United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R04-90/068
September 1990

EPA

Superfund
Record of Decision:

North Hollywood Dump, TN

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. EPA/ROD/R04-90/068	2.	3. Recipient's Accession No.
4. Title and Subtitle SUPERFUND RECORD OF DECISION N h Hollywood Dump, TN E c Remedial Action - Final			5. Report Date 09/13/90 6.
7. Author(s)			8. Performing Organization Rept. No.
9. Performing Orgainization Name and Address			10. Project/Task/Work Unit No. 11. Contract(C) or Grant(G) No. (C) (G)
12. Sponsoring Organization Name and Address U.S. Environmental Protection Agency 401 M Street, S.W. Washington, D.C. 20460			13. Type of Report & Period Covered 800/000 14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

The 70-acre North Hollywood Dump site is an inactive, privately owned landfill in Memphis, Shelby County, Tennessee, in the Wolf River floodplain. Directly beneath the site is a contaminated aquifer from which ground water discharges directly to the Wolf River. Adjacent to the site are an abandoned dredge pond, a beaver pond, and Oxbow Lake, all of which were affected by the site. From the mid-1930s until its closure in 1 municipal and industrial refuse were disposed of at the site, which was operated by e city of Memphis. A precise description of the materials disposed of is unknown. In addition, unauthorized dumping is thought to have occurred during the 1970s. In 1979 and 1980, EPA and State studies revealed various contaminants both onsite and offsite in soil, sediments, ground water, surface water, and fish. Commercial fishing activities in the Wolf River ceased, and EPA required removal of contaminated soil, capping of the landfill, and fencing of the site. The RI/FS process identified buried drums onsite. This Record of Decision (ROD) addresses all of the contaminated media by containing the source areas, including the landfill and onsite surface water bodies, with provisions for offsite surface and shallow ground water monitoring and treatment as necessary. The primary contaminants of concern affecting the soil, sediment, debris, ground water, and

(See Attached Page)

17. Document Analysis a. Descriptors

Record of Decision - North Hollywood Dump, TN
First Remedial Action - Final
Contaminated Media: soil, sediment, debris, gw, sw
Key Contaminants: organics (pesticides), metals (arsenic, lead)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. ility Statement	19. Security Class (This Report) None	21. No. of Pages 275
	20. Security Class (This Page) None	22. Price

(See ANSI-Z39.18) *See Instructions on Reverse* OPTIONAL FORM 272 (4-77) (Formerly NTIS-35) Department of Commerce

Abstract (continued)

surface water are organics including pesticides, specifically aldrin, endrin and chlordane; and metals including arsenic and lead.

The selected remedial action for this site includes excavating buried wastes and soil in easily eroded areas near the edge of the landfill and consolidating them in the landfill area; excavating and characterizing waste within the buried drums; consolidating debris in the landfill or, should contaminant levels warrant it, properly disposing of debris as well as drummed wastes offsite; upgrading the existing landfill cover to be a total of 24 inches thick; partially dewatering the surface impoundments; excavating the contaminated sediment from the beaver pond and placing them within Oxbow Lake; covering the contaminated lake and beaver pond sediments with a 36-inch hydraulic geofabric cover, and infilling Oxbow Lake with clean fill; harvesting contaminated fish from the abandoned dredge pond; hydraulically containing the contaminated dredge pond sediment with geofabric and three feet of clean fill; refilling the pond with water and restocking with unaffected fish; monitoring the shallow ground water, with provisions for future pumping and treatment if necessary; conducting surface water (both onsite and offsite), air, and biota monitoring; and implementing institutional controls to restrict onsite land use and to prohibit well installation in the vicinity, and site access restrictions including fencing. The estimated present worth cost for this remedial action is $8,041,890, which includes a total O&M cost of $1,610,310.

PERFORMANCE STANDARDS OR GOALS: Specific goals for ground water include arsenic 0.140 ug/l (proposed State Water Quality Standard) and lead 3.8 ug/l (CWA Water Quality Criteria) at the point the ground water reaches the Wolf River.

SUMMARY OF REMEDIAL ALTERNATIVE SELECTION

RECORD OF DECISION
REMEDIAL ALTERNATIVE SELECTION

NORTH HOLLYWOOD DUMP
MEMPHIS, TENNESSEE

PREPARED BY:
U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION IV
ATLANTA, GEORGIA

RECORD OF DECISION
Remedial Alternative Selection

SITE NAME AND LOCATION

North Hollywood Dump
Memphis, Tennessee

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the North Hollywood Dump in Memphis, Tennessee developed in accordance with CERCLA, as amended by SARA, and to the extent practicable, the National Contingency Plan.

This decision is based upon the contents of the administrative record for the North Hollywood Dump Site.

The United States Environmental Protection Agency and the State of Tennessee agree on the selected remedy.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this Record of Desision (ROD), may present a current or potential threat to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

This final remedy addresses remediation of soil, sediment, groundwater and fish contamination by eliminating or reducing the risks posed by the site through containment using engineering and institutional controls.

The major components of the selected remedy include:

Install and maintain a 24 inch low-permeability soil cover over the landfill area.

Consolidate contaminated soil near the surface water bodies under the 24 inch cover in the controlled portion of the landfill less prone to flooding and erosion.

Monitor shallow groundwater contaminant levels to insure levels stay below health based standards set to control groundwater discharges to the Wolf River.

Should groundwater levels increase, extract groundwater and discharge to the local sewer system.

Re-sample Oxbow Lake and the Dredge Pond sediments and fish to better identify and define the contamination

Install and maintain a 36 inch hydraulic cover over the contaminated sediments.

Remove contaminated fish and re-stock surface water impoundments to maintain the environmental food chain of the area.

Install and maintain a fence around the entire site.

Impose land and groundwater use restrictions on the site.

STATORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action and is cost-effective. This remedy utilizes permanent solutions and alternative treatment (or resource recovery) technologies, to the maximum extent practicable for this site. However, because treatment of the principal threats of the site was not found to be practicable, this remedy does not satisfy the statutory preference for treatment as a principal element.

As this remedy will initially result in hazardous substances remaining on site above health-based levels, a review will be conducted within five years after the commencement of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

9/13/90

Date

Joe R. Franzmathes for

Greer C. Tidwell
Regional Administrator

TABLE OF CONTENTS

SECTION		PAGE
I.	INTRODUCTION	1
II.	SITE NAME, LOCATION AND DESCRIPTION	1
III.	SITE HISTORY AND ENFORCEMENT ACTIVITIES	1
	HISTORICAL LANDFILLING PRACTICES	1
	INVESTIGATIONS AND STUDIES COMPLETED TO DATE	3
IV.	HIGHLIGHTS OF COMMUNITY PARTICIPATION	5
V.	SCOPE AND ROLE OF RESPONSE ACTION	5
VI.	SUMMARY OF SITE CHARACTERISTICS	5
	GEOLOGY AND HYDROGEOLOGY	5
	DEMOGRAPHY	7
	LAND USE	7
	NATURAL RESOURCES	8
	CLIMATOLOGY	8
	NATURE AND EXTENT OF PROBLEM	8
	WASTE IDENTIFIED ON SITE	8
	GROUNDWATER CONTAMINATION	20
	SURFACE WATER CONTAMINATION	31
	FISH CONTAMINATION	32
	SURFACE WATER IMPOUNDMENTS	43
	HEALTH ASSESSMENT	49
VII.	SUMMARY OF SITE RISKS	49
	SELECTION OF CONTAMINANTS OF CONCERN	49

DOSE-RESPONSE EVALUATION.....52

EXPOSURE ASSESSMENT.....53

RISK CHARACTERIZATION.....56

ENVIRONMENTAL RISKS.....58

UNCERTAINTIES.....64

VIII. DESCRIPTION OF ALTERNATIVES.....66

LANDFILL WASTES AND SHALLOW GROUNDWATER.....67

ALTERNATIVE 1 - NO ACTION.....67

ALTERNATIVE 2 - LOW PERMEABILITY SOIL COVER.....67

ALTERNATIVE 3 - LOW PERMEABILITY SOIL COVER & HYDRAULIC CONTAINMENT BY EXTRACTION WELLS.....68

ALTERNATIVE 4 - LOW PERMEABILITY SOIL COVER & PHYSICAL CONTAINMENT BY BARRIER WALL.....68

ARARs.....68

IX. SURFACE WATER IMPOUNDMENTS.....69

ALTERNATIVE 1 - NO ACTION.....69

ALTERNATIVE 2 - PERIODIC HARVESTING OF FISH.....69

ALTERNATIVE 3 - DREDGE WITH CONTAINMENT ON EAST SECTOR OF LANDFILL.....70

ALTERNATIVE 4 - IN-PLACE CONTAINMENT WITH HYDRAULIC FILL.....70

ALTERNATIVE 5 - IN-PLACE CONTAINMENT BY NATURAL DEPOSITION AND RE-ROUTING OF WOLF RIVER.....70

ALTERNATIVE 6 - EXCAVATE WITH CONTAINMENT ON EAST SECTOR OF LANDFILL AND IN-PLACE CONTAINMENT WITH HYDRAULIC FILL.....71

ARARs.....71

X. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES.....71

LANDFILL WASTES AND SHALLOW GROUNDWATER.....72

OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT.....72

COMPLIANCE WITH ARARs.....72

REDUCTION OF TOXICITY, MOBILITY OR VOLUME THROUGH TREATMENT.....78

LONG-TERM EFFECTIVENESS AND PERMANENCE.....78

SHORT-TERM EFFECTIVENESS.....78

IMPLEMENTABILITY.....79

COST.....79

STATE ACCEPTANCE.....79

COMMUNITY ACCEPTANCE.....79

SURFACE WATER IMPOUNDMENTS.....79

OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT.....80

COMPLIANCE WITH ARARs.....80

REDUCTION OF TOXICITY, MOBILITY OR VOLUME THROUGH TREATMENT.....80

LONG-TERM EFFECTIVENESS AND PERMANENCE.....80

SHORT-TERM EFFECTIVENESS.....80

IMPLEMENTABILITY.....87

COST.....87

STATE ACCEPTANCE.....88

COMMUNITY ACCEPTANCE.....88

XI. SELECTED REMEDIES.....88

LANDFILL WASTES AND SHALLOW GROUNDWATER.....88

SURFACE WATER IMPOUNDMENTS.....92

XII. STATUARY DETERMINATIONS.....100

PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT.....100

COMPLIANCE WITH ARARs.....100

COST EFFECTIVENESS.....101

UTILIZATION OF PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT TECHNOLOGIES OR RESOURCE RECOVERY TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE.....101

PREFERENCE FOR TREATMENT AS A PRINCIPLE ELEMENT.....102

XIII. DOCUMENTATION OF SIGNIFICANT CHANGES.....102

TABLE OF CONTENTS (Cont'd)

LIST OF FIGURES

FIGURE		PAGE
1	SITE LOCATION	2
2	LOCAL ZONING ADJACENT TO SITE	8A
3	OFF-SITE SOIL SAMPLING LOCATIONS	10
4	CAP SURFACE SOIL SAMPLING LOCATIONS	19
5	SAMPLING LOCATIONS	24
6	GROUNDWATER MONITORING LOCATIONS	25
7	REMEDIAL ALTERNATIVE 2 - LANDFILL WASTES AND GROUNDWATER	90
8	REMEDIAL ALTERNATIVE 4 - SURFACE WATER IMPOUNDMENTS	95
9	HYDRAULICALLY FILLED OXBOW LAKE	96
10	HYDRAULICALLY CONTAINED DREDGE POND	97

LIST OF TABLES

TABLE		PAGE
1	SURFICIAL SOIL SAMPLES (ROUND 2)	11
2	SURFICIAL SOIL SAMPLES (ROUND 4)	14
3	SURFACE CAP SAMPLES (ROUND 4)	21
4	THE CONTENT OF VARIOUS METALS IN THE LITHOSPHERE AND IN SOIL	23
5	WOLF RIVER WATER SAMPLES (ROUND 1)	33
6	WOLF RIVER WATER SAMPLES (ROUND 2)	35
7	WOLF RIVER WATER SAMPLES (ROUND 3)	36
8	WOLF RIVER WATER SAMPLES (ROUND 4)	37
9	WOLF RIVER SEDIMENT SAMPLES (ROUND 2)	39
10	FIRST QUARTER WATER SAMPLES	44
11	SECOND QUARTER WATER SAMPLES	45

12 THIRD QUARTER WATER SAMPLES.....46

13 FOURTH QUARTER WATER SAMPLES.....47

14 SEDIMENT SAMPLE RESULTS.....50

15 APPROPRIATE STANDARDS AND CRITERIA FOR HUMAN HEALTH.....54

16 EVALUATION OF HEALTH RISK FOR CONSUMPTION OF FISH FROM OXBOW LAKE.....59

17 SURFACE WATER EXPOSURE AND RISK ASSESSMENT FOR CONSUMPTION OF FISH IN ON-SITE PONDS.....60

18 SUMMARY OF GROUNDWATER MASS FLUX DATA.....62

19 ESTIMATED INCREASED CONCENTRATION IN WOLF RIVER.....63

20 CALCULATION OF GROUNDWATER CONCENTRATIONS FOR ACLs.....65

21 SUMMARY OF DETAILED ANALYSIS OF ALTERNATIVES FOR LANDFILL WASTES AND GROUNDWATER.....73

22 SUMMARY OF DETAILED ANALYSIS OF ALTERNATIVES FOR SURFACE WATER IMPOUNDMENTS.....81

23 COST ESTIMATE - LANDFILL WASTES AND GROUNDWATER.....91

24 ALLOWABLE CONTAMINANT LEVELS IN FISH.....94

25 COST ESTIMATE - SURFACE WATER IMPOUNDMENTS.....98

APPENDIX A - RESPONSIVENESS SUMMARY

APPENDIX B - LETTERS FROM SUPPORT AGENCIES

SUMMARY OF REMEDIAL ALTERNATIVE SELECTION

RECORD OF DECISION
REMEDIAL ALTERNATIVE SELECTION

NORTH HOLLYWOOD DUMP
MEMPHIS, TENNESSEE

PREPARED BY:
U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION IV
ATLANTA, GEORGIA

RECORD OF DECISION
SUMMARY OF REMEDIAL ALTERNATIVE SELECTION
NORTH HOLLYWOOD DUMP
MEMPHIS, TENNESSEE

INTRODUCTION

The North Hollywood Dump Site was included on the National Priorities List (NPL) in October of 1981 as the State of Tennessee's Top Priority Site. Approximately 70 acres, North Hollywood received both municipal and industrial waste and has been the subject of two Remedial Investigations (RI) and a Feasibility Study (FS). The first RI/FS activities were conducted by a Technical Action Group between 1980 and 1984. The need for additional data prompted a second RI/FS between 1985 and 1989 which was conducted by a group of Potential Responsible Parties (PRPs) under the direction of the State and EPA. The Supplemental RI report which examines the quality of air, soil, surface water, stream sediments and shallow aquifer groundwater at the site was completed in April 1990. The FS report which examines alternatives for site remediation was submitted to the public information repository with the RI Report in June 1990.

This Record of Decision has been prepared to summarize the remedial alternative selection process and to present the selected remedial alternative, in accordance with Section 113(k)(2)(B)(v) and Section 117(b) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA) P.L. 99-499). The Administrative Record for the North Hollywood Dump site forms the basis for the Record of Decision contained herein.

SITE NAME, LOCATION, AND DESCRIPTION

The North Hollywood Dump (hereinafter referred to as the Site) is located on the floodplain and abandoned channels of the Wolf River in Memphis Tennessee (Figure 1). The landfill was operational from the Mid-1930s to the mid-1960s. During this period the Site was used primarily for the disposal of municipal refuse; however, industrial refuse was also disposed of in the landfill. The Site is divided into two separate areas of refuse disposal (East Sector and West Sector) by Hollywood Street. Combined, the East and West Sectors encompass an area of approximately 70 acres and have an average refuse layer thickness of approximately 26.5 feet. The Site, comprised of lands owned by the J. Curry family, E.G. Stephenson, E.A. Leone and E.J. Leone, was operated by the City of Memphis.

Due to the disposal of the industrial and chemical wastes at the Site, government agencies have raised concern regarding the potential environmental impact from the Site.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

Historical Landfilling Practices

Records of the operation of the North Hollywood Dump during its active period are not available to identify precisely the nature of material disposed of at the Site and the progression of the Site as it operated. The only information

MEMPHIS
Nashville
Jackson
Huntsville
Paragould
Jonesboro
Blytheville
Dyersburg
Humboldt
Trumann
Newport
Wynne
West Memphis
Forrest City
Brinkley
Marianna
Holly Springs
Corinth
Savannah
Pulaski
Fayetteville
Winchester
Shelbyville
Columbia
Lawrenceburg
Florence
Sheffield
Muscle Shoals
Athens
Decatur
Tuscumbia
Russellville
Bolivar
Somerville
Brownsville
Lexington
Dickson
Franklin
Clarksville
Springfield
Lewisburg
Tullahoma
Sconsboro
Bonneville
New Albany
Sardis
Batesville
Marion
Dresden
Paris
Greenfield
Big Sandy
Camden
Waverly
McKenzie
Martin
Union City
Obion
Newbern
Kenton
Dyer
Humboldt
Alamo
Jackson
Medon
Bruceton
Huntingdon
Parsons
Decaturville
Henderson
Lexington
Mason
Brownsville
Somerville
Bolivar
Adamsville
Savannah
Waynesboro
Lawrenceburg
Pulaski
Saint Joseph
Corinth
Ashland
Ripley
Bonneville
Holly Springs
Coldwater
Byhalia
Hernando
Senatobia
Sardis
Batesville
Marion
Forrest City
Hughes
Wynne
Brinkley
Marianna
Clarendon
Marvell
Helena
Lake City
Jonesboro
Paragould
Walnut Ridge
Imboden
Pocahontas
Kennett
Caruthersville
Sikeston
Poplar Bluff
Doniphan
Ripley
Dyersburg
Humboldt
Trenton
Milan
Jackson
Lexington
Decaturville
Henderson
Mason
Brownsville
Somerville
Bolivar
Savannah

available which provides some information as to how the landfill grew during its years of active operation comes from aerial photographs of the Memphis area for the period 1937 through 1979.

The aerial photographs show that in 1937, the Site was less than one acre in size and was surrounded by woodlands and farmlands. Disposal of waste started on the East Sector of the Site directly adjacent to Belmont Circle. By 1946 and 1948 the landfill was expanding at a rate of approximately two acres per year. The photographs for these periods show no evidence of grading or cover activities during these initial stages of operation. The 1948 aerial photograph indicates that a portion of the landfill is flooded, thereby resulting in floodwater infiltration of the waste. This is known to have happened on a minimum of eight occasions prior to the closing of the Site.

During the early 1950s, the aerial photographs indicate that the landfill was expanding at a rate of three to five acres per year and Site management/control activities were in place. Site access was gate controlled, cover material was being applied periodically, and the new expansion areas were operated in lifts. By the mid 1950s, channelization projects undertaken by the government and Site expansion had impacted the Wolf River, resulting in the severance of one southward and two northward meanders. Active burning operations at the Site are evidence in both the 1955 and 1958 aerial photographs. By the late 1950s, expansion of the landfill was primarily in a vertical rather than a real direction. During 1958, the Site was covered and graded, active dumping was occurring in the depression to the southeast of the landfill and an east-west 84-inch diameter sanitary sewer interceptor was installed across the Site by the City of Memphis. By 1960, waste disposal in the depression to the southeast had expanded to cover approximately eight acres and much of the area covered in 1958 was again an active waste disposal area.

Expansion of the landfill occurred quickly in the early 1960s. Between 1960 and 1965 the landfill expanded from under 50 acres in size to over 70 acres. In 1963 the Site was divided into the East and West Sectors by the extension of Hollywood Street through the Site and across the Wolf River. By 1965 the Site's East Sector had been closed and vegetated. In 1967 legal waste disposal on the West Sector also ceased due to closure of the Site. Vegetation had covered most of the Site by 1979 but several roads from Hollywood Street permitted access to the East Sector where, during the 1970s, unauthorized dumping is thought to have occurred.

Investigations and Studies Completed to Date

Investigative studies on the North Hollywood Dump were initiated by the USEPA in May 1979. This initial study by the USEPA revealed the presence of chemicals in samples of sediment and surface water collected from and adjacent to the Site. On the basis of information available concerning the nature of the waste disposed of at the Site, the USEPA believed that the contamination of the sediment and surface water may have originated from Site-related activities. In conjunction with the USEPA study, the Tennessee Department of Health and Environment conducted a biota (fish) study in the Wolf River which also indicated potential adverse impact from the Site.

As a result of the 1979 USEPA study, the United States Geological Survey (USGS' installed five groundwater observation wells along the northern perimeter of the Site in 1980. During the same period, Memphis State University, on behalt of the Memphis and Shelby County Office of Planning and Development, studied the fish in the Wolf River as part of an environmental evaluation of the Wolf-Loosahatchie River Basins. This study lead to the eventual closure of commercial fishing activities in the Wolf River although the closure was not solely based on contamination coming from North Hollywood. During 1980, the USEPA also completed a soil study at the Shannon Elementary School. Based on the results of these initial technical studies, a Technical Action Group (TAG) comprised of the United States Environmental Protection Agency Region IV (USEPA); the Tennessee Department of Health and Environment (TNDHE); the City of Memphis; Velsicol Chemical Corporation (Velsicol); and the Memphis/Shelby County Health Department (MSCHD) was formed in December 1980. The objectives of the Technical Action Group (TAG) were to immediately address the short-term Site problems and the potential long-term environmental impact that the Site may have on adjacent surface water courses and catchments, the underlying groundwater,and on residents residing in the vicinity of the Site. Along with the TAG investigations, numerous activities occurred at the site. These activities included an EPA immediate removal of contaminated soil, capping of the site by the PRPs and fencing of the site. The TAG studies were complete in 1984.

A number of deficiencies in the TAG investigations were identified by the USEPA; therefore, in February, 1985 the PRPs received a letter of notification from the USEPA requesting that the PRPs respond to an offer made by the USEPA allowing them to complete a Supplemental RI/FS to augment the data previously collected by the TAG. A group of PRPs agreed to prepare a supplemental RI/FS under an amended Commissioner's Order from the State of Tennessee. The Supplemental RI/FS commenced in the spring of 1985.

During the development stage of the final Supplemental RI/FS work plan, the PRPs completed a detailed sediment sampling program in the abandoned dredge pond, the Oxbow Lake and the Beaver Pond. This sampling program involved the collection of sediment samples from the base of these three surface water bodies on a predefined grid both to confirm the data collected by the TAG and to more clearly delineate the limits of sediment contamination. Based on the new data and the existing TAG date, a conceptual design was prepared ("Conceptual Remedial Action Plan-Remediation of Abandoned Dredge Pond, Oxbow Lake and Beaver Pond-North Hollywood Dump-Memphis, Tennessee", Conestoga-Rovers & Associates, August 1985) to address remediation of the three surface water bodies. The plan was approved by the TNDHE and PRPs; however, an agreement was reached to defer commencement of remediation activities on the three surface water bodies until the completion of the data collection phase of the Supplemental RI.

The Supplemental RI was initiated in the spring of 1985. The draft Supplemental RI was issued to the lead agency for comments, upon the completion of the investigation. The state of Tennessee was the lead agency for this site from 1985 until late 1988 when lead was transferred to USEPA, Region IV. The State of Tennessee then became a support agency. The Supplemental RI was finalized in April of 1990. The Supplemental FS was completed in May of 1990.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

During the early 1980's, numerous community relations meetings were held to address community concerns. After the immediate removal and during the Supplemental RI/FS, community concern lessened and the community was informed through the site repository data and a health assessment meeting held by the Centers for Disease Control. For the Proposed Plan, a second community Relations Plan was finalized on May 29, 1990.

This document lists contacts and interested parties throughout government and the local community. It also establishes communication pathways to ensure timely dissemination of pertinent information. The RI/FS and the Proposed Plan were released to the public in June 1990. All of these documents were made available in both the administrative record and the information repository maintained at the Memphis-Shelby County Public Library. A public comment period was held from June 28, 1990 to August 27, 1990. In addition, a public meeting was held on June 28, 1990 to present the results of the RI/FS and the preferred alternative as presented in the Proposed Plan for the Site. All comments which were received by EPA prior to the end of the public comment period, including those expressed verbally at the public meeting, are addressed in the Responsiveness Summary which is attached, as the Appendix A, to this Record of Decision.

SCOPE AND ROLE OF RESPONSE ACTION

This scope of this response action is to address the remaining concerns and threats at the North Hollywood Dump Site. As discussed previously, an emergency removal of contaminated soil and a temporary soil cover were performed to address the immediate health concerns at the site.

This selected alternative for the North Hollywood Dump will address all concerns at the site. The remaining concerns include site soil contamination should the temporary cover erode, contaminated fish and sediments in the surface water impoundments next to the site, and shallow groundwater contamination in the area beneath the site.

The final remedy for the site is intended to address the entire site with regards to the principal threats to human health and the environment posed by the site as indicated in the site risk assessment. The findings of the risk assessment are included in the RI Report and are summarized in a later section of this document.

SUMMARY OF SITE CHARACTERISTICS

Geology and Hydrogeology

The Memphis area is located on the north-south axis of the Mississippi embayment, which is a large structural geologic trough. In the Memphis area, the trough is comprised of a thick and extensive sequence of unconsolidated marine and fluvial sediments. Only the formations in the upper 1000 feet are considered to be of environmental significance with regard to the North Hollywood Dump. From youngest to oldest, these geologic units include:

i) recent alluvium which is comprised of heterogeneous accumulations of clay, silt, sand and gravel;

ii) loess deposits of windblown silt;

iii) fluvial deposits which are laterally continuous and considered to be remnant terraces of ancestral graded streams;

iv) Eocene clay formations containing minor lenses and interbeds of fine sand or lignite;

v) the Memphis sand comprised of a fine to coarse quartz sand which is the primary water source for the Memphis area; and

vi) the Wilcox group which consists of clays of the Flour Island Formation, sands of the Fort Pillow formation, and clays of the Old Breastworks formation.

The hydrogeologic investigations conducted during the original RI and Supplemental RI confirmed the interpretation of the regional geology in the vicinity of the Site. The data collected during the Supplemental RI hydrogeologic study identified that four major stratigraphic units were of significance in the immediate area of the Site. These four units include:

i) Disposed landfill waste;

ii) Upper Silt Unit (loess deposits);

iii) Fluvial Sands (ancestral terrace deposits); and

iv) Lower Clay Unit (Eocene clay also referred to as the Jackson Formation).

Within the landfill limits, the disposed waste is in direct contact with the Fluvial Sands. For the area beyond the limits of the landfill, the Upper Silt Unit is in direct contact with the Fluvial Sands. The Fluvial Sands are underlain by the Lower Clay Unit which is continuous in the area of the Site and has very low hydraulic conductivity (approximately 3.9 x 10-7 cm/sec). The level of groundwater within the waste, where present, fluctuates directly with the groundwater levels in the Fluvial Sand Unit.

The hydraulic conductivity in the Fluvial Sand Unit was confirmed to be relatively uniform across the Site with an average value of approximately 3.75 x 10-2 cm/sec. The Fluvial Sand Unit and the Wolf River are directly connected. The groundwater flow within this unit discharges completely to the Wolf River with no component of flow beneath the river. During periods of high river levels the groundwater flow direction was confirmed to reverse within an area approximately 200 feet to 250 feet back from the Wolf River.

The Lower Clay Unit, which is directly beneath the Fluvial Sand Unit, acts as the base of the groundwater flow in the Fluvial Sand Unit on the basis of the sharp hydraulic conductivity contrast between the two units. Evaluation of the hydraulic conductivities measured from the Lower Clay Unit confirmed that this unit would effectively prevent the migration of contaminants from the Fluvial Sand Unit through the Lower Clay Unit to the Memphis Sands. This was also confirmed through a study completed by Graham and Parks (1986) in the Memphis area. This is significant since the Memphis Sand Aquifer is the major source of water supply in the Memphis area.

The groundwater velocity within the Fluvial Sand Unit was calculated using a hydraulic gradient of 0.006 ft/ft, a mean hydraulic conductivity of 3.75×10^{-2} cm/sec and an assumed porosity of 0.35. Using these values a velocity of 6.4×10^{-4} cm/sec or 665 ft/year was calculated. Based on this calculation any leachate entering the Fluvial Sand Unit is expected to flow to the Wolf River in less than three years.

Based on the long travel times and the probable high attenuation capacity of the Lower Clay Unit due to its clay content, the potential for the disposed waste at the North Hollywood Dump to adversely impact the Memphis Sand was determined to be minimal.

Demography

The North Hollywood Dump is located in a residential area of Memphis with homes on Belmont Circle contiguous to the Site. The 1980 census for the area indicates a population of approximately 2,000 within a 0.25-mile radius of the Site, and a population of 5,300 within a 0.5-mile radius of the Site.

Land Use

The Site is located in the northern part of the City of Memphis, Tennessee. The northern boundary of the Site is bordered by the Wolf River, a meandering tributary of the Mississippi River. Other surface water bodies are located in the vicinity of the Site, including:

i) an abandoned dredge pond,

ii) an Oxbow Lake (former meander isolated after Wolf River re-channelization),

iii) a Beaver Pond, and

iv) an active dredge pond.

The active dredging operation is located directly adjacent to the northwest corner of the Site. Sands and gravels are dredged from an open pond for use in the construction industry. Other areas of former dredging are located in the vicinity of the Site, including the abandoned dredge pond referenced previously, which have resulted in large open surface water bodies.

The area immediately south of the Site is zoned a duplex residential district with isolated areas of multiple dwelling zoning and local commercial zoning in the area. Areas of light and heavy industry are located directly adjacent to the residential area. The majority of the lands to the east, west and north of the Site are zoned floodway district and are essentially undeveloped.

Figure 2 illustrates the local zoning in the immediate vicinity of the North Hollywood Dump.

Natural Resources

Natural resources for the area around North Hollywood Dump are not abundant as the area has been developed with a residential/industrial base. However, the alluvial flood plan of the Wolf River does support a commercial sand and gravel dredging operation. This is probably the best know natural resource for the area.

Two valuable but less thought of natural resources in the area are the "500-foot" and "1,400-foot" groundwater aquifers. These two aquifers, but primarily the 500-foot aquifer, provide water to 26 industrial wells and a well field for residential water supply comprised of 26 wells within a three-mile radius of the Site. These two aquifers do not show evidence of being adversely impacted by the Site. Samples collected from three production wells contained detectable concentrations of three organic chemicals but, as these wells are upgradient of the Site, it is unlikely that the Site is the source of this chemical presence. The data collected as part of this Supplemental RI/FS further confirms this.

An additional natural resource in the area of the Site is the fish population found in the abandoned dredge pond and Wolf River. Data collected to date indicates that the fish in these surface water bodies may have been impacted by the Site. These data have resulted in the banning of fishing in the area. Even though fishing is officially banned, there are reported cases of local residents fishing in these surface water bodies.

Climatology

Winds within the Memphis area are generally southerly (49 percent south, 12 percent southeast, 11 percent southwest) and the average growing season cloud cover is less than three-tenths on a time basis but seven-tenths during the wetter winter months. The annual mean temperature for the area is 61.8 degrees F) with January being the coldest month (mean temperature of 39.5 degrees F) and July being the warmest (mean temperature of 82.1 degrees F). The average annual rainfall is 51.6 inches with the greatest precipitation generally occurring during winter and early spring.

Nature and Extent of Problem

Waste Identified on Site

The North Hollywood Dump was operated as a municipal/industrial landfill between the 1930s and 1969. No precise inventory of the waste has been

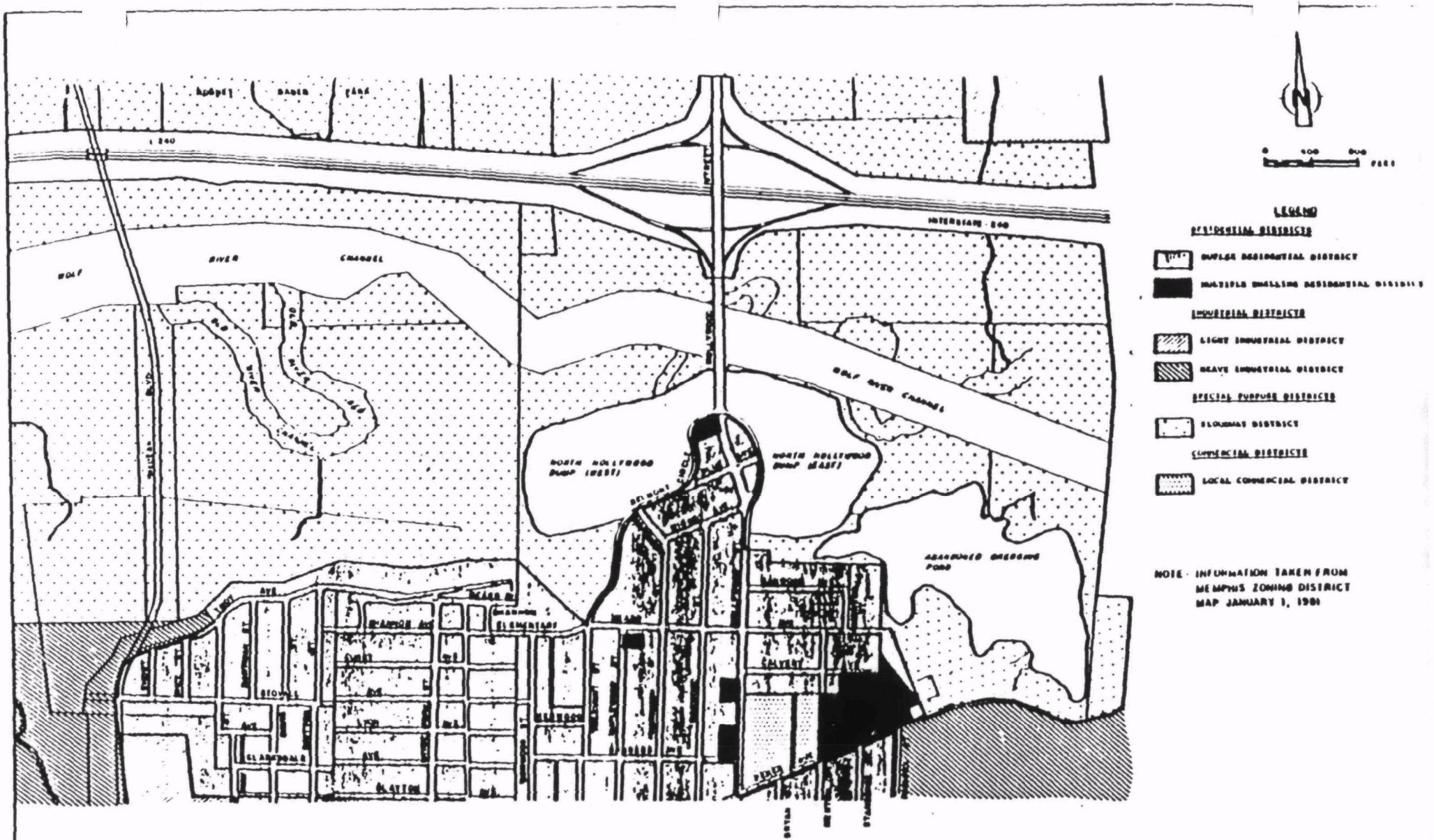


figure 2

LOCAL ZONING ADJACENT TO SITE
North Hollywood Dump

compiled but the following are typical of the wastes which were disposed of at this Site:

i) newsprint;

ii) glass;

iii) household garbage;

iv) wood;

v) miscellaneous metal wastes;

vi) metal drums;

vii) industrial and chemical manufacturing wastes;

viii) plastics; and

ix) concrete and building rubble.

Surface Soil Contamination

Surface soil samples were collected from between the Site and the Wolf River, and from the north bank of the Wolf River during the second and fourth rounds of sampling. During the second round of sampling, samples were obtained from sites AS1-86 through AS20-86 as illustrated on Figure 3. During the fourth round, samples were collected from these locations and from ten additional sites, AS21-86 through AS30-86, also illustrated on Figure 3. Analytical data for the surface soil samples are discussed in the following sections.

The surface soil sampling identified an area of elevated concentrations along the east side of the abandoned dredge pond (AS13-86 through AS17-86) and in the lowlands between the Site constituents in the surface soil appeared to be more wide spread between the East Sector and the Wolf River than between the West Sector and the Wolf River.

A summary of the analytical data for the surface soil samples is presented on Tables 1 and 2.

Volatile Organics (VOCs)

The most prevalent VOCs encountered during the second round of sampling were 2-butanone and chloroform. The fourth round samples contained acetone, vinyl acetate and methylene chloride as the most frequently occurring VOCs.

In both sets of soil samples, chlorinated hydrocarbons such as the dichlorobenzenes were frequently present. These chlorinated hydrocarbons were detected in concentrations as high as 4,600 ug/kg but concentrations less than 1,000 ug/kg were more frequent. During the second round the 6 to 12-in samples for AS3-86 and AS4-86 contained 1,2-dichloroethane in concentrations of 2,640 ug/kg and 4,600 ug/kg, respectively. The 6 to 12-inch sample from AS5-86 contained dibromochloromethane and bromoform in concentrations of 1,350 ug/kg

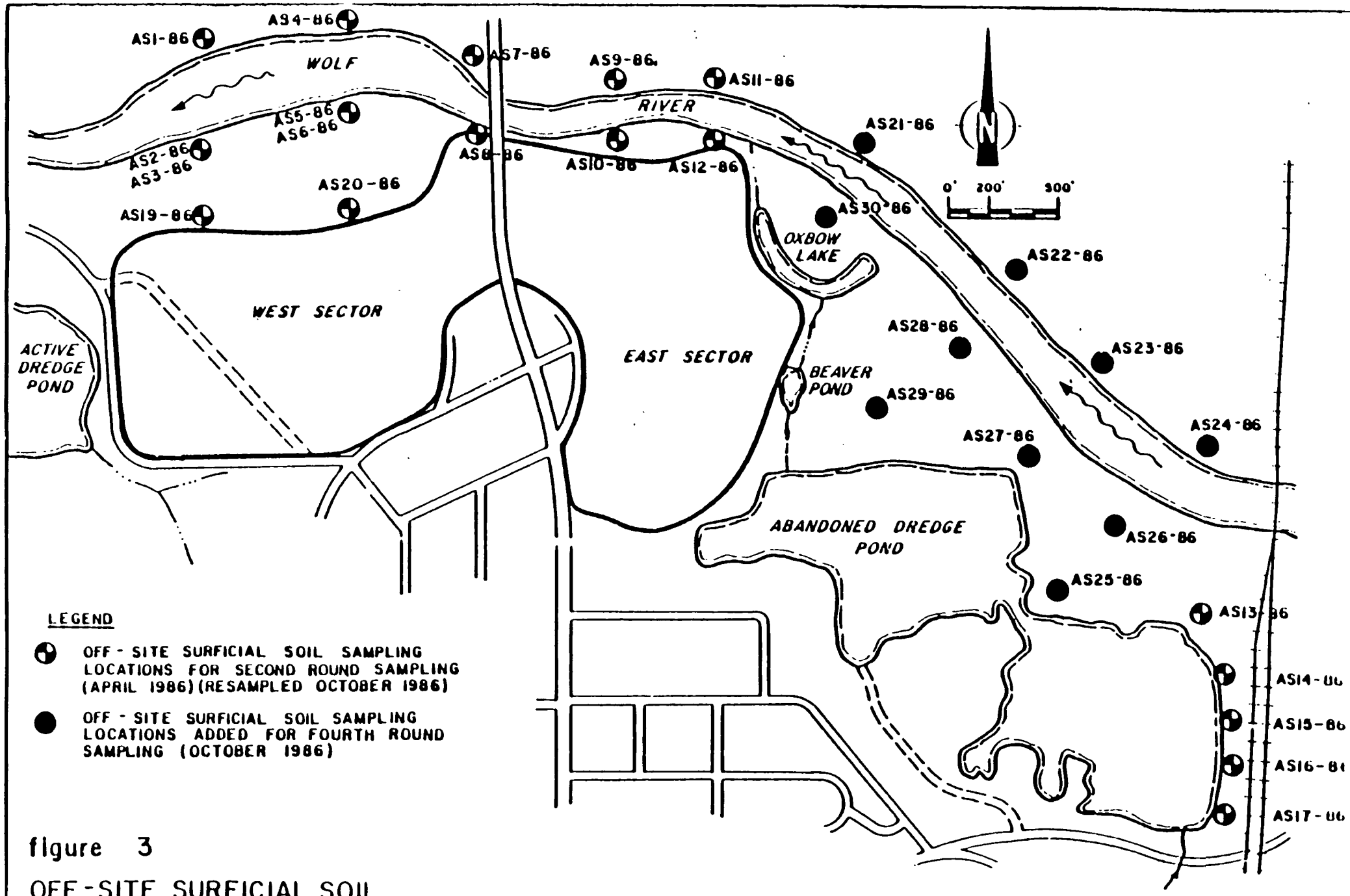


figure 3

OFF-SITE SURFICIAL SOIL SAMPLING LOCATIONS

North Hollywood Dump

TABLE 1

SUMMARY OF ANALYTICAL DATA
SURFICIAL SOIL SAMPLES (ROUND 2)

Compound Detected	Number of Samples Analyzed	Number of Positive Detections	Range of Positive Detections (ug/kg)
A. Volatile Organics			
Acetone	39	2	530 - 670
2-Butanone	39	38	1,200 - 22,200
Chloroform	39	26	202 - 350
1,2-dichloroethane	39	10	240 - 4,600
1,2-dichloropropane	39	1	201
Bromodichloromethane	39	3	220 - 230
2-Chloroethyl Vinyl Ether	39	1	390
Tetrachloroethene	39	4	268 - 525
Dibromochloromethane	39	1	1,350
Bromoform	39	1	2,000
1,3-Dichlorobenzene	39	3	230 - 300
1,4-Dichlorobenzene	39	4	210 - 370
1,2-Dichlorobenzene	39	1	230
B. Base Neutral/Acid Extractable			
Naphthalene	40	1	90
Acenaphthene	40	1	117
Fluorene	40	1	103

continued....

TABLE 1

SUMMARY OF ANALYTICAL DATA
SURFICIAL SOIL SAMPLES (ROUND 2)

Compound Detected	Number of Samples Analyzed	Number of Positive Detections	Range of Positive Detections (ug/kg)
B. Base Neutral/Acid Extractable (cont'd)			
Phenanthrene	40	2	1,491 & 2,401
Fluoranthene	40	2	5,288 & 8,796
Pyrene	40	2	1,260 & 1,896
Benzo(a)pyrene	40	2	1,038 & 1,325
Benzo(b&k)fluoranthene	40	2	1,731 & 2,080
C. Pesticides			
Chlordane	40	11	86.6 - 52,400
Hexachloronorbornadiene	40	3	22.4 - 222
Heptachloronorbornene & Octachlorocyclopentene	40	17	8.51 - 18,300
Total BHCs	40	4	25.7 - 6,130
Heptachlor	40	9	13.3 - 67,800
Aldrin	40	4	276 - 20,041
Isodrin	40	3	19.2 - 1,660
Heptachlor Epoxide	40	9	8.32 - 1,980
Alpha-Endosulfan	40	1	2,680
4,4'-DDE	40	3	1,010 - 1,710

continued....

TABLE 1

SUMMARY OF ANALYTICAL DATA
SURFICIAL SOIL SAMPLES (ROUND 2)

Compound Detected	Number of Samples Analyzed	Number of Positive Detections	Range of Positive Detections (ug/kg)
C. Pesticides (cont'd)			
Endrin	40	1	16.8
4,4'-DDD	40	1	25.7
4,4'-DDT	40	21	16.3 - 62.7
Chlordene	40	7	8.32 - 160,000
D. Metals(1)			
Arsenic	40	36	.4 - 18.9
Beryllium	40	32	.048 - .980
Lead	40	38	1.0 - 51.0
Nickel	40	33	1.2 - 85.7
Zinc	40	34	3.4 - 136.6
Strontium	40	30	4.0 - 29.6
Copper	40	29	2.5 - 71.9
Barium	40	39	2.4 - 1,330
Chromium	40	2	6.11 - 17.9
Cadmium	40	38	.007 - .64
Aluminum	40	40	6.690 - 16,100
Mercury	40	2	.028 - .041
Vanadium	40	23	5.6 - 47.2

(1) Range of metal concentrations given as mg/kg

TABLE 2

SUMMARY OF ANALYTICAL DATA
SURFICIAL SOIL SAMPLES (ROUND 4)

Compound Detected	Number of Samples Analyzed	Number of Positive Detections	Range of Positive Detections (ug/kg)
A. Volatile Organics			
Acetone	27	27	506 - 1,200
Vinyl Acetate	27	14	515 - 648
Methylene Chloride	27	21	141 - 906
2-Butanone	27	3	502 - 529
Carbon Tetrachloride	27	3	425 - 1,050
Tolune	27	1	592
Tetrachloroethene	27	1	2,370
B. Base Neutral/Acid Extractables			
Naphthalene	28	1	265
Acenaphthene	28	1	203
Fluorene	28	1	98.7
Phenanthrene	28	2	667 & 2,410
Fluoranthene	28	2	422 & 1,770
Pyrene	28	1	971
Benzo(a)Pyrene	28	2	251 & 1,640
Benzo(b&k)fluoranthene	28	2	237 & 2,300
4-Chloro-3-Methylphenol	28	1	231

continued....

TABLE 2

SUMMARY OF ANALYTICAL DATA
SURFICIAL SOIL SAMPLES (ROUND 4)

Compound Detected	Number of Samples Analyzed	Number of Positive Detections	Range of Positive Detections (ug/kg)
B. Base Neutral/Acid Extractables (cont'd)			
4-Nitrophenol	28	1	158
Anthracene	28	1	633
Benzidine	28	1	494
Benzo(a)anthracene	28	1	2,300
Bis(2-ethylhexyl) phthalate	28	6	473 - 16,300
Chrysene	28	1	2,320
Di-N-Octyl Phthalate	28	3	935 & 6,350
Benzo(g,h,i)Perylene	28	1	311
Diethyl Phthalate	28	1	316
Di-N-Butyl Phthalane	28	10	166 - 596
C. Pesticides			
Chlordane	28	14	88.1 - 210,000
Hexachloronorbornadiene & Heptachloronorborene	28	2	8.18 - 108
Octachlorocyclopentene	28	2	16.5 - 16,300
Total BHCs	28	7	8.15 - 2,417
Heptachlor	28	15	18.5 - 75,000
Aldrin	28	4	12.0 - 9,100

continued....

TABLE 2

SUMMARY OF ANALYTICAL DATA
SURFICIAL SOIL SAMPLES (ROUND 4)

Compound Detected	Number of Samples Analyzed	Number of Positive Detections	Range of Positive Detections (ug/kg)
C. Pesticides (cont'd)			
Isodrin	28	3	11.1 - 192
Heptachlor Epoxide	28	9	12.1 - 28,000
Endrin	28	5	42.9 - 671
4,4'-DDT	28	1	55.4
Chlordene	28	8	15.1 - 18,000
Dieldrin	28	4	26.5 - 329
D. Metals(1)			
Arsenic	28	28	1.62 - 47
Lead	28	28	1.25 - 158
Nickel	28	22	5.00 - 44.4
Zinc	28	28	4.41 - 376
Strontium	28	28	1.46 - 34.6
Copper	28	27	0.82 - 47.6
Barium	28	28	11.5 - 191
Chromium	28	27	2.60 - 24.4
Aluminum	28	28	1,290 - 11,400
Mercury	28	4	0.10 - 1.54
Vanadium	28	28	1.58 - 38.9

(1) Range of metal concentratins given as mg/kg

TABLE 2

SUMMARY OF ANALYTICAL DATA
SURFICIAL SOIL SAMPLES (ROUND 4)

Compound Detected	Number of Samples Analyzed	Number of Positive Detections	Range of Positive Detections (ug/kg)
C. Pesticides (cont'd)			
Isodrin	28	3	11.1 - 192
Heptachlor Epoxide	28	9	12.1 - 28,000
Endrin	28	5	42.9 - 671
4,4'-DDT	28	1	55.4
Chlordene	28	8	15.1 - 18,000
Dieldrin	28	4	26.5 - 329
C. Metals[1] (mg/kg)			
Arsenic	28	28	1.62 - 47
Lead	28	28	1.25 - 158
Nickel	28	22	5.00 - 44.4
Zinc	28	28	4.41 - 376
Strontium	28	28	1.46 - 34.6
Copper	28	27	0.82 - 47.6
Barium	28	28	11.5 - 191
Chromium	28	27	2.60 - 24.4
Aluminum	28	28	1,290 - 11,400
Mercury	28	4	0.10 - 1.54
Vanadium	28	28	1.58 - 38.9

and 2,00 ug/kg, respectively. The fourth round soil sample from AS28-86 contained carbon tetracholoride and tetrachloroethene in concentrations of 1,050 ug/kg and 2,370 ug/kg, respectively.

Base Neutral/Acid Extractables (BNA)

Only one of the round 2 soil samples contained detectable concentrations of the targeted BNAs with fluoranthene detected in the greatest concentration in the 6 to 12-inch sample (8,796 ug/kg). Other BNAs detected and their maximum concentrations were benzo(a)pyrene (1,325 ug/kg), naphthalene (90 ug/kg), acenaphthene (117 ug/kg), fluorene (103 ug/kg), phenanthrene 2,401 ug/kg), pyrene (1,896 ug/kg) and benzo(b&k) pyrene 2,080 ug/kg).

Round 4 samples were analyzed for the BNA compounds on the revised indicator parameter list. Phthalates were frequently detected with bis(2-ethylhexyl) phthalate the most commonly detected at concentrations as high as 16,300 ug/kg AS12-86).

Pesticides

The results of the pesticide analyses showed large variations between the two sampling rounds. For the second round 4,4' -DDT was the most frequently detected pesticide. In general, most of the pesticides were detected in relatively low concentrations. Sites AS16-86 and AS19-86 were the two locations which contained the greatest concentrations of pesticides. At AS16-86 concentrations as high as 160,000 ug/kg of chlordene were detected at a depth of 6 to 12 inches. Other pesticides detected at elevated concentrations were chlordane, heptachlor, and heptachloronorbornene and octachlorocyclopentene.

The round 4 analytical results showed fewer sites containing pesticides with a much broader range of pesticides detected. Sites AS8-86 and AS20-86 contained the largest concentrations of pesticides. Chlordane, with a concentration of 210,000 ug/kg at AS8-86 and 17,400 ug/kg at AS20-86, was the pesticide found in the highest concentration during the round 4 sampling.

Metals

Metal concentrations for the two rounds of soil samples were generally consistent with those expected for alluvial soils.

Site Surficial Cap

Ten samples of the Site surficial cap were collected during the fourth round to confirm the effectiveness of the cover placed over the Site as part of the 1984 remediation. The locations of these samples were illustrated on Figure 4. Analysis of collected samples indicated that the cover placed on the West Sector had been generally effective in containing surficial contaminants at the Site. The cover over the East Sector was found to contain pesticide contamination. These areas of contamination in most cases occurred at areas that had experienced erosion problems and subsequent cap repairs.

