



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

EPA Region 5 Records Ctr.



226991

REPLY TO THE ATTENTION OF

DATE: MAR 31 1985

SUBJECT: ACTION MEMORANDUM - Request for a \$2 Million Exemption for a Time-Critical Removal Action at the Boerke site, Oak Creek, Wisconsin

FROM: Betty G. Lavis, On-Scene Coordinator *Betty G. Lavis*
Emergency and Enforcement Response Branch

TO: Valdas V. Adamkus
Regional Administrator

THRU: William E. Muno, Director *WEM*
Waste Management Division

Site ID #QO

1. PURPOSE

The purpose of this action memorandum is to request and document approval of the proposed time-critical action and to request an Exemption for the \$2 Million Statutory Limit described herein for the Boerke Site in Oak Creek, Wisconsin. The site is an abandoned landfill and associated property contaminated with high levels of arsenic. It is estimated that the removal of arsenic contaminated soil will take six months at a cost of \$3,368,200. The site is not on the National Priorities List (NPL).

II. SITE CONDITIONS AND BACKGROUND

A. Site Description

1. Removal Site Evaluation

CERCLIS ID #WID981189642

The Boerke site is an abandoned unlined industrial landfill that received arsenic wastes from a dye manufacturing facility that operated from approximately 1915 until 1939 next to the property. The site includes an adjacent wetland area that receives runoff from the landfill and an intermittent stream that carries drainage from the wetland to Lake Michigan, approximately 1/8 of a mile northeast of the site. The landfill covers approximately 30,000 square feet with an average depth of 2.5 feet. The surface is black in color and sparsely vegetated; some areas are covered with black globules resembling coal tar.

Background information was supplied by the State of Wisconsin and the present owner of the site. The actual date of disposal activities is poorly documented but can be assumed to have taken place concurrently with the production activities of the adjacent Carrolville Dye Plant (the Plant). The Plant, owned by the Newport Chemical Company, operated on the site currently occupied by the Allis Chalmers facility and the Boerke site. The Plant came into existence in 1915 as a manufacturer of phenols and later of intermediates and dyes. Arsenic wastes, a by-product of the dye manufacturing process, were disposed of at the Boerke site. In August of 1939, E.I. DuPont de Nemours and Company acquired the Newport Chemical Corporation by a 100% purchase of all capital stock, thereby acquiring the property, the plant and the processes used therein. DuPont operated the facility until at least 1939. The site is currently owned by the Boerke family trust.

The site came to the attention of the Wisconsin Department of Natural Resources (WDNR) in the 1980's and a preliminary assessment (PA) of the site was completed in 1987. Sampling conducted at that time indicated that high levels of arsenic were present in the landfill area, the adjacent wetland, and the stream. In 1989, the DuPont Chemical Company contracted with OH Materials Company to investigate the site in conjunction with a site investigation on an adjacent property. The investigation included collection of surface and subsurface soil samples, deep soil borings, and test pits. Arsenic levels as high as 35,000 milligrams per liter (mg/l) were found in the landfill and levels as high as 380 mg/l were found in the stream sediment at a point 1,050 feet downgradient of the landfill. Arsenic was also detected in a water sample from the wetland at levels exceeding federal standards. No arsenic was detected in a sample from a residential well located approximately 0.1 mile southeast of the landfill.

In August of 1994, WDNR requested that the U.S. Environmental Protection Agency (EPA) perform a site investigation (SI). On October 18, 1994, On-Scene Coordinator (OSC) Betty Lavis and Site Assessment Manager (SAM) Rey Rivera met WDNR officials Robert Amerson (Central Office) and John Krahling (District Office) at the site to conduct a walk through of the site. It was decided the site warranted further investigation and an integrated Site Assessment was scheduled for early December.

On December 7, 1994, the Region V Technical Assistance Team (TAT), the OSC, the SAM, and Amy Parkinson of WDNR met at the site to collect samples and document site conditions. Observation of site conditions was somewhat obstructed by seven inches of snow which had fallen the previous night. Six soil and sediment samples (0-12 inches) were collected; locations were selected with the intent of confirming the results of previous sampling events. Samples were analyzed for semi-volatile organic compounds and 13 priority pollutant metals plus copper and zinc. (See attached map and Table 1 for significant sample analytical results).

