



Remedial Action Decision Document

For
Landfill 02

Newark Air Force Base
Heath, Ohio



Air Force Base Conversion Agency

September 2002

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List of Acronyms

ARARs	Applicable or Relevant and Appropriate Requirements
AF	Air Force
AFBCA	Air Force Base Conversion Agency
BCEE	bis (2-chloroethyl) ether
BCT	BRAC Cleanup Team
bgs	below ground surface
BRA	baseline human health risk assessment
BRAC	Base Realignment and Closure Program
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
EBS	Environmental Baseline Survey
ELCR	excess lifetime cancer risk
FAA	Federal Aviation Administration
FS	Feasibility study
FSRI	Focused Supplemental Remedial Investigation
IRP	Installation Restoration Program
LCRAA	Licking County Regional Airport Authority
LF	Landfill
NAFB	Newark Air Force Base
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPDES	National Pollutant Discharge Elimination System
OEPA	Ohio Environmental Protection Agency
RADD	Remedial Action Decision Document
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
SARA	Superfund Amendments and Reauthorization Act
SRI	Supplemental Remedial Investigation
TBC	To Be Considered
USEPA	United States Environmental Protection Agency
UWBZ	Upper Water Bearing Zone

**I DECLARATION FOR THE REMEDIAL ACTION DECISION
DOCUMENT**

SITE NAME AND LOCATION

This Remedial Action Decision Document (RADD) addresses the findings of a remedial investigation conducted at Landfill 02 (LF02) located at the former Newark Air Force Base (NAFB). NAFB is located within the city limits of Heath in the southeast quadrant of Licking County in central Ohio. NAFB encompasses approximately 70 acres, most of which has been developed. LF02 (also referred to as AC13) consists of approximately 13 acres of undeveloped land in the northern portion of NAFB, south of Irving-Wick Drive and north of Ramp Creek.

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedy for the LF02 site at NAFB that was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA), and, to the extent practical, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the Administrative Record file for this site, which is located at:

Air Force Base Conversion Agency Office (AFBCA)	Newark Public Library, Main Branch
7370 Minuteman Way	101 West Main Street
Rickenbacker IAP, Columbus, OH 43217	Newark, OH 43059

OEPA and the USEPA, Region 5, concur with the selected remedy for LF02.

ASSESSMENT OF LANDFILL 02

The Air Force has determined hazardous substances present in groundwater below LF02, if not addressed, may pose an unacceptable risk to human health and the environment. This determination was based on an assessment of cancer and non-cancer risks to current and future occupants of NAFB documented in the Focused Supplemental Remedial Investigation Report. The response action selected in this Decision Document is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

DESCRIPTION OF THE SELECTED REMEDY

This decision document presents the selected remedy for LF02. The selected remedy addresses the principal threats posed by groundwater contamination. The selected remedy for LF02 is:

- Prevent exposure to groundwater present in the upper water bearing zone through the enforcement of existing land use controls and the implementation of additional Institutional Controls (land use controls).

Declaration

- 1 • Prohibit the installation of any wells for drinking water or any other purposes, which
- 2 could result in the inhalation of vapors from, the dermal absorption of, or the
- 3 ingestion of, the contaminated groundwater.
- 4 • Restrict the future use of the property to commercial/industrial use.

5
6 The selected remedy for LF02 is protective of human health and the environment because it
7 seeks to prevent exposure to human receptors by the use of Institutional Controls (land use
8 controls). The AF may contract or assign the duties of conducting certain monitoring or
9 oversight activities associated with the selected remedy to other parties. In evaluating the
10 effectiveness of the selected remedy, the AF may rely on other available regulatory programs
11 that impose or help implement institutional or land use controls consistent with the selected
12 remedy. Notwithstanding the above, the AF will retain its CERCLA responsibility to ensure the
13 effectiveness of the selected remedy until the residual bis (2-chloroethyl) ether (BCEE)
14 contamination no longer poses a threat to human health and the environment.

15
16 The AF will provide the specific language for any deed restrictions required by this selected
17 remedy to both the USEPA and OEPA prior to the transfer of LF02 to LCRAA. The City of
18 Heath maintains responsibility for enforcing its Ordinance 100-93, which prohibits the use of
19 groundwater for sanitary or consumptive use. The Federal Aviation Administration (FAA), in
20 accordance with 41 C.F.R. § 101-47.308-2(g), will have the responsibility for enforcing its land
21 use restrictions associated with the operation of the Newark-Heath Airport, as described in
22 Section 6.0 of this RADD.

23
24 The deed conveying the LF02 property to LCRAA will include the land use restrictions and
25 controls mentioned above and also; will require the LCRAA to obtain the approval of the AF,
26 OEPA, and the City of Heath prior to commencing excavation activities near the UWBZ at
27 LF02, which is located at depths ranging from about 11.5 to 21 feet below ground surface (bgs).

28
29 The AF will include a covenant in the deed that will require the LCRAA to assume primary
30 responsibility for monitoring the Institutional Controls (land use controls). The AF retains its
31 CERCLA responsibility to ensure the effectiveness and protectiveness of its selected remedies,
32 including the Institutional Controls (land use controls) specified in this Decision Document. The
33 AF will ensure these controls are monitored annually until the first CERCLA Section 121(c) Five
34 Year Review is conducted to determine whether the BCEE contaminant levels in groundwater no
35 longer present a threat to human health and the environment. If the BCEE contaminant levels
36 still pose a threat to human health and the environment when the Five Year Review is conducted,
37 the Air Force will consult with OEPA and USEPA to determine whether the frequency of
38 continued monitoring can be modified to allow less frequent Institutional Control (land use
39 controls) monitoring intervals and still provide adequate protection of human health and the
40 environment.

41

Declaration**1 STATUTORY DETERMINATIONS**

2 The remedy selected by AF for LF02 is protective of human health and the environment,
3 complies with applicable or relevant and appropriate requirements (ARARs) for this action, and
4 is cost-effective. This remedy utilizes a permanent solution.

5
6 Because this remedy will result in hazardous substances, pollutants, or contaminants remaining
7 on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review as
8 mandated by CERCLA and the NCP will be conducted within five (5) years after initiation of
9 remedial action to ensure that ongoing reuse remains protective of human health and the
10 environment.

11 DATA CERTIFICATION CHECKLIST

12 The following information is included in the Decision Summary section of this Decision
13 Document. Additional information can be found in the Administrative Record file for LF02.

- 14
15
- 16 • Chemical of concern and its concentration in the soil at this site.
 - 17 • A summary of the baseline risk assessment (BRA).
 - 18 • Cleanup levels established and the methodology used to calculate them.
 - 19 • Current and reasonable future assumptions regarding land use and groundwater use.
 - 20 • Estimated capital, annual operation and maintenance (O&M) costs for the remedy.
 - 21 • Key factors that led to the selected remedy.