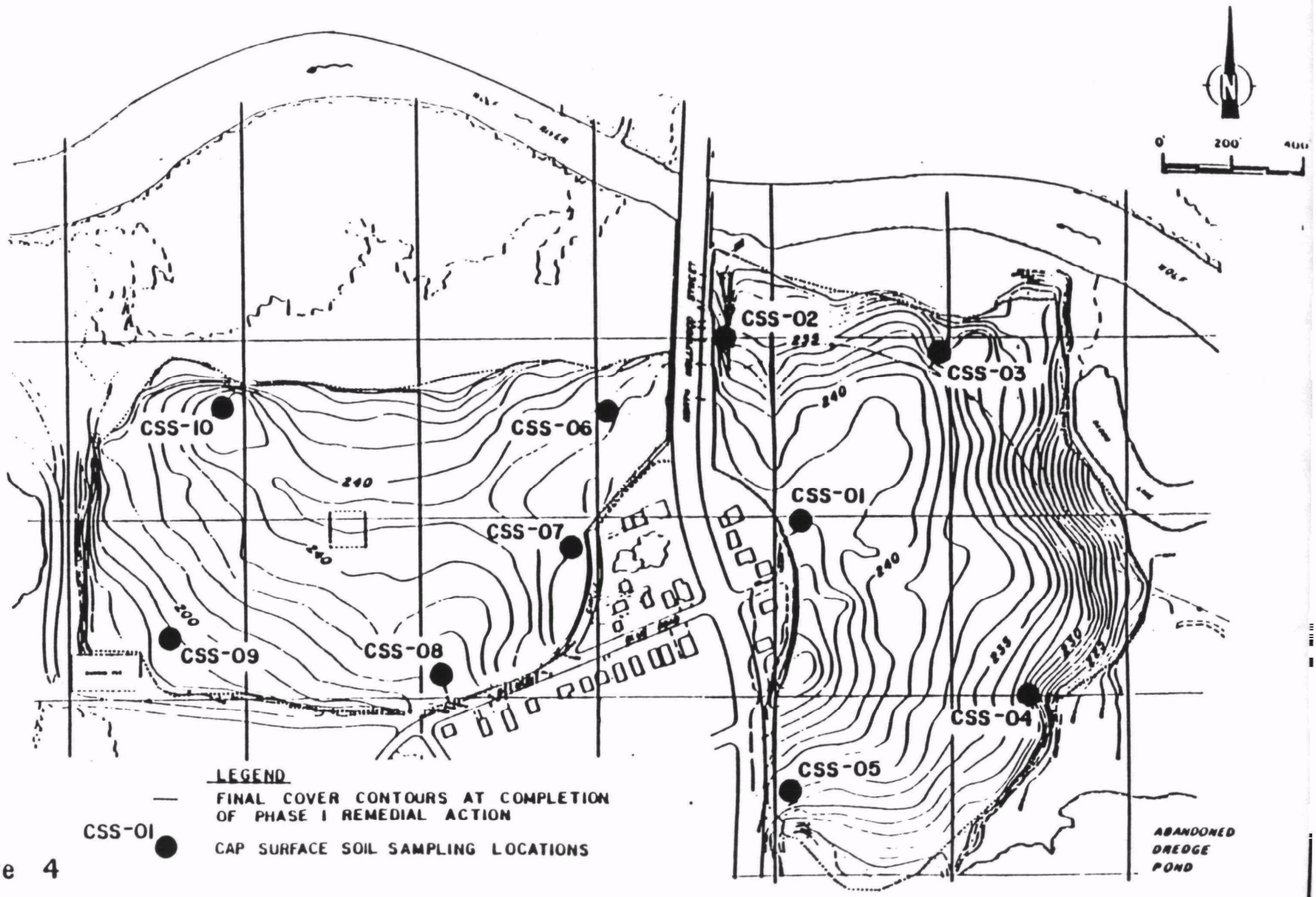


figure 4

CAP SURFACE SOIL SAMPLING LOCATIONS
North Hollywood Dump

Few volatile organics were detected in the surface cap samples. Acetone, vin· acetate and methylene chloride were detected but these parameters are laboratory contaminants. Toluene was the only other VOC detected and this was found only at site CSS1-86.

The BNAs detected were primarily diethyl phthalate, di-n-octyl phthalate and bis(2-ethylhexyl) phthalate. Bis(2-ethylhexyl) phthalate was found in concentrations up to 37,900 ug/kg at site CSS5-86. Hexachlorobenzene was the only non-phthalate BNA detected in the cap samples, detected in sample CSS4-86 at 1,240 ug/kg.

Pesticides in the cap samples were primarily present on the East Sector. Only one sample from the West Sector contained any pesticides and these concentrations did not exceed 90 ug/kg. All five cap samples from the East Sector contained pesticides with site CSS4-86 containing the greatest pesticide concentration (1,810 ug/kg of chlordane).

The concentrations of metals in the cap samples were uniform and within the concentration range expected for alluvial soils.

Table 3 presents a summary of the cap soil analytical data. For perspective, Table 4 presents a listing of the contents of various metals in the lithosphere and in soils.

Buried Drums

During the excavation of an access road for the installation of monitoring well OW14a, b, an area of buried drums was uncovered north of the West Sector of the covered area of the site. The approximate location of the buried drums is shown on Figure 5.

Five samples of the drum contents were collected and analyzed for the priority pollutant list. The sampling and analysis of the drums was not conducted as part of the Supplemental RI program. The sampling and QA/QC protocols outlined in the Work Plan were not followed; however, approved analytical procedures were used. Since much of the required QA/QC data validation was not conducted and method detection limits were not provided, these data can only be used for qualitative purposes. The analytical data for the drum contents showed mostly low level contamination like that of the rest of the landfill waste, i.e. some metals, pesticides and VOCs. The drums did contain high levels of nickel.

Groundwater Contamination

A total of 39 groundwater monitoring wells were sampled for selected indicator parameters during the four sampling events. Of the 39 monitoring wells sampled, ten were the original monitoring wells installed during the study completed by the TAG and 29 were new monitoring wells installed under the Supplemental RI. Figure 6 illustrates the location of all monitoring wells. The seven leachate wells were dry during the four rounds of sampling and, therefore, were not sampled.

TABLE 3

SUMMARY OF ANALYTICAL DATA
SURFACE CAP SAMPLES (ROUND 4)

Compound Detected	Number of Samples Analyzed	Number of Positive Detections	Range of Positive Detections (ug/kg)
A. Volatile Organics			
Acetone	10	10	1,125 - 2,990
Vinyl Acetate	10	2	534 & 543
Methylene Chloride	10	1	142
B. Base Neutral/Acid Extactables			
Bis(2-ethylhexyl) phthalate	10	4	1,550 - 37,900
Di-N-Octyl Phthalate	10	3	224 - 6,120
Diethyl Phthalate	10	1	275
Hexachlorobenzene	10	1	1,240
C. Pesticides			
Chlordane	10	3	164 - 1,810
Hexachloronorbornadiene	10	3	15.2 - 75.8
Heptachlornorbornene & Octachlorocyclopentene	10	3	26.9 - 174
Total BHCs	10	1	14.0
Heptachlor	10	3	41.5 - 1,200
Endrin	10	1	234
Chlordene	10	5	12.2 - 73.1
Dieldrin	10	1	203
Heptachlor Epoxide	10	2	85.2 - [illegible]

cont'd.....

TABLE 3

SUMMARY OF ANALYTICAL DATA
SURFACE CAP SAMPLES (ROUND 4)

Compound Detected	Number of Samples Analyzed	Number of Positive Detections	Range of Positive Detections (ug/kg)
D. Metals[1]			
Arsenic	10	10	9.20 - 25.9
Lead	10	10	3.75 - 11.3
Nickel	10	10	6.25 - 18.8
Zinc	10	10	12.4 - 62.5
Strontium	10	10	1.78 - 20.9
Copper	10	10	2.10 - 15.8
Barium	10	10	16.4 - 124.0
Chromium	10	10	11.7 - 31.3
Aluminum	10	10	3,560 - 9,980
Vanadium	10	10	11.4 - 28.7

(1) Range of metal concentrations given as mg/kg

TABLE 4

THE CONTENT OF VARIOUS METALS IN THE LITHOSPHERE AND IN SOILS

Element	Content in Lithosphere (mg/kg)	Common Range for Soils (mg/kg)	Selected Average for Soils (mg/kg)
Arsenic	5	1-50	5
Lead	16	2-200	10
Nickel	100	5-500	40
Zinc	80	10-300	50
Strontium	150	50-1,000	200
Copper	70	2-100	30
Barium	430	100-3,000	430
Chromium	200	1-1,000	100
Aluminum	81,000	10,000-300,000	71,000
Vanadium	150	20-500	100

Values extracted from Table 1.1, Page 7-8, in Chemical Equilibria in Soils, by Willard L. Lindsay, John Wiley & Sons, Inc., 1979.

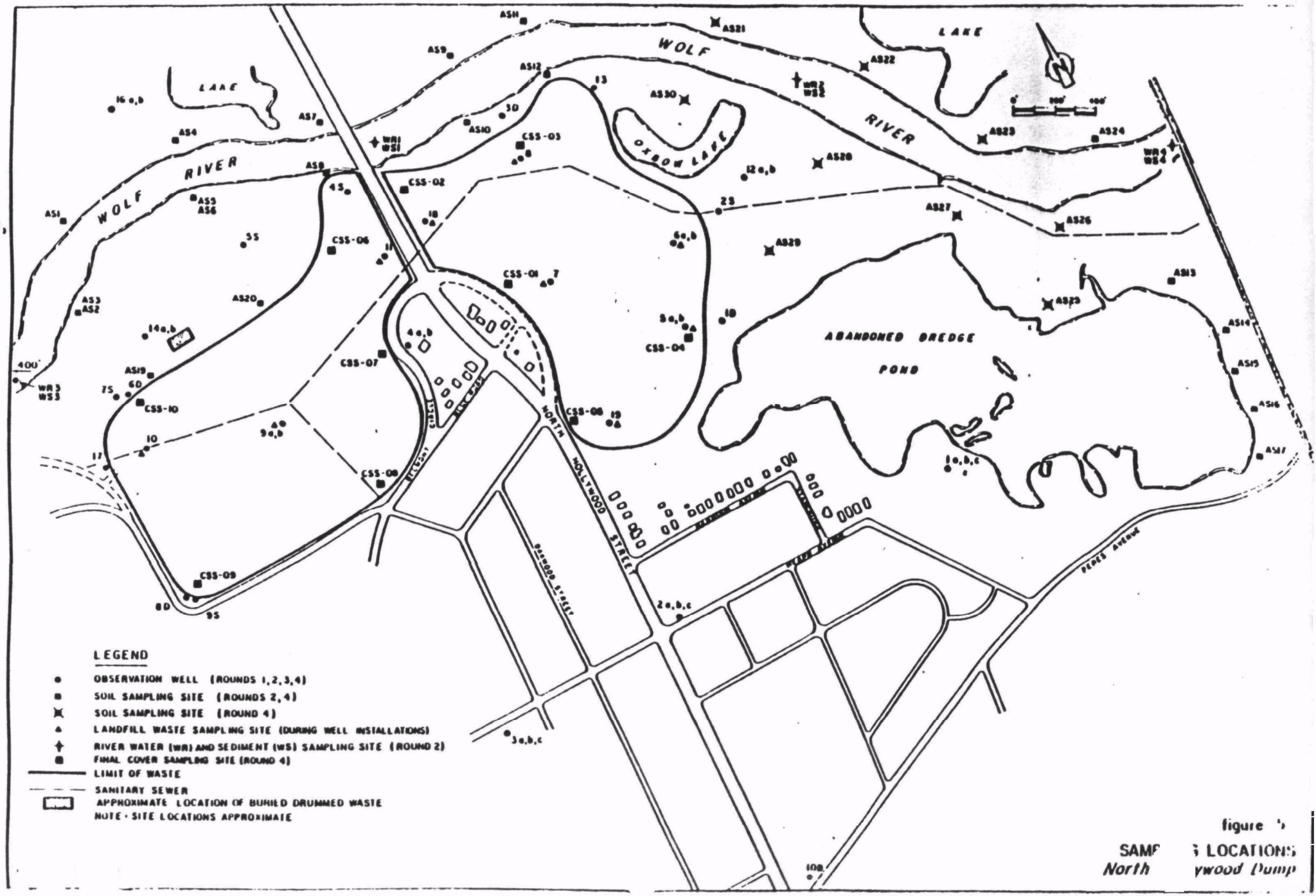


figure 5

SAMP 5 LOCATIONS
North ywood Dump

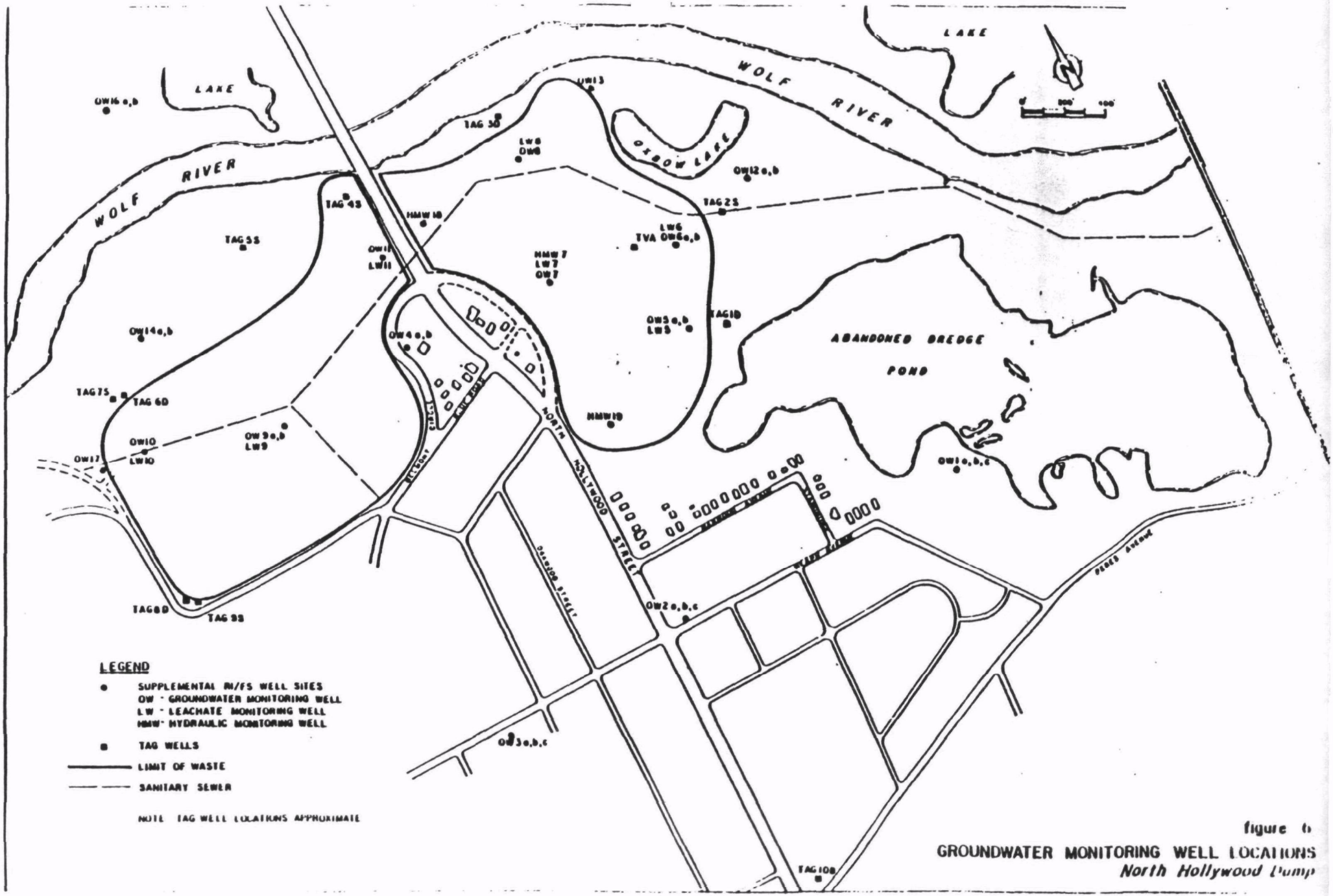


figure 6
GROUNDWATER MONITORING WELL LOCATIONS
North Hollywood Dump

For the purpose of discussing the groundwater analytical results, the monitoring well network has been divided into three zones, which are:

i) monitoring wells upgradient of the Site;

ii) monitoring wells completed beneath and adjacent to the disposed waste; and

iii) monitoring wells downgradient of the Site.

Monitoring Wells Upgradient of Site

Fourteen monitoring wells are located hydraulically upgradient of the Site (Figure 6). These upgradient monitoring wells include Wells OW1a, b, c; OW2a, b,c; OW3a, b, c; OW4a, b; TAG 8D; TAG 9S and TAG 10B.

Monitoring well nest OW1a, b, c, even though located hydraulically upgradient of the Site, has been shown to have levels of contamination slightly higher than the other background wells and in the same range as the monitoring wells downgradient of the site. The reason for this contamination was never defined; therefore, data from these wells have been disregarded in the following discussions on the next several pages.

The analytical data for the remaining upgradient wells form the basis for the following subsections.

Volatile Organics (VOCs)

Groundwater samples collected upgradient of the Site generally contained low levels of VOC parameters with an inconsistent and irregular detection pattern between sampling rounds. VOCs detected during the four rounds of sampling in upgradient groundwater samples included:

i) Acrylonitrile
- Round 1 (OW2b; OW3a)
- Round 3 (TAG 8D)

ii) Benzene
- Round 1 (OW2b)
- Round 3 (TAG 8D)

iii) 2-Butanone
- Round 1 (OW3a; OW3c; OW4a; OW4b; TAG 8D; TAG 10B)

iv) 1,2-Dichloroethane
- Round 3 (OW2a; OW2b; OW2c; OW3a; OW3b; OW3c; OW4a; OW4b; TAG 8D; TAG 9S; TAG 10B)

v) Tetrachloroethene
- Round 4 (OW2b)

i) Toluene
- Round 4 (OW2b)

vii) Trichloroethene
- Round 4 (OW3b)

viii) Vinyl Acetate
- Round 4 (TAG 10B)

ix) 1,1-Dichloroethene
- Round 3 (TAG 8D)

x) Carbon Tetrachloride
- Round 4 (TAG 8D)

Base Neutral/Acid Extractables (BNA)

The analytical data for the four rounds of upgradient groundwater samples indicated that the BNA group of analytes were generally not present in the upgradient groundwater samples or were detected at generally low levels. Phenols were detected in all sampling rounds except round 4. Concentrations ranged from a low of 1.66 ug/L (OW4a) during the third round to a high of 41.2 ug/L (OW3c) during the second round.

Pesticides

Only four pesticide compounds were detected in more than one round of sampling of the upgradient groundwater monitoring wells. These compounds included 4,4'-DDT (TAG 9S); dieldrin (OW3c); heptachlor epoxide (OW3c, TAG 9S); and chlordane (OW4a, OW3b). Of these four compounds detected, chlordane was the most prevalent with concentrations ranging between 0.253 ug/L (OW4a; round 2) and 0.083 ug/L (OW2c; round 2). Chlordane was not detected at any of the upgradient sampling locations in round 3. Heptachlor epoxide was identified in three monitoring wells (OW3a, OW3c and TAG 9S) with concentrations ranging from 0.179 ug/L (TAG 9S); round 2) to 0.02 ug/L (TAG 9S: round 3). Dieldrin was found only at OW3c in samples from rounds 2 and 3 at concentrations of 0.251 ug/L and 0.062 ug/L, respectively. Five monitoring wells (OW2c, OW3a, OW4a, OW4b and TAG 9S) contained 4-4' DDT at concentrations from 0.168 ug/L (TAG 9S: round 2) to 0.035 ug/L (OW4b; round 2).

All remaining pesticides with the exception of hexachloronorbornadiene, heptachlor, isodrin and chlordene, were detected only once or only during one round of sampling of the upgradient monitoring wells. The remaining four pesticides indicated above were not detected in any of the upgradient groundwater samples collected.

Metals

All of the targeted metals were generally detected at anticipated background concentrations with the exception of aluminum (Al) and arsenic (As). tectable concentrations ranged from 0.07 to 50.8 ug/l Al and from 0.002 to .033 ug/l As. Metal concentrations detected at each monitoring well were relatively consistent between rounds.

Monitoring Wells Within Confines of the Site

Eleven of the RI monitoring wells are situated within the physical confines o the Site, and include OW5a, b; OW6a, b; OW7; OW8; OW9a, b; OW10; OW11; and TAG 4S. These monitoring wells are constructed to monitor groundwater quality within the Fluvial Sands immediately beneath the Site.

Volatile Organics (VOC)

Few VOCs were detected in the groundwater samples collected from the monitoring wells situated within the confines of the Site. The VOCs detected were generally at low concentrations and within the same range of concentrations as identified in the background wells. The VOCs detected included:

i) Chloroform
- Round 3 (OW5a; OW5b; OW6a, OW6b)

ii) 1,2-Dichloroethane
- Round 3 (OW6a; OW6b; OW8, OW9b; OW10; TAG 4S)

iii) Chloromethane
- Round 2 (OW6a; OW6b; OW7)

iv) 2-Butanone
- Round 1 (OW5a; OW9b)
- Round 2 (OW7)

The four VOCs outlined above were detected in concentrations less than 50 ug/L except for 2-butanone which was detected at a concentration of 500 ug/L during the second sampling round at OW7.

Base Neutral/Acid Extractables (BNA)

Few BNA compounds were detected in the groundwater monitoring wells situated within the Site.

Phenol was detected during the first two rounds of sampling but not in subsequent sampling rounds. The concentrations of phenol were low, ranging from 2 ug/L at OW7 during the second round to 7.3 ug/L at OW5a during the first round.

Phthalates were not included in the analytical program for the first two sampling rounds but were included for rounds 3 and 4.

Pesticides

With the exception of alpha endosulfan, all pesticides analyzed for were detected in at least one of the sampling rounds. Generally, pesticides were more routinely detected in samples from the East Sector of the Site.

Three pesticide or pesticide-related species were detected at one or more monitoring wells within the limits of the waste for all three monitoring rounds. These compounds included chlordene (TAG 4S), total BHCs (OW-6a; OW-6b), and heptachloronorbornene and octachlorocyclopentene (OW6a; TAG 4S).

Three pesticides were either not detected at all or were detected on a maximum of only two occasions during all sampling rounds. These compounds included alpha-endosulfan (not detected during any rounds); dieldrin (OW9b; Round 2, 0.042 ug/L and OW7; Round 4, 0.63 ug/L); and hexachloronorbonadiene (TAG 4S; Round 1, 0.089 ug/L).

The most prevalent pesticides were Total BHCs and heptachloronorbornene and octachlorocyclopentene. The OW11; round 2 concentration of 29.1 ug/L for total BHCs was the highest pesticide concentration detected in the groundwater samples obtained from within the Site.

Metals

All of the targeted metals were generally detected in the four rounds of samples collected from the monitoring wells beneath the Site. As with the upgradient wells, metal concentrations were consistent from round to round with aluminum and arsenic present at elevated concentrations. The aluminum and arsenic concentrations in the monitoring wells within the confines of the waste were identified to be within the same range of concentrations as the background monitoring wells. Detectable concentrations ranged from 0.41 to 39.6 ug/l Al and 0.002 to 0.089 ug/l As.

Monitoring Wells Downgradient of Site

Twelve of the monitoring wells utilized for the Supplemental RI were located hydraulically downgradient of the Site and include Wells OW12a, b; OW13; OW14a, b; OW16a, b; OW17; TAG 1D; TAG 2S; TAG 3D; TAG 5S; TAG 6D; and TAG 7S. Two additional wells, OW16a and OW16b were situated on the north side of the Wolf River to determine if contaminant underflow of the Wolf River had occurred. (Results were negative). The 12 downgradient wells were located to ascertain if contaminants were migrating from the site toward or into the Wolf River. (Results were negative).

Volatile Organics (VOC)

Methylene chloride and acetone were detected in most of the groundwater samples. These parameters are believed to be laboratory introduced contaminants.

Nine other VOCs were detected including:

i) 1,1-Dichloroethene
- Round 1 (TAG 1D)

ii) Trichloroethene
- Round 1 (TAG 2S)
- Round 4 (OW12a, TAG 2S)

iii) Chlorobenzene
- Round 1 (OW14a)
- Round 2 (OW14a, TAG 6D)
- Round 4 (OW14a, OW14b and TAG 5S)

iv) 2-Butanone
- Round 1 (OW17 and TAG 5S)

v) 1,2-Dichloroethane
- Round 3 (OW12a, OW12b, OW13, OW14a, OW14b, OW16a, OW16b, OW17, TAG 1D, TAG 3D, TAG 5S and TAG 7S)

vi) Chloromethane
- Round 3 (OW14a, OW14b, OW17 and TAG 5S)

vii) Benzene
- Round 3 (OW16a)

viii) Acrylonitrile
- Round 3 (OW14a, OW14b, OW17, TAG 2S and TAG 5S)

ix) Vinyl Acetate
- Round 4 (TAG 7S)

All of the VOCs detected were within the same range of concentrations as the wells within the confines of the waste and the background wells.

Base Neutrals/Acid Extractables (BNA)

The monitoring well samples downgradient of the Site, as in all other monitoring well samples, contained phthalates as the primary BNA component. Phthalates were added to the indicator parameter list following round 2.

The round one sample collected from monitoring well OW12b contained detectable concentrations of three PAH species, namely benzo(a)pyrene (18.6 ug/L), chrysene (17.8 ug/L) and benzo(b & k) fluoranthene (5.2 ug/L). The PAH species were not detected during any other sampling rounds.

Other BNA compounds detected included:

i) Naphthalene
- Round 3 (TAG 7S - 3.1 ug/L)
- Round 4 (OW13 - 230 ug/L)

ii) 2,4-Dichlorophenol
- Round 4 (OW13 - 126 ug/L)

iii) Phenol
- Round 2 (TAG 1D - 1.7 ug/L)

Pesticides

Pesticides were detected in groundwater samples obtained from the observation wells located downgradient of the Site during all three sampling rounds with the majority of positive detections occurring during the second round. The round one pesticide analytical results were deemed invalid and are not included in this discussion.

esticides were detected in the downgradient monitoring wells on a regular asis with the exception of hexachloronorbornadiene, (detected once at TAG 6D during Round 2); alpha endosulfan (not detected during any round); dieldrin (detected once during Round 2); 4,4' -DDD (detected three times during Round 2); and endrin (detected five times during Round 2). Generally, the downgradient pesticide data showed a marked increase in concentrations from the upgradient data. Specifically, isodrin, heptachlor epoxide and chlordene were consistently detected at a higher concentration in the downgradient than in the upgradient wells.

Metals

All of the metals analyzed were found in concentrations similar to those present in the upgradient wells. Barium showed the greatest difference from upgradient to downgradient; but even this increase, compared to the MCL of 1000 ug/l, is not significant. The ranges of selected metals are presented below:

Detectable Values in ug/l

Metal	Upgradient Range	Downgradient Range
Aluminum	0.07-50.8	0.07-11.7
Copper	0.015-0.078	0.007-0.132
Arsenic	0.002-0.033	0.002-0.052
Barium	0.028-0.686	0.094-2.24

Surface Water Contamination

Wolf River

The Wolf River, a tributary of the Mississippi River, flows past the Site in an east to west direction. In order to determine the impact that the Site has or may have had on the Wolf River and its aquatic life, river water samples were obtained during each of the four sampling rounds and samples of river sediment were collected during one sampling round. The locations of these sampling stations are illustrated in Figure 5.

The round 1 upstream water sample contained numerous VOCs but they were generally found in low concentrations. The VOC detected in the highest concentration was toluene at 68.4 ug/L. Few BNA species were detected in the Wolf River water samples. The majority of the metals analyzed for were detected in at least one round of Wolf River water samples. There was no variation in metals concentrations from upstream to downstream of the Site. This would indicate that the Site is not a source of metal contamination in the Wolf River water.

Tables 5 through 8 present the analytical data for the Wolf River Water samples.

During the second round of sampling, sediment samples were collected from the Wolf River and analyzed for the selected indicator parameters. As with the Wolf River water samples, sediment composition downstream of the Site was not significantly different from that upgradient or adjacent to the Site. A summary of the analytical results for the Wolf River sediments showing only the positive detections is presented on Table 9.

Fish Contamination

State of Tennessee Fish Study Data Assessment

The State of Tennessee conducted a fish study along the Wolf River in 1981 in an attempt to determine whether the North Hollywood Dump had impacted the fish in the Wolf River directly adjacent to the Site. The study included the collection of various fish types in the Wolf River at a select number of locations upstream, downstream and directly adjacent to the Site. The collected fish were analyzed for a predefined parameter list which included pesticides commonly known to exist at the Site.

The analytical data collected generally indicated low levels of pesticide contamination in fish flesh, with chlordane being detected at levels approximately one order of magnitude higher than the other pesticides. The concentrations of chlordane were slightly above the action level set by the Food and Drug Administration. Problems that were identified with the data included:

i) higher concentrations in fish upstream than in fish downstream of the Site suggests a potential source of contaminants other than the North Hollywood Dump; and

ii) variability in collected data made it difficult for comparison of data because of the large migratory potential of fish.

Subsequent to completion of this study, the North Hollywood Dump was remediated by placing a vegetated soil cover over the limits of surficial contamination. This work eliminated most contaminated sediment loading to the Wolf River.

MSCHD Fish Study Data Assessment

The Memphis and Shelby County Health Department (MSCHD) sponsored a study to determine the status of contamination in the fish of the Wolf River. The study was completed by Christian Brothers College and Memphis State University between June and November 1985. The study included the collection of various species of fish in the Wolf River from the Mississippi River to a point approximately 35 miles upstream. The fish collected were analyzed for twelve pesticide compounds.

Results of the study showed that the mean concentration of pesticides in the fish along the entire 35-mile stretch of the Wolf River were below the Food and

TABLE 5

SUMMARY OF ANALYTICAL DATA
WOLF RIVER WATER SAMPLES (ROUND 1)

Compound Detected	Sample Locations (See Figure 5) WR1 Midway Past Dump	WR2 Upstream Edge of Dump	WR3 Downstream	WR4 Upstream
A. Volatile Organics				
Chloromethane	ND	ND	ND	12.3
Chloroethane	ND	ND	ND	7.33
Acetone[1]	ND	ND	ND	42.5
1,1-Dichloroethane	ND	ND	ND	7.18
Trans-1,2-Dichloroethene	ND	ND	ND	10.8
Carbon Tetrachloride	ND	ND	ND	3.10
Benzene	ND	ND	ND	6.52
Trichloroethene	ND	ND	ND	8.43
Bromodichloromethane	ND	ND	ND	19.4
Toluene	ND	ND	ND	68.4
Tetrachloroethene	ND	ND	ND	6.69
Chlorobenzene	ND	ND	ND	19.2
Ethyl Benzene	ND	ND	ND	28.4
1,1-Dichloroethane	ND	ND	ND	21.2
B. Base Neutral/Acid Extractables[2]				

continued...

TABLE 5

SUMMARY OF ANALYTICAL DATA
WOLF RIVER WATER SAMPLES (ROUND 1)

Compound Detected	Sample Locations			
	WR1 Midway Past Dump	WR2 Upstream Edge of Dump	WR3 Downstream	WR4 Upstream
C. Pesticides(3)				
D. Metals(4)				
Copper	0.024	ND	ND	ND
Barium	0.024	0.025	0.023	0.029
Strontium	0.023	0.024	0.026	0.027
Aluminum	0.260	0.376	0.200	0.310
Zinc	0.004	0.007	0.005	ND

Notes:

1) QA/QC evaluation concluded that positive detections are due to laboratory contamination
2) No Base Neutral/Acid Extractables were detected in the four samples analyzed
3) Pesticide data not used from round 1 due to lack of confirmation and elevated concentrations in blanks
4) Range of positive detections for metals shown are mg/L

TABLE 6

SUMMARY OF ANALYTICAL DATA
WOLF RIVER WATER SAMPLES (ROUND 2)

Compound Detected	Sample Locations			
	WR1 Midway Past Dump	WR2 Upstream Edge of Dump	WR3 Downstream	WR4 Upstream
A. Volatile Organics(1)				
B. Base Neutral/Acid Extractables(2)				
C. Pesticides				
Chlordane	ND	0.121	ND	ND
Heptachlor Epoxide	ND	ND	ND	0.022
D. Metals(3)				
Barium	0.032	0.031	0.034	0.029
Strontium	0.031	0.035	0.035	0.031
Aluminum	1.624	2.059	1.826	2.071
Arsenic	ND	0.005	0.005	0.003
Lead	0.002	0.002	0.002	0.002
Mercury	ND	0.0006	0.0003	0.0004
Zinc	0.026	0.017	0.015	0.017

Notes:

1) No Volatile Organics were detected in the 4 river water samples
2) No Base Neutral/Acid Extractables were identified in the 4 river water samples analyzed
3) Range of positive detections for metals shown as mg/L

TABLE 7

SUMMARY OF ANALYTICAL DATA
WOLF RIVER WATER SAMPLES (ROUND 3)

Compound Detected	Sample Locations			
	WR1 Midway Past Dump	WR2 Upstream Edge of Dump	WR3 Downstream	WR4 Upstream
A. Volatile Organics				
Acetone(1)	17.0	13.3	12.3	ND
Methylene Chloride(1)	22.7	4.56	25.4	30.8
1,2-Dichloroethane	10.7	3.93	3.47	5.2
B. Base Neutral/Acid Extractables				
Bis(2-Ethylhexyl) phthalate	ND	ND	ND	37.1
C. Pesticides(2)				
D. Metals(3)				
Aluminum	1.23	1.03	1.11	1.26
Arsenic	0.008	ND	0.005	0.008
Nickel	ND	ND	ND	0.008
Lead	0.004	0.005	0.006	0.008
Mercury	ND	0.002	0.003	0.003
Zinc	0.006	ND	0.006	ND
Vanadium	0.023	0.022	0.071	0.027

Notes:

1) QA/QC evaluation concluded that positive detections are due to laboratory contamination
2) Pesticides were not detected in the 4 river water samples analyzed
3) Range of positive detections for metals shown as mg/L

TABLE 8

SUMMARY OF ANALYTICAL DATA
WOLF RIVER WATER SAMPLES (ROUND 4)

Compound Detected	Sample Locations			
	WR1 Midway Past Dump	WR2 Upstream Edge of Dump	WR3 Downstream	WR4 Upstream
A. Volatile Organics				
Acetone[1]	15.2	81.4	149.0	121.0
Methylene Chloride[1]	3.17	ND	6.39	5.87
Trichloroethene	ND	9.11	ND	2.07
B. Base Neutral/Acid Extractables				
Di-N-Butyl Phthalate	ND	4.16	ND	ND
C. [illegible]sticides[2]				
D. Metals[3]				
Copper	0.004	0.004	0.005	0.006
Barium	0.029	0.029	0.027	0.022
Strontium	0.022	0.024	0.021	0.022
Arsenic	0.302	0.452	0.592	0.686
Aluminum	ND	ND	ND	0.003

continued....

TABLE 8

SUMMARY OF ANALYTICAL DATA
WOLF RIVER WATER SAMPLES (ROUND 4)

Compound Detected	Sample Locations			
	WR1 Midway Past Dump	WR2 Upstream Edge of Dump	WR3 Downstream	WR4 Upstream
D. Metals(3) (cont'd)				
Nickel	0.001	0.001	0.004	ND
Lead	0.002	0.003	0.001	0.001
Zinc	0.011	0.023	0.020	0.019
Vanadium	ND	ND	ND	0.015
Cyanide	ND	ND	0.002	0.005

Notes:

1) QA/QC evaluation concluded that positive detections are due to laboratory contamination
2) Pesticides were not identified in the 4 river water samples analyzed
3) Range of positive detections for metals shown are mg/L

TABLE 9

SUMMARY OF ANALYTICAL DATA
WOLF RIVER SEDIMENT SAMPLES (ROUND 2)

Compound Detected	Sample Locations			
	WS1 Midway Past Dump	WS2 Upstream Edge of Dump	WS3 Downstream	WS4 Upstream
A. Volatile Organics				
Acetone	420/NS	ND/ND	ND/ND	ND/ND
2-Butanone	6300/NS	3800/2900	5600/5200	4900/3100
Chloroform	280/NS	260/260	260/320	280/ND
Toluene	ND/NS	370/450	670/350	ND/ND
B. Base Neutral/Acid Extractables(1)				
C. sticides				
Heptachlor	ND/NS	ND/ND	ND/14.2	ND/15.8
Heptachlor Epoxide	ND/NS	ND/ND	ND/14.0	23.7/ND
4,4'-DDT	ND/NS	ND/ND	ND/24.8	26.0/44.4
D. Metals(2)				
Arsenic	5.9/NS	12.5/0.9	8.4/8.7	4.2/0.6
Beryllium	0.491/NS	0.452/0.477	0.440/0.461	0.420/0.507
Lead	13.5/NS	10.4/10.7	8.4/9.5	18.3/6.0
Nickel	9.6/NS	7.9/8.6	8.7/9.4	7.9/9.5

continued....

TABLE 9

SUMMARY OF ANALYTICAL DATA
WOLF RIVER SEDIMENT SAMPLES (ROUND 2)

Compound Detected	Sample Locations			
	WS1 Midway Past Dump	WS2 Upstream Edge of Dump	WS3 Downstream	WS4 Upstream
D. Metals[2] (cont'd)				
Zinc	36.1/NS	34.2/33.7	29.4/34.7	29.4/26.9
Strontium	11.2/NS	10.4/11.7	11.3/ND	8.5/9.3
Copper	15.4/NS	15.3/19.6	13.4/10.0	14.6/15.3
Barium	107/NS	90.1/148.0	141.0/88.0	81.0/83.3
Cadmium	0.38/NS	0.21/0.19	0.20/0.27	0.19/0.16
Aluminum	8520/NS	6530/8020	6770/7340	5250/6320
Mercury	ND/NS	ND/ND	0.050/0.026	ND/ND
Vanadium	20.6/NS	12.8/14.0	26.0/13.1	14.3/22.2

Notes:

1) Base Neutrals/Acid Extractables were not detected in any of the 7 samples

2) Data reported in mg/kg

3) NS - Not Sampled

4) Data presented for 0-6"/6"-12" sediment samples.

TABLE 9

SUMMARY OF ANALYTICAL DATA
WOLF RIVER SEDIMENT SAMPLES (ROUND 2)

Compound Detected	Sample Locations			
	WS1 Midway Past Dump	WS2 Upstream Edge of Dump	WS3 Downstream	WS4 Upstream
A. Volatile Organics				
Acetone	420/NS	ND/ND	ND/ND	ND/ND
2-Butanone	6300/NS	3800/2900	5600/5200	4900/3100
Chloroform	280/NS	260/260	260/320	280/ND
Toluene	ND/NS	370/450	670/350	ND/ND
B. Base Neutral/Acid Extractables(1)				
C. Pesticides				
Heptachlor	ND/NS	ND/ND	ND/14.2	ND/15.8
Heptachlor Epoxide	ND/NS	ND/ND	ND/14.0	23.7/ND
4,4'-DDT	ND/NS	ND/ND	ND/24.8	26.0/44.4
D. Metals(2)				
Arsenic	5.9/NS	12.5/0.9	8.4/8.7	4.2/0.6
Beryllium	0.491/NS	0.452/0.477	0.440/0.461	0.420/0.507
Lead	13.5/NS	10.4/10.7	8.4/9.5	18.3/6.0
Nickel	9.6/NS	7.9/8.6	8.7/9.4	7.9/9.5

continued....

TABLE 9

SUMMARY OF ANALYTICAL DATA
WOLF RIVER SEDIMENT SAMPLES (ROUND 2)

Compound Detected	Sample Locations			
	WS1 Midway Past Dump	WS2 Upstream Edge of Dump	WS3 Downstream	WS4 Upstream
D. Metals[2] (cont'd)				
Zinc	36.1/NS	34.2/33.7	29.4/34.7	29.4/26.9
Strontium	11.2/NS	10.4/11.7	11.3/ND	8.5/9.3
Copper	15.4/NS	15.3/19.6	13.4/10.0	14.6/15.3
Barium	107/NS	90.1/148.0	141.0/88.0	81.0/83.3
Cadmium	0.38/NS	0.21/0.19	0.20/0.27	0.19/0.16
Aluminum	8520/NS	6530/8020	6770/7340	5250/6320
Mercury	ND/NS	ND/ND	0.050/0.026	ND/ND
Vanadium	20.6/NS	12.8/14.0	26.0/13.1	14.3/22.2

Notes:

1) Base Neutrals/Acid Extractables were not detected in any of the 7 samples

2) Data reported in mg/kg

3) NS - Not Sampled

4) Data presented for 0-6"/6"-12" sediment samples.

Drug Administration (FDA) action levels established for pesticides. For the twelve pesticides analyzed, chlordane was most regularly detected and generally at the highest concentration. Of the 98 fish samples collected along the 35-mile study area, and chemically analyzed, only 17.3 percent contained chlordane concentrations above the FDA action level.

The study concluded that concentrations of pesticides, particularly chlordane, in the fish found in the Wolf River have dropped since 1981 and in most cases are below the FDA action life. The study further showed that the concentrations identified in the fish are within the same range as would be expected in other agricultural based areas of the southeast region of the United States.

Surface Water Impoundments

The surface water impoundments located adjacent to the North Hollywood Dump were not investigated as part of the Supplemental RI. The only information available regarding the nature and extent of contamination of these surface water bodies predates to the 1983 TAG studies presented in E.C. Jordan's Data Interpretation Report (DIR) and the studies completed by the PRPs during the development stage of the final Supplemental RI/FS work plan; consequently the findings of these studies may not be representative of present conditions.

The surface water impoundments located adjacent to the Site include:

i) the 40-acre abandoned dredge pond;

ii) the Oxbow Lake;

iii) a Beaver Pond; and

iv) an active dredge pond west of the Site

The primary contaminants identified by the DIR in the surface water impoundments consisted of pesticides and related chlorinated compounds. Pesticides identified in surface waters included:

i) Oxbow Lake - heptachlor, heptachlor epoxide, chlordene, 1-hydroxychlordene; and dieldrin;

ii) Beaver pond - heptachlor, heptachlor epoxide, chlordene, and 1-hydroxychlordene;

iii) Abandoned Dredge Pond - heptachlor, heptachlor epoxide, chlordene, endrin ketone, and dieldrin.

The data used in the DIR are presented on Tables 10 through 13 for compounds detected in surface waters. The concentrations of total pesticides and related compounds were identified to generally be less than 1 ug/L. Elevated values were attributed to sediments which were not filtered from the samples and to the collection of runoff from a residual surficial soil contamination area.

TABLE 10

FIRST QUARTER WATER SAMPLE ANALYTICAL RESULTS (MG/l)[1]

NORTH HOLLYWOOD DUMP, MEMPHIS, TENNESSEE

	Oxbow Lake NHOB-1	Beaver Pond NHBP1	Abandoned Dredge Pond NHADP-1	NHADP-1 (split)
Barium	0.130	0.094	0.068	NR[2]
Chromium	ND[3]	ND	ND	NR
Srontium	0.120	0.080	0.082	NR
Titanium	0.033	0.063	0.013	NR
Vanadium	ND	0.010	ND	NR
Zinc	0.013	0.130	0.017	NR
Aluminum	1.300	2.500	0.400	NR
Manganese	0.440	0.120	ND	NR
Calcium	26	22	19	NR
Magnesium	9.7	9.9	10	NR
Iron	1.5	2.1	0.3	NR
Sodium	15	17	16	NR
Cyanide	0.002K[4]	0.002K	0.002K	0.002K

NOTES:

[1] This data was obtained from TAG 1983 studies and has not been verified or reviewed for quality assurance.

[2] NR - Not Reported

[3] ND - Not Detected

[4] K - Actual Value is Known to be Less Than Value Given

TABLE 11

SECOND QUARTER WATER SAMPLE ANALYTICAL RESULTS (MG/L)[1]

NORTH HOLLYWOOD DUMP, MEMPHIS, TENNESSEE

	Oxbow Lake	*Beaver Pond*	*Abandoned Dredge Pond*
	NHOB-1	*NHBP-1*	*NHADP-1*
C11 Alkylbenzene	--	--	--
Acetone	--	--	--
Heptachlor	0.00021	0.00047	0.00067
Heptachlor Epoxide	0.00033	0.00090	0.00030
1-Hydroxychlordene	--	--	0.001A [3]
Chlordene	0.00007J[2]	0.00006J	0.00006JA
Endrin Ketone	--	--	--
Hexachloronornadiene (HCNBD)	--	--	--
Heptachloronorbornene (HCNB)	--	--	--
Boron	1.200	1.1	1.400
Aluminum	0.420	0.920	0.290
Manganese	0.160	0.120	0.420
Iron	0.81	1.1	0.42
Barium	0.200	--	--
Zinc	--	0.013	--
Lead	--	--	0.024
Copper	--	--	--
Cadmium	--	--	--
Cyanide	0.027	0.034	--

NOTES:

[1] This data was obtained from TAG 1983 studies and has not been verified or reviewed for quality assurance.

[2] J - Estimated value

[3] A - Average value

TABLE 12

THIRD QUARTER WATER SAMPLE ANALYTICAL RESULTS (MG/L) [1]

NORTH HOLLYWOOD DUMP, MEMPHIS, TENNESSEE

	Beaver Pond	*Oxbow Lake*	*Abandoned Dredge Pond*
	Ambient Water NHBP-1	***Ambient Water NHOB-1***	***Ambient Water NHADP-1***
Benzene	--	--	--
Chlorobenzene	--	--	--
D&P-Xylene (mixed)	--	--	--
1,4-Dichlorobenzene	--	--	--
Naphthalene	--	--	--
Acenaphthene	--	--	--
2-Methyl Naphthalene	--	--	--
1-Methyl Naphthalene	--	--	--
Dimethyl Naphthalene (2 isomers)	--	--	--
Petroleum Product	--	--	--
Acetone	--	--	--
1-Hydroxychlordene	0.00043	0.00055	0.00045
Cyanide	--	--	--
Gamma-Chlordane/2	--	--	--
Chlordene/2	--	--	--
Endrin Ketone	--	--	--
Heptachlor	--	--	--
Dieldrin	--	--	--
Endrin	--	--	--
Heptachlor Epoxide	--	--	--
Barium	--	--	--
Chromium	--	--	--
Copper	--	--	--
Strontium	--	--	--
Vanadium	--	--	--
Yttrium	--	--	--
Zinc	--	0.020	0.012
Aluminum	0.500	0.430	0.470
Manganese	0.200	0.300	0.190
Calcium	--	--	--
Magnesium	--	--	--
Iron	1.2	1.5	0.85
Sodium	--	--	--
Lead	--	0.010	--
Boron	0.230	0.225	0.240
Cadmium	--	--	--

TABLE 12

THIRD QUARTER WATER SAMPLE ANALYTICAL RESULTS (MG/L) [1]

NORTH HOLLYWOOD DUMP, MEMPHIS, TENNESSEE

	Beaver Pond	*Oxbow Lake*	*Abandoned Dredge Pond*
	Ambient Water NHBP-1	*Ambient Water NHOB-1*	*Ambient Water NHADP-1*
Hardness	72	92	70
Alkalinity	78	110	77

NOTES:

[1] This data was obtained from TAG 1983 studies and has not been verified or reviewed for quality assurance.

TABLE 13

FOURTH QUARTER WATER SAMPLE ANALYTICAL RESULTS (mg/L) [1]

NORTH HOLLYWOOD DUMP, MEMPHIS, TENNESSEE

	Abandoned Dredge Pond	*Oxbow Lake*	*Beaver Pond*	
	Ambient Water NHADP-1	*Ambient Water NHOB-1*	*Ambient Water NHBP-1*	*Ambient Water NHBP-1* Split
Endrin Ketone	0.00017N [2]	--	--	--
1-Hydroxychlordene	0.00029	--	--	0.0053
Heptachlor	0.00009	0.00006	0.00004JS	0.000092N
Heptachlor Epoxide	0.00048	0.00075	0.00038S	--
Dieldrin	0.00004J [3]	0.00008	--	--
1 Unidentified				--
Chlorinated Compound	--	--	--	--
Cyanide	--	--	--	--
3 Unidentified	--	--	--	--
Chlorinated Compounds	--	--	--	--
Chlordene/2	--	--	--	--
Isodrin	--	--	--	--
4,4'-DDD (P,P'-DDD)	--	--	--	--
Endrin	--	--	--	--
Trans-Nonachlor/2	--	--	--	--
Benzene	--	--	--	--
Chlorobenzene	--	--	--	--
o&p-Xylene (mixed)	--	--	--	--
1,4-Dichlorobenzene	--	--	--	--
2,4-Dinitrotoluene	--	--	--	--
Pyrene	--	--	--	--
2-Chlorophenol	--	--	--	--
Phenol	--	--	--	--
4-Chloro-3-Methylphenol	--	--	--	--
	--	--	--	--

NOTES:

[1] This data was obtained from TAG 1983 studies and has not been verified or reviewed for quality assurance.
[2] N=Presumptive evidence of presence of material
[3] J=Estimated value

Pesticides and related chlorinated compounds were identified in sediments collected from the surface water impoundments during the TAG study. The available sediment analytical results from the TAG study are shown on Table 14. Chemical compounds which were identified in the Beaver Pond, Oxbow Lake, and abandoned dredge pond include aldrin, chlordene, 1-hydroxychlordene, gamma-chlordane, and alpha-chlordane.

Within the abandoned dredge pond, the DIR reported that the concentration of total pesticides were highest adjacent to the landfill, decrease in the central portion of the pond and increase at the southeast end of the pond.

In sediments studies completed by the PRPs, the pesticides which were detected in the upper portions of the sediment samples included aldrin, 4,4-DDD, 4,4'-DDE, 4,4'-DDT, dieldrin, endosulfan-alpha, endosulfan-beta, endosulfan sulfate, endrin, endrin aldehyde, heptachlor, and heptachlor epoxide. Pesticides which were detected in the middle portions of sediment samples included aldrin, 4,4-DDD, endosulfan-alpha, endosulfan-beta, endrin, heptachlor and heptachlor epoxide.

Health Assessment

The MSCHD with assistance from the Centers for Disease Control (CDC) conducted a cross-sectional study of residents of Hollywood and a comparison area of Memphis, Tennessee in 1985 (Soil pesticide levels for a variety of pesticides were higher in the Hollywood area than in the comparison area). However, only for serum hexachlorobenzene and adipose tissue heptachlor epoxide were there increased pesticide levels in Hollywood residents compared with residents in the comparison area. There was no evidence of increased health effects among persons in the Hollywood area based on data from questionnaires, physical examinations, and blood pressure, liver enzyme, and urinary porphyrin tests. In summary, there was no evidence of increased health effects among persons living in the Hollywood area that could be attributed to the Hollywood Dump.

SUMMARY OF SITE RISKS

A baseline risk assessment was conducted for the North Hollywood Dump and is presented in the RI (Supplemental Report) in the Public Health Evaluation section. The risk assessment consisted of hazard identification, a dose-response evaluation, exposure assessment and risk characterization.

