

Public Health Assessment

Beloit Corporation

Rockton, Winnebago County, Illinois

EPA Facility ID# ILD021440375

May 4, 2004

Prepared by

**Illinois Department of Public Health
Under a Cooperative Agreement With the
U.S. Department of Health and Human Services
Agency for Toxic Substances and Disease Registry**

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Summary

The Beloit Corporation Superfund site is located along the Rock River, north of Rockton, Illinois. The site includes the former Beloit Corporation facility, several smaller industrial businesses, and a residential area of approximately 70 homes. The area surrounding the site is a combination of residential and industrial properties. There are five separate plumes of known groundwater contamination in the area. Four of the plumes are within the site boundaries. The fifth plume appears to have headed south of the site under a portion of the Village of Rockton.

Surface soils and groundwater in the area are the completed exposure pathways at the site. The chemicals of interest in the surface soils are polycyclic aromatic hydrocarbons (PAHs) and some metals. The chemicals of interest in the groundwater are primarily tetrachloroethylene (PCE) and trichloroethylene (TCE). The homes in the residential area use private water wells. Several of these wells have been contaminated with PCE and TCE. Those homes with elevated levels of PCE had whole-house treatment units installed in 1993. Three out of four of these treatment units are still in service and have effectively reduced contaminant levels below detection limits. A public well serving Rockton is located approximately 1,000 yards south-southeast of the site and has remained unaffected.

On August 30, 1990, the Beloit Corporation Facility was added to the National Priorities List (NPL). The Illinois Department of Public Health (IDPH) issued an interim public health assessment on July 28, 1992. The site was considered a public health hazard at the time because volatile organic compounds (VOCs) were detected in on-site groundwater and private wells.

IDPH has evaluated the current data and concludes that the Beloit Corporation site poses no apparent public health hazard at this time. Currently, no one is exposed to levels of contaminants that would be expected to cause adverse health effects.

Purpose

The Illinois Department of Public Health (IDPH) prepared this health assessment under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). Its purpose is to re-evaluate potential human health hazards from exposure to site contaminants. On July 28, 1992, IDPH issued an interim public health assessment and concluded that the site was a public health hazard [1]. The conclusions and recommendations of the interim public health assessment are included as Attachment 4.

The conclusions of this health assessment are based on a review of available environmental information from the July 1999 remedial investigation, recent residential well sample results, site visits, and community health concerns.

Background

Site Description and History

The Beloit Corporation Superfund site is located on the Rock River, north of Rockton, Illinois, in a mixed industrial and residential area (Attachment 1). The site consists of the former Beloit Corporation facility, the former United Recovery/Soterion facility (Soterion), the former Safe-T-Way manufacturing plant, Blackhawk Acres subdivision, and a portion of Taylor Inc. (Attachment 2).

Investigations in the area began in the early 1980s. In 1988, the U.S. Environmental Protection Agency (U.S. EPA) proposed to list the site on the National Priorities List (NPL) and on August 30, 1990 the site was listed. After signing a consent decree with the Illinois Environmental Protection Agency (Illinois EPA), effective in May 1991, Beloit Corporation initiated a four-phase remedial investigation (RI). The RI began in June 1992 and was completed in 1998. Its purpose was to determine the nature and extent of contamination at the Beloit Corporation Superfund site. The investigation began with the installation and sampling of monitoring wells, sampling of residential wells, and soil borings [2]. In July 1996, the Beloit Corporation initiated an early action pump and treat system. The purpose of the system is to limit the potential for migration and remove volatile organic compounds (VOCs) in groundwater plume #1 (Attachment 3). The system is still operating and treats approximately 8 million gallons of groundwater per month [3].

Beloit Corporation Facility

Beloit Corporation began operations on the 200-acre Rockton site in 1961. There were two operations at the facility: a plant for manufacturing wet-end paper machines and a research and development facility. The company used virgin pulp at the research facility to demonstrate machines to prospective customers. Before 1986, wastewater containing paper fibers from the demonstration activities was deposited into three unlined lagoons at the northern end of the

facility, along the Rock River. There it seeped into the ground. Wastewater generated after 1986 was treated in a new on-site wastewater treatment system.

The settled paper fibers (sludge) were periodically removed from the lagoons and stockpiled or injected into the subsurface soil on approximately 10 acres of land near the southern boundary of the facility. This practice ended in 1984 when local residents complained about odors. A former foundry sand disposal area is also located near the southern boundary [2].

The Beloit Corporation continued operations until 2000 when the parent company declared bankruptcy and closed the plant. Money for clean up of the site has been set aside from the bankruptcy proceedings. The property was sold to a Milwaukee developer in 2000. A transloading and distribution company has leased the manufacturing portion of the old Beloit Corporation facility. The research center is no longer occupied and is available for lease.

Soterion

Soterion is an inactive, industrial waste-processing plant located at the southern edge of Blackhawk Acres subdivision. The plant reclaimed waste cuttings from metal fabricating operations and recycled cooling oil and high-speed drill cuttings. Complaints of poor waste-handling practices and detections of elevated levels of VOCs in the wells of nearby homes on Watts Avenue (plume #4) prompted Illinois EPA to conduct an investigation from 1980 through 1982. Illinois EPA files documented releases of waste oil on the grounds, in a septic system, and in a dry well in front of the Soterion building. However, because Soterion is downgradient from Blackhawk Acres subdivision and the Beloit site, the former waste-processing plant is not likely to have contributed to the on-site groundwater contamination [2].

Safe-T-Way

Safe-T-Way was a small manufacturing facility on the cul-de-sac of Blackhawk Boulevard in the southeastern area of Blackhawk Acres. Explosion-proof containers for gasoline and other flammable liquids were manufactured at the facility until operations were recently moved to Rockford, Illinois. The facility in Rockton is now for sale.

Blackhawk Acres

Blackhawk Acres subdivision is about 600 feet east of the Beloit Corporation property and consists of about 70 homes. A railroad line and wooded area along the tracks separate the subdivision from the Beloit Corporation site. Homes in the subdivision use private wells as water sources. In 1993, four wells in the subdivision were found to have low levels of VOCs and Illinois EPA supplied those homes with carbon treatment filter units [3].

