilities, on potentially contaminated land and mining sites can reduce pressure on greenfields for siting these facilities.

In addition, developing solar facilities on contaminated or abandoned mine land can provide an economically viable reuse option for sites with significant cleanup costs or if local economic conditions prohibit traditional reuse of the site. These sites may also have existing transmission capacity, roads and other critical infrastructure in place, as well as industrial zoning adequate for renewable energy projects.

Figure 2: Utility Scale PV Solar Generation Potential of Potentially Contaminated Lands and Mining Sites in Southeastern Pennsylvania



Renewable Portfolio Standards and Solar Energy Generation

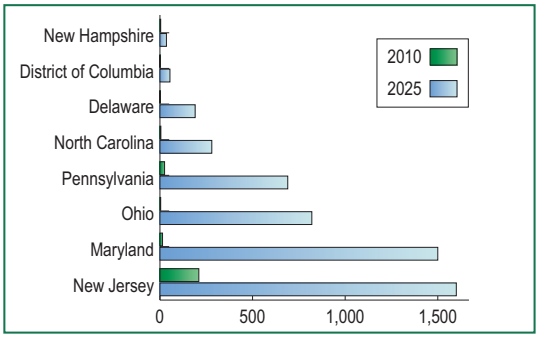
Regardless of solar resource availability, no solar energy project is likely to take place if it does not make economic sense. State policies designed to spur solar energy development can drive demand for solar energy and compensate for lower solar resource availability. These policy and market drivers include: renewable portfolio standards and solar shares; electricity market conditions; consistent public support for renewable energy development; state and local incentives; and promotion of renewable energy as an engine of economic development and job creation.

Renewable portfolio standards and solar shares—Solar energy development is expected to grow primarily in the 14 states that have established an RPS with a solar share. The RPS requires a portion of electricity to be generated from renewable energy sources and a solar share specifies what potion must come from solar resources. An electric power provider can achieve this by either producing a certain amount of its electricity from solar resources or by purchasing solar renewable energy certificates (RECs). A large share of the projected growth of solar energy is in states with low to moderate solar resource levels because they have RPS and solar share policies (see Figure 3). In these states, solar energy is expected to grow from an estimated 260 megawatts of installed capacity in 2010 to over 5,100 megawatts by 2025, based on the RPS and solar share policies currently in place.

Electricity market conditions—Electricity pricing is based on the location of power generation relative to demand and transmission constraints. Geographic areas that have a strong demand for solar generated electricity (e.g., states with strong RPS and solar share requirements), but not much installed capacity, may find solar energy generation more profitable. The sale of these tradable RECs, which are issued for every 1,000 kilowatt-hours of solar electricity generated, creates a revenue stream that can be used to finance additional solar PV installations in those states. In addition, in areas of high transmission line congestion, electricity prices can rise, making solar energy more competitive.

Consistent public support for renewable energy development—State policies must recognize that solar markets cannot fulfill future RPS mandates without clear, predictable, long-term government support. Research shows that areas with strong local and state government support, as well as strong public support, are more likely to see solar development due to a reduction in major investment risk factors such as public opposition and permitting times.

Figure 3: RPS-driven Demand for Solar Electricity in Selected States, 2010 and 2025



Renewable Portfolio Standard
State-level requirement that electric power providers generate or purchase a specified percentage of the power they supply or sell from renewable energy resources by a target date.

Solar Share
May be included in state RPS to require a portion of an electric provider's electricity come from solar resources.

State and local incentives—Targeted state and local incentive programs provide a combination of low cost loans, grants or tax incentives to reduce the startup and operating costs of utility scale solar installations. Combined with federal programs such as the 30 percent Federal Investment Tax Credit, state incentives abate considerably the effective cost of installing new solar capacity.

Promotion of renewable energy as economic development—Solar panels are subject to breakage when transported over long distances, so economic development policies that encourage local manufacturing can accelerate solar energy development by providing material and capital needs locally, thus bringing down capital costs.

With the right mix of targeted policies, utility-scale solar generation is possible anywhere the sun shines. Solar energy generation is poised for growth across the United States and potentially contaminated land and mining sites can provide an ideal location for these facilities.

For more information on EPA's RE-Powering America's Land: Renewable Energy on Contaminated Land and Mining Sites, please visit: **www.epa.gov/renewableenergyland**, or contact EPA at **cleanenergy@epa.gov**

Attachment 4

EPA United States Environmental Protection Agency

State Incentives for Achieving Clean and Renewable Energy Development on Contaminated Lands

Colorado

The development of clean and renewable energy on formerly used land offers many economic and environmental benefits. Combining clean and renewable energy and contaminated land cleanup incentives can allow investors and communities to create economically viable clean and renewable energy redevelopment projects. This document provides information about incentives in your state that can be leveraged for clean and renewable energy and development of contaminated land.

Incentives for Clean and Renewable Energy

Funding (grants, loans, bonds, etc.)

Colorado Clean Energy Fund – New Energy Economic Development (NEED) Program
www.colorado.gov/energy/resources/funding-opportunities.asp

Provides grants, loans, and other financial incentives to producers of renewable energy, including solar thermal electric, photovoltaic (PV), wind, biomass, hydroelectric, fuel cells, small hydroelectric, renewable fuels, and other distributed generation technologies. Approximately $650,000 is available through the Clean Energy Fund.

