Reuse Assessment Report: Chem-Dyne Corporation Superfund Site

July 2008

Prepared for:

EPA Region 5
Superfund Redevelopment Initiative

Prepared by:

E² Inc.

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Cover Photographs: (top) View of the Chem-Dyne Corporation Superfund site, looking north from Joe Nuxhaul Blvd.; (bottom) View of the Ford Hydraulic Canal, looking north from levee

I. Site Overview

EPA's primary responsibility at Superfund sites is to ensure the protection of human health and the environment. Consideration of a site's potential future use is an important part of this responsibility under the National Contingency Plan (NCP), because it is a part of two of the nine criteria for remedy selection. The first is the threshold criterion of overall protection of human health and the environment. EPA uses its evaluation of reasonably anticipated future land use to establish remedial goals and to select remedies that will allow for those uses whenever possible. Collaboration among EPA, communities, and site stakeholders in the evaluation of future uses establishes realistic expectations for how a site can be used after cleanup. This collaborative process can also help implement appropriate institutional controls, which are necessary to help maintain the protectiveness of remedies at sites where waste is left in place.

Consideration of future land use also plays a central role in addressing the modifying community acceptance criterion of the NCP. It has been demonstrated at many Superfund sites that, when EPA works closely with communities and site stakeholders to determine a site's reasonably anticipated future land use, a high degree of community acceptance of the remedy is likely.

Finally, the proper consideration of future site uses can help enable communities to safely return sites to protective, sustainable, and productive uses, a national goal outlined in the Agency's 2006-2011 Strategic Plan. The Superfund Redevelopment Initiative (SRI) was created by EPA in 1999 to help communities and stakeholders in their efforts to return environmentally impaired sites to beneficial use. SRI provides a range of tools and information resources for EPA staff and stakeholders interested in Superfund site reuse.

At the Chem-Dyne Corporation Superfund site in Hamilton, Ohio, EPA Region 5 provided resources for EPA contractor E² Inc. to conduct research and analyses of the site's characteristics, remedy components, ownership, and reuse opportunities to help inform the development of an institutional controls study for the site. The draft site remedy and reuse considerations report was developed following the information collection guidelines outlined in EPA's 2001 Reuse Assessment Guidance (OSWER 9355.7-06P). Information gathered and reviewed included site features and environmental considerations, site ownership, land use considerations and environmental regulations, targeted stakeholder input, public initiatives, and likely future uses.

Introduction

Remediation and long-term stewardship planning efforts are underway at the Chem-Dyne Corporation Superfund site (Chem-Dyne site) in Hamilton, Ohio. Remediation of soil and ground water contamination at the site is ongoing. EPA has completed the remediation of contaminated site soils, and completion of the site's ground water cleanup is expected in several years time. As remedial activities are completed, portions of the site may become available for limited reuse. In order to ensure the protection of human health and the environment over the long-term, EPA, the site's owners, prospective purchasers, state and local government officials, and responsible parties will need to work together to ensure that potential future land uses and activities at the site are carefully integrated with the site's remedy components, including a clay capped area and subsurface ground water remedy components. As future land uses are considered for the site, institutional controls (ICs) will play a critical role in restricting the types of land uses and activities that are compatible with the site's remedy.1

[1] Institutional controls (ICs) are non-engineered component of site remedies that limit the potential for human exposure to contamination at sites where waste remains in place at levels that do not allow for unrestricted future use and unlimited exposure. ICs limit land resource use by producing information that helps modify or guide human behavior at a site. Examples of ICs include zoning restrictions, building or excavation permits, well drilling prohibitions, and easements and covenants.

The following report highlights key information about the site's history, selected remedy, ownership, physical characteristics, surrounding land uses, and potential stakeholders that can help to inform the implementation of institutional controls and potential future land uses at the site.