Taylor Inc.

Taylor Inc. is a large manufacturing facility south of the Blackhawk Acres subdivision. Only the northern portion is within the Beloit Corporation Superfund site, as defined by U.S. EPA and Illinois EPA. Taylor Inc. makes refrigeration units for commercial applications. According to Illinois EPA, it used small quantities of trichloroethylene (TCE) and reportedly did not dispose of TCE on the property [2].

Site Visit

IDPH conducted a site visit on October 10, 2003. Currently, the site remains unchanged. A portion of the Beloit Corporation property is now a warehousing and distribution center, and the research center did not appear to be used. An asphalt-covered parking lot was southeast of the building. Access to the Beloit Corporation property is restricted. A chain-link fence appears to surround most of the property. Several large outdoor storage areas, which hold scrap metal, pipe, and miscellaneous equipment are located on the Beloit Corporation property. Some storage areas were partially paved with asphalt and others were covered with crushed stone.

Demographics, Land Use, and Natural Resources

The Beloit Corporation site is at the north end of the Village of Rockton and southwest of South Beloit, Illinois. The U.S. Census Bureau lists Rockton's 2000 population as 5,296 and South Beloit's as 5,397 [4]. Both communities have municipal water supplies. One of Rockton's municipal wells is approximately 1,000 yards south-southeast of the site, but it remains unaffected by the contaminants. The other municipal wells are not likely to be affected by the site. The Blackhawk Acres subdivision, in which approximately 70 homes use private wells for drinking water, is within the site boundaries.

The Beloit Corporation site is bordered to the west by the Rock River, which is used exclusively for recreational purposes. A dam spans the river approximately 400 feet downstream of the southern boundary of the site. The dam maintains the required water elevations for a raceway, which runs along the west and southwest side of the village to a hydroelectric plant [2].

Discussion**Chemicals of Interest**

IDPH compared the results of each sample collected with the appropriate comparison value to select chemicals for further evaluation for exposure and possible carcinogenic and noncarcinogenic health effects. Chemicals found at levels greater than comparison values or those for which no comparison values exist were selected for further evaluation. A brief explanation of each comparison value used is found in Attachment 5. IDPH assumed the samples were collected and handled properly and that appropriate analytical techniques were used.

Chemicals of interest requiring further evaluation were identified in surface and subsurface soils and in groundwater (Tables 1–5).

Soil Contamination

Soil samples were collected at several locations across the site, but most came from the Beloit Corporation property (Table 1). Thus, IDPH focused on evaluating results for surface and subsurface soil samples from the Beloit Corporation property. Only two samples were collected off-site; both came from the Soterion property in 1992. These were considered insufficient for thoroughly assessing exposures to chemicals in off-site soil. Because on-site surface soil samples have not shown high levels of chemicals, it has generally been considered unlikely that residential areas were impacted.

Surface Water and Sediment Contamination

One surface water sample and 10 sediment samples were collected from the Rock River and backwater area. Those were used to evaluate the potential migration of contaminants toward the river and wetlands. No organic compounds were detected in the surface water sample. Samples for inorganic chemicals were not collected.

Table 2 shows chemicals of interest detected in sediment samples. The highest levels of chemicals were detected in sediment samples from west of the site (SD07). The levels of chemicals were much less in a sediment sample (SD08) located between SD07 and the Beloit Corporation property. This suggests that the chemicals found in sample SD07 may be unrelated to site activities [2].

Groundwater Contamination

There appears to have been five separate groundwater contamination plumes related to this site. Four of the five plumes are located within site boundaries (Attachment 3). The fifth plume is migrating off the site, below the Village of Rockton [2].

Plume #1

This plume is located in the central portion of the Beloit Corporation property. It consists primarily of tetrachloroethylene (PCE) with 1,1,1-trichloroethane (TCA), trichloroethylene (TCE), 1,1-dichloroethylene, and cis-1,2-dichloroethylene also present. The plume is in the upper portion of the shallow aquifer and does not affect any drinking water wells. The plume is being contained by the groundwater pump and treat system [2].

Plume #2

This plume was located in the northern portion of the Blackhawk Acres subdivision. It was a small chloroform plume that affected only a few residential wells. Recent samples have not detected any chloroform, suggesting that the source has dissipated.

Plume #3

This plume was located in the eastern portion of the Blackhawk Acres subdivision. It was a small plume, primarily of TCE, that affected only a few residential wells. Recent samples have not detected any TCE, suggesting that the source has dissipated [2].

Plume #4

This plume is located in the southern portion of Blackhawk Acres subdivision. It originally consisted of PCE with low TCA levels, and affected only a few residential wells (Table 3). These homes were provided with whole-house carbon filter units in 1993, which are still in use. Recent water samples from the wells have shown that the level of PCE is decreasing, suggesting that the source is beginning to dissipate. No contaminants have been detected in water samples collected after passing through the carbon filter units.

Several additional wells in this area have been sampled recently and are beginning to show low levels of PCE, TCE (possibly a degradation product of PCE), and TCA. Table 4 shows the levels of these chemicals detected in the wells [5].

Plume #5

This plume is located in the southern portion of the site. It consists primarily of TCE and TCA in the deeper portion of the shallow aquifer (Table 5). The plume is migrating off the site to the south, following the groundwater flow toward the Rock River, south of the village. In 1997, the Village of Rockton identified 10 addresses with private wells potentially downgradient of this plume. One well was found to have water contaminated by this plume. The home using that well was connected to the city water supply in 1999. Illinois EPA is continuing to sample wells that may potentially be affected by this plume. As of their last sampling round in the spring of 2003, no wells have been found with elevated VOCs [5].

Exposure Analysis

A chemical can cause an adverse health effect only if people are exposed to sufficient quantities of the chemical. This requires a source of contamination, an environmental transport pathway, a point of exposure, a route of exposure, and a receptor population. These are the five elements of an exposure pathway.

If all five elements are present, then a completed exposure pathway exists. Exposure to contaminants has occurred or is occurring. If one or more of the five elements is missing but could be present, then a potential exposure pathway exists. Exposure may have occurred, may be occurring, or could occur. An exposure pathway can be eliminated if at least one of the five elements is missing and will never be present.

