DePue / New Jersey Zinc / Mobil Chemical Corporation Superfund Site

Project Report
August 2004

Superfund Redevelopment
Initiative Pilot Project

Prepared for
The Village of DePue

Project Team
E^2 Inc.
D.I.R.T. studio

Funded by
United States Environmental Protection Agency
Superfund Redevelopment Initiative (SRI)

Project Timeline

1997

U.S. EPA lists the Depue/New Jersey Zinc/Mobil Chemical Corp. (“the site”) on the National Priorities List (NPL)

July 2002

U.S. EPA awards the Village of DePue a grant of technical services from the Superfund Redevelopment Initiative

October/November 2002

Members of the Project Team visit the site and meet with Illinois EPA Remedial Project Manager (RPM) Rich Lange and Village President Don Bosnich

January 2003

1st Land Use Committee (LUC) Meeting to introduce the project and define site reuse goals

March 2003

2nd LUC Meeting to discuss reuse obstacles and opportunities

May 2003

3rd LUC Meeting to present the Draft Conceptual Design Framework

“the site”

Project Overview

The U.S. Environmental Protection Agency (U.S. EPA)'s primary responsibility at Superfund sites is the protection of human health and the environment. Since 1995, it has also been U.S. EPA policy to consider reasonably anticipated future land uses when making remedy decisions at Superfund sites, so that the remediation of Superfund sites can allow for safe reuse for commercial, recreational, ecological, or other purposes. Since 1999, U.S. EPA's Superfund Redevelopment Initiative (SRI) has been helping communities and stakeholders plan for reuse at more than 70 National Priorities List (NPL) sites across the country.

With forethought and planning, communities can help transition formerly contaminated and idle sites into active use without jeopardizing the effectiveness of the remedy put into place. Across the nation, more than 330 former NPL sites are in reuse or plans for their reuse are under development. The commercial and industrial use of these sites supports 15,000 jobs and a half-a-billion dollar increase in annual incomes. Other sites are providing more than 60,000 acres for ecological and recreational uses, including athletic fields and wildlife habitat.

Reuse planning at NPL sites presents a unique set of obstacles, challenges, and opportunities. Superfund site designation represents a commitment from U.S. EPA that a site's contamination will be remediated and that the site will be made safe for human health and the environment. However, reuse considerations at these sites can be complicated by several factors, including the level and complexity of contamination, the regulatory and liability scheme used to enforce site remedies, and unclear or resistant site ownership, which can lead to a lengthy remediation process. Any successful reuse planning effort must be mindful of how a site's reuse and remediation will work together, involve and expand the capacity of diverse stakeholders to meaningfully participate in the process, and take into account the long time frames often involved in NPL site remediation.

In 2002, the Village of DePue, Illinois, received assistance from SRI to undertake a community-based reuse planning process and develop future land use recommendations for the 985-acre DePue/New Jersey Zinc/Mobil Chemical Corporation NPL site. During the reuse planning process, the community worked closely with environmental consultants E^2 Inc. and industrial site architects D.I.R.T. studio (the Project Team), and with support from U.S. EPA and Illinois EPA, to develop reasonably anticipated future land use recommendations and a reuse strategy for the site. The recommendations and reuse strategy are intended to inform both the site's remedial design and implementation, ensuring that reuse considerations are taken into account in future community planning efforts.

This report, prepared by the Project Team, presents reuse recommendations and a site reuse strategy, called a Conceptual Design Framework, and provides site background information to provide context for the reuse recommendations. The process included a community-based, 19-member Land Use Committee, which was designed to include a diverse range of local perspectives. The Committee, Project Team, and representatives from the Potentially Responsible Parties (PRPs), Illinois EPA, and Illinois Department of Natural Resources met three times between January and May 2003. Discussions focused on community needs and site reuse obstacles and opportunities. However, due to conflicting commitments and other circumstances, Committee member attendance at these meetings was lower than anticipated. Nonetheless, the project team used the discussions at these meetings to help inform the development of this reuse report. This report also contains a list of potential resources to support multiple site reuses and larger, community-wide revitalization efforts. The Project Team focused on the following areas of research: area businesses and industries, nearby parks and recreational amenities, and potential project linkages with regional economic and environmental initiatives. The Project Team presented a draft of the Conceptual Design Framework to the Committee for review and comment on May 27th, 2003.

Acknowledgments

The Project Team would like to thank the following people and organizations for their valuable contribution to this report:

Land Use Committee Members:

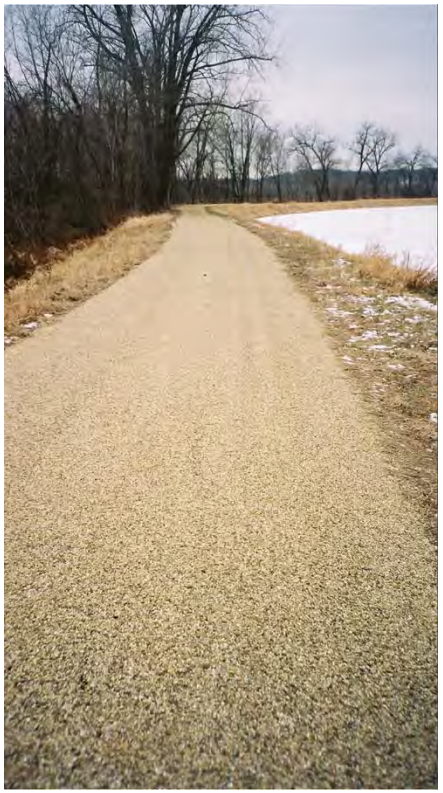
Don Bosnich
Dan Burnham
Alfredo Godinez
Carol Greathouse
Jeff Groy
Beverly Harrison
Roger Harrison
Gustavo Hernandez
Dolores Hoffert
Hank Ipsen
Tom Janeck
Cecilia Marroquin
Ed Repulski
Steve Solorio
Barb Smith
Butch Torri
John Widmar

Resource Members:

Tom Bloom	U.S. EPA Reuse Coordinator, Region V
Virginia Forrer	Illinois EPA Community Involvement Coordinator
Rich Lange	Illinois EPA Remedial Project Manager
Mike Resetich	Illinois Department of Natural Resources
Kirk Riley	Technical Outreach Services for Communities (TOSC)

Table of Contents

small tree growing from zinc slag pile



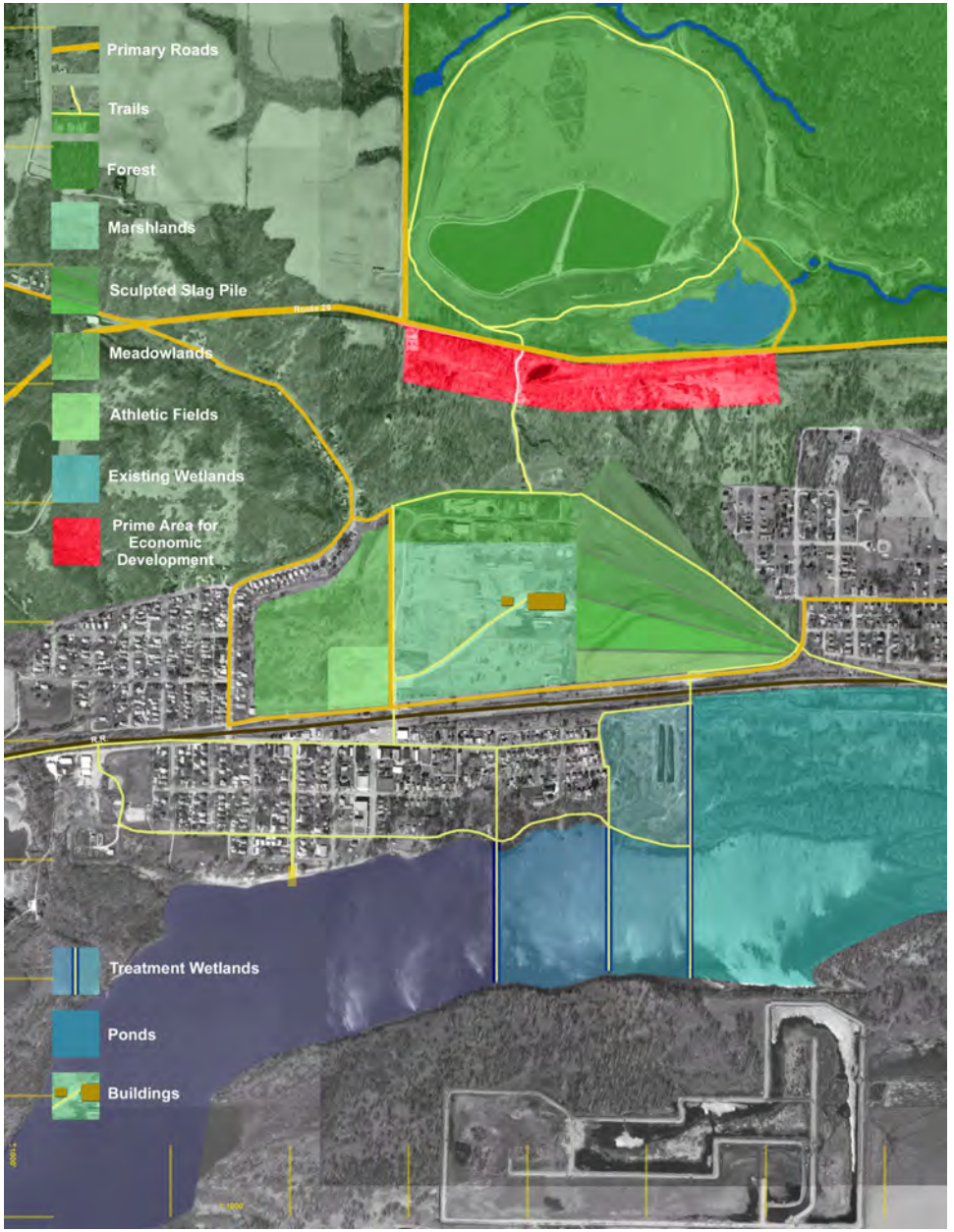
clockwise from top left: former New Jersey Zinc facility (now location for water treatment); Hennepin Canal State Trail in Bureau, Illinois; pond at the gypsum stack. opposite page: zinc slag pile panoramic