Selection of Contaminants of Concern

The hazard identification involved the selection of contaminants of concern (COCs), detected contaminants which have inherent toxic/carcinogenic properties that are likely to pose the greatest concern with respect to the protection of public health and the environment. Selected contaminants of concern at North Hollywood included:

Inorganics

Arsenic	Copper
Barium	Zinc
Nickel	Vanadium
Lead	

TABLE 14

SEDIMENT SAMPLE ANALYTICAL RESULTS (mg/kg) (1)

NORTH HOLLYWOOD DUMP, MEMPHIS, TENNESSEE

	OXBOW LAKE			BEAVER POND		ABANDONED DREDGE POND								
Compounds	*NHOB-1*	*NHOB-2*	*NHOB-3*	*NHBP-1*	*NHBP-2*	*NHADP-1*	*NHADP-1 (split)*	*NHADP-2*	*NHADP-3*	*NHADP-4*	*NHADP-5*	*NHADP-6*	*NHADP-7*	*NHADP-8*
PESTICIDES														
Aldrin	0.022	0.160	0.034	0.150	0.160	2.600N	NR	0.630	0.100J	0.110	0.052	ND	0.200	0.710
Chlordane	0.058	0.081	0.081	0.460	0.230	6.500	NR	0.560	0.300	0.250	0.160	0.610	1.300	87.000
1-Hydroxychlordene	0.048	0.220	0.082	0.211	0.310	7.900	NR	ND	ND	0.090	0.062	0.160	ND	ND
Gamma Chlordane	0.076	0.150	0.130	0.840	0.520	56.000	NR	1.000	0.690	0.360	0.120	0.270	0.630	5.200
Alpha Chlordane	0.019	0.078	0.028	0.180	0.110	7.000	NR	0.220	0.097	0.063	0.024	0.067	0.270	2.100
Heptachlor	ND	ND	ND	ND	ND	21.000	NR	ND	ND	ND	ND	ND	ND	ND
Heptachloronorbornene	ND	ND	ND	ND	ND	0.500J	0.500J	ND	ND	ND	ND	ND	ND	23.000
Hexachloronorbornadiene	ND	ND	ND	ND	ND	ND	0.500J	ND	ND	ND	ND	ND	ND	5.300
Pentachloronorbornadiene	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	54.00 JN
OTHER ORGANICS														
Decadienal (2 isomers)	ND	5.000 JN	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND
Hexadecanoic Acid	ND	ND	ND	ND	5.000 JN-	38.000 JN-	15.000 JN-	ND	ND	ND	5.000 JN-	5.000 JN-	5.000 JN-	5.700 JN
Octachloronaphthalene	ND	ND	ND	ND	ND	110.000	110.000	0.520J	0.500J	ND	ND	ND	ND	2.600 J
Tetradecanoic Acid	ND	ND	ND	ND	ND	5.000 JN-	5.000 JN-	ND	ND	ND	ND	ND	ND	ND
Pentachloro (Trichloromethenyl) Benzene	ND	ND	ND	ND	ND	5.000 JN	5.000 JN-	ND	ND	ND	ND	ND	ND	ND
Octadecanoic Acid	ND	ND	ND	ND	ND	5.200 JN-	NR	ND	ND	ND	ND	ND	ND	ND
Eicosanoic Acid	ND	ND	ND	ND	ND	5.000 JN-	5.000 JN-	ND	ND	ND	ND	ND	ND	ND
Heptadecanol	ND	ND	ND	ND	ND	5.000 JN	NR	ND	ND	ND	ND	ND	ND	ND
8 Unidentified Chlorinated Compounds	ND	ND	ND	ND	ND	15.000 JN	15.000 JN*	ND	ND	ND	ND	ND	ND	140.000 JN
Methyl Pyridine	ND	ND	ND	ND	ND	ND	NR	0.015JN	ND	ND	ND	ND	ND	ND
C3 Alkyl Benzene (2 isomers)	ND	ND	ND	ND	ND	ND	NR	ND	ND	5.000JN	5.000JN	ND	ND	ND
Dimethylheptanol	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	5.000JN	ND	ND	ND
Ethylhexanol	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	5.000JN-	ND	ND	ND
Methyl Cyclohexane	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	0.100 JN	ND
Dimethyl Heptane	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	0.020 JN	ND
Unidentified Chlorinated Compounds	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	8.200 JN	ND

TABLE 14

SEDIMENT SAMPLE ANALYTICAL RESULTS (mg/kg) [1]

NORTH HOLLYWOOD DUMP, MEMPHIS, TENNESSEE

	OXBOW LAKE			BEAVER POND		ABANDONNED DREDGE POND								
Compounds	*NHOB-1*	*NHOB-2*	*NHOB-3*	*NHBP-1*	*NHBP-2*	*NHADP-1*	*NHADP-1 (split)*	*NHADP-2*	*NHADP-3*	*NHADP-4*	*NHADP-5*	*NHADP-6*	*NHADP-7*	*NHADP-8*
Unidentified Hydrocarbon Compounds	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	11 000J
Methylnaphthalene	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	5.100JN
Pentachlorobenzene-methanol	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	12 000JN
Petroleum Product	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND
4 Unidentified Compounds	ND	ND	ND	ND	ND	ND	NR	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	0.009J	NR	ND	ND	ND	ND	ND	0.009J	ND
Chlorobenzene	ND	ND	ND	ND	ND	0.011	0.016	ND	ND	ND	ND	ND	0.002J	0.060
INORGANICS														
Barium	100	170	110	200	200	680	NR	320	260	190	92	50	180	280
Cadmium	1.3	1.9	1.1	2.5	2.3	2.3	NR	2.6	1.7	2.0	ND	ND	1.5	2.6
Chromium	15	25	16	29	28	17	NR	36	26	23	12	9	23	30
Copper	11	21	13	31	31	67	NR	32	22	19	10	7.6	20	31
Lead	15	27	18	44	39	140	NR	63	37	31	20	19	35	70
Strontium	12	19	13	19	19	26	NR	26	18	16	11	7	16	20
Titanium	280	390	310	360	370	260	NR	390	320	280	260	200	320	350
Vanadium	25	45	29	49	52	29	NR	63	60	60	20	10	39	54
Yttrium	9	14	9.6	16	16	12	NR	20	15	13	7.8	4.8	13	16
Zinc	63	81	51	100	97	160	NR	130	90	31	45	34	85	130
Aluminum	11,000	23,000	13,000	25,000	27,000	13,000	NR	34,000	26,000	21,000	9,400	4,700	19,000	27,000
Manganese	350	650	380	310	270	530	NR	1,100	760	800	450	160	740	970
Calcium	1,400	2,200	1,500	2,500	2,300	3,800	NR	3,800	2,500	2,200	1,700	1,100	2,200	3,700
Magnesium	1,800	3,100	1,900	3,500	3,500	2,100	NR	4,000	2,800	2,700	1,500	750	2,600	3,300
Iron	15,000	28,000	17,000	25,000	25,000	17,000	NR	3,700	26,000	22,000	11,000	5,600	21,000	31,000
Nickel	11	20	13	32	25	23	NR	32	25	22	10	9.2	21	39
Mercury	ND	ND	ND	0.27	0.38	0.34	NR	0.24	0.17	0.16	ND	ND	0.23	0.41
Cyanide	0.2 K	0.2 K	0.2 K	0.2 K	0.2 K	0.2 K	0.2 K	1.39	0.2 K	0.2K	0.2K	0.2 K	0.54	0.2 K

NOTES:

[1] This data was obtained from TAG 1983 studies and has not been verified or reviewed for quality assurance.

[2] J Estimated Value

[3] N Presumptive Evidence of Presence of Material

[4] K Actual Value is Known to be Less Than Value Given

[5] NR Not Reported

[6] ND Not Detected

Pesticides

Chlordane	Aldrin
Dieldrin	Total BHC
Heptachlor	4,4' DDT
Heptachlor Epoxide	Endrin

Dose-Response Evaluation

The dose-response evaluation presented available human health and environmental criteria for the contaminants of concern, and related the chemical exposure (dose) to expected adverse health effects (response). Included in this assessment are the pertinent standards, criteria, advisories and guidelines developed for the protection of human health and the environment. An explanation of how these values were derived and how they should be applied is presented below.

Cancer potency factor (CPFs) have been developed by EPA's Carcinogenic Assessment Group for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. CPFs, which are expressed in units of $(mg/kg/day)^{-1}$, are multiplied by the estimated intake of a potential carcinogen, in mg/kg/day, to provide an upper-bound estimate of the excess lifetime cancer risk associated with exposure at that intake level. The term "upper-bound" reflects the conservative estimate of the risks calculated from the CPF. Use of this approach makes underestimation of the actual cancer risk highly unlikely. Cancer potency factors are derived from the results of human epidemiological studies or chronic animal bioassays to which animal-to-human extrapolation has been applied.

Reference doses (RfDs) have been developed by EPA for indicating the potential for adverse health effects from exposure to chemicals exhibiting noncarcinogenic effects. RfDs, which are expressed in units of mg/kg/day, are estimates of lifetime daily exposure levels for humans, including sensitive individuals. Estimated intakes of chemicals from environmental media (e.g., the amount of a chemical ingested from contaminated drinking water) can be compared to the RfD. RfDs are derived from human epidemiological studies or animal studies to which uncertainty factors have been applied (e.g., to account for the use of animal data to predict effects of humans). These uncertainty factors help ensure that the RfDs will not underestimate the potential for adverse noncarcinogenic effects to occur.

The sources for standards criteria and guidelines used for this assessment were:

i) EPA AMBIENT STANDARDS AND CRITERIA FOR SUPERFUND REMEDIAL SITES. Table 5-2, Page 5-9, Guidance on Feasibility Studies Under CERCLA. (June 1985)

ii) EPA SUPERFUND PUBLIC HEALTH EVALUATION MANUAL (October 1986)

*Exhibit 4-5, Applicable or Relevant and Appropriate Ambient Requirements.
*Exhibit 4-6, EPA Ambient Water Quality Criteria (WQC) for Protection of Human Health
*Exhibit 4-7, EPA Drinking Water Health Advisories

iii) 45FR 79310 November 1980, 49FR 4551 February 1984 52 FR 25690 July 1987.

The standards, criteria and guidelines for each of the indicators chemicals identified are summarized in Table 15. Evaluation of these criteria indicated that the 1/10 96-hour LC/50, which is the criteria established by Tennessee under the Tennessee Water Quality Criteria is in all cases much higher than the Federal numbers.

In addition to comparing the exposure point concentrations to the criteria presented in Table 15, total increased additive lifetime cancer risk was estimated for exposure to on-Site soils, exposure to surface waters by swimmers and the consumption of fish from potentially contaminated surface water. In the Federal Register publication (FR Vol. 52, No. 130, page 25700) in which EPA promulgated MCLs for certain VOCs, it is stated that "the target reference risk range for carcinogens is 10^{-4} to 10^{-6} and the MCLs EPA is promulgating in this notice generally fall in this range. EPA considers additional risk no greater than this range to be protective of public health. The target range of 10^{-4} to 10^{-6} was used in this assessment to evaluate the acceptability of the risks which were estimated for the receptors of complete pathways.

The estimated health hazard from exposure to non-carcinogenic chemicals was determined by comparing the estimated exposure (mg/kg/day) with the Acceptable Daily Intake (ADI), which is also called Acceptable Intake Chronic (AIC). An Exposure/AIC ratio equal to one (1) or greater, represents a concern for public health. An Exposure/AIC ratio of of less than one (1) is considered protective of public health. The "Acceptable Intake Chronic" (AIC) is similar to the concept of the Reference Dose (RfD) previously discussed. It is an estimate of an exposure level which would not be expected to cause adverse effects when exposure occurs for a lifetime. The AIC is also considered to be route specific.

AIC values are generally derived from animal studies to which uncertainty factors have been applied. AIC values are expressed both in terms of human intake (mg/kg/day) and ambient concentration (e.g., mg/L for drinking water).

Exposure Assessment

The exposure assessment identified potential pathways and routes for contaminants of concern to reach the receptors and the estimated contaminant concentration at the points of exposure. Contaminant release mechanisms from environmental media, based on relevant hydrologic and hydrogeologic information (fate and transport, and other pertinent site-specific information, such as local land and water use or demographic information), were also presented.

TABLE 15
APPROPRIATE STANDARDS AND CRITERIA FOR HUMAN HEALTH

Chemical	Toxicological(1) Class	Representative(8) Concentrations in Groundwater Quality (ug/L)	Water(2) Quality Criteria (ug/L)	Aquatic Criteria 1/10th LC_{50}(6)	Aquatic Criteria EPA (3) (ug/L)
INORGANICS					
Arsenic	PC	20.88	0.025	310	190
Barium	NC	396	1,000	40,000	1,400(5)
Copper	NC	30	1,000	300	5.6(5)
Lead	NC	55	50	140	3.8(5)
Nickel	NC	26	15.4	400	96(5)
Vanadium	NC	42	NA (4)	480	NA
Zinc	NC	124	5,000	190	320(5)
Chromium	NC	58	50	500	0.29(9)
ORGANICS					
Aldrin	PC	0.34	7.9×10^{-3}, 7.9×10^{-4}, 7.9×10^{-5}	1.8	1.9×10^{-3}
Total BHC	PC	3.78	3.1; 0.31; 0.031(10)	6.4	0.08(7)
Chlordane	PC	1.7	4.8×10^{-2}, $4,8\times10^{-3}$, 4.8×10^{-4}	4.1	4.3×10^{-3}

Continued.....

TABLF

APPROPRIATE STANDARDS AND CRITERIA FOR HUMAN HEALTH

Chemical	Toxicological[1] Class	Representative[8] Concentrations in Groundwater Quality (ug/L)	Water Quality Criteria[2] (ug/L)	Aquatic Criteria: 1/10th LC_{50}[6]	Aquatic Criteria: EPA[3] (ug/L)
4,4'-DDT	PC	0.54	$2.4x10^{-3}$, $2.4x10^{-4}$, $2.4x10^{-5}$	1.1	$1.0x10^{-3}$
Dieldrin	PC	0.4	$7.1x10^{-3}$, $7.6x10^{-10}$, $7.6x10^{-5}$	0.8	$1.9x10^{-3}$
Heptachlor	PC	0.88	$2.9x10^{-2}$, $2.9x10^{-3}$, $2.9x10^{-4}$	19	$3.8x10^{-3}$
Heptachlor Expoxide	PC	0.76	N/A[4]	4	NA

Notes:

(1) NC - non-carcinogen
PC - potential carcinogen

(2) Criteria reflect EPA Water Quality Criteria (WQC) concentrations (unless otherwise noted). WQC for potential carcinogens are presented as the three concentrations that represent 10^{-4}, 10^{-5}, and 10^{-6} additional risk of cancer for consumption of fish only.

(3) Freshwater Chronic Exposure Criteria (EPA) for 24-hour period unless otherwise noted. (FR. Vol. 45, No. 231, Nov. 28, 1980; 79318-79341).

(4) NA - No criteria established on this chemical.

(5) Water hardness - 100 mg/L

(6) 1/10 96 hour LC_{50}. (LC_{50} value for organic chemicals in warm water species listed in Handbook of Environmental Data on Organic Chemicals, Karel Verschueren, Van Norstrand Rhershold Co. New York). Inorganic LC_{50} information from Water Quality Criteria, California State Water Resources Control Board, J.E. McKee, H.W. Wolf, Editors, 2nd Edition 1963.

(7) Presented for gamma-BHC (Lindane)

(8) Representative Concentration is average of all positive detects.

(9) Chromium presented as worst case for hexavalent chromium.

(10) Presented for alpha-BHC.

At North Hollywood Dump, the current receptor population was identified as limited to the residential community surrounding the site. Potential exposure pathways evaluated included the ingestion by or direct contact with surface soils, direct contact with surface waters (swimming), and the ingestion of fish. Ingestion of groundwater or inhalation of airborne contaminations or fugitive dust were not identified as significant exposure pathways.

Groundwater ingestion was not considered an exposure pathway since the contaminated shallow groundwater is located directly beneath the site and flows directly into the Wolf River. There are currently no domestic supply wells located in the Fluvial Sands Unit (shallow aquifer) between the Site and the Wolf River. Therefore, there is no current direct exposure by the public to the contaminants detected in the shallow aquifer. An ordinance in the City of Memphis (Memphis Charter Section 424) prevents the installation of a water supply well into the shallow aquifer within City limits if City water is available. A groundwater Quality Control Board for Shelby County has been established under Ordinance No. 3736 to secure, protect and preserve the quality and quantity of the groundwater within Shelby County. This governing body has responsibility for enforcing the development of groundwater use in Memphis.

In addition to the establishment of the Groundwater Quality Control Board, the Memphis and Shelby County Health Department is establishing regulations for the construction and modification of water wells in Shelby County. These regulations are in accordance with the authority granted by House Bill No. 1008; Chapter 167; Section 17. These regulations require that all wells be constructed at least two feet above the 100-year flood plain. The area between the Site and the Wolf River is within the Wolf River 100-year flood plain. Therefore, a domestic supply well could not be legally installed between the Site and the Wolf River in the future.

Based on the institutional controls in place, the shallow aquifer between the Site and the Wolf River cannot be used now or in the future as a drinking water source. Therefore, the use of shallow aquifer water as a potable water source is not a complete route of exposure. However, contaminated groundwater discharging to the Wolf River may potentially impact the water quality of the river. Therefore, the principal exposure to the contaminated groundwater is addressed under the discussion of the Wolf River.

Inhalation of airborne contaminants was not considered a pathway since the contaminants are contained by a soil cover and the major contaminants do not volatilize readily.

Assumptions used to characterize exposure point concentrations were all based on a 70-kg adult.

Risk Characterization

The risk characterization quantifies present and/or potential future threats to human health that result from exposure to the contaminants of concern at North Hollywood. The site-specific risk values are estimated by incorporating information from the hazard identification, dose-response evaluation, and exposure assessment.

ien sufficient data are available, a quantitative evaluation is made of either ie incremental risk to the individual, resulting from exposure to a carcinogen or, for noncarcinogens, a numerical index or ratio of the exposure dose level to an acceptable does level is calculated.

Risks which were assessed in the North Hollywood Remedial Investigation include noncarcinogenic and carcinogenic risks resulting from exposure to individual COCs.

For noncarcinogenic compounds, various regulatory agencies have developed standards, guidelines and criteria which provide "acceptable" contaminant levels considered to protect human populations from the possible adverse effects resulting from chemical exposures. A ratio of the estimated body dose level to the RfD or AIC provides a numerical index to show the transition between acceptable and unacceptable exposure. This ratio is referred to as the chronic hazard index. For noncarcinogenic risks, the term "significant" is used when the chronic hazard index is greater than one. When Federal standards do not exist, a comparison was made to the most applicable criteria or guideline.

Calculated contaminant dose levels, as described previously, were compared to the dose level associated with the most applicable standard or guideline. The estimated chronic dose level in ug/kg/day is estimated using the exposure assessment assumptions and actual site data. The dose level is then compared to the AIC to determine if chronic exposure to the contaminated soil presents a gnificant risk.

For carcinogens or suspected carcinogens, a quantitative risk assessment involves calculating risk levels considered to represent the probability or range of probabilities of developing additional incidences of cancer under the prescribed exposure conditions. Carcinogenic risk estimates, expressed as additional incidences of cancer, are determined by multiplying the carcinogenic potency factor, as described earlier, by the projected exposure dose level. These risks are probabilities that are generally expressed in scientific notation (e.g., 1×10^{-6}). An excess lifetime cancer risk of 1×10^{-6} indicates that, as a plausible upper bound, an individual has a one in one million chance of developing cancer as a result of site-related exposure to a carcinogen over a 70-year lifetime under the specific exposure conditions at a site. To put the calculated risk estimates into perspective, they should be evaluated against a baseline risk level. Risk levels of 10^{-4} to 10^{-6} can be used to determine the "environmental significance" of the risk incurred and are used as a target range for remedial purposes (U.S EPA, 1986). Using this range as a baseline, a risk level greater then 10^{-4} is considered to present a "significant" risk with regard to human health in an environmental context, and levels less than 10^{-6} are considered "insignificant." A risk level between 10^{-4} and 10^{-6} is classified as "potentially significant." The use of the terms "significant", "potentially significant" and "insignificant" are not meant to imply acceptability; however, they help to put numerical risk estimates developed in a risk assessment into perspective.

The noncarcinogenic risk characterization for the North Hollywood Dump concluded that under "realistic worst-case" and "most probable" exposure scenarios the chronic noncarcinogenic risks associated with current and futur exposures (ingestion or dermal contact) to surface soils appear to be "insignificant." Likewise, acute or chronic dermal contact with surface water under realistic worst-case and most probable exposure scenarios does not appear to result in "significant" noncarcinogenic risk.

The carcinogenic risk characterization concluded that the carcinogenic risks associated with future incidental ingestion of surface soils and dermal contact with surface soils under realistic worst-case and most probable exposure scenarios are considered "insignificant." Direct dermal contact with surface waters under future realistic worst-case and most probable exposure scenarios appears to be "insignificant" and fish consumption from the Wolf River also appears to be "insignificant." However, scenarios which evaluate the carcinogenic hazard associated with the ingestion of fish from the on-site ponds (Oxbow Lake and the dredge pond) predict the carcinogenic risk to be "significant" (i.e., exceeds the EPA target range of 10^{-4} to 10^{-6}) for the realistic worst-case and "significant" for the most probable exposure scenarios. A summary of carcinogenic risks for consuming fish from Oxbow lake and/or the dredge pond is presented in Tables 16 and 17.

Environmental Risks

Environmental risks associated with the presence of soil contamination at North Hollywood are expected to be minimal. Based on the investigation results, surficial contamination is limited to relatively small areas of the present cover that have eroded. Therefore, risks to flora and fauna at the surface are limited. Environmental risks from the contaminated sediments in the on-site ponds have already contaminated fish to above acceptable human health levels and the contaminant have the potential to bioaccumulate in other biota. It should be noted; however, that subsequent sedimentation of the on-site ponds could have decreased the exposure to the contaminated sediments.

Affects of the shallow groundwater on the Wolf River were evaluated based on stream water quality standards set by State and Federal criteria. In order to evaluate whether the low level contaminated groundwater which discharges to the Wolf River results in an exceedence of the Tennessee Water Quality Criteria or the Federal Water Quality Criteria, it is necessary to calculate the total contaminant mass flux into the Wolf River immediately adjacent to the Site. upon determination of the mass flux to the river, a resultant instream concentration can be calculated for comparison of the instream water quality to pre-established criteria.

The total mass flux was calculated across a boundary from upstream at a point adjacent to the eastern edge of the landfill to a point downstream adjacent to the western edge of the landfill. The contaminants used for this calculation were the indicator chemicals previously identified.

TABLE 16

EVALUATION OF HEALTH RISK
CONSUMPTION OF FISH FROM OXBOW LAKE

Reported Chemical	Chemical (1) Concentration in Fish mg/kg	Average Daily Intake of Chemical mg/day		Cancer Potency Factor (4)	Lifetime Additional Risk of Cancer	
		Level 1 (2)	Level 2 (3)		Level 1 (2)	Level 2 (3)
Chlordane	6.45	4.19×10^{-2}	9.03×10^{-2}	1.3	7.7×10^{-4}	1.7×10^{-3}
Lindane	2.23	1.45×10^{-2}	3.12×10^{-2}	1.33	3.34×10^{-4}	7.18×10^{-4}
Heptachlor	0.26	1.69×10^{-3}	3.64×10^{-3}	4.5	5.15×10^{-4}	1.11×10^{-3}
Heptochlor Epoxide	0.33	2.15×10^{-3}	4.62×10^{-3}	9.1	1.73×10^{-3}	3.71×10^{-3}
DDT	0.45	2.92×10^{-3}	6.30×10^{-3}	0.34	6.72×10^{-4}	1.45×10^{-3}
TOTAL					4.0×10^{-3}	8.7×10^{-3}

NOTES:

(1) Concentrations reported by State of Tennessee DHE Fish Study (1981). Whole body concentrations are reported and edible portion concentrations would be generally lower.
(2) Level 1: Assumes average consumption of fish is 6.5 gm/day and 10% comes from Oxbow Lake.
(3) Level 2: Assumes average consumption of fish is 14 gm/day and 10% comes from Oxbow Lake.
(4) From EPA IRIS database 01/90.

TABLE 17
SURFACE WATER EXPOSURE AND RISK ASSESSMENT
CONSUMPTION OF FISH
ON-SITE PONDS

NORTH HOLLYWOOD DUMP

	Abandoned Dredge Pond				Oxbow Lake			
	Heptachlor	Heptachlor Epoxide	Dieldrin	Totals	Heptachlor	Heptachlor Epoxide	Dieldrin	Totals
Water								
Concentration (mg/kg)	1.80×10^{-4}	3.90×10^{-4}	4.00×10^{-5}		1.35×10^{-4}	5.40×10^{-4}	8.00×10^{-5}	
BCF	$1.57 \times 10^{+4}$	$1.44 \times 10^{+4}$	$4.76 \times 10^{+3}$		$1.57 \times 10^{+4}$	$1.44 \times 10^{+4}$	$4.76 \times 10^{+3}$	
Conc. in Fish (mg/kg)	$2.83 \times 10^{+0}$	$5.62 \times 10^{+0}$	1.908×10^{-1}		$2.12 \times 10^{+0}$	$7.78 \times 10^{+0}$	3.81×10^{-1}	
Chemical from Fish								
Level 1 (mg/DAY)	3.88×10^{-2}	3.65×10^{-2}	1.23×10^{-3}		1.38×10^{-2}	6.06×10^{-2}	2.48×10^{-3}	
Level 2 (mg/DAY)	8.35×10^{-2}	7.86×10^{-2}	2.67×10^{-3}		2.97×10^{-2}	1.09×10^{-1}	5.33×10^{-3}	
Fish Dose (mg/kg/DAY)								
Level 1	5.54×10^{-4}	5.21×10^{-4}	1.17×10^{-5}		1.97×10^{-4}	7.22×10^{-4}	3.54×10^{-5}	
Level 2	1.19×10^{-3}	1.12×10^{-3}	3.81×10^{-5}		4.24×10^{-4}	1.56×10^{-3}	7.62×10^{-5}	
CPF/ (mg/kg/DAY)	4.5	9.1	16		4.5	9.1	16	
Cancer Risk-Fish								
Level 1	1.56×10^{-3}	4.76×10^{-3}	2.83×10^{-3}	9.2×10^{-3}	3.53×10^{-4}	6.58×10^{-3}	5.65×10^{-4}	7.5×10^{-3}
Level 2	5.38×10^{-3}	1.02×10^{-3}	6.07×10^{-5}	1.2×10^{-2}	1.91×10^{-3}	1.41×10^{-2}	1.21×10^{-3}	1.1×10^{-2}

Notes:

Pond chemical concentrations as reported in Task Element IV Reports. Average of Detects.
BCF (Bioconcentration Factor). Source: Superfund Public Health Evaluation Manual, Exhibit C-1.
Total daily intake of chemicals ingested based on two daily average levels of fish ingestion. Level 1, 6.5 grams/day. Level 2, 14 grams/day.
Average daily dose of chemicals from fish intake, and assumed to continue for a lifetime (70 years).
CPF - Cancer Potency Factor, Oral exposure. Source: EPA IRIS database 01/90.
Cancer Risk-Fish: Additional lifetime cancer risk estimated to result from the specified level fo fish consumption for a lifetime (70 years).

›le 18 presents the results of mass flux calculations for each indicator mical and for each round of sampling including an average mass flux for all rounds. Since the attenuation capacity of the constituents was not considered in the mass flux calculations and since the full or partial limit of detection was used for constituents not detected, the total mass flux presented in Table 18 is conservative. The actual mass flux to the Wolf River would be expected to be much lower than these numbers. The sampling completed during the Supplemental RI confirms this.

Using the mass flux calculation presented in Table 18 the resultant concentration in the river was calculated to determine what impact contaminated groundwater discharge could potentially have on the Wolf River water, sediment quality, and aquatic life. The resultant concentrations in the Wolf River were calculated using two flow rates provided by the USGS. The 3Q20 flow rate was used to evaluate any immediate or short-term toxic effects to fish which could potentially occur if contaminated groundwater was discharged to the Wolf River at low flow conditions. In addition, although not specifically identified in the Tennessee Water Quality Criteria, the 15-year average flow in the Wolf River was used to evaluate the long-term chronic effects (of lifetime exposure) to humans that could potentially catch and consume fish from the Wolf River on a frequent basis.

Table 19 presents a summary of the resultant concentrations in the Wolf River for each of the indicator chemicals for each of the assumed river flow rates.

Tennessee Water Quality Criteria established for the four river ssifications are most stringent for Fish and Aquatic Life. In addition to these State standards, Federal Water Quality Criteria are also established for toxic effects to aquatic life and chronic effects to humans that consume aquatic life only. All three of these criteria are presented on Table 19.

The resultant inriver concentration for all of the indicator chemicals, with the exception of chlordane for the second round of data, are below the Federal criteria for Freshwater Aquatic Life for both 24-hour exposure and the ceiling exposure. Therefore, for the low flow ("worst case scenario") there will be no significant impact to the fish found in the Wolf River except potentially for chlordane.

Evaluation of the inriver concentration for long-tern chronic effects is more appropriately carried out on the annual average flow of the river. The inriver concentration for the Supplemental RI sampling rounds for this flow were all below the Federal Water Quality Criteria for the consumption of fish only except for chlordane during the second round of sampling. Given the conservative assumptions used in the mass flux calculations and the calculations for the inriver concentration, it is concluded that the Site should not significantly impact the Wolf River water quality based on preestablished regulatory health-based criteria.

To monitor the shallow groundwater for changes in its effects on the river, Alternate Concentration Limits (ACLs) were established using the mass flux 'culation and a 10^{-6} risk level for the consumption of fish from the

TABLE 18

SUMMARY OF GROUNDWATER MASS FLUX DATA

COMPOUND NAME	AVERAGES				
	ROUND 1 (ug/d)	ROUND 2 (ug/d)	ROUND 3 (ug/d)	ROUND 4 (ug/d)	AVERAGE (ug/d)
Total BHCs	---	5.74E+06	1.49E+05	4.35E+05	2.1[illegible]E+06
Heptachlor	---	3.57E+05	1.14E+05	8.41E+05	4.3[illegible]E+05
Aldrin	---	6.11E+04	7.97E+03	1.37E+05	6.8[illegible]E+04
Heptachlor Epoxide	---	4.71E+05	1.27E+05	4.68E+04	2.15E+05
Dieldrin	---	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4,4'-DDT	---	1.97E+05	7.97E+03	2.64E+04	7.72E+04
Chlordane	---	2.38E+06	7.17E+04	5.59E+05	1.00E+06
Arsenic	2.04E+07	5.25E+06	9.51E+07	6.58 +07	4.66E+07
Barium	1.47E+09	1.59E+09	1.95E+09	1.02E+09	1.5[illegible]E+09
Nickel	2.19E+07	2.39E+07	1.77E+07	3.26E+07	2.40
Lead	1.06E+08	5.17E+07	2.04E+08	8.30E+07	1.14E+08
Copper	8.83E+07	1.51E+08	1.02E+08	5.93E+07	1.00E+08
Zinc	1.73E+08	9.44E+07	1.86E+08	1.66E+08	1.55E+08
Vanadium	5.55E+07	4.55E+07	5.87E+07	6.76E+07	5.68E+07
Chromium	1.13E+08	1.56E+07	7.79E+07	1.03E+08	7.72E+07

Notes:

1) First round pesticide data not used due to lack of confirmation and elevated concentrations in blanks.

2) 2.11E+06 = 2,110,000

TABLE 19

ESTIMATED INCREASED CONCENTRATION IN WOLF RIVER CAUSED BY NORTH HOLLYWOOD DUMP MAX FLUX CALCULATIONS (ng/L)

Parameter	Tennessee[1] Water Quality Criteria for Aquatic Life (ug/L)	Fresh Water Aquatic Life (ng/L) (8)	Water[2] Quality Criteria (ng/L)	Round 01[3] C 1	Round 01[3] C 2	Round 02 C 1	Round 02 C 2	Round 03 C 1	Round 03 C 2	Round 04 C 1	Round 04 C 2	Average All Rounds C 1	Average All Rounds C 2
Total BHCs	6.4	(10)80/2,000	62.5(9)(11)	--	--	2.23	12.35	0.06	0.32	0.17	0.94	0.82	4.54
Heptachlor	19.0	3.8/520	0.214 (11)	--	--	0.14	0.77	0.04	0.25	0.33	1.81	0.17	0.94
Aldrin	1.8	1.9/2,500	1.36(11)	--	--	0.02	0.13	0.00	0.02	0.05	0.30	0.03	0.15
Heptachlor Epoxide	4.0	NA/NA	1.00	--	--	0.18	1.01	0.05	0.27	0.02	0.10	0.08	0.46
Dieldrin	0.8	1.9/2,500	0.184	--	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,4'-DDT	1.1	1.0/1,100	0.59	--	--	0.08	0.42	0.03	0.02	0.01	0.06	0.03	0.17
Chlordane	4.1	4.3/2,400	0.48 (11)	--	--	0.93	5.12	0.18	0.15	0.22	1.20	0.39	2.15
Arsenic	310	NA/440,000	140	7.79	43.02	2.06	11.40	36.98	204.35	25.69	141.97	18.29	101.10
Barium	40,000	NA/NA	1,000,000(7)	583.84	3,226.5	622.76	3,441.6	778.46	4,302.0	389.23	2,151.0	583.84	3,226.5
Nickel	400	96,000/1,800,000	87,710(7)	8.56	47.32	9.34	51.62	7.01	38.72	12.85	70.98	9.34	51.62
Lead	140	3,800/170,000	1,320(7)	47.71	256.12	20.24	111.85	77.85	430.20	32.31	178.53	42.82	236.61
Copper	300	5,600/22,000	6,540(7)	34.25	189.29	58.38	322.65	38.92	215.10	22.96	126.91	38.92	215.10
Zinc	190	47,000/320,000	58,910(7)	66.17	365.67	36.59	202.19	73.95	408.69	66.17	365.67	58.38	322.65
Vanadium	480	NA/NA	ND	21.41	118.31	17.52	96.80	22.96	126.91	26.47	146.27	22.18	122.61
Chromium	500	290/21,000	11,000	42.82	236.61	6.23	34.42	30.36	167.76	38.92	215.10	29.97	165.61

NOTES:

1) Values presented are 1/10 of LD_{50} for each constituent. LC_{50} value for organic chemicals in warm water species listed in Handbook of Environmental Data on Organic Chemicals, Karel Verschueren, Van Norstrand Rherehold Co. New York). Inorganic LC_{50} information from Water Quality Criteria, California State Water Resources Control Board, L.E. McKee, H.W. Wolf, Editors, 2nd Edition 1963).

2) Values presented potential carcinogens are for a 10^{-6} cancer risk due to exposure through ingestion of contaminated aquatic organisms only (Environmental Protection Agency Water Quality Criteria).

3) First round pesticide data not used due to lack of confirmation and elevated concentrations in blanks.

4) C_1 represents 15 year average flow in Wolf River at Germantown Road bridge (1,050 cfs/2.569 x 10^9 L/d). 5) C_2 represents 1020 flow in Wolf River at Germantown Road bridge as presented in USGS Open File Report 84-4347 (190 cfs/4.65 x 10^9 L/d). 6) ND - Not Developed.

7) Hardness @ 100 ug/L $CaCO_3$

8) 1.9/2,500 = 24-hour exposure/ceiling

9) Presented for gamma-BHC (Lindane)

10) Presented for alpha-BHC.

11) Number presented is proposed State Water Quality Criteria

river. The ACLs are calculated in Table 20. In order to determine if any of the ACLs have been exceeded, the monitoring wells representing each of the cells along the Wolf River would be sampled and analyzed for the indicator chemicals. The data from each monitoring well would be averaged together using a weighing factor based on the groundwater flux from each cell.

Groundwater and surface water samples will initially be collected on a quarterly basis.

1. If four consecutive quarterly samples show no exceedance of established ACLs (which may be modified up to higher background concentrations determined as an average of concurrent results from the seven upgradient monitoring wells OW-2a, b, c; OW-3a, b, c; and TAG 10B), then the monitoring frequency may be reduced to a semiannual basis.

2. If eight consecutive semiannual samples show no exceedance of established ACLs, then the monitoring frequency may be reduced further to an annual basis.

3. If, after five years of monitoring, no ACL exceedance has been shown, then further modifications of the monitoring program may be considered.

4. If any sample during the monitoring period above shows an exceedance of a parameter(s) specified in the ACLs, monthly monitoring will be instituted for that (those) parameters. This monitoring will be conducted at the ten downgradient wells specified for the calculation of contaminant flux in groundwater from the Site to Wolf River. Quarterly monitoring will be continued for all other parameters.

   a. After twelve consecutive samples, a statistical analysis using the t-distribution will be performed to determine if a violation has occurred.

   b. If a violation has occurred, appropriate remedial action will be begun by the PRPs as specified on Page 92 and monthly monitoring will continue until a statistical analysis shows a violation is no longer occuring.

   c. If a violation has not occurred, quarterly monitoring may be resumed and monthly monitoring will not again be required for that (those) parameter(s) that triggered the previous series of monthly monitoring unless it (they) exceeds the high value(s) measured during the twelve-month monitoring sequence.

Uncertainties

Regardless of the type of risk estimate developed, it should be emphasized that all estimates of risk are based upon numerous assumptions and uncertainties. In addition to limitations associated with site-specific chemical data, other

TABLE 20

CALCULATION OF GROUNDWATER CONCENTRATIONS FOR ACLs

INDICATOR CHEMICAL	WATER QUALITY[1] CRITERIA (ug/L)	MASS FLUX TO WOLF RIVER (ug/d)	AVERAGE GROUNDWATER CONCENTRATION (ug/L)
Total BHCs	62.5(5)	1.61×10^{8}	57.29
Heptachlor	0.214	5.50×10^{5}	0.23
Aldrin	1.36	3.49×10^{6}	1.46
Heptachlor Epoxide	1.00	2.57×10^{6}	1.07
Dieldrin	0.144	3.70×10^{5}	0.15
4,4'-DDT	0.59	1.52×10^{6}	0.64
Chlordane	0.48	1.23×10^{6}	0.51
Arsenic	140	3.60×10^{8}	150.42
Barium	1,000,000(4)	2.57×10^{12}	1,073,940
Nickel[7]	96,000(6)	4.46×10^{10}	18,652
Lead[7]	3,800(6)	1.77×10^{9}	738.3
Copper[7]	5,600(6)	2.60×10^{9}	1,086
Zinc[7]	47,000(6)	2.19×10^{10}	9,151
Vanadium	NA	NA	NA
Chromium[7]	290(6)	1.35×10^{8}	56.4
Endrin[7]	2.3(6)	1.07×10^{6}	0.45

NOTES:

(1) Values presented as potential carcinogens are for 1×10^{-6} cancer risk due to exposure through ingestion of contaminated aquatic organisms only as presented in Environmental Protection Agency Water Quality Criteria

(2) Proposed State Water Quality Standard.

(3) NA - Not available.

(4) Criteria shown for hardness of 100 mg/L $CaCO_2$.

(5) Criteria shown of alpha-BHC.

(6) Chronic level for protection of aquatic life.

(7) Calculated based on 3020 flow in Wolf River.

assumptions and uncertainties that affect the accuracy of the site-specific risk characterizations result from the extrapolation of potential adverse human health effects from animal studies, the extrapolation of effects observed at high-dose to low-dose effects, the modeling of dose response effects, and route-to-route extrapolation.

The use of acceptable levels (established standards, criteria and guidelines) and unit cancer risk values which are derived from animal studies introduces uncertainty into the risk estimates. In addition, the exposure coefficients used in estimating body dose levels are often surrounded by uncertainties. As such, these estimates should not stand alone from the various assumptions and uncertainties upon which they are based. In developing numerical indices of risk, an attempt is made to evaluate the effect of the assumptions and limitations on the numerical estimates. When the assumptions and uncertainties outweigh the meaningfulness of a risk assessment, a qualitative assessment of the risk is performed.

The uncertainty factors which are incorporated into the risk estimates are believed to be conservative. As such, when they are considered collectively, exposure, and subsequently risk, may be overestimated. These estimated risk calculations were based on present conditions at the site including the temporary cover and no major increases of contaminants in the shallow aquifer which discharges to the Wolf River. Additional risk could occur should the concentration increase or the temporary cover erode.

In conclusion, based on the results of the risk assessment, actual or threatened releases of hazardous substances from North Hollywood Dump, if not addressed by implementing the response action selected in this ROD, may present an endangerment to public health, welfare, or the environment.

DESCRIPTION OF ALTERNATIVES

The dump wastes, contaminated soil, surficial groundwater and pond sediments are under consideration for cleanup. The landfill wastes and groundwater require different technologies for remediation. The treatment alternatives are divided into those for the landfill and groundwater and those for the surface water impoundments. A remedy for the site and underlying surficial groundwater is proposed to protect public health and the environment by controlling exposure to contaminated materials and controlling migration of contaminants into surrounding soils, sediments, and surface water. The on-site contaminated wastes and soils present risk levels which are within EPA's acceptable range.

However, the landfill does not meet municipal landfill standards for the time of its closure, and the temporary soil cover has the potential to erode. Identified as a Class II aquifer, the contaminated shallow groundwater beneath the site is not used as a drinking water source due to well restrictions imposed by Shelby County. Also, the shallow groundwater beneath the site discharges directly into the Wolf River. Based on this information, the shallow groundwater was evaluated on its effects on the Wolf River, and there is presently no indication that the shallow ground is or will in the future present a risk to the Wolf River. A remedy for the impoundment sediments is proposed to protect public health and the environment by controlling the

ingestion and accumulation of contaminants by flora and fauna, especially fish, in Oxbow Lake and the dredge pond. The preferred alternatives will address the dump wastes, contaminated soil, surficial groundwater and pond sediments as one response action. The two preferred alternatives, once implemented, should complete the response action at this site.

A total of four alternatives were evaluated in detail for remediating the landfill wastes and shallow ground water. In addition, six alternatives were evaluated in detail for remediating the sediments in the surface water impoundments.

Landfill Wastes and Shallow Groundwater

The following lists the remedial alternatives under consideration for the landfill wastes and shallow groundwater.

All these alternatives involve restrictions on land and well use at the site, upkeep of the fence and property, and monitoring to assess the effectiveness of the remedy.

ALTERNATIVE 1: NO ACTION

Present Worth (PW) Cost: $2,338,670
Years to Implement: 0

CERCLA requires that the "No Action" alternative be considered at every site. Under this alternative, no soil, sediment, or groundwater containment or treatment would take place. They only reduction of contaminant levels would occur via natural processes such as dispersion and attenuation. The only costs would be for monitoring the site. Monitoring can be implemented using previously installed wells.

ALTERNATIVE 2: LOW PERMEABILITY SOIL COVER

Present Worth Cost: $4,942,950
PW Capital Cost: $3,364,280
PW O & M Cost: $1,578,670
Years to Implement: 1

The existing low permeability cover on-site will be upgraded to meet the sanitary landfill standards of a twenty-four inch cover and the existing fence will be completed around the perimeter of the site. Excavation of the buried wastes and contaminated soil identified during the supplemental RI/FS in the more easily eroded areas near the Wolf River and the surface water impoundments will be placed beneath the upgraded cover as part of this alternative.

The cover will contain an area of approximately seventy acres with an average refuse layer of 26.5 feet thick. Erosion control matting will be placed along the edges of the landfill in the ten-year flood plan and easily eroded areas. Pegged sod will be placed along drainage swales and steep slopes of the landfill. Erosion control will also be performed during the construction and the period after while vegetation is established over the upgraded landfill cover.

ALTERNATIVE 3: LOW PERMEABILITY SOIL COVER AND HYDRAULIC CONTAINMENT BY EXTRACTION WELLS:

Present Worth Cost: $6,802,580
PW Capital Cost: $4,490,420
PW O & M Cost $4,312,260
Year to Implement: 5

The site will be covered and specific areas will be excavated as described in Alternative 2. Alternative 3 also includes hydraulic containment of the site by the use of extraction wells. Extraction wells will be place on site and hydraulic performance monitoring wells will be installed for assessing the performance of the extraction system. The extracted groundwater will be discharged to the City of Memphis sewer system for treatment.

ALTERNATIVE 4: LOW PERMEABILITY SOIL COVER AND PHYSICAL CONTAINMENT BY BARRIER WALL

Present Worth Cost: $13,251,555
PW Capital Cost: $11,025,685
O & M Cost: $2,225,870
Years to Implement: 2

Alternative 4 will consist of upgrading the existing cover and excavating specified areas as described in Alternative 2. Alternative 4 will also include the construction of a barrier wall (containment wall) into the ground around the perimeter to contain the landfill wastes and underlying shallow groundwater. The wall will be installed using slurry trench techniques and will require the construction of a collection drain system to maintain an inward hydraulic gradient and control flood waters higher than a ten year flood. Extraction wells will be installed to remove water resulting from infiltration and hydraulic performance monitoring wells will be installed to monitor the performance of the containment system.

ARARs

Several specific Applicable or Relevant and Appropriate Requirements (ARARs) were identified for the remedial alternatives of the North Hollywood landfill and shallow groundwater.

The sanitary landfill standards specified in the Tennessee Solid Waste Regulations are an Applicable or Relevant and Appropriate Requirement (ARAR) for the closure of North Hollywood due to it primarily being an old municipal landfill for the City of Memphis. Under UIC regulations, to leave contaminants in an aquifer above MCLs in Tennessee (even one not used as a drinking water source) and in order to place additional restrictions on well installation and use at the site, a groundwater classification for the site area must must be obtained from the Tennessee Water Quality Control Board. State and Federal Water Quality criteria are ARARs for groundwater discharges into the Wolf River. The criteria and the associated Alternate Concentration Limits (ACLs) for the groundwater contaminant levels are listed in Table 20 of the Risk Characterization Section. The consolidation of waste in the area of

contamination (AOC) does not constitute placement under the Resource Conservation and Recovery Act (RCRA) Land Disposal Restriction (LDRs), and therefore LDRs do not apply to the remedial alternatives. However, should wastes be unexpectedly uncovered during the waste consolidation or movement that require additional containment, treatment, or removal, LDRs will be complied with or treatability variances will be obtained. Should it become necessary to pump and discharge groundwater, Clean Water Act pretreatment standards for discharges to Publicly Owned Treatment Works (POTWs) would apply.

Surface Water Impoundments

As stated in the summary of site risks, sediment from early sampling indicates an unacceptable human risk level from the long-term and frequent consumption of fish from Oxbow Lake and the dredge pond. Due to the changes that can occur to the sediment in a surface water body, additional sampling will take place during the design phase of the remedy. This sampling will be done concurrently with the design so as not to delay the remediation process. The sampling will be done to verify the condition of the impoundments and to better define the contaminated areas. This sampling will not affect the selected remedy unless surface sediment contamination concentrations have decreased to within acceptable risk levels.

The following lists the alternatives selected for remediation of the surface water impoundments.

All alternatives involve restrictions on fishing until remediation is complete, and monitoring is established to assess the effectiveness of the remedy.

ALTERNATIVE 1: NO ACTION

Present Worth (PW) Cost: $406,500
Years to Implement: 0

CERCLA requires that the "No Action" alternative be considered at every site. Under this alternative, no remediation of the impoundments' sediment or fish would take place. The only reduction of contaminant levels would occur via natural processes, and ARARs would not be met. The only costs would be for monitoring.

ALTERNATIVE 2: PERIODIC HARVESTING OF FISH

Present Worth Cost: $340,910
PW Capital Cost: $113,635
PW O & M Cost: $227,275
Years to Implement: 20

Fish in the ponds will be harvested on a periodic basis to ensure bioaccumulated contaminant levels in the fish are below acceptable concentration levels set using the 10^{-6} risk of one potential additional case of cancer in a population of one million persons. Fish will be harvested using "Rotenone" or other appropriate agent. Poisoned fish will be disposed of in containers paced with soil and sent to an appropriate landfill. Monitoring of fish contaminant levels will be required to determine harvesting times.

ALTERNATIVE 3: DREDGE WITH CONTAINMENT ON EAST SECTOR OF LANDFILL

Present Worth Cost: $2,341,885
PW Capital Cost: $2,298,875
PW O & M: $43,010
Years to Implement: 2

Alternative 3 consists of the dredge/excavation of contaminated sediments from the impoundments and containing sediments on the east sector of the landfill beneath new cover. The sampling during the Remedial Design (RD) phase will be used to determine contaminated sediment levels based on a 10^{-6} risk level for consumption of the fish. The impoundments will be dewatered during the excavation process and the fish will be harvested. The impoundments will be restocked with fish after the action is complete to keep from affecting the wildlife food chain in the area.

ALTERNATIVE 4: IN-PLACE CONTAINMENT WITH HYDRAULIC FILL

Present Worth Cost: $3,098,940
PW Capital Cost: $3,067,300
PW O & M: $31,640
Years to Implement: 2

Three (3) feet of fill will be placed over the contaminated sediments to contain the contamination. Depending on results from the fish and sediment sampling establishing acceptable sediment levels, all or part of the approximate seventy acres of the dredge pond and the approximate ten acres of Oxbow lake will be hydraulically contained. Geofabric will be placed on the slopes of the dredge pond and on the contaminated area of Oxbow Lake to suspend the movement of contaminants and sediments from the small beaver pond will be excavated and contained in Oxbow Lake. Partial dewatering of the impoundments will be necessary. Fish from the impoundments will be harvested and the impoundments restocked upon completion of the Remedial Action (RA).

ALTERNATIVES 5: IN-PLACE CONTAINMENT BY NATURAL DEPOSITION AND REROUTING OF WOLF RIVER

Present Worth Cost: $2,263,130
PW Capital Cost: $2,224,700
PW O & M Cost: $38,430
Years to Implement: 10

Alternative 5 consists of diverting the Wolf River through the dredge pond and utilizing natural sedimentation to cover the contaminated sediments. Inlet and outlet channels from the Wolf River will be excavated, and a dam will built to channel water from the Wolf River to flow through the dredge pond. Soil excavated from the channels would be used to backfill Oxbow Lake. Fish would be harvested from the dredge pond to prevent them from entering the Wolf River and fish barriers would be used to prevent fish from the Wolf River from entering the dredge pond and coming in contact with the sediments.

ALTERNATIVE 6: EXCAVATE WITH CONTAINMENT ON EAST SECTOR OF LANDFILL AND IN-PLACE CONTAINMENT WITH HYDRAULIC FILL

Present Worth Cost: $2,988,860
PW Capital Cost: $2,945,850
PW O & M Cost: $43,010
Years to Implement: 2

Alternative 6 consists of excavation of contaminated sediments at shallow water depths with on-site disposal like Alternative 3 and the in-place containment of contaminated bottom sediments with hydraulic fill like Alternative 4. As in Alternatives 3 and 4, the fish will be harvested and the impoundments restocked at the end of the Remedial Action.

ARARs

ARARs for the surface water impoundments include the Food and Drug Admininstration's (FDA) action levels for contaminants in fish tissue. However, it is anticipated that levels set on a 10^{-6} risk level using the data taken from the fish sampling that will be performed during the RD will be lower than the FDA action levels. In the interest of public health, EPA will use the fish concentration levels that are more protective in establishing acceptable sediment concentration levels and remediation requirements for the surface impoundments.

In dewatering the impoundments for remediation, Clean Water Act standards for discharges to POTWs and the filling of inland surface water bodies under Section 404 will apply.

Any consolidation of the contaminated sediments on site would not, however, be applicable under RCRA LDRs since the consolidation in the area of containment does not constitute placement.

SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

The remedial alternatives developed during the North Hollywood Dump Site FS were evaluated by U.S. EPA using the following nine criteria. The advantages and disadvantages of each alternative were then compared to identify the alternative providing the best balance among these nine criteria.

1. Overall Protection of Human Health and the Environment addresses whether or not an alternative provides adequate protection and describes how risks are eliminated, reduced or controlled through treatment and engineering or institutional controls.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) addresses whether or not an alternative will meet all of the applicable or relevant and appropriate requirements or provide grounds for invoking a waiver.

3. Long-term Effectiveness and Permanence refers to the ability of an alternative to maintain reliable protection of human health and the environment, over time, once cleanup objectives have been met.

4. Reduction of Toxicity, Mobility or Volume is the anticipated performance of the treatment technologies an alternative may employ.

5. Short-term Effectiveness involves the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup objectives are achieved.

6. Implementability is the technical and administrative feasibility of an alternative, including the availability of goods and services needed to implement the solution.

7. Cost includes capital costs, as well as operation and maintenance costs.

8. Agency Acceptance indicates whether, based on its review of the HS/FS and Proposed Plan, U.S. EPA TNDHE agree on the preferred alternative.

9. Community Acceptance indicates the public support of a given alternative. This criteria is discussed in the Responsiveness Summary.

Landfill Wastes and Shallow Groundwater

The following is the evaluation of the four (4) alternatives for the landfill wastes and groundwater using the nine criteria. A comparison of the alternatives omitting State and Community Acceptance is presented in Table 21.

Overall Protection of Human Health and the Environment

All alternatives presented in this document except for No Action would be protective of human health and the environment based on present conditions. The No Action alternative is not protective because in the future, failure of the temporary cover on the site could allow human or animal exposure to contaminants through soil contact and migration of unacceptable levels of contaminants into the Wolf River. The other alternatives would prevent human or animal exposure to on-site contaminants and control contaminant concentrations from entering the Wolf River. However, should contaminant concentrations in the groundwater increase to above acceptable 10^{-6} risk levels, Alternatives 3 and 4 would be protective of human health and the environment.