Completed Exposure Pathways

Completed exposure pathways associated with the Beloit site are summarized in Table 6. Some residents in the Blackhawk Acres subdivision have been exposed to VOCs in groundwater. Routes of exposure have been by ingestion, inhalation of vapors and dermal contact with contaminated groundwater. Some residents in the Blackhawk Acres subdivision are currently exposed to low levels of VOCs in groundwater. Routes of exposure are by ingestion, inhalation of vapors, and dermal contact with contaminated groundwater.

IDPH estimated exposures to chemicals in surface soils, subsurface soils, sediments, and groundwater. Several exposure scenarios are considered, depending on the media (soil, air, or water) and receptor population. The estimated dose of each chemical that a person could come in contact with was compared to minimal risk levels (MRLs) developed by ATSDR for chemicals commonly found at hazardous waste sites. An MRL is an estimate of the daily human exposure to a contaminant below which adverse, noncancerous health effects are unlikely to occur. If an MRL was not available, IDPH used the U.S. EPA reference dose (RfD). An RfD is similar to an MRL, but is developed by U.S. EPA.

Soils

Table 1 shows the chemicals of interest in surface and subsurface soils. IDPH used the highest levels of the chemicals detected in our exposure scenarios.

Although a fence restricts access to the Beloit Corporation property, there are concerns that children may trespass and be exposed to contaminants in surface soils. IDPH used an exposure scenario of children trespassing on the property and ingesting 200 milligrams of soil per day, 2 days a week, for 26 weeks per year. Based on this exposure scenario, no adverse health effects are expected.

The Beloit Corporation property is extensively paved and graveled. Most of the employees on the site would probably not be exposed to surface soils on a daily basis. However, as an exposure scenario, IDPH used an adult ingesting 100 milligrams per day, 5 days a week, 50 weeks per year, for 25 years. Based on this exposure scenario, no adverse health effects are expected.

The levels of chemicals in the subsurface soils on the Beloit Corporation property are greater than the surface soils. Exposure to subsurface soils will likely be limited to construction workers during digging or excavating activities. IDPH used an exposure scenario for construction workers ingesting 330 milligrams of soil per day, 5 days per week for 13 weeks. Based on this exposure scenario, no adverse health effects are expected.

Sediments

The chemicals of interest in sediments are detailed in Table 2. IDPH assumed that children would be exposed to the maximum levels of chemicals. We also assumed that a reasonable estimate of exposure for children would be 3 days per week, 12 weeks per year, for 5 years. Based on this exposure scenario, no adverse health effects would be expected.

Groundwater

The maximum contaminant level (MCL) of 5 parts per billion (ppb) was used as the comparison value for PCE (Attachment 5). MCLs have been established by USEPA for public water supplies to reduce the chances of adverse health effects from ingesting contaminated drinking water. These standards are well below levels at which health effects have been observed. MCLs are enforceable limits that public water supplies must meet. PCE has been detected in residential wells at levels up to 14 ppb.

Currently, the only people exposed to contaminated groundwater are in the area of plume #4, primarily residents who do not have whole-house carbon filters. These residents are not being exposed to levels of chemicals that would be expected to cause adverse health effects. Residents who are not properly using their whole house filters also may be exposed to contaminated groundwater in the area of plume #4. If residents do not properly maintain the whole house filter units or if they stop using the units, they may be exposed to elevated levels of PCE.

IDPH estimated exposure to a level of 14 ppb of PCE in groundwater using two exposure scenarios. One was for a child drinking 1 liter of water a day for 15 years and the other for an adult drinking 2 liters of water a day for 30 years. At this level, the U.S. EPA oral reference dose (RfD) would not be exceeded for children or adults. RfDs are daily exposure estimates with no appreciable risks of adverse non-cancer health effects over a specified length of exposure expressed in units of milligrams of chemical per kilogram of body weight per day (mg/kg/day). Conservative approaches used to derive RfDs often result in them being 3-100 times below levels shown to be non-toxic. Such no-effect levels are referred to as no observable adverse effect levels (NOAELs) or no observable effect levels (NOELs). No adverse health effects are expected if people were to drink this water based on the above scenario. U.S. EPA is currently reviewing the carcinogenic potential for this chemical [7].

Potential Exposure Pathways

Table 7 summarizes the potential exposure pathways associated with this site. If the residents in the area of plume #4 discontinue using the whole-house water treatment units, they may be exposed to VOCs through ingestion, inhalation, and dermal contact. There also is a potential that residents with private wells located along the river south of plume #5 may be exposed in the future to VOCs through ingestion, inhalation, and dermal contact.

Past exposures to contaminants in surface and subsurface soils on Beloit Corporation property may have occurred. Site workers and trespassers may have been exposed by incidental ingestion, inhalation, or dermal contact with contaminated soils.

A potential exposure pathway exists for past inhalation of VOCs migrating into the basements and crawl spaces of homes from groundwater contamination plume #4. It is doubtful that a present or future vapor exposure pathway exists for this plume. The levels of VOCs in the groundwater are too low.

A potential exposure pathway exists for future inhalation of VOCs migrating into the basements of homes in Rockton from groundwater plume #5. Although this plume is migrating below the Village of Rockton, IDPH doubts there will be a future vapor exposure pathway. There are no VOCs in the upper aquifer where vaporization would occur. The VOCs are in the lower part of the aquifer [2].

Community Health Concerns

Area residents are concerned that they might have been drinking contaminated water for years and might be experiencing adverse health effects from exposure to VOCs. Illinois EPA has repeatedly sampled residential wells in the area from the 1980s until the present. IDPH sent letters to residents whose wells were tested in April 2000, May 2001, May 2002 and May 2003, explaining the results of the water sampling. The levels of VOCs found were not at levels expected to cause adverse health effects in exposed individuals. Residents were advised about what they could do to reduce exposure.

A copy of the Draft Public Health Assessment for the Beloit Corporation site was available for public review and comment at the Talcott Free Library at 101 East Main Street in Rockton from January 7 to February 13, 2004. The comments received can be found in Attachment 6.