2. Physical Location

The Boerke site is located in a rural area south of the City of South Milwaukee, on Ryan Road (latitude 42° 52.252" N; longitude 82° 50.907" W) in the City of Oak Creek, County of Milwaukee, State of Wisconsin. The site is bordered to the south by Ryan Road, to the east by Lake Michigan, and to the north and west by industrial properties. The area of the landfill itself covers approximately 30,000 square feet with an average depth of 2.5 feet. Allis Chalmers currently operates a chemical manufacturing facility on property adjacent to the

northwest border of the site. A fence with a locked gate separates the site from Ryan Road but does not surround the entire property.

The landfill area is in a low-lying marshy area. The area immediately adjacent to the landfill is a wetland; the wetland is *drained by an intermittent stream that flows directly into Lake Michigan 1/8 of a mile away*. During the walk through in October of 1994, the team observed many bird species, both indigenous and migratory, using the area around the site. Animal tracks were also observed in several places on site. The property around the site is heavily wooded, particularly the area around the stream.

Approximately 17,000 people live in and around Oak Creek, 30 within one mile of the site; the nearest residence is located .2 miles west of the site. Bender Park, a large wooded public park with a network of multi-use access trails, lies directly south of the site and borders Lake Michigan. The stream flows through the park on its way to Lake Michigan.

3. Site Characteristics

The site is an abandoned landfill on property currently owned by the Boerke Family Trust. This action will be the first removal at the site.

4. Release or Threatened Release into the Environment of a Hazardous Substance, or Pollutant or Contaminant

The analytical results for soil and sediment samples collected during the 12/7/94 site assessment (SA) confirms that elevated levels of arsenic are present in the area of the landfill and have been released to the wetland and stream (see Table 1). Total arsenic levels as high as 42,000 mg/l were found in the landfill area; the wetland area had total arsenic levels as high as 4,900 mg/l. Arsenic levels in the lower part of the stream as it discharges to Lake Michigan were also elevated at 3400 mg/l. Toxic Characteristic Leaching Procedure (TCLP) was performed on all samples. Samples collected from the landfill and wetland contained TCLP arsenic levels of 108 mg/l and 23 mg/l respectively. The suggested removal action level (RAL) for total arsenic in soils is 5.0 mg/l. Approximately 10,000 cubic yards of soil and sediment are contaminated with high levels of arsenic.

5. NPL Status

The OSC has been working closely with the SAM and the State of Wisconsin on the Boerke site. The site has not been proposed for the NPL.

6. Maps, Pictures and other Graphic Representations

Location and Site maps are attached to this Memorandum. Also attached are Table 1 (Analytical Results) and Attachments 1 and 2 (Contractor Cost Estimate and the Administrative Record Index).

B. Other Actions to Date

No cleanup activities have taken place at the site and no activities are planned other than

those to be undertaken by EPA.

C. State and Local Authorities' Roles

The WDNR requested EPA assistance both verbally and by letter, describing the threats posed by an uncontrolled arsenic landfill in a sensitive area. WDNR Central and District Office personnel have actively participated in assessing the threat and have provided extensive background information. The State does not intend to respond to the threat or provide any funding.

III. THREATS TO PUBLIC HEALTH, WELFARE, OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

A. Threats to Public Health or Welfare

The documented conditions at the Boerke site meet the criteria for a removal action as outlined in the National Contingency Plan (NCP), Section 300.415(b)(2), specifically:

- 1) Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants;**

Analysis of soil and sediment collected from the Boerke site indicates the presence of TCLP arsenic in concentrations ranging from 23 to 108 mg/l. Access to the Boerke site is only partially restricted. The nearest residence is within .2 miles of the site. A public park with a trail system borders the site to the south. The Allis Chalmers Chemical plant operates a chemical manufacturing facility on property adjacent to the northwest border of the site. The potential exists for trespassers such as neighborhood children, hikers, and hunters, to come in contact with high levels of arsenic.

During the October 1994 site walk through, animal tracks were observed in the arsenic contaminated waste in the landfill/marsh area. The area around and adjacent to the landfill area, which is mostly nonvegetated with a few stressed plants, is heavily vegetated and supports a wide variety of wildlife, including waterfowl, small mammals, large mammals such as deer, and reptiles. Arsenic is a known carcinogen and, in addition, has toxic effects on humans and some mammals. Long term ingestion of low levels of arsenic have been associated with skin cancers and may increase the risk of internal cancers. It can also result in anemia, leukopenia, nerve damage, damage to arteries and dermal lesions. Ingestion of water contaminated with levels of inorganic arsenic at 100 mg/l can cause death.