Compliance with Applicable or the Relevant and Appropriate Requirements

All alternatives except for No Action would comply with applicable or relevant and appropriate requirements (ARARs). The No Action alternative is not in full compliance with ARARs for the closure of landfills and would allow for possible direct contact or exposure to hazardous substances. Alternatives 2 through 4 are in compliance with sanitary landfill closure requirements and Alternatives

TABLE 21

SUMMARY OF DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES FOR LANDFILL WASTES AND GROUNDWATER

NORTH HOLLYWOOD DUMP, MEMPHIS, TENNESSEE

EVALUATION CRITERIA	*ALTERNATIVE 1* *No Further Action*	*ALTERNATIVE 2* *Permeable Cover*	*ALTERNATIVE 3* *Permeable Cover and Containment by Extraction Wells*	*ALTERNATIVE 4* *Permeable Cover and Containment Wall*
Short-Term Effectiveness	• N/A [1]	• Short term impacts from airborne emissions and sediment loading to adjacent areas • Short term impacts can be readily controlled	• Short term impacts from airborne emissions and sediment loading to adjacent areas • Additional risks to workers from contaminated media • Short-term impacts can be readily controlled	• Short term impacts from airborne emissions and sediment loading to adjacent areas • Additional risks from excavation into landfilled wastes • Short-term impacts can be readily controlled for landfill component • Short-term impacts associated with construction of the containment wall may be difficult to control
Long-Term Effectiveness and Permanence	• Residual risk associated with landfill wastes unchanged	• Residual risk associated with landfill wastes unchanged	• Residual risk associated with landfill wastes unchanged	• Residual risk associated with landfill wastes unchanged

TABLE 21

SUMMARY OF DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES FOR LANDFILL WASTES AND GROUNDWATER

NORTH HOLLYWOOD DUMP, MEMPHIS, TENNESSEE

EVALUATION CRITERIA	*ALTERNATIVE 1* *No Further Action*	*ALTERNATIVE 2* *Permeable Cover*	*ALTERNATIVE 3* *Permeable Cover and Containment by Extraction Wells*	*ALTERNATIVE 4* *Permeable Cover and Containment Wall*
Long-Term Effectiveness and Permanence (continued)	• Existing landfill cover only partially effective and permanent in the long term • Does not address groundwater transport	• Landfill cover permanent and effective in the long-term • Does not address groundwater transport	• Landfill cover permanent and effective in the long-term • Effective containment of groundwater transport in the long term	• Landfill cover permanent and effective in the long-term • Effective containment of groundwater transport in the long term
Reduction of Toxicity, Mobility or Volume	• No reduction achieved	• No direct reduction through treatment for landfill wastes	• No direct reduction through treatment for landfill wastes	• No direct reduction through treatment for landfill wastes

TABLE 21

SUMMARY OF DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES FOR LANDFILL WASTES AND GROUNDWATER

NORTH HOLLYWOOD DUMP, MEMPHIS, TENNESSEE

EVALUATION CRITERIA	*ALTERNATIVE 1* *No Further Action*	*ALTERNATIVE 2* *Permeable Cover*	*ALTERNATIVE 3* *Permeable Cover and Containment by Extraction Wells*	*ALTERNATIVE 4* *Permeable Cover and Containment Wall*
Reduction of Toxicity, Mobility or Volume (continued)	• Indirect reduction in mass of contaminants due to natural processes	• Indirect reduction in mass of contaminants due to natural processes • Indirect reduction of mobility of landfill waste contaminants due to increased cover thickness and associated reduction in infiltration	• Indirect reduction in mass of contaminants due to natural processes • Indirect reduction of mobility of landfill waste contaminants due to increased cover thickness and associated reduction in infiltration • Direct reduction in groundwater contaminant mass and mobility due to extraction • Direct reduction of toxicity of extracted groundwater through treatment in Memphis POTW	• Indirect reduction in mass of contaminants due to natural processes • Indirect reduction of mobility of landfill waste contaminants due to increased cover thickness and associated reduction in infiltration • Direct reduction in groundwater contaminant mass and mobility due to containment and extraction • Direct reduction of toxicity of extracted groundwater through treatment in Memphis POTW

TABLE 21

SUMMARY OF DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES FOR LANDFILL WASTES AND GROUNDWATER

NORTH HOLLYWOOD DUMP, MEMPHIS, TENNESSEE

EVALUATION CRITERIA	ALTERNATIVE 1 *No Further Action*	ALTERNATIVE 2 *Permeable Cover*	ALTERNATIVE 3 *Permeable Cover and Containment by Extraction Wells*	ALTERNATIVE 4 *Permeable Cover and Containment Wall*
Implementability	• N/A	• No foreseeable major concerns	• No foreseeable major concerns for landfill cover component • Evaluation of hydraulic performance may be difficult	• No foreseeable major concerns for landfill cover component • Several significant construction related concerns • Integrity of constructed containment wall questionable due to implementability difficulties
Cost	• Capital Costs: $ N/A • O & M Costs: 1,559,120 • Indirect Costs and Contingencies: 779,550 • Total Present Worth: 2,338,670	• Capital Costs: $ 1,584,580 • O & M Costs: 1,578,670 • Indirect Costs and Contingencies: 1,779,700 • Total Present Worth: 4,942,950	• Capital Costs: $ 2,051,880 • O & M Costs: 2,312,260 • Indirect Costs and Contingencies: 2,438,540 • Total Present Worth: 6,802,680	• Capital Costs: $ 6,100,1[illegible] • O & M Costs: 2,225,870 • Indirect Costs and Contingencies: 4,925,5[illegible]0 • Total Present Worth: 13,251,5[illegible] • Capital Cost sensitive to anticipated implementability difficulties

TABLE 21

SUMMARY OF DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES FOR LANDFILL WASTES AND GROUNDWATER

NORTH HOLLYWOOD DUMP, MEMPHIS, TENNESSEE

EVALUATION CRITERIA	*ALTERNATIVE 1* *No Further Action*	*ALTERNATIVE 2* *Permeable Cover*	*ALTERNATIVE 3* *Permeable Cover and Containment by Extraction Wells*	*ALTERNATIVE 4* *Permeable Cover and Containment Wall*
Compliance with ARARs	• Partial compliance with landfill closure ARARs	• Full compliance with landfill closure ARARs except where waiver justified	• Full compliance with landfill closure ARARs except where impractical • Full compliance with discharge ARARs for extracted groundwater	• Full compliance with landfill closure ARARs except where impractical • Full compliance with discharge ARARs for extracted groundwater
Overall Protection of Human Health and the Environment	• Protection relies on institutional controls for ingestion pathway of concern	• Protection relies on institutional controls for ingestion pathway of concern • Protection increased for landfill trespassers	• Protection relies on institutional controls for ingestion pathway of concern in short term • Protection increased for landfill trespassers • Protection of human health and the environment ensured in the long term	• Protection relies on institutional controls for ingestion pathway of concern in short term • Protection increased for landfill trespassers • Protection of human health and the environment ensured in the long term

Notes:

(1) N/A Not applicable

3 and 4 are in compliance with the ARARs for discharge of waste water. Alternatives 2 through 4 will also comply with all applicable RCRA LDRs. Variances in the State of Tennessee groundwater standards under the Underground Injection Control (UIC) Regulations will be sought so that restrictions could be placed on groundwater use at the site. Should the variances be denied and a waiver not be justified, groundwater treatment as specified in Alternative 3 could be used to meet applicable groundwater standards.

Reduction of Toxicity, Mobility or Volume

Since none of the remedial alternatives will involve the treatment of the landfilled wastes, there will be no direct reduction in the toxicity, mobility, or volume of landfill contaminants. Indirectly, a reduction in the mobility of landfill contaminants will occur for Alternatives 2 through 4 due to the cover reducing the amount of rain water filtering through the wastes and eliminating contaminated soils moving off-site from erosion.

Alternatives 3 and 4 will result in a significant reduction of the aquifer contaminant mobility, toxicity, and mass due to the removal of contaminated shallow groundwater.

Long-Term Effectiveness

All alternatives except for No Action will provide long-term effectiveness and permanence. The temporary cover in place could in the future expose the public and the environment to the contaminants on-site

Short-Term Effectiveness

The degree of short-term effectiveness achieved by the alternatives which involve remedial action is greatest for Alternative 2. The lowest degree of short-term effectiveness is achieved by Alternative 4.

The construction of the low permeability soil landfill cover in Alternative 2 will result in the least amount of risk to the community, workers and the environment. The primary risks to the community and workers will be due to airborne dust emissions whereas the main impact of the environment will be due to potential increased sediment loadings to the adjacent surface waterbodies in the short-term. These risks, however, are readily controlled and mitigated. These potential impacts are common to all three of the alternatives which involve upgrading the existing cover.

Alternative 3 will increase the potential risk to workers due to the increased contact with contaminated media. However, this risk to the worker is readily addressed by enforcing an appropriate health and safety program during construction. Alternative 4 will present potential risks to the workers and community which will be more difficult to address. The construction of the containment wall in Alternative 4 will likely encounter landfilled wastes along the landfill perimeter. Consequently, the implementation of this alternative would present a greater risk to workers and the community than for the other remedial alternatives due to the potential for serious site incidents to occur.

Implementability

The implementability of an alternative is based on technical feasibility, administrative feasibility and availability of services and materials. The construction and materials of the upgraded low permeability soil landfill cover for Alternatives 2 through 4 utilizes standard construction techniques and can be completed within a single construction season. Consequently, the implementation of this component of these remedial alternatives will not be of concern.

The primary difficulty which is anticipated for Alternative 3 is the inherent problem in evaluating the hydraulic performance of the system due to the hydraulic characteristic of the shallow aquifer and the proximity of the Wolf River. By comparison, the implementation of Alternative 4 is anticipated to encounter numerous difficulties. The constructability of the containment wall is the major implementability concern. Due to geologic conditions at the site, the integrity of a constructed containment wall will be questionable. In addition, the existing topography is not well-suited to the construction of a containment wall. Other implementability concerns include the anticipated interference of adjacent structures, the stability of landfill slopes, and the availability of suitable clay backfill.

Cost

The present worth cost associated with Alternative 1 is $2,338,670. The estimated present worth cost of Alternative 2 is $4,942,950. Alternative 3 is $6,778,620, and Alternative 4 is $13,251,555. The present worth value represents the total cost of the remediation expressed in today's dollars.

Alternatives 3 and 4 are not cost effective for present site conditions since contaminant concentrations in the groundwater are not above acceptable risk levels, and therefore, do not provide an added degree of protection.

State Acceptance

The State of Tennessee has assisted EPA in the review of reports and site evaluations. The State has reviewed and conditionally concur with the selected remedy for the landfill wastes and groundwater as long as the groundwater variance is received from the Tennessee Water Quality Board (See Appendix B).

Community Acceptance

Community response to the alternatives is presented in the responsiveness summary which addresses comments received during the public meeting and public comment period. Although the public had general questions concerning the remedy, no comments were received that indicated the need for a major change in the remedy selected.

Surface Water Impoundments

The following is the evaluation of the six (6) alternatives for the surface water impoundments using the nine criteria. A comparison of the alternatives omitting State and Community Acceptance is Presented in Table 22.

Overall Protection of Human Health and the Environment

All the alternatives presented in this document except for No Action would be protective of human health; however, Alternative 2 does not provide a degree of protection to the environment. The No Action alternative is not protective because it allows bioaccumulation of contaminants by wildlife in the impoundment and the possible human ingestion of contaminated fish. Alternative 2 does not prevent bioaccumulation in the wildlife population. Alternative 3 through 6 prevent the biota in the impoundment from coming in contact with or ingesting contaminated sediments.

Compliance with Applicable or Relevant and Appropriate requirements

All alternatives except for No Action and Alternative 5 would comply with ARARs. The No Action alternative would allow the levels of contaminants in the edible portions of fish to remain above health risk levels. Alternative 5 would not comply with the U.S. Army Corps of Engineers regulatory program requirements. The other alternatives would return fish contamination levels to below acceptable standard and would meet applicable RCRA LDRs, surface water quality standards, closure regulations, and effluent discharge requirements.

Reduction of Toxicity, Mobility or Volume

Since none of the remedial alternatives will involve the treatment of the contaminated sediments, there will be no reduction in the toxicity, or volume of contaminants associated with bottom sediments.

Due to the removal and securement of the bottom sediments, Alternative 3, 5, and 6 will result in a significant reduction in environmental mobility and mass of contaminants in the aquatic environment, but not for the whole site since the sediments will be placed in the landfill. Alternatives 4, 5, and 6 will result in a significant reduction in environmental mobility due to the isolation of contaminated sediments below a layer of clean fill.

Long-Term Effectiveness

All of the alternatives except no Action would provide long-term effectiveness; however, there is no permanence associated with Alternative 2. Once the contaminated sediments are no longer accessible to the impoundments' biota for accumulation, fish tissue concentrations will start decreasing and return to acceptable levels.

Short-Term Effectiveness

All of the remedies except No Action will remove contaminated fish from the impoundments during the remedial action effectively reducing short-term exposure to contaminated fish. Prior to the action, the community will be protected from short-term risk from fish consumption through institutional controls warning persons of fishing hazards. Short-term human exposure through contact with contaminated sediments during the remediation will be controlled through health and safety procedures.

TABLE 22

SUMMARY OF DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES FOR SURFACE WATER IMPOUNDMENTS

EVALUATION CRITERIA	ALTERNATIVE 1 *No Action*	ALTERNATIVE 2 *Periodic Harvesting of Fish*	ALTERNATIVE 3 *Dredge with Containment on East Sector of Landfill*	ALTERNATIVE 4 *In Place Containment with Hydraulic Fill*	ALTERNATIVE 5 *Rerouting of Wolf River*	ALTERNATIVE 6 *Excavate/In Place Containment*
Short-Term Effectiveness	• N/A	• Potential risk to members of community from ingestion of harvested fish • Short-term environmental impact from petroleum distillates • Short-term impacts can be readily controlled	• Potential risk to community from airborne emissions and breaching of settling basin dykes • Potential environmental impact from releases of suspended contaminated sediments • Short-term impacts can be readily controlled • Estimated remedial period: in excess of 6 months	• No environmental impacts of significance • Short-term impacts can be readily controlled • Estimated remedial period: 4 months	• Potential risk to community from airborne emissions • Potential environmental impacts are numerous and include: migration of contaminated sediments to Wolf River, migration of contaminated fish, loss of navigable waterway, backwater effects, loss of usable floodplain, effects on downstream river ecology • Short term impacts difficult to quantify and control • Estimated remedial period: potentially 3 year, however period required is highly uncertain	• Potential risk to community from airborne emissions • Potential environmental impact from tracking of contaminants • Short-term impacts can be readily controlled • Estimated remedial period: 4 months

TABLE 22

SUMMARY OF DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES FOR SURFACE WATER IMPOUNDMENTS

EVALUATION CRITERIA	ALTERNATIVE 1 *No Action*	ALTERNATIVE 2 *Periodic Harvesting of Fish*	ALTERNATIVE 3 *Dredge with Containment on East Sector of Landfill*	ALTERNATIVE 4 *In Place Containment with Hydraulic Fill*	ALTERNATIVE 5 *Rerouting of Wolf River*	ALTERNATIVE 6 *Excavate/In Place Containment*
Long-Term Effectiveness and Permanence	• Residual risk associated with bottom sediments and contaminated fish • Not effective or permanent in long term	• Residual risk associated with bottom sediments unchanged • Residual risk due to contaminated fish reduced but not eliminated due to potential migration of contaminated fish to Wolf River • Significant degree of long term effectiveness but no permanence	• Effective and permanent in the long term	• Residual risk associated with bottom sediments unchanged • Residual risk associated with contaminated fish significantly reduced • Effective in the long term	• Residual risk associated with bottom sediments reduced • Residual risk associated with contaminated fish unknown • May be effective in the long term • Permanence may not be achieved in the long term	• Effective in the long term • Permanence will be achieved to a significant degree in the long term

TABLE 22

SUMMARY OF DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES FOR SURFACE WATER IMPOUNDMENTS

EVALUATION CRITERIA	ALTERNATIVE 1 *No Action*	ALTERNATIVE 2 *Periodic Harvesting of Fish*	ALTERNATIVE 3 *Dredge with Containment on East Sector of Landfill*	ALTERNATIVE 4 *In Place Containment with Hydraulic Fill*	ALTERNATIVE 5 *Rerouting of Wolf River*	ALTERNATIVE 6 *Excavation Place Containment*
Reduction of Toxicity, Mobility or Volume	• No direct reduction achieved through treatment • Some natural biodegradation will occur thereby reducing toxicity and volume	• No direct reduction achieved through treatment • Insignificant reduction due to biological uptake from bottom sediments	• No direct reduction achieved through treatment • Significant reduction of mobility and volume of contaminants in aquatic environment achieved due to removal of all contaminated sediments from impoundments	• No direct reduction achieved through treatment • Significant reduction of mobility of contaminants and direct contact by fish in aquatic environment achieved due to isolation of contaminated sediments below clean fill	• No direct reduction achieved through treatment • Significant reduction of mobility and volume of contaminants in aquatic environment (33% in dredge pond) achieved due to removal of contaminated sediments from impoundments • Significant reduction of mobility of contaminants remaining in aquatic environment achieved due to isolation of contaminated sediments below clean fill	• No direct reduction achieved through treatment • Significant reduction of mobility and volume of contaminants in aquatic environment (65% in dredge pond, 100% in Oxbow Lake) achieved due to removal of contaminated sediments from impoundments • Significant reduction of mobility of contaminants remaining in aquatic environment achieved due to isolation of contaminated sediments below clean fill

TABLE 22

SUMMARY OF DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES FOR SURFACE WATER IMPOUNDMENTS

EVALUATION CRITERIA	ALTERNATIVE 1 *No Action*	ALTERNATIVE 2 *Periodic Harvesting of Fish*	ALTERNATIVE 3 *Dredge with Containment on East Sector of Landfill*	ALTERNATIVE 4 *In Place Containment with Hydraulic Fill*	ALTERNATIVE 5 *Rerouting of Wolf River*	ALTERNATIVE 6 *Excavation Place Containment*
Implementability	• N/A	• No foreseeable major concerns	• Several significant concerns regarding constructability including ability to anchor and operate dredge over large surface area, acceptability of significant dewatering flows to Memphis sewer system, probability of interruption by Wolf River floods, and ability to accommodate significant changes in volume of dredged material to be handled • Effectiveness may be limited by size of dredge pond • Technical feasibility of settling out dredged sediments without the use of flocculants is uncertain	• Several concerns include acceptability of significant dewatering flows to Memphis sewer system, availability of volume of fill, and potential resuspension of bottom sediments • Dewatering flows deemed to be only significant concern	• Significant concerns regarding administrative feasibility due to required coordination between agencies • EIS process may delay implementation significantly • Time period required for implementation is uncertain	• Several significant concerns regarding constructability including acceptability of significant dewatering flows to Memphis sewer system and ability to work on impoundment bottoms

TABLE 22

SUMMARY OF DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES FOR SURFACE WATER IMPOUNDMENTS

EVALUATION CRITERIA	ALTERNATIVE 1 *No Action*	ALTERNATIVE 2 *Periodic Harvesting of Fish*	ALTERNATIVE 3 *Dredge with Containment on East Sector of Landfill*	ALTERNATIVE 4 *In Place Containment with Hydraulic Fill*	ALTERNATIVE 5 *Rerouting of Wolf River*	ALTERNATIVE 6 *Excavation Place Containment*
Cost	• Capital Costs: $ N/A • O & M Costs: 211,000 • Indirect Costs and Contingencies: 135,500 • Total Estimated Present Worth: 406,500	• Capital Costs: $ N/A • O & M Costs: 227,275 • Indirect Costs and Contingencies: 113,635 • Total Estimated Present Worth: 340,910	• Capital Costs: $ 1,401,660 • O & M Costs: 43,010 • Indirect Costs and Contingencies: 897,015 • Total Estimated Present Worth: 2,341,685 • Capital costs are extremely sensitive to final volume to be dredged • Capital costs directly proportional to volume of sediments to be removed to meet criteria	• Capital Costs: $ 1,883,660 • O & M Costs: 31,660 • Indirect Costs and Contingencies: 1,183,610 • Total Estimated Present Worth: 3,098,940 • Capital costs not sensitive since removal of sediments not involved	• Capital Costs: $ 1,357,230 • O & M Costs: 30,430 • Indirect Costs and Contingencies: 867,470 • Total Estimated Present Worth: 2,263,130 • Capital costs associated with excavation and containment of sediments is sensitive to volume changes (less than 20% of capital cost)	• Capital Costs: $ 1,799,[illegible] • [illegible] 61,010 • Indirect Costs and Contingencies: 1,166,250 • Total Estimat[illegible] Pr[illegible] Worth: 2,[illegible] • Capital costs associated with excavation and containment of sediments is sensitive to volume changes (approximately 50% of capital cost)
Compliance with ARARs	• Compliance with surface water ARARs except where impractical • Does not comply with ARARs for contaminated fish	• Compliance with surface water ARARs except where impractical • Complies with ARARs for contaminated fish	• Compliance with surface water ARARs except where impractical • Complies with ARARs for contaminated fish	• Compliance with surface water ARARs except where impractical • Complies with ARARs for contaminated fish	• Compliance with surface water ARARs except where impractical • May not comply with ARARs for contaminated fish	• Compliance with surface water ARARs except where impractical • Complies with ARARs for contaminated fish

TABLE 22

SUMMARY OF DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES FOR SURFACE WATER IMPOUNDMENTS

EVALUATION CRITERIA	ALTERNATIVE 1 *No Action*	ALTERNATIVE 2 *Periodic Harvesting of Fish*	ALTERNATIVE 3 *Dredge with Containment on East Sector of Landfill*	ALTERNATIVE 4 *In Place Containment with Hydraulic Fill*	ALTERNATIVE 5 *Rerouting of Wolf River*	ALTERNATIVE 6 *Excavate/In Place Containment*
Compliance with ARARs (cont'd)			• Complies with discharge ARARs to Memphis POTW • Compliance with ARARs for containment facility contingent upon classification of sediments	• Complies with discharge ARARs to Memphis POTW • No ARARs applicable to hydraulic fill component	• Complies with discharge ARARs to Memphis POTW • Compliance with ARARs for containment facility contingent upon classification of sediments • Will not comply with USACOE requirements	• Complies with discharge ARARs to Memphis POTW • Compliance with ARARs for containment facility contingent upon classification of sediments • No ARARs applicable to hydraulic fill component
Overall Protection of Human Health and the Environment	• Protection of human health relies on institutional controls • Protection of environment not provided	• Protection of human health in short term relies to a limited extent on institutional controls • Effective protection of human health in long term • Protection of environment not provided	• Effective protection of human health and the environment	• Effective protection of human health and the environment	• Protection of human health in the short term relies on institutional controls • Effective protection of human health and the environment in the long term • Protection of human health and the environment not effective in the short term	• Effective protection of human health and the environment

Note:
(1) N/A - Not applicable

The primary differences between the alternatives are the extent of the potential environmental impact related to implementation. Alternative 4 does not require the handling of contaminated sediments whereas the other alternatives involve dredge/excavation activities which may potentially impact workers and the community. Consequently, this alternative is considered to have a greater degree of short-term effectiveness. The potential for short-term impact associated with Alternative 3 is deemed to be marginally greater than the potential for impacts associated with the implementation of Alternative 6. This difference is primarily due to the nature of the work and recognizes that dredging is less readily controlled than mechanical excavation and that there are hazards to the community and the environment which are inherent to the operation of liquid impoundments. Alternative 5 is deemed to be the least effective of the alternatives in the short-term due to the potential impacts to the Wolf River and adjoining floodplain. The potential impacts from the implementation of this alternative are not limited to the immediate area of the impoundments.

Implementability

The implementability of an alternative is based on technical feasibility, administrative feasibility and the availability of services and materials.

There are no major concerns regarding the implementability of Alternatives 2 and 4. Alternatives 3 and 6, however, are considered difficult to implement due to the degree of dewatering of the abandoned dredge pond which is required. In addition, the implementation of Alternative 3 will be limited by the size of the dredge pond, the ability to accommodate significant changes in the volume of material to be handled, and the required length of the construction period. Alternative 3 also requires the wet handling of contaminated sediments which may be difficult. The technical feasibility of settling out dredged sediments without the use of flocculants is uncertain. This factor will potentially have a significant impact on the implementability of this alternative.

Consequently, Alternative 3 is considered to be the most difficult to implement and the most sensitive to potential implementation problems.

The implementability of Alternative 5 is anticipated to be limited by administrative and environmental concerns. Due to the potential environmental impact of this alternative, it is anticipated that the implementation of this alternative will be delayed significantly.

Cost

The present worth cost of Alternative 1 is $406,500. Alternative 2 has an estimated present worth cost of $340,910 including Operations and Maintenance (O&M) costs. The estimated present worth of Alternative 3 is $2,341,885, Alternative 4 is $3,098,940, Alternative 5 is $2,263,130 and Alternative 6 is $2,988,860.

The indirect capital costs for several of these alternatives, however, are highly sensitive to changes in the volume of contaminated sediments to be

handled. Alternative 3 is the most sensitive to volume changes whereas Alternative 4 is the least sensitive. Due to the required partial excavation of contaminated sediments to be handled, the indirect capital costs for Alternatives 5 and 6 are moderately sensitive. Consequently, the indirect capital costs associated with Alternatives 3, 5, and 6 could vary significantly once the lateral and vertical extent of sediments to be removed is refined by the results from the preconstruction sediment sampling program.

State Acceptance

The State of Tennessee has assisted EPA in the review of reports and site evaluations. The State has reviewed and concurs with the selected remedy for the impoundments (See Appendix B).

Community Acceptance

Community response to the alternatives is presented in the responsiveness summary which addresses comments received during the public meeting and public comment period. Although the public had general questions concerning the remedy, no comments were received that indicated the need for a major change in the remedy selected.

SELECTED REMEDIES

Landfill Wastes and Shallow Groundwater

The selected remedy for the landfill wastes and shallow groundwater is Alternative 2 involving the containment of the wastes using a low permeability sanitary landfill cover and securing the site by completing the perimeter fence.

The selected remedy will include the following activities:

i) discing the existing 70-acre landfill surface;

ii) proof rolling the entire 70-acre landfill surface;

iii) excavating the buried drums north of the West Sector, characterizing drum contents and consolidating all solid contents on the surface of the West Sector beneath the final cover. All liquid wastes found will be disposed of off-Site in accordance with Federal and State standards. Should contaminant levels in the solid contents of the drums warrant off-site disposal, the solid contents would also be disposed of off-site in accordance with applicable regulations.

iv) excavating contaminated surface soil detected in the more easily eroded areas near the Wolf River and the abandoned dredge a pond and consolidating all excavated material on the Site beneath the final cover.

v) supply, place and compact approximately 67,000 cubic yards of common fill over the West Sector to increase the final cover thickness by an additional twelve inches to a total thickness of 24 inches;

vi) supply, place and compact approximately 82,000 cubic yards of common fill over the East Sector to increase the final cover thickness by an additional sixteen inches to a total thickness of 24 inches;

vii) broadcast fertilizing and seeding of the landfill surface;

ix) placing pegged sod along drainage swales and on steep slopes of the landfill; and

x) installing approximately 3,900 feet and 3,300 feet of standard chain-link fencing to complete the perimeter fencing of the West and East Sectors, respectively.

The extent of remedial activities are shown on Figure 7. Estimated costs are shown in Table 23.

Maintenance activities will include:

i) periodic inspection of the landfill surface including slopes;

ii) periodic inspection of the monitoring well network and Site fence;

iii) periodic mowing of the vegetation over the 70-acre landfill;

iv) the application of fertilizer at a specified frequency;

v) re-establishment of vegetation over distressed areas;

vi) periodic repair of areas eroded by surface water runoff or by flooding of the Wolf River;

vii) maintenance of the Site fence and signs; and

viii) control of burrowing animals.

Monitoring activities will include:

i) periodic collection of water level measurements from the existing monitoring well network and the continuous water level monitoring of the Wolf River;

ii) periodic sampling and analysis of groundwater from the monitoring well network;

iii) periodic sampling and analysis of surface water from the Wolf River; and

iv) periodic sampling and analysis of fish from the Wolf River.

The ACLs (see Table 20, Summary of Site Risks) set for the shallow groundwater mass flux into the river will be monitored at the edge of the waste management area. Should the mass flux of shallow groundwater from the site increase and

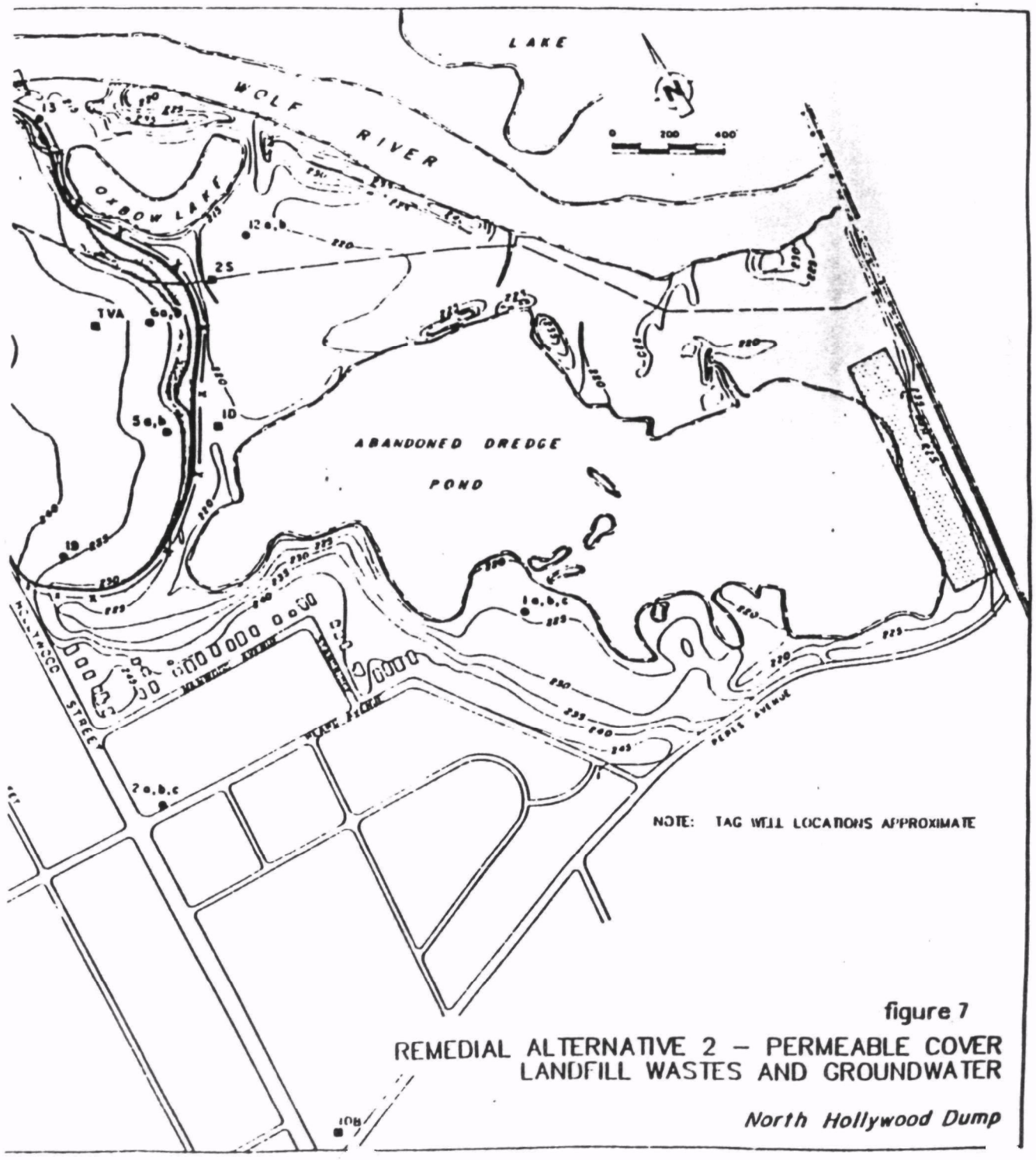


figure 7

REMEDIAL ALTERNATIVE 2 – PERMEABLE COVER LANDFILL WASTES AND GROUNDWATER

North Hollywood Dump

TABLE 23

LANDFILL WASTES AND GROUNDWATER
COST ESTIMATE SUMMARY - PERMEABLE COVER

NORTH HOLLYWOOD DUMP, MEMPHIS TENNESSEE

Description	Present Worth	Present Worth Totals
A. CAPITAL COSTS		
Project Startup & Closeout	$ 66,300	
Excavation of Drums and Contaminated Soil	$ 75,000	
Permeable Landfill Cover	819,580	
Erosion Control (10 Year Flood)	478,300	
Fencing	86,400	
Health and Safety	52,500	
Miscellaneous	6,000	
SUBTOTAL - CAPITAL COSTS		$1,584,580
B. OPERATION & MAINTENANCE COSTS		
Groundwater Monitoring	$144,870	
Wolf River Monitoring	114,450	
Biota Monitoring	141,850	
Landfill Inspection & Maintenance	846,760	
Monitoring Well Inspection & Maintenance	30,740	
SUBTOTAL - O&M COSTS		$1,578,670
SUBTOTAL - CAPITAL AND O&M COSTS		$3,163,250
C. INDIRECT COSTS		
Administration & Legal	$394,960	
Engineering	158,460	
Construction Supervision	237,690	
SUBTOTAL - INDIRECT COSTS		$791,110
D. CONTINGENCY		$988,590
TOTAL ESTIMATED COST		$4,942,950

Note:

1) Refer to Appendix C for detailed cost breakdown.

start exceeding the ACLs on a continual basis (see page 64 for the shallow groundwater monitoring criteria), the contingency alternative 3, (groundwater pump and discharge to the city sewer) will be implemented to control contaminated groundwater flow into the river to below the 10^{-6} risk level. The point of compliance for the groundwater will be the edge of the waste management area. If necessary, pretreatment will be conducted prior to discharging the contaminated groundwater into the city sewer.

In addition to the above activities, various support activities will be conducted including:

i) the implementation of a worker health and safety program;

ii) environmental monitoring for dust and particulate indicator pesticide emissions; and

iii) the implementation of a soil erosion control program during construction and in the interim period following construction during establishment of vegetation over the upgraded landfill cover.

Surface Water Impoundments

The selected remedy for the surface water impoundments is Alternative 4 involving the containment of contaminated sediments in the impoundments using hydraulic fill. Prior to the remedial action during the design phase, additional sampling of the sediments and fish in the impoundments will be performed due to the changes that can occur to the sediment in a surface water body over time.

This sampling will be done concurrently with the design so as not to delay the remediation process. The sampling will be done to verify the condition of the impoundments, to better define the contaminated areas and to determine acceptable sediment concentrations based on a 10^{-6} risk for fish consumption. Acceptable sediment contaminant levels will be calculated using levels presently found in the impoundment sediments and fish, and the acceptable fish tissue concentration levels in Table 24. This sampling will not affect the selected remedy unless fish and surface sediment contamination concentrations have decreased to within acceptable risk levels.

The selected remedy will include the following activities:

i) the implementation of a detained bottom profile survey using sonar techniques to determine pre-fill conditions;

ii) the construction of rough graded access roads to the impoundments;

iii) the installation of a pipeline and discharge headers from the inactive dredge pond located north of the Wolf River to the abandoned dredge pond and Oxbow Lake;

iv) the installation of geofabric onto slopes and bottom surfaces of the impoundment which may be susceptible to scour during the hydraulic fill operation;

v) the placement of dredged fill by hydraulic methods in the dredge pond and the Oxbow Lake;

vi the placement of dredged and stockpiled backfill onto the upper slopes which cannot be covered effectively by hydraulic methods;

vii) the excavation of sediments from the Beaver Pond and placement of these sediments in the Oxbow Lake prior to hydraulic fill;

viii) the implementation of a post-construction bottom profile survey in the abandoned dredge pond to confirm the fill thickness; and

ix) the harvesting and restocking of fish from the impoundments.

Geofabric will be placed over the contaminated surface of the Oxbow Lake and along contaminated shallow slopes of the abandoned dredge pond due to the potential scour and suspension of contaminated sediments while placing fill hydraulically. The geofabric sheets will be prestitched together prior to placement and will be sunk into position using sandbags. Prior to filling, the geofabric will be securely anchored by staking.

The placement of hydraulic fill will be performed in a controlled manner. Dredged fill will be discharged initially over the deepest areas of the impoundments to be covered and proceed towards the more shallow areas. Prior to covering the Oxbow Lake contamination the contaminated sediments from the Beaver pond will be excavated and placed on the slopes of the Oxbow. The abandoned dredge pond will receive a cover thickness of three feet. Due to the difficulty of placing fill by hydraulic methods directly against shallow slopes in the dredge pond, these slopes will be covered by mechanical means. Dredged material will be discharged onto a spoil area adjacent to the Wolf River and drained for use as backfill material. This backfill material will be mechanically placed over the upper slopes of the dredge pond where hydraulic filling is ineffective. It is anticipated that mechanical dewatering will be required to lower the water level in the dredge pond during mechanical placement of the dredged fill.

Upon completion of the fill operations, the fish remaining in the abandoned dredge pond will be harvested. A post-construction bottom profile survey will be conducted in the completed dredge pond to verify the uniformity of the fill operation. Disturbed areas around the impoundments will be restored by reseeding as necessary and the impoundments will be restocked with fish.

Figures 8 through 10 illustrates the extent of the remedial construction activities required for this alternative. Estimated costs are shown in Table 25.

A long-term monitoring program for the surface water impoundments would be implemented after the remediation is complete to verify that sediment levels do not increase above the 10^{-6} health based levels set during the Remedial Design.

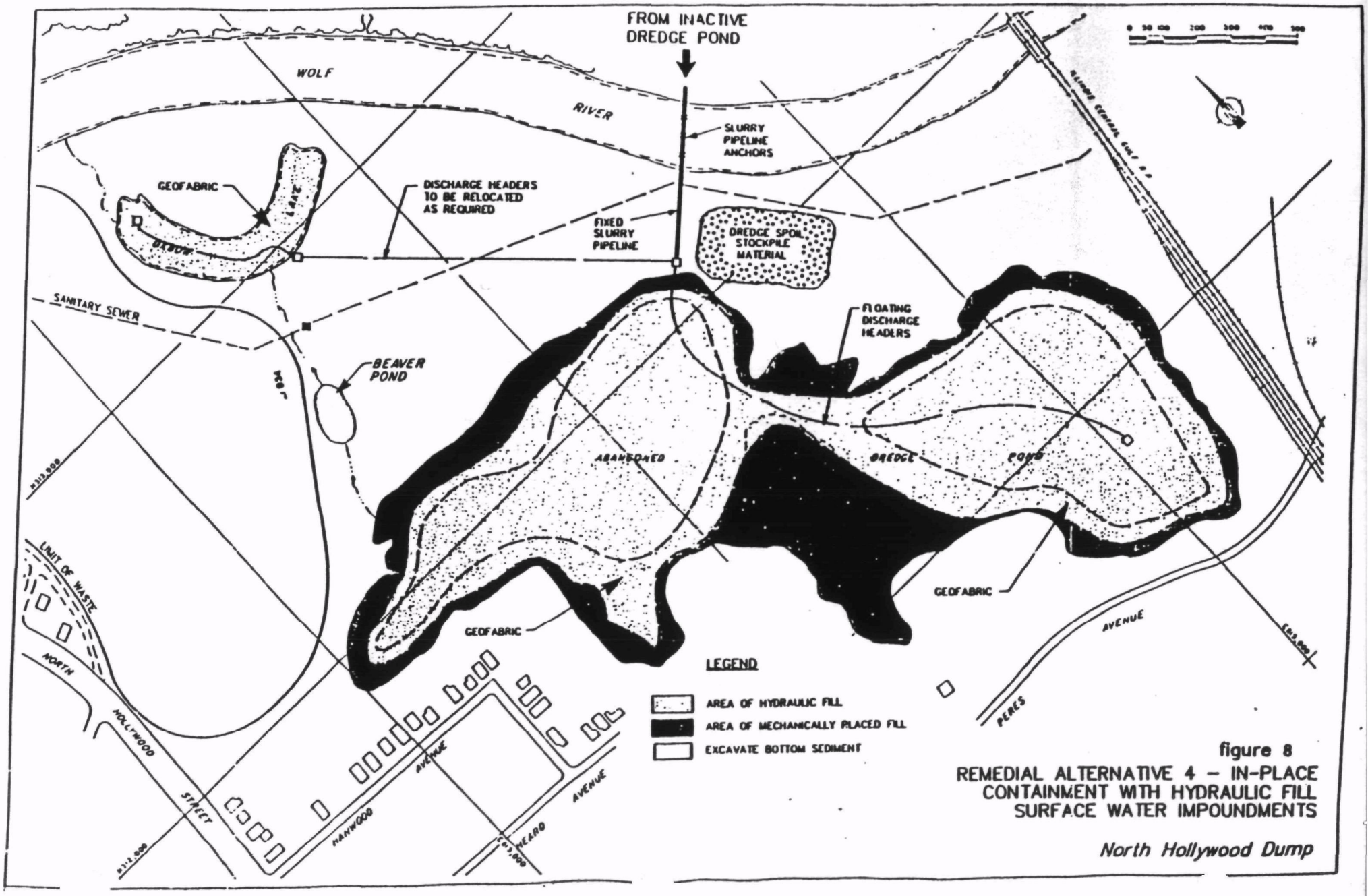


figure 8
REMEDIAL ALTERNATIVE 4 – IN-PLACE CONTAINMENT WITH HYDRAULIC FILL SURFACE WATER IMPOUNDMENTS

North Hollywood Dump

TABLE 24

ALLOWABLE CONTAMINANT LEVELS IN FISH TISSUE

(USING A 10^{-6} RISK LEVEL FOR A 70 KG ADULT CONSUMING 6.5 GRAMS OF FISH PER DAY)

CONTAMINANT	ALLOWABLE CONTAMINANT LEVEL (MG/KG)
Chlorodane	8.3×10^{-3}
Chlorodene	8.3×10^{-3}
Heptachlor	2.4×10^{-3}
Heptachlor Epoxide	2.4×10^{-3}
Aldrin	6.54×10^{-4}
Dieldrin	6.7×10^{-4}
Total BHC	2.0×10^{-2}
,4' DDT	3.2×10^{-2}
Endrin	3.2
Arsenic	6.2×10^{-3}
Barium	538
Nickel	215
Lead	1.5
Copper	398
Zinc	2154
Vanadium	75

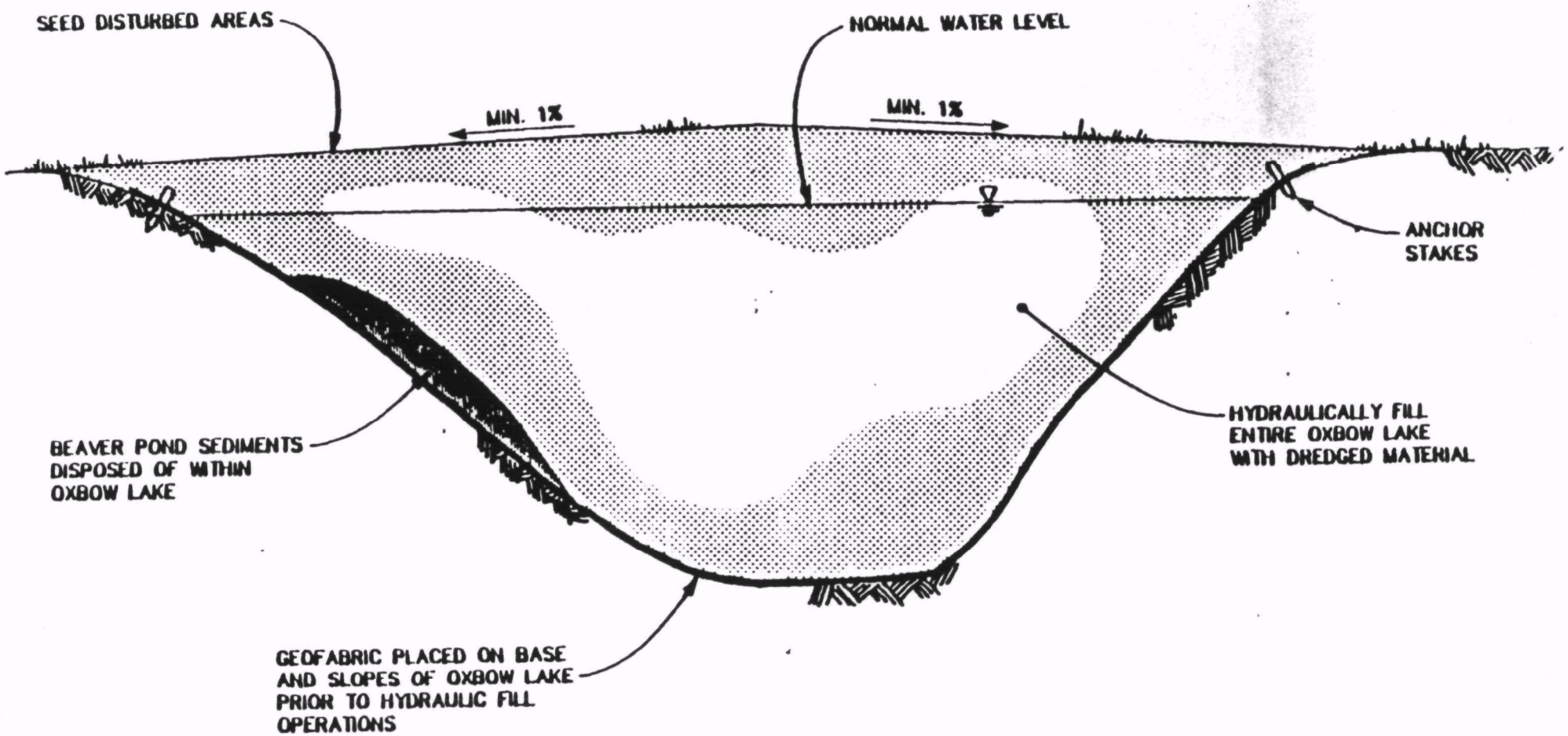


figure 9

HYDRAULICALLY FILLED OXBOW LAKE

North Hollywood Dump

TABLE 25

SURFACE WATER IMPOUNDMENTS
COST ESTIMATE SUMMARY - IN PLACE CONTAINMENT OF SEDIMENTS WITH HYDRAULIC FILL

NORTH HOLLYWOOD DUMP, MEMPHIS TENNESSEE

Description	*Present Worth*	*Present Worth Totals*
A. CAPITAL COSTS		
Preconstruction Sampling and Surveys	$ 90,000	
Project Startup & Closeout	105,300	
Slurry Pipe and Discharge Headers	45,000	
Installation of Geofabric	151,400	
Hydraulically Cover Dredge Pond	904,800	
Hydraulically Fill Oxbow	234,000	
Excavate Beaver Pond	6,500	
Mechanical Placement of Backfill	228,000	
Dewatering of Dredge Pond	58,100	
Confirmatory Survey	15,000	
Harvesting of Fish	27,000	
Health and Safety	16,520	
Environmental Monitoring	2,070	
SUBTOTAL - CAPITAL COSTS		$1,883,690
B. OPERATION & MAINTENANCE COSTS		
Monitoring of Impoundment Waters	$17,650	
Biota Monitoring	13,990	
SUBTOTAL - O&M COSTS		$ 31,640
SUBTOTAL - CAPITAL AND O&M COSTS		$1,915,330

STATUTORY DETERMINATIONS

Under its legal authorities, EPA's primary responsibility at Superfund sites is to undertake remedial actions that achieve adequate protection of human health and the environment. In addition, section 121 of CERCLA establishes several other statutory requirements and preferences. These specify that when complete, the selected remedial action or this site must comply with applicable or relevant and appropriate environmental standards established under Federal and State environmental laws unless a statutory waiver is justified. The selected remedy also must be cost effective and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Finally, the statute includes a preference for remedies that employ treatment that permanently and significantly reduce the volume, toxicity, or mobility of hazardous wastes as their principal element. The following sections discuss how the selected remedy meets these statutory requirements.

Protection of Human Health and the Environment

Based on the site risk assessment, long term exposure to contaminants through the consumption of contaminated fish is the identified risk associated with the site. And although no excessive risk was identified for exposure to the landfill, this risk level was based on present conditions which include a temporary cover over the site.

The placement of the low permeability sanitary landfill cover over the site and hydraulic fill over the contaminated sediments protects human health and the environment by removing and containing the contaminants away from the exposure pathway. The landfill contaminants and contaminated sediments will be contained so that plant and animal life will no longer come in contact with and bioaccumulate the contamination. The contaminated fish will then be removed and the surface water impoundments restocked. The cancer risk associated with the site will be reduced to around 1×10^{-6} and the Hazard Indices (HI) ratio will be less than 1.

There will be no unacceptable short-term threats or cross media impacts associated with the selected remedies that cannot be readily controlled since only minimal contact with or movement of the wastes will occur.

Compliance with ARARs

The selected remedies of a low permeability soil cover for the landfill contaminants, groundwater monitoring, hydraulic fill containment of contaminated sediments in the impoundments, and removal of the contaminated fish will comply with all applicable or relevant and appropriate requirements (ARARs). The ARARs are presented below.

Action Specific ARARs:

* Tennessee Solid Waste Regulations, Rule 1200-1-7 - 001-007

* Tennessee Water Quality Control Act, TN Code 69-3-104

TABLE 25

SURFACE WATER IMPOUNDMENTS
COST ESTIMATE SUMMARY - IN PLACE CONTAINMENT OF SEDIMENTS WITH HYDRAULIC FILL

NORTH HOLLYWOOD DUMP, MEMPHIS TENNESSEE

Description	*Present Worth*	*Present Worth Totals*
C. INDIRECT COSTS		
Administration & Legal	$ 100,510	
Engineering	188,360	
Construction Supervision	282,550	
SUBTOTAL - INDIRECT COSTS		$ 571,420
D. CONTINGENCY		$ 612,190
TOTAL ESTIMATED COST		$3,098,940

* Clean Water Act (40 CFR 122), including Section 404

* National Pretreatment Standards (40 CFR 403)

* Chapter 33 of the Memphis Code related to "Sewer and Sewage Disposal" (Memphis Sewer Ordinance)

* USFDA Edible portion of Fish levels

* and National Primary and Secondary Ambient Air Quality (40 CFR 50)

Chemical Specific ARARs:

* Tennessee Water Quality Criteria (1200-4)

Location Specific ARARs:

* none

RCRA Land Disposal Restrictions (LDRs) are not applicable to this remedial action since the consolidation of waste within the area of containment (which is being performed for the flood plain areas of the landfill and part of the contaminated sediments) does not constitute "placement." Therefore LDRs do not apply. The Federal Safe Drinking Water Act (SDWA) does not apply to the shallow groundwater beneath the site since the contaminated groundwater is only

beneath the site and flows directly into the Wolf River. Institutional controls by Shelby County controlling the placement of wells into the shallow aquifer inside of the Memphis City limits and land restrictions also preclude the contaminated groundwater from being used a drinking water source.

Cost Effectiveness

The selected remedies are cost-effective because they have been determined to provide overall effectiveness proportional to their costs. Alternative 2 for the landfill wastes and groundwater is the least costly of Alternatives 2, 3 and 4 which meet all ARARs and are equally protective of human health and the environment. Alternative 4 for the surface water impoundments is comparable in cost to Alternatives 3 and 6 which also meet all evaluation criteria, but Alternative 4 has a lesser degree of short-term impacts and cost variability.

Utilization of Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable

U.S. EPA and the State of Tennessee believe the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a cost-effective manner for the final remedy at the North Hollywood site. Of the alternatives that are protective of human health and the environment and comply with ARARs, U.S. EPA and the State have determined that the selected remedy provides the best balance of trade-offs in terms of long-term effectiveness and permanence, reduction in toxicity, mobility or volume achieved through treatment, short-term effectiveness, implementability,

st, also considering the statutory preference for treatment as a principal element and considering State and community acceptance.

The selected remedies for the containment of the landfill wastes and the surface water impoundments can be implemented and completed more quickly, with less difficulty, and at less cost than treatment technologies due to the vast amount of material and the low levels of contamination present at the site.

Preference for Treatment as a Principal Element

In selecting the remedies for the North Hollywood Dump, EPA considered the use of treatment technologies to the maximum extent possible. As stated previously, however, due to high costs and implementation problems for treatment use at a large municipal landfill and since no significant changes in risk levels would occur with the containment of the waste, treatment was not consider an effective option for North Hollywood Dump.

DOCUMENTATION OF SIGNIFICANT CHANGES

The preferred alternative (Alternative 4) for the surface water impoundments originally did not intend to remove and restock the contaminated fish from the surface water impoundments in addition to placing hydraulic fill over the contaminated sediments. The selected remedy for the surface water impoundments will include the removal of contaminated fish from the surface water impoundments as well as the hydraulic containment of the contaminated sediments.

Originally, institutional fishing restrictions were going to be kept in place to warn residents from eating contaminated fish from the impoundments. However, public comments (see responsiveness summary) indicated the resident will likely continue to fish in the impoundments regardless of posted restricts. In the interest of public health and to quicken the clean-up's effect on the environment, fish from the impoundments will be removed during the remedial action and the impoundments will be restocked after remediation. The impoundments will be restocked due to the potential for environmental effects on the area's wildlife and their food supply should the fish not be replaced. It is not the intent of EPA to approve of fishing in the impoundments until it is determined that it is safe again to fish.

NORTH HOLLYWOOD DUMP SITE
RESPONSIVENESS SUMMARY

I. RESPONSIVENESS SUMMARY OVERVIEW

The U.S. Environmental Protection Agency (EPA) held a public comment period from June 28 through July 27, 1990 for interested pa :es to comment on the Remedial Investigation/Feasibility Study (RI/FS) results and the Proposed Plan for the North Hollywood Dump Site in Memphis, Tennessee.