21 DECLARATION

22 This RADD represents the selection of a remedial action for LF02 at NAFB, and has been
23 prepared by AF and approved by OEPA and USEPA as documented in the signature page. The
24 RADD is authorized for immediate implementation.

26 Department of the Air ForceBy: Albert F. Lowas

27
28
29 Albert F. Lowas, Director
30 Air Force Base Conversion Agency
31

Date: September 30, 2002**32 Ohio Environmental Protection Agency**By: Fred Myers

33
34
35 Fred Myers, Site Coordinator
36 Ohio Environmental Protection Agency, Central District Office
37

Date: 9/26/02**38 United States Environmental Protection Agency**By: Timothy G. Fischer

39
40
41 Timothy Fischer, Remedial Project Manager,
42 United States Environmental Protection Agency, Region 5

Date: 9/26/02

Decision Summary

II DECISION SUMMARY

1.0 Site Name, Location and Description

NAFB is located in central Ohio in Licking County, approximately 35 miles east of Columbus. The former base is located within the city limits of Heath, Ohio. NAFB encompasses approximately 70 acres, most of which has been developed. NAFB fabricated aircraft wings and housed the only AF facility that had the technical capability to repair missile guidance and navigation systems. In addition, the AF metrology laboratories were located at the base. In September 1993, NAFB was subject to closure pursuant to the Defense Base Closure and Realignment Act of 1990. The base closed on September 30, 1996.

LF02 (also referred to as AC13) consists of approximately 13 acres of undeveloped land in the northern portion of NAFB, south of Irving-Wick Drive and north of Ramp Creek (Figure 1).

2.0 Site History

This section provides the history of LF02 and an overview of the response history of NAFB and the regulatory framework under which the responses were completed.

NAFB acquired LF02 in 1984 from David and Inez Myers (HAZWRAP, 1991). The site was once owned by Pure Oil Company prior to ownership by Koppers/Byerlyte Corporation and David and Inez Myers (Clyde E. Williams & Associates, [CEWA], 1984). According to Dames and Moore (1993), the site was originally lowland along Ramp Creek that was filled with excavated soil, concrete rubble, steel structures, and asphaltic materials. Two unlined drainage ditches cut across LF02, running from north to south and discharge into Ramp Creek (Figure 2). The eastern ditch (which flows across the middle portion of LF02) is a National Pollutant Discharge Elimination System (NPDES)-permitted discharge point from Koch Materials, an asphalt plant located north of Irving-Wick Drive. The discharge is monitored periodically for flow rate, total suspended solids, chemical oxygen demand, and oil and grease. The permit indicates that the discharge to the ditch is composed of noncontact cooling water, boiler blowdown, and stormwater runoff from an onsite storage tank area (CEWA, 1984). The western ditch conveys surface stormwater runoff.

Environmental investigation activities have been conducted periodically at LF02 since 1984. These activities included soil and groundwater sampling, test pit excavation, aerial photograph evaluation, and geophysical surveys. BCEE was identified as a chemical of concern in the groundwater in the upper water-bearing zone (UWBZ) in 1984 (CEWA, 1984) but was not found in the unsaturated soil. This investigation was prior to AF ownership of the LF02 parcel. BCEE is (or was) used primarily as a reagent for organic synthesis (including the synthesis of medicinals, pharmaceuticals, paint, varnish, and finish remover), as a solvent in the petroleum industry, and to scavenge lead deposits in gasoline. BCEE's other uses include (d): acaride (i.e., a chemical agent used to kill mites), anesthetic, pesticide (oil solution sprayed on corn silk to control earworms), textile scouring agent, and soil fumigant. BCEE was selected as the sole

Decision Summary

1 contaminant of concern at LF02 in the 1996 SRI because human health risk was shown to be
2 predominantly associated with the potential ingestion of BCEE-contaminated groundwater from
3 the UWBZ.
4

5 As part of the facility transition, a portion of the NAFB property, including LF02, is planned for
6 transfer from AF to LCRAA. Consequently, AF conducted investigations of the soil and
7 groundwater to evaluate the nature and extent of contamination at LF02 in preparation for
8 transfer of the property to the LCRAA. The assessments and investigative studies conducted at
9 LF02 and the years when the work was conducted are as follows:

- | | | |
|----|---|--------------|
| 10 | | |
| 11 | • Property Acquisition Investigation | 1984 |
| 12 | • Site Inspection | 1989 |
| 13 | • Remedial Investigation (RI) | 1991 |
| 14 | • Focused Feasibility Study – Site AC 13 (now LF02) | 1993 |
| 15 | • Supplemental Remedial Investigation | |
| 16 | with Ecological/Baseline Risk Assessment | 1996 |
| 17 | • Environmental Baseline Study (EBS) | 1998 |
| 18 | • Focused Supplemental Remedial | |
| 19 | Investigation (FSRI) | 1999 to 2002 |
| 20 | • Feasibility Study (FS) | 2002 |
| 21 | • Proposed Plan/ Fact Sheet | 2002 |
| 22 | | |

23 Investigations conducted prior to 1996, summarized in the Supplemental Remedial Investigation
24 with Ecological/Baseline Risk Assessment (SRI), included soil and groundwater sampling, test
25 pit excavation, aerial photograph evaluation, and geophysical surveys. Based on the conclusions
26 presented in the SRI additional soil, groundwater, and surface water sampling was determined to
27 be necessary. These investigations were conducted in the EBS, RI, Stage 1 and Stage 2
28 investigations and the FSRI. It was concluded, based on assessment of risk of residual
29 contamination that unacceptable human health risk from residential contact with groundwater
30 remained on site. Based on the conclusions of the Risk Assessment, a Feasibility Study (FS) was
31 completed to evaluate potential technologies for remedial action.
32

33 **3.0 Community Participation**

34 Throughout the history of remedial investigations at NAFB, the community has been kept
35 informed of base closure activities. The first public involvement with the NAFB IRP program
36 dates to 1989.
37

38 AF has made the NAFB Administrative Record available for public review. The Administrative
39 Record includes all information considered or relied on in selecting the remedy, including all
40 comments from the public and from the regulatory agencies. The Administrative Record is
41 currently available for public review at:
42

Decision Summary

1 Air Force Base Conversion Agency Office (AFBCA) Newark Public Library, Main Branch
2 7370 Minuteman Way 101 West Main Street
3 Rickenbacker IAP, Columbus, OH 43217 Newark, OH 43059
4