Part One: Project Reuse Guidelines

To guide the development of the Conceptual Design Framework for the reuse of the DePue/New Jersey Zinc/Mobil Chemical Corp. NPL site, the project's Land Use Committee and Project Team worked together to develop a set of reuse guidelines for the site. These guidelines document the Committee's reuse priorities and site-related concerns and highlight community considerations that will need to be kept in mind as the site is remediated and returned to use.

The Land Use Committee's Reuse Guidelines include:

- Site reuses should support, not impede, the fast and efficient cleanup of the site.
- Reuse of portions of the site should support the economic revitalization of DePue, creating opportunities for new jobs and tax revenue.
- Site reuses should preserve and capitalize on the natural beauty and character of the Village of DePue and its surroundings.
- Site reuses should take into account the importance of Lake DePue for recreational and ecological purposes.
- Site reuses should integrate educational components that provide information about the community and its history.
- The site's remedy should consider different phasing schemes and time frames that would allow for the reuse of portions of the site prior to the completion of remedial activities at the entire site.
- The site's remedy and reuse should improve the appearance of the zinc slag pile.



clockwise from top left: proposed constructed wetlands for treating contaminated water at the main plant facility; New Jersey Zinc/Mobil Chemical NPL site Conceptual Design Framework; proposed community athletic fields.

Reuse Recommendations

Upon development of the Reuse Guidelines, the Project Team set about establishing a site strategy for reuse a the DePue/New Jersey Zinc/ Mobil Chemical Corp. NPL site. The Conceptual Design Framework (opposite page) and the following recommendations were presented to the Land Use Committee at a public meeting in May 2003.

1. *Adapt the former New Jersey Zinc plant facility as a new museum of history and industry that showcases DePue's natural and industrial heritage.*

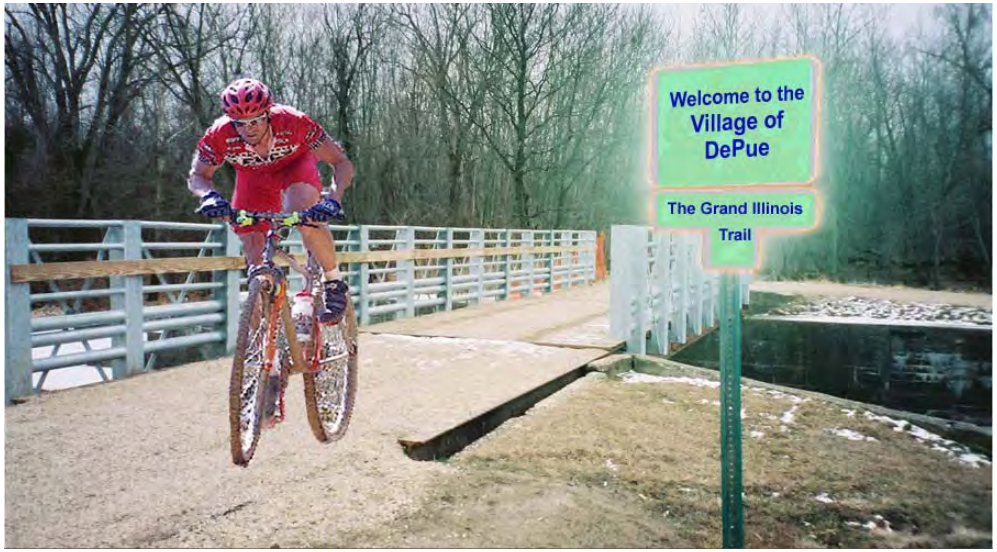
    - The remnant building is currently used for primary treatment of contaminated water from the site and its surroundings. Once water treatment has concluded, the building could be retrofitted to house a community museum.
    - The museum could present the dynamic history of the DePue/New Jersey Zinc/Mobil Chemical Corp. NPL site and the Village of DePue. The museum would serve as a source of community pride, as well as an educational resource for DePue residents and visitors.
    - The CSX building located near the rail tracks along Marquette Street could be relocated to the main plant site and could house additional relics and artifacts that highlight the history of DePue.

2. *Promote DePue as a tourist destination, and emphasize ecotourism as a unique local economic development opportunity.*

    - Lake DePue offers ample tourism opportunities that could be further developed and marketed, including the annual U.S. Title Series National Boat Races, duck hunting, and great wildlife viewing opportunities along the banks of the lake and the Illinois River.
    - Steps should be taken to market DePue as an urban escape. Only 90 miles from Chicago, DePue's small-town charm represents a peaceful escape from the hectic, traffic-filled lifestyle of the city. Signage along major highways, roads, and trails near DePue would help attract birders and recreationists to the community.
    - In order to promote DePue as a tourist destination, there will need to be a range of support facilities for visitors. Currently, for example, there are limited restaurants and no hotels, motels, bed-and-breakfasts, or camping grounds in DePue.
    - The Village could invest in promotion materials such as brochures and a web page to advertise DePue as a tourist destination.
    - The Nature Conservancy is currently developing a strategic ecotourism plan for the Illinois River Valley and is currently looking at potential destinations along the river. The Village of DePue is located within the area that The Nature Conservancy is assessing for potential projects and is an ideal candidate for such a plan.
    - Successfully marketing DePue to tourists will attract increasing numbers of visitors to the area, which can, in turn, attract new private investment to the Village of DePue. With increased tourism, the need for support facilities such as lodging, outdoor gear, and restaurants would also grow, ultimately translating to increased economic activity for the community.

3. *Create recreational opportunities at the site and link the site to regional recreational amenities.*

    - The Illinois Department of Natural Resources is currently planning to build the Alliance Trail, a 15.1-mile link between the I & M Canal State Trail and the Hennepin Canal State Trail, through DePue (see Appendix B - List of Resources). This expanded trail would draw hikers and bikers to the Village and provide new tourism opportunities.
    - Currently, DePue residents are in need of more athletic fields, including soccer fields. The western portion of the plant site could accommodate multiple fields, meeting community needs.



DePue's potential future: the zinc slag pile becomes a sculpted landform for birding, picnicking or flying kites; the Grand Illinois Trail is extended and travels through DePue.

- Steps should be taken to link the different areas of the site to the residential and commercial areas of the Village and the Lake. There are currently few pathways or sidewalks that provide access through town to the Lake. In addition, there is no safe pedestrian crossing along route 29 to the gypsum stack, an area that is likely to develop into a prime wildlife viewing area.
- Developing new and improved on-site outdoor and recreational opportunities as well as linking these amenities to regional outdoor and recreational systems could provide the community with economic benefits through increased tourism. It would also enhance the Villages's image as a quality place to live or have a second home.

4. Provide opportunities for ecological restoration, wildlife habitat enhancements and general environmental education.

- According to local residents, the lake habitat is particularly appealing to migrating eagles, egrets, blue herons, and white pelicans. Efforts should be made to maintain the lake's biodiversity and make it attractive to various birds and animals.
- Maintaining and improving the ecological habitat in DePue would help encourage visitors to return to the area as well as provide DePue with a competitive advantage in marketing the area for tourism, business, vacation residences, and primary homeownership.
- The U.S. Fish & Wildlife Service manages a refuge system in Illinois. Prime habitats in need of restoration, such as portions of the DePue/New Jersey Zinc/Mobil Chemical Corp. site, represent the best candidates for addition to the refuge system. Research should be done to explore the option of adding the Lake DePue area to the Illinois River National Fish & Wildlife Refuge System.
- Another possibility is incorporating DePue into the Illinois-Michigan Canal Heritage Area, which currently ends roughly six miles east of DePue. As there are no legislative criteria for designation of a National Heritage Area (NHA), DePue may be able to partner with the National Park Service to be included in this NHA.
- The Donnelley/Depue State Wildlife Area is a major migratory flyway for waterfowl and facilitates the feeding, resting and harvesting of birds. Located nearby the Village of DePue, The Donnelley/Depue State Wildlife Area could be marketed as another tourist attraction bringing visitors who desire recreation such as fishing, hiking and hunting, and environmental educational oportunities.
- Once remediation is complete, the gypsum stack will likely serve as a popular wildlife area complementing existing habitat opportunities nearby. Efforts should be taken to assure that this happens and that the gypsum stack is planted with native species similar to that of the surrounding ecosystems.
- The remnant New Jersey Zinc facility houses a water treatment system for contaminated area ground and surface water. Potentially, this water could be treated through a system of constructed wetlands, which could be built near the former plant facility. In addition, phytoremediation may be a viable treatment option for the south ditch contamination.
- As innovative bioremediation technologies continue to be discovered and developed, these new technologies could be applied at the plant facility area, zinc slag pile, lithopone ridges and south ditch. Potentially these areas could serve as grounds for the EPA or other organizations seeking opportunities to test out new treatment options.