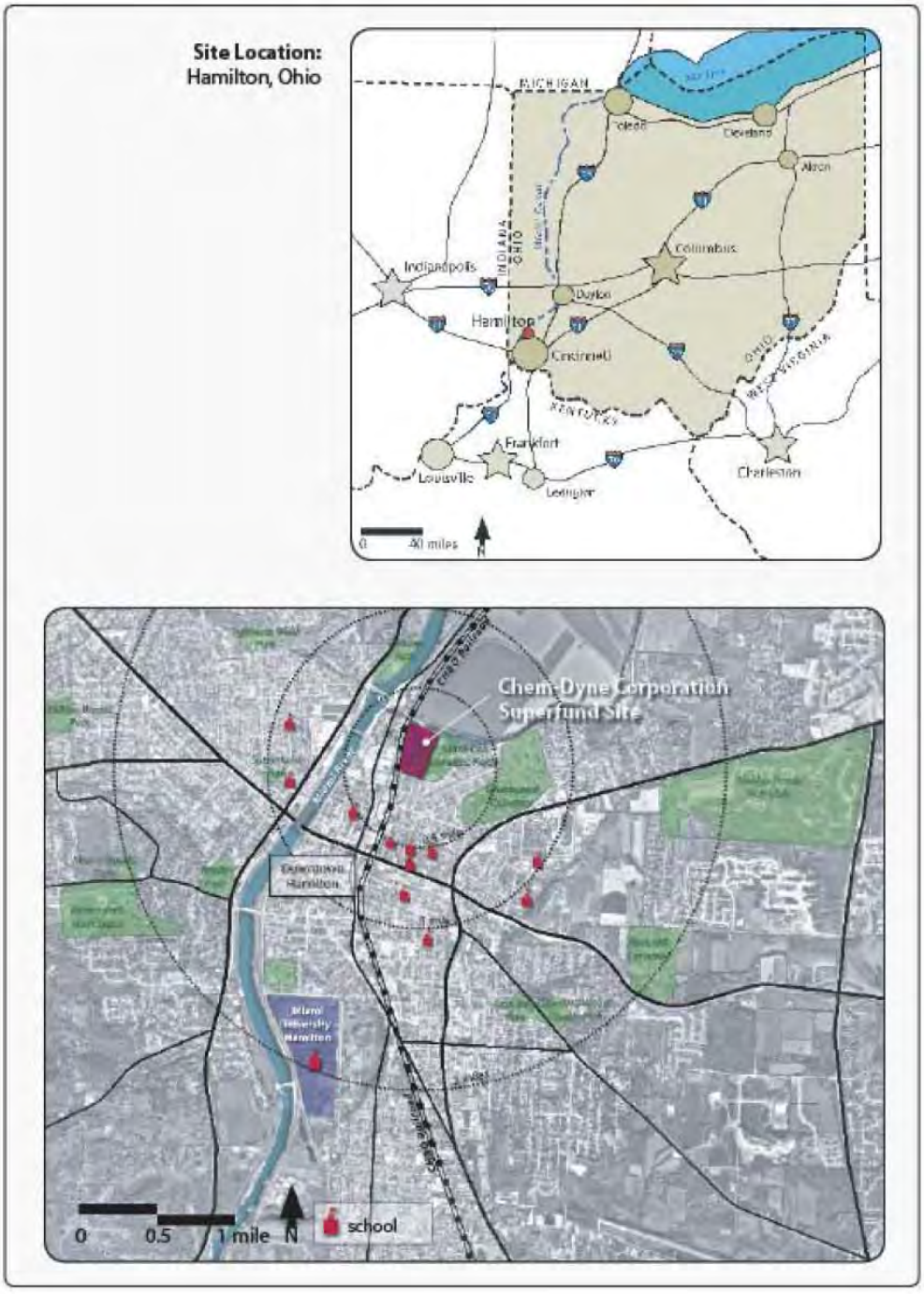


	Figure 1 Site Location Map	*Chem-Dyne Corporation* *Superfund Site*

II. Site History Considerations

The Chem-Dyne site is a former chemical waste recycling and storage facility located in Hamilton, Ohio (see Figure 1 on page 5). Between 1974 and 1979, Chem-Dyne Corporation accepted drums and bulk cargo containers of chemical waste from over 200 generators. The company recycled, stored, and disposed of a broad range of chemical industrial wastes.

Over 30,000 barrels and 300,000 gallons of bulk materials were left on the site when chemical storage and recycling operations ceased in 1980. According to the site's 1985 Record of Decision (ROD), uncontrolled releases of hazardous materials were frequent at the Chem-Dyne facility. Liquid wastes were often mixed in open gravel pits, resulting in the release of vapors into the air as well as the contamination of the underlying soils and ground water. Various wastes stored in 55-gallon drums and railroad tank cars were also dumped into ditches and stored on the site.

Improper hazardous waste handling and disposal practices at the site led to the contamination of the site's soil and ground water. Ground water was contaminated with volatile organic compounds (VOCs) and heavy metals. However, drinking water supplies were not affected. Soils were contaminated with VOCs, pesticides, other organic compounds, and non-organic compounds, including mercury, arsenic, nickel, and beryllium. On-site buildings were contaminated with polychlorinated biphenyls (PCBs).

In 1985, EPA selected a final remedy for the site. The site's ROD outlined the following response actions for the site:

- removal of contaminated soil hot spots;
- construction of a cap over the remaining contaminated soils;
- installation of a ground water extraction-injection system;
- demolition of eight contaminated buildings on the site; and
- excavation of a perimeter trench, which would sever utilities and stormwater conveyances.

All surface cleanup actions were completed in 1987. The ground water extraction-injection system has been in operation since 1988 and is expected to remain in operation beyond 2008.

Key Site History Considerations:

- The site's remedy has removed the immediate threats of exposure to the VOC, SVOC, and heavy metals contamination at the site; however, waste remains in place at the site at levels that do not allow for unrestricted future use and unlimited exposure. The site's 1985 ROD requires the use of ICs, including deed notices, covenants and easements, to help maintain the protectiveness of the site's remedy. The site's 2005 Five-Year Review states that an IC study for the site was scheduled to begin in 2006. EPA site staff indicated that, as of November 2007, ICs for the site have not yet been designed or implemented.

III. Site Remedy Considerations

To help inform EPA's efforts to maintain the long-term effectiveness and permanence of the Chem-Dyne site's remedy, the following section of the report analyzes the site's remedy components, identifying key reuse and long-term stewardship considerations that will need to be kept in mind as the site is returned to reuse. A discussion of the remedies selected for contaminated soils, on-site facilities, and ground water is presented below; key reuse and long-term stewardship considerations highlight the potential reuse implications of each component of the site's remedy.

Soil Remediation and On-Site Facility Demolition:

Prior to the selection of the site's remedy, removal actions conducted by EPA and the Chem-Dyne Trust addressed priority VOC and PCB-contaminated soils within a 10-acre area at the site. The ROD specified the need for further removal of contaminated source material, the demolition and removal of contaminated buildings and structures from the site, and the construction of a composite cap over the 10-acre area (see Figure 2 on page 8).

The remediation of the site's contaminated soils included the excavation and removal of contaminated hotspots located on and off-site, as determined by sampling. Eight buildings were demolished and disposed of off-site. Storm sewers at the site were decontaminated and all other utilities were severed and grouted at the site boundary. Once soil removals and facility demolition and disposal activities were complete, remaining contaminated soils were capped with a composite cap with the following specifications:

- a six-inch layer of top soil
- a six-inch layer of sand
- a high-density polyethylene liner
- a six-inch layer of sand
- a 24" layer of clay