Child Health Considerations

IDPH recognizes that children are especially sensitive to some contaminants. For that reason, IDPH includes children when evaluating exposures to contaminants. Children are the most sensitive population considered in this public health assessment. Currently, based on our exposure scenarios for children, no adverse health effects would be expected from exposure to VOCs in drinking water.

Conclusions

Although past exposures to contaminants may have occurred, no individuals are currently exposed to levels of contaminants that would be expected to cause adverse health effects. Exposure to contaminants is still possible, but not at levels expected to cause adverse effects. Thus, IDPH concludes that the Beloit Corporation site poses **no apparent public health hazard**.

Recommendations

IDPH recommends that:

- Illinois EPA continue to prevent exposures to contaminated groundwater by maintaining and monitoring the whole-house carbon treatment units.
- Illinois EPA continue to sample the private wells in the area of plume #4 and down-gradient of plume #5 annually.
- The on-site pump and treat system remain operational.

Public Health Action Plan

IDPH will continue to review results of groundwater samples that are collected and provide residents with information about these samples. If necessary, IDPH will also provide information on ways to reduce or prevent exposure to contaminated groundwater.

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References

1. Agency for Toxic Substances and Disease Registry. Preliminary health assessment for Beloit Corporation, Rockton, Illinois. Atlanta: US Department of Health and Human Services; 1992 July 28.

2. Montgomery Watson (MWH). Remedial investigation report. Beloit Corporation Blackhawk facility, Rockton, Illinois. Madison, Wisconsin: Montgomery Watson (MWH); 1999 July.
3. Montgomery Watson (MWH). Baseline risk assessment report, Beloit Corporation Blackhawk facility, Rockton, Illinois. Madison, Wisconsin: Montgomery Watson (MWH); 2000 August.
4. US Census Bureau. Census 2000 data for the State of Illinois. Available at URL: www.census.gov/census2000/states/il.html
5. Illinois Department of Public Health. Well sampling results, Rockton, Illinois. Springfield, Illinois: Illinois Department of Public Health; 2003 July.
6. Agency for Toxic Substances and Disease Registry. Comparison values for air, drinking water, and soil. Atlanta: US Department of Health and Human Services; 2003.
7. Agency for Toxic Substances and Disease Registry. Toxicological profile for tetrachloroethylene (update). Atlanta: US Department of Health and Human Services; 1997 September.
8. Agency for Toxic Substances and Disease Registry. Toxicological profile for polycyclic aromatic hydrocarbons (PAHs) (update). Atlanta: US Department of Health and Human Services; 1995 August.
9. Agency for Toxic Substances and Disease Registry. Toxicological profile for mercury (update). Atlanta: US Department of Health and Human Services; 1999 March.
10. Agency for Toxic Substances and Disease Registry. Toxicological profile for trichloroethylene (update). Atlanta: US Department of Health and Human Services; 1997 September.
11. Agency for Toxic Substances and Disease Registry. Toxicological profile for arsenic (update). Atlanta: US Department of Health and Human Services; 2000 September.
12. Agency for Toxic Substances and Disease Registry. Toxicological profile for cadmium. Atlanta: US Department of Health and Human Services; 1999 July.

Certification

The Illinois Department of Public Health prepared this Beloit Corporation site health consultation under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It was done in accordance with methods and procedures approved at the time the health consultation was begun.

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ATSDR

The Division of Health Assessment and Consultation, ATSDR, has reviewed this health consultation and concurs with its findings.

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Tables

Table 1. Chemicals of interest detected in Beloit Corporation property soils in phase 1 and 2 of the remedial investigation (in milligrams per kilogram).

Chemical	Range in Surface Soils	Range in Subsurface Soils	Average Level in Background Soils	Comparison Value/Source
Semi-volatile organic chemicals				
Benzo(a)pyrene	ND–1.0	ND–57	ND	0.1 CREG
Benzo(b)fluoranthene	ND–1.7	ND–130	ND	none
Benzo(k)fluoranthene	ND–1.7	ND–130	ND	none
Benzo(g,h,i)perylene	ND–0.8	ND–73	ND	none
Chrysene	ND–1.4	ND–54	ND	none
Phenanthrene	ND–1.6	ND–27	ND	none
Metals				
Arsenic	0.45–5.1	ND–10.7	2.1	0.5 CREG
Cadmium	0.56–4.3	ND–11.5	1.0	10 child EMEG
Mercury	0.16–0.39	ND–0.66	ND	none

CREG—cancer risk evaluation guide

EMEG—environmental media evaluation guide

ND—indicates the chemical was not detected

Table 2. Chemicals of interest detected in sediment samples collected in phase 3 of the remedial investigation (in milligrams per kilogram).

Chemicals	Locations		Comparison Value/Source (in mg/kg)
	SD07	SD08	
Semi-volatile chemicals			
Benzo(a)pyrene	30	ND	0.1 CREG
Benzo(b)fluoranthene	20	ND	none
Benzo(k)fluoranthene	17	ND	none
Benzo(g,h,i)perylene	12	ND	none
Chrysene	35	ND	none
Phenanthrene	100	ND	none
Metals			
Arsenic	7.3	0.76	0.5 CREG
Mercury	4.1	0.05	none

ND—indicates the chemical was not detected

CREG—cancer risk evaluation guide

Sediment sample SD08 is located between the site and sediment sample SD07

Table 3. Plume #4; tetrachloroethylene (PCE) detected in residential wells (homes with whole-house carbon filters; in micrograms per liter).

Location	Sample Date								
	1992	1994	1996	1997	1999	2000	2001	2002	2003
Home 1	29	95	140	80	7	5.5	2.3	1.9	1.6
Home 2	86	68	110	56	47	36	21	–	14.0
Home 3	9	22	–	4	ND	ND	ND	ND	ND
Comparison Value = 5 MCL									

Dash (–)—not sampled

ND—indicates the compound was not detected at concentrations greater than the laboratory reporting limits

MCL—U.S. EPA maximum contaminant level for public water supplies

Note: These results are for samples of untreated water. No VOCs have been detected in samples of treated water.