5. Create new economic opportunities in DePue.

- The Village of DePue is located along route 29, a significant transportation corridor between hwys 180 and 39. The area of the site on the southern side of route 29 across from the gypsum stack appears to be the portion of the site best suited for commercial and/or industrial development due to its location on route 29. Given that this portion of the site may have the lowest levels of contamination, this portion of the site may present the best opportunity for early commercial redevelopment.
- Commercial and industrial facilities would provide new jobs for local residents and generate increased tax revenues for the Village of DePue.

Challenges to Site Reuse and Community Renewal

The citizens of Depue face significant challenges as they seek to revitalize their community and reintegrate the Depue/New Jersey Zinc/Mobil Chemical Corporation Superfund Site into the physical fabric of the community. Like many rural communities with an industrial past, Depue has not transitioned to a viable post-industrial economy. In addition to contamination and stigma, Depue must deal with shifting demographics and the lack of any employment base. What was once a small but thriving industry town is now a small bedroom community struggling to maintain its identity.

Remedial Progress

The community perceives the pace of remediation to be extremely slow, resulting in frustration for residents and local government representatives. While the site's remediation is being lead by the PRPs and work at the gypsum stack is progressing, there is a general sense in the Village that the US EPA and Illinois EPA have done little to speed up the process for the remainder of the site. Community members have cited the remediation of the South Ditch area as support for this assertion. They note that the DePue Site Group completed its investigation of contamination in the South Ditch area in 1997, but Illinois EPA did not complete its remedial plan for the area until 2003 - a full six years later.

While community members expressed interest in how the plant facilities might be used in the future, the overwhelming concern of the community was that the remediation of the site move at a much faster pace. Residents strongly expressed their belief that until the remediation was completed the Superfund label would hang over the community making new potential residents wary, discouraging investment and depressing property values.

Community Involvement

Largely due to a perceived sense of powerlessness in the remediation of the New Jersey Zinc/Mobil Chemical site, community involvement in the remediation and reuse planning process has been inconsistent. Some within the community have disengaged from the process altogether, and those residents who do attend meetings on the site tend to focus on the slow pace of remediation and their distrust of the agencies involved. Community members frequently complain that the regulatory agencies involved with the site (U.S. EPA, Illinois EPA, and Illinois Department of Natural Resources) have not communicated well with one another and consequently, done little to speed up the site's remediation. This desire to improve the pace of the site's remediation predominates the community's site concerns, and Committee members participated in the reuse planning primarily in the hopes of catalyzing the remedial process.

Despite this community-wide concern, the Village has yet to act collectively to address the site's remediation and plan for the Village's future. For a variety of reasons, including the small size of the community, a scarcity of free time, and more pressing everyday concerns, community members may find it difficult to gather the energy to seriously consider the Village's and the Superfund site's future. External forces may also be a factor; with the Village's primary economic base gone, the stigma of Superfund in its place, and a perception of limited influence in the site's remediation, the community may feel powerless to shape the Village's and the site's future. In truth, however, the Village's future lies in the community's ability to coalesce as a unified force and proactively work towards the revitalization of the Village and the site. Many of the challenges that the Village faces are not related to the Superfund site.

A Changing Economy

DePue is facing a scenario common to small industrial towns across America, although the presence of the Superfund site adds an additional dimension to the Village's situation. When facilities at the former New Jersey Zinc/Mobil Chemical Superfund site were operating, the Village realized a certain degree of prosperity and residents worked at one of the site plants or at small stores in DePue. Following the closing of the facilities, economic opportunities in the Village dwindled, forcing most residents to pursue employment outside of DePue. The lack of a primary employer combined with declining property values has resulted in economic stagnation and declining tax revenues.

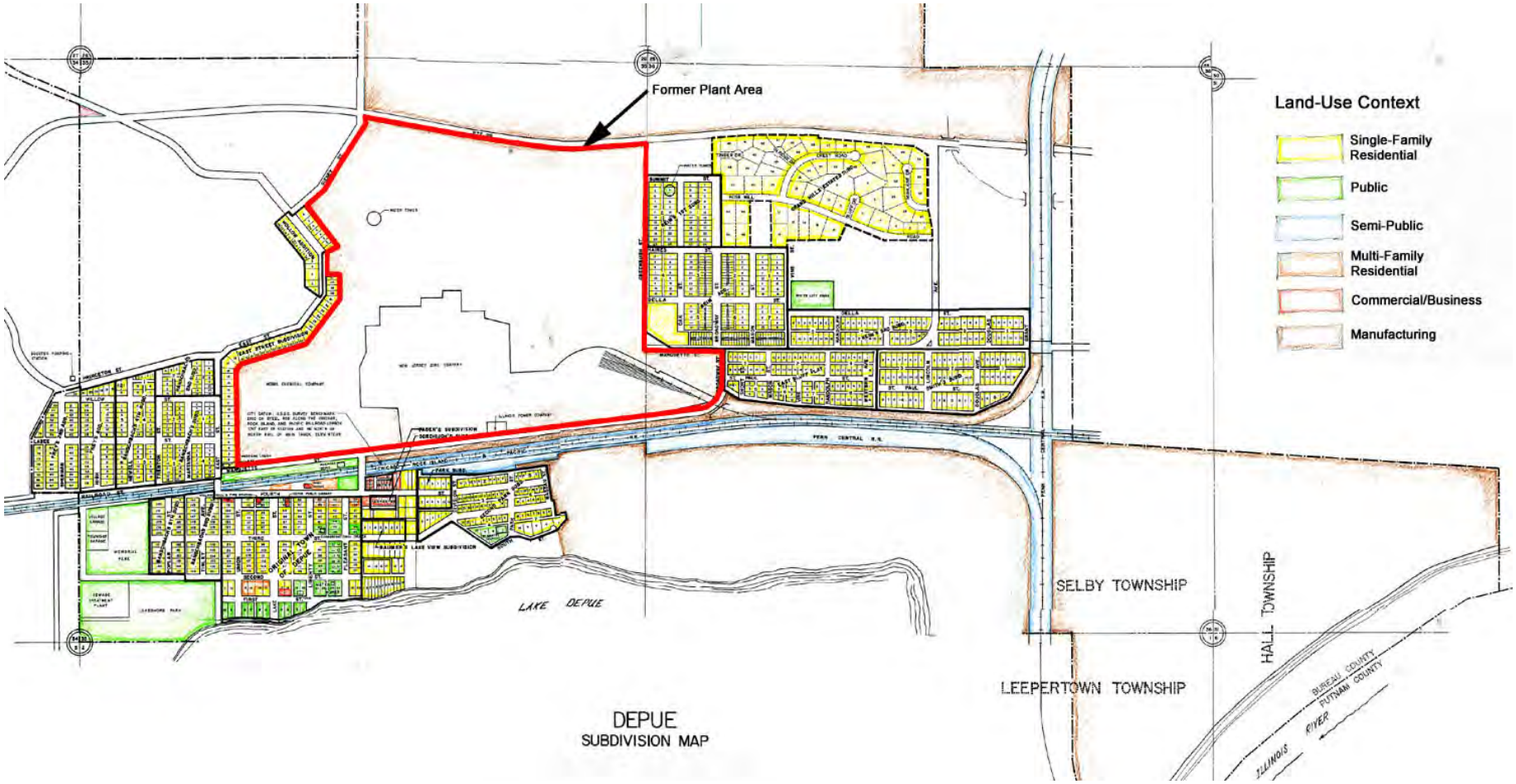
While remediating the site and making portions of it available for reuse could serve as a catalyst for the economic revitalization of the Village, the availability of the property for development alone will not change the economic situation in DePue. Current market forces create very little demand for land use in Depue and the Village enjoys very few strategic economic advantages. The strong sense that Depue is a great place to raise a family and has significant scenic and recreational resources are the key assets upon which the community needs to capitalize. The Village needs to develop a comprehensive community revitalization plan to attract business and tourists, capture revenue from visitors and to maintain the high quality of life that residents enjoy. These are the keys to Depue's future.

Lake DePue

One of the most contentious site issues involves the future of Lake DePue. Due to the historical, ecological, and cultural significance of the lake to the community, DePue residents have strong feelings about its future. Some segments of the community feel very strongly that contaminants in the lake sediment should be removed so that the lake can be dredged. They believe this would allow the annual professional boat races to continue and make possible the development of a marina. While no credible plans have been brought forward for the development of a marina, the village's location on the Illinois River and proximity to the greater Chicago area, on the surface, make this a possibility. Yet, despite the significant role the boat races play in the culture and history of Depue it may not be feasible to remove contaminants in the lake sediments.