Tax Incentives (abatements, deductions, credits, etc.)

Renewable Energy Property Assessment Thresholds
www.dola.state.co.us/dpt/state_assessed/index.htm

Offers a valuation methodology for determining the value of a renewable energy facility that primarily generates electricity from wind, solar thermal electric, PV, landfill gas, wind, biomass, hydroelectric, geothermal electric, municipal solid waste, and anaerobic. When determining the value of a renewable energy facility, the administrator shall consider the additional incremental cost per kW of the construction of the renewable energy facility over that of the construction of a comparable nonrenewable energy facility that primarily generates electricity to be an investment cost and shall not include such additional incremental cost in the valuation of the facility. The incremental value of the renewable facilities above the nonrenewable facilities is disregarded, thereby reducing the assessed value for taxation. Renewable Energy Credits (RECs) are not assessed a property tax.

Local Option – Property Tax Exemption for Renewable Energy Systems
www.dsireusa.org/library/includes/incentive2.cfm?Incentive_Code=CO49F&state=CO&CurrentPageID=1&RE=1&EE=1

Authorizes counties and municipalities to offer property or sales tax rebates or credits to residential and commercial property owners who install renewable energy systems on their property.

Technical Assistance and Other Incentives

Colorado Anemometer Loan Program
www.engr.colostate.edu/ALP

Loans qualified participants with anemometer, wind vane, tower, data logger, and assistance and interpretation to assess their site for small scale wind development.

Net Metering

www.dora.state.co.us/PUC/

Offers net metering for Investor Owned Utilities (IOUs) for systems up to 2 MW in capacity or for commercial and industrial systems up to 25 kW to be credited monthly at the retail rate for any net excess generation their systems produce; electric cooperatives and municipal utilities for systems up to 25 kW for commercial and industrial that generate electricity using qualifying renewable energy resources. For IOUs, customer net excess generation in a given month is applied as a kWh credit to the customer's next bill on a one-to-one basis. If in a calendar year, a customer's generation exceeds consumption, the utility reimburses the customer for the excess generation at the utility's average hourly incremental cost for the prior 12-month period.

Quick Facts

Public Benefit Fund (PBF)	
Available only in Boulder, CO	Yes ☑ No ☐
Renewable Portfolio Standard	Yes ☑ No ☐
Investor-owned utilities: 20% by 2020	
Electric cooperatives: 10% by 2020	
Municipal utilities serving more than 40,000 customers: 10% by 2020	
Net Metering	Yes ☑ No ☐
Interconnection Standards	Yes ☑ No ☐

Electric Power Industry Generation by Primary Energy Source (EIA, 2006)

Petroleum-Fired	--	Nuclear	--
Natural Gas-Fired	23.4%	Hydroelectric	3.5%
Coal-Fired	71.5%	Other Renewables	1.8%

Points of Contact

Colorado Clean Energy Fund – NEED Program
Seth Portner, seth.portner@state.co.us, (303) 866-2100

Renewable Energy Property Assessment Thresholds
Colorado Department of Local Affairs
Bill Hyde, dola.helpdesk@state.co.us, (303) 866-2371

Local Option – Property Tax Exemption for Renewable Energy Systems
Contact the local municipality

Colorado Anemometer Loan Program
Michael Kostrzewa, michael@engr.colostate.edu, (970) 491-7709

Net Metering
Richard Mignogna, richard.mignogna@dora.state.co.us, (303) 894-2871

Information current as of November 2008; please refer to www.dsireusa.org and the state Web sites provided, or contact the points of contact identified above for more up to date information.

Incentives for Development of Contaminated Land

Colorado

Funding (grants, loans, bonds, etc.)

Colorado Brownfields Revolving Loan Fund

www.cdphe.state.co.us/hm/rpbrownfields.htm#

Offers financing with reduced interest rates, flexible loan terms, and flexibility in acceptable forms of collateral. Some loans from the Brownfields Revolving Loan Fund require a 20% match, which can be in-kind. Loan funds may be used for the purchase of environmental insurance. Total loan amounts are capped at $2 million. All cleanups financed through the Fund must have previous approval under the Colorado Department of Public Health and Environment's (CDPHE) Voluntary Cleanup Program.

Colorado Petroleum Storage Tank Fund

http://oil.cdle.state.co.us/OIL/Fund/fundindex.asp

Reimburses eligible applicants up to $2 million per release occurrence or up to $3 million per fiscal year for allowable costs incurred in cleaning up petroleum contamination from underground and above-ground petroleum storage tanks, and for third-party liability expenses. Tank owners and operators are responsible for the first $10,000 of remediation costs and the first $25,000 of third-party liability expenses. After meeting the deductible, an eligible tank owner or operator is eligible for reimbursement of all allowable costs. Persons deemed to bear no responsibility for the release are eligible for reimbursement without paying any deductible and without penalty for prior non-compliance with storage tank regulations.