Arsenic has long been used in the production of herbicides and insecticides, as it has a detrimental effect on many plants and animals. The effect of arsenic on non-human species, according to the U.S. Fish and Wildlife Service Biological Report 85, January 1988, tends to be primarily acute and subacute rather than chronic and/or carcinogenic. The report also states that single oral doses of arsenicals fatal to 50% of sensitive species tested ranged from 17 to 48 milligram/kilogram (mg/kg) body weight (BW) in birds and from 2.5 to 33 mg/kg BW in mammals. Sensitive species of mammals (including many varieties of birds, small mammals and deer) were adversely affected at doses of 1 to 10 mg of arsenic per kilogram BW.

Sensitive aquatic species were damaged at water concentrations of 19 to 48 micrograms of arsenic per liter. Arsenic is also a known teratogen in several classes of vertebrates. Arsenic bioaccumulates in sensitive species but does not appear to biomagnify.

The primary route of exposure for both humans and animals is through ingestion of food (such as plants that accumulate arsenic), or water containing arsenic, or through inhalation of fine particles (dust) containing arsenic. It is highly likely that arsenic is entering the food chain through direct contact with the contaminated water and sediment and/or ingestion of plants. The potential for waterfowl to come in contact with arsenic-contaminated sediment or water is especially high. Continued human and animal exposure is likely until the contaminants at the site are removed.

2) Actual or potential contamination of drinking water supplies or sensitive ecosystems;

The landfill is situated in an environmentally sensitive area adjacent to a wetland and heavily wooded public park.

3) High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate;

Sampling at the site shows that contaminants from the open, unlined landfill have already migrated to the wetland and into the stream, resulting in levels of total arsenic as high as 4,900 mg/l in sediment samples taken from the wetland and as high as 3400 mg/l in sediment samples taken from the stream. The stream flows into Lake Michigan 1/8 of a mile northeast of the site.

4) Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released;

The landfill at the Boerke site is currently unlined and uncovered. Rain water and snow melt can accumulate and flow off the landfill. This results in a release to the wetland area (where high levels of arsenic are now found). As levels of contaminated water continue to rise in the wetland area, the excess overflows into the creek and eventually exits into nearby Lake Michigan. Flood events can also cause the contaminated soil and sediment to migrate into the wetland and stream.

5) The availability of other appropriate Federal or State response mechanisms to respond to the release.

The WDNR does not have adequate funding to conduct a removal action at the Boerke site.

B. Threats to the Environment

1) Actual or potential exposure to hazardous substances or pollutants or contaminants by nearby animals, sensitive ecosystems, or the food chain.

High levels of total arsenic (4,900 mg/l) were detected in sediment samples from the stream

and wetland adjacent to the landfill. These findings indicate that hazardous substances present in the landfill are migrating and releasing to the wetland and stream. The wetland are close to a heavily wooded public park and provide an important habitat for local wildlife and migrating birds. Drainage from the site flows into the stream which runs through the public park and ultimately enters Lake Michigan. Please see the discussion under III.A.1. for more specific information.

IV. ENDANGERMENT DETERMINATION

Given the site conditions, the nature of the hazardous substances on site, and the potential exposure pathways to nearby populations described in Sections II and III above, actual or threatened release of hazardous substances from this site, if not addressed by implementing the response actions selected in this Action Memorandum, may present an imminent and substantial endangerment to public health, or welfare, or the environment. The presence of TCLP arsenic as high as 108 mg/l in soil at the landfill and as high as 23 mg/l in the wetland is well above the suggested RCRA TCLP RAL level of 5 mg/l and represents an imminent and substantial threat to both local residents, the local ecosystem, and to Lake Michigan.

V. EXEMPTION FROM STATUTORY LIMITS

Section 104(c)(1) of CERCLA as amended by SARA, limits federal emergency response actions to \$2 million unless three criteria are met. The quantities and levels of hazardous substances found at the Boerke site warrant the \$2 million exemption request based on the following factors:

1) There is an immediate risk to public health or welfare or the environment: Arsenic is present in an uncontrolled, open landfill at levels as high as 108 mg/l TCLP, well above the suggested RAL of 5 mg/l, and is migrating into a nearby wetland and stream. The stream discharges into Lake Michigan 1/8 of a mile away. Access to the site is only partially restricted. The nearest residence is within .2 miles of the site. A public park with an extensive trail system borders the site to the south. The potential exists for trespassers such as neighborhood children, hikers, and hunters, to come in contact with high levels of arsenic through direct contact with contaminated soil and sediment and/or airborne dust containing arsenic.