Further, the physical, regulatory, financial, and ecological practicality of either dredging the lake or opening it up to the Illinois River, regardless of sediment contamination, are questionable. To support the argument that the sediment should be removed because of local economic impacts would require a great deal of additional research and feasibility studies beyond the scope of this report. On the surface, based on information available to the project team, the costs of dredging the area appear to far outweigh the financial benefits realized by the community through the boat races. Additionally, dredging is not necessary for the lake to provide significant benefits to the community as wildlife habitat and an eco-tourism attraction.

At this point, the PRPs have not yet conducted a Remedial Investigation/Feasibility Study of the lake. Therefore, the Illinois EPA does not know the nature and extent of the lake's contamination nor can a full evaluation of remedial options and their impacts be evaluated. Whatever decision is reached about the lake will have to be balanced with a variety of interests and concerns. Undoubtedly, compromises will need to be reached. Should a decision be reached that leaves contaminants in place and prevents future dredging of the lake, it must be recognized that the Village of Depue will suffer a significant loss of cultural heritage that might best be compensated for through a Natural Resources Damage Claim.



Village of DePue land use map

Part Two: Site Context

The Village of DePue

The New Jersey Zinc/Mobil Chemical Corp. NPL site is located in the Village of DePue in north central Illinois, in close proximity to the Illinois River and approximately 90 miles southwest of Chicago. In 2000, the Village of DePue's population was 1,842, while the population of surrounding Bureau County was 35,503. While Bureau County's population did not change significantly between 1990 and 2000, DePue grew by 6.5 percent over the same time period, adding 113 new residents. DePue's population also includes a substantial and growing number (46 percent in 2000) of residents that are of Hispanic descent. Many community residents are employed outside of the Village, as economic opportunities within DePue are limited. Major employers in the area include the Monterey mushroom plant, a Wal-Mart distribution center, and the Mid-America Growers nursery.

The DePue/New Jersey Zinc/Mobil Chemical Corporation NPL Site

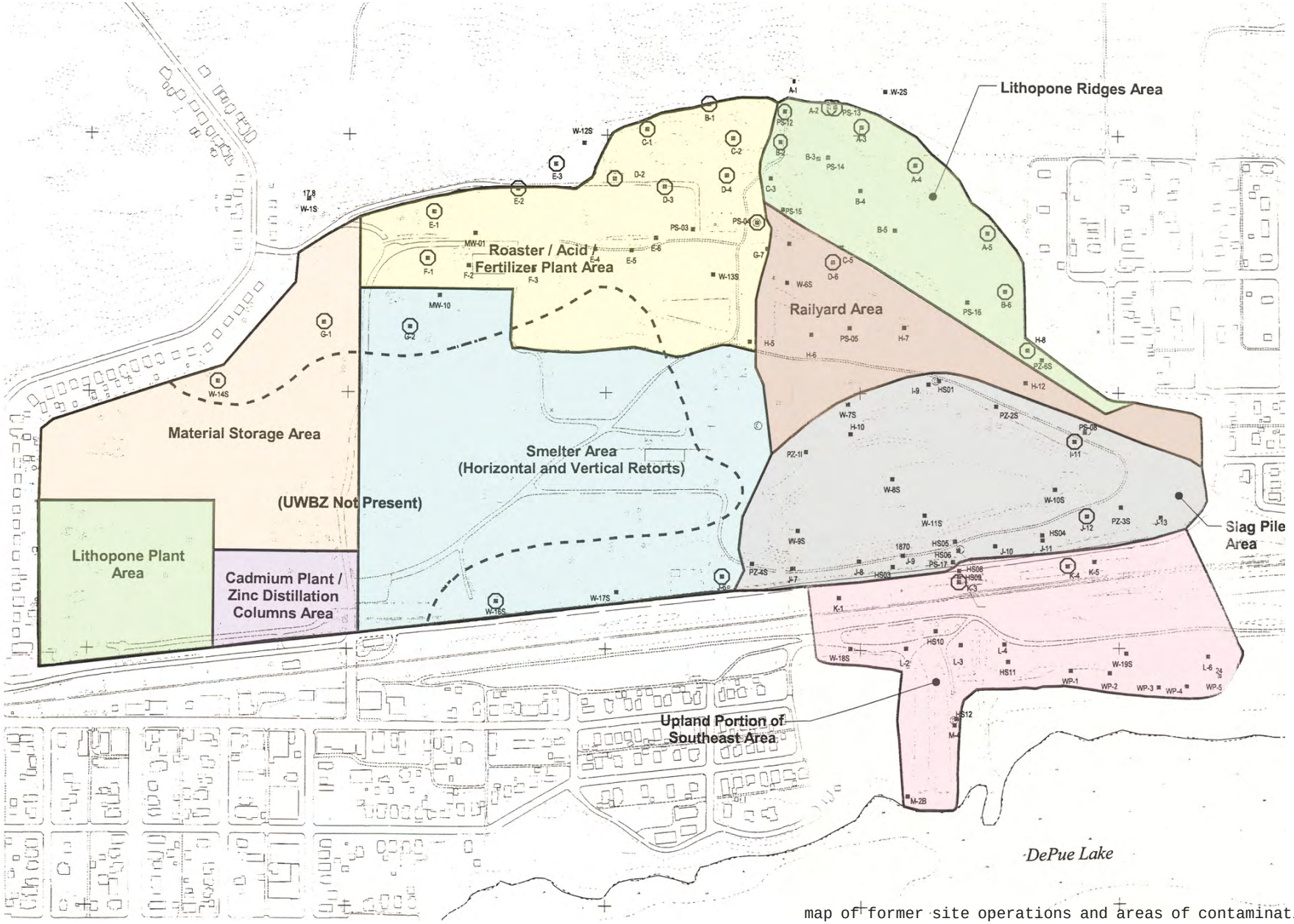
According to Illinois EPA, the New Jersey Zinc/Mobil Chemical Corp. NPL site is approximately 985 acres in size. Features within the site's boundaries include the gypsum stack, plant site, lithopone ridges, slag pile, south ditch, and portions of Lake DePue (see map on page 2). The plant area is relatively flat, but the site's elevation rises approximately 170 feet between the plant area's northern fence and Route 29. The hillside between the plant site and the gypsum stack is a woodland area that extends across Route 29.

Surrounding Land Uses

Residential neighborhoods are located directly east and west of the site. A mixed-use area is located south of the plant area, across Marquette Street; the area includes residential and commercial land uses, as well as several institutional land uses, including a school, post office, fire station, and public library. The plant area is located upgradient of the 525-acre Lake DePue, which is the Village's primary tourist attraction.

Lake DePue

Lake DePue is located on the north bank of the Illinois River, upstream from the "great bend" of the river at Hennepin in Bureau County. Prior to World War II, Lake DePue was a popular boating lake, with annual racing events and regattas drawing large crowds. In the 1960s and 1970s, however, the deposition of sediments from Illinois River flood flows and agricultural runoff reduced the navigable portion of the lake, threatening the viability of DePue's annual boat races. In the early 1980s, the Village of Depue worked successfully with the state legislature to obtain funds to dredge the lake. Approximately 400,000 yards of material within a 1.25 mile circumference were dredged from the bottom of the lake between 1979 and 1982. Today, the U.S. Title Series National Boat Races are held on the lake each July, attracting 25,000 visitors. Lake DePue is also well known within the Village for attracting large numbers of migrating eagles, egrets, blue herons, and white pelicans every year.



map of former site operations and areas of contamination

Site History

Industrial History

Between 1903 and 1989, zinc smelting, lithopone production, sulfuric acid production, and fertilizer production facilities operated at the DePue/New Jersey Zinc/Mobil Chemical Corp. NPL site (see map of operations on page 16). Waste from zinc smelting operations, the first industrial activity at the site, was disposed of on-site, creating the highly-visible, 15-acre slag pile. Lithopone production began on the western portion of the facility site in 1923 and continued until 1956. Waste from this process was deposited along the site's eastern boundary, resulting in the site's lithopone ridge area. Sulfuric acid and fertilizer production operations began at the site in the late 1960s and continued until 1987, when the facilities were closed and demolished. Waste, primarily gypsum, from fertilizer plant operations was disposed of in the 150-acre site area north of Route 29.

Site Ownership

Ownership of the land within the boundaries of the DePue/New Jersey Zinc/Mobil Chemical Corp. NPL site has changed many times since industrial operations began at the site in 1903. Site owners have included Minera Point Zinc, the New Jersey Zinc Company, Gulf & Western Industries (now Viacom), Mobil Oil Corp., and Horsehead Industries. Viacom, Mobil Oil Corp. (now Exxon Mobil Corporation), and Horsehead Industries have been identified as the site's Potentially Responsible Parties (PRPs). The companies, which formed the "DePue Group" in 1995 to represent themselves as the former owners and/or operators of the site, are responsible for the site's assessment and remediation, with oversight provided by Illinois EPA. Viacom and Mobil Oil Corp. are the two principal site PRPs. Horsehead Industries, which owns 150 acres of the site, entered into a buyout agreement with Viacom and is not currently involved in the site's cleanup.