State Brownfields Cleanup Fund

www.cdphe.state.co.us/hm/rpbrownfields.htm#state

Provides limited state authority to clean up sites where there is no other federal or state program that can accomplish the cleanup. It provides $250,000 for such cleanup, which is designed first to protect human health and the environment, and also to enhance the redevelopment potential of these properties. Private parties are eligible for funding, but they must demonstrate a clear public benefit.

Tax Incentives (abatements, credits, deductions, etc.)

Colorado Contaminated Land Redevelopment Tax Credit

www.cdphe.state.co.us/hm/rpbrownfields.htm#state

Provides an income tax credit for companies that redevelop contaminated property (brownfields) up to $100,000—broken down as 50% of the first $100,000 spent on cleanup, 30% of the next $100,000, and 20% of the third $100,000 to offset cleanup costs and make the redevelopment of such properties financially viable. The property must be located in a municipality with a population of 10,000 or more and must be eligible for inclusion under the state's Voluntary Cleanup and Redevelopment Act.

Technical Assistance and Other Incentives

Colorado Targeted Brownfields Assessments

www.cdphe.state.co.us/hm/rpbrownfields.htm#assessment

Performs targeted site assessments to characterize the nature and extent of site contamination. This characterization is at no cost to the property owner, and provides assistance in quantifying the need for and potential cost of cleanup. Sites are eligible if they are not on the NPL or under enforcement or other action by a government agency. For a private party to be eligible there must be a clear public benefit.

Colorado Brownfields Foundation

www.coloradobrownfieldsfoundation.org/index.html

Supports an environmental resource hotline through the Colorado Brownfields Foundation. The nonprofit Colorado Brownfields Foundation provides assistance in four service areas: environmental strategy, gap financing, information services, and property transfer assistance.

Limitations on Liability

Colorado Voluntary Cleanup Program (VCP)

www.cdphe.state.co.us/hm/rpvoluntarycleanup.htm

Facilitates the timely redevelopment and transfer of contaminated properties. Allows owners of contaminated properties to voluntarily propose cleanup actions; provides timely (45 days) review of cleanup plans submitted by property owners; offers No Further Action determinations from the state upon completion and approval of cleanup; provides protection from Superfund liability under a Memorandum of Agreement with EPA; and offers an income tax credit.

Quick Facts

Limitations on Liability	Yes ☑ No ☐
Number of State-Tracked Contaminated Properties: Includes Voluntary Remediation Program and Brownfields sites	518
Number of EPA CERCLIS Sites: Sites identified for potential investigation under the federal Superfund Program	214
Number of EPA Brownfields Properties: Properties being funded or addressed under the EPA Brownfields Program	514

There may be some overlap among the categories listed and sites listed may not represent all potentially contaminated sites in Colorado.

Points of Contact

Colorado Department of Public Health and Environment
www.cdphe.state.co.us
Colorado Revolving Loan Fund
Dan Scheppers, daniel.scheppers@state.co.us, (303) 692-3398
Colorado Petroleum Storage Tank Fund
Jane Bral, jane.bral@state.co.us, (303) 318-8510
State Brownfields Cleanup Fund
Barbara Nabors, Barbara.nabors@state.co.us, (303) 692-3402
Colorado Contaminated Land Redevelopment Tax Credit
Fonda Apostolopoulos, Fonda.Apostolopoulos@state.co.us, (303) 692-3411
Colorado Targeted Brownfields Assessments
Mark Rudolph, mark.rudolph@state.co.us, (303) 692-3311
Colorado VCP
Fonda Apostolopoulos, Fonda.Apostolopoulos@state.co.us, (303) 692-3411

Colorado Brownfields Foundation
www.coloradobrownfieldsfoundation.org/index.html
Jesse Silverstein, jesse@ColoradoBrownfieldsFoundation.org, (303) 962-0942

Information current as of November 2008; please refer to www.epa.gov/brownfields/pubs/st_res_prog_report.htm and the state Web sites provided, or contact the points of contact identified above for more up to date information.

Attachment 5

MAY 2008
EPA-330-F-08-001

Top 10 Questions to Ask When Buying a Superfund Site

Office of Enforcement and Compliance Assurance
Office of Site Remediation Enforcement

Office of Solid Waste and Emergency Response
Office of Superfund Remediation and Technology Innovation

The purpose of this document is to provide answers to some of the questions that a prospective purchaser may have when considering whether to purchase property at a privately owned Superfund site.

The U.S. Environmental Protection Agency (EPA) supports the reuse of Superfund sites and believes this document may be useful in clarifying some of the opportunities and issues associated with their reuse. For purposes of this document, a Superfund site is defined as any property on EPA's National Priorities List (NPL) where a hazardous substance has been released into the environment or has come to be located on or under. Thus, even if a property is not the source of the release of the contamination, it can be part of a Superfund site.[1]

Information for Prospective Purchasers of Federally-Owned Superfund Sites

This document does not address the unique considerations associated with the purchase and transfer of real property on federally-owned Superfund sites (also known as federal facilities). While many of the questions and answers in this document are a useful starting point for prospective purchasers of property on federal facilities, Superfund cleanups at federal facilities are governed by CERCLA § 120 which has requirements specific to these facilities. For example, federal facility agreements between EPA and the current federal owner are required to address the clean up of these properties. A number of landowner liability issues unique to federal facilities are raised in the context of transfers of federal property and have been addressed by EPA guidance. While they warrant additional considerations, federal facilities are continuing to be cleaned up and purchased by local governments and developers and put back into reuse. Additional information on EPA's efforts to clean up federal facilities and make them available for reuse is available at http://www.epa.gov/swerffrr/.