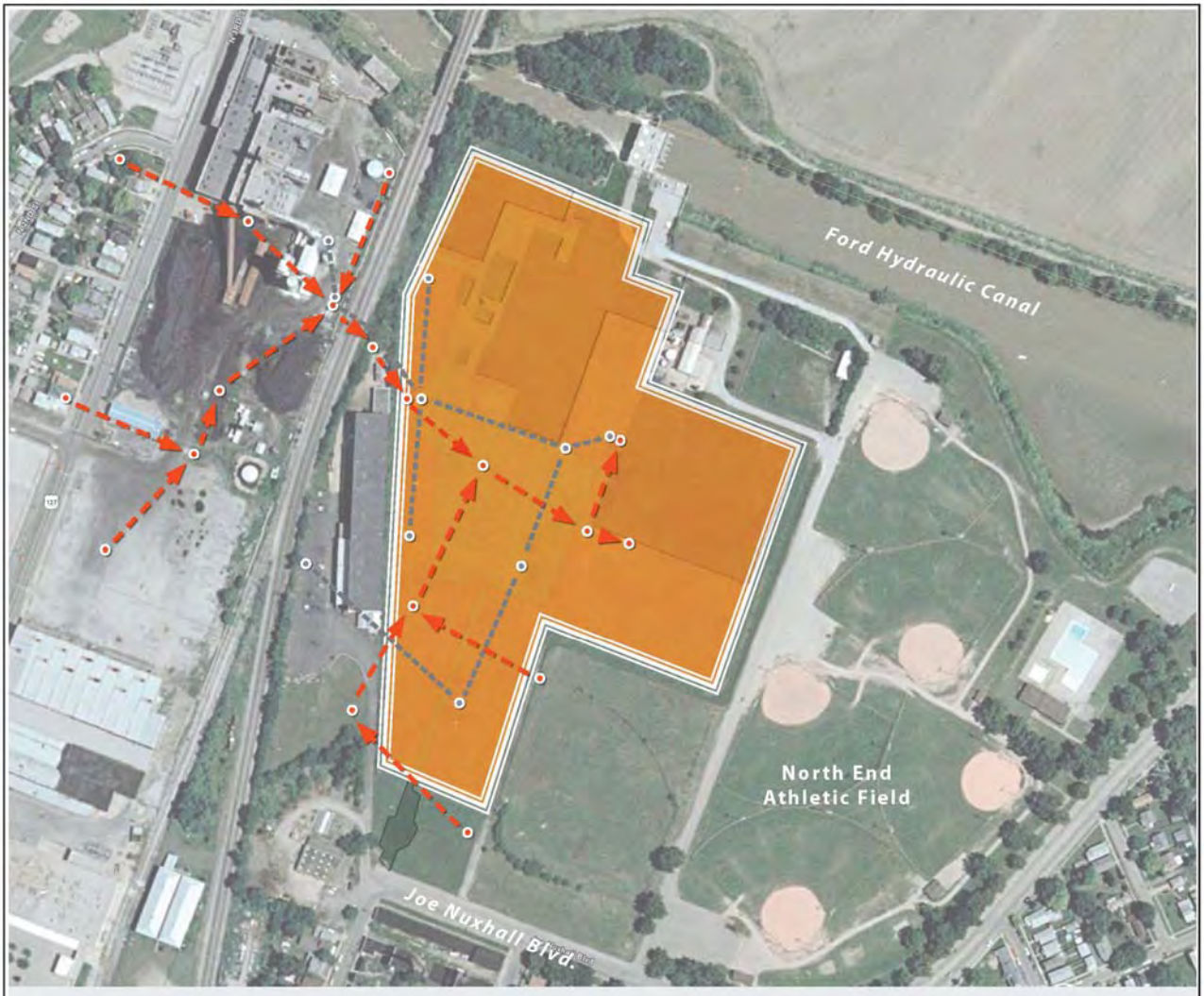
The Chem-Dyne Trust is responsible for the maintenance of the cap until ground water cleanup standards have been achieved or until another viable entity is willing and able to continue its maintenance.

Key Future Land Use and IC Considerations for Capped Areas:

- Due to the presence of waste-in-place, future land uses and activities within the 10-acre capped area will likely need to be restricted through the use of ICs, which may include deed notices, or proprietary restrictions such as restrictive covenants. As of the site's 2005 Five-Year-Review, ICs had not been established for the site.

- ICs for the site's capped area would likely need to prevent excavation and the construction of buildings with a foundation, as well as the use of the area for residential land uses. Re-grading of the site's capped area would not be possible without significant modification of the remedy, and excavation for building foundations or footings would likely cause a breach of the site's cap.

- In the future, reuse opportunities for the capped area could include: paved parking or material storage areas; light frame buildings that do not require concrete footings, such as hoop house–style green houses; and passive recreational uses, such as walking trails. Further discussion among EPA Region 5, Ohio EPA, and the Chem-Dyne Trust would be needed to determine the range of materials that could serve as effective covers for the site's cap (e.g., asphalt, concrete, vegetative covers).



MAP KEY

- Site Boundary and Approximate Area of Cap
- Former Location of Site Structures
- Extraction Wells and Gravity Sewer Collection Lines
- (Inactive) Injection Wells and Force-main Aquifer Recharge Lines

SCALE: 0 250 500ft.

Extraction Wells and Gravity Sewer Collection Lines:
A series of extraction wells withdraw ground water contaminated with VOCs from a plume that extends beneath the Chem-Dyne property and northeast toward the Great Miami River. A network of underground gravity sewer collection lines carry the contaminated ground water to a treatment building located on the northwestern portion of the site. The contaminated ground water is treated on-site through an air stripping process, designed to remove 95 percent of the VOC contaminants.

Inactive Injection Wells and Force-main Aquifer Recharge Lines:

A series of underground aquifer recharge pipes formerly carried treated ground water back to injection wells. The injection system has not been operative since 1992; underground infrastructure remains in place.

NORTH

Figure 2
Post-Remediation Site Plan

Chem-Dyne Corporation
Superfund Site

Ground Water Remediation:

The site's ROD identified a VOC ground water plume located beneath the site and extending northwest toward the Great Miami River. The ROD required the operation and maintenance of a ground water extraction and injection system to address the contamination.

The ground water extraction and injection system includes a network of extraction wells and underground gravity sewer collection lines, which carry contaminated ground water to a treatment building located on the northwestern portion of the site (shown in red dashed lines in Figure 2 on page 8) Contaminated ground water is treated on-site through an air stripping process designed to remove 95 percent of the VOC contaminants. Formerly, restored ground water was pumped back into a shallow-zone aquifer via a second network of underground force-main aquifer recharge pipes (shown in gray dashed lines in Figure 2 on page 8). The aquifer re-injection system was not effective and has not operated since 1992. However, the inactive well heads and force-main water lines remain in place.

The remedy components for the site's ground water treatment system extend throughout the capped area and beyond the boundaries of the former Chem-Dyne facility property boundary. Six extraction wells and seven inactive injection well heads extend above the surface of the 10-acre capped area, and an additional twelve extraction well heads and three inactive injection well heads are located outside the boundaries of the 10-acre capped area.

The operation and maintenance of the ground water treatment system is currently the responsibility of the Chem-Dyne Trust. The Trust has operated the site's ground water treatment system since its installation in 1987. The Enforcement Decision Document (EDD) for the site specified that the Trust is responsible for the system's operation and maintenance for a period of 20 years, or until the Trust can demonstrate that ground water cleanup standards (a total VOC concentration of 100 parts per billion) have been achieved and that contaminant levels are consistently below that standard. If ground water cleanup goals have not been achieved after 20 years, the EDD indicates that EPA, Ohio EPA, and the Trust could potentially consider modification of the system. Currently, EPA, Ohio EPA, and the Trust are working to determine whether cleanup standards have been achieved.