Contamination and Remediation

Industrial activities at the DePue/New Jersey Zinc/Mobil Chemical Corp. NPL site resulted in the contamination of the site's soils, surface water, groundwater, and sediments in Lake DePue with arsenic, cyanide, lead, zinc, mercury, and selenium. Detailed information on the site's contamination and remedial history is available from Illinois EPA – please refer to the appendices section of this report for contact information.

The site comprises five operable units (OUs): the south ditch (OU1), the gypsum stack (OU2), the former facility site (OU3), Lake DePue sediments (OU4), and residential soils (OU5). In general, site PRPs have taken measures to minimize airborne, soil, ground water and surface water contamination by covering on-site slag piles and lithopone ridges with soil and fencing contaminated areas. Future plans for the various OUs are briefly described below, and a map of the different areas is located on page 2 of this report:

- (OU1) South Ditch: Illinois EPA selected an interim remedy for OU1 that includes removal of south ditch sediments and on-site storage of the sediments in an interim containment cell to be located on the property. Previous remediation at the south ditch location has included the installation of iron-rich media walls. The potentially responsible parties (PRPs) have retained a firm to construct the remedy.

view north from plant site

view to residences from plant site

gypsum stack pond

plant building

- (OU2) Gypsum Stack: The remedy selected for OU2 includes the seeding and dewatering of the gypsum stack and groundwater monitoring. Site PRPs anticipate the completion of the seeding and dewatering of the gypsum stack by late 2004. Site PRPs are also proceeding with a hydro-geological study that will characterize the site's subsurface conditions and groundwater quality that will help guide final closure options and the creation of a long-term monitoring program.

- (OU3) Former Facility site: The former facility site includes the area where the New Jersey Zinc plant building is located, the lithopone ridges, and the zinc slag pile. The site's PRPs are completing a revised Phase I remedial investigation (RI) report on the plant area and submittal to Illinois EPA is pending. The former plant facility building is currently the location of the interim water treatment plant. The PRPs have taken measures to minimize airborne, soil, groundwater and surface water contamination by covering the slag piles and lithopone ridges with soil and fencing the contaminated areas. The Interim Consent Decree signed by the PRPs in 1995 presumes that the most likely remedy for the slag pile is on site closure due to its large volume.

- (OU4) Lake DePue sediments: Site PRPs are preparing a work plan for OU4 that will be submitted to the Illinois EPA for approval. No remedial work on the lake has been completed to date.

- (OU5) Off-Site Soils: Illinois EPA is completing internal review of a PRP draft workplan for sampling all soils outside the fences of the original factory site, including residential soil. Soil sampling is tentatively planned for fall 2004 if Illinois EPA and the PRPs can rapidly agree on the workplan. In 1992, Illinois EPA detected elevated levels of metals in 20 residential soil samples. The Illinois Department of Public Health (IDPH) evaluated the 1992 soil samples and concluded that metals concentrations in these samples did not pose a risk over the short term. However, IDPH did recommend residents take precautions to limit soil exposure.

gypsum stack

Appendices

Appendix A – Project Participants

Tom Bloom	U.S. EPA Superfund Reuse Coordinator, Region V
Don Bosnich	Village President/Board of Trustees
Dan Burnham	DePue Site Group (Exxon/Mobil)
Virginia Forrer	Illinois EPA Community Involvement Coordinator
Alfredo Godinez	Community Resident
Carol Greathouse	Community Resident
Jeff Groy	DePue Site Group (Viacom)
Beverly Harrison	Community Resident
Roger Harrison, Jr.	Board of Trustees
Gustavo Hernandez	Community Resident
Dolores Hoffert	Community Resident
Hank Ipsen	DePue Site Group (Viacom)
Tom Janeck	DePue Site Group (Horsehead Industries)
Rich Lange	Illinois EPA Remedial Project Manager
Cecilia Marroquin	Community Resident
Ed Repulski	Community Resident
Mike Resetich	Illinois Department of Natural Resources
Kirk Riley	Technical Outreach Services for Communities (TOSC)
Barb Smith	Community Resident
Steve Solorio	DePue Men's Club
Butch Torri	Board of Trustees
John Widmar	DePue Men's Club

Appendix B – List of Resources

Numerous organizations can provide the community with technical, informational, and funding assistance in developing nature tourism plans, nature observation facilities, recreational trails and facilities, fishing and hunting facilities, and restoring habitat. These programs and organizations include:

Economic Development Administration (EDA) – The EDA aids communities with substantial and persistent underemployment and unemployment by providing grants and technical assistance to support innovative economic development projects; aid in the development of public facilities and private enterprises; and help generate or retain long-term, private sector jobs and investment in communities. While Bureau County does not qualify for assistance from this organization, the EDA often examines communities on a case-by-case basis and provides assistance to areas with declining local economies. Communities such as DePue facing unique circumstances may qualify for assistance. For more information, contact Jack Arnold, Economic Development Representative for Illinois, at 1-888-865-5719.

Heartland Center for Leadership Development – Through training programs, workshops, and research, this nonprofit organization helps rural towns develop the capacity and planning skills to adapt to change and leverage their existing resources in a way that benefits quality of life and the local economy. For more information, call 402-474-7667 or 1-800-927-1115.

Heartland Water Resources Council of Central Illinois (HWRC) – HWRC focuses its efforts on improving the condition of the Illinois River and its watershed through public education, partnerships, and other activities. In October of 2003, HWRC helped organize the Governor's Conference on the Management of the Illinois River System. The proceedings from the meeting, which brought together a variety of organizations and touched on the Illinois River watershed as a tourist and recreational attraction, will be available in early 2004. For more information, contact Tom Tincher at 309-637-5253.

Illinois Bicycle Path Grant Program – This Illinois Department of Natural Resources (IDNR) program provides financial assistance to local government for the acquisition, construction, and rehabilitation of public, nonmotorized bicycle paths and directly related support facilities. Assistance up to 50% of approved project costs with a maximum annual award for development projects of $200,000 is available through the program. For additional information, contact Mick Rosendahl at 217-782-7481.

Illinois Conservation Foundation (ICF) Grant Program – This program supports activities that assist or enhance the biodiversity of wildlife habitat; assist in teaching young people, the disabled, or adults the benefits of conservation; or expose them to an outdoor experience such as hunting, fishing, camping, or enjoying Illinois natural resources. The ICF encourages applications from not-for-profit organizations or local governments. The ICF gives precedence to grant applications which have matching funds at least equal to the amount being requested. For more information, call 217-785-2003.

Illinois Department of Commerce and Economic Opportunity (DCEO) – DCEO is the state's lead economic development agency. DCEO's responsibilities range from workforce development to business financing, public infrastructure to tourism development, and from creation of economic opportunities to recycling and energy development. For more information, call 212-782-7500.

Illinois Department of Natural Resources (IDNR) – IDNR activities center around managing, protecting, and sustaining Illinois' natural and cultural resources. IDNR serves as the central repository for information on Lake DePue, and has worked closely with the Village and the Illinois EPA throughout the site's remediation. For more information, contact Mike Resetich at 815-447-2353.

Illinois Environmental Protection Agency (IEPA) -- The mission of the Illinois Environmental Protection Agency (IEPA) is to safeguard environmental quality, consistent with the social and economic needs of the State, so as to protect health, welfare, property and the quality of life. For more information, contact http://www.epa.state.il.us.

Illinois River Wildlife & Fish Refuge System – The U.S. Fish & Wildlife Service acquires and manages lands from willing sellers to conserve fish, wildlife, plants and their habitats and to provide wildlife-dependent public use for educational and recreational purposes. Refuges are currently located in the nearby counties of Marshall, Fulton, and Mason. For more information, contact Ross Adams at 309-535-2290.

The International Ecotourism Society (TIES) – TIES is dedicated to finding resources and building expertise to make tourism a viable tool for conservation and sustainable development. TIES offers courses in investment and financing for sustainable hotels and resorts as well as tutorials on planning, designing, and operating "ecolodges." For more information, contact TIES at 202-347-9203.

Land & Water Conservation Fund/Open Space Lands Acquisition and Development Program – This National Park Service program provides matching grants to local governments for the acquisition and development of public outdoor recreation areas and facilities. The program pays up to 50% of the project costs with a maximum of $200,000. Funding assistance is provided for additions to existing parks, wildlife areas, nature preserves, beaches and greenways, parkways for public outdoor recreation, development of camping facilities, playgrounds and recreational trails, picnic facilities, and fishing & hunting facilities. Contact Sue Eubanks, Grant Administrator, at 217-785-3884 or 217-782-7481 for more information.

National Center for Bicycling and Walking – This organization provides information, training and education on bicycle and pedestrian facility planning, design & engineering; education and safety research and programs; effective advocacy techniques; and trails and greenway development. For more information, call 202-463-6622.

National Center for Small Communities (NCSC) – This organization is dedicated to providing elected leaders of America's small communities with tools to govern effectively and the skills to expand local economies, protect natural resources, and preserve community character. The

NCSC offers answers and how-to assistance on such issues as community capacity building, economic development, environmental planning and regulatory compliance, local government management, financing and budget, grassroots fundraising, and technology. For more information, contact 202-624-3550.