The Proposed Plan, included in Attachment A of this document, provides a summary of the site's background information leading up to the public comment period. Specifically, the Proposed Plan includes the following sections: Introduction, Site Background, Scope and Role of the Response Action, Summary of Site Risks, Summary of Alternatives, Evaluation and Analysis of Alternatives, The Community's Role in the Selection Process, List of Contacts, Glossary of Evaluation Criteria, and Glossary of Terms.

EPA held a public meeting at 7:30 pm on June 28, 1990 at the Board of Education facility in Memphis, Tennessee to outline the RI/FS and describe EPA's proposed remedial alternatives for contaminants found in the landfill, groundwater, lakes, and sediments at the North Hollywood Dump Site. All comments received by EPA during the public comment period will be considered in the final selection of a remedial alternative for the areas of contamination at the North Hollywood Dump Site.

The Responsiveness Summary, required by the Superfund Law, provides a summary of citizens' comments and concerns identified and received during the public comment period, and EPA's responses to those comments and concerns.

This Responsiveness Summary is organized into the following sections and attachments:

I. RESPONSIVENESS SUMMARY OVERVIEW. This section outlines the purposes of the public comment period and the Responsiveness Summary. It also references the appended background information leading up to the public comment period.

II. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS. This section provides a brief history of community concerns and interest

identified as part of the Community Relations Plan and during the RI/FS.

III. SUMMARY OF MAJOR QUESTIONS AND COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND EPA RESPONSES TO THESE COMMENTS. This section summarizes the oral comments received by EPA at the June 28, 1990 public meeting, and provides EPA's responses to these comments.

IV. WRITTEN COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND EPA'S RESPONSES TO THESE COMMENTS. This section contains the one letter received by EPA containing written comments, as well as EPA's written response to that letter.

ATTACHMENT A: Attachment A contains the Proposed Plan which was distributed to the public during the public meeting held on June 28, 1990 and mailed to the information repository and those included on the mailing list.

ATTACHMENT B: Attachment B includes the sign in sheets from the public meeting held on June 28, 1990 at the Board of Education facility, 2597 Avery Avenue, Memphis, Tennessee.

ATTACHMENT C: Attachment C includes names, addresses and phone numbers of the information repositories designated for the North Hollywood Dump Site.

ATTACHMENT D: Attachment D includes the official transcript of the Public Hearing on the Proposed Plan for the Cleanup of the North Hollywood Dump National Priorities List Site located in Memphis, Tennessee.

II. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

A. Background on Community Involvement

Frequent print, radio and television media coverage on the site began in 1980 and continued through 1984. Media coverage from 1984 to 1990 was infrequent and sporadic. The most active period of community involvement was from 1980 to 1981. During this time, citizens of North Hollywood became concerned about the toxic chemicals buried at the site.

Environmental groups formed prior to and during the early 1980's, such as the North Hollywood Health and Safety Committee and the Cypress Health and Safety Committee (CHSC), expressed concerns about the site. Community groups and

organizations became involved with the site. These groups included the League of Women's Voters (LOWV), the Tennessee Association of Community Organization Reform Now (ACORN), the Urban League (UL), Tennesseeans Against Chemical Hazards, and the Tennessee Self Help Missions. EPA formed the Metro Area Environmental Task Force (MATF), consisting of representatives from local citizens groups and Federal, county and city government personnel to address local concerns regarding the site and obtain public comments regarding plans for site work.

In December 1980, state and local officials announced the formation of the Technical Action Group (TAG), consisting of representatives from the EPA, the state and others including the Velsicol Chemical Corporation, a potentially responsible party (PRP). The TAG was organized to maximize cleanup efforts conducted by Velsicol. In February 1981, the TAG conducted a cleanup of hot spots at the site.

After the discovery of contaminated fish in the Wolf River, county commissioners requested that the Memphis and Shelby County Health Department (MSCHD) conduct medical examination of persons who regularly ate chemically-contaminated fish. The MSCHD ran tests on fish from two wholesale dealers and found that pesticide levels in the fish were well below Food and Drug Administration (FDA) levels. Warnings against using fish as a food source were posted along the Wolf River in March 1981.

According to information obtained from community interviews conducted in March 1990, community members were unaware of the site status and activities conducted during the past two to three years. Residents who were familiar with current conditions at the site stated that fishing near the site was still a problem. Most residents interviewed stated that the governmental agencies handling the site remedial activities had done an acceptable job.

B. Background on Community Concerns

From information obtained during the community interviews conducted in March 1990, the site, which was considered by the community to be a high priority during the early 1980's, no longer appeared to be as high of a concern to the

majority of Hollywood residents. The people interviewed in the Hollywood community were generally unaware of the site conditions and activities conducted to date, and therefore stated no concerns. Only a few residents living near the site and a number of citizens living outside the Hollywood community were familiar with the site and expressed concerns. Their concerns are summarized as follows:

1. Hollywood residents stated concern regarding their general health and the environment. Residents had heard rumors regarding illnesses developed from the toxic chemicals buried at the site. The community would like to see the site cleaned up and monitored on a regular basis to protect their health and safety.

2. Some residents stated a mistrust for EPA and local government officials.

3. Hollywood residents expressed concern that those persons fishing at the site may be selling potentially site-contaminated fish to the public.

4. Hollywood residents requested more information about the site. They claimed that no information had been received since the health surveys were conducted approximately two to three years ago.

III. SUMMARY OF MAJOR QUESTIONS AND COMMENTS RECEIVED DURING THE PUBLIC MEETING CONDUCTED ON JUNE 28, 1990 AND EPA'S RESPONSES TO THESE COMMENTS

COMMENT: A local resident questioned why a landfill cover of only 24 inches was considered and what the cover was to consist of.

RESPONSE: EPA classified the North Hollywood Dump as a municipal waste landfill rather than a hazardous waste landfill. The borings obtained at the site found tree stumps, burned debris and ash. Under EPA's classification, the most appropriate regulation for this site was to close the landfill as a sanitary landfill; requiring a 24 inch cover of low permeability soil.

COMMENT: A local resident questioned if groundwater from the dump was going only to the Wolf River; not beyond.

RESPONSE: EPA carefully investigated the flow of groundwater through the site to the Wolf River. EPA was concerned about the possibility of:

1. Contaminated groundwater in the surficial aquifer under the site migrating into the lower, confined, drinking water aquifer; and

2. Groundwater in the surficial aquifer flowing under the Wolf River and contaminating areas to the north of the Wolf River.

Detailed studies indicated that a continuous clay layer, 100 to 200 feet in thickness, separated the underlying drinking water aquifer (the Memphis Sands) from contaminants in the surficial aquifer (the Fluvial Sands). Hydraulic gradients clearly showed that the water was flowing toward and converging at the Wolf River from both the north and south sides of the Wolf River. Pressure gradients also indicated that groundwater within the surficial aquifer was rising into the Wolf River, rather than flowing under it.

COMMENT: A local resident questioned why contamination warning signs were posted at the ponds located north of Interstate 240 and if contaminated fish were found in the ponds.

RESPONSE: Contaminated fish were found in the aforementioned ponds and both upstream and downstream of the site in the Wolf River. Contamination found in the ponds north of Interstate 240 and upstream in the Wolf River did not originate from the site. Additional sources of contamination existed in this area.

COMMENT: A local resident questioned if the North Hollywood Dump posed a potential risk for fishing in the Wolf River.

RESPONSE: Data from EPA's investigation indicates that the North Hollywood Dump itself does not pose a significant risk to fishing in the Wolf River, and extensive monitoring will be undertaken to insure that no potential risk inadvertently develops in the future. Groundwater flowing from the dump contains mostly pesticides and metals which move very slowly toward the Wolf River. These

compounds exist only in concentrations below levels which would significantly affect the fish in the Wolf River.

COMMENT: A citizen questioned why EPA was going to conduct any site remedial work if there was a relatively low risk associated with the contaminants originating from the site.

RESPONSE: Despite the low risk associated with the site, the site does not meet Federal and state regulatory standards. EPA will continue to monitor the groundwater leaving the North Hollywood Dump and flowing toward the Wolf River.

COMMENT: A local resident asked EPA to explain the preferred alternative for the remediation of Oxbow Lake and the dredge lake.

RESPONSE: The preferred alternative for remediation of Oxbow Lake and the dredge lake consisted of a three foot clay cover placed on the bottoms of the lakes to keep biota (i.e., fish) from coming in contact with plant life growing in contaminated areas.

COMMENT: A local resident questioned if the sediment covers would allow people to consume fish obtained from Oxbow Lake and the dredge lake and not become contaminated.

RESPONSE: Fishing restrictions would be placed on the aforementioned lakes until future periodic fish studies indicated that the fish were acceptable for human consumption. Based on public concerns about fishing and the effect of contaminated fish on the animal food chain, the fish in the lakes will be removed, and the lakes restocked.

COMMENT: A local resident questioned when it would be safe to fish in Oxbow Lake and the dredge lake.

RESPONSE: Once EPA sampling indicated that the fish were no longer contaminated, fishing could resume immediately. The anticipated time frame was approximately five years, the life span of the contaminated fish, once the covers were in-

place. However, Oxbow Lake and the dredge pond are located on private property and EPA will not determine if fishing is allowed on the property, only if the fish are safe for consumption.

COMMENT: A local resident questioned the mobilization of chlordane in the groundwater.

RESPONSE: Sampling results indicated that concentrations of chlordane found in the groundwater were below EPA established standards and would not significantly affect the Wolf River. To ensure that chlordane remained relatively immobile, EPA would install groundwater monitoring wells along the Wolf River to routinely measure the chlordane concentrations in the groundwater. Should levels exceed the established levels in the future, measures would be taken to remediate the problem.

COMMENT: A local resident questioned why the fence did not totally encompass the site.

RESPONSE: The fence would be upgraded to totally encompass the site and maintained as part of the remedy.

COMMENT: A concerned resident heard that the Wolf River was not contaminated by the North Hollywood Dump and wanted to know how fish became contaminated with chlordane.

RESPONSE: The North Hollywood Dump Site is not the only source of contamination found along the Wolf River. EPA has not been able to pinpoint any significant point sources to date, but chlordane is used in most homes for termite control. The impact of the site on the Wolf River has decreased significantly over the years that EPA has studied this site. Studies indicate that the site's current impact on the Wolf River is below the EPA established water quality criteria.

COMMENT: A local resident questioned what level of protection would be required for workers excavating the material on the north side of the site, adjacent to the Wolf River, for burial in the middle of the site.

RESPONSE: EPA estimated that the material to be excavated would require level B or C personal protective equipment. The level would be determined prior to releasing the contract for bids. The level would determine the health and safety requirements specified in the design for remedial action.

COMMENT: A local resident questioned if EPA was aware that the State of Tennessee had issued a National Pollution Discharge Elimination System (NPDES) permit to a local factory allowing them to discharge water to the abandoned dredge pond.

RESPONSE: During the public meeting, EPA and the State of Tennessee Superfund Program agreed to check into this permit. Upon review, the State of Tennessee identified an industry located on Chelsea Street that has a NPDES permit for discharge of cooling water. The discharge enters a city drainage ditch which leads to the Workhouse Bayou Pumping Station and then to the Wolf River. Storm drainage from the north side of the plant enters the abandoned dredge pond through a culvert. Recently, state personnel observed an oily material in the ditch. The industry has installed an oil-water separator to control the oily material in the stormwater run-off. Since the stormwater is receiving treatment, the existing NPDES permit was modified to add another discharge point.

There has been no change in the amount of water entering the dredge pond (storm water only). The storm water is now receiving treatment (and being monitored) to prevent contaminants from entering the pond.

COMMENT: A local resident questioned if there were any provisions available to residents to help them understand the technical issues presented in the Proposed Plan Fact Sheet.

RESPONSE: EPA explained the Technical Assistance Grant Program and how residents and groups could apply for the grant. Information was provided in the package of handouts EPA prepared and distributed to those attending the meeting.

COMMENT: A local citizen wanted to know how many sampling points existed north of the site on the Wolf River.

RESPONSE: There was one well located north of the site on the other side of the Wolf River to demonstrate a groundwater upflow and discharge to the Wolf River consistent with the findings on the south side of the site. EPA was primarily concentrating on monitoring the site itself with minimal sampling on the north site of the Wolf River.

COMMENT: A local resident questioned the hydraulics of the site area; specifically the upward hydraulics on both sides of the Wolf River and the continuity of the underlying clay layer.

RESPONSE: Monitoring conducted by EPA and the United States Geological Survey (USGS) demonstrated that the clay layer was continuous from each side of the Wolf River. The aforementioned monitoring indicated that groundwater discharge was to the Wolf River.

COMMENT: A local resident questioned, if chosen as an alternative, how a barrier would be constructed since the landfill was permeable.

RESPONSE: The problem with the barrier would be digging through the waste itself in order to construct it. Hydraulic pumping was preferred over the barrier wall and would prevent discharge to the Wolf River.

COMMENT: A local resident questioned if a monitoring well was installed to the Memphis aquifer located 500-1000 feet below land surface and, if so, stated concern about contaminating the Memphis aquifer.

RESPONSE: Wells were not installed into the Memphis aquifer under the Supplemental RI but were installed under the Technical Action Group study.

COMMENT: A local resident questioned if severe pumping from some of the groundwater wells would cause groundwater in the surface aquifer to penetrate into the confined aquifer.

RESPONSE: There could be some areas in the overall larger Memphis vicinity where this would be possible, but not in the area of the site because of the existing clay layer.

COMMENT: A resident was concerned about the flooding of Wolf River. He raised the question of the Wolf River recharging the contaminated shallow aquifer during flood stages.

RESPONSE: EPA was concerned that during flood stages an extensive reversal flow could occur. EPA was also concerned that contamination concentrations measured in the background well were influenced by backflow caused by flood stages. There could be some backflow, but it would be a localized effect so when conditions returned to normal, the flood waters would return to the Wolf River and not affect property very far back on each bank.

COMMENT: A local citizen questioned if the elevated levels of chlordane found in background wells located on Birch Street originated from the site or other sources.

RESPONSE: It apparently originated from other sources; flood backflow from the Wolf River would not reach those wells.

COMMENT: A local citizen asked if EPA had conducted any studies to determine if contamination existed in the neighborhoods adjacent to the site and roadways leading to the site.

RESPONSE: In the early 1980's, Johns Hopkins University conducted a preliminary health study in the community. Around 1982, the Centers for Disease Control started working officially with EPA to deal with health issues relating to Superfund. Offsite contamination was found in the neighborhood. One hundred and ninety four people in the Hollywood area were studied. Results from these studies did not indicate elevated levels of contaminants that could be attributed to the site. Elevated levels of pesticides, not associated with the site, were found in people who consumed fish from Oxbow lake, the dredge lake and the Wolf River. No adverse health effects were found in the people studied.

COMMENT: A local resident questioned when the remedial alternative program would start.

RESPONSE: A typical Superfund site requires approximately one year to complete construction. Actual physical construction would not begin until the design work was completed, approved, signed off, and a contract was released for bids either by EPA or the PRPs. Actual construction would probably not start until approximately 1 1/2 years.

COMMENT: A local resident questioned if the contractor's work had to meet all applicable EPA cleanup standards.

RESPONSE: The contractor had to comply with EPA's cleanup standards no matter if EPA or the City of Memphis lets the contract. The Corps of Engineers would most likely oversee the contractor's work to ensure compliance.

COMMENT: A local resident questioned how much the site remediation would cost and who would pay for the remediation.

RESPONSE: The total cost, not including a contingency, was estimated at 8 million dollars. If the PRPs did not make a good faith offer to pay for the remediation, then EPA will spend public monies to implement the remedy.

COMMENT: A local resident questioned if the PRPs would be willing to pay for the site remediation.

RESPONSE: EPA anticipated that the PRPs would come forth with a good faith offer but would not know until negotiations were conducted.

COMMENT: A local resident questioned what the cost would be to revitalize the dump to the extent that it would be commercially useful property.

RESPONSE: This was discussed and concluded that to revitalize the dump into commercially useful property was not technically feasible for a site of this size. A commercial incinerator would have to be brought onsite to incinerate all

the waste and then stabilize or solidify the ash for burial in a RCRA-permitted landfill.

COMMENT: A local resident questioned who owned the site property.

RESPONSE: The site was private property. EPA had conducted a file search on the property and the property owners.

COMMENT: A local resident questioned if EPA had a list of PRPs, who the PRPs were and if he could obtain a copy of the list.

RESPONSE: EPA has a list of PRPs which is a continuously evolving list. To obtain a copy of the list, an individual would have to submit a Freedom of Information Act (FOIA) request to obtain the list. EPA explained that parties included on the list were potentially responsible and not necessarily the actual responsible parties. Therefore, the list is subject to additions or deletions at any point in time.

COMMENT: A local resident questioned how much input the PRPs had in selecting the cleanup remedy and expressed concern that the PRPs would select the least expensive alternative.

RESPONSE: EPA, not the PRPs, selected all alternatives for any site. The cleanup plan was non-negotiable; it was an independent EPA (Federal) and state decision.

COMMENT: A local resident questioned if a local organization could obtain a Technical Assistance Grant (TAG).

RESPONSE: Yes; if the group was the only local group applying for the TAG and met EPA's requirements.

IV. WRITTEN COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND EPA'S RESPONSE TO THESE COMMENTS

This section contains copies of the five letters received by EPA containing written comments. Each letter is followed by a copy of EPA's written response to the letter.

[illegible]

[illegible]

REMEDIAL BRANCH

Felicia Barnett
345 Courtland Street
Atlanta, GA [illegible]

WE, AREA RESIDENTS OF THE HOLLYWOOD LANDFILL, HAVE NOT BEEN ADEQUATELY REASSURED ABOUT THE SAFETY OF THE SOIL AND WATER IN OUR AREA. WE ARE NOTIFYING ALL THE "POTENTIALLY RESPONSIBLE PARTIES" FOR THE HAZARDOUS SUBSTANCES IN THE HOLLYWOOD LANDFILL THAT ACCEPTABLE ALTERNATIVES TO THE EXISTING SITE AS IS, MUST INCLUDE CONSIDERATION OF THE HEALTH, WELFARE, FEARS, AND DESIRES OF OUR NEIGHBORHOOD WHICH FOR YEARS HAS DIRECTLY SUFFERED THE POLLUTION AND SAFETY PROBLEMS ASSOCIATED WITH THE HOLLYWOOD LANDFILL. IN RESPONSE TO OUR PREDICAMENT WE ARE NOW ASKING YOU TO CONSIDER A BUY-OUT OF OUR PROPERTIES AND A RELOCATION OF OUR FAMILIES. WE DESIRE FURTHER CONTACT WITH THE POTENTIALLY RESPONSIBLE PARTIES AND THE LOCAL LEGISLATIVE BODIES CONCERNING OUR REQUEST.

NAME	ADDRESS
James L Smith Jr	
Wesley R Smith	2472 Heard
Roger B. Smith	2472 Heard
Rev. James Smith	2472 Heard
Dina Smith	1026 N Watkins #1
Marie Tuers	2658 Whitney
Bro Emily H Austin Sr	2115 Heard Rd
Rosie M. Anderson	2625 Holting Cir
Mrs. Glenda Lawrence	1554 Railton Rd.
Lou [illegible]	1554 Railton Rd.
[illegible]	2338 Rosebud
[illegible] Gooden	1608 Britton ST
Glenda J Gooden	1647 Davis ST
[illegible] Boder	3055 Bellevue #1304
[illegible]	1512 Boxwood 38108
[illegible]	38108

WE, AREA RESIDENTS OF THE HOLLYWOOD LANDFILL, HAVE NOT BEEN ADEQUATELY REASSURED ABOUT THE SAFETY OF THE SOIL AND WATER IN OUR AREA. WE ARE NOTIFYING ALL THE "POTENTIALLY RESPONSIBLE PARTIES" FOR THE HAZARDOUS SUBSTANCES IN THE HOLLYWOOD LANDFILL THAT ACCEPTABLE ALTERNATIVES TO THE EXISTING SITE AS IS, MUST INCLUDE CONSIDERATION OF THE HEALTH, WELFARE, FEARS, AND DESIRES OF OUR NEIGHBORHOOD WHICH FOR YEARS HAS DIRECTLY SUFFERED THE POLLUTION AND SAFETY PROBLEMS ASSOCIATED WITH THE HOLLYWOOD LANDFILL. IN RESPONSE TO OUR PREDICAMENT WE ARE NOW ASKING YOU TO CONSIDER A BUY-OUT OF OUR PROPERTIES AND A RELOCATION OF OUR FAMILIES. WE DESIRE FURTHER CONTACT WITH THE POTENTIALLY RESPONSIBLE PARTIES AND THE LOCAL LEGISLATIVE BODIES CONCERNING OUR REQUEST.

NAME	ADDRESS
Marian S. Wilburn	1605 N. Michelle Cir.
Peri Wilburn	"
Rochelle Linder	2896 Glasgow 38127
Lawrence Linder	1524 Davis 38108
Nicole Hayden	3858 Wildleaf Dr 38116
Ladie Jay	2625 Woodcliff Dr #1 38112
Rita Boyd	1782 Eldridge
Gertha M. Pope	2199 Eldridge Ave
Addie M. Johnson	2185 Hunter Ave
[illegible] Russell	1298 No. Willett St
Porter L. Lamar	1427 Austin St
[illegible] Hall	1958 Chelsea Ave
Rena Davis	2480 Heard Ave Memphis Tenn
[illegible] Davis	2480 " "
W.T. Davis	2480 Heard
Carol Whitney	1488 Leland St. 38[illegible]5

WE, AREA: RESIDENTS OF THE HOLLYWOOD LANDFILL, HAVE NOT BEEN ADEQUATELY REASSURED ABOUT THE SAFETY OF THE SOIL AND WATER IN OUR AREA. WE ARE NOTIFYING ALL THE "POTENTIALLY RESPONSIBLE PARTIES" FOR THE HAZARDOUS SUBSTANCES IN THE HOLLYWOOD LANDFILL THAT ACCEPTABLE ALTERNATIVES TO THE EXISTING SITE AS IS, MUST INCLUDE CONSIDERATION OF THE HEALTH, WELFARE, FEARS, AND DESIRES OF OUR NEIGHBORHOOD WHICH FOR YEARS HAS DIRECTLY SUFFERED THE POLLUTION AND SAFETY PROBLEMS ASSOCIATED WITH THE HOLLYWOOD LANDFILL. IN RESPONSE TO OUR PREDICAMENT WE ARE NOW ASKING YOU TO CONSIDER A BUY-OUT OF OUR PROPERTIES AND A RELOCATION OF OUR FAMILIES. WE DESIRE FURTHER CONTACT WITH THE POTENTIALLY RESPONSIBLE PARTIES AND THE LOCAL LEGISLATIVE BODIES CONCERNING OUR REQUEST.

NAME	ADDRESS	
Bertha Mines	2508 Heard	38108
Debra Jackson	2508 Heard	38108
Linda Wallace	2508 Heard	38108
Teresa Shotwell	2508 Heard	38108
Lee Mines	2508 Heard	38108
Michael O Mines	2508 Heard	38108
Winfred Mines	2508 Heard	38108
Gloria Mines	2508 Heard	38108
Denise Dodson	1453 N. Hollywood	38108
Floyd Shotwell	3918 Native	
Reggie Lewis	3918 Native	
Freddie Coleman	3918 Native	
Vincent Mines	1453 N. Hollywood	38108
Clyde Jackson	4700 Edgewood	
Demitra Clark	3816 New Allen Rd.	
Damion Clark	3816 New Allen Rd.	

WE, AREA: RESIDENTS OF THE HOLLYWOOD LANDFILL, HAVE NOT BEEN ADEQUATELY REASSURED ABOUT THE SAFETY OF THE SOIL AND WATER IN OUR AREA. WE ARE NOTIFYING ALL THE "POTENTIALLY RESPONSIBLE PARTIES" FOR THE HAZARDOUS SUBSTANCES IN THE HOLLYWOOD LANDFILL THAT ACCEPTABLE ALTERNATIVES TO THE EXISTING SITE AS IS, MUST INCLUDE CONSIDERATION OF THE HEALTH, WELFARE, FEARS, AND DESIRES OF OUR NEIGHBORHOOD WHICH FOR YEARS HAS DIRECTLY SUFFERED THE POLLUTION AND SAFETY PROBLEMS ASSOCIATED WITH THE HOLLYWOOD LANDFILL. IN RESPONSE TO OUR PREDICAMENT WE ARE NOW ASKING YOU TO CONSIDER A BUY-OUT OF OUR PROPERTIES AND A RELOCATION OF OUR FAMILIES. WE DESIRE FURTHER CONTACT WITH THE POTENTIALLY RESPONSIBLE PARTIES AND THE LOCAL LEGISLATIVE BODIES CONCERNING OUR REQUEST.

NAME	ADDRESS
Delois Dickerson	851 Cypress Dr.
Robert Dickerson	851 Cypress Dr.
Mr. + Mrs. Walter	2512 Heard Ave
[illegible] Jackson	2502 Harwood Ave.
Mancherelle Jackson	2502 Harwood Ave
Lee M. Dale	2520 Heard Ave
Ruby Sum	2524 Heard
Mrs Annie Chatman	2525 Heard ave
Mrs Betty Richard	2517 Heard
[illegible] Richard	2517 Heard
[illegible] Richard	2517 Heard
[illegible] Tate	2512 Heard
Carolyn Tate	2512 Heard
Jackie Smith	2522 Heard
Andrew Smith	2522 Heard
Mr. Michael Jones	2496 Harwood

WE, AREA: RESIDENTS OF THE HOLLYWOOD LANDFILL, HAVE NOT BEEN ADEQUATELY REASSURED ABOUT THE SAFETY OF THE SOIL AND WATER IN OUR AREA. WE ARE NOTIFYING ALL THE "POTENTIALLY RESPONSIBLE PARTIES" FOR THE HAZARDOUS SUBSTANCES IN THE HOLLYWOOD LANDFILL THAT ACCEPTABLE ALTERNATIVES TO THE EXISTING SITE AS IS, MUST INCLUDE CONSIDERATION OF THE HEALTH, WELFARE, FEARS, AND DESIRES OF OUR NEIGHBORHOOD WHICH FOR YEARS HAS DIRECTLY SUFFERED THE POLLUTION AND SAFETY PROBLEMS ASSOCIATED WITH THE HOLLYWOOD LANDFILL. IN RESPONSE TO OUR PREDICAMENT WE ARE NOW ASKING YOU TO CONSIDER A BUY-OUT OF OUR PROPERTIES AND A RELOCATION OF OUR FAMILIES. WE DESIRE FURTHER CONTACT WITH THE POTENTIALLY RESPONSIBLE PARTIES AND THE LOCAL LEGISLATIVE BODIES CONCERNING OUR REQUEST.

NAME	ADDRESS
Lloyd Simpson Sr	1341 Snowden Ave
Charlotte Wheeler	2503 Kenner 38114
Leroy Wheeler Jr	2503 Kenner 38114
Leroy Wheeler Sr	
Kathleen Tate	1222 Empire Cove
Rose Sam Cudors	3167 Benjestown
[illegible] P. Reed	2032 Trinity Ave 38108
William B. Dyke	1370 Lembert
Billy Dawson	905 Utica 38108
[illegible] Melvin Porter	1471 Decatur 38107
Fannie Williams	2015 Clayton 38108
Angie Frank Brown	2203 Clayton 38108
Shuldine Murphy	2633 Marble 380[illegible]
Odessa Brooks	2139 Stovall Ave 38108
Florine Hayden	3858 Wadlee Dr 3[illegible]
Alice Hayden	9424 Davis St

WE, AREA RESIDENTS OF THE HOLLYWOOD LANDFILL, HAVE NOT BEEN ADEQUATELY REASSURED ABOUT THE SAFETY OF THE SOIL AND WATER IN OUR AREA. WE ARE NOTIFYING ALL THE "POTENTIALLY RESPONSIBLE PARTIES" FOR THE HAZARDOUS SUBSTANCES IN THE HOLLYWOOD LANDFILL THAT ACCEPTABLE ALTERNATIVES TO THE EXISTING SITE AS IS, MUST INCLUDE CONSIDERATION OF THE HEALTH, WELFARE, FEARS, AND DESIRES OF OUR NEIGHBORHOOD WHICH FOR YEARS HAS DIRECTLY SUFFERED THE POLLUTION AND SAFETY PROBLEMS ASSOCIATED WITH THE HOLLYWOOD LANDFILL. IN RESPONSE TO OUR PREDICAMENT WE ARE NOW ASKING YOU TO CONSIDER A BUY-OUT OF OUR PROPERTIES AND A RELOCATION OF OUR FAMILIES. WE DESIRE FURTHER CONTACT WITH THE POTENTIALLY RESPONSIBLE PARTIES AND THE LOCAL LEGISLATIVE BODIES CONCERNING OUR REQUEST.

NAME	ADDRESS
Roy L. Kent	446 Lorraine 38109
[illegible]	2[illegible] [illegible] #12 Memphis 38[illegible]
Renee Brown	446 Lorraine 38109
Bernadette Williams	2215 Clayton 38108
Johnnie Mae Avery	2215 Clayton 38108
Lydia Scivera	1554 Bailton 38111
[illegible] Mercutto	758 E Holly 38106
Ford Avery Sr	1049 University 38108
Pamela Nelson	5109 Holbrook 38116
[illegible] Nelson	" " "
[illegible] Gardner	1964 Nebraska 38108
[illegible] Flora	2658 Whitney
[illegible] Hayden	3858 Wildwood 38114
Jackie Gray	2522 Hero
Lois Parham	1424 Tunica 38108
Marie Owens	2658 Whitney

WE, AREA RESIDENTS OF THE HOLLYWOOD LANDFILL, HAVE NOT BEEN ADEQUATELY REASSURED ABOUT THE SAFETY OF THE SOIL AND WATER IN OUR AREA. WE ARE NOTIFYING ALL THE "POTENTIALLY RESPONSIBLE PARTIES" FOR THE HAZARDOUS SUBSTANCES IN THE HOLLYWOOD LANDFILL THAT ACCEPTABLE ALTERNATIVES TO THE EXISTING SITE AS IS, MUST INCLUDE CONSIDERATION OF THE HEALTH, WELFARE, FEARS, AND DESIRES OF OUR NEIGHBORHOOD WHICH FOR YEARS HAS DIRECTLY SUFFERED THE POLLUTION AND SAFETY PROBLEMS ASSOCIATED WITH THE HOLLYWOOD LANDFILL. IN RESPONSE TO OUR PREDICAMENT WE ARE NOW ASKING YOU TO CONSIDER A BUY-OUT OF OUR PROPERTIES AND A RELOCATION OF OUR FAMILIES. WE DESIRE FURTHER CONTACT WITH THE POTENTIALLY RESPONSIBLE PARTIES AND THE LOCAL LEGISLATIVE BODIES CONCERNING OUR REQUEST.

NAME	ADDRESS
Sarah Smith	2492 Heard
Sabrina Jones	2492 Heard
James Smith	2492 Heard
Mary E. Gamble	2496 Heard Ave.
Fred H. Gamble Sr.	2496 Heard Ave.
Debra Blund	2500 Heard Ave
Barbara Barnes	2500 Heard Ave
Mr. & Mrs. Freddie Durham Sr.	2504 Heard

YELLOW

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

AUG 27 1990

Ms. Rosie B. Smith
2472 Heard Avenue
Memphis, TN 38108

Dear Ms. Smith:

Thank you for notifying EPA of your concerns about the North Hollywood Dump NPL site in Memphis, Tennessee. I have forwarded your petition to the State of Tennesse and Memphis City Councilman Shepperson A. Wilbun.

Based on studies of North Hollywood performed by different agencies, EPA has proposed a final remediation for the site that will remove the few health risks that have been identified. Since this remediation should remove the final health risks associated with the site, EPA is not presently considering the permanent relocation of area residents; however, as stated before, local representatives have been notified of your concern.

Please find enclosed a letter sent to Councilman Wilbun addressing specific health concerns at North Hollywood which I hope will address some of your concerns as well.

Please contact me at (404) 347-7791, should you have any additional questions.

Sincerely,

Felicia Barnett

Felicia Barnett
Remedial Project Manager
KY/TN Section, NSRB

Enclosure

cc: Richard Holland, State of Tennessee

City of Memphis
TENNESSEE

SHEPPERSON A. WILBUN, JR.
Councilman · District 7
CITY COUNCIL

August 3, 1990

Felicia Barnett
Remedial Project Manager
U.S. EPA Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Dear Ms. Barnett:

I share with my constituents from North Memphis a growing concern over EPA's plans for the North Hollywood Dump Site. It is the perception of many area residents that no one is genuinely concerned for their health, well being, and property values. I am deeply disturbed by the possibility that EPA's plans may not fully weigh the plight of those who live, and have lived for years, with the daily realities of this landfill.

Specifically, I have questions about the surface soil and the Health Department's study: 1) A mixed message is sent to area residents when they are told that there are "high" concentrations of harmful chemicals in their yards, yet there is no health threat to them. I cannot get reassurances about the sub-surface soil. If the groundwater under the site is contaminated with chlordane, heptachlor, arsenic, lead, etc., what is the status of the soil between the groundwater and the surface soil? Is working in a garden or eating from a garden as dangerous as eating fish from the Wolf River where the groundwater discharges? 2) Were the results of the Health Department's study explained to area residents? What is the health status of children, the elderly, and the sick if the "no health threat" report is based on the effects of these chemicals on adults? I have other similar questions.

I have pledged my support to the residents who live near the landfill. Given that the present plan basically calls only for extra dirt to be used as cover, we seek the certainty that there are no future, present, or residual health hazards to the community from the site. We also seek equitable and just treatment for area residents, including the consideration of a buy-out of their properties and relocation of their families.

Sincerely,

Shep Wilbun

Shep Wilbun

cc: Mr. R.J. Hanson

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET NE
ATLANTA GEORGIA 30365

YELLOW

AUG 23 1990

Councilman Shepperson A. Wilbun, Jr.
City Council
City of Memphis
Suite 514
125 N. Mid-America Mall
Memphis, TN 38103-2086

Dear Mr. Wilbun:

This letter is in response to your letter of August 3, 1990, concerning the North Hollywood Dump Proposed Plan for site remediation. These responses to your request for information will also be included in EPA's final Record of Decision document for this site.

EPA regrets that you and possibly some of the residents in the area of North Hollywood perceive a lack of concern over their health and well being. EPA is deeply concerned about the public health and environment around the North Hollywood NPL site. EPA has been involved with extensive studies of the area including the Memphis and Shelby County Health Department (MSCHD) study (please find enclosed that you mentioned in your letter and a Remedial Investigation/Feasibility Study (RI/FS) performed under a Commissioner's Order from the State of Tennessee. All of these reports and additional data on North Hollywood are available in the Memphis-Shelby County Public Library located at 1850 Peabody Avenue in Memphis, Tennessee. On March 26 and 27, EPA representatives conducted a door to door survey in the nearby community requesting names for our mailing list and interviewing around twenty residents about their concerns. EPA has also requested public comments on its Proposed Plan for the North Hollywood site through two notices in the Memphis Commercial Appeal, facts sheets that were mailed to local residents and a public meeting that was held on June 28, 1990. As of this date, EPA has not received specific comments on the plan except from persons at the public meeting.

Your letter asks questions concerning the May 12, 1988 Health Department Study performed by Memphis-Shelby County and the Centers for Disease Control (CDC). This study addresses effects of the dump on persons near the site up to the date of the study. Very specific questions about the study should be addressed to the Health Department or the CDC. The public health advisor who works with us here at EPA Region 4 has already requested some of the medical/toxicological staff who were involved in the study to respond to you regarding your health related questions. However, I hope the following will respond to the general questions in your letter. Please note that EPA did not base its selection of a remedy for North Hollywood on the Health Department Study, but used all of the information and studies performed on the site.

1) A mixed message is sent to area residents when they are told that there are "high" concentrations of harmful chemicals in their yards, yet there is no health threat to them.

The Health Department Study does not state that the levels of dump contaminants in the surrounding neighbor are "high". The report states that the levels are "higher" or elevated above levels that were found in a comparison area. Although elevated higher than levels in another similar community in the area, these contaminant levels are not high enough to cause health concerns as indicated by the blood tests run by the Health Department and additional long-term risk calculations made for the site during the RI/FS study. The long term risks for the site are calculated in the Health Assessment Section of the RI report. These calculations were based on the both children and adult exposures over a lifetime of exposure using conservative assumptions such as continual exposure to the highest level of off site soil contamination found instead of an average of the contamination found in the nearby residential area. These calculations indicated that long term risks from contact with off-site soils are within acceptable risk ranges.

2) I cannot get reassurances about sub-surface soil. If the groundwater under the site is contaminated with chlorodane, heptachlor, arsenic, lead, etc., what is the status of the soil between the groundwater and the surface soil? Is working in a garden or eating from a garden as dangerous as eating fish out of the Wolf River, where the groundwater discharges?

As stated previously the risks associated with long term exposure to off-site soils were found to be within acceptable risk ranges. The Health Department study also showed no adverse effects from the consumption of vegetables taken from gardens in the area. It should be noted that the contaminated groundwater that you refer to is beneath the site and flows into the Wolf River, not into the residential area.

Groundwater contaminant levels in the residential area are generally much lower than those detected beneath the dump.

3) Were the results of the Health Department's study explained to the area residents? What is the health status of children, the elderly and the sick if the "no health threat" report is based on the effects of these chemicals on adults?

The MSCHD and the CDC held a meeting to discuss the study with local residents at the Shannon School on June 30, 1988. Also as previously stated, EPA's evaluation of the site risks was based on additional risk studies besides the Health Department's. These risks were calculated using possible exposures to children.

MEMPHIS AND SHELBY COUNTY
HEALTH DEPARTMENT

RICHARD SWIGGART
Director

SHERMAN KAHN, M.D.
Health Officer

RICHARD C HACKETT
Mayor, Memphis

WILLIAM N MORRIS JR
Mayor, Shelby County

August 22, 1990

CERTIFIED MAIL # P-104 160 706

Ms. Felicia Barnett
Remedial Project Manager
U.S. EPA Region IV
345 Courtland Street, N.E.
Atlanta, GA 30365

Dear Ms. Barnett:

Let me take this opportunity to thank you for coming to Memphis and addressing our Groundwater Quality Control Board for Shelby County regarding the North Hollywood Dump Site and the proposed plan for the cleanup of said site.

The Groundwater Quality Control Board is in agreement with EPA's current proposal, but did have some long-range concerns regarding the contamination levels that would remain in the shallow groundwater. The Board's concern was over the proposed long-range use of the site which might disturb the artificial and/or the natural barriers that currently prevent the shallow groundwater from entering the Memphis sands from which this area draws its drinking water. You did mention that restrictions would be recorded in the titles of current property owners. However, the Board is concerned about the extent of the restriction and the length of time in which they would remain in effect. We, therefore, would appreciate knowing more about the nature of the restrictions and how they would be handled.

Once again thank you for the very informative update, and we look forward to working with you in the future.

Sincerely,

W. S. Crawford

W.S. Crawford, Chairman
Groundwater Quality Control Board

WSC:HK:br

CC: Groundwater Quality Control Board Members
Richard Holland

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET N.E.
ATLANTA GEORGIA 30365

AUG 2 0 1990

Mr. W. S. Crawford
Chairman, Groundwater Quality Control Board
Memphis and Shelby County Health Department
814 Jefferson Avenue
Memphis, Tennessee 38105

Dear Mr. Crawford:

I wish to thank you for the opportunity to address the MSCHD Groundwater Quality Board concerning EPA's proposed remedy for the North Hollywood Dump.

In reference to the concern expressed in your letter of August 22, 1990, EPA would welcome the MSCHD Groundwater Quality Board's comments on the final deed restrictions placed on the North Hollywood Dump to prevent contamination from entering the Memphis Sands Aquifer. Specific deed restrictions for the North Hollywood site will be established by EPA's legal staff during the Remedial Design/Remedial Action (RD/RA) phase of the remedy. At that time, EPA can notify you of the restrictions and review your comments on them prior to incorporating the restrictions on the land deeds.

Please contact me at (404) 347-7791 to let me know if you would like to be notified directly or through the State of Tennessee Superfund program.

Sincerely,

Felicia Barnett

Felicia Barnett
Remedial Project Manager
KY/TN Section, NSRB

cc: Deborah Espy, ORC
Richard Holland, State of Tennessee

MEMPHIS ENVIRONMENTAL CENTER, INC.

[illegible] Avenue [illegible]
Memphis, Tenn[illegible]
Phone [illegible] Fax [illegible]

August 23, 1990

CERTIFIED MAIL --
RETURN RECEIPT REQUESTED

Ms. Felicia Barnett
United States Environmental
Protection Agency, Superfund Branch
345 Courtland Street, NE
Atlanta, Georgia 30365

Re: **Hollywood Dump**
Public Hearing Comments

Dear Ms. Barnett:

The following are Velsicol Chemical Corporation's comments regarding the Proposed Remediation Plan for the North Hollywood Dump Site. Please see that they are entered into the Administrative Record.

- Velsicol generally supports the agency's proposed remedial plan as outlined in the June 1990 Plan Fact Sheet. This plan in essence would close the North Hollywood Dump in a manner consistent with that of any other sanitary municipal landfill. The available information, including investigation to date establish that this type of remedy will fully and adequately protect human health and environment. Velsicol believes this is an appropriate and reasonable remedial measure that will satisfy both the environmental as well as the regulatory requirements of this site.

- There are other contaminants found at the site other than just the pesticides and metals mentioned in the Public Hearing. These contaminants are identified in the Supplemental RI/FS, April, 1990. Any sound remediation plan must take into account the world of contaminants found at the site and structure any remedial program to address the requirements of the site as a whole. Velsicol believes that the agency's currently proposed remedy meets this requirement of an overall remedial program for the site.

- Velsicol supports the findings and conclusions expressed in the Public Hearing that the site poses little current and future risk to the environment (i.e. Wolf River) and that the planned additional remediation actions (i.e. additional cover and erosion control) will increase the overall security of the site and help maintain that security into the future.

- Velsicol Chemical Corporation, City of Memphis and Buckman Laboratories have worked cooperatively with both the State of Tennessee and the USEPA to investigate and resolve any environmental problems the North Hollywood Dump Site may pose. Up to this point in time these PRPs are all that have come forward to take responsibility for this site. On March 5, 1990, the USEPA notified some 20 other PRPs of their potential liability. Velsicol supports and will assist in any way possible the agency's renewed efforts to enlist the help of these additional PRPs.

Sincerely,

George R. Harvell, III
Manager, Environmental Services

GRH/dkd

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET NE
ATLANTA GEORGIA 30365

AUG 29 1990

Mr. George Harvell
Manager, Environmental Services
Memphis Environmental Center
2603 Corporate Avenue
Suite 100
Memphis, Tennessee 38132

Dear Mr. Harvell:

Thank you for your statements concerning the Remedial Investigation/Feasibility Study (RI/FS) and selected remedy for the North Hollywood Dump NPL site in Memphis, Tennessee. Your comments will be incorporated into the Responsiveness Summary of the Record of Decision (ROD) and the Administrative Record for the site.

Please contact me at (404) 347-7791 if you have any questions.

Sincerely,

Felicia Barnett

Felicia Barnett
Remedial Project Manager
KY/TN Section, NSRB

cc: Richard Holland, State of Tennessee

LAW OFFICES
HEISKELL, DONELSON, BEARMAN, ADAMS, WILLIAMS & KIRSCH
A PROFESSIONAL CORPORATION
[illegible]
[illegible]
MEMPHIS, TENNESSEE 38103
[illegible]

August 24, 1990

Ms. Felicia Barnett
Remedial Project Manager
U.S. EPA, Region IV
345 Courtland St., N.E.
Atlanta, Georgia 30365

RE: North Hollywood Dump Supplemental Remedial Investigation Final Report, July 1989

Dear Ms. Barnett:

This letter is written for the purpose of commenting on the above-referenced report on behalf of The Procter & Gamble Cellulose Company. After a thorough review of the Supplemental Remedial Investigation Final Report and other documents which show the levels of copper which have been detected at the North Hollywood Dump, we have been advised by our environmental consultants that there are no health or environmental risks associated with the presence of this substance. The data in the Administrative Record appears to wholly support this conclusion. Furthermore, it is our understanding from conversations with EPA technical personnel that the agency's opinion is in accord.

Additionally, although copper is noted as a "major contaminant" in the Superfund Proposed Plan Fact Sheet and as a metal of concern and indicator chemical in the Executive Summary for the Supplemental Remedial Investigation Final Report, the analysis of the data has revealed that no action is necessary in response to copper because copper presents no environmental or health risk at the Hollywood Dump site.

We would ask that the results of the technical review as outlined in the report of Dames & Moore, and the analysis used therein regarding the lack of any problems related to copper be included in the Administrative Record in this matter.

Very truly yours,

Jon P. McCalla

Leo Bearman, Jr.
Jon P. McCalla
M. Scott Willhite
Attorneys for The Procter & Gamble Cellulose Company

MSW/sg/5487
cc: David E. Ross, Esq.
Sharon E. Abrams, Esq.

DAMES & MOORE

August 27, 1990

Ms. Felicia Barnett
Remedial Project Manager
U.S. EPA Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Re: North Hollywood Dump
Supplemental Remedial Investigation
Final Report, July 1989

Dear Ms. Barnett:

At the request of The Procter & Gamble Cellulose Company, Dames & Moore reviewed the Supplemental Remedial Investigation Final Report, dated July 1989 (Supplemental RI), that was prepared by Conestoga-Rovers & Associates. The focus of Dames & Moore's review of that report was on the effect of copper disposal at the site. Our review indicates that copper contamination is not a concern in any of the exposure routes for the site, as outlined below:

Ground water - Copper concentrations in downgradient well samples are similar to upgradient wells (see page 147 of Supplemental RI and Appendices L and M).

Surface water - Comparison of copper concentrations in surface water samples downstream and upstream indicate that the stream water is not impacted by copper concentrations in leachate or runoff from the site (see Tables 4.9 and 4.12 and page 152 of the Supplemental RI).

Stream sediment - There was no variation in copper concentrations in the sediment samples taken downstream and upstream of the site (see page 154 of the Supplemental RI and Appendix N).

Surface soil and cap - The concentrations of copper in the site soils and the cap placed over the site are within the range expected for alluvial soils (see page 160 and Tables 4.16 and 4.17).

Therefore, disposal of copper at the North Hollywood Dump does not appear to present a health or environmental risk to the surrounding area. Based on the information provided in the Supplemental RI, no response appears necessary due to the presence of copper.

Respectfully yours,

DAMES & MOORE

Jane P. MacGregor

Jane P. MacGregor
Regulatory Analyst

William G. Smith, PG
Senior Geologist/Associate

PB87-226739

United States
Environmental Protection
Agency

Office of Water
Regulations and Standards
Washington, DC 20460

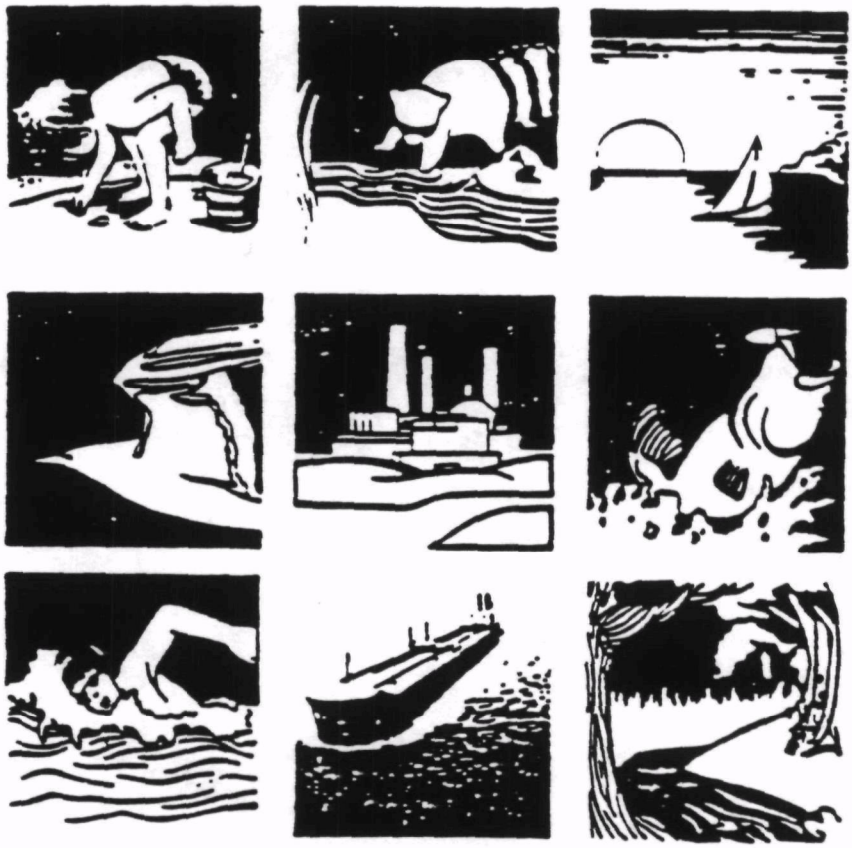
May 1, 1986

EPA

Water

EPA 440/5-86-001

QUALITY CRITERIA for WATER 1986



REPRODUCED BY
U.S. DEPARTMENT OF COMMERCE
NATIONAL TECHNICAL
INFORMATION SERVICE
SPRINGFIELD, VA 22161

*COPPER

ACU...IC LIFE SUMMARY:

Acute toxicity data are available for species in 41 genera of freshwater animals. At a hardness of 50 mg/L the genera range in sensitivity from 16.74 ug/L for Ptychocheilus to 10,240 ug/L for Acroneuria. Data for eight species indicate that acute toxicity decreases as hardness increases. Additional data for several species indicate that toxicity also decreases with increases in alkalinity and total organic carbon.

Chronic values are available for 15 freshwater species and range from 3.873 ug/L for brook trout to 60.36 ug/L for northern pike. Fish and invertebrate species seem to be about equally sensitive to the chronic toxicity of copper.

Toxicity tests have been conducted on copper with a wide range of freshwater plants and the sensitivities are similar to those of animals. Complexing effects of the test media and a lack of good analytical data make interpretation and application of these results difficult. Protection of animal species, however, appears to offer adequate protection of plants. Copper does not appear to bioconcentrate very much in the edible portion of freshwater aquatic species.

The acute sensitivities of saltwater animals to copper range from 5.8 ug/L for the blue mussel to 600 ug/L for the green crab. A chronic life-cycle test has been conducted with a mysid, and adverse effects were observed at 77 ug/L but not at 38 ug/L, w ch resulted in an acute-chronic ratio of 3.346. Several

*...dicates suspended, canceled or restricted by U.S.EPA Office of Pesticides and Toxic Substances

saltwater algal species have been tested, and effects were observed between 5 and 100 ug/L. Oysters can bioaccumulate copper up to 28,200 times, and become bluish-green, apparently without significant mortality. In long-term exposures, the bay scallop was killed at 5 ug/L.

NATIONAL CRITERIA:

The procedures described in the Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Uses indicate that, except possibly where a locally important species is very sensitive, freshwater aquatic organisms and their uses should not be affected unacceptably if the 4-day average concentration (in ug/L) of copper does not exceed the numerical value given by $e^{(0.8545[\ln(hardness)]-1.465)}$ more than once every 3 years on the average and if the 1-hour average concentration (in ug/L) does not exceed the numerical value given by $e^{(0.9422[\ln(hardness)]-1.464)}$ more than once every 3 years on the average. For example, at hardnesses of 50, 100, and 200 mg/L as $CaCO_3$ the 4-day average concentrations of copper are 6.5, 12, and 21 ug/L, respectively, and the 1-hour average concentrations are 9.2, 18, and 34 ug/L.

The procedures described in the Guidelines indicate that, except possibly where a locally important species is very sensitive, saltwater aquatic organisms and their uses should not be affected unacceptably if the 1-hour average concentration of copper does not exceed 2.9 ug/L more than once every 3 years on the average.

EPA believes that a measurement such as "acid-soluble" would

ovide a more scientifically correct basis upon which to establish criteria for metals. The criteria were developed on this basis. However, at this time, no EPA approved methods for such a measurement are available to implement the criteria through the regulatory programs of the Agency and the States. The Agency is considering development and approval of methods for a measurement such as acid-soluble. Until available, however, EPA recommends applying the criteria using the total recoverable method. This has two impacts: (1) certain species of some metals cannot be analyzed directly because the total recoverable method does not distinguish between individual oxidation states, and (2) these criteria may be overly protective when based on the total recoverable method.