5 The final version of the Proposed Plan was issued on August 20, 2002. The AF issued a public
6 notice about the NAFB Proposed Plan in the Newark Advocate on August 20, 2002 and made
7 the Feasibility Study, Proposed Plan and an informational fact sheet available to the public at the
8 Newark Public Library, Main Branch and the AFBCA Office.
9

10 On August 22, 2002, AF held a public meeting to present the Proposed Plan. From August 21,
11 2002, through September 19, 2002, AF held a 30-day public comment period to accept public
12 input on the selected remedy for LF02 presented in the Proposed Plan. A Responsiveness
13 Summary is included as Section III of this RADD. Based on the responsiveness summary the
14 public is generally in agreement regarding the selected remedy for LF02 as presented in the
15 Proposed Plan.
16

17 **4.0 Scope and Role of Landfill 02 Response Actions**

18 AF has determined that the groundwater at LF02 was found to have been contaminated with
19 BCEE at sufficiently high levels to create an unacceptable risk from potential residential
20 exposures and to warrant remedial action. The risks associated with the soils at the site were
21 found to be within the acceptable range for industrial/commercial reuse of the site. The remedy
22 selected for LF02 consists of Institutional Controls (land use controls) implemented by the City
23 of Heath, FAA, and AF.
24

25 The Institutional Controls would utilize existing and future land use controls to protect against
26 human exposure to contaminated groundwater. Current land use controls include City of Heath
27 Ordinance 100-93 which prohibits groundwater use at potential future drinking water sources
28 and prohibits further well installation. Residential use of LF02 groundwater is further unlikely
29 because the City of Heath supplies potable water to NAFB and the surrounding community.
30 Therefore, the enforcement of the ordinance precludes the use of groundwater at LF02 by nearby
31 residents. Future land use controls would include a covenant to the deed upon conveyance of the
32 property to LCRAA. Covenants will also be included in the deed to ensure that any response
33 actions that are the responsibility of the AF, found to be necessary after the date of delivery of
34 the deed, will be conducted by the United States. Provisions will also be included in the deed to
35 allow the United States and the State of Ohio access to the property in any case in which any
36 such response action is found to be necessary, or where such access is necessary to carry out a
37 response action on adjoining property. In addition, a covenant will also be included in the deed
38 stating that the property will be used for specific reuse activities (airport purposes only). The AF
39 will ensure ongoing compliance with the restrictions identified in Section 9.2 of this RADD
40 annually until the first Five Year Review is conducted, and thereafter in accordance with the
41 conclusions of the Five Year Review as specified in Section 11.2 of this RADD. If the property
42 would cease to be used for such specified purposes, it will revert to the U.S. Government.

Decision Summary

5.0 Site Characteristics

This section provides a summary of the subsurface conditions present at LF02. Included are descriptions of the geology, hydrogeology, and residual contamination present in groundwater and soil. Detailed descriptions of LF02, including cross-sections and contamination information, are presented in the FSRI and FS.

Subsurface investigations indicate that the site is underlain by 5 to 15 feet of interbedded clays, silts, and fill materials. This layer is generally thinner to the north and thickens toward the south. The clay layer is underlain by a silty, gravely sand layer that extends to a lower clay layer at between 30 and 35 feet bgs.

The groundwater table is generally located between about 11 and 21 feet bgs. The saturated sand zone has been designated the UWBZ, and the bottom of the UWBZ has been designated as the top of the underlying clay layer (IT, 1996). Groundwater flow is typically from the north to south, indicating a flow direction toward Ramp Creek.

The findings of the groundwater sampling and analyses indicate that BCEE is present in groundwater in the UWBZ across a large portion of LF02. BCEE was consistently detected in groundwater samples collected from the central portion of the facility, with the highest concentrations in samples collected from near the area immediately east of the central drainage ditch, just north of Ramp Creek. BCEE was also detected in offsite geoprobe samples in the highway right-of-way north of Irving Wick Drive. BCEE-contaminated groundwater thus extends from north of Irving Wick Road upgradient of LF02 to Ramp Creek, the southern boundary of LF02 (Figure 3).

Based on the interpreted groundwater flow gradients in the area of LF02, BCEE in the UWBZ would be expected to migrate in a general north-to-south direction. At least some of the BCEE plume identified in the central portion of LF02 (Figure 3) may have migrated from property located north of Irving Wick Road. Because no significant source of BCEE was identified on the LF02 property, the only significant source of BCEE to LF02 groundwater that has been identified during this investigation is advective flow from up gradient areas onto LF02.

The results of validated analyses of 26 soil samples collected above the seasonally saturated zone indicate that there were no validated detections of BCEE in the soil. Preliminary, unvalidated soil samples taken from a depth of 2 to 4 ft. below ground surface (bgs) during the installation of four monitoring wells yielded results of 62, ND, 1.6, and 0.68J $\mu\text{g}/\text{kg}$. However, modeling results verify that even 62 $\mu\text{g}/\text{kg}$ of BCEE in the soil would not significantly impact groundwater. These data indicate no significant source of BCEE was identified above the seasonally saturated zone in site soils at LF02.

The findings of the surface water and sediment sampling indicated that the highest concentrations of BCEE were detected in both surface water and sediment samples collected immediately downstream from the ditch that bisects LF02. Samples collected downgradient from this point tended to contain progressively lower BCEE concentrations. The samples

Decision Summary

1 collected upstream from the ditch contained no detectable BCEE. These observations are
2 consistent with a source of BCEE located near the subject stream discharge to Ramp Creek. The
3 most likely source of this contamination is infiltration of groundwater to Ramp Creek and other
4 on-site surface water bodies.
5

6 **6.0 Current and Potential Future Site Use**

7 The site is currently a fenced-in clear zone. Land use at LF02 is expected to remain
8 industrial/commercial and subject to land use controls. LF02 is intended to continue serving as a
9 clear zone for the Newark-Heath Airport in the future and there is no anticipated future
10 groundwater use. The FAA has stated in the Standard Airport Application Format for NAFB
11 (FAA, 1999) that FAA "...recommends that the instruments of transfer of land to anyone other
12 than the LCRAA contain certain rights with respect to right of over flight and consequent noise
13 and air emissions and the right to control the erection of structures or growth of vegetation which
14 (sic) would exceed the obstruction standards of Federal Aviation Regulation, Part 77. FAA also
15 recommends that transfer of property include prohibitions of uses which (sic) could result in
16 hazards to flight, such as electrical interference affecting radio communications and navigation
17 aids, lighting that would affect aircraft operations, and obstructions to visibility such as smoke
18 and other non-compatible land uses..." These restrictions would preclude residential
19 development at LF02 and limit the types of construction projects that could be undertaken.
20