Table 4. Plume #4; VOCs detected in residential wells (without whole-house filters; in micrograms per liter).

Location	2001			2002			2003		
	PCE	TCE	TCA	PCE	TCE	TCA	PCE	TCE	TCA
Home 4	ND	ND	ND	0.9	ND	1.0	ND	1.9	1.4
Home 5	0.9	ND	ND	0.9	ND	ND	0.5	ND	ND
Home 6	ND	ND	ND	ND	0.9	0.5	ND	1.3	1.0
Comparison Value (MCL)	5	5	200	5	5	200	5	5	200

µg/L—micrograms of chemical per liter of water = parts per billion (ppb)

ND—indicates the compound was not detected at concentrations greater than the laboratory reporting limits

MCL—U.S. EPA maximum contaminant level for public water supplies

PCE—tetrachloroethylene

TCE—trichloroethylene

TCA—1,1,1-trichloroethane

Table 5. Plume #5; trichloroethylene (TCE) detected in monitoring wells (in micrograms per liter).

Sample Location	Sample Date										
	Phase 1 1992	Phase 2 1994	Phase 3 1995	Jul 1996	Oct 1996	Jan 1997	Apr 1997	Jul 1997	Oct 1997	Jan 1998	Apr 1998
W18	24	36	27	17	12	12	13	16	18	16	22
W26c	61	160	110	78	57	83	68	31	30	22	19
W43c	–	–	130	110	–	–	–	69	–	60	45
W47c	–	–	65	–	–	–	–	–	–	110	180
W48c	–	–	30	–	–	–	–	22	–	11	17
G108d	ND	ND	2	1	–	–	–	ND	–	–	13
Comparison Value = 5 MCL											

µg/L—micrograms of chemical per liter of water = parts per billion (ppb)

Dash (–)—not sampled

ND—indicates the compound was not detected at concentrations greater than the laboratory reporting limits

MCL— U.S. EPA maximum contaminant level for public water supplies

Table 6. Completed exposure pathways associated with the Beloit Corporation site, Rockton, Illinois.

Pathway Name	Source	Medium	Exposure Point	Exposure Route	Receptor Population	Time of Exposure	Exposure Activities	Estimated Number Exposed	Chemicals
Groundwater	Contaminant Plume 4	Groundwater	Private Wells	Ingestion, Inhalation, Dermal	Residents	Past	Drinking and Bathing	12	Volatile organic compounds (tetrachloroethylene)
Groundwater	Contaminant Plume 4	Groundwater	Private Wells	Ingestion, Inhalation, Dermal	Residents	Current	Drinking and Bathing	12	Volatile organic compounds (tetrachloroethylene, trichloroethylene)

Table 7. Potential exposure pathways associated with the Beloit Corporation site, Rockton, Illinois.

Pathway Name	Source	Medium	Exposure Point	Exposure Route	Receptor Population	Time of Exposure	Exposure Activities	Estimated Number Exposed	Chemicals
Groundwater	Contaminant Plume 4	Groundwater	Private Wells	Ingestion, Inhalation, Dermal	Residents	Future	Drinking and Bathing	12	VOCs (tetrachloroethylene)
Groundwater	Contaminant Plume 5	Groundwater	Private Wells	Ingestion, Inhalation, Dermal	Residents	Future	Drinking and Bathing	20	VOCs (trichloroethylene)
Soil	Beloit Corp	Soil	Site Soils	Ingestion, Inhalation, Dermal	Trespassers, Employees, Site Workers	Past–Future	Excavating Site Worker	100	PAHs, Metals
Indoor Air	Contaminant Plume 4	Air	Basements	Inhalation	Residents	Past	Activities in Basements	12	VOCs (tetrachloroethylene)
Indoor Air	Contaminant Plume 5	Air	Basements	Inhalation	Residents	Future	Activities in Basements	100	VOCs (trichloroethylene)