The site's 2005 Five-Year-Review clarifies that the site's ground water remedy has effectively contained the VOC plume and references an IC study planned for 2006 that will consider ICs to help maintain the protectiveness of the site's ground water remedy. However, there is some indication that the system is not effectively reducing VOC concentrations. The inefficiencies of the ground water remedy have been the subject of ongoing discussions among EPA, Ohio EPA, and the Chem-Dyne Trust.

The Chem-Dyne Trust has indicated that the current system may not be a cost-effective method of remediating the site's ground water. The Trust is currently evaluating a range of potential remedy enhancements that would address residual source contamination that could be a potential contributor to the remaining VOC concentrations in the ground water plume. The precise location and method of the proposed source material removal are not known at this time. Source material is believed to be located within the Chem-Dyne site boundary. In-situ treatment of contaminated subsurface soils (e.g, soil vapor extraction) has been contemplated, but plans have not been finalized. Ohio EPA representatives have indicated that the Trust would likely complete site remedy enhancements in the next two to five years. Further coordination among EPA, Ohio EPA, and the Chem-Dyne Trust will likely take place in the near-term to determine the feasibility and implications of the proposed source removal.

Key Future Land Use and IC Considerations for Ground Water Remediation Areas:

- ICs for the site's ground water contamination will be required to restrict the use of ground water for potable use. Ground water use restrictions would need to cover the 10-acre Chem-Dyne site, as well as a 30-acre off-site area that approximates the extent of the VOC plume. In addition to ground water use restrictions, excavation restrictions or one-call notification would likely be needed for off-site areas to ensure that excavation activities do not cause a breach of the subsurface remedy components.

- December 2007 marks the end of a 20-year operation and maintenance period for the site's ground water remedy. The Trust is responsible for operating the site's remedy until ground water cleanup standards have been achieved. However, if cleanup standards have not been achieved after 20 years of the system's operation, a determination may be made by EPA, OEPA, and the Trust as to whether the continued operation or modification of the system would be cost effective. A discussion of alternatives to the continued operation of the existing system will likely happen in the near term. These conversations would likely be an opportunity build on discussions regarding ICs and long-term stewardship issues for the site.

- The warehouse buildings that house the Chem-Dyne Trust site office and the site's ground water treatment system may present reuse opportunities in the long-term. The facilities include a 3,000 square foot warehouse and ancillary office space. The Chem-Dyne Trust's willingness to retain these structures and the cost and feasibility of removing the ground water remedy components from the buildings would be key factors in determining the viability of reusing the buildings.

IV. Zoning and Surrounding Land Use Considerations

The following analysis of the Chem-Dyne site's surrounding land uses and zoning districts highlights general land use trends to keep in mind as future land use alternatives are considered for the site.

- *Site Location:* The Chem-Dyne site is located at the northern edge of the City of Hamilton, as shown in Figure 3 (see page 12). In close proximity to the Great Miami River, the site is bordered by residential land uses to the south and a municipal park to the east. The Ford Hydraulic Canal and open space areas are located to the north of the site, and a CSX rail line, manufacturing company Armor Metals and several other industrial land uses are located immediately west of the site. The site is accessible from the south via Joe Nuxhaul Boulevard and via a gravel access road located east of the site.

- *Site Zoning:* The site is located within Hamilton's I-1 Industrial Zoning District. I-1 zoning regulations permit a range of heavy industrial uses, including manufacturing, storage, processing, and limited commercial and agricultural uses. Residential land uses are prohibited in the I-1 zoning district.

- *Surrounding Industrial Land Uses:* An established industrial district (I-1 Zoning District) is located to the west of the Chem-Dyne site. Facilities in the area include an abutting manufacturing company, Armor Metals, a City-owned coal-fired power plant, a paper mill, and several manufacturing businesses. This industrial district is physically constrained by the Great Miami River and the CSX railroad. Limited land is available in the district for expansion of existing industrial facilities.

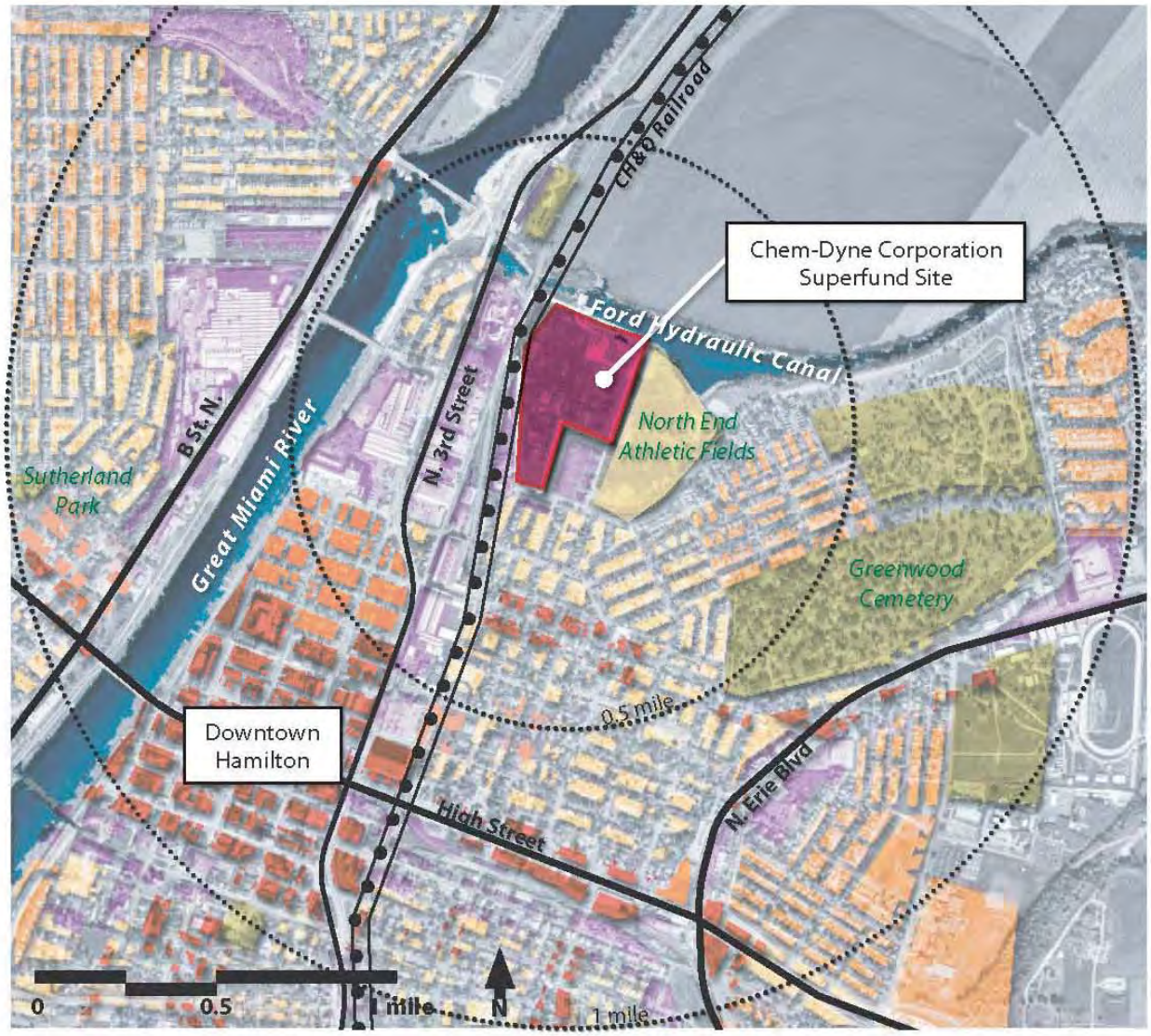
- *Surrounding Residential Land Uses:* Residential areas, zoned for single-family dwellings and duplexes, are located south and east of the site. These neighborhoods are generally built-out, with few parcels available for new construction.