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[1] The Superfund program and the authority to clean up Superfund sites was created by the federal Superfund law which is officially known as the *Comprehensive Environmental Response, Compensation, and Liability Act* ("CERCLA"), 42 U.S.C. § 9601, *et seq*.

Disclaimer: This document is provided solely as general information to highlight certain aspects of a more comprehensive program. It does not provide legal advice, have any legally binding effect, or expressly or implicitly create, expand, or limit any legal rights, obligations, responsibilities, expectations, or benefits for any person. This document is not intended as a substitute for reading the statute or the guidance documents described above. It is the prospective purchaser's sole responsibility to ensure that its proposed use does not interfere with or impede the site's cleanup or protectiveness. EPA does not offer any guarantees or warranties as to the compatibility of a proposed use with the cleanup. It is also the purchaser's sole responsibility to maintain liability protection status as a bona fide prospective purchaser.

The 2002 Superfund liability protections[2] are designed to be self-implementing, meaning that a prospective purchaser does not need to obtain approval from EPA prior to purchasing a Superfund site where an EPA cleanup or enforcement action is ongoing or has been completed. However, EPA strongly recommends that prospective purchasers contact the appropriate EPA Regional office[3] prior to purchasing a Superfund site or a property within a site to discuss the cleanup status of the site and other site-related issues.

1. WHY IS IT A GOOD IDEA TO BUY A PROPERTY WITHIN A SUPERFUND SITE?

LOCATION, location, location. Many Superfund sites have advantageous and desirable locations. Some federal, state, and local government agencies offer grants, loans, and tax incentives to encourage development and revitalization of contaminated and formerly contaminated properties and surrounding areas.[4]

Superfund sites throughout the country have been transformed into major shopping centers, business parks, residential subdivisions, and recreational facilities. Many more Superfund sites are being revitalized for use by small businesses. A large number of Superfund sites are suitable for revitalization even while cleanup on the property progresses. (*See* http://www.epa.gov/superfund/programs/recycle/ for more information on revitalization of Superfund sites). Integrating the reuse of a Superfund site into the cleanup can often occur smoothly, which minimizes future surprises regarding undiscovered contamination.

A series of manufacturers at the Industri-Plex Superfund site in Woburn, Massachusetts once produced chemicals, insecticides, munitions, and glue products made from raw and chrome-tanned animal hides. A unique public/private partnership has redeveloped the site into a Regional Transportation Center, a major commercial and retail district, and a wetland preserve.

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2 The 2002 Superfund liability protections were created by the *Small Business Liability Relief and Brownfields Revitalization Act,* Pub. L. 107-118, also known as the "Brownfields Amendments," which amended CERCLA.

3 Information on contacting EPA's Regional offices is available on EPA's Web site at http://www.epa.gov/epahome/whereyoulive.htm#regiontext

4 Superfund sites are not eligible for grant funding under the Brownfields Amendments to CERCLA.

2. *How do I find information on a site's cleanup status and if it is safe for reuse?*

EPA's Regional contacts and internet sites will provide site-specific information. Much information is available online. For example, fact sheets describing a site's history, current cleanup status, and who to contact for more information are available on EPA's Superfund Web site at http://cfpub.epa.gov/supercpad/cursites/srchsites.cfm.

The vast majority of Superfund sites are protective of human health and the environment for certain types of reuse activities after they are cleaned up. However, not all site cleanups are protective for all uses. Superfund cleanups may be designed to accommodate specific future uses. For example, a property cleaned up to accommodate commercial/industrial uses may be protective for uses such as manufacturing, shopping or office complexes but not for residential use. Many sites will have use restrictions to protect the public and environment by limiting the site's future uses to activities that will not disturb the site's engineered cleanup. In some cases, Superfund sites, or portions of the sites, are protective enough such that site revitalization for certain uses can occur in conjunction with the cleanup. Integrating cleanup and reuse can introduce economic efficiencies and enable the property to be reused in a timely and appropriate manner throughout the cleanup process.

EPA also offers many tools to help facilitate the reuse of Superfund sites including:

- comfort/status letters[5];
- site-specific reuse fact sheets;
- Ready for Reuse Determinations[6];
- performance measures which indicate which sites or parts of sites are ready for their anticipated use; and
- bona fide prospective purchaser "doing work" agreements. (*See* Question 10 for additional information on these tools.)

Some EPA Regional offices have developed prospective purchaser inquiry procedures and schedule conference calls or meetings with prospective purchasers to answer questions and discuss whether the proposed use of the site is compatible with an ongoing cleanup, any current or future property use restrictions on the site, resolution of potential liens, and other matters.

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[5] A comfort/status letter is intended to combat the stigma and concerns about cleanup liability at contaminated sites by clarifying the cleanup status and likelihood of EPA involvement at a site. *See* Question 10 for more information on the use of comfort/status letters..