21 **7.0 Summary of Site Risks**

22 A baseline human health risk assessment (BRA) was performed for LF02, as part of the SRI and
23 FSRI, using USEPA approved methods to determine the baseline risk associated with exposure
24 to the BCEE present in groundwater and Ramp Creek sediments. Groundwater was evaluated
25 for exposure to a maintenance worker (in keeping with the projected future land use for this site),
26 a construction worker, and by a potential trespasser. In addition, groundwater was evaluated for
27 potential residential exposures to both adults and children in accordance with OEPA
28 requirements. The BRA estimates the probability and magnitude of potential adverse human
29 health effects from exposure to soil and groundwater contaminants detected at LF02.
30

31 The results of the risk assessment are summarized in Table 1. Based on the approach and
32 assumptions presented for the FSRI quantitative human health risk assessment, cumulative
33 excess lifetime cancer risk (ELCR) estimates for the following exposure scenarios exceed
34 USEPA's point of departure of 1×10^{-6} for risk management decisions:
35

- 36 • Construction worker exposures to LF02 groundwater. The cumulative ELCR is within
37 the target risk range of 1×10^{-6} to 1×10^{-4} , due to exposures via inhalation of volatilized
38 BCEE in a construction trench in the unlikely event such a trench would be dug to the
39 depth of the UWBZ.
- 40 • Hypothetical adult resident exposures to LF02 groundwater. The cumulative ELCR is
41 above the target risk range of 1×10^{-6} to 1×10^{-4} , primarily due to exposures via ingestion
42 and inhalation.

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- 1 • Hypothetical child resident exposures to LF02 groundwater. The cumulative ELCR is
2 above target risk range of 1×10^{-6} to 1×10^{-4} , primarily due to exposures via ingestion
3 and inhalation.
- 4 • Maintenance worker exposures to Ramp Creek surface water. The cumulative ELCR is
5 within the target risk range of 1×10^{-6} to 1×10^{-4} , due to exposure via incidental
6 ingestion.

7
8 A qualitative ecological risk assessment was performed in the FSRI to determine whether the
9 current concentrations of BCEE in surface water and sediment in Ramp Creek exceed toxicity
10 benchmarks for BCEE. This ecological risk assessment concluded that current concentrations of
11 BCEE in Ramp Creek surface water and sediment do not exceed their respective benchmarks for
12 ecological risk.

14 **8.0 Remedial Action Objectives**

15 Remedial actions are required to address and satisfy Applicable or Relevant and Appropriate
16 Requirements (ARARs) as mandated by section 121(d)(2)(A) of CERCLA. These requirements
17 include Federal and state environmental laws that are legally applicable or are relevant and
18 appropriate under the circumstances of the release of site-related constituents. There are three
19 general types of ARARs: chemical-specific, location-specific, and action-specific. By definition,
20 ARARs are promulgated and legally enforceable Federal and State requirements. In some cases,
21 goals and criteria are considered to be potential ARARs because they are "relevant and
22 appropriate." Another category of requirements includes non-promulgated criteria, advisories,
23 guidance, and proposed Federal and State standards and is designated as "To Be Considered"
24 (TBC). The chemical-specific, location-specific, and action-specific ARARs for the
25 groundwater at NAFB were evaluated in detail in the FS for LF02 (IT, 2002a).

26
27 Remedial Action Objectives (RAOs) were developed to address residual contamination detected
28 in the UWBZ at LF02. The results of the risk assessment, which are summarized in Table 1,
29 revealed that the risks of exposure for construction worker and maintenance workers fell within
30 the USEPA's target cancer risk range of 1×10^{-4} to 1×10^{-6} . Residential risk was calculated to be
31 above USEPA's target cancer risk range of 1×10^{-4} to 1×10^{-6} . Based on the results and
32 conclusions of the site investigations, the following RAO has been developed to address BCEE
33 contamination present at LF02:

34
35 To prevent exposure to contaminants in groundwater at LF02.

37 **9.0 Description of Alternatives**

38 Three remedial alternatives were developed and screened for LF02. This section presents the
39 remedial alternatives developed for LF02, the remedy components, common elements, and
40 distinguishing features of each alternative, and the expected outcome of each alternative. Based
41 on the technologies retained a number of technically and economically practical alternatives

Decision Summary

1 were developed for addressing residual contamination present in groundwater in the UWBZ at
2 LF02. The alternatives are listed below:

- 3
- 4 • Alternative 1 – No Action
- 5 • Alternative 2 – Institutional Controls
- 6 • Alternative 3 – In-situ Biological Treatment, Institutional Controls, and Long-Term
7 Monitoring
- 8

9 Alternative 1: No Action

10 CERCLA requires that the “No Action” alternative be evaluated at every site to establish a
11 baseline with which other alternatives can be compared. Under this alternative, there would be
12 no further action taken at this site to prevent potential exposure to groundwater. Once every five
13 years, the groundwater would be sampled to evaluate the condition of the plume and whether
14 action may be needed at the site.

15 Alternative 2 – Institutional Controls

16 This alternative consists of instituting land use controls for the property. There are currently
17 restrictions in place (Heath Ordinance 100-93 and lease conditions) preventing the use of (and
18 subsequent exposure to) the groundwater in the UWBZ. Additional restrictions, in the form of
19 deed covenants, may be required upon conveyance of the property to LCRAA. Current
20 restrictions also prevent the installation of drinking water wells in the UWBZ. Additional
21 restrictions, in the form of deed covenants, will be implemented upon conveyance of the property
22 to LCRAA. . These restrictions will prohibit well installation and restrict the future land use to
23 commercial/industrial at LF02. Groundwater conditions will be evaluated at least every five
24 years per CERCLA requirements.

25

26		
27	Estimated Capital Cost	\$3,000
28	Operating Cost (every 5 years)	\$13,000
29	Total Present Worth	\$31,000
30	(30 years at 7%)	
31		

32 Alternative 3 – In-situ Biological Treatment, Institutional Controls (LUCs), and Long- 33 Term Monitoring

34 This alternative involves the installation of a passive treatment wall to intercept and treat
35 groundwater. The media installed in the treatment wall create anaerobic conditions in the aquifer
36 and provide the nutrients required for enhancing the biodegradation of BCEE. Groundwater
37 moves through the treatment zone by the natural groundwater gradient.

38

39 Institutional Controls (land use controls) are necessary during implementation of the remedial
40 action to prevent exposure to the groundwater. Monitoring is necessary to document the current
41 conditions and measure changes in conditions due to implementation of the treatment
42 technology. Once it is documented that BCEE concentrations in groundwater have fallen and
43 remained below an unacceptable level of risk to human health, the Institutional Controls (land
44 use controls) can be removed and monitoring can be ceased.