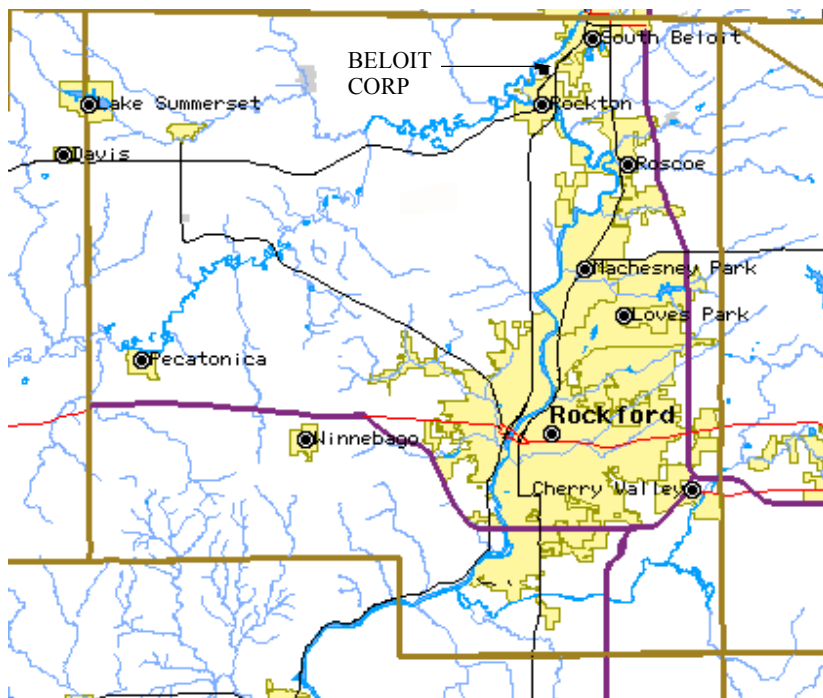
VOCs—volatile organic compounds

PAHs—polycyclic aromatic hydrocarbons

Attachments

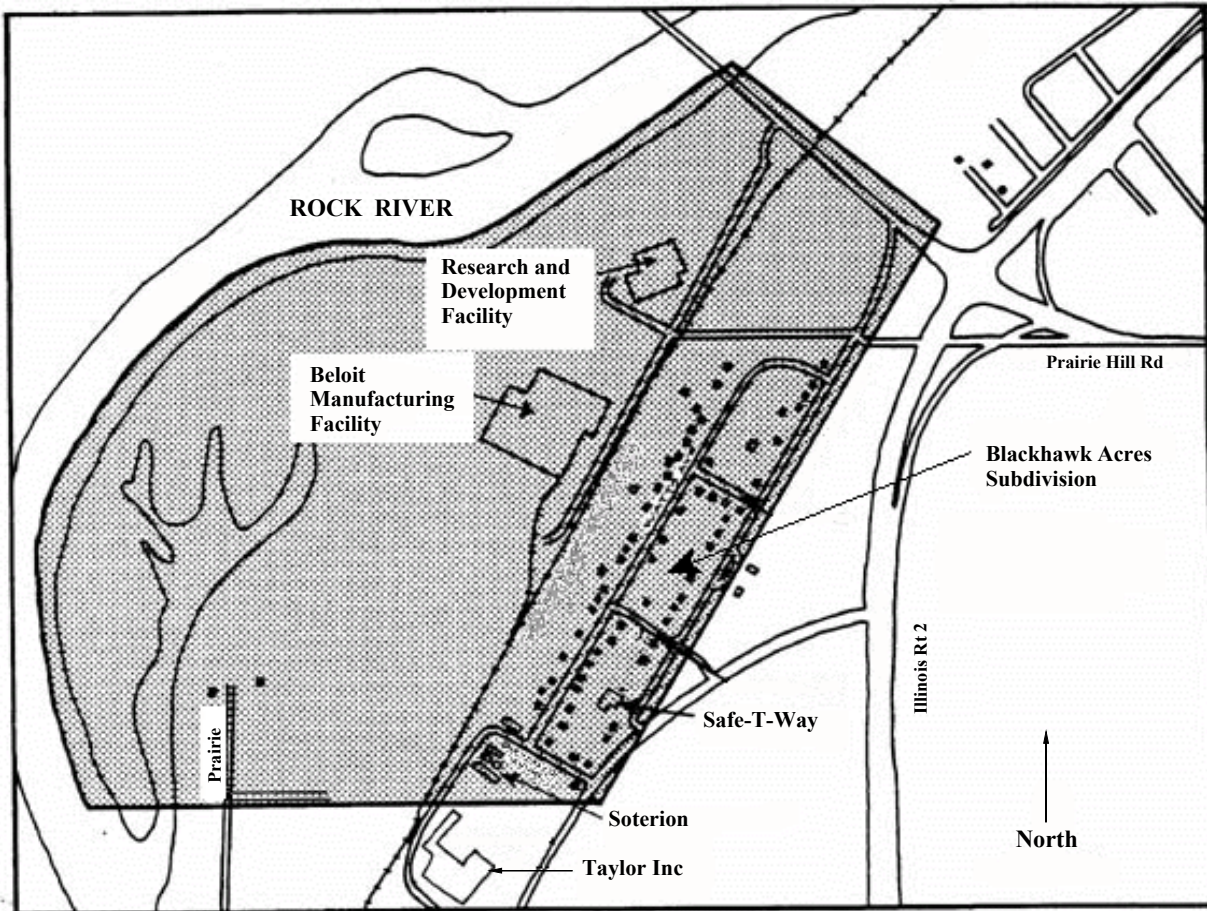
Attachment 1

Beloit Corporation Site Location



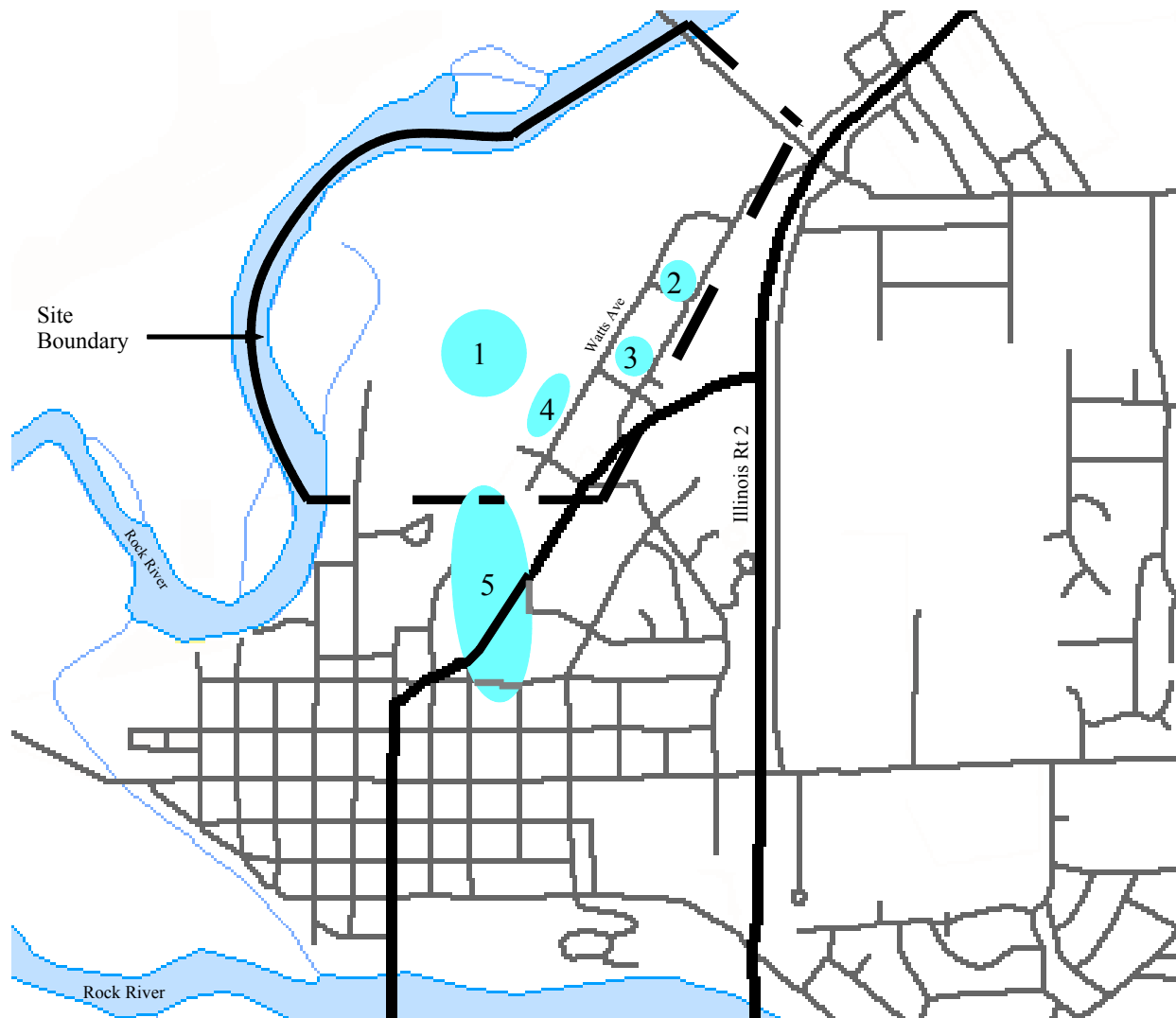
Source: IDPH

Attachment 2



Beloit Corporation Superfund Site Location

Attachment 3

**Beloit Corporation
Approximate Plume Locations**

Plume Number	Major Contaminants
1.	Tetrachloroethylene and 1,1,1-trichloroethane
2.	Chloroform
3.	Trichloroethylene
4.	Tetrachloroethylene, trichloroethylene, and 1,1,1-trichloroethane
5.	Trichloroethylene and 1,1,1-trichloroethane

Conclusions and Recommendations from the July 28, 1992, Interim Public Health Assessment

Conclusions

ATSDR has chosen five categories to classify the level of public health hazard posed by each NPL site. The five categories are:

1. Urgent Public Health Hazard
2. Public Health Hazard
3. Indeterminate Public Health Hazard
4. No Apparent Public Health Hazard
5. No Public Health Hazard

Based on the available information, this site is considered to be a category B public health hazard because of the risk to human health resulting from the past or present exposure to hazardous substances at concentrations that may result in an increased risk of adverse health effects. Past exposure to several chlorinated solvents is known to have occurred at several residences in the Blackhawk Subdivision and presently at least one of the private wells continues to show significant contamination. Three residences with contaminated wells were advised to seek alternate water supplies. It is known that presently at least one of these residences is using an alternate water source for drinking and cooking but continues to use contaminated well water for other household uses (bathing, cleaning, etc.). The status of the other two residences is unknown.

The old seepage lagoons and the area used for sludge application are two potential sources of environmental contamination on the BC property. The limited sampling data from the lagoons (one waste water and one bottom sludge sample) make it difficult to characterize the nature and extent of contamination as well as the lagoon's potential for release of contaminants. The release of contaminants into the air through volatilization is possible. However, the lagoons are located approximately one-fourth of a mile away from any homes. Given this distance, it is unlikely that any volatilization of contaminants from the lagoons poses a public health concern.

To date, soil samples have only been taken from the lagoons. It is difficult, therefore, to assess the potential environmental and public health risks that other areas of contamination may pose. Since the BC property is enclosed, direct contact with potentially contaminated soils by people outside of the facility is unlikely.

Groundwater sampling on-site has detected significant levels of contaminants. Five monitoring wells on the BC property have contained levels of total VOCs ranging from 1 to 1,273 ppb. These levels are of public health concern. The area of highest groundwater contamination on-site appears to be near well # 3 located just west of the area of sludge application.