The recommended exceedence frequency of 3 years is the Agency's best scientific judgment of the average amount of time it will take an unstressed system to recover from a pollution event in which exposure to copper exceeds the criterion. A stressed system, for example, one in which several outfalls occur in a limited area, would be expected to require more time for recovery. The resilience of ecosystems and their ability to recover differ greatly, however, and site-specific criteria may be established if adequate justification is provided.

The use of criteria in developing waste treatment facilities requires the selection of an appropriate wasteload allocation model. Dynamic models are preferred for the application of these criteria. Limited data or other factors may make their use impractical, in which case one should rely on a steady-state model. The Agency recommends the interim use of 1Q5 or 1Q10 for

Criterion Maximum Concentration design flow and 7Q5 or 7Q10 for the Criterion Continuous Concentration (CCC) design flow in steady-state models for unstressed and stressed systems respectively. These matters are discussed in more detail in the Technical Support Document for Water Quality-Based Toxics Control (U.S. EPA, 1985).

HUMAN HEALTH CRITERIA:

Sufficient data is not available for copper to derive a level which would protect against the potential toxicity of this compound. Using available organoleptic data, for controlling undesirable taste and odor quality of ambient water, the estimated level is 1 mg/L. It should be recognized that organoleptic data as a basis for establishing a water quality criteria have limitations and have no demonstrated relationship to potential adverse human health effects.

(45 F.R. 79318 Nov. 28,1980) (50 F.R. 30784, July 29, 1985)
SEE APPENDIX A FOR METHODOLOGY

LEVELS OF COPPER DETECTED AT HOLLYWOOD DUMP

Maximum Posi e Detection

(Water Measured in Milligrams/ Liters or parts per Million)	Round 1	Round 2	Round 3	Round 4
Groundwater	.078[1]	.110[2,3]	.090[4]	.057[5]
Surface Water (Wolf River)[6]	.024	ND	ND	.006
Safe Drinking Water Standard[7]	1.00	1.00	1.00	1.00

---

1. Table. QA/QC Metals Analysis (mg/L) Round 1, Groundwater Samples, Supplemental RI/FS, North Hollywood Dump. Page 1 of 3 (Exhibit 1).

2. Table. QA/QC Metal Analysis (mg/L) Round 2, Groundwater Samples, Supplemental RI/FS, North Hollywood Dump. Page 2 of 5 (Exhibit 2).

3. Table. QA/QC Metal Analysis (mg/L) Round 2, Groundwater Samples, Supplemental RI/FS, North Hollywood Dump. Page _____ of 5. (Exhibit 3).

4. Table. Metal Analysis (mg/L) Round 3, Groundwater Samples, Supplemental RI/FS North Hollywood Dump. Page 1 of 2. (Exhibit 4).

5. Table. Metal Analysis (mg/L) Round 4, Groundwater Samples, Supplemental RI/FS, North Hollywood Dump. (Exhibit 5).

6. Table. Metals Analysis (mg/L) Wolf River Water, Supplemental RI/FS, North Hollywood Dump (Exhibit 6).

7. Hazardous Substance Guidelines. Tennessee Division of Solid Waste Management Superfund (Exhibit 7). C.F.R. § 141, et seq.

(Soil Measured in Milligrams Per Kilogram Unless Designated Otherwise)	Round 1	Round 2	Round 3	Round 4
Surface Soil	NA[8]*	71.9[10]	NA*	47.6[11]
Wolf River Sediment (ug/kg)[12]	NA	19.6	NA	NA
Safety Standard[13]	100.00	100.00	100.00	100.00

---

8. Table. Limits of Detection, Metals Analysis (mg/kg) Surface Soil Samples, Supplemental RI/FS, North Hollywood Dump. (Exhibit 8).

9. Table. Metal Analysis (mg/kg) Round 2, Surface Soil Samples, Supplemental RI/FS, North Hollywood Dump. (Exhibit 9).

10. Table. Metal Analysis (mg/kg) Round 2, Surface Soil Samples, Supplemental RI/FS, North Hollywood Dump. Page 2 of 2. (Exhibit 10).

11. Table. Metal Analysis (mg/kg) Round 4, Surface Soil Samples, Supplemental RI/FS, North Hollywood Dump. Page 1 of 2. (Exhibit 11).

12. Table. Metal Analysis (ug/kg) Round 2, Wolf River Sediment Samples, Supplemental RI/FS North Hollywood Dump. Page 1 of 1. (Exhibit 12).

13. See Footnote 7. (Exhibit 7).

TAB

QA/QC METALS ANALYSIS (mg/L)
ROUND 1, GROUNDWATER SAMPLES
SUPPLEMENTAL RI/FS, NORTH HOLLYWOOD DUMP

METAL NAME	OW1B	OW1B Lab Dup.	OW1C	OW1C Spike (% Rec.)	OW2A	OW2A Lab Dup.	OW2C	OW2C Lab Dup.	OW2C	OW3A	OW3A Spike (% Rec.)	OW5A	OW5A Spike (% Rec.)
SAMPLE NUM	2	2	3	3	4	4	5	5	5	7	7	12	12
COPPER	.040	NA	.049	NA	.069	.033	.060	NA	NA	.030	NA	.070	.070
BARIUM	.170	NA	.156	NA	.090	.101	.030	NA	NA	.606	NA	.179	.091
BERYLLIUM	ND	NA	ND	NA	ND	ND	ND	NA	NA	ND	NA	ND	.003
CHROMIUM	ND	NA	.029	NA	.025	.025	.026	NA	NA	.019	NA	.029	.073
CADMIUM	ND	NA	ND	NA	ND	ND	ND	NA	NA	ND	NA	ND	.073
STRONTIUM	.187	NA	.169	NA	.421	.435	.039	NA	NA	2.040	NA	.157	.152
ALUMINUM	2.630	NA	1.930	NA	1.260	1.370	1.200	NA	NA	7.310	NA	2.090	.082
ARSENIC	ND	NA	ND	NA	ND	NA	ND	NA	.093	.009	NA	ND	.060
NICKEL	.026	NA	.020	NA	.021	NA	ND	NA	.070	.004	NA	.012	.052
LEAD	.034	NA	.032	NA	.032	NA	.055	.057	.030	.060	NA	.019	.081
MERCURY	ND	ND	ND	NA	ND	NA	ND	NA	NA	ND	.002	ND	.056
ZINC	.086	NA	.056	NA	.050	NA	.062	NA	.095	.071	NA	.065	NA
VANADIUM	.020	NA	.016	NA	ND	NA	ND	NA	NA	.020	NA	.010	.132
CYANIDE	ND	NA	ND	.092	NA	NA	.0035	NA	NA	ND	NA	ND	.074

METAL NAME	OW6A	OW6A Field Dup.	OW7	OW7 Lab Dup.	OW12A	OW12A Spike (% Rec.)	OW13	OW13 Lab Dup.	OW14A	OW14A Spike (% Rec.)	OW14B	OW14B Field Dup.
SAMPLE NUM	14	48	16	16	22	22	24	24	25	47	26	51
COPPER	ND	.019	ND	NA	ND	.093	.025	.026	.033	.006	.059	.065
BARIUM	.356	.395	.540	NA	.275	.080	.793	.770	1.100	.079	1.930	1.934
BERYLLIUM	ND	ND	ND	NA	ND	.083	ND	ND	ND	.081	ND	ND
CHROMIUM	.033	.029	ND	NA	.014	.008	.056	.070	.050	.000	.004	.005
CADMIUM	ND	ND	ND	NA	ND	.005	ND	ND	ND	.000	.010	.010
STRONTIUM	.371	.304	.400	NA	.290	.049	.427	.411	.351	.057	.401	.396
ALUMINUM	2.340	2.030	2.510	NA	1.470	.004	2.040	3.310	2.220	.070	9.670	11.740
ARSENIC	ND	ND	.021	NA	.004	NA	ND	NA	.010	.095	.010	.010
NICKEL	ND	.002	.005	NA	.004	NA	.004	NA	.008	NA	.011	.045
LEAD	.034	.012	.030	NA	.015	NA	.006	NA	.016	.075	.059	.011
MERCURY	ND	ND	ND	ND	ND	NA	ND	ND	ND	.090	ND	ND
ZINC	ND	.010	.035	NA	.034	NA	.036	NA	.029	.116	.135	.201
VANADIUM	ND	ND	.024	NA	.015	NA	.010	NA	.020	.115	.024	.050
CYANIDE	ND	ND	ND	NA	ND	NA	ND	NA	ND	.074	ND	ND

TABLE

QA/QC METAL ANALYSIS (mg/L)
ROUND 2, GROUNDWATER SAMPLES
SUPPLEMENTAL RI/FS, NORTH HOLLYWOOD DUMP

METAL NAME	OW7	OW7 Lab Dup.	OW8	OW8 Filtered	OW8 Un-filtered	OW9D	OW9D Lab Dup.	OW10	OW10 Lab Dup.	OW10 Field Dup.	OW11	OW11 Lab Dup. 01	OW11 Lab Dup. 02
SAMPLE NUM	16	16	17	94	98	19	19	20	20	51	21	21	21
COPPER	.110	NA	NA	ND	ND	.020	NA	.000	.016	ND	.021	NA	NA
BARIUM	.505	NA	NA	.120	ND	.192	NA	.942	.933	1.113	.090	NA	NA
BERYLLIUM	ND	NA	NA	ND	ND	.0007	NA	ND	ND	.0006	ND	NA	NA
CHROMIUM	ND	NA	NA	ND	ND	ND	NA	ND	ND	ND	ND	NA	NA
CADMIUM	ND	NA	NA	ND	ND	ND	NA	ND	ND	ND	ND	NA	NA
STRONTIUM	.360	NA	NA	.150	ND	.153	NA	.500	.560	.615	.165	NA	NA
ALUMINUM	8.980	NA	NA	.590	ND	8.260	NA	3.277	2.793	3.060	4.556	NA	NA
ARSENIC	.003	NA	NA	.004	.002	.005	.008	.002	NA	ND	ND	NA	NA
NICKEL	.066	NA	NA	.012	ND	.043	.060	.013	NA	.012	.019	NA	NA
LEAD	.121	NA	NA	ND	.004	.014	.017	.008	NA	.004	.035	NA	NA
MERCURY	ND	ND	NA	.0004	ND	.0004	.0004	ND	NA	ND	ND	NA	NA
ZINC	.256	NA	NA	.013	.026	.762	NA	.043	.010	.009	.033	NA	NA
VANADIUM	.007	NA	NA	ND	ND	.006	.013	ND	NA	ND	ND	NA	NA
CYANIDE	.0012	NA	ND	NA	NA	ND	NA	ND	NA	.014	NA	.019	.010

METAL NAME	OW13	OW13 Lab Dup. 01	OW13 Lab Dup. 02	OW13 Matrix	OW13 Matrix Lab Dup. 01	OW13 Matrix Lab Dup. 02	OW14A	OW14A Field Dup.	OW14B	OW14B Filtered	OW14B Un-filtered	OW16A	OW16A Lab Dup.
SAMPLE NUM	24	24	24	46	46	46	25	52	26	95	99	27	27
COPPER	ND	NA	NA	.022	NA	NA	.016	.019	NA	ND	.068	.053	.057
BARIUM	.907	NA	NA	.931	NA	NA	1.500	1.420	NA	1.490	1.660	.303	.350
BERYLLIUM	ND	NA	NA	ND	NA	NA	ND	ND	NA	ND	.0007	ND	ND
CHROMIUM	ND	NA	NA	ND	NA	NA	ND	ND	NA	ND	ND	ND	ND
CADMIUM	ND	NA	NA	ND	NA	NA	ND	ND	NA	ND	ND	ND	ND
STRONTIUM	.510	NA	NA	.491	NA	NA	.540	.643	NA	.460	.427	.245	.232
ALUMINUM	2.491	NA	NA	2.220	NA	NA	1.392	1.932	NA	1.272	9.049	.992	.650
ARSENIC	ND	NA	NA	ND	NA	NA	ND	.002	NA	.002	ND	.069	NA
NICKEL	.003	NA	NA	.004	NA	NA	.018	.021	NA	.014	.018	.002	NA
LEAD	.007	NA	NA	.019	NA	NA	.025	.027	NA	ND	.025	.193	NA
MERCURY	ND	NA	NA	ND	NA	NA	ND	ND	NA	ND	ND	.0003	.0003
ZINC	.014	NA	NA	.018	NA	NA	.042	.024	NA	.009	.069	.095	.003
VANADIUM	ND	NA	NA	ND	NA	NA	ND	ND	NA	ND	ND	ND	ND
CYANIDE	ND	ND	.0037	.0027	.0025	.0028	NA	.150	.026	NA	NA	ND	NA

Exhibit

HLE
QA/QC METALS ANALYSIS (mg/L)
ROUND 2, GROUNDWATER SAMPLES
SUPPLEMENTAL RI/FS, NORTH HOLLYWOOD DUMP

METAL NAME	OW1C	OW1C Spike (Known)	OW1C Spike (Meas'd)	OW2A	OW2A Lab Dup.	OW2B	OW2B Spike (Known)	OW2A Spike (Meas'd)	OW2C	OW2C Lab Dup.	OW1A	OW1A Filtered Dup.	OW1A Filtered Dup.	OW1A Un-filtere
SAMPLE NUM	3	3	3	4	4	5	45	45	6	6	7	93	93	97
COPPER	.026	NA	NA	ND	NA	.066	.159	.160	.085	NA	ND	ND	NA	NA
BARIUM	.179	NA	NA	.076	NA	.301	.613	.639	.150	NA	.141	.111	NA	NA
BERYLLIUM	ND	NA	NA	ND	NA	.008	.013	.011	.002	NA	ND	ND	NA	NA
CHROMIUM	ND	NA	NA	ND	NA	.136	.263	.215	.096	NA	ND	ND	NA	NA
CADMIUM	ND	NA	NA	ND	NA	.021	.070	.007	.010	NA	ND	ND	NA	NA
STRONTIUM	.120	NA	NA	.323	NA	.052	.114	.246	.008	NA	.258	.320	NA	NA
ALUMINUM	1.105	NA	NA	.473	NA	50.040	1.640	3.710	27.090	NA	1.190	.059	NA	NA
ARSENIC	ND	NA	NA	ND	NA	.008	.021	.022	.003	NA	.004	ND	ND	NA
NICKEL	.105	NA	NA	.022	NA	.096	.049	.069	.116	NA	ND	ND	ND	NA
LEAD	.003	NA	NA	.005	NA	.007	.027	.026	.044	NA	ND	ND	ND	NA
MERCURY	ND	NA	NA	ND	ND	.0004	.0025	.0026	ND	ND	ND	ND	NA	NA
ZINC	.030	NA	NA	ND	NA	.117	.063	.115	.056	NA	.015	.003	NA	NA
VANADIUM	ND	NA	NA	ND	NA	.202	.170	.159	.252	NA	ND	ND	ND	NA
CYANIDE	ND	.150	.142	.0035	NA	ND	500.000	490.000	.0024	NA	NA	NA	NA	NA

METAL NAME	OW3C	OW3C Spike (Known)	OW3C Spike (Meas'd)	OW4A	OW4A Lab Dup. #1	OW4A Lab Dup. #2	OW5A	OW5A Spike (Known)	OW5A Spike (Meas'd)	OW5B	OW5B Lab Dup.	OW5B Field Dup.
SAMPLE NUM	9	49	49	10	10	10	12	12	12	13	13	50
COPPER	ND	.130	.119	.040	NA	NA	ND	NA	NA	.036	.036	ND
BARIUM	.051	.640	.630	ND	NA	NA	.105	NA	NA	.320	.300	.290
BERYLLIUM	ND	.013	.011	ND	NA	NA	ND	NA	NA	ND	ND	ND
CHROMIUM	ND	.255	.254	ND	NA	NA	ND	NA	NA	.056	.015	ND
CADMIUM	ND	.057	.064	ND	NA	NA	ND	NA	NA	ND	ND	ND
STRONTIUM	.101	.116	.210	.310	NA	NA	.324	NA	NA	.226	.211	.213
ALUMINUM	1.900	1.170	5.260	.091	NA	NA	2.020	NA	NA	3.640	3.290	2.060
ARSENIC	ND	.014	.016	ND	NA	NA	ND	NA	NA	ND	NA	ND
NICKEL	.021	.040	.070	.007	NA	NA	.021	NA	NA	.016	NA	.013
LEAD	ND	.029	.020	.016	NA	NA	.005	NA	NA	.006	NA	.011
MERCURY	ND	.063	.060	ND	NA	NA	ND	NA	NA	ND	NA	ND
ZINC	.044	.063	.093	.015	NA	NA	.017	NA	NA	.011	.014	.013
VANADIUM	ND	.177	.184	ND	NA	NA	ND	NA	NA	.079	NA	.050
CYANIDE	ND	500.000	520.000	ND	ND	ND	.0036	.150	.141	ND	NA	ND

Exhibit 3

TABLE
METAL ANALYSIS (mg/L)
ROUND 1, GROUNDWATER SAMPLES
SUPPLEMENTAL RI/FS, NORTH HOLLYWOOD DUMP

METAL NAME	OW1A	OW1B	OW1C	OW2A	OW2B	OW2C	OW3A	OW3B	OW3C	OW4A	OW4B	OW5A	OW5B
SAMPLE NUM	11	5	6	26	9	10	27	11	14	34	12	1	2
COMMENTS	M	L	F			L	L			FM		L	
ARSENIC	0.042	0.016	0.022	0.008	0.007	0.012	0.007	0.019	ND	ND	0.008	0.008	0.021
BERYLLIUM	ND	ND	ND	ND	0.0005	ND	ND	ND	ND	ND	0.0007	ND	0.0007
LEAD	0.044	0.015	0.055	ND	0.012	0.011	0.005	0.010	0.012	0.006	0.009	0.010	0.019
NICKEL	0.046	0.035	0.070	0.006	0.027	0.035	0.006	0.015	0.098	0.022	ND	0.032	0.011
ZINC	ND	0.042	0.101	0.038	0.636	0.043	0.043	0.438	0.476	0.028	0.051	0.350	0.435
STRONTIUM	0.556	0.146	0.143	0.706	0.189	0.058	0.214	0.213	0.107	0.481	0.127	0.293	0.236
COPPER	0.012	0.017	0.043	ND	ND	0.012	ND	ND	ND	ND	0.018	0.012	0.023
BARIUM	0.413	0.142	0.150	0.261	0.133	0.042	0.161	0.112	0.086	0.161	0.080	0.249	0.303
CHROMIUM	ND	ND	ND	ND	0.073	0.036	ND	0.041	0.039	0.036	0.060	0.041	0.062
CADMIUM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.044
ALUMINUM	3.440	1.56	1.22	0.910	7.02	7.07	1.14	0.04	10.09	0.716	11.54	7.12	13.2
MERCURY	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
VANADIUM	0.022	0.022	ND	ND	0.024	0.046	0.025	0.037	0.055	ND	0.015	ND	0.067
CYANIDE	ND	ND	ND	0.0057	ND	0.004	ND	ND	ND	ND	ND	0.003	ND

METAL NAME	OW6A	OW6B	OW7	OW8	OW9A	OW9B	OW10	OW11	OW12A	OW12B	OW13	OW14A	OW14B
SAMPLE NUM	3	4	20	30	36	37	38	39	18	21	31	60	61
COMMENTS		L		L				M	M	LF			
ARSENIC	0.009	0.005	0.014	0.009	0.007	0.013	0.008	0.036	0.014	0.007	0.019	0.018	0.024
BERYLLIUM	ND	ND	ND	0.0011	ND	ND	ND	ND	ND	0.0006	ND	ND	0.0021
LEAD	0.007	0.009	0.005	0.032	0.006	0.022	0.021	0.011	0.049	0.059	0.030	0.309	0.066
NICKEL	0.006	0.022	ND	0.008	0.006	0.021	0.009	0.007	0.005	0.033	0.007	0.009	0.049
ZINC	0.042	0.376	0.138	0.109	0.048	0.013	0.056	0.053	0.021	0.086	0.078	0.046	0.163
STRONTIUM	0.443	0.347	0.356	0.219	0.151	0.122	0.581	0.144	0.237	0.096	0.480	0.470	0.496
COPPER	0.011	0.015	0.034	0.028	ND	0.019	0.015	ND	0.022	0.049	0.038	0.003	0.090
BARIUM	0.344	0.424	0.527	0.476	0.141	0.070	0.905	ND	0.254	0.304	0.015	1.46	2.05
CHROMIUM	0.047	0.053	0.095	0.006	ND	0.078	0.048	0.015	ND	0.067	ND	ND	0.078
CADMIUM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ALUMINUM	6.25	6.58	3.17	12.6	1.30	2.45	1.80	1.04	1.773	11.31	1.80	1.60	19.8
MERCURY	ND	ND	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND
VANADIUM	0.047	0.027	0.035	ND	ND	0.033	0.026	0.046	0.029	0.016	0.023	0.030	0.101
CYANIDE	ND	0.0027	0.0022	ND	ND	ND	ND	ND	0.0026	0.0062	0.0025	ND	ND

[illegible]

METAL .SIS (mg/L)

ROUND 4, GROUNDWATER SAMPLES

SUPPLEMENTAL RI/FS, NORTH HOLLYWOOD DUMP

METAL NAME	OW1A	OW1B	OW1C	OW2A	OW2B	OW2C	OW3A	OW3B	OW3C	OW4A	OW4B	OW5A	OW5B
SAMPLE NUM	59	18	16	58	21	20	55	56	57	60	19	1	2
ARSENIC	.021	ND	ND	ND	ND	.015	ND	ND	.003	.006	.015	.003	.006
BERYLLIUM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
LEAD	.049	.008	.006	.007	.066	.060	.040	.032	.007	.101	.066	.017	.009
NICKEL	.017	.035	.046	.014	.012	.105	.007	.008	.017	.111	.022	.015	.007
ZINC	.039	.020	.063	.055	.004	.001	.061	.101	.006	.123	.071	.11	.051
STRONTIUM	.407	.135	.143	.996	.103	.066	.721	.20	.041	.292	.026	.251	.204
COPPER	.035	.030	.015	.053	.020	.042	.055	.031	.019	.055	ND	.020	.008
BARIUM	.309	.078	.164	.176	.007	.125	.272	.002	.037	.244	.020	.236	.220
CHROMIUM	.079	.090	.009	.029	.052	.176	.021	.068	.041	.159	ND	.041	.016
CADMIUM	.004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ALUMINUM	.203	.306	.500	.360	.576	27.4	.424	.212	1.170	10.6	1.040	17.1	2.410
MERCURY	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
VANADIUM	.016	.019	.015	.017	ND	.047	ND	.017	.017	.044	.092	.027	.020
CYANIDE	ND	.008	ND	.012	ND	ND	ND	ND	.002	ND	.007	ND	ND

METAL NAME	OW6A	OW6B	OW7	OW8	OW9A	OW9B	OW10	OW11	OW12A	OW12B	OW13	OW14A	OW14B
SAMPLE NUM	9	10	7	8	12	13	45	22	31	30	10	41	42
ARSENIC	ND	.005	.008	.050	ND	.004	ND	.002	.004	.004	.002	ND	.006
BERYLLIUM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
LEAD	.003	.072	.068	.046	.100	.146	.022	.104	.068	.030	.020	.054	.010
NICKEL	.009	.013	.010	.040	.010	.070	.012	.029	.005	.021	.003	.012	.015
ZINC	.053	.205	.201	.100	.056	.155	.116	.036	.090	.104	.044	.146	.066
STRONTIUM	.400	.946	.337	.162	.110	.161	.322	.117	.220	.001	.261	.230	.496
COPPER	.026	.020	.032	.057	.019	.032	.020	.017	.032	.040	.007	.019	.017
BARIUM	.377	.555	.367	.200	.001	.139	.547	.061	.210	.100	.160	.490	1.620
CHROMIUM	.026	.036	.067	.123	.025	.147	.070	.070	.029	.040	.013	.050	.001
CADMIUM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ALUMINUM	.775	3.92	1.770	3.02	.400	11.2	8.74	.489	.741	14.4	.071	1.01	4.42
MERCURY	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
VANADIUM	ND	.022	.016	.057	ND	.068	.046	ND	ND	.010	ND	.026	.027
CYANIDE	.002	ND	ND	ND	ND	ND	.003	ND	ND	ND	.005	.003	.002

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]				[illegible]				[illegible]				[illegible]			
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	52	53	54	55	56	[illegible]	56	57	[illegible]	46	48	49	25	26	27	28
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]					[illegible]		[illegible]				
[illegible]	0.024	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.004	0.004	0.005	0.006
[illegible]	0.024	0.025	0.023	0.029	0.032	0.031	0.034	0.029	ND	ND	ND	ND	0.029	0.029	0.027	0.022
[illegible]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
[illegible]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
[illegible]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
[illegible]	0.023	0.024	0.026	0.027	0.031	0.035	0.035	0.031	ND	ND	ND	ND	0.022	0.024	0.021	0.022
[illegible]	0.268	0.376	0.288	0.318	1.624	2.039	1.026	2.071	1.23	1.03	1.11	1.26	0.082	0.432	0.392	0.606
[illegible]	ND	ND	ND	ND	ND	0.003	0.003	0.001	0.004	ND	0.005	0.008	ND	ND	ND	0.001
[illegible]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.008	0.001	0.001	0.004	ND
[illegible]	ND	ND	ND	ND	0.002	0.002	0.002	0.002	0.004	0.005	0.006	0.008	0.002	0.001	0.001	0.001
[illegible]	ND	ND	ND	ND	ND	0.0006	0.0003	0.0004	ND	0.002	0.003	0.001	ND	ND	ND	ND
[illegible]	0.004	0.007	0.003	ND	0.026	0.017	0.015	0.017	0.006	ND	0.006	ND	0.011	0.023	0.028	0.017
[illegible]	ND	ND	ND	ND	ND	ND	ND	ND	0.023	0.022	0.021	0.027	ND	ND	ND	0.015
[illegible]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.002	0.005

[illegible]

Hazardous Substance Guidelines
Tennessee Division of Solid Waste Management - Superfund

Compound	Maximum limit, water ppm or mg/l	Maximum limit, soil ppm or mg/kg	Water Reference
Benzene	0.025	2.5	6
Ethylbenzene	1.4	140	1
Toluene	14.3	1430	1
Carbon tetrachloride	0.025	2.5	6
Chloroform	0.002	0.2	1
1,2-Dichloroethane	0.26	26	1
1,1-Dichloroethylene	0.35	35	6
Methylene chloride	0.15	15	2
Tetrachloroethylene	0.035	3.5	6
Trichloroethylene	0.26	26.0	6
1,1,1-Trichloroethane	1.0	100	6
Acetone	20	2,000	7
Ethylacetate	400	40,000	4
Xylenes	0.62	62	2
Methyl ethyl ketone	0.75	75	2
Methyl isobutyl ketone	100	10,000	4
Vinyl chloride	0.06	6.0	6
Naphthalene	0.025	2.0	1
Di-n-butyl phthalate	0.034	3.4	1
Pentachlorophenol	1.01	101	1
Phenols	0.2	10	3,8
Phenol	0.3	30	1,3
Copper	1	100	3
Zinc	5	500	3,8
Nickel	0.2	20	3,8
Mercury	0.002	0.2	3,8
Arsenic	0.05	5	3,8
Cadmium	0.01	1.0	3,8
Chromium	0.05	5	3,8
Silver	0.05	5	3,8
Lead	0.05	5	3,8
PAH's	0.000028	0.0028	1

Water limits, clarified by MED 8-28-84:
Nitrates (N)-10 ppm
Sulfates-250 ppm
phosphate - should be set below 50 ppm in water (gives renal damage in rats, is 10 times dietary, adequate nutritional level for rats)

References:

1. Federal Register, 45:231, Nov. 1980.
2. Long term SNARL
3. Interim Drinking Water Standard
   Dangerous Properties of Industrial Materials. N. Irving Sax
   10-day SNARL
4. Federal Register, 49:114, 24338, June 1984.
7. Flash point concentration.
8. E.P. Toxicity limit or suggested level (Phenol, cyanide, nickel)

Water Act as amended (42 U.S.C. 300f *et seq.*).

(b) "Contaminant" means any physical, chemical, biological, or radiological substance or matter in water.

(c) "Public water system" means a system for the provision to the public of piped water for human consumption, if such a system has at least fifteen service connections or regularly serves an average of at least twenty-five individuals daily at least 60 days out of the year. Such term includes (1) any collection, treatment, storage, and distribution facilities under control of the operator of such system and used primarily in connection with such system, and (2) any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system. A public water system is either a "community water system" or a "non-community water system."

(d) "State" means the agency of the State or Tribal government which has jurisdiction over public water systems. During any period when a State does not have responsibility pursuant to [illegible]ion 1443 of the Act, the term "State" means the Regional Administrator, U.S. Environmental Protection Agency.

(e) "Supplier of water" means any person who owns or operates a public water system.

(f) "Secondary maximum contaminant levels" means SMCLs which apply to public water systems and which, in the judgement of the Administrator, are requisite to protect the public welfare. The SMCL means the maximum permissible level of a contaminant in water which is delivered to the free flowing outlet of the ultimate user of public water system. Contaminants added to the water under circumstances controlled by the user, except those resulting from corrosion of piping and plumbing caused by water quality, are excluded from this definition.

[44 FR 42198, July 19, 1979, as amended at [illegible] FR 37412, Sept. 26, 1988]

The secondary maximum contaminant levels for public water systems are as follows:

Contaminant	Level
Chloride	250 mg/L
Color	15 color units
Copper	1 mg/L
Corrosivity	Noncorrosive
Fluoride	2.0 mg/L
Foaming agents	0.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Odor	3 threshold odor number
pH	6.5–8.5
Sulfate	250 mg/L
Total dissolved solids (TDS)	500 mg/L
Zinc	5 mg/L

These levels represent reasonable goals for drinking water quality. The States may establish higher or lower levels which may be appropriate dependent upon local conditions such as unavailability of alternate source waters or other compelling factors, provided that public health and welfare are not adversely affected.

[44 FR 42198, July 19, 1979, as amended at 51 FR 11412, Apr. 2, 1986]

§ 143.4 Monitoring.

(a) It is recommended that the parameters in these regulations should be monitored at intervals no less frequent than the monitoring performed for inorganic chemical contaminants listed in the National Interim Primary Drinking Water Regulations as applicable to community water systems. More frequent monitoring would be appropriate for specific parameters such as pH, color, odor or others under certain circumstances as directed by the State.

(b) Analyses conducted to determine compliance with § 143.3 should be made in accordance with the following methods:

(1) Chloride—Potentiometric Method, "Standard Methods for the Examination of Water and Wastewater," 14th Edition, p. 306.

(2) Color—Platinum-Cobalt Method, "Methods for Chemical Analysis of Water and Wastes," p. 36–38, EPA, Office of Technology Transfer, Wash-

EXHIBIT 7

TABLE
LIMITS OF DETECTION, METALS ANALYSIS (mg/kg)
SURFACE SOIL SAMPLES
SUPPLEMENTAL RI/FS, NORTH HOLLYWOOD DUMP

	ROUND 2	ROUND 4
COPPER	2.4	0.8
BARIUM	1.5	0.7
BERYLLIUM	0.102	0.8
CHROMIUM	2.34	1.4
CADMIUM	0.02	1.0
STRONTIUM	4.0	0.4
ALUMINUM	4.7	20.0
ARSENIC	0.4	1.1
NICKEL	1.1	5.0
LEAD	3.12	1.0
MERCURY	0.025	0.10
ZINC	3.4	1.0
VANADIUM	5.0	1.0

METAL ANALYSIS (mg/kg)
ROUND 2, SURFACE SOIL SAMPLES
SUPPLEMENTAL RI/FS, NORTH HOLLYWOOD DUMP

METAL NAME	AS1 0-6"	AS1 6-12"	AS2 0-6"	AS2 6-12"	AS3 0-6"	AS3 6-12"	AS4 0-6"	AS4 6-12"	AS5 0-6"	AS5 6-12"	AS6 0-6"	AS6 6-12"
COMMENTS					I.	I.			M			
ARSENIC	3.0	6.0	7.7	5.9	6.5	3.6	0.7	6.1	ND	0.9	4.0	12.6
BERYLLIUM	0.160	0.323	0.483	0.405	0.516	0.319	0.474	0.313	ND	ND	ND	0.310
LEAD	6.3	0.2	10.1	12.0	0.3	10.4	13.2	9.3	ND	1.0	5.2	0.1
NICKEL	2.1	5.9	1.6	7.0	20.0	1.2	0.0	5.2	ND	ND	4.0	9.7
ZINC	11.9	24.1	35.0	35.5	32.6	22.0	31.4	20.7	ND	ND	20.6	20.1
STRONTIUM	4.0	7.0	12.4	10.0	10.0	6.6	10.7	6.2	ND	ND	7.0	0.7
COPPER	4.7	10.6	15.5	16.1	15.3	7.6	14.2	0.1	ND	2.5	7.5	13.3
BARIUM	35.7	90.4	111	98.6	105	67.1	115	64.1	9.7	17.2	62.3	142
CHROMIUM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CADMIUM	0.05	0.03	0.14	0.08	0.007	0.03	0.07	0.10	0.04	0.07	0.009	0.16
ALUMINUM	21.2	5440	0.63	6.040	6.690	4290	6000	3690	154	212	4210	5220
MERCURY	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
VANADIUM	ND	10.0	40.4	ND	ND	ND	ND	ND	11.6	ND	ND	ND

METAL NAME	AS7 0-6"	AS7 6-12"	AS8 0-6"	AS8 6-12"	AS9 0-6"	AS9 6-12"	AS10 0-6"	AS10 6-12"	AS11 0-6"	AS11 6-12"	AS12 0-6"	AS12 6-12"
COMMENTS			LM	M	M	I.				I.	LM	LM
ARSENIC	9.2	2.6	0.4	0.9	2.3	2.6	0.9	7.9	6.1	12.4	3.1	0.9
BERYLLIU	0.405	0.240	0.040	ND	0.137	0.130	0.413	0.360	0.287	0.326	0.256	0.101
LEAD	10.4	6.1	1.6	3.6	7.0	ND	9.0	6.3	7.2	7.6	3.5	6.2
NICKEL	2.5	3.9	ND	ND	1.9	2.1	0.5	ND	0.0	7.5	6.6	7.1
ZINC	35.3	17.1	ND	4.0	12.2	11.1	40.3	20.4	27.6	27.0	25.3	21.9
STRONTIU	11.6	6.0	ND	ND	ND	ND	9.4	9.0	7.5	0.5	6.7	7.04
COPPER	12.1	0.1	2.9	ND	ND	ND	5.2	5.9	6.0	5.9	6.0	ND
BARIUM	101	56.3	6.4	24.9	35.6	33.0	99.0	94.0	141	153	122	00
CHROMIUM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.11
CADMIUM	0.26	0.00	ND	0.00	0.00	0.06	0.14	0.13	0.10	0.16	0.05	0.09
ALUMINUM	6920	3260	300	319	2150	2350	8400	0020	5910	6440	4490	6170
MERCURY	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
VANADIUM	ND	ND	ND	ND	7.0	7.0	32.6	13.0	11.2	0.2	12.6	11.0

TABLE

METAL ANALYSIS (mg/kg)

ROUND 2, SURFACE SOIL SAMPLES

SUPPLEMENTAL RI/FS, NORTH HOLLYWOOD DUMP

METAL NAME	AS13 0-6"	AS13 6-12"	AS14 0-6"	AS14 6-12"	AS15 0-6"	AS15 6-12"	AS16 0-6"	AS16 6-12"	AS17 0-6"	AS17 6-12"	AS18 0-6"	AS18 6-12"
COMMENTS			M			M					L	
ARSENIC	10.9	9.8	ND	ND	0.9	ND	3.4	1.1	3.1	5.3	7.6	0.5
BERYLLIU	0.581	0.512	ND	ND	ND	ND	0.240	0.141	0.900	0.620	0.575	0.504
LEAD	20.5	22.5	2.6	1.2	2.2	1.2	15.0	4.0	10.5	10.4	24.2	12.5
NICKEL	11.7	12.1	19.0	ND	1.4	ND	0.3	2.6	24.7	11.4	15.2	11.2
ZINC	35.5	27.0	ND	ND	1.4	ND	10.2	16.3	31.0	33.6	32.2	30.1
STRONTIU	9.6	6.6	ND	ND	ND	ND	5.3	ND	29.6	10.0	0.5	6.2
COPPER	10.0	0.5	ND	ND	ND	ND	ND	ND	4.2	0.6	11.0	5.1
BARIUM	150	204	2.4	ND	22.7	4.3	115	69.5	1310	205	153	132
CHROMIUM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CADMIUM	0.11	0.10	0.04	ND	0.05	0.05	ND	0.09	0.51	0.11	0.12	0.12
ALUMINIUM	16100	8460	420	296	719	435	4040	2040	5110	7370	9130	7100
MERCURY	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
VANADIUM	21.6	13.1	ND	ND	ND	ND	10.0	5.6	30.0	12.2	17.4	11.4

METAL NAME	AS19 0-6"	AS19 6-12"	AS20 0-6"	AS20 6-12"
COMMENTS				M
ARSENIC	11.7	0.5	13.9	3.5
BERYLLIU	0.202	0.454	0.533	0.376
LEAD	35.4	51.0	22.5	15.0
NICKEL	50.2	05.7	24.7	16.4
ZINC	61.0	136.6	123.7	17.0
STRONTIU	11.2	17.0	17.4	10.4
COPPER	23.2	50.2	25.2	71.9
BARIUM	175	153	116	90.0
CHROMIUM	ND	ND	ND	17.9
CADMIUM	0.64	0.21	0.16	0.20
ALUMINUM	5190	9090	10600	0070
MERCURY	ND	0.041	0.020	ND
VANADIUM	47.2	21.6	27.0	16.1

TABLE

METAL ANALYSIS (mg/kg)

ROUND 4, SURFACE SOIL SAMPLES

CONTROLLED METAL HI/PS, NORTH HOLLYWOOD HOME

COMPOUND NAME (first 8 char.)	AS1-86	AS2-86	AS3-86	AS4-86	AS5-86	AS7-86	AS8-86	AS9-86	AS10-86	AS11-86	AS12-86	AS13-86
SAMPLE N												
ARSENIC	9.02	13.7	10.7	8.76	11.9	5.50	41.5	6.42	11.2	6.78	9.99	10.8
BERYLLIU	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
LEAD	6.88	9.38	9.38	15.0	10.0	9.38	158.0	3.13	7.50	6.25	8.75	10.0
NICKEL	ND	8.13	8.13	10.6	8.75	6.25	41.3	5.00	8.75	ND	6.00	8.75
ZINC	26.5	35.3	29.8	40.5	31.9	22.0	176.0	27.5	20.6	17.9	24.7	22.3
STRONTIU	5.69	10.7	5.58	10.8	9.58	6.94	34.60	3.09	7.84	6.29	5.66	4.98
COPPER	5.60	9.04	5.02	9.27	7.96	6.63	47.60	2.28	8.06	5.07	5.54	3.79
BARIUM	49.9	86.0	51.0	101.0	76.7	55.5	191.0	41.0	71.6	49.4	54.1	70.4
CHROMIUM	18.2	20.6	11.1	21.7	18.9	13.5	24.4	7.46	16.4	9.21	13.90	11.9
CADMIUM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ALUMINUM	4900.0	7350.0	3610.0	7900.0	7400.0	4700.0	4000.0	3620.0	6910.0	3630.0	5520.0	6250.0
MERCURY	ND	ND	ND	ND	ND	ND	1.54	ND	ND	ND	ND	ND
VANADIUM	13.0	12.4	21.9	11.7	16.2	11.6	11.7	10.9	12.3	11.1	8.61	14.6

COMPOUND NAME (first 8 char.)	AS14-86	AS15-86	AS16-86	AS17-86	AS19-86	AS20-86	AS21-86	AS22-86	AS23-86	AS24-86	AS25-86	AS26-86	AS27-86
SAMPLE N													
ARSENIC	1.62	3.00	7.60	8.93	10.5	11.0	9.40	7.77	7.21	8.10	11.5	6.99	9.70
BERYLLIU	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
LEAD	1.25	1.25	5.63	5.00	3.13	31.9	9.38	6.88	7.50	10.6	8.13	4.38	7.50
NICKEL	ND	ND	8.13	9.38	8.75	44.4	5.63	8.75	5.63	8.13	6.25	ND	ND
ZINC	4.41	6.59	18.8	32.9	25.0	83.7	23.5	28.2	31.3	41.3	28.6	15.4	27.4
STRONTIU	1.47	1.46	7.02	8.69	5.01	12.5	6.07	8.59	4.79	8.90	6.75	3.59	6.40
COPPER	0.82	ND	2.28	3.22	2.79	19.1	6.25	6.72	5.56	7.40	9.74	4.24	16.3
BARIUM	11.5	26.4	41.1	48.1	10.5	90.2	64.1	82.7	52.0	80.0	51.9	28.4	60.6
CHROMIUM	ND	2.60	8.42	15.1	9.16	22.6	12.6	17.3	10.5	16.7	11.6	6.40	12.8
CADMIUM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ALUMINUM	1290.0	1650.0	4430.0	5610.0	3940.0	7730.0	5000.0	7500.0	3240.0	6990.0	5770.0	3270.0	5770.0
MERCURY	ND	ND	ND	ND	ND	0.26	ND	ND	ND	ND	0.15	ND	ND
VANADIUM	1.58	2.26	7.61	10.5	10.6	17.7	8.72	13.7	4.91	16.4	14.1	5.96	14.1

TABLE
METAL ANALYSIS (mg/kg)
ROUND 2, WOLF RIVER SEDIMENT SAMPLES
SUPPLEMENTAL RI/FS, NORTH HOLLYWOOD DUMP

COMPOUND NAME	WS1 0-6"	WS2 0-6"	WS2 6-12"	WS3 0-6"	WS3 6-12"	WS4 0-6"	WS4 6-12"
COMMENTS	F	M				B.	
ARSENIC	5.9	12.5	0.9	0.4	0.7	6.2	0.6
BERYLLIUM	0.491	0.652	0.677	0.660	0.661	0.620	0.507
LEAD	13.5	10.4	10.7	0.4	9.5	10.3	6.0
NICKEL	9.6	7.9	0.6	0.7	9.4	7.9	9.5
ZINC	36.1	30.2	33.7	29.4	34.7	29.4	26.9
STRONTIUM	11.2	10.6	11.7	11.3	ND	0.5	9.3
COPPER	15.4	15.3	19.6	13.4	18.0	14.6	15.3
BARIUM	107	90.1	140	141	80.0	81.0	83.3
CHROMIUM	ND	ND	ND	ND	ND	ND	ND
CADMIUM	0.10	0.21	0.19	0.20	0.27	0.19	0.16
ALUMINUM	8520	6510	8020	6770	7140	5250	6120
MERCURY	ND	ND	ND	0.050	0.026	ND	ND
VANADIUM	20.6	12.0	14.0	26.0	13.1	14.1	22.2

NORTH HOLLYWOOD DUMP SITE
PROPOSED PLAN

Superfund
Proposed Plan Fact Sheet

EPA

North Hollywood Dump Site

Memphis, Tennessee — *June 1990*

INTRODUCTION

This Proposed Plan is issued to describe the alternatives that the U.S. Environmental Protection Agency (EPA) has considered for the cleanup of the North Hollywood Dump National Priorities List (NPL) Site (the site) located in Memphis, Tennessee (see Figure 1). This plan presents an evaluation of cleanup alternatives, including the alternatives preferred by EPA. The alternatives summarized are described in greater detail in the Remedial Investigation (RI) and Feasibility Study (FS) Reports which are available, with the site's Administrative Record, at the information repository located at the Memphis-Shelby County Public Library, 1850 Peabody Avenue, Memphis, Tennessee.

A supplemental RI was conducted and an FS was prepared by some of the potentially responsible parties (PRPs) under a Commissioner's Order from the State of Tennessee. The State of Tennessee was the lead agency for the site from 1985 until late 1988, when site lead was transferred to EPA. The State of Tennessee now acts as a support agency for this site.

The alternatives EPA prefers represent a preliminary decision, subject to public comment. Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, requires publication of a notice and brief analysis of a

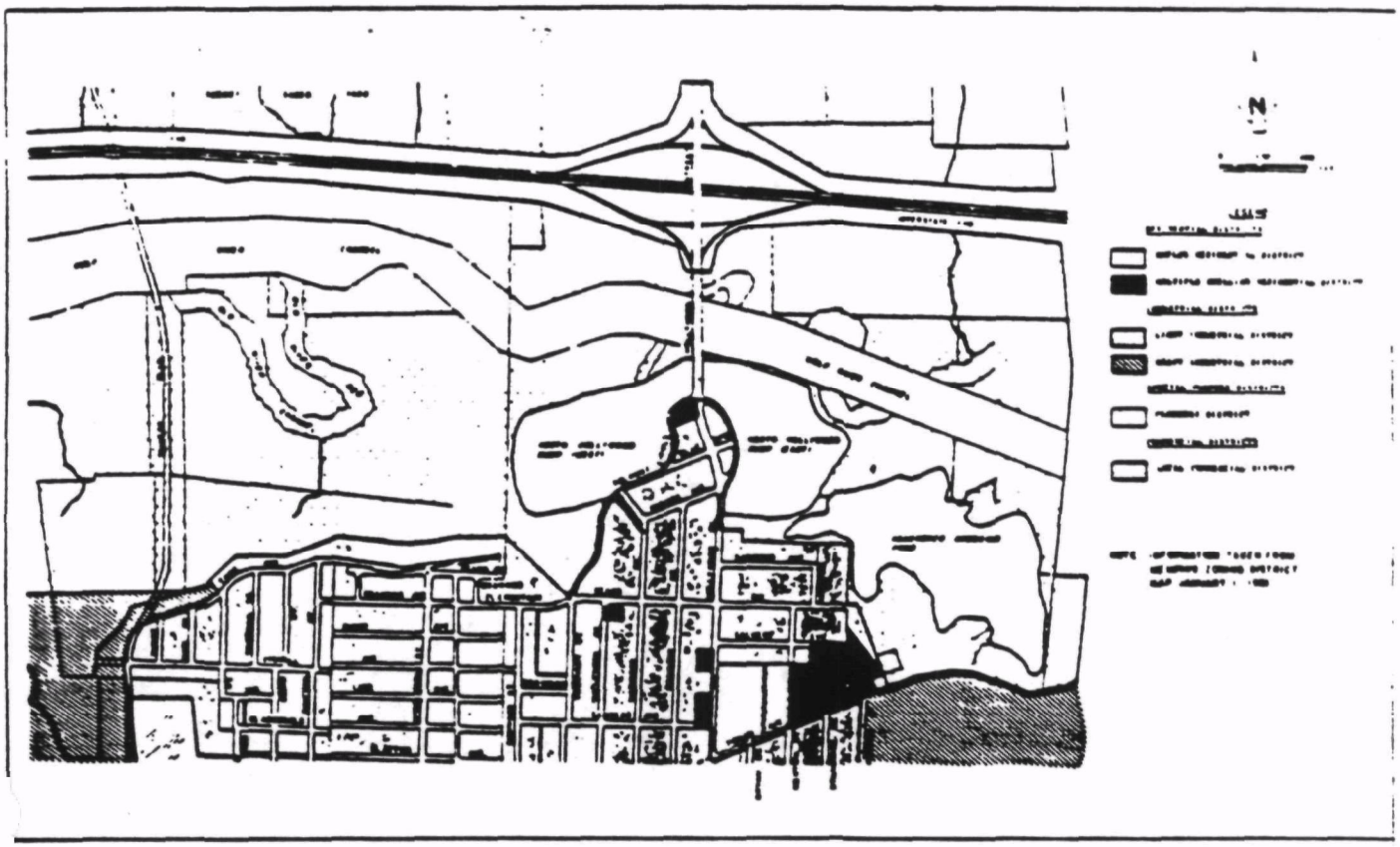


FIGURE 1. Location Map, North Hollywood Dump Site

Proposed Plan for site remediation. This plan provides background information on the site, describes the remedial alternatives, provides the rationale for identification of the preferred alternatives, and outlines the role of the public in helping EPA make a final decision on a remedy.

EPA encourages the public to submit written comments on all alternatives presented in this plan. Public comments may result in selection of alternatives other than the ones preferred by EPA for the site.

SITE BACKGROUND

The North Hollywood Dump was a municipal landfill that operated from the mid-1930's until the mid-1960's. The landfill was used primarily for the disposal of municipal refuse; nowever, industrial refuse was also disposed in the landfill.

The site is divided by Hollywood Street into two separate areas of refuse disposal: the East and West Sectors. Combined, the East and West Sectors encompass an area of approximately seventy acres and have an average refuse layer of 26.5 feet (see Figure 2).

Although disposal records for the site are not available, aerial photographs of the Memphis area between 1937 and 1979 show horizontal expansion of the site between the mid-1930's to the mid-1950's. During the mid to late 1950's active burning was evident and by the late 1950's, expansion of the dump was primarily vertical instead of horizontal. The landfill expanded quickly in the 1960's from under 50 acres to over 70 acres. By 1967, legal disposal had ceased at the site although unauthorized dumping occurred in the 1970's.

In 1979, EPA and the State of Tennessee began investigating this site due to concerns regarding the possible disposal of hazardous substances in the landfill. Initial studies conducted by EPA, U S Geological Survey (USGS) and local authorities identified chemicals in the dump that had the potential to cause adverse health and environmental effects. Based on the results of these studies, a Technical Action Group was formed in 1980. The group consisted of personnel from the following agencies: EPA Region IV, the Tennessee Department of Health and Environment (TNDHE), the City of Memphis, Velsicol Chemical Corporation (a PRP), and the Memphis Shelby County Health Department (MSCHD). In October 1981, the North Hollywood Dump was placed on the NPL for investigation under CERCLA, commonly referred to as Superfund. During the early 1980's, numerous activities occurred at the site. These activities included an EPA immediate removal of contaminated soil, capping of the site by the PRPs, fencing and posting of the site, and numerous sampling activities which were coordinated by the Technical Action Group. At the conclusion of the Technical Action Group investigation, proposed remedies

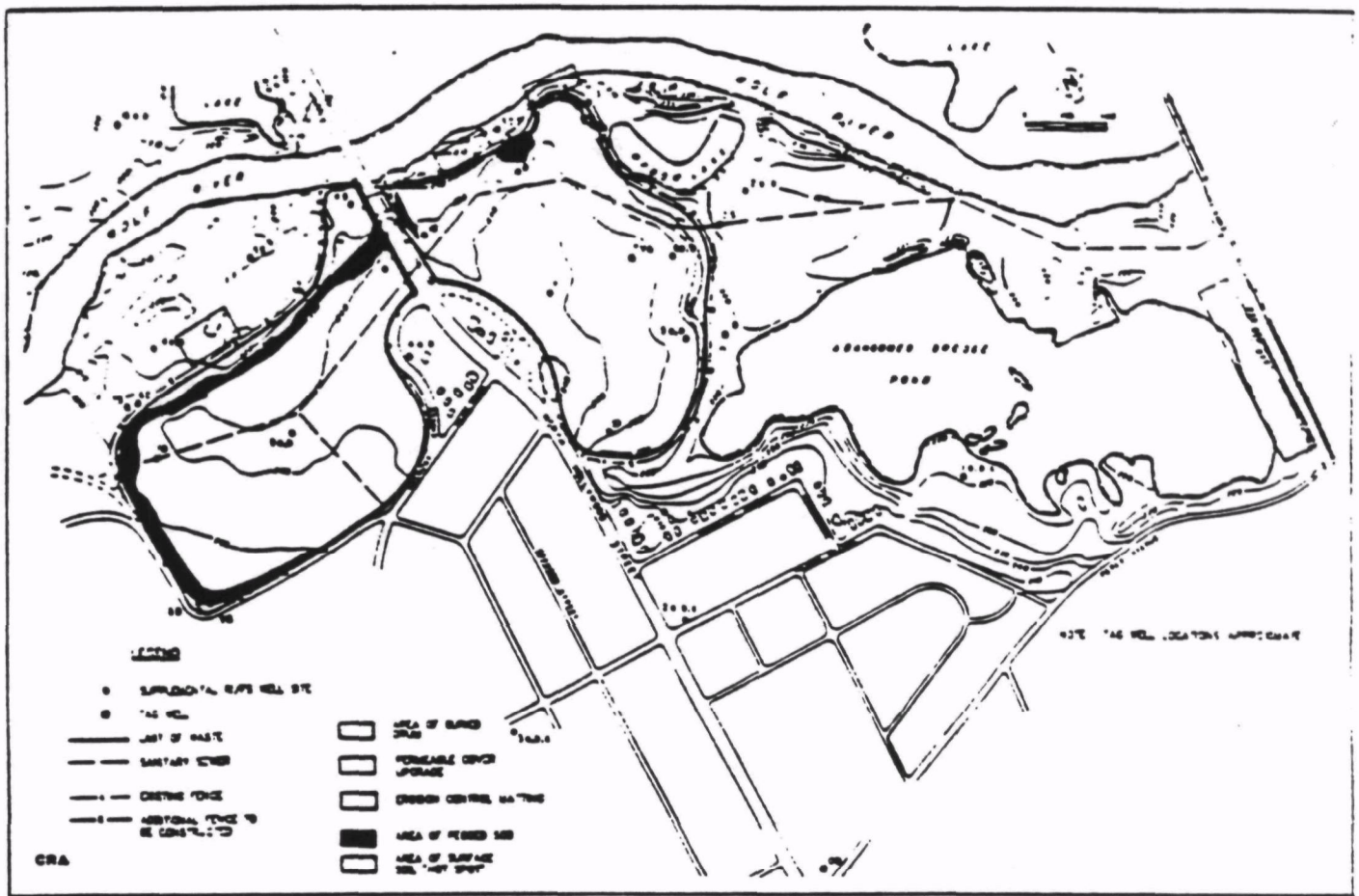


FIGURE 2. North Hollywood Dump Site Map

are discussed, however, it was determined by EPA that additional data was needed before selection of a final rem-

Upon notification by EPA, a group of PRPs agreed to perform a supplemental RI/FS in 1985. At that time, the State of Tennessee became the lead agency and issued a Commissioner's Order under which the supplemental RI/FS would be performed. The State of Tennessee was the lead agency from 1985 to late 1988 when EPA Region IV became the lead agency. The supplemental RI and FS Reports were finalized in April and May 1990, respectively.