- *Surrounding Recreational Land Uses:* The North End Athletic Fields, a 25-acre municipal park that includes four baseball diamonds and several small buildings, is located immediately east of the site's access road. The park serves as a resource for the City of Hamilton and surrounding neighborhoods. The park is zoned for residential land uses.

  An approximately seven-acre property immediately east of the site, located between the site fence and the access road, was likely used for recreational uses in the past. Vegetation patterns suggest it was used as a baseball diamond. The property is currently vacant, overgrown, and included in the I-1 zoning district.

- *Water Resources:* The site lies within half a mile of the Great Miami River, a critical resource for the southwestern Ohio region. The Great Miami River not only serves as a valuable surface water resource, but the underlying Miami aquifer is also one of the region's most productive sole source aquifers, providing drinking water for the region's residents. Soils in the region are predominantly composed of sand and gravel, and the upper ground water aquifer is estimated to be located 25 feet below the surface of the Chem-Dyne site. Ground water flows westerly from the site toward the Great Miami River.

- *Regional Trails:* The Ford Hydraulic Canal, which borders the site to the north, represents a potentially important recreational resource for the region. The canal diverts surface water from the Great Miami River north of the Chem-Dyne site, and extends through agricultural areas before flowing through a hydraulic dam and returning to the Great Miami River just north of downtown Hamilton. Local plans for recreational trails along the Great Miami River include a spur trail that would run along the Ford Hydraulic Canal. This trail could potentially intersect with the North End Athletic fields adjacent to the Chem-Dyne site.



KEY

- Industrial Land Uses
- Commercial Land Uses
- Business Planned Development District
- Single Family Residential Land Uses
- Multi-Family Residential Land Uses
- Municipal Land Uses

	Figure 3 City of Hamilton Zoning Districts	*Chem-Dyne Corporation Superfund Site*

Key Future Land Use and Long-term Stewardship Considerations for Size Zoning and Site Surroundings

Zoning and IC Considerations:

- The site's current I-1 zoning designation is consistent with future land use restrictions required as part of the site's remedy. Residential uses would not be permitted under the site's current zoning. However, a broad range of industrial uses allowable under the I-1 zoning designation would likely not be compatible with site remedy components. For example, building construction and excavation would not be compatible with the cap in place at the site. Agricultural land uses permitted within the I-1 zoning designation may also not be compatible with site's remedy. Appendix D provides additional information on the City of Hamilton's zoning regulations.

- Future efforts to select and implement ICs for the site will need to consider additional mechanisms beyond the use of the site's existing zoning. A specialized zoning overlay district for the Chem-Dyne site could allow for an appropriate mix of allowable uses, while maintaining excavation and development restrictions. Proprietary ICs, such as restrictions enforceable under Ohio's Uniform Environmental Covenant Act (UECA), could also be considered for the site. Appendices B and C provide additional information on the provisions of Ohio's UECA.

Recreational Reuse Considerations:

- The Ford Hydraulic Canal presents several reuse opportunities. A 10-15' high grass levee, which is accessible from a public access road leading to the North End Athletic Field, provides an excellent vantage point for viewing the Chem-Dyne site, canal, athletic fields, downtown Hamilton, and surrounding neighborhoods. A recreational path with a formal viewing area and series of interpretive signs on the levee could provide a unique opportunity for local residents and visitors to learn about the history of the north end of Hamilton, the Chem-Dyne site's remediation, the Great Miami River, and the canal.

- The vacant, seven-acre industrially-zoned property located east of the site and west of the access road presents a potential recreational reuse opportunity. Recreational uses at this property would likely be compatible with the site's remedy. In the short term, provisions may be required to ensure that recreational activities uses at the property would not lead to trespassing within the site's fenced area.

- In the long-term, the site's capped area could potentially support passive recreational uses such as walking trails. Further discussion among potential future owners, EPA Region 5, Ohio EPA, and the Chem-Dyne Trust would be necessary to determine an appropriate range of recreational uses and surface materials that could be placed on top of the cap.

Industrial Reuse Considerations:

- Due to limited space for expansion in the industrial district located west of the site, the location of industrial land uses at the Chem-Dyne site will likely be an important long-term reuse consideration. .

- Armor Metals Group, a metal products manufacturing company, owns a facility located on a rectangular property located immediately west of the Chem-Dyne site. The company has expressed interest in expanding existing operations. In preliminary conversations with EPA Region 5 staff, company representatives inquired about the feasibility of expanding a portion of an existing three-story building, or erecting a steel pole-barn structure, on the Chem-Dyne site.