A large part of the residential population in the area relies on private wells constructed in the shallow alluvial aquifer. Compounds such as 1,1-dichloroethene (1 to 177 ppb),

tetrachloroethylene (1 to 488 ppb), and 1,1,1-trichloroethane (0.3 to 954 ppb) have been detected in the residential wells. The maximum level of contamination in these wells occurred between 1985 and 1987. During that time period, sample results showed total VOC concentrations in two of these wells in excess of 600 ppb. The most heavily contaminated wells were sampled by the IDPH and U.S. EPA's Technical Assistance Team (TAT) in June and August 1989. According to the June of 1989 IDPH sample results, the two most heavily contaminated wells showed total VOC levels of approximately 40 ppb. The U.S. EPA TAT sampling results from August of 1989 showed total VOC levels in the same two wells of 35.3 and 280 ppb. In addition, the August sampling detected low levels of two compounds, benzene (1.5 ppb) and toluene (1.5 ppb), not previously detected in groundwater samples. The sample taken by IDPH in June 1991 confirms that contamination still exists on-site.

Recommendations

1. Residential wells should be routinely sampled to determine any new contamination or any increase in contaminant levels in wells with existing contamination.
2. Residents with a well that is contaminated should be provided an alternate water supply for potable and nonpotable use. Because of the large number of potentially affected homes, public water supply for the area or the extension of a pre-existing supply should be considered.
3. Monitoring wells should be routinely sampled to determine any movement in the contaminant plume or any new contamination.
4. Soil sampling should be performed on the areas of the former lagoons, sludge application areas, and any other areas suspected of being contaminated to determine the more extensive location and extent of soil contamination.

Comparison Values Used in Screening Contaminants for Further Evaluation

Environmental Media Evaluation Guides (EMEGs) are developed for chemicals based on their toxicity, frequency of occurrence at a National Priority List (NPL) site, and potential for human exposure. EMEGs are comparison values used only to select chemicals for future evaluation. They are developed without consideration for carcinogenic effects, chemical interaction, multiple routes of exposure, or other media-specific routes of exposure. EMEGs are very conservative concentration values designed to protect sensitive members of the population.

Reference Dose Media Evaluation Guides (RMEGs) are another type of comparison value derived to protect the most sensitive populations. They are developed without consideration for carcinogenic effects, chemical interactions, multiple routes of exposure, or other media-specific routes of exposure. RMEGs are conservative concentrations.

Cancer Risk Evaluation Guides (CREGs) are estimated concentrations that are based on 1 excess cancer in 1 million persons exposed to a chemical over a lifetime. CREGs are also conservative values designed to protect sensitive members of the population.