The finding of the supplemental RI confirmed the presence of contaminants at the site, in shallow groundwater beneath the site and in sediments of adjacent surface water impoundments (Oxbow Lake, and dredge pond). The following lists the major contaminants detected at the site:

Chlordane	Arsenic
Aldrin	Barium
Heptachlor	Nickel
Total BHC	Lead
Heptachlor Epoxide	Copper
4, 4 DDT	Zinc
Dieldrin	Vanadium
Chromium	Endrin

The Proposed Plan addresses two identified areas of concern associated with the site. The first area addressed includes the site wastes and the Fluvial Sand Unit (shallow groundwater) that discharge to the Wolf River. The second area addressed includes the sediment and fish in adjacent surface water impoundments.

SCOPE AND ROLE OF RESPONSE ACTION

The dump wastes, contaminated soil, surficial groundwater and pond sediments are under consideration for cleanup. A remedy for the site and underlying surficial groundwater is proposed to protect public health and the environment by controlling exposure to contaminated materials and controlling migration of contaminants into surrounding soils, sediments, and surface water. The contaminated shallow groundwater beneath the site is not used as a drinking water source due to well restrictions imposed by Shelby County. In addition, the groundwater underlying the site discharges directly into the Wolf River and does not leave the site in any other direction. For these reasons, the shallow groundwater is evaluated based on its effects on the Wolf River, not as a drinking water source. A remedy for the impoundment sediments is proposed to protect public health and the environment by controlling the ingestion and accumulation of contaminants by flora and fauna, especially fish, in Oxbow Lake and the dredge pond. The preferred alternatives will address the dump wastes, contaminated soil, surficial groundwater and pond sediments as one response action. The two preferred alternatives, once implemented, should complete the response action at this site.

The remedial alternatives under consideration are presented below. The FS Report presents a more thorough description and evaluation of these alternatives. The Administrative Record, which contains the FS Report along with other documents and correspondence that are used to decide the site remedies, is available for public review at the site information repository, located at the Memphis- Shelby County Public Library, 1850 Peabody Avenue, Memphis, Tennessee.

Based on new information or public comments, EPA in consultation with the State of Tennessee, may modify the preferred alternatives or select another response action presented in the Proposed Plan and the FS Report. The public is encouraged to review and comment on all alternatives identified.

SUMMARY OF SITE RISKS

During the supplemental RI/FS, an analysis was conducted to estimate the health or environmental problems that could result if the contamination at the site was not remediated. This analysis, commonly referred to as a baseline risk assessment, focused on the health effects that could result from long-term direct exposure to high concentrations of the contaminants as a result of ingesting the fish or having the skin come in contact with the soil or surface water.

Groundwater contaminated by the site flows directly into the Wolf River and is not accessible as a drinking water source due to the prohibition imposed by Shelby County for the installation of shallow wells and borings throughout the county. Therefore, there should be no pathway of direct exposure to contaminated groundwater. However, to provide greater assurance that institutional control will prevent the use of the shallow groundwater beneath the North Hollywood Dump, variances in state and local groundwater standards for the site area will be sought so that groundwater use restrictions could be placed on property deeds.

Risk of long-term exposure to contaminants from the site were calculated based on major contaminants detected at the site which included potential human carcinogens. Carcinogenic risks are expressed as the probability of additional cancer risks resulting from a lifetime of exposure. For non-carcinogens, the Agency evaluates the risk by determining a Hazard Index (HI). The HI is a number that reflects a comparison of the calculated exposure level for a contaminant at the site to an exposure level that would not cause harm from daily exposure for a lifetime i.e., the reference dose (RfD). A HI greater than 1.0 indicates that exposure exceeds the protective level. These estimated risk calculations were based on present conditions at the site including the temporary cap and no major increases of contaminants in the shallow aquifer which discharges into the Wolf River. Allowable groundwater concentrations for discharge to the Wolf River were set based on Federal, state and local water quality standards for carcinogens using a 10^{-6} risk from exposure through ingestion of contaminated fish.

The HI calculated for exposure to non-carcinogens in the soil and surface waters at the site were well below 1.0. Therefore, these substances are not present at levels that would be expected to cause concern. Likewise, exposure to carcinogenic compounds through soil or surface water contact was also determined not to be a health concern. Risk calculations based on assumed possible exposure pathways yielded an upperbound lifetime risk of less than 10^{-6}. Risk from the ingestion of aquatic organisms and fish in the stretch of the Wolf River impacted by the site was also determined to be

below the levels of concern. However, health risks from long-term (70 years) exposure to carcinogenic compounds from the site in fish obtained from the Oxbow Lake and dredge pond were found to present concern for those who consume contaminated fish caught from these areas as a major and frequent food staple. From the risk calculations, it was estimated there is a 2 to 7 in 1,000 excess chance of developing cancer if 6.5 grams of fish from the impoundments were eaten every day for 70 years if the impoundments are not remediated. However, it is appropriate to note that the findings from the major health study of Hollywood area residents conducted by the Centers for Disease Control in 1985 at the request of the U.S. EPA found no evidence of increased health effects among persons living in the Hollywood area that could be attributed to the North Hollywood Dump. Also, this risk calculation is based on contaminant levels measured during the original RI. Changes in conditions that could affect the risk are likely to have occurred since that time. Additional contaminant measurement to evaluate this situation will be conducted during the remedial design phase of the project. Actual or threatened future releases of hazardous substances from this site, if not addressed by the preferred alternatives or one of the active measures considered, may present an endangerment to public health, welfare or the environment, including possible exposure to hazardous substances should the temporary cover erode.

SUMMARY OF ALTERNATIVES

Landfill Wastes and Shallow Groundwater

The following lists the remedial alternatives under consideration for the landfill wastes and shallow groundwater. The FS Report contains a more detailed evaluation of each alternative.

1. No Action;
2. Low Permeability Soil Cover;
3. Low Permeability Soil Cover and groundwater extraction with discharge to sewer system for treatment; and
4. Low Permeability Soil Cover and physical containment by barrier wall.

All these alternatives involve restrictions on land and well use at the site, upkeep of the fence and property, and monitoring to assess the effectiveness of the remedy.

ALTERNATIVE 1: NO ACTION

Present Worth (PW) Cost: $2,338,670
Years to Implement: 0

CERCLA requires that the "No Action" alternative be considered at every site. Under this alternative, no soil, sediment, or groundwater containment or treatment would take place. The only reduction of contaminant levels would occur via natural processes such as dispersion and attenuation. The only costs would be for monitoring the site.

ALTERNATIVE 2: LOW PERMEABILITY SOIL COVER

Present Worth Cost: $4,942,950
PW Capital Cost: $3,364,280
PW O & M Cost: $1,578,670
Years to Implement: 1

The existing low permeability cover onsite will be upgraded to meet the sanitary landfill standards and the existing fence will be completed around the perimeter of the site. Excavation of the buried wastes and contaminated soil identified during the supplemental RI/FS in the more easily eroded areas near the Wolf River and the surface water impoundments will be placed beneath the upgraded cover as part of this alternative. The movement of the wastes onsite will comply with all applicable Resource Conservation and Recovery Act (RCRA) Land Disposal Restrictions (LDRs).

ALTERNATIVE 3: LOW PERMEABILITY SOIL COVER AND HYDRAULIC CONTAINMENT BY EXTRACTION WELLS:

Present Worth Cost: $6,802,680
PW Capital Cost: $4,490,420
PW O & M Cost $ 2,312,260
Years to Implement: 5

The site will be covered and specific areas will be excavated as described in Alternative 2. Alternative 3 also includes hydraulic containment of the site by the use of extraction wells. The extracted groundwater will be discharged to the City of Memphis sewer system for treatment.

ALTERNATIVE 4: LOW PERMEABILITY SOIL COVER AND PHYSICAL CONTAINMENT BY BARRIER WALL

Present Worth Cost: $13,251,555
PW Capital Cost: $11,025,685
O & M Cost: $2,225,870
Years to Implement: 2

Alternative 4 will consist of upgrading the existing cover and excavating specified areas as described in Alternative 2. Alternative 4 will also include the construction of a barrier wall (containment wall) into the ground around the perimeter to contain the landfill wastes and underlying shallow groundwater. Soil removed from the wall area will be disposed onsite in compliance with all applicable RCRA LDRs.

EVALUATION OF ALTERNATIVES

The preferred alternative for the landfill wastes and groundwater at the site is Alternative 2 with Alternative 3 as a contingency alternative should groundwater contamination levels increase to above acceptable 10^{-4} risk levels. Based on studies of the shallow groundwater beneath the site and investigations of the site contamination and its migration, this is not expected to occur; however, should conditions change in the shallow groundwater, Alternative 3 will be used to address the contamination.

Both of these alternatives involve the covering of the landfill with a soil cap and excavation of contaminated soil close to the river or public areas. The cover on the site will be increased to an even thickness of 24 inches across the entire site. The site will be grassed and sod will be placed in drainage areas. Erosion control matting will be placed on the landfill slopes that are below the 10 year flood level. Alternative 3 includes groundwater extraction for the remediation and containment of the contaminated groundwater onsite

sed on current information, these alternatives provide the best balance among the nine criteria that EPA uses to evaluate alternatives. The following analysis section provides a glossary of these criteria and an analysis of the alternatives under consideration for the North Hollywood Dump wastes and groundwater

ANALYSIS, LANDFILL WASTES AND GROUNDWATER

Overall Protection of Human Health and the Environment

All alternatives presented in this document except for No Action would be protective of human health and the environment based on present conditions. The No Action alternative is not protective because in the future, failure of the temporary cover on the site could allow human or animal exposure to contaminants through soil contact and migration of unacceptable levels of contaminants into the Wolf River. The other alternatives would prevent human or animal exposure to onsite contaminants and control contaminant concentrations from entering the Wolf River However, should contaminant concentrations in the groundwater increase to above acceptable 10^{-4} risk levels, Alternatives 3 and 4 would be protective of human health and the environment.

Compliance with Applicable or the Relevant and Appropriate Requirements

All alternatives except for No Action would comply with applicable or relevant and appropriate requirements (ARARs). The No Action alternative is not in full compliance with ARARs for the closure of landfills and would allow for possible direct contact or exposure to hazardous substances. Alternatives 2 through 4 are in compliance with sanitary landfill closure requirements and Alternatives 3 and 4 are in compliance with the ARARs for discharge of waste water. Alternatives 2 through 4 will also comply with all applicable RCRA LDRs. Variances in the State of Tennessee groundwater standards under the Underground Injection Control (UIC) Regulations will be sought so that groundwater use restrictions could be placed on property deeds.

Reduction of Toxicity, Mobility or Volume

Since none of the remedial alternatives will involve the treatment of the landfilled wastes, there will be no direct reduction in the toxicity, mobility, or volume of landfill contaminants. Indirectly, a reduction in the mobility of landfill contaminants will occur for Alternatives 2 through 4 due to the cover reducing the amount of rain water filtering through the wastes and eliminating contaminated soils moving offsite from erosion.

Alternatives 3 and 4 will result in a significant reduction of the aquifer contaminant mobility, toxicity, and mass due to the removal of contaminated shallow groundwater.

Long-Term Effectiveness

All alternatives except for No Action will provide long-term effectiveness and permanence. The temporary cover in place could in the future expose the public and the environment to the contaminants onsite.

Short-Term Effectiveness

The degree of short-term effectiveness achieved by the alternatives which involve remedial action is greatest for Alternative 2 and less for Alternative 3 and Alternative 4 The lowest degree of short-term effectiveness is achieved by Alternative 4.

The construction of the low permeability soil landfill cover in Alternative 2 will result in the least amount of risk to the community, workers and the environment. The primary risks to the community and workers will be due to airborne dust emissions whereas the main impact of the environment will be due to potential increased sediment loadings to the adjacent surface water bodies in the short-term. These risks, however, are readily controlled and mitigated. These potential impacts are common to all three of the alternatives which involve upgrading the existing cover.

Alternative 3 will increase the potential risk to workers due to the increased contact with contaminated media. However, this risk to the worker is readily addressed by enforcing an appropriate health and safety program during construction. Alternative 4 will present potential risks to the workers and community which will be more difficult to address. The construction of the containment wall in Alternative 4 will likely encounter landfilled wastes along the landfill perimeter. Consequently, the implementation of this alternative would present a greater risk to workers and the community than for the other remedial alternatives due to the potential for serious site incidents to occur.

Implementability

The implementability of an alternative is based on technical feasibility, administrative feasibility and availability of services and materials. The construction and materials of the upgraded low permeability soil landfill cover for Alternatives 2 through 4 utilizes standard construction techniques and can be completed within a single construction season. Consequently, the implementation of this component of these remedial alternatives will not be of concern.

The primary difficulty which is anticipated for Alternative 3 is the inherent problem in evaluating the hydraulic performance of the system due to the hydraulic characteristics of the shallow aquifer and the proximity of the Wolf River. By comparison, the implementation of Alternative 4 is anticipated to encounter numerous difficulties. The constructability of the containment wall is the major implementability concern. Due to geologic conditions at the site, the integrity of a constructed containment wall will be questionable. In addition, the existing topography is not well-suited to the construction of a containment wall. Other implementability concerns include the anticipated interference of adjacent structures, the stability of landfill slopes, and the availability of suitable clay backfill.

Cost

The present worth cost associated with Alternative 1 is $ 2,338,670. The estimated present worth cost of Alternative 2 is $4,942,950. Alternative 3 is $ 6,778,620, and Alternative 4 is $13,251,555. The present worth value represents the total cost of the remediation expressed in today's dollars.

Alternatives 3 and 4 are not cost effective for present site conditions since contaminant concentrations in the groundwater are not above acceptable risk levels, and therefore, do not provide an added degree of protection

State Acceptance

The State of Tennessee has assisted EPA in the review of reports and site evaluations The State has reviewed and tentatively agrees with the proposed remedy for the landfill wastes and groundwater and is awaiting public comment before final concurrence.

Community Acceptance

Community acceptance of the various alternatives will be evaluated during the public comment period and will be described in the Record of Decision (ROD) for the site.

The Preferred Alternatives

The preferred alternative - Alternative 2 - utilizes proven containment techniques for large municipal landfills. It involves covering the wastes areas to prevent rainwater filtering through the wastes and direct contact with contamination. The alternative includes restrictions on the land and well use at the site, installation of a complete security fence, and groundwater and site monitoring. Alternative 3 would be used should groundwater contamination increase to above acceptable health and environmental risk levels.

Summary of Statutory Findings

In summary, the preferred alternative represents the best balance among the criteria used to evaluate remedies. Based on the information currently available, EPA has determined that the preferred alternative would be protective of human health and the environment, would attain ARARs and would be cost-effective.

SUMMARY OF ALTERNATIVES

Surface Water Impoundments

As stated in the summary of site risks, sediment from early sampling indicates an unacceptable human risk level for the long-term and frequent consumption of fish from Oxbow Lake and the dredge pond. Due to the changes that can occur to the sediment in a surface water body, additional sampling will take place during the design phase of the remedy. This sampling will be done concurrently with the design so as not to delay the remediation process. The sampling will be done to verify the condition of the impoundments and to better define the contaminated areas. This sampling will not affect the selected remedy unless surface sediment contamination concentrations have decreased to within acceptable risk levels.

The following lists the alternatives selected for remediation of the surface water impoundments. The FS Report contains a more detailed evaluation of the alternatives.

1. No action;
2. Periodic harvesting of fish;
3. Dredge with containment on east sector of landfill;
4. In-place containment with hydraulic fill,
5. In-place containment by natural deposition - rerouting of the Wolf River; and
6. Excavate with containment on east sector of landfill place containment with hydraulic fill.

All alternatives involve restrictions on fishing until remediation is complete and monitoring is established to assess the effectiveness of the remedy. Institutional controls on fishing will remain after the sediment is remediated and until fish contaminant levels decrease to acceptable amounts Although the removal of contaminated fish is recommended in the FS Report for Alternatives 3 through 6, EPA is presently planning to allow natural processes to remove the contaminated fish.

ALTERNATIVE 1: NO ACTION

Present Worth (PW) Cost: $406,500
Years to Implement: 0

CERCLA requires that the "No Action" alternative be considered at every site. Under this alternative, no remediation of the impoundments' sediment or fish would take place. The only reduction of contaminant levels would occur via natural processes. The only costs would be for monitoring.

ALTERNATIVE 2: PERIODIC HARVESTING OF FISH

Present Worth Cost: $340,910
PW Capital Cost: $113,635
PW O&M Cost: $227,275
Years to Implement: 20

Fish in the ponds will be harvested on a periodic basis to ensure bioaccumulated contaminant levels in the fish are below acceptable concentration levels set using a 10^{-6} risk of one potential additional case of cancer in a population of one million persons. Monitoring of fish contaminant levels will be required to determine harvesting times.

ALTERNATIVE 3: DREDGE WITH CONTAINMENT ON EAST SECTOR OF LANDFILL

Present Worth Cost: $2,341,885
PW Capital Cost: $2,298,875
PW O&M: $43,010
Years to Implement: 10

Alternative 3 consists of the dredging/excavation of contaminated sediments from the impoundments and containing the sediments on the east sector of the landfill beneath new cover. Applicable RCRA LDRs will be met for the sediment placed in the landfill.

ALTERNATIVE 4: IN-PLACE CONTAINMENT WITH HYDRAULIC FILL

Present Worth Cost: $3,098,940
PW Capital Cost: $3,067,300
PW O&M: $31,640
Years to Implement: 10

Hydraulic fill material will be placed over the identified con-

minated sediments in the impoundments to contain them place and remove them from the pathway of exposure to the fish.

ALTERNATIVE 5: IN-PLACE CONTAINMENT BY NATURAL DEPOSITION AND REROUTING OF WOLF RIVER

Present Worth Cost: $2,263,130
PW Capital Cost: $2,224,700
PW O&M Cost: $38,430
Years to Implement: 10

Alternative 5 consists of diverting the Wolf River through the impoundments and utilizing natural sedimentation to cover the contaminated sediments.

ALTERNATIVE 6: EXCAVATE WITH CONTAINMENT ON EAST SECTOR OF LANDFILL AND IN-PLACE CONTAINMENT WITH HYDRAULIC FILL

Present Worth Cost: $2,988,860
PW Capital Cost: $2,945,850
PW O&M Cost: $43,010
Years to Implement: 10

Alternative 6 consists of excavation of contaminated sediments at shallow water depths with onsite disposal like Alternative 3 and the in-place containment of contaminated bottom sediments with hydraulic fill like Alternative 4. Applicable RCRA LDRs will be met for the sediment placed in the landfill.

EVALUATION OF ALTERNATIVES

The preferred alternative for remediation of the surface-water impoundments at the North Hollywood Dump Site is Alternative 4. Alternative 4 involves the in-place containment of contaminated sediments using hydraulic fill. This includes placement of an even layer of fill over contaminated sediments to prevent contact with the impoundments' aquatic biota and monitoring to ensure the effectiveness and permanence of the remedy. Based on current information, this alternative provides the best balance among the nine criteria.

ANALYSIS

Overall Protection of Human Health and the Environment

All the alternatives presented in this document except for No Action would be protective of human health; however, Alternative 2 does not provide a degree of protection to the environment. The No Action alternative is not protective because it allows bioaccumulation of contaminants by wildlife in the impoundment and the possible human ingestion of contaminated fish. Alternative 2 does not prevent bioaccumulation in the wildlife population. Alternative 3 through 6 prevent the biota in the impoundment from coming in contact with or ingesting contaminated sediments.

Compliance with Applicable or Relevant and Appropriate Requirements

All alternatives except for No Action and Alternative 5 would comply with ARARs. The No Action alternative would allow the levels of contaminants in the edible portions of fish to remain above health risk levels. Alternative 5 would not comply with the U S Army Corps of Engineers regulatory program requirements. The other alternatives would return fish contamination levels to below acceptable standards and would meet applicable RCRA LDRs, surface water quality standards, closure regulations, and effluent discharge requirements.

Reduction of Toxicity, Mobility or Volume

Since none of the remedial alternatives will involve the treatment of the contaminated sediments, there will be no reduction in the toxicity, or volume of contaminants associated with bottom sediments.

Due to the removal and securement of the bottom sediments, Alternatives 3, 5, and 6 will result in a significant reduction in environmental mobility and mass of contaminants in the aquatic environment, but not for the whole site since the sediments will be placed in the landfill. Alternatives 4, 5, and 6 will result in a significant reduction in environmental mobility due to the isolation of contaminated sediments below a layer of clean fill.

Long-Term Effectiveness

All of the alternatives except No Action would provide long-term effectiveness; however, there is no permanence associated with Alternative 2. Once the contaminated sediments are no longer accessible to the impoundments' biota for accumulation, fish tissue concentrations will start decreasing and return to acceptable levels.

Short-Term Effectiveness

An estimated ten years will be necessary to achieve the remedial action goals for the decreased contaminant concentration levels in the impoundment fish for all of the alternatives except No Action and fish harvesting. During that time the community will be protected from short-term risk from fish consumption through institutional controls warning persons of fishing hazards. Short-term human exposure through contact with contaminated sediments during the remediation will be controlled through health and safety procedures.

The primary differences between the alternatives are the extent of the potential environmental impact related to implementation. Alternative 4 does not require the handling of contaminated sediments whereas the other alternatives involve dredging/excavation activities which may potentially impact workers and the community. Consequently, this alternative is considered to have a greater degree of short-term effectiveness. The potential for short-term impacts associated with Alternative 3 is deemed to be marginally greater than the potential for impacts associated with the implementation of Alternative 6. This difference is primarily due to the nature of the work and recognizes that dredging is less readily controlled than mechanical excavation and that there are hazards to the community and the environment which are inherent to the operation of liquid impoundments. Alternative 5 is deemed to be the least effective of the alternatives in the short-term due to the potential impacts to

the Wolf River and adjoining floodplain. The potential impacts from the implementation of this alternative are not limited to the immediate area of the impoundments.

Implementability

The implementability of an alternative is based on technical feasibility, administrative feasibility and the availability of services and materials.

There are no major concerns regarding the implementability of Alternatives 2 and 4. Alternatives 3 and 6, however, are considered difficult to implement due to the degree of dewatering of the abandoned dredge pond which is required. In addition, the implementation of Alternative 3 will be limited by the size of the dredge pond, the ability to accommodate significant changes in the volume of material to be handled, and the required length of the construction period. Alternative 3 also requires the wet handling of contaminated sediments which may be difficult. The technical feasibility of settling out dredged sediments without the use of flocculants is uncertain. This factor will potentially have a significant impact on the implementability of this alternative. Consequently, Alternative 3 is considered to be the most difficult to implement and the most sensitive to potential implementation problems.

The implementability of Alternative 5 is anticipated to be limited by administrative and environmental concerns. Due to the potential environmental impact of this alternative, it is anticipated that the implementation of this alternative will be delayed significantly.

Cost

The present worth cost of Alternative 1 is $408,500. Alternative 2 has an estimated present worth cost of $340,910 including Operations and Maintenance (O&M) costs. The estimated present worth of Alternative 3 is $2,341,885. Alternative 4 is $3,098,940, Alternative 5 is $2,263,130 and Alternative 6 is $2,988,860.

The indirect capital costs for several of these alternatives, however, are highly sensitive to changes in the volume of contaminated sediments to be handled. Alternative 3 is the most sensitive to volume changes whereas Alternative 4 is the least sensitive. Due to the required partial excavation of contaminated sediments, the indirect capital costs for Alternatives 5 and 6 are moderately sensitive. Consequently, the indirect capital costs associated with Alternatives 3, 5, and 6 could vary significantly once the lateral and vertical extent of sediments to be removed is refined by the results from the preconstruction sediment sampling program.

State Acceptance

The State of Tennessee has assisted EPA in the review of reports and site evaluations. The State has reviewed and tentatively agrees with the proposed remedy for the impoundments and is awaiting public comment before final concurrence.

Community Acceptance

Community acceptance of the various alternatives will be evaluated during the public comment period and will be described in the ROD for the site.

The Preferred Alternative

The preferred alternative - Alternative 4 - involves the containment of contaminated sediment to prevent biota contact with and accumulation of the site contaminants found at elevated risk levels. Alternative 4 involves containment of contaminants through fill or cover over the contaminated areas and institutional controls on fishing until acceptable fish tissue levels are reached. Alternative 4 has the lowest degree of short-term impact of the four alternatives that contain the sediments and fewer concerns over the implementability of the procedure. The cost is presently estimated based on the total coverage of the bottom of the impoundments. The costs of the excavation alternatives could vary greatly based on the volume of contaminated sediments that may have to be removed. Alternative 4 will permanently reduce the risk of exposure to contaminants through fish consumption.

Summary of Statutory Findings

In summary, the preferred alternative represents the best balance among the criteria used to evaluate remedies. Based on the information currently available, EPA has determined that the preferred alternative would be protective of human health and the environment, would attain ARARs and would be cost effective.

THE COMMUNITY'S ROLE IN THE SELECTION PROCESS

EPA solicits input from the community on the cleanup methods proposed for each Superfund response action. EPA has set a public comment period from June 28 through July 27, 1990 to encourage public participation in the selection process. The comment period includes a public meeting at which EPA will present the RI/FS Report and Proposed Plan, answer questions, and receive both oral and written comments. The public meeting is scheduled for 7:30 pm, June 28, 1990, and will be held at the Board of Education, 2597 Avery Avenue, Memphis, Tennessee. Comments will be summarized and responses provided in the Responsiveness Summary section of the ROD. The ROD is the document that presents EPA's final selection for cleanup. The public can send written comments to or obtain further information from:

Felicia Barnett
Remedial Project Manager
U.S. EPA Region IV
345 Courtland Street, N.E.
Atlanta, GA 30365
(404)347-7791

EPA is soliciting public comments about the most acceptable way to clean up the North Hollywood Dump Site. The Proposed Plan and the RI/FS Report have been placed in the information repository and Administrative Record for the site. The Administrative Record includes all documents such a work plans, data analysis, public comments, transcripts, and other relevant material used in developing the remedial alternatives for the North Hollywood Dump Site. These documents are available for public review and copying at th following location:

Memphis-Shelby County Public Library and
Information Center
850 Peabody Avenue
Memphis, Tennessee 38104
(901) 725-8821
Contact: Ms. Jan Condren

LIST OF CONTACTS

Felicia Barnett
Remedial Project Manager
U.S. EPA Region IV
345 Courtland Street, N.E.
Atlanta, GA 30365
(404)347-7791

Suzanne Durham
Community Relations Coordinator
U.S. EPA Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365
(404) 347-7791

Richard Holland
Tennessee Department of Health and Environment
Tennessee Superfund
295 Summer Avenue
Jackson, Tennessee 38301
(901) 423-6600

Suzanne Wilkes
Community Relations Coordinator
Tennessee Department of Health and Environment
Division of Superfund
Doctors Building
706 Church Street
Nashville, Tennessee 37219
(615) 741-6287

GLOSSARY OF EVALUATION CRITERIA

Overall Protection of Human Health and the Environment: addresses whether or not a remedy provides adequate protection and describes how risks are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

Compliance with ARARs: addresses whether or not a remedy will meet all of the applicable or relevant and appropriate requirements of other environmental statutes and/or provide grounds for invoking a waiver.

Long-term effectiveness and permanence: refers to the ability to maintain reliable protection of human health and the environment over time once cleanup goals have been met.

Reduction of toxicity, mobility, or volume: is the anticipated performance of the treatment technologies a remedy may employ.

Short-term effectiveness: involves the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

Implementability: is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the chosen solution

Cost: includes capital and operation and maintenance costs.

State Acceptance: indicates whether, based on its review of the RI/FS and Proposed Plan, the State concurs with, opposes, or has no comments on the preferred alternative

Community Acceptance: will be assessed in the Record of Decision following a review of the public comments received on the RI/FS Report and the Proposed Plan.

GLOSSARY

Administrative Record: A file which is maintained and contains all information used by the lead agency to make its decision on the selection of a response action under CERCLA. This file is required to be available for public review and a copy is to be established at or near the site, usually at an information repository. A duplicate file is maintained in a central location, such as a regional EPA and/or state office.

Aquifer: Rock or sediments in a formation which is saturated and sufficiently permeable to transmit economic quantities of water to wells and springs.

ARARs: Applicable or Relevant and Appropriate Requirements. Refers to the Federal and State requirements that a remedy that EPA selects must attain. These requirements may vary from site to site.

Baseline Risk Assessment: An assessment which provides an evaluation of the potential threat to human health and the environment in the absence of remedial action.

Bioaccumulated: The escalating accumulation of toxic materials that occurs within the food chain of an ecosystem.

Carcinogen: Any substance that produces cancer.

Chlordane: A chlorinated, highly poisonous, volatile oil used as an insecticide.

Commissioner's Order: A legal agreement between the State of Tennessee and the PRPs where by the PRPs agree to perform work at the site. The agreement describes actions to be taken at the site.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): A Federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act. The Acts created a special tax that goes into a trust fund, commonly known as Superfund, to investigate and cleanup abandoned or uncontrolled hazardous waste sites. Under the program, EPA can either pay for site cleanup when the responsible parties cannot be located or are unwilling or unable to perform the work, or take legal action to force responsible parties to cleanup the site or reimburse EPA the cost of the cleanup.

Groundwater: Underground water that fills pores in soils or

openings in rocks to the point of saturation. Unlike surface water, groundwater cannot clean itself by exposure to sun or rapid aeration. Groundwater is often used as a source of drinking water via municipal or domestic wells.

Hazardous Substances: Any material that poses a threat to public health and/or the environment. Typical hazardous substances are materials that are toxic, corrosive, ignitable, explosive or chemically active.

Information Repository: A file containing current information, technical reports and reference documents regarding a Superfund NPL site. The information repository is usually located in a public building that is convenient for local residents, such as a public school, city hall, or a library. As the site proceeds through the Superfund Remedial Process, the file at the information repository is continually updated.

Monitoring: The continued collection of information about the environment that helps gauge the effectiveness of a cleanup action.

Potential Responsible Parties (PRPs): This may be an individual, a company or a group of companies who may have contributed to the hazardous conditions at a site. These parties may be held liable for costs of the remedial activities by the EPA through CERCLA laws.

Preferred Alternative: After evaluating and examining the various remedial alternatives, EPA selects the best alternative based on relevant cost and non-cost factors.

Proposed Plan: A fact sheet summarizing EPA's preferred cleanup strategy for an NPL site, the rationale for the preference and reviews of the alternatives presented in the detailed analysis of the remedial investigation/feasibility study.

Resource Conservation and Recovery Act (RCRA): A Federal law that established a regulatory system to track hazardous substances from the time of generation to disposal. The law requires safe and secure procedures to be used in treating, transporting, storing, and disposing hazardous substances. RCRA is designed to prevent new, uncontrolled hazardous waste sites.

Record of Decision (ROD): A public document that explains which cleanup alternative will be used at a National Priorities List site and the reasons for choosing that cleanup alternative over other possibilities.

Remedial Alternatives: A list of the most technologically feasible alternatives for a remedial strategy.

Remedial Investigation and Feasibility Study (RI/FS). Two distinct but related studies, normally conducted together, intended to define the nature and extent of contamination at a site (RI) and to evaluate appropriate, site-specific remedies necessary to achieve final cleanup at the site (FS).

Responsiveness Summary: A summary of oral and/or written public comments received by EPA during a comment period.

Superfund Amendments and Reauthorization Act (SARA): Modifications to CERCLA enacted on October 17, 1986.

Total BHC: A man-made chemical that exists in eight different chemical forms that are used as insecticides. While no longer available, the most commonly used was lincane.

MAILING LIST ADDITIONS

To be placed on the mailing list for the North Hollywood Dump Site, please complete this form and mail to:

Ms. Suzanne Durham
Community Relations Coordinator, U.S. EPA, Region IV
345 Courtland Street, N.E., Atlanta, GA 30365

Name _____

Address _____

Affiliation _____

Telephone _____

United States
Environmental Protection Agency

Region 4
345 Courtland Street, NE
Atlanta, GA 30365

Official Business
Penalty for Private Use
$300

NORTH HOLLYWOOD DUMP SITE

PUBLIC MEETING SIGN IN SHEETS

North Hollywood Dump Site
Public Meeting Sign In Sheet
June 28, 90

Name	Address	Telephone Number	Affiliation	Do you want to be included on the mailing list?	How did you learn about this meeting?
Taylor	USEPA, 345 Courtland St. Atlanta	(404) 347-7791	USEPA	no	—
Terry	8466 E Glendale Ct	901 757-420	Concerned citizen	yes	
MANESS	295 SUMMER, JACKSON	901-423-6600	TDHE-DSF	Yes	—
HOLLAND	"	"	"	"	—
COLLINS	"	"	"	"	—
Burnell	USEPA, 345 Courtland St. Atlanta	(404) 347-7791	USEPA	no	-
Graham	EPA/Community Rel 345 Courtland St Atl	404/347-7791		no	-
Sr.	6459 Chase Rd. Millington, TN	901 872-0654	POW/water watch	Yes	Public Notice
Adams	5752 Rust Rd. Memphis 38127	901/357-2216	POW	"	" "
Adams	" "	"	"	"	" "
Pippin	Ramon 3686 Clearwood Cove Mem				38122
Ruiles	4796 Gwynne 38117	685-0478	Sierra Club	Yes	
Anderson-Cordova	USEPA 345 Courtland St NE	Atlanta (404) 347-7109	USEPA	no	—
W. Hill	"	404-347-7109	"	"	—
Hubbard	2688 Stage Park Memphis 38134	901-372-8183	Kiwanis Club	no.	notice
Goodwin	900 Getwell Rd 38111	458-2521	WKNO-TV	~~no~~ Yes	Pager

Public Meeting Sign In Sheet
June 28, 1990

Name	Address	Telephone Number	Affiliation	Do you want to be included on the mailing list?	How did you learn about this meeting?
PHILIP RODGERS	P.O. Box 13427 MEMPHIS 38113	775-3031	FOUR F CORP	YES	PAPER
Elmer Akin	EPA - Reg IV				
Rodney Ede	City of Memphis				
ART STRAUGHN	3042 Laurence Kirk 38128	358-4002	Scenic Hills	Yes	Paper
Colin Malone	2369 Devonwood 38114	743-1311	MLOE	yes	TV
BRUCE MONTEITH	651 COLBY DR ONT. WAT.	(519) 884-0510	CRA		
Gene Bernstein	1 1st National Pl Chicago, IL 60603	312/857-7000	Sidley & Austin		
Chuck HANSON	4455 Tall Trees Memphis 38117	901 345-1788	Memphis Riv. Center.	Yes	
STEVE RETTIG	5871 ARDWICK DR W MEMPHIS TN 38119		MEC	Yes	
Bruce Varner	1673 Humber's Bluff #262 Memphis, 38119	901-753-0165	Schering-Plough	already on	
Ed Powell	Box 377 Memphis TN 38151	901-320-2630	" "	Sure	notice
Carla Higginbotham	926 Minnow West Memphis AR 72301	501-735-2454	Bryson Ind. Ser	yes	Bruce Varner
Randy Carroll	800 PARK Little Rock AR 72201	501-792-7334	BRYSON Ind. Ser.	Yes	Bruce Varner
George Harrell	2603 Corporate Ave	345-1788	MEC	Yes	Paper/TV, fin
Jim McCalla	N39 Peabody	725-4547		Yes	Paper ...
Linda Logan	Dept. Biology, MSU	678-2955	Memphis State University	Yes	Commercial Appeal

Public Meeting Sign In Sheet
June 28, 90

Name	Address	Telephone Number	Affiliation	Do you want to be included on the mailing list?	How did you learn about this meeting?
Ford Hebert	232 Angelus	274-2212	Commercial Appeal	no	news item
Will Williams	94 N. Willett	274-1866	Counsel	yes	Newspaper
LaChapelle	814 Jefferson	901-576-7582	Health Dept	Yes	TDHE
[illegible]	PO Box 96444 Memphis TN	901-785-3851	IUOE	yes	News
Masten	2369 Airways	7432311	IUOE Local 369	"	News
Flanigan	2742 Central	324-4133		yes	news
Thurbell	2944 Castleman	3634551		yes	Paper
Byrd	4815 Amboy	682-2852		yes	news
J. Fast	2000 PA. Ave. N.W. Wash. DC	202-955-1500	Journal	yes	
T. Wood	8564 W. Park Trail 38137	755-1578	—	yes	Mailing
Fidler	2816 Central 38111	323-9278	League of Women Voters	Yes	mailing + phone call
L. Luley	3736 Winderwood 38128	901 3735565	—	Yes	News

NAMES, ADDRESSES AND TELEPHONE NUMBERS OF THE INFORMATION REPOSITORIES DESIGNATED FOR THE NORTH HOLLYWOOD DUMP SITE

1. Memphis-Shelby County Public Library and Information Center
   1850 Peabody Avenue
   Memphis, Tennessee 38104
   (901) 725-8821
   Contact: Ms. Jan Condren

2. EPA Record Center
   345 Courtland Street, NE
   Atlanta, Georgia 30365
   (404) 347-0506

THE OFFICIAL TRANSCRIPT OF THE PUBLIC HEARING ON THE PROPOSED PLAN FOR CLEANUP OF THE NORTH HOLLYWOOD DUMP NATIONAL PRIORITIES LIST SITE LOCATED IN MEMPHIS, TENNESSEE

North Hollywood Dump Site
Public Meeting Sign In Sheet
June 28, 1990

Name	Address	Telephone Number	Affiliation	Do you want to be included on the mailing list?	How did you learn about this meeting?
Isabel Taylor	USEPA, 345 Courtland St. Atlanta	(404) 347-7791	USEPA	no	—
Jerry Berry	8466 E Glendale Ct	901 757-420	Concerned citizen	yes	
B. MAYESS	295 SUMMER, JACKSON	901-423 6600	TDHE-DSF	Yes	—
P. HOLLAND	"	"	"	"	—
R. COLLINS	"	"	"	"	—
Felicia Barnett	USEPA, 345 Courtland St. Atlanta	(404) 347-7791	USEPA	no	-
Susanne Wilkham	EPA/Community Rel 345 Courtland St Atl	404/347-7791		no	-
Kenny Kelly Sr.	6459 Chase Rd. Millington, TN	901 872-0654	POW/waste watch	Yes	Public Notice
R. Adams	5752 Rust Rd. MEMPHIS 38127	901/357-2216	POW	"	" "
R. Adams	" "	"	"	"	" "
Marjorie Raines	3686 Charlewood Gwyn				38122
Lois Ruiken	4796 Gwynne 38117	685-0478	Sierra Club	Yes	
Ada Anderson-Cooper	USEPA 345 Courtland St NE	Atlanta (404) 347-7109	USEPA	no	—
Ronald W. Hill	"	404-347-7109	"	"	—
Michael T. Huber	2688 Stage Park Memphis 38134	901-372-8883	Kimberly-Clark	no.	notice
Amy Goodwin	900 Getwell Rd 38111	458-2521	WKNO-TV	~~no~~ Yes	Paper

North Hollywood Dump Site
Public Meeting Sign In Sheet
June 28, 1990

Name	Address	Telephone Number	Affiliation	Do you want to be included on the mailing list?	How did you learn about this meeting?
PHILIP RODGERS	P.O. Box 13427 MEMPHIS 38113	775-3031	FOUR F CORP	YES	PAPER.
Elmer Akin	EPA — Reg IV				
Rodney Hall	City of Memphis				
ART STRAUGHN	3042 Lawrence Kirk 38128	358-4002	Scenic Hills	Yes	Paper
Eli Malone	2369 Alemeyer 38114	743-1311	MLOE	yes	TV
BRUCE MONTEITH	651 COLBY DR ONT. WAT.	(519) 884-0510	CRA		
Gene Bernstein	1 1st National Pl Chicago, IL 60603	312/853-7000	Sidley & Austin		
Chuck HANSON	4455 Tall Trees Memphis 38117	901 345-1788	Memphis Univ. Center.	Yes	
STEVE RETTIG	5871 ARDWICK DR #4 MEMPHIS TN 38119		MEC	Yes	
Bruce Varner	1673 Humber's Bluff #202 Memphis, 38119	901-753-0165	Schering-Plough	already on	
Ed Powell	Box 377 Memphis TN 38151	901-320-2630	" "	Sure	notice
Carla Higginbotham	926 Minnow West Memphis AR 72301	501-735-2956	Bryson Ind. Ser	yes	Bruce Varner
Randy Carroll	800 PARK Eagle Ark 72331	501-792-7330	BRYSON Ind. Ser.	Yes	Bruce Varner
George Harrell	2603 Copperah Ave	345-1788	MEC	Yes	Paper/TV, fine
Jim McCall	N39 Peabody	725-4541		Yes	Paper...
Linda Logan	Dept. Biology, MSU	678-2955	Memphis State University	Yes	Commercial Appeal

North Hollywood Dump Site
Public Meeting 8 In Sheet
June 28, 1990

Name	Address	Telephone Number	Affiliation	Do you want to be included on the mailing list?	How did you learn about this meeting?
Floyd Stewart	232 Angelus	274-2212	Commercial Appeal	no	news item
Scott Willhite	94 N. Willett	274-1866	Counsel	yes	Newspaper
J. LaChapelle	814 Jefferson	901-576-7588	Health Dept	Yes	TDHE
Paul Williams	PO Box 96444 Memphis TN	901-785-3851	IUOE	yes	News
J. Martin	2369 Airways	7434311	IUOE-Local 369	"	News
F. Flanigan	2742 Central	324-4133		yes	news
N. Theobald	2944 Castleman	3634551		yes	Paper
K. Byrd	4815 Amboy	682-2852		yes	~~News~~ news
K. East	2000 PA. Ave. N.W. Wash. DC	202-955-1500	Journal	yes	
J. Wood	8564 W. Park Trail 38137	755-1578	—	yes	Mailing
S. Fidlek	2816 Central 38111	323-9278	League of Women Voters	Yes	mailing + phone call
N. Luley	3736 Winderwood 38128	901 3735565	—	Yes	News

NAMES, ADDRESSES AND TELEPHONE NUMBERS OF THE INFORMATION REPOSITORIES DESIGNATED FOR THE NORTH HOLLYWOOD DUMP SITE

1. Memphis-Shelby County Public Library and Information Center
   1850 Peabody Avenue
   Memphis, Tennessee 38104
   (901) 725-8821
   Contact: Ms. Jan Condren

2. EPA Record Center
   345 Courtland Street, NE
   Atlanta, Georgia 30365
   (404) 347-0506

THE OFFICIAL TRANSCRIPT OF THE PUBLIC HEARING ON THE PROPOSED PLAN FOR CLEANUP OF THE NORTH HOLLYWOOD DUMP NATIONAL PRIORITIES LIST SITE LOCATED IN MEMPHIS, TENNESSEE

1
2
3
4
5 PUBLIC HEARING ON THE PROPOSED
PLAN FOR THE CLEANUP OF THE NORTH HOLLYWOOD
6 DUMP NATIONAL PRIORITIES LIST SITE
LOCATED IN MEMPHIS, TENNESSEE
7
8
9
10
11
12
13
14
15 JUNE 28, 1990
16 7:30 p.m.
17 Board of Education
18 2597 Avery Avenue
19 Memphis, Tennessee
20
21
22
23

ORIGINAL

1 P R O C E E D I N G S

MR. TAYLOR: First of all, I would
3 like to welcome everyone to the meeting. My name
4 is Harold Taylor, and I'll be the moderator, if
5 needed, tonight. I'm an employee with the United
6 States Environmental Protection Agency, Region
7 IV. And our office is located in Atlanta,
8 Georgia. From that office we do the federal
9 regulatory affairs for the eight southeastern
10 states. Currently, I am the acting chief of the
11 Tennessee/Kentucky remedial section in the EPA
12 Superfund program.

The purpose of the meeting tonight, as
14 I'm sure you are aware, is to go over and present
15 to you the proposed plan for the remediation of
16 the North Hollywood Superfund Site. EPA has
17 basically planned to present to you and to solicit
18 comments from you. We'll go over a little bit
19 tonight about how we would like to do that.

20 I think the main objective of the meeting
21 tonight is to present to you what that plan is and
22 to tell you how you can get involved in community
23 relations and get involved in the final selection

1 of the plan.

2 If I could just a minute, does everyone
3 have the handouts that were available at the
4 front? There are actually three handouts. One is
5 about a ten page beige document, which is actually
6 a fact sheet on the proposed plan that we'll be
7 discussing tonight. If you don't have a copy,
8 we'll be glad to present you one at the end of the
9 meeting, or if you raise your hand I'm sure
10 someone will get you one. The second is a white
11 document. It basically describes what the
12 Superfund process is. It's a good reference
13 document. The third is basically a two page beige
14 handout which has the agenda for tonight. If I
15 could, I'll ask you to turn to page two of that
16 handout.

17 As you see, we've got about an hour of
18 presentation that we would like to make to you.
19 We would like to go over a little bit of the
20 history of the site, where we currently are with
21 the site as far as the Superfund process, where
22 we're headed with the site, and a little bit about
23 how you can get involved in that process.

We would like to go over the past sampling that's been done at the site. And we would like to go over briefly the risk assessment that was done at the site. We would like to go into a little more detail on the proposed plans, the alternatives that have been considered and the one that we're proposing to you here tonight.

And then we would like to reserve the end of the meeting for questions and answers. We have a number of people here, that I'll go over in just a minute, that surely can answer the majority of your questions for you.

As you notice, there's a microphone in the middle of the room. And, if I could, I would ask you to refrain from asking questions during the presentation, but make note of them. And then after the formal presentation is finished what I would like for you to do is use the microphone so that everyone can hear what your question is and so that we can basically have a record of what your concerns are here tonight.

When you approach the microphone, I would like for you to basically state your name and then

1 the question. If you have a number of questions
2 tonight, because of the number of people that are
3 here, I would like to ask that you at least
4 initially keep your questions to about five
5 minutes per person. If we have more time at the
6 end of the meeting, then we'll go back. If you
7 have more questions, we'll rotate and let you ask
8 your additional questions.
9 At the very end after we're through with
10 your questions if anyone would like to just have a
11 comment, we're here to receive your oral comments
12 today. We do have a stenographer who will be
13 recording your comments for EPA.
14 If I could, I would like to take just a
15 minute to introduce a few of the state and federal
16 people who are here tonight. On my left is
17 Felicia Barnett. Felicia works with me in EPA
18 Region IV in Atlanta. She's the remedial project
19 manager for the North Hollywood site. She
20 basically coordinates all the functions as far as
21 EPA is concerned, and she's the one that basically
22 formats and writes the decision to the agency.
23 Over on Felicia's left -- Elmer, if you

1 could, raise your hand -- is Elmer Akin. Elmer is
2 our risk assessment coordinator. He works in both
3 the Superfund program and the ongoing RCRA
4 hazardous waste program.
5 On Elmer's left is Suzanne Durham. And
6 Suzanne Durham, again, works for EPA Region IV.
7 She's the community relations coordinator for the
8 site. In addition to this site she works all the
9 sites in Tennessee, Kentucky, North Carolina, and
10 South Carolina community relations.
11 Over on my right is Richard Holland.
12 Richard Holland is with the Tennessee Department
1 of Public Health, Division Superfund, and he's out
14 of the Jackson office.
15 Over on Richard's right is Bruce
16 Monteith. And Bruce Monteith is a consultant of
17 Conestoga-Rovers & Associates, and they are the
18 consultants who perform a lot of the remedial
19 investigations at the site.
20 Rudy Collins -- Rudy, raise your hand --
21 is with the Tennessee Department of Public Health,
22 Division Superfund, out of the Jackson office.
23 Betty Manis (phonetically spelled), who

1 is out of the Jackson office, Tennessee Division
2 of Superfund.
3 Linda Anderson-Carnahan. I'll get out
4 that hard name. Linda is with the office of
5 policy and management with EPA.
6 Dave Hill is also EPA Region IV, and Dave
7 is with the groundwater technology unit.
8 Over here on my left, Chuck
9 Pietrosewicz. Chuck is with another federal
10 agency, the Agency for Toxic Substance and Disease
11 Registry. They are basically another agency from
12 EPA that was created to oversee and conduct health
13 assessments at Superfund sites.
14 I think that's basically the people we
15 have here tonight. So I hope that any questions
16 that you have we can answer. Again, let me just
17 briefly go over, before we go into the history,
18 the Superfund process and where we are tonight.
19 As you are well aware, North Hollywood
20 has been a Superfund site for a number of years.
21 Basically the first part of the Superfund process
22 is listing a site on the National Priority List.
23 And North Hollywood was listed in the early

1980's.