A comparison of the site's remedy components and the company's proposed expansion highlights several potential complications. An expansion of the existing building onto the Chem-Dyne site would likely require a modification of the site's cap; the capped area extends to the site's western border, within 10 feet of the company's existing facility. Building expansion would also likely require a modification of ground water remedy components; three active ground water extraction wells and three inactive injection wells are located along the site's western border, adjacent to the company's existing facility. The Chem-Dyne Trust's proposed removal action could also create potential complications for an eastward expansion of the Armor Metals building. Constructing a new foundation or new footers would likely require altering the cap and addressing residual contaminated soils Finally, the costs required to alter the cap and modify the site's remedy would likely limit the feasibility of such an expansion.

While building construction or expansion on the western edge of the site faces these challenges, other portions of the site could potentially provide opportunities for a paved parking area or a storage area in the future. Armor Metals Group currently maintains a parking area located west of the facility. The company could consider expanding its facility westward, into its existing parking area, and relocating the parking area onto the Chem-Dyne site. The presence of wellheads throughout the site, remaining VOC contaminated soils beneath the site's cap, and the Chem-Dyne Trust's proposed removal action would be important considerations in determining an appropriate location for a parking area on the site. Proposed future uses of the capped area of the site would need to be reviewed in coordination with EPA Region 5, Ohio EPA, the Chem-Dyne Trust and the site's owner.

V. Site Ownership and Potential Stakeholders

The engagement of property owners and key site stakeholders will be an important future step in the development of a long-term stewardship plan for the Chem-Dyne site. This section of the report describes the site's property parcels and owners, and identifies an expanded group of stakeholders that could be included in further evaluations of future land use considerations and site ICs.

Site Ownership

The site is owned by multiple parties. The now-bankrupt Chem-Dyne Corporation owns a parcel located in the northeast corner of the site. Teton Valley Country Club (TVCC), a land-holding entity based in California, controls the majority of the site's acreage. TVCC purchased two of the site's parcels in the 1990s. Subsequent to purchasing the property, TVCC transferred the title to the properties multiple times, to multiple land holding companies. Research suggests that these land holding companies are tied to TVCC. The City of Hamilton owns several small parcels located north of the capped area.

Key Ownership Considerations for the Site's Reuse and Long-term Stewardship

- Maintaining the protectiveness of site remedies over the long-term often requires the involvement of site property owners. With the majority of the properties included in the Chem-Dyne site boundary controlled by an absentee land owner, establishing ICs and reuse plans for the site will likely be challenging. Currently, the Chem-Dyne Trust and regulatory agencies have access agreements in place for the operation and maintenance of the site's remedy. In the future, when the site's remediation is complete, EPA, Ohio EPA, current property owners, and the Chem-Dyne trust will likely need to work to identify a viable future owner and steward for the site will be an important consideration.

Potential Site Stakeholders

In the future, several parties will likely need to be involved in determining future site operation and maintenance responsibilities, and developing a long-term reuse and stewardship plan for the site. In addition to EPA Region 5 and Ohio EPA, the following entities are likely to be important stakeholders in this process.

Chem-Dyne Trust

- The Chem-Dyne Trust, which represents the site's 173-member group of potentially responsible parties, operates the site's ground water remedy with oversight from EPA and Ohio EPA. The Trust's 20-year operation and maintenance obligation comes to an end in 2007. While the Trust will be required to operate the system until ground water cleanup standards have been achieved, the Trust does not own any property at the site and does not have an interest in acquiring property at the site in the future. Ideally, the Trust would like to see the site returned to use in the long-term.

Armor Metals Group

- Representatives from adjacent property owner Armor Metals Group have indicated that the company would be interested in expanding industrial operations beyond its existing facility. The Armor Metal facility includes a rectangular, three-story building located along the site's eastern boundary, as well as a rail spur and a parking area located further to the east. In initial conversations with EPA Region 5 staff, Armor Metal representatives asked if the Chem-Dyne site would be available and suitable for industrial manufacturing operations. The earlier discussion of potential industrial reuse considerations highlighted some of the potential opportunities and constraints for the company's expansion priorities. In the future, Armor Metals Group may be an important stakeholder to engage in discussions about the future use of the site.

City of Hamilton

- The City of Hamilton owns several properties adjacent to the Chem-Dyne site. A municipal coal-fired generating plant is located west of the site and public recreation facilities are located east of the site. The City also maintains a public right of way that provides access to site offices, the Ford Hydraulic canal, and the North End Athletic Fields. The City of Hamilton also has the authority to regulate land uses at the site and throughout surrounding areas. In the future, city planning, zoning, and economic development officials will likely need to be included in discussions about the reuse and long-term stewardship of the site.

Hamilton-New Baltimore Ground Water Consortium

- The Hamilton-New Baltimore Ground Water Consortium (Ground Water Consortium) is a group of representatives from municipal and regional ground water management organizations. Ground Water Consortium representatives have indicated that the remediation of the VOC plume at the Chem-Dyne site is a key priority for the organization.

Key Stakeholder Considerations for the Site's Reuse and Long-Term Stewardship:

- In order to implement institutional controls and identify a range of potential future land uses for the site, ongoing coordination among EPA Region 5, Ohio EPA, the City of Hamilton, the Ground Water Consortium, the Chem-Dyne Trust, and an engaged property owner will be required. A Chem-Dyne Site Long-Term Stewardship Committee could be formed with representation from each of the parties identified above, as well as other key stakeholders that have not yet been identified. This committee could function as an advisory body, providing recommendations to EPA Region 5 to help inform the selection, implementation, and enforcement of institutional controls for the site. The Committee could also help to identify and recommend an appropriate range of future land uses for the site, and develop a strategy for returning appropriate portions of the site to productive use, following completion of the site's remediation.

	Figure 4 Parcels and Ownership	*Chem-Dyne Corporation Superfund Site*

VI. Institutional Controls Framework

The following section incorporates site remedy and property ownership considerations, as well as potential IC objectives and IC mechanisms for the site in a potential IC framework. The framework is presented in a matrix that outlines potential IC objectives, highlights a set of IC mechanisms, weighs the potential benefits and limitations of each mechanism, and identifies a set of potential stakeholders that could be engaged in the design and implementation of an IC plan for the site.

Because IC objectives will likely vary somewhat across the site, the matrix presents potential IC objectives for three separate potential IC areas: A) Capped Area, Former Chem-Dyne Facility, B) Uncapped Areas, Former Chem-Dyne Facility, and C) Ground Water Remedy Components Area, Adjacent Industrial Properties. The three potential IC areas were determined by overlaying site remedy components, and parcel boundaries. The matrix below clarifies the types of restrictions that will likely need to be implemented within each of the three potential IC areas, and Figure 5 (see page 21) shows the location of these three areas relative to the site and its key remedy components.