The National Park Service's National Heritage Areas Program – The Village of DePue can speak with Phyllis Ellin at 815-588-6040 about partnering with the National Park Service to designate the Village as a Heritage Area, as discussed earlier.

The Nature Conservancy (TNC) – TNC is currently working to promote nature-based tourism in the Illinois River Valley. The Village of DePue can speak with Joanne Skoglund in the Havana, Illinois office about this project at 309-547-2730 or by email at jskoglund@tnc.org.

The Peoria Park District – The Peoria Park District offers educational materials and tours to individuals interested in promoting nature-based tourism. The District has a 15 minute Gold Medal Tape, which touches on the many benefits of ecotourism, including its attractiveness to retirees, limited use of tax dollars, and minimal impact on the environment. The District can also provide tours to the new and highly successful RiverPlex Recreation & Wellness Center. For more information, contact Bonnie Noble at 309-682-1200 ext. 210.

Resource Conservation and Development (RC&D) Program – This Natural Resources Conservation Service program is designed to accelerate the conservation, development, and utilization of natural resources, improve the general level of economic activity, and enhance the environment and standard of living in designated RC&D areas. Bureau County and DePue fall in the Prairie Rivers RC&D Area. http://www.prairieriversrcd.org/ Prairie Rivers RC&D is a non-profit organization that brings together local people to address community development, recreation and tourism, land conservation, environmental enhancement, and sustainable economic development by helping to plan projects, answer technical questions, and obtain funding and assistance from other agencies. Prairie Rivers RC&D can be reached at 309-364-3979.

Rivers, Trails, and Conservation Assistance Program – This National Park Service program works with community groups and local and State governments to conserve rivers, preserve open space, and develop trails and greenways. The technical assistance offered through this program includes assessing resources, developing concept plans, identifying potential sources of funding, and providing conservation and recreation information. For more information, contact Diane Banta or Andre Gaither at 312-427-3688.

United States Environmental Protection Agency Superfund Redevelopment Initiative -- EPA's Superfund Redevelopment Program helps communities return some of the nation's worst hazardous waste sites to safe and productive uses. While cleaning up these Superfund sites and making them protective, the Agency is working with communities and other partners in considering future use opportunities and integrating appropriate reuse options into the cleanup process. For more information, contact Tom Bloom at 312-886-1967.

United States Tourist Council – This nonprofit association of conservation-concerned individuals, industries, and institutions who travel or cater to the traveler focuses on historic and scenic preservation, wilderness and roadside development, ecology through sound planning and education, and support of scientific studies of natural wilderness. For more information, call 202-479-3395.

Wal-Mart Good.Works Program – Wal-Mart and Sam's Club provide environmental grants to support environmental efforts and education in communities where their stores are located. Eligible organizations include non-profit organizations, schools, churches, and government-funded agencies. All requests for funding must be directed through Wal-Mart Stores, Sam's Clubs, Neighborhood Markets and Distribution Centers. With the Wal-Mart Distribution center nearby, the Village may be able to garner assistance for habitat preservation and ecotourism development efforts. For more information, see the Foundation's website at http://www.walmartfoundation.org/wmstore/goodworks/scripts/index.jsp.

Appendix C – Design Precedents

Dupage County Landfill/Blackwell Forest Preserve

The Dupage County Landfill Superfund site covers approximately 40 acres within the 1,235-acre Blackwell Forest Preserve. Two million cubic yards of wastes were deposited in the landfill between 1965 and 1973, creating a virtual mountain of waste and soil that rises 150 feet above the original ground surface. Local residents call this “mountain” Mount Hoy. EPA found groundwater contamination and, in 1990, added the site to its list of hazardous waste sites needing cleanup. EPA, Illinois EPA, and the Dupage County Forest Preserve District cleaned up the site, and it is now being used as a recreational area with picnic and camping areas, trails, and a lake. Mount Hoy is used for sledding and snow tubing during the winter months.

Cherokee County Superfund Site

Native grasses, streams, and wildlife have replaced barren rock and gravel at the Cherokee County Superfund site in Cherokee County, Kansas. One hundred years of mining left the land looking like the desolate surface of the moon. Today, however, a 900-acre portion of the site has been restored and it is now a wildlife habitat. This dramatic transformation happened after EPA added the site to its list of hazardous waste sites needing cleanup in 1983. EPA took action to prevent the dangerous levels of lead, cadmium, and zinc from endangering nearby residents and further damaging the area’s surface and groundwater. After ensuring that residents with private wells in the area had safe drinking water, EPA consolidated surface mine wastes and buried them on site in abandoned mine pits and shafts. The land was then covered with clean soil, streams were diverted to avoid the stored wastes, and the entire site was planted with native vegetation.

Bangor Gas Works Superfund Site

The construction of a Shaw’s Supermarket has returned the abandoned Bangor Gas Works site in Bangor, Maine, to economic viability and serves as a catalyst for future redevelopment activities in the community. From 1853 to 1963, a coal gasification processing plant operated on the site, resulting in the widespread coal tar contamination of soil and groundwater. EPA, the State of Maine, the City of Bangor and a local developer formed a partnership to clean up and redevelop the site. In addition to the much-needed grocery store, the City of Bangor used uncontaminated portions of the property to expand an abutting recreational park and donated a parcel to a nonprofit organization to build homes for the needy.

Army Materials Technology Laboratory (AMTL) Watertown Superfund Site

Since the summer of 1999, the historic AMTL Watertown area has been an office and manufacturing center, and the focus of attention in Watertown, Massachusetts. The center has been developed with the style and architecture of the original brick buildings. AMTL Watertown was established in 1816 and used for a variety of military- and war-related activities, including weapons and ammunition manufacture and storage. In addition, a research nuclear reactor was used for molecular and atomic structure research activities in the 1960s. In 1987, the Army discovered contamination during a site inspection, and in 1994, EPA added the site to its list of hazardous waste sites needing cleanup. Since that time, sources of contamination have been removed from the site and the nuclear reactor was demolished. The first redevelopment at the site occurred in 1968 when the town bought 55 acres of the property and built the Arsenal Mall, Harvard Community Health Center, and Arsenal Apartments on a portion of the land. In 1996, the Watertown Arsenal Development Corporation was formed, and its seven members, all residents of Watertown, are responsible for choosing, negotiating with, and overseeing a developer who will create an office park on 30 acres of the land. The first tenant, the Harvard Business School Publishing Office, is negotiating a lease and will bring 250-300 jobs to the site.

For more information on the Superfund Redevelopment Initiative, including success stories, an overview of the program, and tools and resources for the community, please see the Superfund Redevelopment Initiative website http://www.epa.gov/superfund/programs/recycle/.

AMD & Art, Testing the Waters

In Vintondale, Pennsylvania, forty acres of the demolished Vinton Coal and Coke Company mine are being transformed into a passive acid mine drainage treatment system integrated with a local community park and state heritage trail system. The Vintondale pilot project, which was co-designed by the D.I.R.T. Studio, combines the application of progressive science and technology and environmental education while celebrating the cultural heritage of the region. Rusty, mineral-laden water flows along the colorful plantings of a “Litmus Garden”, from an initial rate of 80-200 gallons per minute into a series of large gravity-fed water treatment ponds lined with crushed limestone to neutralize the pH and remove toxic metals. The water continues through bioremediation ponds and into a wetlands area, which further purifies the water before it joins a nearby river. This sort of passive treatment system incorporating the use of wetlands is a cost efficient, low-maintenance alternative to active, chemical treatment of acid mine drainage. The Ghost Town Trail, a Rails-to-Trails hiking and biking trail, follows the path of a former rail bed and brings 75,000 people by the Vitondale site annually. (For more information: http://www.amdandart.org/; http://www.dirtstudio.com/PROJECTS/AMD/amda.htm)

AMD & Art’s Vitondale, PA project “Testing the Waters” site conceptual plan and site under construction.

Appendix D – List of Acronyms

ATSDR - **(*Agency for Toxic Substances and Disease Registry*):** Federal agency within the Department of Health and Human Services tasked to prevent exposure and adverse human health effects and diminished quality of life associated with exposure to hazardous substances from waste sites, unplanned releases, and other sources of pollution present in the environment.

CDBG - (*Community Development Block Grant*): A Community Development Block Grant is a federal entitlement program administered by the U.S. Department of Housing and Urban Development (HUD) Community Planning and Development Office. These grants provide eligible metropolitan cities and urban counties (called "entitlement communities") with annual direct grants that they can use to revitalize neighborhoods, expand affordable housing and economic opportunities, and/or improve community facilities and services, principally to benefit low- and moderate-income persons.

CERCLA - (*Comprehensive Environmental Response, Compensation, and Liability Act (1980)*): The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, was enacted by Congress on December 11, 1980. This law created a tax on the chemical and petroleum industries and provided broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment.

CERCLIS - (*Comprehensive Environmental Response, Compensation, and Liability Information System*): The Comprehensive Environmental Response, Compensation, and Liability Act Information System (CERCLIS) is EPA's database management system which maintains a permanent record of all information regarding all reported potential hazardous waste sites.