[6] A Ready for Reuse (RfR) Determination is an environmental status report documenting that EPA has made a technical determination, in consultation with States, Tribes, and local governments, that all or a portion of the property at a Superfund can support specified types of uses and remain protective of human health and the environment. The guidance is available on EPA's Web site at http://www.epa.gov/superfund/programs/recycle/pdf/rfrguidance.pdf

3. *HOW DO I IDENTIFY ALL OF THE PARTIES I HAVE TO DEAL WITH TO BUY THE SITE OR A PROPERTY WITHIN THE SITE AND HOW IS EPA INVOLVED?*

THERE is no simple solution to identify all of the parties associated with a Superfund site but the process begins with the current owner. As with the purchase of any property, negotiations to buy a Superfund site begin with the current owner who can be identified through property title or tax records. EPA rarely owns the site being cleaned up. Generally, EPA's Regional offices may assist in addressing the following questions:

- What is the current status of a site's cleanup and what are EPA's future anticipated actions?
- Is the proposed redevelopment compatible with a site's cleanup and with the existing and potential future property use restrictions? **Note:** EPA does not offer guarantees of compatibility.
- Is the prospective purchaser aware of the applicable landowner liability protections under Superfund?
- How can EPA work with the prospective purchaser to settle or resolve any EPA liens?[7]

EPA is willing to work with prospective purchasers to clarify a property's cleanup status and potential liability issues including the existence and satisfaction of EPA liens and property use restrictions. States also have cleanup programs and prospective purchasers should contact the appropriate state environmental agency to make certain they are aware of planned or ongoing state-lead cleanup actions at the property.

Alcyon Lake in Pitman, New Jersey, had been severely contaminated by the nearby Lipari Landfill. EPA teamed with the state, local government, and community to develop a cleanup plan that allowed for the expansion of the park and accelerated cleanup of the lake.

[7] *See* Question 8 for more information on EPA liens.

4. *If I buy the property, will I be responsible for past or future cleanup costs?*

In most cases, a prospective purchaser will not be responsible for past or future Superfund cleanup costs for existing contamination that is present on the property when the site is purchased.

Criteria for Managing Liability as a BFPP

- All disposal of hazardous substances occurred before acquisition
- The person made all appropriate inquiries about the property before acquisition
- The person provided all legally required notices with respect to discovery or release of any hazardous substances at the facility
- The person exercises appropriate care with respect to hazardous substances found at the facility by taking reasonable steps to prevent releases
- The person provides full cooperation and access to EPA
- The person complies with land use restrictions in connection with the response action and does not impede the effectiveness of institutional controls
- The person complies with requests for information and subpoenas
- The person is not potentially liable or affiliated with a potentially responsible party.

New purchasers are protected from owner or operator liability under the Superfund law so long as the new purchaser meets the definition of a "bona fide prospective purchaser" (BFPP)[8].

This BFPP provision states that a purchaser who acquires a Superfund site or other contaminated property after January 11, 2002, and who complies with statutory criteria, will not incur federal Superfund liability as an owner of the property. (*See* text box "Criteria for Managing Liability as a BFPP" on this page.)

To remain protected from Superfund liability for the existing contamination at the site, a new purchaser must achieve and maintain BFPP status for as long as potential liability exists.

Potential liability exists for as long as contamination remains on the property and/or the statute of limitations on cost recovery actions is in effect.

Although a BFPP is not personally liable, the property itself could be subject to a lien as a result of EPA incurring costs to clean up the site (*See* Question 8 below).

Some of the criteria for obtaining BFPP status must be satisfied prior to acquiring a site or property within the site. Other criteria for maintaining BFPP status are ongoing obligations that must be met after purchase of the property.

[8] 42 U.S.C. § 9601(40).

One example of a threshold criterion that must be satisfied prior to purchase is that a BFPP must perform "all appropriate inquiries" (AAI) concerning environmental conditions at the site. The final rule for AAI, which sets forth standards for satisfying the criterion, became effective on November 1, 2006. Information on how to comply with the AAI regulation is available on EPA's Web site at http://www.epa.gov/brownfields/regneg.htm. (*See* text box "Criteria for All Appropriate Inquiry".)

It is important to note that new purchasers who have achieved BFPP status could become liable for cleaning up contamination if they interfere with the existing cleanup, exacerbate existing contamination, or cause a new release of contamination.

EPA is willing to discuss potential liability issues, including qualifications for BFPP status, with prospective purchasers and their lenders. Please note that EPA cannot give prospective purchasers legal advice. Legal advice must be sought from private legal counsel, but EPA can explain the available liability protections.

Criteria for All Appropriate Inquiry

- Site inquiry by environmental professional
- Interviews with past/present owners
- Review of historical sources of information
- Search for recorded cleanup liens
- Review of federal, state and local records
- Visual inspection of site
- Specialized knowledge of BFPP
- Relationship of purchase price to value of property
- Commonly known/reasonably ascertainable information
- Obviousness of presence of contamination

Although a purchaser who achieves and maintains BFPP status is not responsible for existing contamination, situations may arise where the purchaser may nonetheless want to voluntarily clean up a site, rather than wait for the potentially responsible party or the government to do it.