Maximum Contaminant Levels (MCLs) have been established by U.S. EPA as standards for public water supplies to reduce the chances of adverse health effects from use of contaminated drinking water. These standards are well below levels for which health effects have been observed and take into account the financial feasibility of achieving specific contaminant levels. MCLs are enforceable limits that public water supplies must meet.

Attachment 6

A copy of the Draft Public Health Assessment for the Beloit Corporation site was available for public review and comment at the Talcott Free Library at 101 East Main Street in Rockton from January 7 to February 13, 2004. The following comments were received.

Comment 1. On-Site Soil Contamination, Page 3: This section states that one or two samples per area are insufficient to predict exposure. Is this implying that there were only one or two samples in some areas and that exposure was not estimated for these areas?

Only on-site samples were evaluated using exposure estimates. The off-site samples were too few to accurately characterize exposure. This has been clarified in the text.

Comment 2. Surface Water and Sediment Contamination, page 3: The paragraph discussing sediment samples results is a little confusing. Is this implying that SD07 or SD08 is upgradient of the site and therefore indicative of contamination coming onto the site from another location?

Because contamination was found at a point west of the site (SD07), but not at a sampling point between the site and SD07, the source of the contamination is not known.

Comment 3. Completed Exposure Pathways, Soils, page 7: IDPH assumed that construction workers would ingest 100 mg soil per day. The same value was used for on-site workers. It seems likely that construction workers would ingest more soil because digging and excavating activities create more dust. USEPA recommends a soil ingestion rate of 330 mg/day for construction workers (Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, December 2002).

After recalculating the exposure estimates based on an ingestion rate of 330 mg/day for construction workers, the conclusions and recommendations were the same.

Comment 4. Completed Exposure Pathways, Groundwater, Page 8: The last paragraph of this section discussing the effects of exceeding the MCL and the RfD for PCE is confusing. It should explain that the MCL is set to protect against carcinogenic effects. It is our understanding that because USEPA is currently reviewing the carcinogenic potential for PCE, the cancer risks to consumers of the groundwater were not addressed in this Public Health Assessment.

The Groundwater section has been reworded to better clarify what comparison values were used to evaluate exposure to PCE.

Comment 5. Potential Exposure Pathways, page 8: This section and Table 7 discuss the potential for vapors migrating into the basements of homes from the contaminated groundwater. For the vapor intrusion into indoor air pathway, homes without basements may be affected, too. The vapors can infiltrate through the crawl spaces into the main living floor of the homes.

The text has been changed to include crawl spaces in the discussion.

Comment 6. Table 1: This table compares the range of detected concentrations of chemicals of concern in soils to average background levels. What is the source of the average background levels? Are these site-specific values?

The source of the background levels used in Table 1 were site specific and were from the 1999 Remedial Investigation report prepared by Montgomery Watson.

Comment 7. Page 1: Four carbon filter treatment units (CTUs) were installed for five residences; early on in the Remedial Investigation, one well provided drinking water for two residences. At this time, only three CTUs are in service.

Page 3: Be reminded again, there were only four wells for five residences, not five.

Page 6: Be reminded again, only three of the four original CTUs are in use at this time.

The text has been changed to update the information.

Comment 8. Page 9: Somehow convey that the Illinois EPA has been conducting drinking water well sampling for many years in the Blackhawk Acres subdivision and nearby locations. I know we have sampled periodically since the beginning of the RI in 1990, but also before then in the 1980s. The wording under Community Health Concerns may be interpreted as the Illinois EPA only sampled during the years that IDPH sent letters to the residents.

The text has been changed to clarify the sampling dates.

Comment 11. Page 22: Provide a source and date for this map. It is my understanding that some of these plumes overlap and have changed shape since the installation of the pump and treatment system was installed in 1993.

The map was made by IDPH staff and based on information from the 1999 Remedial Investigation.

Comment 12. As a clean ground-water protector (charter member of initial Northern Illinois Groundwater Protection Committee-Winn., Boone, McHenry counties and an Ad Hoc member as of this date), I am requesting that IDPA [sic] "Conclusions" be amended to omit "IDPH concludes that the Beloit Corporation site poses no apparent health hazard." and include the level of Public Health Hazard as "Indeterminate Public Health Hazard" at this time. My reasons follow:

Pages 4 and 22, attachments #3, Public Health Assessment, Beloit Corp., Rockton, Winnebago Co., Illinois, EPA Facility ID #ILD021440375" makes reference to plume #5 on this included map. Also see "Demographics, Land Use, and Natural Resources", in paragraph #2, to "one of the municipal wells in Rockton is approximately 1,000 yds. Southwest of the site. This well continues to remain unaffected by the site. The other municipal wells are unlikely to be affected by the site." Please note, on the above referenced map and all the written portions of this P.H. Assessment, the "public municipal well" is really only a water storage tank to which water from the municipal water well is pumped, via a closed system. I have noted the storage tank in yellow on the map and the municipal well (correct) in red.

I believe the correct well should be monitored on a yearly basis for VOCs and heavy metals, for the indifinate [sic] future with the testing and analysis to be paid for out of funds from the existing Superfund clean-up monies.

A mistake was made in the referenced direction of the well in the public comment version. It should have stated that the well was approximately 1,000 yards south-southeast of the site. The text has been changed to correct this information.

In addition, all public water supplies are tested annually for quality. Because of this, additional testing is not needed.

These points do not warrant a change in the hazard category for the site.

Comment 13. I further request that monitoring wells be located South and Southeast of plume #5, at varying depth levels to ascertain [sic] the lateral and vertical movements of this #5 plume. Since this plume #5 has not moved toward surface water (Rock River West of Beloit Corp. site), there is no reason to believe the hydrogeologic draw of the pre-historic Pecatonic River will lessen. Where the plume #5 will be drawn is not known, but every effort must be made to protect municipal water sources for the Village of Rockton and Rock River Valley aquifers.

IDPH does not install monitoring wells. This is typically done by either IEPA or U.S. EPA. This concern will be passed along to those agencies.