2) Continued response actions are immediately required to prevent, limit or mitigate the emergency: High levels of arsenic at the site present a serious threat to public health and sensitive ecosystems. Contaminated soil and sediment must be excavated and removed to eliminate the risk of ingestion by trespassers, neighborhood children, and wildlife including migratory birds and prevent further off-site migration of the contaminants.

3) Assistance will not otherwise be provided on a timely basis: Neither the State nor the local government has access to or resources to acquire the proper equipment and services needed to address the site. U.S. EPA is ready to mobilize to the site immediately.

VI. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions

1. Proposed Action Description

The following removal activities are proposed to alleviate the potential and actual threats to human health and the environment posed by the hazardous contaminants at the Boerke site:

- a) Establish site security by constructing a fence to restrict site access;
- b) Develop and implement a site health and safety plan;
- c) Construct a service road and work area;
- d) Determine the vertical and horizontal extent of contamination;
- e) Excavate approximately 10,000 cu/yds of contaminated soil and sediment;
- f) Stabilize contaminated soil/sediment;
- g) Analyze soil/sediment for TCLP arsenic prior to off-site disposal;
- h) Dispose of treated materials and restore area.

2. Contribution to Remedial Performance

The proposed removal action will address all known threats at the site. If groundwater remediation is required, the removal activities will be consistent with remedial activities.

3. Applicable or Relevant and Appropriate Requirements (ARARs)

All Federal and State ARARs will be complied with to the extent practicable. A letter has been sent to Amy Parkinson of the WDNR on 3/24/95 requesting that she identify State ARARs. Any State ARARs identified in a timely manner for this removal action will be complied with to the extent practicable.

4. Project Schedule

The proposed removal action is estimated to take 6 months. Response activities can begin in early May, as soon as the ground thaws.

B. Estimated Costs

The detailed contractor costs are presented in Attachment 1 with the estimated project costs summarized below:

EXTRAMURAL COSTS:

Cleanup Contractor Costs	\$ 2,066,706
Contingency 20%	\$ 413,214
Subtotal	\$ 2,479,284
Total TAT, including multiplier costs	\$ <u>161,940</u>
Extramural Subtotal	\$ 2,641,224
Extramural Contingency (20%)	\$ <u>528,234</u>
TOTAL, EXTRAMURAL COSTS:	\$ 3,169,460

INTRAMURAL COSTS:

Intramural Direct Costs (2160 hrs x 30/hour)	\$ 64,800
Intramural Indirect Costs (2160 hrs x 62/hour)	\$ 133,920
TOTAL, INTRAMURAL COSTS:	\$ 198,720
TOTAL REMOVAL PROJECT CEILING	\$ 3,368,200

The response actions described in this memorandum directly address actual or threatened releases of hazardous substances, pollutants, or contaminants at the facility which may pose an imminent and substantial endangerment to public health and safety, and to the environment. These response actions do not impose a burden on affected property disproportionate to the extent to which that property contributes to the conditions being addressed. The On-Scene Coordinator has begun planning for provision of post-removal site control, consistent with the provisions of the NCP set forth at 40 C.F.R. Section 300.415(k)

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Increased risk to public health and the environment will result if no or delayed action ensues. Uncontrolled access to the landfill, wetland, and stream ensures the likelihood of continued human and animal exposure to arsenic. In addition, continued exposure to the elements will allow further deterioration of the landfill and additional migration of arsenic contaminated surface water and sediment into the adjacent wetlands and stream, and ultimately, Lake Michigan.

VII. OUTSTANDING POLICY ISSUES

None.

VIII. ENFORCEMENT

For administrative purposes, information concerning the enforcement strategy for this site is contained in the Enforcement Confidential Addendum (Attachment 3).