Decision Summary

1
2 Treatment walls are constructed to intercept the full depth of the contaminated zone. The
3 location is determined based on the local hydrogeologic conditions and the intent of the
4 treatment wall. If the intent is to prevent further down gradient migration, the treatment wall is
5 placed at the leading edge of the contaminant plume. Another goal may be to intercept the
6 source area and allow the downgradient portion of the plume to attenuate.

7
8 Regular monitoring is conducted to determine if anaerobic conditions have been established and
9 to measure the effectiveness of the remedy in reducing the concentration of BCEE in
10 groundwater. Besides BCEE, typical parameters to be measured to determine if anaerobic
11 degradation is taking place include dissolved oxygen, nitrate, sulfate, sulfide, ferrous iron, and
12 methane. Typical byproducts of the degradation of ethers may also be measured. For
13 development of the cost estimate for this option, it was assumed that quarterly groundwater
14 monitoring would be conducted for two years, followed by annual monitoring for ten years. At
15 that time it is estimated that BCEE levels will be below the levels of concern and monitoring can
16 be ceased and Institutional Controls (land use controls) removed.

17
18 Prior to full-scale implementation, bench and pilot scale testing is necessary as this is an
19 unproven technology for the remediation of BCEE in groundwater. These tests would provide
20 information to establish the optimal material mix for the reactive barrier, biodegradation rates,
21 and required residence times (to determine wall thickness).

22

23	Estimated Capital Cost	\$294,000
24	Annual Operating Cost	\$19,000
25	Total Present Worth	\$440,000
26	(10 years at 7%)	

27

28 **10.0 Comparative Analysis of Alternatives**

29 This section presents a summary of the comparative analysis of the remedial alternatives for
30 LF02. The comparative analysis was completed using the nine criteria presented in the EPA
31 RI/FS guidance document (EPA 1988) and CERCLA (40 CFR 300.430(e)(9)(iii)). The nine
32 criteria are as follows:

- 33
- 34 • Overall protection of human health and the environment
 - 35 • Compliance with ARARs
 - 36 • Long-term effectiveness and permanence
 - 37 • Reduction of toxicity, mobility, or volume through treatment
 - 38 • Short-term effectiveness
 - 39 • Implementability
 - 40 • Cost
 - 41 • State and/or support agency acceptance
 - 42 • Community acceptance
- 43

Decision Summary

1 The first two criteria are termed “threshold criteria” because an alternative must meet both to be
2 considered as the final remedy. Specifically, alternatives that do not protect human health and
3 the environment, or do not comply with ARARs (or justify a waiver), will not meet statutory
4 requirements for a selected remedy in the RADD. Then next five criteria are termed “balancing
5 criteria” and are used to weigh major trade-offs among alternatives. The last two criteria are
6 termed “modifying criteria”. These two criteria are considered after public comment is received
7 on the Proposed Plan and are of equal importance to the balancing criteria. A summary of the
8 comparative analysis of the alternatives developed in detail in Section 9.0 is found in the text that
9 follows.

10
11 The following alternatives were developed and evaluated in detail in Section 9:

- 12
- 13 • Alternative 1 – No Action
- 14 • Alternative 2 – Institutional Controls
- 15 • Alternative 3 – In-situ Biological Treatment, Institutional Controls (Land Use Controls,
16 and Long-Term Monitoring
- 17

10.1 Overall protection of human health and the environment

18 Groundwater sample analyses have shown that BCEE exceeds RAOs. Alternative 1 will not
19 change this situation and therefore will not be protective of human health and the environment.
20

21
22 Alternative 2 limits exposure by placing restrictions on groundwater use and is therefore more
23 protective than Alternative 1. Alternative 3 will limit short-term exposure by placing restrictions
24 on groundwater use while implementing the in-situ biological degradation process to treat the
25 residual BCEE present in groundwater.
26

10.2 Compliance with ARARs

27 Alternative 1 does not meet site ARARs. Alternatives 2 and 3 meet all ARARs.
28
29

10.3 Long-term effectiveness and permanence

30 Alternative 1 does not provide a long-term or permanent solution. Alternative 2 provides a long-
31 term effective solution, assuming LUCs remain in place and the extent of the contaminant plume
32 does not migrate off property. Alternative 3 requires application of technology that is in the
33 development stage. Given the developmental stage of the technology the long-term effectiveness
34 and permanence of the technology is somewhat unknown. It is expected that BCEE will degrade
35 under anaerobic conditions, but the destruction efficiency is unknown. Bench scale and pilot
36 testing is recommended prior to system design.
37
38

10.4 Reduction of toxicity, mobility, or volume through treatment

39 Alternative 1 does not reduce the toxicity, mobility, or volume of the contaminants.
40 Alternative 2 does not reduce the toxicity but limits potential exposure to the contaminants.
41 Alternative 2 is not expected to reduce the mobility or volume of the contaminants. However,
42 site characterization data indicates that the extent of the plume has stabilized. Alternative 3
43 reduces the toxicity, mobility, and volume through biological degradation of BCEE.
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Decision Summary

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10.5 Short-term effectiveness

Alternative 1 is not effective in the short-term, as there are no changes in the contamination present and no measures are taken to limit exposure. Alternative 2 and 3 are effective in the short-term. Field activities required for the implementation of Alternative 3 may result in short term exposure to the contaminants by construction workers. Because the projects are short term and appropriate health and safety measures will be implemented, exposure will be limited such that the risks are acceptable.

10.6 Implementability

Alternative 1 would be easy to implement since no action is involved. LUCs described in Alternative 2 are already in place, and additional restrictions will be relatively easy to implement upon conveyance of the LF02 property to the LCRAA. Alternative 3 can be implemented following successful completion of pilot testing.

10.7 Cost

Alternative 1 is the lowest cost option and Alternative 3 is the most expensive alternative.

10.8 State and USEPA Acceptance

USEPA and OEPA support the selected remedy.

10.9 Community Acceptance

On August 20, 2002 the Proposed Plan was issued in its final version. No public comments were received either orally at the August 22, 2002 public meeting or subsequently in writing during the public comment period.

11.0 Selected Remedy

This section provides the action levels for remediation and a description of the selected remedy for LF02 at NAFB. The selection was based on the analysis of alternatives as outlined in the previous sections, considering the nine criteria outlined in the RI/FS guidance.

11.1 Action Levels

In accordance with USEPA Risk Assessment Guidance for Superfund, AF has established, with concurrence of the regulatory agencies, site-specific action levels that will be protective of human health and the environment. These action levels are based on Chemical-Specific ARARs, Action-Specific ARARs, Location-Specific ARARs, and Risk Assessment discussed in Section 7.