HAZMAT - (*Hazardous Materials*): Chemicals, usually the by-product of an industrial process, that are a danger to human health and the environment.

HRS - (*Hazard Ranking System*): The HRS is the scoring system used by EPA's Superfund program to assess the relative threat associated with actual or potential releases of hazardous substances. The HRS is the primary screening tool for determining whether a site will be included on the National Priorities List (NPL), EPA's list of priority sites identified for possible long-term remedial action under Superfund. The scoring system assigns each site reviewed with a value between 0 and 100. A score of 28.5 or higher will place the site on the NPL.

IDNR – (***Illinois Department of Natural Resources*):** The state agency responsible for managing Illinois' cultural and natural resources.

NCP - (*National Contingency Plan*): The National Oil and Hazardous Substances Pollution Contingency Plan, more commonly called the National Contingency Plan or NCP, is the federal government's blueprint for responding to both oil spills and hazardous substance releases.

NPL - (*National Priorities List*): The NPL is EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for

possible long-term remedial action under Superfund. The list is based primarily on the score a site receives from the Hazard Ranking System. EPA is required to update the NPL at least once a year. A site must be on the NPL to receive money from the Trust Fund for remedial action.

O&M - (*Operations and Maintenance*): Activities conducted after a Superfund site remedial action is completed to ensure that the site remedy remains effective in the future.

OERR - (*Office of Emergency and Remedial Response*): Manages the Superfund program, which was created to protect citizens from the dangers posed by abandoned or uncontrolled hazardous waste sites. Congress established Superfund through the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

OSWER - (*Office of Solid Waste & Emergency Response*): The Office of Solid Waste and Emergency Response (OSWER) develops guidelines and standards for the land disposal of hazardous wastes and underground storage tanks. OSWER also implements a program to respond to abandoned and active hazardous waste sites and accidental releases, including some oil spills, and encourages the use of innovative technologies for contaminated soil and groundwater.

PA - (*Preliminary Assessment*): The PA is the first stage of the EPA site assessment process. It is a relatively quick, low-cost compilation of readily available information about a site and its surroundings. The PA emphasizes identifying populations and other targets that might be affected by the site. It includes a reconnaissance of the site and surrounding area, but not environmental sampling. The PA is designed to distinguish between sites that pose little or no potential threat to human health and sites that warrant further investigation.

PRP - (*Potentially Responsible Party*): A group that has been identified by EPA as being liable for incurring the costs of cleanup at a contaminated site.

RCRA - (*Resource and Recovery Act of 1976*): The regulatory system that manages hazardous waste from the time they are generated to their final disposal. RCRA imposes standards for transporting, treating, storing, and disposing of hazardous wastes. It is designed to prevent the creation of new hazardous waste sites by authorizing EPA to take administrative, civil, and criminal actions against facility owners and operators who do not comply with RCRA requirements.

RD/RA - (*Remedial Design / Remedial Action*): Remedial Design (RD) is the phase in Superfund site cleanup where the technical specifications for cleanup remedies and technologies are decided. Remedial Action (RA) follows the remedial design phase and involves the actual construction or implementation phase of Superfund site cleanup. The RD/RA is based on the specifications described in the record of decision.

RI/FS - (*Remedial Investigation / Feasibility Study*): After a site is listed on the NPL, an RI/FS is performed at the site. The RI serves as the mechanism for collecting data, while the FS is the mechanism for developing, screening, and evaluating alternative remedial actions. The RI and FS are conducted concurrently. Data collected in the RI influence the development of remedial alternatives in the FS, which in turn affect the data needs and scope of treatability studies and additional field investigations.

ROD - (*Record of Decision*): This EPA document represents the final remediation plan for a site. It documents all activities prior to selection of the remedy, and provides a conceptual plan for activities subsequent to the ROD. The purpose of the ROD is to document the remedy selected, provide a rationale for the selected remedy, and establish performance standards or goals for the site or operable unit under construction. The ROD provides a plan for site remediation, and documents the extent of human health or environmental risks posed by the site or operable unit. It also serves as legal certification that the remedy was selected in accordance with CERCLA and NCP requirements.

RPM - (*Remedial Project Manager*): The principle person responsible for the oversight of the cleanup of hazardous waste sites. The RPM directs all investigations, planning, remedial activities, and manages technical, legal and community relations issues at assigned sites. The RPM also directs contractual efforts to ensure proper allocation of funds and that contractor uses are effective and efficient. The RPM represents the agency responsible for the cleanup in contacts with the public, industry, elected officials and the media.

SARA - (*Superfund Amendments and Reauthorization Act of 1986*): This legislation amended the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in 1986. SARA's changes stressed the importance of permanent remedies and innovative treatment technologies in cleaning up hazardous waste sites; required Superfund actions to consider the standards and requirements found in other state and federal environmental regulations; provided new enforcement authorities and settlement tools; increased state involvement in every phase of the Superfund program; increased the focus on human health problems posed by hazardous waste sites; encouraged greater citizen participation in site remediation plan designs; and increased the size of the trust fund to $8.5 billion.

SI - (*Site Inspection*): Part of the EPA site assessment pipeline. The SI is a dynamic process tailored to the specific circumstances of individual sites; it is not a standardized process to be repeated at every site. The objective of the SI is to gather information to determine if the site poses a threat to human health or the environment in order to support a site decision regarding the need for further Superfund action. The SI begins by verifying the hypothesis put forth in the PA. This is accomplished through the collection and analysis of wastes and environmental media samples to determine whether hazardous substances are present at the site and are migrating to the surrounding environment. The SI data is used for removal actions, other response actions, and to determine if the site is eligible for inclusion on the NPL.

SRI - (*Superfund Redevelopment Initiative*): A national EPA program that focuses on the return of Superfund sites to productive use, the achievement of site cleanups that are consistent with a community's anticipated land use, and the facilitation of the reuse of sites where appropriate. The components of the program include pilots, policies, partnerships, and promotion.

TAG – **(*Technical Assistance Grant*):** A grant that provides money for activities that help communities living near a Superfund site participate in decision-making at the Superfund site. The bulk of TAG funds are typically used to hire an independent technical advisor to help the community interpret and comment on site-related decisions.

TOSC - (*Technical Outreach Services for Communities*): The TOSC program uses university-based educational and technical resources to help communities understand the technical information and issues associated with local hazardous waste sites. TOSC's mission is to empower communities to participate substantively in the decision-making process regarding their hazardous substance problems.

Appendix E – Sources of Information

Adams, Ross. U.S. Fish and Wildlife Service. Havana, IL.

Bellovics, George. Illinois Department of Natural Resources.

Dittmer, Daria. April 1993. *Wythe County Economic Development Strategic Plan*. Virginia Polytechnic Institute and State University. Blacksburg, VA.

Ellin, Phyllis. National Park Service. Lockport, IL.

Forrer, Virginia. Illinois EPA. Springfield, IL.

Illinois Department of Public Health. December 17, 1999. *Public Health Assessment for DePue/New Jersey Zinc/Mobil Chemical Corporation.* Available online at http://www.atsdr.cdc.gov/HAC/PHA/depue/dep_toc.html.

Illinois Environmental Protection Agency (EPA). October 1992 – September 2002. *New Jersey Zinc/Mobil Chemical Fact Sheets # 1-8.* Springfield, IL.

Illinois EPA. September 2003. *New Jersey Zinc/Mobil Chemical Superfund Site Update*. Springfield, IL.

Illinois EPA. March 2004. *New Jersey Zinc/Mobil Chemical Superfund Site Update*. Springfield, IL.

Illinois EPA. September 2003. *Responsiveness Summary – South Ditch Unnatural Sediments Proposed Plan and Alternatives*. Springfield, IL.

Lange, Rich. Illinois EPA. Springfield, IL.

North Central Illinois Council of Governments. Princeton, IL. Available online at http://ncicg.org/.

Resetich, Mike. Illinois Department of Natural Resources. DePue, IL.

Appendix E – Sources of Information, cont.

U.S. Army Corps of Engineers – Rock Island District. http://www.mvr.usace.army.mil/.

U.S. Department of the Interior, U.S. Fish and Wildlife Service, and U.S. Department of Commerce/U.S. Census Bureau. 2001. *National Survey of Fishing, Hunting, and Wildlife-Associated Recreation.* Available online at http://www.census.gov/prod/www/abs/fishing.html.

U.S. EPA Office of Sustainable Ecosystems & Communities. May 1997. *Nature-Based Tourism Issue Brief #1.* Washington, DC. Available online at http://yosemite.epa.gov/water/OSECWeb.nsf/76bd294a0ca89b0685256324004f09cc/b7097c4b669136be8525648b006593f3?OpenDocument

U.S. Forest Service & National Oceanic and Atmospheric Administration. 2000. *National Survey on Recreation and the Environment.* Available online at http://www.srs.fs.usda.gov/trends/Nsre/nsre2.html.

Widmar, John. DePue Men's Club.

Appendix F -- Questions and Answers regarding Lake DePue
Source: Mike Resetich, Illinois Department of Natural Resources

1. What was the historical condition of this lake? (Is it known to the USGS whether it is a natural oxbow or was it sectioned off of the IL River? If so, when?)