IX. RECOMMENDATION

This decision document represents the selected removal action for the Boerke site in Oak Creek, Wisconsin, developed in accordance with CERCLA, as amended by SARA, and not inconsistent with the NCP. This decision is based on the Administrative Record for the site. Conditions at the site meet the NCP Section 300.415(b)(2) criteria for a removal and the CERCLA section 104 (c) emergency exemption from the \$2 Million Dollar statutory limitations and I recommend your approval of the proposed removal action. The total project ceiling, if approved, will be \$3,368,200, of which \$3,007,512 may be used for extramural clean-up contractor costs. You may indicate your decision by signing below.

APPROVE: _____

Regional Administrator

DATE: _____

3/31/95

DISAPPROVE: _____

Regional Administrator

DATE: _____

Attachments:

- 1. Detailed Cleanup Contractor Cost Estimate**
- 2. Index to the Administrative Record**
- 3. Enforcement Confidential Addendum**

cc: T. Johnson, U.S. EPA, OERR, OS-210
D. Henne, U.S. Department of the Interior
Office of Environmental Policy and Compliance
U.S. Custom House, Room 217
200 Chestnut Street
Philadelphia, PA 19106
A. Parkinson, Wisconsin Dept. of Natural Resources
Environmental Response Division
Madison, Wisconsin

bcc: A. Baumann, HSRL-5J
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L. Fabinski, ATSDR, HSRL-5J
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T. Lesser, P-19J
D. Crume, MF-10J
EERB Site File (E. Brennehan, WMD Records Center, 7th Fl.)
EERB Read File (L. Taylor)
EERB Delivery Order File (M. Gustafson)
R. Dumelle, Contracting Officer, MC10-J
B. Lavis, On-Scene Coordinator
D. Dawley, Enforcement Specialist, HSE-5J
T. Nash, CS-29A

ATTACHMENT 1

DETAILED CLEANUP CONTRACTOR COST ESTIMATE

The estimated cleanup contractor costs are as follow:

Contractor Personnel	\$ 761,650
Contractor Equipment	\$ 311,860
Subcontractor Cost	\$ 216,840
Unit Rate Material	\$ 449,350
At Cost Materials	\$ 0
Waste Disposal	\$ 36,370
Waste Transportation	<u>\$ 290,000</u>
TOTAL	\$ 2,066,070

ATTACHMENT 2

ADMINISTRATIVE RECORD INDEX

ATTACHMENT 2

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMOVAL ACTION

ADMINISTRATIVE RECORD
FOR
BOERKE SITE
OAK CREEK, WISCONSIN

March 10, 1995

<u>DATES</u>	<u>AUTHOR</u>	<u>RECIPIENT</u>	<u>TITLE/DESCRIPTION</u>	<u>PAGES</u>
10/14/94	Krahling, J., WDNR	Lavis, B., U.S. EPA	FAX Transmittal: Preliminary Assess- ment (w/Attachments)	45
00/00/00	Lavis, B., U.S. EPA	Adamkus, V., U.S. EPA	Action Memorandum (Pending)	

ATTACHMENT 3

ENFORCEMENT CONFIDENTIAL ADDENDUM

THE ENFORCEMENT CONFIDENTIAL ADDENDUM

HAS BEEN REDACTED

NOT RELEVANT TO THE SELECTION OF THE REMOVAL ACTION

Table 1

**ANALYTICAL RESULTS
BOERKE SITE
OAK CREEK, WISCONSIN**

Units = milligrams per liter (mg/l)