11.2 Remedy

This section presents the selected remedy for LF02. The selected remedy addresses the principal threats posed by groundwater contamination. The selected remedy for LF02 is:

Decision Summary

- 1 • Prevent exposure to groundwater present in the upper water bearing zone through the
2 enforcement of existing land use controls and the implementation of additional
3 Institutional Controls (land use controls).
- 4 • Prohibit the installation of any wells for drinking water or any other purposes, which
5 could result in the inhalation of vapors from, the dermal absorption of, or the
6 ingestion of, the contaminated groundwater.
- 7 • Restrict the future use of the property to commercial/industrial use.
8

9 The selected remedy for LF02 is protective of human health and the environment because it
10 seeks to prevent exposure to human receptors by the use of Institutional Controls (land use
11 controls). The AF may contract or assign the duties of conducting certain monitoring or
12 oversight activities associated with the selected remedy to other parties. In evaluating the
13 effectiveness of the selected remedy, the AF may rely on other available regulatory programs
14 that impose or help implement institutional or land use controls consistent with the selected
15 remedy. Notwithstanding the above, the AF will retain its CERCLA responsibility to ensure the
16 effectiveness of the selected remedy until the residual BCEE contamination no longer poses a
17 threat to human health and the environment.
18

19 The AF will provide the specific language for any deed restrictions required by this selected
20 remedy to both the USEPA and OEPA prior to the transfer of LF02 to LCRAA. The City of
21 Heath maintains responsibility for enforcing its Ordinance 100-93, which prohibits the use of
22 groundwater for sanitary or consumptive use. The Federal Aviation Administration (FAA), in
23 accordance with 41 C.F.R. § 101-47.308-2(g), will have the responsibility for enforcing its land
24 use restrictions associated with the operation of the Newark-Heath Airport, as described in
25 Section 6.0 of this RADD.
26

27 The deed conveying the LF02 property to LCRAA will include the land use restrictions and
28 controls mentioned above and also, will require the LCRAA to obtain the approval of the AF,
29 OEPA, and the City of Heath prior to commencing excavation activities near the UWBZ at
30 LF02, which is located at depths ranging from about 11.5 to 21 feet below ground surface (bgs).
31

32 The AF will include a covenant in the deed that will require the LCRAA to assume primary
33 responsibility for monitoring the Institutional Controls (land use controls). The AF retains its
34 CERCLA responsibility to ensure the effectiveness and protectiveness of its selected remedies,
35 including the Institutional Controls (land use controls) specified in this Decision Document. The
36 AF will ensure these controls are monitored annually until the first CERCLA Section 121(c) Five
37 Year Review is conducted to determine whether the BCEE contaminant levels in groundwater no
38 longer present a threat to human health and the environment. If the BCEE contaminant levels
39 still pose a threat to human health and the environment when the Five Year Review is conducted,
40 the Air Force will consult with OEPA and USEPA to determine whether the frequency of
41 continued monitoring can be modified to allow less frequent Institutional Control (land use
42 controls) monitoring intervals and still provide adequate protection of human health and the
43 environment.
44

Decision Summary

1 Based on current information, Alternative 2 appears to provide the best balance of trade-offs
2 among the alternatives with respect to the nine criteria that EPA uses to evaluate alternatives.
3 The estimated capital cost to implement this remedy is \$31,000 with an estimated operating cost
4 every five years of \$13,000. The project time frame for this remedy is 30 years. Therefore,
5 Alternative 2, Institutional Controls, is recommended for LF02.
6

7 **11.3 Performance Standards**

8 Performance standards are applicable standards and criteria for the remedial action and operation
9 and maintenance of the remedial alternative. The standards identified as applicable to the chosen
10 remedy of Institutional Control (land use controls) are:
11

- 12 • That the City of Heath Ordinance 100-93 prohibiting the use of groundwater for sanitary
13 and consumptive use will remain in effect and will be enforceable at LF02.
- 14 • That the FAA restrictive covenants described in Section 6 will remain in effect and be
15 enforceable at LF02.
- 16 • That covenants in the deed transferring LF02 to LCRAA limiting construction worker
17 exposure to the groundwater and prohibiting residential use will remain in effect and are
18 enforceable at LF02.
- 19 • That the RAO has been attained.
20

21 **12.0 Statutory Determinations**

22 The remedial action selected for implementation at LF02 is consistent with CERCLA, and, to the
23 extent practical, the NCP. The selected remedy is protective of human health and the
24 environment, attains ARARs, uses permanent solutions to the extent practical, employs
25 treatments that reduce toxicity, mobility and volume, and is cost effective.
26

27 **12.1 The Selected Remedy is Protective of Human Health and the Environment**

28 The selected remedy for LF02, will meet the response objectives of preventing human exposure
29 to contaminated groundwater. Institutional controls will be applied at LF02 to prevent the
30 installation of groundwater wells in the UWBZ and to prevent development of the area for
31 residential uses. These LUCs will remain in effect as long as BCEE is present in groundwater at
32 concentrations that pose an unacceptable human health risk, and, this measure will ensure that
33 the new property owner has been alerted that the UWBZ is not available for consumption. The
34 deed will also restrict future land use of the site for airport uses.
35

36 **12.2 The Selected Remedy Achieves ARARs**

37 The selected remedy will attain ARARs developed in the *Final Feasibility Study Newark Air*
38 *Force Base*, dated August 2002.
39

40 **12.3 The Selected Remedy is Cost Effective**

41 In AF's judgment, the remedy selected for LF02 is cost effective. The overall effectiveness of
42 each alternative that satisfied the threshold criteria (protection of human health and satisfaction

Decision Summary

1 of ARARs) for LF02 was assessed. The assessment evaluated the long-term effectiveness and
2 permanence in reduction in toxicity, mobility and volume. The overall effectiveness was then
3 related to cost for comparison purposes.
4

5 **12.4 The Selected Remedy Utilizes Permanent Solutions and Alternative** 6 **Treatment Resources Recovery Techniques to the Maximum Extent** 7 **Practicable**

8 The intent of this criterion is to limit the use of off-site disposal as the remedial technology. This
9 has to be balanced against providing long-term effectiveness in reduction of toxicity, mobility or
10 volume through treatment. The selected remedy provides a permanent solution by preventing
11 exposure to the contamination present. An active treatment system was not deemed necessary by
12 AF because of the stability of the plume, low relative risk due to exposure, and the apparent
13 presence of the source upgradient of the AF property.
14

15 **12.5 Preference for Treatment as a Principal Element**

16 The proposed remedy does not include treatment as a principle element since the passive remedy
17 satisfies ARARs for the site and presents a long-term option for managing residual
18 contamination at the site. The active remediation option was evaluated and rejected in this case
19 because of the uncertainty of success due to the experimental nature of treatment and the costs
20 associated with it.
21

22 **12.6 Five-Year Review Requirements**

23 Because this remedy will result in hazardous substances, pollutants, or contaminants remaining
24 on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review
25 will be conducted within five years after initiation of this remedial action to ensure that the
26 remedy remains protective of human health and the environment.