When appropriate, EPA will enter into an agreement with a BFPP willing to perform a cleanup action at a site. EPA has developed a model agreement for BFPPs that is available on EPA's Web site at http://www.epa.gov/compliance/resources/policies/cleanup/superfund/bfpp-ra-mem.pdf.

There are many reasons why a BFPP may want to perform a cleanup:

- **Faster Cleanup:** a BFPP may be able to clean up a site more quickly;
- **Better Coordination:** a BFPP may be better able to coordinate cleanup activities into its reuse and/or redevelopment plans;
- **Purchasing Incentives:** a BFPP may be able to negotiate a lower purchase price from the seller by undertaking cleanup work that the seller would otherwise be responsible for;
- **Windfall Lien Settlements:** a BFPP may be able to settle a windfall lien by agreeing to perform all or part of a necessary cleanup; and/or
- **Cost Recovery:** a BFPP performing a cleanup action may be entitled to cost recovery from responsible parties under appropriate circumstances.

5. *DO I NEED A DOCUMENT FROM EPA CONFIRMING THAT I HAVE BFPP STATUS?*

NO, the BFPP provision is self-implementing. This means that a prospective purchaser may achieve, and after the purchase, maintain BFPP status without obtaining approval or oversight from EPA. In appropriate circumstances, however, EPA may issue a comfort/status letter to prospective purchasers or their lenders to describe:

- the cleanup status of a site;
- anticipated future cleanup actions overseen by EPA, if any;
- the available liability protection provisions;
- the site-specific reasonable steps a purchaser should take with respect to the appropriate care criteria; and
- the status of any EPA liens.

EPA recommends that prospective purchasers contact the appropriate EPA Regional office prior to purchase of a Superfund site to discuss the cleanup status of the site and other site-related issues. EPA Regional Superfund Redevelopment Initiative contact information is available on EPA's Superfund Web site at http://www.epa.gov/superfund/programs/ recycle/contact/redevelopment.html. In addition, EPA strongly encourages prospective purchasers to contact the state environmental protection agency where the site is located to discuss potential state issues such as liability and additional cleanup.

Once contaminated with coal tar and creosote, the Reilly Tar & Chemical site in St. Louis Park, Minnesota now boasts a park, a residential development, and a pond that provides wildlife habitats.

6. *As the property owner, will I be responsible for ongoing or future cleanup actions at the site?*

No, a property owner with BFPP status generally will not be responsible for the ongoing or future cleanup actions, beyond resolving any applicable liens. However, certain responsibilities associated with BFPP status may involve actions to prevent or mitigate releases of contamination. For example, in certain circumstances, BFPPs may need to take reasonable steps to stop continuing releases, prevent threatened future releases, and prevent or limit human, environmental, or natural resource exposure to earlier releases of contamination.

Examples of reasonable steps to fulfill appropriate care obligations could include, but may not be limited to, actions such as:

- providing notice of contamination to appropriate governmental officials;
- assessing threats after the discovery of contamination;
- restricting site access by erecting and maintaining signs and perimeter fences;
- segregating and containing deteriorating drums;
- identifying unknown materials in deteriorating drums; or
- maintaining and repairing existing on-site hazardous waste containment systems.

EPA has issued guidance, questions and answers, and a sample comfort/status letter on appropriate care and reasonable steps that are available on EPA's Web site at http://www.epa.gov/compliance/resources/policies/cleanup/superfund/common-elem-guide.pdf.

A FAQs fact sheet addressing reasonable steps is available on EPA's Web site at http://www.epa.gov/compliance/resources/policies/cleanup/superfund/common-elem-ref.pdf.

At the Avtex Fibers Superfund site in Front Royal, Virginia, EPA served in an advisory capacity to the local Economic Development Authority (EDA), the U.S. Soccer Foundation, and FMC Corporation as site stakeholders worked together to build four soccer fields on the site. September 2006 marked the opening of the Skyline Soccerplex. The EDA is continuing with redevelopment efforts for a commercial/industrial park and a nature conservation area.

7. ARE THERE LIMITATIONS ON HOW I CAN USE THE SITE AND, IF SO, HOW CAN I FIND OUT WHETHER ANY PROPERTY USE RESTRICTIONS ARE IN EFFECT AND WHAT THEY ARE?

THERE may be limits on uses of the site or properties within the site. The statutory criteria for maintaining BFPP status include not impeding the integrity or effectiveness of institutional controls (ICs) and complying with all land use restrictions. Accordingly, prospective purchasers must determine whether any temporary, permanent, or future use restrictions (such as ICs) are or will be placed on the site during cleanup or post-cleanup, whether these are short or long-term use restrictions, and how these use restrictions may affect their plans for the property.

In some cases, BFPPs may be asked to implement appropriate property use restrictions after purchasing the property. Prospective purchasers must also determine if engineered controls, such as a clay cap or monitoring wells, limit what they can do at the site property.

EPA encourages BFPPs to inquire about property restrictions before they purchase the site. Prospective purchasers can find out whether any use restrictions may apply to the site property now, or in the future, by contacting EPA's Regional office, the state environmental agency and/or the local government, and by talking to the current property owner. If a BFPP purchases a site before EPA has made a final cleanup decision, EPA may be unable to predict what property use restrictions may need to be implemented in the future. Prospective purchasers can also find out information on use restrictions in effect by performing all appropriate inquiries. (*See* Question 4 for more information on all appropriate inquiries.)