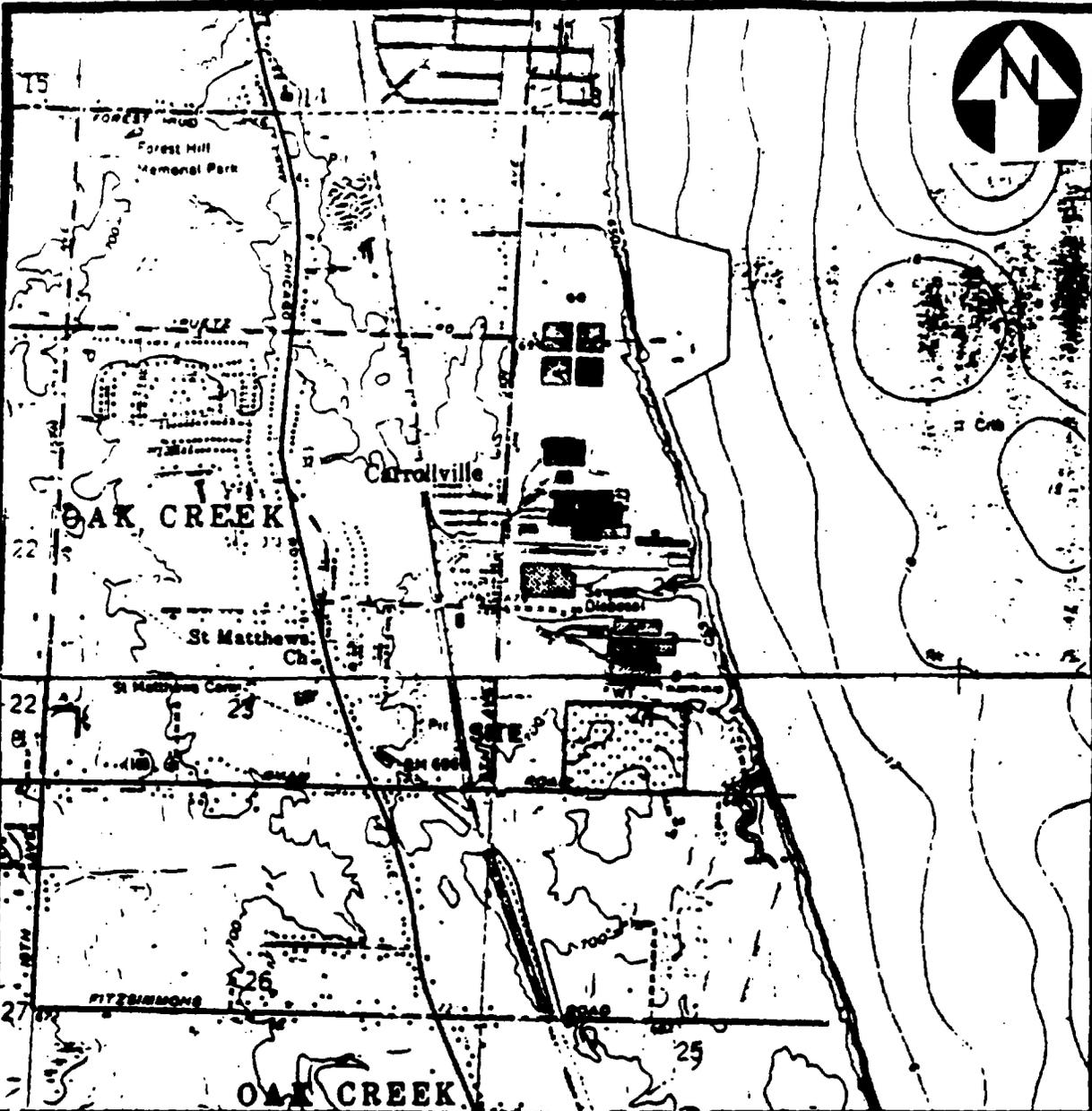
Parameters	Sample Designation					
	BSD-01	BSD-02	BSD-03	BSD-04	BSD-05	BKG-01
Total arsenic	3000	3400	1100	4900	42000	3.1
TCLP arsenic	4.1	3.5	.78	23	108	.018
Total chromium	27	21	36	19	18	21
Total lead	21	16	31	240	120	15
Total mercury	ND	0.2	0.3	1.4	0.8	ND
Naphthalene	0.1	0.078	1.0	9900	150	0.52

ND = Not Detected

Source: Quality Analytical Labs, Inc., Lisle, Illinois.

The following is a description of the sample collection sites:

- BSD-1, furthest downgradient point in stream bed;
- BSD-2, 50 yards downgradient from the mouth of the stream;
- BSD-3, mouth of the stream;
- BSD-4, wetland adjacent to landfill;
- BSD-5, landfill;
- BKG-01, background sample.



Quadrangle
Location



ecology and environment, inc.
Technical Assistance Team
Region V

111 W. Jackson Blvd., Chicago, Illinois 60604

FILE	SITE LOCATION MAP	FIGURE #	2-1	
SITE	BOERKE SITE	SCALE	1 : 24,000	
CITY	OAK CREEK	STATE	WI	
SOURCE	U.S.G.S., 7.5 minute series topographic maps for Racine North and South Milwaukee, WI Quadrangles.		DATE	1958
			REVISED	1971