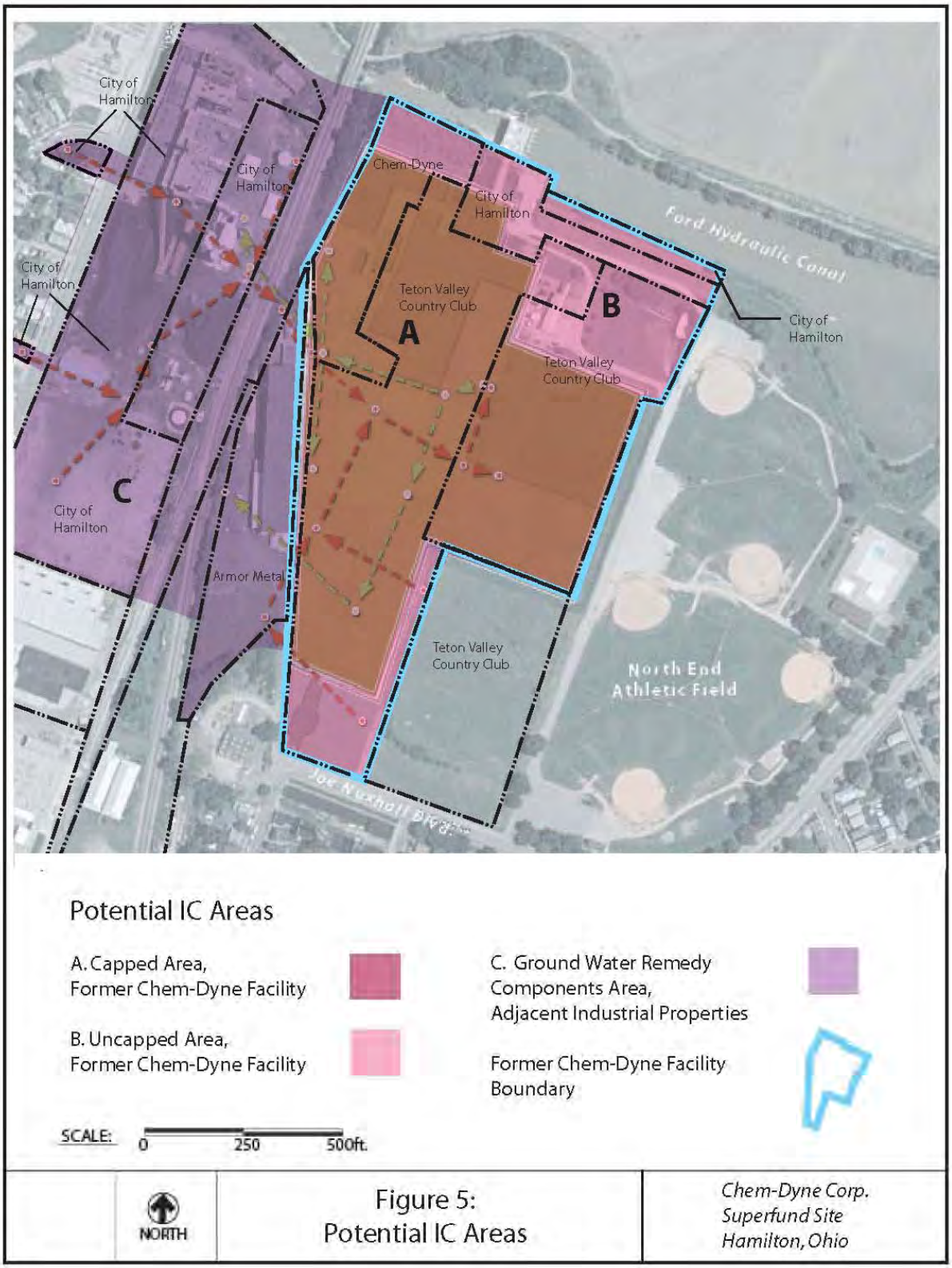
This section is included to help inform EPA Region 5's future efforts to design site ICs and engage a diverse stakeholder group in an IC implementation process.

Institutional Controls Matrix

Potential IC Objectives

The identification of IC objectives would likely be an important first step in the development of an IC plan for the Chem-Dyne site. A set of potential IC objectives are presented below for consideration.

	A: Former Chem-Dyne Facility Capped Areas	B: Former Chem-Dyne Facility Uncapped Areas	C: Adjacent Industrial Land Uses Over VOC Plume
Engineering Controls			
• Protect integrity of composite cap.	√		
• Protect integrity of ground water remedy components (e.g., extraction – injection wells, and pumping lines).	√	√	√
• Protect above-ground ground water remedy components (monitoring wells, extraction wells and inactive injection wells).			√
• Protect integrity of subsurface ground water remedy components.			
Future Use			
• Restrict future land uses to industrial activities.	√		
Contaminated Soil			
• Limit potential for human exposure to contaminated soil that remains in place beneath capped portions of the site. • Prevent excavation of protective cover on capped portion of the site.	√		
Contaminated Ground Water			
• Limit potential for human exposure to contaminated ground water at the site. • Prevent ground water withdrawal for potable water use.	√	√	√
Site Access			
• Maintain access easement for operation of ground water treatment system and maintenance of site cap and fenced areas. • Maintain access to well heads and subsurface infrastructure.	√		√


City of Hamilton
City of Hamilton
Chem-Dyne
City of Hamilton
Ford Hydraulic Canal
City of Hamilton
Teton Valley Country Club
A
B
City of Hamilton
Teton Valley Country Club
C
City of Hamilton
Armor Metal
Teton Valley Country Club
North End Athletic Field
Joe Nuxhall Blvd.
Potential IC Areas
A. Capped Area, Former Chem-Dyne Facility
B. Uncapped Area, Former Chem-Dyne Facility
C. Ground Water Remedy Components Area, Adjacent Industrial Properties
Former Chem-Dyne Facility Boundary
SCALE: 0 250 500ft.
NORTH
Figure 5: Potential IC Areas
Chem-Dyne Corp. Superfund Site Hamilton, Ohio

Key IC Mechanism Considerations

At the Chem-Dyne site, soil and ground water have been affected by site contaminants. The design of an IC plan will need to help maintain protectiveness of both ground water and soil remedies. An IC plan for the site will likely need to include multiple IC mechanisms in order to achieve potential IC objectives. The key considerations outlined below highlight both strengths and weaknesses of selected IC mechanisms that may be appropriate for the site. The check boxes in the columns indicate the potential applicability of each mechanism to each of the three potential IC areas.