27 **13.0 Documentation of No Significant Changes**

28 There are no significant changes between the preferred alternative presented in the Proposed
29 Plan for the site LF02 and the selected remedy presented in this RADD.
30

31 **14.0 References**

- 32
- 33 1. City of Heath, Ohio, 1993, An Ordinance Requiring the Exclusive Use of City Water for
34 the Purpose of Sanitary and Consumptive Use, Ordinance No. 100-93.
 - 35
 - 36 2. Clyde E. Williams & Associates (CEWA), 1984, Newark Air Station, Investigation of
37 Proffered Donation of 13.30 Acres to Newark AFS, Worthington, Ohio.
 - 38
 - 39 3. Dames & Moore, Inc., 1989, Installation Restoration Program, Newark AFB, Site
40 Inspection, July.
 - 41

Decision Summary

- 1 4. Dames & Moore, 1993, Final Focused Feasibility Study, Site AC-13, Newark Air Force
2 Base, Newark, Ohio, Prepared for U.S. Air Force Center for Environmental Excellence,
3 Brooks AFB, TX 78235, 8 December.
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- 5 5. HAZWRAP (Dames & Moore), 1991, Remedial Investigation Report, Newark Air Force
6 Base, Prepared for the U.S. Department of Energy.
7
- 8 6. IT Corporation (IT), 1996, Supplemental Remedial Investigation With
9 Ecological/Baseline Risk Assessment, Newark Air Force Base, Ohio, Prepared for U.S.
10 Air Force Center for Environmental Excellence, Brooks AFB, TX 78235.
11
- 12 7. IT Corporation (IT), 2000a, Stage 01 Investigation – Landfill 02, Former Newark Air
13 Force Base, Ohio, Prepared for U.S. Air Force Center for Environmental Excellence,
14 Brooks AFB, TX 78235.
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- 16 8. IT Corporation (IT), 2000b, Stage 02 Geoprobe[®] Investigation – Landfill 02, Newark Air
17 Force Base, Ohio, Prepared for U.S. Air Force Center for Environmental Excellence,
18 Brooks AFB, TX 78235.
19
- 20 9. IT Corporation (IT), 2002, Focused Supplemental Remedial Investigation, Landfill 02,
21 Newark Air Force Base, Ohio
22
- 23 10. IT Corporation (IT), 2002a, Feasibility Study for Landfill 02, Newark Air Force Base,
24 Ohio
25

Responsiveness Summary

III RESPONSIVENESS SUMMARY

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3 A public meeting was held by the AF at the Heath-Newark-Licking County Port Authority
4 Offices Conference Room on August 22, 2002. The meeting was attended by representatives of
5 the USEPA and OEPA. No members of the public were present for the meeting and no
6 comments have been received from the public on the Proposed Plan during the Public Comment
7 Period (August 22 through September 20). Thus, based on public acceptance of the remedy, the
8 BCT will proceed with implementing the final remedy.
9

Table 1
Summary of Risk Assessment for LF02
Newark AFB, Ohio

Exposure Pathways	Construction Worker	Adult Resident^a	Child Resident^a	Maintenance Worker	Trespasser
LF02 Groundwater^b					
Ingestion	2.3E-07	7.9E-04^c	7.4E-04	NA ^d	NA
Dermal Absorption	7.8E-08	1.6E-05^e	6.2E-06	NA	NA
Inhalation of Vapors	2.1E-05	4.3E-03	4.0E-03	NA	NA
Total (Groundwater)	2.E-05	5.E-03	5.E-03		
Ramp Creek Surface Water					
Incidental Ingestion	1.6E-07	NA	NA	1.6E-06	3.5E-07
Dermal Absorption	2.8E-08	NA	NA	4.0E-07	1.0E-07
Total (Surface Water)	2.E-07	NA	NA	2.0E-06	5.E-07
Ramp Creek Sediment					
Incidental Ingestion	4.3E-10	NA	NA	1.3E-09	7.7E-10
Dermal Absorption	1.3E-09	NA	NA	1.3E-09	7.5E-10
Total (Sediment)	2.E-09	NA	NA	3.E-09	2.E-09
TOTAL (ALL PATHWAYS)	2.E-05	5.E-03	5.E-03	2.E-06	5.E-07

^a A hypothetical residential scenario was evaluated to satisfy OEPA policy (IT, 2002).