Early in the 1900's, the bottomland water areas of the Illinois River were almost pristine even though a surprising amount of forest in the lower valley flood plain had been cleared for cultivation. Today, the appearance of the Illinois Valley is a far cry from its appearance in the early 1900's. Near-pristine condition is available in sketchy historical accounts, in old photographs, and in maps prepared by J.W. Woermann between 1092 and 1904 for the U.S. Army Corps of Engineers' Chicago Office.

Water diverted in appreciable volumes from Lake Michigan to the Illinois River when the Sanitary and Ship Canal opened at Chicago in January of 1900. Navigation dams were completed in 1933 on the upper river above Utica. These dams had a profound effect on this reach, which had a narrow flood plain and narrow fall. In 1938, the Peoria and LaGrange dams were completed, but had less of an effect on the middle portion of the river.

Lake DePue is a backwater lake located on the north bank of the Illinois River just upstream from the "great bend" at Hennepin (approx. river mile 209 in Bureau County). Lake DePue is at the upper end of the Peoria pool, which stretches from river mile 157 to 230. Before World War II, Lake DePue was a highly popular boating lake. In particular, boat racing and regattas were popular. The former lake depth was about 18 to 20 feet according to information from local residents. However, sediment has been carried into the lake by flood flows of the Illinois River and probably also by tributary inflow from agricultural lands to the north of the lake. This sediment has reduced the size of the navigable part of the lake.

2. How does Lake DePue impact the hydrology of the area? Does it have a role in flood control? If the site were to become a wetland, would overland flow go into the IL River?

First, the east end of the lake receives inflows directly from the Illinois River through the railroad openings during high river stages. Once the flow passes westward through the narrow restriction, the water spreads over the wide marshy lake area. Most of the sediment then deposits in the lake. Second, the natural levee along the south side of the lake has an elevation of approximately 450 msl, which is only 9 feet above the normal lake level. Therefore, the lake often receives water from the Illinois River directly, overtopping the natural levee. Consequently, the sediment is rather uniformly deposited.

The term wetland is a very broad term and needs to be more defined. It can be broken down to marshes and swamps and from there 20 other categories. So, we will narrow it down as best as we can to meet our needs and our geographic features. We will call it a deep fresh marsh with soil covered with six inches to three feet of water with cattails, reeds, bulrushes and spiked rushes. In order for a wetland condition to happen, there needs to be some sort of water control.

Stabilization of Water Levels: Plants and animals are usually not too versatile in relation to a change from water to land habitats or the reverse. Certain animals are suited to both wet and dy conditions (amphibians), but usually the degree of versatility is pretty well fixed even with these species. Some of the most successful techniques for managing wildlife have been the brining back of water levels to drained lands and the stabilization of these levels after the water has been brought back. Such stabilization is concerned with retaining the water and enabling it to be passed along when too much is available.

During flood conditions, the overland flow would proceed into the Illinois River as with all other backwater lakes in the Illinois River system.

For the creation of a wetland: (1) The water level in Lake DePue would be raised to an elevation of 443 feet. This would increase the lake surface area to 677 acres - a 20% increase. (2) A water control structure with a spillway at an elevation of 444 feet would be constructed at the outlet of Lake DePue into the Illinois River. (3) A levee would be constructed to enable Lake DePue to be maintained at an elevation of 443 feet. (4) A pump would be installed to raise the lake level one foot in a ten day period, particularly when the lake level is down in the dry season. (5) A small boat lift would be installed to allow access to the lake from the Illinois River.

Ultimately, the creation of a wetland could potentially act to contain contaminated lake sediment, thus prohibiting its movement onto adjacent lands and water.

3. How would the hydrology of the local area change if the lake were to become a wetland?

The only change would be a good change in the fact that we can have water control and be able to keep the wetland situation as described above. By being able to control the water, we could increase the surface water by 20% and that water could be insured during the drier summer season. This would alleviate the problem that occurs during low water stages in which the water from the river cannot flow into the lake.

4. Where does the water pouring into the lake originate?

There are five flood stages at water elevations of 440, 442, 447 and 450 msl, which delineate where the water originates. The river flow goes through the railroad opening at a river stage of about 447 ft, msl. Based on the duration table at Hennepin, the water is higher than 447 feet for roughly 10% of the year. Therefore, inflow to Lake DePue through the east side railroad opening occurs about 36 days per year. The junction of Negro Creek to the Illinois River is located immediately upstream of the railroad openings. The drainage area of Negro Creek is about 32 square miles. The sediment yield from this watershed can be carried into the east side to Lake DePue only at a river stage of 447 feet or above. The sediment yield from this watershed was not estimated. However, it has been observed that the significant sedimentation may be transported into the lake at about 447 feet, which occurs during roughly 36 days of the year.

The third sediment transport mode comes from the north side of the lake. The total drainage areas of the north side is not significant. A bluff area may contribute some sediment yield.

The fourth sediment transport mode comes from the south side island at high river stage. The river flow can inundate the island only at 450 feet msl (approx.), which is about 2.5% of the days in a year. Compared to other modes, the likelihood of sediment transport via this mechanism is remote.

5. If the Lake does play a role in flood control, do the contaminated sediments have the potential to impact the selected remedy?

It may depend on the remedy but by creating the wetland as described in #2 above, not only does the wetland get created, but it also contains the contaminants.

6. What local wildlife might be negatively impacted by the lake becoming a wetland? Do any species stand to benefit? Suffer?

No wildlife should be negatively impacted. This habitat enhancement would help ducks, geese, all varieties of shorebirds, egrets, herons, eagles, bitterns, beavers, otters, muskrat , minks, weasels, and racoons, as well as other animals. Additionally, aquatic vertebrates and invertebrates would benefit.

7. How would the lake becoming a wetland affect surrounding ecosystems?

Community in the ecological sense includes all of the populations occupying a given area. The community and the nonliving environment function together as an ecological system or ecosystem. Marshes are wetlands in which the grass life form is dominant, while swamps are wooded. Both may range from deep to shallow water, and both embrace a richness and diversity of life that is hard to equal in other temperate communities. Yet marshes and swamps too frequently are considered more as places to be drained or filled than as areas to be managed and preserved.

Appendix G - Remedial Precedents and Related Research

Many of the contaminants found on the DePue / New Jersey Zinc / Mobil Chemical Corporation Superfund site, such as arsenic, cadmium, lead, zinc, copper, cyanide, iron, and selenium can be remediated using natural or constructed wetlands. The ability of wetlands to cleanse contaminants from soil and surface water was discovered in the early 1990s. Since then, several contaminated sites around the country have been successfully remediated through the creation and restoration of wetlands. Examples of wetland remediation of several site contaminants follow.

Richmond, California - constructed wetlands successfully removed nearly 90 percent of soil selenium concentrations from discharge at the Chevron Oil Refinery site. http://216.239.53.104/search?q=cache:rd3e0yKKdXcJ:danr.ucop.edu/news/newsreleases/wetlands.html+%22wetland%22,+%22remediation%22,+%22selenium%22&hl=en&ie=UTF-8

Idaho Springs, Colorado - constructed wetlands were used to treat an area of acid mine drainage from the Big Five Tunnel site. Over a three year period, dissolved aluminum, cadmium, chromium, copper, zinc, iron, and lead concentrations were reduced by nearly 100%. Significant nickel and manganese concentrations were also reduced, and surface water pH was raised from 2.9 to 6.5. http://216.239.57.104/search?q=cache:oz21dkjUb8oJ:www.frtr.gov/matrix2/section4/4_48.html+%22wetland%22,+%22remediation%22,+%22copper%22&hl=en&ie=UTF-8

Coeur d'Alene River Basin, Idaho - high concentrations of arsenic, cadmium, zinc, and lead from the smelters at the Bunker Hill Superfund site caused loss of hillside and wetland vegetation and severe deposition of eroded soil in the river basin. Surface application of biosolids, wood ash, logyard waste, and a seeding mixture added to the tailings piles and eroded hillsides lead to a dramatic reestablishment of wetland species, reduction of soil metal toxicity, and improved surface water quality. http://216.239.57.104/search?q=cache:BCnHncZDiqUJ:www.cfr.washington.edu/Research/fact_sheets/06-Henry-bunkerhill.pdf+%22wetland%22,+%22remediation%22,%22lead%22&hl=en&ie=UTF-8

Casper, Wyoming - wetlands were used to treat petroleum hydrocarbons at a closed refinery. http://216.239.53.104/search?q=cache:o_8QPHBoeK0J:lbewww.epfl.ch/COST837/grainau/W3.pdf+%22wetland%22,+%22remediation%22,+%22cyanide%22&hl=en&ie=UTF-8

Knoxville, Tennessee - cyanide and petroleum hydrocarbons were reduced in groundwater discharge by wetlands. http://216.239.53.104/search?q=cache:o_8QPHBoeK0J:lbewww.epfl.ch/COST837/grainau/W3.pdf+%22wetland%22,+%22remediation%22,+%22cyanide%22&hl=en&ie=UTF-8

For more information, contact:

E² Inc.
2417 Northfield Road
Charlottesville, VA 22901
434.975.6700 - fax 434.975.6701
www.e2inc.com