Zoning

	A: Capped Area, Former Chem-Dyne Facility	B: Uncapped Areas , Former Chem-Dyne Facility	C: Ground Water Remedy Components Area, Adjacent Industrial Properties
Potential Benefits: • All three IC areas are located within City of Hamilton zoning districts. designated for heavy industrial use (I-2). • I-2 zoning districts prohibit residential uses, day care centers, and commercial retail uses. • Zoning regulations are enforceable by the City of Hamilton. • In the short term, existing zoning regulations would help to achieve potential future use IC objectives.	√	√	√
Potential Limitations: • I-2 zoning districts allow certain agricultural land uses that may not be compatible with the remedy in place on the capped portion of the site. • Over the long-term, existing zoning designations may be altered through re-zoning, limiting the effectiveness of zoning as a mechanism for restricting future land uses on capped and uncapped portions of site.	√	√	√
Recommendation: Zoning districts would likely need to be combined with enforceable IC mechanisms (e.g., proprietary restrictions, such as restrictive covenants) that can remain in place in perpetuity.	√	√	√

Environmental Covenant (EC)			
	A: Capped Area, Former Chem-Dyne Facility	B: Uncapped Areas, Former Chem-Dyne Facility	C: Ground Water Remedy Components Area, Adjacent Industrial Properties
Potential Benefits: • Ohio has adopted a Uniform Environmental Covenants Act that enables parties involved in environmental response projects to establish environmental covenants that place activity and use limitations on interests in real property. • Activity and use limitations imposed through an Environmental Covenant (EC) can include a broad range of restrictions and obligations that could be used to help maintain protectiveness of the site's remedy (e.g., access easements, ground water use restrictions, future land use restrictions, and excavation restrictions). • U.S. EPA, Ohio EPA, or another appropriate state or federal agency could potentially hold an EC. This would allow the appropriate Agency to establish activity and use restrictions at the site without taking ownership of real property. • ECs are enforceable legal agreements. • ECs run with the land and can remain in place regardless of property ownership. • Termination of an EC can be tied to a specific action or outcome (e.g., ground water use restrictions remain in place until specified ground water cleanup targets have been met). • ECs can include provisions for periodic monitoring to demonstrate compliance with specified activity and use limitations.	√	√	√
Potential Limitations: • State and federal agency control of an EC can circumvent local stakeholders, and municipal land use authorities. • UECAs can be time consuming to implement.	√	√	√
Recommendations: • An EC could be an effective tool for helping to achieve multiple IC objectives at the Chem-Dyne site. • An EC could supplement existing zoning regulations and serve as an effective and enforceable IC mechanism over the long-term. • Activity and use limitations imposed through an EC would likely need to be developed with input and participation from EPA, Ohio EPA, the City of Hamilton, property owners, and the Chem-Dyne Trust.	√	√	√

Permit Notification Process			
	A: Capped Area, Former Chem-Dyne Facility	B: Uncapped Areas, Former Chem-Dyne Facility	C: Ground Water Remedy Components Area, Adjacent Industrial Properties
Potential Benefits: • The City of Hamilton's Planning and Zoning Department (P&Z Department) enforces zoning and building codes, and issues permits for construction and excavation activities. The P&Z Department's existing permitting process could be adapted to require that EPA and OEPA be notified whenever an application is filed for any development activity within any of the proposed IC areas.	√	√	√
• The Hamilton New Baltimore-Ground Water Consortium coordinates regionally with local governments on ground water use well permitting. The consortium is aware of the ground water VOC plume at the Chem-Dyne site and coordinates regularly with site managers to ensure that drinking water withdrawal permits are not issued within effected areas.	√	√	√
Potential Limitations: • EPA and Ohio EPA do not have permitting authority and will need to coordinate with municipal governments. The effectiveness of a permit notification process as an IC mechanism relies on effective communication between local permitting authorities and the state and federal regulatory authorities. A permit notification process is unenforceable, informational IC mechanism that relies on regular monitoring to ensure effectiveness.			
Recommendations: • Permitting processes for activities including, but not limited to, land development, excavation, and well drilling likely need to be able to flag permit applications that fall within the area affected by contamination at the Chem-Dyne site. • Flagged applications would likely also need to be reviewed by EPA and Ohio EPA to ensure that permitted activities would not compromise the effectiveness of the site's remedy.	√	√	√

Potential Stakeholders

As institutional control mechanisms are considered for the site, engaging a diverse group of stakeholders would likely facilitate the development of an effective IC implementation strategy. Site property owners, adjacent property owners, PRPs, local government, and state and federal agencies are listed below for reference.

	A: Capped Area, Former Chem-Dyne Facility	B: Uncapped Areas, Former Chem-Dyne Facility	C: Ground Water Remedy Components Area, Adjacent Industrial Properties
• EPA Region 5 (Remedial Project Manager, Site Attorney)	√	√	√
• Teton Valley CC (Site Owner)	√	√	
• Ohio EPA (State Site Manager)	√	√	√
• Chem-Dyne Trust (PRP Group)	√	√	√
• City of Hamilton	√	√	√
• Hamilton-New Baltimore Ground Water Consortium	√	√	√
• Smart Papers, LLC			√
• Armor Metals Group			√

VII. Key Considerations Next Steps

The analyses highlighted in this reuse assessment report can help to inform EPA's determination of future land uses and institutional controls for the site. First, analyses of the site's remedy identified potential institutional control requirements, as well as reuse opportunities and constraints for the site's two major remedy components. Second, analyses of zoning and surrounding land uses identified the potential limitations of the City of Hamilton's zoning regulations as a tool to implement institutional controls, and highlighted recreational and industrial reuse considerations for the Chem-Dyne site. Third, the report's discussion of site ownership and potential stakeholders identified a group of key parties that will likely need to be included in future land use and institutional control discussions regarding the Chem-Dyne site. Finally, further analyses of reuse, property ownership, and institutional controls considerations provided a potential framework and strategy to inform IC implementation efforts at the site.

The appendices of this report include several resources for IC implementation, including Appendix A: Ohio's Uniform Environmental Covenants Act, Appendix B: Uniform Environmental Covenant Template, and Appendix C: City of Hamilton Zoning Ordinance.

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