Davie Landfill in Broward County, Florida has been redeveloped into Vista View Park, which includes walking, horseback riding, and bike trails; a picnic area; and a catch-and-release fishing pond.

To ensure that BFPP liability protection is maintained, it is important that all the property use restrictions are implemented and followed and that the BFPP's use of the site does not adversely affect or impede the cleanup.

Enforcement of property use restrictions established as part of a cleanup (*e.g.*, restricting site property for commercial uses only) is normally overseen by the state or local government. Where contamination is left in place above unrestricted use levels, EPA (or the state) is required by law to conduct periodic reviews (at least every five years) to examine how the cleanup is functioning and whether it remains protective.

8. *Does EPA use liens that could affect me if I acquire a site or property within a site and how can I resolve or settle an EPA lien?*

EPA uses two types of liens that may affect site property: Superfund liens and windfall liens. A Superfund lien entitles EPA to recover cleanup costs that EPA has incurred from the property owner. A windfall lien is potentially applicable to a site property if the owner is a BFPP. The windfall lien is designed to prevent an entity from realizing an unfair windfall from the purchase of a property that has been cleaned up using taxpayer dollars. EPA's potential cost recovery under a windfall lien is limited to the increase in fair market value of the property attributable to the cleanup or the United States' unrecovered response costs, whichever is less. BFPPs should contact their EPA Regional office regarding the existence of a lien or EPA's future intentions to perfect a lien on the property.

The MDI Site in Houston, Texas is located two miles east of downtown and is near an environmental justice community. EPA and the U.S. Department of Justice worked with the bankruptcy trustee to ensure that the purchaser of the site committed to perform the on-site cleanup work. This was the first settlement in which a BFPP agreed to perform the cleanup work at a Superfund site.

Both of these liens can be released or waived upon satisfaction before the purchase of the site. The satisfaction amount may be negotiated with EPA and would be embodied in a settlement agreement.

EPA may seek cash consideration, performance of work, or a combination of such consideration in connection with the lien releases and waivers. Because EPA liens affect the total value of the property, lien settlement negotiations need to include EPA, the current property owner, and the BFPP. Often the liens can be resolved or settled concurrently because both the Superfund lien and the windfall lien draw from the same available equity in a property. In addition, EPA may also issue a comfort/status letter to prospective purchasers or their lenders to describe the status of any EPA liens.

EPA has issued guidance, a model settlement document, and a sample comfort/status letter on windfall liens that are available on EPA's Web site at http://www.epa.gov/compliance/resources/policies/cleanup/superfund/interim-windfall-lien.pdf.

EPA also has issued guidance and model notice letter on the timing and administrative procedures for EPA filing notice of a windfall lien on a property after acquisition by a BFPP that is available on EPA's Web site at http://www.epa.gov/compliance/resources/policies/cleanup/superfund/wf-admin-mem.pdf.

A FAQs fact sheet on windfall liens is available on EPA's Web site at http://www.epa.gov/compliance/resources/policies/cleanup/superfund/interim-windfall-lien-faq.pdf.

9. Could I encounter problems when I try to get financing to buy a site or borrow for improvements and how can EPA help?

Changes to the federal Superfund law addressed many lender concerns, but prospective purchasers might still experience problems. In the past, lenders were reluctant to provide financing for the purchase of Superfund sites because of concerns about:

- lender liability;
- potential liability of the owner affecting the owner's ability to repay the loan; and
- the impact of the contamination on the value of the site property that secures the loan.

These concerns are diminishing. A 1996 amendment to the federal Superfund law protects lenders from federal Superfund liability when the lenders comply with certain statutory requirements. In particular, the lenders may not participate in the management of the facility.

Use of environmental insurance policies is increasingly alleviating lenders' concerns about financial risks at Superfund sites. The passage of time and increased reuse of brownfields and Superfund sites are demonstrating to lenders the significant financial value that these properties have and the potentially low risks of financing their purchase and redevelopment.

In addition, the Brownfield Amendments to the federal Superfund law, which provide for BFPP status for new buyers, may provide assurance to lenders because these borrowers will not be liable and will not affect their ability to repay the lender.

EPA has many tools to help alleviate lenders' concerns about financing contaminated properties, including guidance documents, comfort/status letters, BFPP doing work agreements, and Ready for Reuse Determinations. EPA's willingness to work with buyers and their lenders makes the acquisition of Superfund properties more feasible than ever before.

10. What can EPA do to help a prospective purchaser decide, and convince lenders, tenants, and others, that buying a Superfund site is a good idea?

EPA has tools that can be used to demonstrate that buying or using a Superfund site can be a great opportunity. Some of these tools include:

- **Comfort/Status Letters:** EPA may issue comfort/status letters to address the following:
  - status of the site;
  - future anticipated actions at the site;
  - available liability protections;
  - reasonable steps that a purchaser should take to stop any on-going releases and prevent future releases at sites where EPA has this information; and
  - the status of EPA liens.