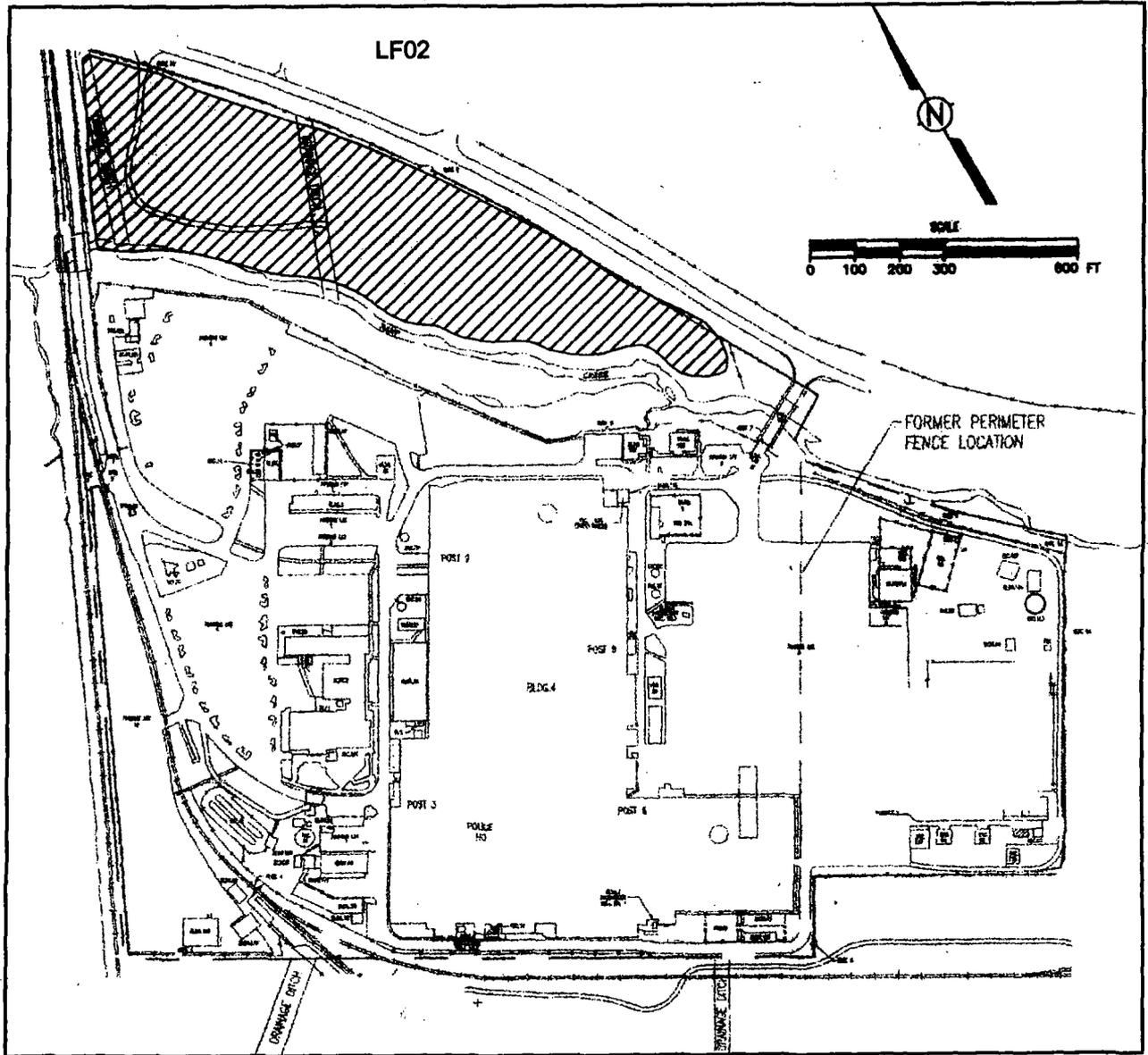
^b Groundwater samples were collected from the upper water-bearing zone.

^c Values above the target risk range of 10E-06 to 10E-04 are in bold italics.

^d Not Applicable (NA). The pathway was not calculated for this receptor.

^e Values within the target risk range of 10E-06 to 10E-04 are in italics.

Figure 1 - LF02 Site Location Map

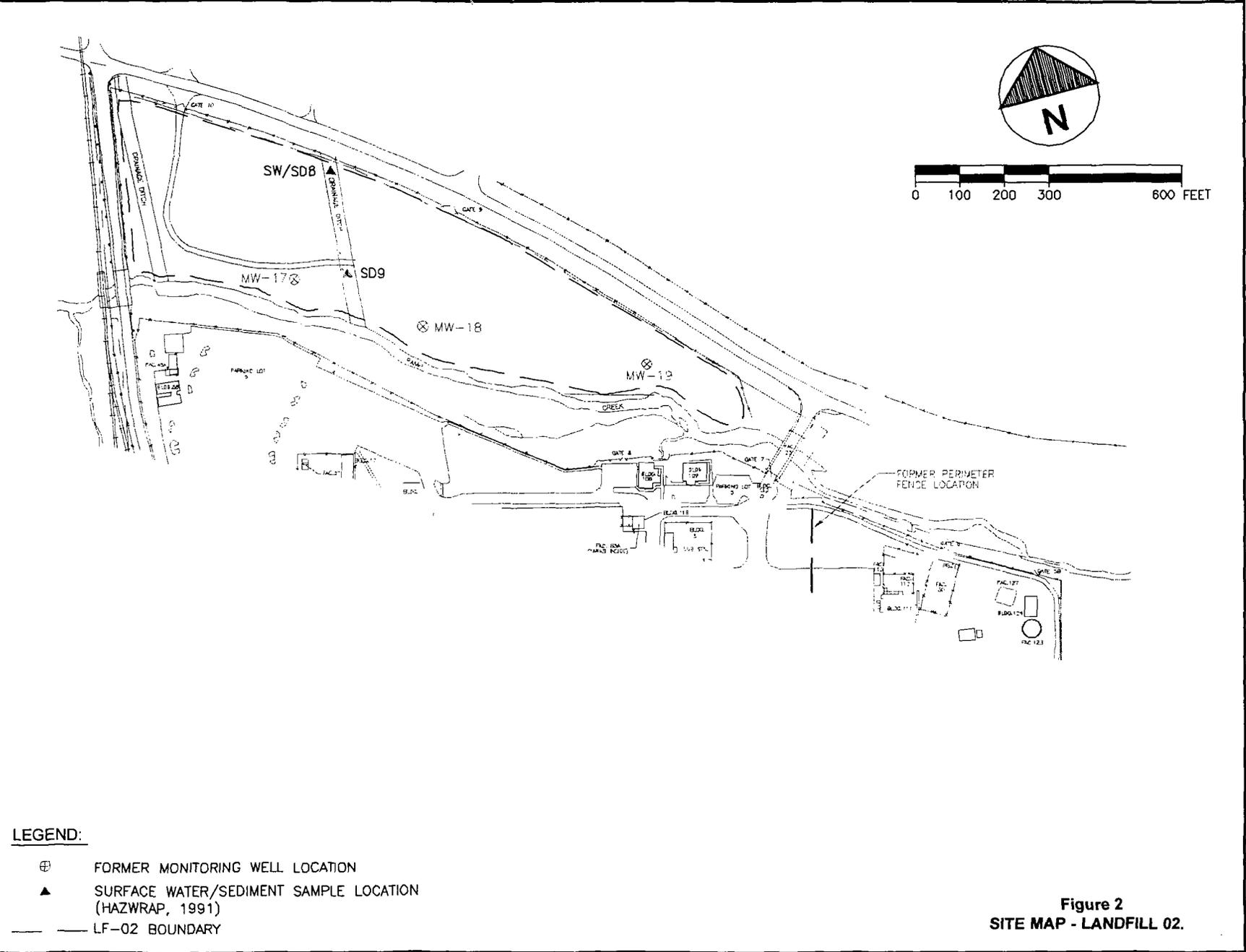


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LEGEND:

- ⊕ FORMER MONITORING WELL LOCATION
- ▲ SURFACE WATER/SEDIMENT SAMPLE LOCATION (HAZWRAP, 1991)
- LF-02 BOUNDARY

Figure 2
SITE MAP - LANDFILL 02.

Figure 3 – Extent of BCEE Plume – Shallow Groundwater Samples