The Town of Arlington, Tennessee acquired the Arlington Blending & Packaging site in 2004 after EPA issued a comfort/status letter and a Ready for Reuse Determination. Today the site is an active neighborhood park.

- **Ready for Reuse (RfR) Determinations:** EPA may issue an RfR Determination to affirm that a site's conditions are protective of human health and the environment for specific types of uses.

- **BFPP "Doing Work" Agreements:** EPA may enter into a settlement agreement with a BFPP who wishes to perform part or all of a cleanup. The agreement provides for EPA oversight and may satisfy part or all of any windfall lien.

- **Lien Settlements:** EPA is willing to enter into negotiations and settlement agreements to resolve lien issues and facilitate reuse.

- **Discussions:** EPA Regional staff is often available to talk with or meet with prospective purchasers, sellers, lenders, and other stakeholders to discuss the issues critical to the successful purchase and reuse of a Superfund site. Providing examples of other Superfund sites that were successfully redeveloped and are now in reuse can also reassure local citizens and stakeholders about revitalization opportunities.

- **Site Reuse Fact Sheets:** EPA's Superfund Redevelopment Initiative Web site at http://www.epa.gov/superfund/programs/recycle/ provides summary information about Superfund sites that have been reused. Detailed fact sheets for some sites are also available and may include data on economic impacts and environmental and social benefits resulting from the reuse of Superfund sites.

- **Partial Deletions:** While total cleanup of a site may take many years, many sites on EPA's national priorities list (NPL) include portions that have been cleaned up and may be available for productive use. These portions may be partially deleted from the NPL if EPA makes a determination that no further cleanup work is required, the state concurs, and necessary institutional controls are in place. Any person, including individuals, businesses, entities, states, local governments, and other federal agencies, may submit a petition requesting a partial deletion. EPA will evaluate the request and make a determination whether to proceed. A partial deletion of a portion of a Superfund site from the NPL can help to increase the site's marketability. **Please note:** EPA Superfund liens may still apply to the deleted parcel.

Sites in Reuse
Cascade Park Gasification Plant Superfund Site
Intersection of Gadsden & Bloxham, Tallahassee, Florida 32301

View from the site looking northwest toward downtown Tallahassee (left); remedial activities began at the Cascade Site with a ground breaking ceremony on November 15, 2005 (center); the scenic St. Augustine Branch traverses the site (right).

Site size: Approximately 7.8 acres
Planned Site Reuses: Recreation and open space

Tallahassee, Florida

INTRODUCTION

The remediation of the Cascade Park Gasification Plant Superfund site has become a key component of an ecological and cultural heritage planning effort in Florida's capital city. With ongoing coordination and support for site remediation from EPA Region 4, the City of Tallahassee, Leon County, Blueprint 2000, and a group of local stakeholders have developed a conceptual revitalization plan for the Cascade Park site.

The Cascade Park site occupies a culturally and ecologically significant place in the history of Tallahassee. Located south of the state capitol building, the site is named for a scenic waterfall along St. Augustine Branch. In 1823, the City of Tallahassee's founders discovered the cascade and were inspired to select a nearby site as the location for Florida's capital. Historically, the Cascade Park site was also the location of an important community recreation field and gathering place for Tallahassee's residents.

Today, the City of Tallahassee is planning a new recreational park system, which aims to preserve the city's natural resources and to celebrate the Cascade Park site's cultural heritage. The city and Blueprint 2000, a local, taxpayer-funded Intergovernmental Agency, have developed a community wide plan, linking recreational trails, community gathering places, public parks and stormwater management facilities. The city's Capital Cascades Trail Master Plan encompasses the areas of the Cascade Park site, illustrating how remediation and community visioning processes can combine to transform abandoned industrial sites into valuable community resources.

SITE HISTORY

From the early 1900s until the mid-1950s, the City of Tallahassee operated a manufactured gas plant (MGP) on the southeastern edge of the Cascade Park site, near the intersection of Gadsden and Bloxham Streets. The plant converted coal resources into gas to provide lighting and heating fuel for the city's residents. Certain waste products associated with the process were released at the site, and municipal solid wastes were deposited on a city-owned landfill on the southern portion of the site. Industrial MGP operations ended at the Cascade Park site at the 1950s.

Historically, the northwestern portion of the Cascade Park site was used for recreational purposes. In 1926, the Centennial Field athletic park was constructed to celebrate Tallahassee's 100th anniversary. Throughout the mid-twentieth century Centennial Field was the home of several little league baseball and football teams, a minor league baseball franchise, and various Florida State University teams. Since the closure of Centennial Field in 1975, the Cascade Park site has remained vacant.

EPA Region 4 Reuse Fact Sheets: June 2007

The Site Reuse Fact Sheet for the Cascade Park Gasification Site in Tallahassee, Florida addresses the site's history, cleanup status, infrastructure upgrades, and how city residents will be able to enjoy a new public park and trail system when the cleanup is complete.

More information on partial deletions is available on EPA's Superfund Web site at http://www.epa.gov/superfund/cleanup/postconstruction/deletion.htm.

Information about many of these tools can also be found on EPA's Landowner Liability Protections Web page at http://www.epa.gov/compliance/cleanup/revitalization/landowner.html.