2 The second step basically in the
3 Superfund process, if you want to sort of look, on
4 this white handout that I gave you, about the
5 third page, it has a flow chart of the Superfund
6 process. You'll see step three and four of the
7 remedial investigation feasibility studies, and we
8 would like to present to you tonight some of the
9 findings from the studies that have been conducted
10 at North Hollywood.
11 We're basically right in the middle at
12 number five which is public comments. We're here
1 tonight to basically present to you the plan that
14 we're proposing to go over, to answer any
15 questions that you may have, and tell you how you
16 can become involved in that decision making
17 process.
18 The next step after we've solicited your
19 comments will be to formalize the closure plan or
20 remediation plan for North Hollywood, and that
21 will be done so in what's recorded there as number
22 six as record of decision. And that will be
23 signed by the regional administrator of EPA Region

1 IV. It will basically formalize the plan that EPA
2 has used at the site.
3 After the record of decision EPA will
4 basically negotiate with any potential responsible
5 parties that we've identified at the site to do
6 the remedial design. We hope to start the
7 remedial design on the project sometime at the end
8 of this year. Designs can take anywhere from six
9 months to a year to complete. Then the actual
10 remediation will occur at the EPA oversite.
11 There's basically two ways that can
12 happen. One, the potential responsible parties
13 can enter into and consent to a decree with EPA
14 which will be overseen by Federal District Court,
15 or the fund can go ahead and clean up and EPA will
16 hire the contractors and do the work.
17 With that brief introduction, I would
18 like to turn it over to Felicia Barnett who will
19 go over a little bit of the site history and where
20 we are presently with the North Hollywood site.
21 MS. BARNETT: Hello, I'm Felicia
22 Barnett, and I'm the remedial project manager for
23 this site. I'm going to put a photo -- for most

people, I'm sure that you know where the dump is
2 located, but I want to put this on the screen just
3 to look at.
4 The North Hollywood dump was a municipal
5 landfill that was run by the City of Memphis from
6 about the mid 1930's to the mid 1960's. It did
7 accept some industrial waste during that time.
8 And about the late 1970's it was determined that
9 there may be some health concerns. The community
10 was concerned and the state and EPA got together
11 and started working on some investigations of the
12 site. Also at that time a few of the PRP's,
1. potential responsibility parties, that had placed
14 some of the industrial waste in the dump did come
15 in and help us do some study work on the site and
16 paid for some of it.
17 EPA in the early 1980's determined that
18 there was some emergency work that needed to be
19 done to protect the public health, and there was
20 emergency removal of some soil off the site. A
21 technical assistance group was formulated in the
22 early 1980's as the site was put on the National
23 Priorities List. This was mainly a federal EPA

1 program, and the state officials. There were also
2 a few of the potential responsible parties in this
3 group.
4 When this group went out to study the
5 dump and determine what potential hazards were
6 related to it, the studies were done and they were
7 evaluated by EPA. And in 1984 we tried to come up
8 with a remedy for the site. However, upon the
9 review of the data it was noted that we needed
10 additional data to make a final remediation, and
11 we did do the emergency work that was needed.
12 There was a cover that was put on the site by some
13 potential responsible parties of about twelve
14 inches.
15 At that time in 1984 because there was
16 additional data that needed to be done, a
17 supplemental remedial investigation was put
18 together, and there were notice letters sent out
19 to potential responsible parties to come in and do
20 that work. Some of those responsible parties did
21 come forward and were put under a commissioner's
22 order from the State of Tennessee. The State of
23 Tennessee overviewed some more investigative work,

and remedial investigation reports have been put
2 together.
3 In late 1988, because of overview
4 problems EPA took back, over the review of the
5 supplemental remedial investigation and the RI,
6 the feasibility study that was performed.
7 From this data we've come up with a
8 proposed plan that we're presenting to you this
9 evening, and we've reached the point of trying to
10 get to the record of decision for this site.
11 And from here I want to turn it over to
12 Suzanne Durham who will tell you a few things
1 about community relations.
14 MS. DURHAM: I'm Suzanne Durham,
15 Community Relations Coordinator for this site.
16 Community involvement is very important for the
17 Superfund sites and can have a tremendous impact
18 on decisions that are made at these sites. There
19 are nine criteria used in evaluating cleanup
20 alternatives. One of those is community
21 acceptance.
22 The purpose of our meeting tonight is to
23 present the findings of our investigation, to

1 present the alternatives under consideration,
2 EPA's preferred alternative, and then to hear from
3 you, the affected community.
4 We very recently issued a Proposed Plan
5 Fact Sheet, one of these handouts you picked up at
6 the registration table, which summarizes the
7 findings of our investigations. We also sent an
8 administrative record to the Memphis-Shelby County
9 Public Library. This administrative record
10 contains all the documents EPA used in making its
11 preferred alternative decision.
12 I urge you to review those documents, to
13 ask us questions tonight, and to submit written
14 comments to our agency. The comment period begins
15 today, June 28th, and runs through July 27th. If,
16 however, additional time is needed to prepare your
17 comments, we can grant an extension. Your request
18 for that extension must be in the regional office
19 within two weeks of today's meeting.
20 After the comment period closes, we
21 prepare a responsiveness summary which is a
22 document that will summarize your questions and
23 concerns and our responses to those questions and

concerns. After careful consideration of your
2 comments, state comments, our regional
3 administrator will sign a record of decision which
4 will document in detail how we will go about site
5 cleanup.
6 After signature of that record of
7 decision we will place a notice in your local
8 newspaper announcing our decision. And at that
9 point, the record of decision, a responsiveness
10 summary will become a part of the public record
11 and will be included in the administrative record
12 at the library.
An excellent opportunity for communities
14 to become involved in these decisions at sites in
15 their communities is through our Technical
16 Assistance Grant, or TAG program. Congress
17 recognizes that our documents are quite lengthy
18 and highly technical in nature, and we do now
19 offer a community group the opportunity to apply
20 for a grant in the amount of fifty thousand
21 dollars to hire technical advisors to interpret
22 our data. There is more information about the TAG
23 program in the handout that you picked up off the

1 registration table.

2 In summary, the goal of the community

3 relations program is to keep you informed and

4 involved in complex decisions that are made within

5 your community. Felicia and I will be your two

6 contacts at EPA. Our names, addresses, and

7 telephone numbers are in that fact sheet. Feel

8 free to call either one of us at any time.

9 And now Bruce Monteith will talk with you

10 about sampling investigation at the site.

11 MR. MONTEITH: What I would like to

12 do tonight is just briefly summarize the sampling

13 that was completed at the North Hollywood dump as

14 part of the supplemental RI program. The sampling

15 completed was for purposes of generating data to

16 help develop the proposed plan, final

17 remediation.

18 Just to highlight some of the pertinent

19 areas of the site, the landfill itself shown in

20 the green here is approximately seventy acres and

21 is divided by North Hollywood Street. The west

22 sector, which is this side, and the east sector

23 cover approximately the same area.

There is also the abandoned dredge pond
2 off to the east here. Oxbow Lake, which is the
3 original channel of Wolf River which is now an
4 isolated surface water body as a result of some
5 rechannelization of the Wolf River. There's also
6 what's referred to as a beaver pond. It's not
7 shown on here, but it's a small little wet area in
8 between the Oxbow Lake and the abandoned dredge
9 pond. And then the Wolf River, which drains from
10 east to west towards the Mississippi.
11 As Felicia identified, the initial work
12 that was completed was completed by the TAG group,
the Technical Action Group. And there was really
14 two objectives of that group, some short-term
15 objectives, which included some remedial work on
16 the site to secure some areas, and then the larger
17 task was the initial RI/FS, or investigation of
18 the site itself. And that was divided into six
19 task elements which again included some data
20 collections, specifically collecting samples from
21 the Wolf River, the surface water bodies in the
22 area of the site, monitoring well installations,
23 and groundwater sampling, and some surface oil

sampling around the property.

Subsequent to the initial RF that was completed by the TAG there was a determination made that there was some additional data that was required for the site to, again, help develop the final remedy. And this work was completed by the PRP group that Felicia had mentioned, and the specific objectives of that supplemental RI program is listed here. And, again, the PRP group developed a work plan which was designed to collect the additional samples at the site to augment the program completed initially by the TAG.

In order to meet these objectives, the supplemental RI work plan was divided into five specific work tasks: Including sampling of the landfill waste, a hydrogeological investigation which included installation of some additional groundwater monitoring wells, some water level measurements of the Wolf River, and some of the wells on the site, some four rounds of groundwater sampling. There was also surface water and sediment sampling of the Wolf River, some surface

there was a number of wells installed around the
2 area of the site, including three background wells
3 which were to measure the groundwater quality
4 prior to it flowing underneath the landfill, as
5 well as a number of wells located along Wolf
6 River, both on the south side and the north side,
7 to try and find the hydraulics of the groundwater
8 system. The biggest question was whether the
9 groundwater did, in fact, discharge to the Wolf
10 River.
11 The results of the analysis of the
12 groundwater sampling demonstrated that it had
actually confirmed the work that had been done by
14 the TAG group which showed that there were some
15 areas that were impacted by the site directly
16 beneath the landfill and between the landfill and
17 the river and that, in fact, the groundwater did
18 discharge to the Wolf River. There was no flow
19 past the Wolf River.
20 Just to briefly summarize the hydraulics
21 of the system or the groundwater flow condition,
22 this just demonstrates the water is flowing from a
23 north to south direction to the Wolf River.

1 Again, to help put the conditions of the
2 site in perspective, the green is showing the
3 landfill, the waste area. The groundwater that
4 was being investigated was within what's called
5 the fluvial sand unit, and that was the upper
6 aquifer. And it was found to be in direct contact
7 with the waste. And the arrows here show the
8 direction of groundwater flow. And through the
9 series of nested wells around the site, as we've
10 demonstrated, the groundwater flows to the north
11 and then there's an upward flow to the Wolf
12 River.
13 In addition to the groundwater monitoring
14 that was completed at the site there was some
15 sampling of the Wolf River completed at four
16 locations: One being upgrading of the site, two
17 immediately adjacent to the site, and one
18 downstream of site. The river flow is from the
19 east to west direction to the Mississippi River.
20 At each of these locations there was a round of
21 sediment samples collected as well as a round of
22 surface water samples collected jointly for each
23 groundwater sampling round. The results of this

1 sampling did not demonstrate that there was any
2 impact to the surface water and sediment quality
3 in the Wolf River caused by the site.
4 In addition to the sediment samples there
5 was some surface samples collected in the
6 immediate area of the landfill and over around the
7 abandoned dredge pond area. The yellow dots were
8 the surface soil samples initially proposed under
9 the work plan. After that first round of sampling
10 there was a second round proposed, and some
11 additional surface soil samples were collected
12 between these two areas trying to correlate the
13 two areas. The surface soil sampling included six
14 inch intervals down to a depth of eighteen
15 inches.
16 For the surface soil sampling there were
17 isolated locations where some of the site specific
18 constituents were detected at elevated levels, and
19 they were concentrated around the immediate area
20 landfill and at a few locations along the east
21 side of the abandoned dredge pond.
22 And, finally, the last set of samples
23 collected. Again, this was not originally

1 included under the work plan, but they were added
2 to the sampling program while it was being carried
3 out. There were samples collected from the final
4 cover which was placed over the landfill in 1984,
5 and it was decided to collect the surface soil
6 samples at these locations just to try and
7 demonstrate whether the cover placed in 1984 had
8 been effective in securing the site.
9 And the results of the sampling here
10 again showed very isolated spots where there were
11 some site constituents detected, but they were in
12 areas where there had been identified erosional
13 problems when the cap was first put on and over
14 the first year to two years where those erosional
15 problems had gradually been recovered and secured
16 again. So overall the sampling of the cap itself
17 demonstrated it had been effective in securing the
18 site.
19 Elmer Akin will now talk on the risk
20 assessments.
21 MR. AKIN: We're real pleased that
22 there are more of you than there are of us
23 tonight. We have been in situations where we

outnumber the audience. We really appreciate your
2 interest because we've done a lot of work here,
3 and we're very pleased with the site at this point
4 and maybe the end in sight.
5 I want to talk about quickly -- I really
6 want to be here to answer your questions later in
7 the meeting, but I want to just say a few things
8 about risk assessment.
9 There are really two types of risk
10 assessments or health evaluations that are done on
11 any Superfund site and were done on this site.
12 One is called a health assessment, and that's
13 conducted by Chuck's group, ATSDR, the sister
14 federal agency that does a lot of the health work
15 at Superfund sites. The health assessment is an
16 evaluation to determine if there's any ill effect
17 or health hazards to any of the citizens of the
18 community from the site as it now exists. So
19 that's a look at the current situation, to see if
20 anyone is harmed.
21 The part that I do, the risk assessment
22 part, is -- that I'm going to talk about here --
23 is that look at the long range, what effect this

1 site might have to anyone who would come in
2 contact with it into the future. We look at a lot
3 of possibilities of waste that people could be
4 harmed from that site.
5 One of the biggest jobs of risk
6 assessment is to determine what are the possible
7 ways that people could be harmed after long-term
8 exposure to that site. What about kids that might
9 get on that site, climb the fence, or ride their
10 bikes over there, fishing in the pond, dust coming
11 off the site, water getting to the river, all
12 those possible ways, all that we can possibly come
13 up with where people might be harmed. Not that
14 they are, but they might be if this situation
15 happened.
16 That's part of the risk assessment
17 process, and the agency mandates that we do that
18 for each Superfund site. It requires a number of
19 skills to conduct that, toxicologists who know
20 about the toxic effects of chemicals, people like
21 Dave and Linda who are involved in the ecology or
22 the movement of waters, hydrogeology, and that
23 type of thing to evaluate the possibility of

contamination as it goes there.

We think we've done a thorough evaluation of this site relative to the possible future exposure-ways, pathways. And we think, from the work that Bruce has talked about, the site has been characterized from the standpoint of what types of hazardous substances are there.

And you have kind of a brief summary of the risk assessment -- everyone does have this, right? The risk assessment is a technical report, but we try to make it so it's understandable. And I'll certainly be here this evening to answer any questions you might have about the risk assessment. Thank you.

MS. BARNETT: I want to get back up here and discuss the alternatives that we have looked at for this site and the preferred alternative that we've done. One of the things that I think should be said is the majority of the contaminants that we found to be of a concern when we were evaluating the site were pesticides and metals. These are relatively nonmobile. However, they do have some high toxicities associated with

1 them.

2 During the RI and the FS, the RI samples

3 the site, identifies contaminants that we have

4 problems with, and the risk assessment is done to

5 determine areas that can have a long term risk.

6 And then, as part of the feasibility study, the

7 feasibility study also evaluates different

8 alternatives for the site using nine criteria that

9 EPA uses. One of which, if you can see, is

10 community acceptance.

11 The nine criteria are the overall

12 protection of human health in the environment,

13 compliance with what we call applicable or

14 relevant and appropriate requirements -- which are

15 really basically local standards, federal

16 standards, laws, regulations -- production of

17 toxicity, mobility of volume, the short-term

18 effectiveness of the remedy, the implementability

19 of the remedy or how easily it can be done or how

20 hard it is going to be or what kind of problems we

21 might run into, the cost, state acceptance and

22 community acceptance, and long-term effectiveness

23 and permanence.

1 I'm using these criteria. The
2 feasibility study evaluates alternatives, looks at
3 different alternatives for the site and comes up
4 with the most feasible. On the North Hollywood
5 dump site it was determined that there are
6 actually two areas of concern that needed to be
7 addressed. One of which is the landfill itself
8 and the groundwater underneath it coming in
9 contact with it. The other is the abandoned
10 dredge pond and Oxbow Lake.
11 There are alternatives for both. I'm
12 going to discuss the landfill first, and then I'm
13 going to discuss the pond and the sediments. The
14 landfill did not during the risk assessment show
15 any immediate risk to the community now that the
16 twelve inch cover has been placed on it. However,
17 when going through the criteria, one of the things
18 that that covers is it doesn't even meet standards
19 for municipal landfills. Another thing is that we
20 couldn't guarantee the permanence of it because it
21 is a cover that's not as large as we think it
22 should be.
23 So we reviewed alternatives to deal with

1 those problems. And of those we came up with four
2 separate alternatives. We also have the
3 groundwater underneath it that has to be
4 reviewed. One of them is no action. That's done
5 on all Superfund sites, and it's a basis for
6 comparison. The second alternative is a low
7 permeability cover. The third is a low
8 permeability cover with containment of the
9 groundwater by extraction wells. And the fourth
10 is a low permeability cover with containment by a
11 barrier wall.
12 These alternatives are mentioned on page
13 four of your handout. And the criteria are
14 mentioned on page nine so that you can go back and
15 evaluate. A discussion of those criteria and how
16 they fit with these alternatives goes from page
17 four to page six.
18 Upon review of the criteria and basing it
19 on the risk assessment, the shallow groundwater
20 going into the river is presently not having a
21 major effect on the river. So it was determined
22 that all the groundwater needed was monitoring and
23 that extraction by the wells was not necessary.

1 However, upon reviewing the criteria we did
2 determine that there still wasn't permanence with
3 the cap, nor did it meet regulatory standards. So
4 the low permeability cover was the preferred
5 alternative by EPA for the landfill.
6 For the dredge ponds and the Oxbow Lake
7 there was a risk associated with eating fish over
8 the long-term from that site, continuous
9 consumption of fish taken from those ponds.
10 Because of that problem and the risk associated
11 with it, six alternatives were evaluated using the
12 criteria to address the fish in the pond and the
13 sediments where the contamination was coming
14 from.
15 Alternative number one is no action.
16 Number two is a periodic harvesting of the fish so
17 the people wouldn't be eating contaminated fish.
18 Dredge with containment on east sector of the
19 landfill, which is basically dredging of
20 contaminated sediments from the bottom of the pond
21 and placing them on the landfill underneath the
22 cover. The fourth alternative is in-place
23 containment with a hydraulic fill, a wet sediment

1 fill. And the fifth is in-place containment by
2 rerouting of the Wolf River. Six was excavation
3 and containment on the east sector of the landfill
4 for the shallow areas and a hydraulic containment
5 of the lower areas of the ponds.
6 These were evaluated as well using the
7 nine criteria, and from that alternative four was
8 chosen as EPA's preferred alternative. This was
9 based on the fact that the short-term effects of
10 doing this would be a great deal less than it
11 would be for excavation or any type of rerouting
12 of Wolf River.
13 Excavation would, of course, bring
14 contaminated sediments to the surface and possibly
15 cause problems with short-term exposure to people
16 where there are sediments.
17 The periodic harvesting of the fish was
18 not really a permanent solution to the problem.
19 And no action obviously is not doing
20 anything permanent for the risk associated with
21 the site.
22 But the in-place containment by rerouting
23 of the Wolf River had a lot of problems, including

meeting the Corps of Engineers standards. The implementability of that would be very hard to do.

I'm going to put up a photograph of the site showing you the areas that would be covered by the landfill cover. This is the dump here. This area would all be covered by a two foot cover. The edges here that are dark would have peg sod and matting placed around it in certain areas. They are to control erosion problems because those areas are next to the river and have flood problems. There are areas along here and the edges next to the river that we will be moving into the center of the dump. There is no great difference between contamination in the dump and along the edges. However, because of erosion problems we want to put them in a more containable place.

For the dredge ponds and the lake, the large area is the dredge pond. The lighter area that you see would be mechanically placed fill. Whereas, just an area of hydraulic sediments here would be placed along the edges. All of this

1 would be mechanically placed in Oxbow Lake. There
2 would also be a Geofabric placed along the edges
3 that were more likely to slide or move to hold the
4 sediments in place and contain the landfill and
5 the dredge ponds.
6 And we'll start the question and answer
7 session, and Harold will be our moderator.
8 MR. TAYLOR: Surely you've got a
9 question, someone.
10 MR. KELLY: My name is Kenny Kelly.
11 I'm with the people of Woodstock, Incorporated.
12 I've been watching this site pretty extensively
13 for at least years now. And, first off, I would
14 like to make a comment. I think the whole
15 situation has been a farce. The U.S. EPA who
16 couldn't find the so-called hot spots on the North
17 Hollywood dump until Dr. David Wilson came down
18 from Vanderbilt University and, with his own
19 sampling and analysis, identified them. And then
20 it got on the list. Y'all were tripping all over
21 the hexachlorobenzene and didn't even see it
22 there.
23 Second off, I have a question, and then

I'll sit down and give somebody else a chance. If
2 nobody else wants one, I've got more. Why are we
3 only considering a twenty-four inch cover? What
4 is this cover consisting of? And is it my
5 understanding it's an acceptable cover for a
6 sanitary or so-called municipal landfill? We're
7 dealing with a hazardous site here.
8 MR. TAYLOR: I'll try a stab at
9 that. We've basically classified the North
10 Hollywood dump, although there are some industrial
11 wastes there -- and I think everyone is well aware
12 of that -- we've classified it more as a municipal
waste landfill than a hazardous waste landfill.
14 The borings that were done at the site
15 largely found washing machines, tree stumps,
16 burned debris, ash. As you well know, it was an
17 open burning dump for a number of years. So under
18 our classification we basically feel that closing
19 the landfill as a sanitary landfill is the most
20 appropriate regulation to close the landfill
21 under.
22 Clay is put on there because that's
23 basically the method which you use to close a

1 sanitary landfill. I think you should also take
2 into account that the North Hollywood dump, that
3 the bottom is basically placed on sand and gravel,
4 but closed pretty readily to the Wolf River. So
5 you are basically not looking at a cap doing a
6 whole heck of a lot of good except for keeping
7 some percolation out of the waste and keeping
8 people from coming in contact with the waste.
9 So I think that's primarily why the clay
10 cap was chosen over what you might call a RCRA
11 engineered cap with multiple layers or those kinds
12 of things. It really wasn't thought to be that
13 much of an advantage.
14 MR. STRAUGHN: I'm Art Straughn. I
15 have a couple of questions to clarify. One, the
16 hydrodynamics of the situation, the flow of the
17 groundwater, it appears that the groundwater that
18 came off of the dump just went to the Wolf River
19 and no further, is that correct, from the
20 viewpoint you just showed on -- your engineer
21 showed?
22 MR. TAYLOR: Perhaps I can get Dave
23 Hill to address that, if you would, Dave.

MR. HILL: We looked in detail at
2 what happens to the groundwater after it goes by.
3 And we're very concerned that we don't want this
4 to get into anyone's drinking water aquifer. We
5 looked carefully at the deeper aquifer that the
6 City of Memphis gets its water supply from. And
7 as you may know, the U.S. Geological Survey has
8 made a detailed study of some windows between the
9 superficial sands and the lower aquifer.
10 In the broad -- more than the Memphis
11 area. It's kind of the West Tennessee area. And
12 there are some interconnections, but in the area
13 of -- a large area -- well, around the North
14 Hollywood dump there is at least -- I forget the
15 figure, but there's one or two hundred feet of
16 clay that's protecting the underlying aquifer from
17 anything that would come down from the dump.
18 Now, within the superficial sands itself,
19 if you remember from the diagram that was set up
20 here, the flow lines came up. What we see
21 actually is an increased head where the lower --
22 and we actually detect the pressure gradient is
23 from the deeper... Toward the surface. So the

1 water is actually flowing up toward the river from
2 both sides of it.
3 And because of these two considerations
4 there is a good clay layer aquifer, we call it,
5 that separates the good drink water aquifer below
6 from the impact of -- the flow lines clearly show
7 that it was bringing it to the Wolf River.
8 MR. STRAUGHN: Why is it then that
9 they have the contaminated signs on the ponds that
10 are north of the interstate from there, apparently
11 they have found contaminated fish in those ponds
12 in the past?
13 MR. HILL: There is significant
14 contamination here, and we wish it was only
15 attributable to this site, and we can get a handle
16 on it just from dealing with this site. But we've
17 done upstream and downstream studies and we've
18 found contamination both upstream and downstream
19 in the fish.
20 MR. STRAUGHN: But north of the
21 interstate there is some ponds that are a good
22 half a mile to a mile north, and they have in the
23 past been found to contain contaminated fish.

Where would that contamination be coming from?

MR. HILL: Felicia is just running over with answers. Here she is.

MS. BARNETT: When the studies were done -- those ponds do sit next to the dump. That's coming from sedimentation back when the site was eroding. The Wolf River would flood back over the site back before the covers were put on it, and the superficial contamination was being pushed back into those ponds.

MR. STRAUGHN: North of the interstate?

MS. BARNETT: North of the interstate?

MR. STRAUGHN: Yes.

MS. BARNETT: I'm not familiar with which ponds you are talking about then.

MR. STRAUGHN: There are some small ponds north of the interstate that have had signs posted from the Health Department indicating contamination.

MS. BARNETT: Those, as far as we can tell, are not related to the site. I think

1 what he said is true. There are other sources of
2 contamination in this area. And the river when it
3 floods back is carrying contamination into any
4 ponds it may flood into because the river itself
5 is posted no fishing as well.
6 MR. STRAUGHN: But earlier you
7 seemed to indicate that the Wolf River is no
8 longer being contaminated from the dump.
9 MS. BARNETT: The contamination from
10 the dump is not affecting the Wolf River, but the
11 Wolf River does have contamination in it. As a
12 matter of fact, you know some history of the Wolf
13 River. It has been closed for fishing many miles
14 upstream of the North Hollywood dump. They just
15 opened a section of it recently again for fishing,
16 and in an area that's north of the dump.
17 MR. STRAUGHN: But you are saying
18 that the Hollywood dump does not present a
19 potential hazard for fishing in the Wolf River
20 now?
21 MS. BARNETT: The North Hollywood
22 dump is not adding a potential hazard to the Wolf
23 River, no, from the dump itself. But there are

problems with the Wolf River as far as things that
2 have gotten into it. The flow coming from the
3 dump -- like I said, the contamination is mostly
4 pesticides and metals. Those do not move readily
5 in water, and that is not one of the major
6 contaminants that are affecting the fish in the
7 enclosure of the Wolf River now.
8 MR. STRAUGHN: So you've presented
9 to us this evening a picture of a relatively low
10 risk associated with the Hollywood dump. Why are
11 you going to do anything at all?
12 MS. BARNETT: Well, like I said,
13 there is a low risk, but it does hot meet
14 regulatory standards. And there is the risk that
15 the cover that's been placed on it from a direct
16 contact standpoint is not permanent. Although it
17 is not affecting the river, we do have a backup.
18 We are going to be monitoring the groundwater
19 that's going from the dump into the river. And
20 right now we don't see a problem, but we will be
21 monitoring it and there is a backup should that
22 groundwater increase. We don't expect it to. But
23 should it happen, we can go in and treat the

1 groundwater so it doesn't go into the river.
2 MR. STRAUGHN: The alternative you
3 had for taking care of the Oxbow Lake and the
4 dredge lake, I wasn't sure -- are you going to
5 actually fill them in completely or put a --
6 MS. BARNETT: No. It's a cover.
7 It's about three feet of cover.
8 MR. STRAUGHN: On the bottom of the
9 lake?
10 MS. BARNETT: On the bottom of the
11 lake, yes.
12 MR. STRAUGHN: Keep anything from
13 seeping up into --
14 MS. BARNETT: Yeah. Right. It will
15 keep biota, the fish, from coming in contact with
16 plant life growing in a contaminated area. And
17 fish bio-accumulate certain types of compounds,
18 and one of them happens to be pesticides and -- or
19 some of these pesticides. The one that we found
20 was chlordane, and it is bio-accumulable. Small
21 concentrations can get bio-accumulated. Fish eat
22 from the same area over and over and over again.
23 And we will be covering the bottom of those ponds

to deal with that problem.

2 MR. STRAUGHN: And so those people
3 who did fish in those ponds could be assured that
4 they would not be contaminated if they ate the
5 fish?

6 MS. BARNETT: There will be
7 restrictions on the ponds until -- we will be
8 studying the fish on a periodic basis. The level
9 should go down and the fish -- when we cover the
10 bottom over, then they will be acceptable for
11 fishing.

12 However, there is also the alternative
13 that -- and we want comments on this -- if there's
14 people who are not going to obey those signs and
15 stuff, we could go in after we cover the ponds and
16 remove the fish and restock it. Although, they
17 are private ponds right now and supposedly only
18 the people that own them are supposed to be
19 fishing out of them. But should the community
20 indicate to us that there is a vast majority of
21 the people fishing out of those ponds right now,
22 we can go in. And when we do this bottom
23 sediment, we'll go ahead and remove the fish

1 immediately.

2 MR. STRAUGHN: What would be the

3 time frame then you would expect to clear up the

4 problem so that fishing would be safe?

5 MS. BARNETT: The time frame for if

6 we put in the sediments and cover them as is now

7 and don't remove -- some of the fish will have to

8 be removed anyway, especially the larger ones,

9 because we will have to lower the level of the

10 lake and the dredge ponds. If sampling shows that

11 there is no problem with those that are left

12 behind, then fishing would be immediate. However,

13 the life span of the fish that are contaminated

14 would be the time, which would be about five

15 years, before fishing could be resumed.

16 MR. STRAUGHN: Thank you.

17 MS. LOGAN: I'm Linda Logan (court

18 reporter requested name repeated for

19 clarification). I've been working on the

20 mobilization of chlordane at the North Hollywood

21 dump project (court reporter requested Ms. Logan

22 to speak up and repeat what was said). And while

23 I agree that chlordane is essentially a

1 (inaudible) compound, I'm certainly concerned
2 about its mobilization in the downgrading
3 groundwater, which we know has elevated,
4 dissolving any (inaudible) kind of
5 concentrations. And certainly any kind of a
6 compound, it's apparent absorbability is going to
7 be increased because it's all absorbed in the
8 (inaudible). I wanted to get a few comments on
9 that, please.
10 MR. HILL: We have been particularly
11 concerned with chlordane. As Bruce knows, we've
12 commented back and forth between ourselves a lot
13 about that. In the sampling that's been done in
14 the past, that's what we're basing our results
15 on. It showed that the levels of the groundwater
16 were below any that would significantly affect the
17 Wolf River to make it follow the criteria that EPA
18 has set up -- with a few exceptions and just a few
19 samples -- where chlordane was above the standards
20 we were setting.
21 And we realize, as you said, that
22 although something in its purest state can be
23 fairly immobile and absorbed into the soil, there

1 are many factors that can make it more mobile. So
2 we are very concerned about that. And because of
3 that, we're setting up a network of wells, that
4 Bruce touched on, along the river to measure --
5 and these will be monitored regularly -- for the
6 concentrations of these contaminants in the
7 groundwater.
8 And this will be kind of a double-edged
9 sword. If we find there is no problem, then we
10 can gradually reduce the monitoring frequency. If
11 we find there is a problem, we're going to
12 increase the frequency. I mean, if there's a
13 suggestion of a problem, we're going to increase
14 the monitoring of the frequency so we can
15 determine for sure -- if we're actually causing a
16 violation of the standards that would affect the
17 Wolf River above our water quality criteria, then
18 we're going to require that action be taken,
19 whether it's -- it'll probably involve some
20 extraction of groundwater so we can get back below
21 these levels.
22 We'll be watching chlordane very closely
23 because that's the number one problem we find.

1 MR. TAYLOR: I would like to just
2 stress, too -- and I don't think we've made this
3 really apparent tonight -- that we do have a
4 contingency which will be in the record of
5 decision that the proposed panel will discuss.
6 And should the levels exceed some of the health
7 based or aquatic based levels we'll be looking at,
8 that pump and treat can be implemented without
9 having to go back and do another rod, do another
10 feasibility study, those kinds of things.
11 So we will have a backup plan should
12 those levels be of concern. That plan will be to
13 basically contain the water on site, to pump and
14 treat and discharge to the municipal treatments.
15 MR. KELLY: I've just got a head
16 full of questions about this site. You'll have to
17 excuse me. One of them I've heard, looking at the
18 different studies of health consequences, somebody
19 may climb over the fence. Why should we have to
20 climb over the fence when the fence does not go
21 around North Hollywood dump? I would like to
22 bring it to the attention of the U.S. EPA that the
23 fence ends behind the residences and is basically

1 just a cosmetic approach to dealing with the
2 landfill.
3 I don't remember the specific year at
4 this point in time, but you've mentioned the
5 different shallow wells that were placed on that
6 site. I was on site as a member of the Memphis
7 Area Environmental Task Force, Investigative
8 Subcommittee, when the United States Geological
9 Survey was putting wells in on the west side of
10 the North Hollywood dump, at which point while I
11 was on the site they did not hit clay in one of
12 their auger holes. That point has never been
13 mentioned in any study that I've seen. I haven't
14 gotten to the library yet, so I don't know if it
15 is in the one that you've got now.
16 Terry Cochran (phonetically spelled)
17 explained that they brought another auger on the
18 next day, moved fifty or seventy foot away, dug a
19 hole and they hit clay. But that auger that did
20 hit that clay layer that day had already dug two
21 or three wells previously that morning before it
22 hit clay.
23 So basically my comment is that I do not

1 see any investigations to date that prove that
there is not a direct hydraulic connection via
3 stained windows between the contaminated shallow
4 aquifer and Memphis drinking water supply.
5 I heard a statement made that the Wolf
6 River is not being contaminated by the North
7 Hollywood. Then how did the chlordane get in the
8 fish? Does anybody have a response to that?
9 MR. TAYLOR: There are several
10 questions there.
11 MR. KELLY: Several comments. One
12 question.
13 MR. HILL: We're not saying that the
14 North Hollywood dump has not impacted the Wolf
15 River. I think it clearly has. That's why we're
16 here. It appears that the impact has decreased
17 significantly over the, as you point out, years
18 we've been looking at this site.
19 It's our hope that when we take the
20 actions that Felicia has talked about, put the
21 cover on and stabilize the size, that the impact
22 will further decrease. As we calculate the impact
23 now, we impact -- although it is an impact, the

1 impact is below the levels that EPA has set to
2 regulate in the water quality criteria. These are
3 extremely low levels based on some very sensitive
4 organisms that EPA geologists have looked at in
5 detail.
6 There are apparently other sources.
7 We've not been able to pinpoint any significant
8 point source. But as you well know, chlordane is
9 used in almost every home site in the past for
10 termite control. So we're not saying the Wolf
11 River is crystalline. We're not quite that dumb.
12 We realize there are lots of sources of
13 contamination.
14 The North Hollywood dump is a single site
15 that we can put or draw on a map and approach with
16 our procedures here. But the way the whole
17 process works is we go after the -- you'll notice
18 our term -- potential responsible parties, but we
19 can't hold them responsible for something that's
20 outside their jurisdiction. We realize there are
21 other sources. We're trying to address the one
22 that's here.
23 If you know of any other significant

1 sources -- this is one we've been beating on
2 people for a long, long time -- tell us about
3 them. We can follow what we can find. It's not a
4 river based study. We can't go and -- we're not
5 studying the river all the way up. We're trying
6 to isolate what comes from this source so we can
7 get this under control.
8 MR. TAYLOR: I think we've glossed
9 over a few things tonight. The fence will be
10 upgraded and, of course, maintained as part of the
11 remedy.
12 MR. KELLY: One decade later. It
13 only took a decade to get that fence completed.
We're really making progress.
15 MR. TAYLOR: We share your concern
16 over the length of time it has taken to get this
17 site addressed properly.
18 MR. MALONE: I'm Ellis Malone. I'm
19 with the Operating Engineers. You say you are
20 going to move some of the material on the north
21 side of the landfill next to the river and bring
22 it in through the middle and bury it, is that
23 right?

1 MR. TAYLOR: Yes, sir.
2 MR. MALONE: What level of material
3 cleanup will that be?
4 MS. BARNETT: It's a low level
5 contaminated material we will use.
6 MR. MALONE; Will it be B, C?
7 MS. BARNETT: We will do a safety
8 plan to evaluate exactly what it will be. It
9 won't be level A.
10 MR. MALONE: Oh, I didn't figure it
11 would be.
12 MS. BARNETT: It will probably be, I
13 would say, at least C to B level, depending on
14 which area we're doing. But it will be moved and
15 placed into a better empty cover.
16 MR. MALONE: Before the contract is
17 ever led, you will have the level of material?
18 MS. BARNETT: Yes. We'll know what
19 level we'll need before we do that.
20 MR. TAYLOR: That will be part of
21 the design, basically to determine what health and
22 safety needs are needed during the remedial
23 action.

1 MR. KELLY: Is the U.S. EPA aware
that the State of Tennessee has issued a national
3 pollution discharge elimination permit, NPS, to a
4 local factory to allow them to discharge water
5 into the abandoned dredge pond?
6 MR. TAYLOR: I'm not aware of that.
7 MR. KELLY: I wasn't either until
8 just a few days ago.
9 MR. TAYLOR: Could you give us a
10 little more detail?
11 MR. KELLY: We've got some people
12 from the state, the Department of Health
13 Environment, perhaps they can give you some more
1 detail. That's what they get paid for. It's a
15 cotton seed oil company down the road on Chelsea
16 Avenue who has been discharging contaminated
17 material. They just recently got an NPS permit
18 modification which called for -- and I believe
19 there's a commissioner's order on it, so I don't
20 know why it's such a mystery to everybody.
21 MR. TAYLOR: I think what they're
22 saying is it's a different division, but we'll
23 certainly look into that for you. We certainly

1 appreciate you bringing it up. Are there any
2 other questions?
3 MR. KELLY: Why didn't we hold this
4 meeting at Shannon School next to the North
5 Hollywood dump? Maybe we would have gotten some
6 participants from the neighborhood that are
7 possibly being affected by the landfill.
8 MS. BARNETT: We knocked on doors in
9 the neighborhood. We sent fliers to all of those
10 people. We didn't hold it at Shannon School
11 because this setup was a better setup for a
12 community meeting. The school really wasn't a
13 good place to have a meeting and be able to get
14 microphones and be able to set up and hear all the
15 comrents easily. Those people were notified.
16 MS. BELL: Is this the flier, when
17 you say you sent fliers out in the community?
18 MS. BARNETT: Yeah, we mailed them
19 out to people. We knocked on doors. I sent
20 people out --
21 MS. BELL: I received a copy in the
22 mail, and I was a little bit concerned. It's a
23 good document, but it's a technical document, and

1 we acknowledge that. So those residents in the
area would not understand not one iota of this
3 type information. And I'm not being critical. I
4 guess at this point the question I'm raising is
5 whether or not there would be some provisions for
6 the people from the community -- it seems to me I
7 remember some years ago some provision in
8 Superfund that would allow for some community
9 ground or something to be made available so --
10 MS. BARNETT: Yeah -- if you could,
11 come up to the microphone and tell her your
12 name -- there is, and I'll let Suzanne address
13 that.
MS. BELL: My name is Carolyn Bell,
15 and I'm a concerned citizen. And since the
16 gentleman brought the question up, I was just
17 following up on the fact the information here is
18 very technical and it does not limit itself to the
19 residents that live around the Hollywood dump. So
20 I was wondering if there would be some provision
21 available for those residents to perhaps hire
22 their own consultant to sift through this
23 information and present it to them in a manner in

1 which they would be able to understand.

2 MS. DURHAM: Thank you, Carolyn.

3 Yes, we do have a Technical Assistance Grant

4 program available. It is a little complicated,

5 and it takes a lot of time. We do have people at

6 EPA who can come into this community and sit down

7 with those people and help them fill out their

8 application and walk them through the process.

9 They need to be incorporated. They need to send a

10 letter to EPA stating that there is a group

11 interested in a TAG grant, and then we will send a

12 package and get back with them.

13 If anyone is interested in applying for a

14 Technical Assistance Grant, they need to submit a

15 letter of intent. And they can submit it to my

16 attention and I'll get back with them.

17 MS. BELL: And then if someone does

18 submit, and as you do go through this process,

19 will this delay your response period? I see the

20 period is one month.

21 MS. DURHAM: No, it won't delay that

22 at all. And, unfortunately, this is a little

23 misleading, offering the Technical Assistance

1 Grant now. It really won't help much at this
2 point, but this process will go on for two, maybe
3 three years. So they will still have an
4 opportunity to participate. It will take
5 approximately four months to get the grant on
6 board, and hopefully our record of decision will
7 be signed by then.
8 MS. ADAMS: Clara Adams, and I'm
9 with the people of Woodstock. We would like to
10 have one of those fifty thousand dollar grants to
11 study our neighborhood, if we can get it.
12 MS. DURHAM: Would you submit a
letter of intent to the agency? And we'll send a
14 grant application.
15 MS. ADAMS: Yeah.
16 MS. DURHAM: This document is in
17 your package of handouts. Ma'am, there are some
18 restrictions on the fifty thousand dollars.
19 Okay. Call the agency and we'll get you started
20 on it.
21 MR. POWELL: Ed Powell. I'm a
22 little concerned about the chlordane runoff. I
23 was wondering why every stream in Tennessee

1 doesn't have fishing restrictions if we're worried
2 about runoff. On your chart with the red and
3 yellow dots and so forth -- I guess it was Bruce's
4 question -- I only saw one sampling point north of
5 the Wolf River. How many actual sampling points
6 were north?
7 MR. MONTEITH: There was the one
8 sampling point north of the Wolf River. What we
9 were trying to demonstrate with these was the
10 hydraulics of the system. The groundwater did
11 discharge to the Wolf River. So we were able to
12 do that with nested wells primarily on this area
13 of the site. We're concentrating on monitoring
14 the site itself.
15 But by locating the one well on the north
16 site of the landfill -- that's the well that also
17 demonstrated that there was the upward grading and
18 the groundwater discharging up into the Wolf
19 River -- we are finding it consistent with what we
20 found on the south side. It was felt only the one
21 site was required on the north side of the
22 landfill. Once we define the hydraulics of the
23 system, the one site was adequate.

1 MR. POWELL: For the level you were
checking the hydraulics out there, there were a
3 number of hydraulics?
4 MR. MONTEITH: Right.
5 MR. POWELL: Of course, we don't
6 really know -- knowing the hydrogeology and the
7 holes we discovered out at Carrier air
8 conditioning or somewhere, we don't really know
9 that a lot of this isn't going straight down?
10 MR. MONTEITH: Well, at this site
11 and partially in response to Mr. Kelly's comment
12 about them not finding any clay -- I'm not sure
where he's getting that information. Once I think
14 he has an opportunity to read the supplement RR
15 report and review the boring logs for the site
16 he'll see that we did, in fact, hit clay at every
17 location that we drilled at the site.
18 MR. KELLY: No, sir, you didn't. I
19 was an eyewitness.
20 MR. MONTEITH: And that will also go
21 into details in describing the hydraulics.
22 MR. POWELL: I'm a little surprised
23 that you got the upperward hydraulics on both

1 sides of the Wolf River, which is normally formed
2 by a softer area. It seems a little strange, but
3 yet I assume the clay bed keeps it from crossing
4 the Wolf River?
5 MR. MONTEITH: Well, again, without
6 getting into a lot of detail -- I don't know if
7 you've had an opportunity to read the document,
8 but it goes into a lot of detail in describing the
9 geology of the site and the hydraulics at the
10 site. And I think once you see the way it is
11 presented there, that it will become clear to you
12 that we're dealing with the fluvial sands of the
13 site here. And all the monitoring that we have
14 done here demonstrates that the clay is continuous
15 from each site and that there is discharge to the
16 Wolf River.
17 MR. POWELL: You have one other
18 chart up there that showed elevation of the site.
19 I was just wondering how exaggerated that was. It
20 looked like a little mound.
21 MR. MONTEITH: It is an exaggerated
22 scale. Again, to fit it on to the drawing there
23 is an exaggeration to that scale. Again, if you

1 are familiar to the site, the site is relatively
2 flat.
3 MR. POWELL: But basically it is,
4 however, higher in elevation than the surrounding
5 areas?
6 MR. MONTEITH: The surrounding areas
7 surrounding the Wolf River.
8 MR. POWELL: The Oxbow Lake and
9 dredge ponds and so forth around it, they appear
10 to be higher.
11 MR. MONTEITH: Yes.
12 MR. POWELL: The landfill is
obviously very permeable. But a barrier wall that
14 they've mentioned in alternative four, I've seen
15 it a variety of different ways, how would they go
16 about constructing a barrier wall if they decided
17 to?
18 MR. MONTEITH: Well, that was one of
19 the things that was evaluated under the
20 feasibility study. Felicia ran through a number
21 of criteria that evaluate the technologies. And
22 one of the difficulties with the barrier wall,
23 this site, was the constructability of that. To

1 avoid having to -- there would be difficulty
2 potentially trying to dig through the waste itself
3 which creates problems itself with the
4 construction of it, significant elevation and
5 changes around the perimeter of the site also
6 creates difficulty.
7 There are a lot of problems associated
8 with that barrier wall. That's why there was
9 the -- if there is a need to do any further work
10 down the road, the hydraulic pumping is the
11 preferred alternative to the barrier wall. It
12 will serve the same purpose, preventing discharge
13 to the Wolf River.
14 MR. POWELL: Did I understand that
15 y'all did run a well down to the Memphis aquifer
16 which is about a five hundred to a thousand feet?
17 MR. MONTEITH: Under this study that
18 wasn't done.
19 MR. POWELL: It was not?
20 MR. MONTEITH: It was not done under
21 this study.
22 MR. POWELL: Good. Because I'm
23 worried about putting a well through this land.

1 It would contaminate this.

MR. MONTEITH: When I say under this

3 study, I mean under the supplemental RI program

4 which we were directly involved in that was not

5 carried out. But there was sampling done under

6 the TAG study of wells within the area that were

7 done in the Memphis sand.

8 MR. POWELL: The Memphis wells?

9 MLG&W wells?

10 MR. MONTEITH: Wells within the area

11 of the site, Memphis area, that were in that

12 aquifer. And they were set up.

13 MS. LOGAN: Linda Logan from Memphis

14 State again. Is there not some evidence that

15 severe pumping from some of the groundwater wells

16 has actually now caused some of the groundwater to

17 actually be able to go from the surface aquifer to

18 the confined aquifer? Somewhere I seemed to have

19 read this, or I think it was an article that was

20 in the Commercial Appeal about a month ago based

21 on some work that was done by the civil

22 engineering department at Memphis State.

23 MR. HILL: I'm not familiar with the

1 study you are talking about in particular, but I
2 do remember looking at the geological survey
3 report where they indicated that there are some
4 areas in the overall larger Memphis area where
5 that would be possible, and I would imagine it
6 would be those areas. It's not in this particular
7 dump site area because of the clay layer there.
8 Even the tremendous amount of overpumping of the
9 aquifer wouldn't change the local hydrogeology
10 right through the river side.
11 As far as the rainwater feeding the Wolf
12 River, it doesn't take a clay finger down there to
13 convert it up. It's simply the concept that the
14 river is draining groundwater as opposed to being
15 a discharging river which would feed the
16 groundwater. If it was feeding the groundwater,
17 that groundwater we've shown flowing from south to
18 north would clearly flow under. But since it's
19 draining the groundwater, it is just the hydraulic
20 flow is all that is needed to ride it out through
21 the river.
22 MR. KELLY: I'm not a hydrologist.
23 I'm not an environmentalist. I'm not a

1 scientist. But I know the Wolf River rises. And
when the Wolf River gets high at flood stages is
3 it not possible it is recharging this contaminated
4 shallow aquifer? It's a situation that works both
5 ways at different times of the year, is that not
6 correct?
7 MR. HILL: We've had a lot of
8 discussions about that, too, and we were concerned
9 that during flood stage it might get a tremendous
10 reversal flow. We were concerned about some of
11 the consecrations that we've measured in the
12 background wells being influenced by back flow
13 caused by flood stages.
So I personally got the geologic -- the
15 U.S. GS flood records all the way back into the
16 1940's following that river. And as best we could
17 determine after extensive discussion back and
18 forth, the back flow would probably go about a
19 little over two hundred feet back up toward the
20 dump site. It would not be in the order of a
21 thousand or more feet.
22 Yes, there would be some back flow, but
23 it would be a mobilized effect so when you get

1 back to normal conditions it would go back to the
2 river and it would not affect it that far out on
3 each bank.
4 MR. KELLY: In the early 1980's a
5 background well was placed at the -- let's see, I
6 believe it's called the library now, the North
7 Hollywood Street, which showed elevated levels of
8 chlordane in that background sample well.
9 MR. HILL: You are speaking along
10 Birch Street?
11 MR. KELLY: Yes. Those that came
12 from the North Hollywood dump or other sources?
13 MR. HILL: We've had a lot of
14 discussion about that, too. That's why I raised
15 the issue of the effect of floods on the dump
16 site. And apparently the flood back flow is not
17 enough to reach those wells.
18 MR. KELLY: So the answer would be
19 from other sources?
20 MR. HILL: It's apparently not from
21 the dump.
22 MR. KELLY: Back in the early
23 1980's, once again, Dr. David Wilson did studies

1 not only on the dump site but the neighborhood
2 surrounding the North Hollywood dump. They found
3 elevated levels of chlordane and other chemicals
4 along the streets and in the neighborhood. Has
5 U.S. EPA done any studies to back this up or to
6 disprove it, or is this just going to be
7 overlooked?
8 MR. HILL: In years past we've done
9 exhaustive studies of claims just such as that for
10 individual neighborhoods where they felt there
11 were high levels, and we have a lot more claims
12 that we have not been able to find the source
1 for.
14 MR. KELLY: At the North Hollywood
15 site have y'all done any studies to see if any
16 contaminants were along the roadways leading to
17 the North Hollywood dump?
18 MR. TAYLOR: If I could, I'll now
19 introduce Chuck Pietrosewicz with the Agency for
20 Disease Registry, basically their sister agency to
21 CDC who did a health study.
22 MR. KELLY: That's also a farce.
23 MR. PIETROSEWICZ: That's a matter

1 for discussion.

2 MR. KELLY: Yes, it is.

3 MR. PIETROSEWICZ: Back in the early

4 1980's John Hopkins University did a preliminary

5 health study in the community. And back in 1982

6 or thereabouts is when the Center for Disease

7 Control, which I used to work for, started working

8 officially with EPA to deal with health issues

9 relating to Superfund. This is one of the handful

10 of sites around the country that EPA has to do a

11 formal major health study at. And we did.

12 And you are right, we found based on the

13 environmental samples, a lot of off-site

14 contamination in the neighborhood and such, but we

15 also studied the people. We studied a hundred and

16 ninety-four folks in the Hollywood area --

17 MR. KELLY: Compare damage to

18 another --

19 MR. PIETROSEWICZ: And a hundred and

20 seventy-four people in what we call a comparative

21 study area and studied bloods, fat, urine,

22 questionnaires, and physical examinations and

23 really did not find any elevated levels that could

be attributed to folks in the area being exposed
2 to various pesticides that we found at the dump.
3 We did find elevated levels of folks who
4 fished and ate from Oxbow Lake and the other lake
5 and the river.
6 MR. KELLY: I just thought I heard
7 an opinion stated a minute ago that these are
8 private bodies of waters and they didn't think
9 people were fishing in there besides the land
10 owners.
11 MS. BARNETT: No. We didn't say we
12 didn't think people -- we wanted to know from the
community how many --
14 MR. KELLY: They are.
15 MS. BARNETT: Yeah, how many --
16 MR. KELLY: They are. They are
17 fishing.
18 MS. BARNETT: (Continuing...) how
19 many and such because we are going to be dealing
20 with those lakes and ponds.
21 MR. KELLY: Just drive down the road
22 that goes along where the fence is and you'll see
23 them.

1 MR. PIETROSEWICZ: Oh, yeah. I've
2 been there. I know what you are talking about.
3 But we did find elevated fat and blood levels in
4 folks who admitted to fishing and eating fish from
5 the ponds. We never found adverse health effects
6 in the folks that we studied. We did find
7 elevated levels of blood and fat.
8 I don't know how much you know about what
9 the Center for Disease Control is all about, but
10 the issue is try to cut down on exposure. So the
11 concern is to cut down potential for exposure of
12 pesticides from eating fish in the lakes and
13 rivers.
14 MR. POWELL: Wasn't that study
15 really just to try to be able to propose a much
16 larger study that was never finished or done?
17 MR. PIETROSEWICZ: No.
18 MR. POWELL: Well, I thought that it
19 was.
20 MR. PIETROSEWICZ: John Hopkins
21 essentially composed that. We followed up on it
22 after the work that we did. Collaboratively
23 Tennessee Department of Health Environment --

actually the Memphis-Shelby County Health
2 Department, they had the lead really, and we
3 worked with them. It really is a collaborative
4 effort. The bottom line is no.
5 MR. KELLY: That's the same health
6 department that said darn we didn't know that
7 neighborhood was contaminated until we used them
8 for background samples.
9 I would like to answer two questions. He
10 said he didn't know where I got my information
11 concerning the drilling of a well that did not hit
12 the clay layer. That is from an eyewitness
account, another man who was present, David
14 Graham. The United States Geological Survey and I
15 will send U.S. EPA a notarized statement from an
16 independent eyewitness who was also present on the
17 site when I was there and made that observation.
18 MR. TAYLOR: Are there any other
19 questions?
20 MR. MALONE: My name is Ellis
21 Malone. If you do this work, when will you have
22 the program to start?
23 MR. TAYLOR: Mr. Malone, what we

1 need to do, of course, first is to summarize the
2 plan. Of course we're here tonight soliciting
3 public comments. Assuming that the public likes
4 the plan or accepts the plan and we move on to a
5 record of decision, we would like to start the
6 design work basically before the wet season
7 starts, which is November, December, January.
8 That design work -- without going into great
9 detail about the scheduling, a typical Superfund
10 site takes around a year to complete from the day
11 you start until the day you finish.
12 So actual physical construction wouldn't
13 begin until that design work is done, complete,
14 approved, signed off on, and a contract is led out
15 to bid either by EPA or PRP's to do the work. So
16 we're probably looking at, optimistically, actual
17 construction to start in a year and a half or a
18 year and a quarter or something like that.
19 MR. MALONE: When you get ready to
20 do the work, that contractor will have to meet all
21 EPA standards as far as cleaning up the whatever
22 level that you decide it is, is that right?
23 MR. TAYLOR: Yes, sir. What will

1 happen, if EPA obviously bids out the project,
we'll have our own stats and the contractor will
3 bid on it, and he'll have to comply with our
4 stats. It will most likely be overseen by the
5 Corps of Engineers.
6 MR. MALONE: If it's EPA's money
7 used for the cleanup, regardless of who lets --
8 whether you let the contract, whether the city
9 lets the contract, or whoever lets the contract,
10 the standards set up by EPA for cleanup, the
11 contractor will have to meet those?
12 MR. TAYLOR: That's correct. The
13 standard set in the remedial design plan approved
14 by EPA, whoever lets the contract, will have to be
15 met by the contractor, that's correct.
16 MR. MALONE: Is the cost for this
17 going to be about eight million dollars?
18 MR. PIETROSEWICZ: I think that's
19 the total cost, if we don't have to go to a
20 contingency.
21 MR. MALONE: And you mentioned these
22 potential responsible parties for the
23 contamination are going to share in the cost?

1 MR. TAYLOR: That is one option that
2 EPA will have. And once the record of decision is
3 signed, those potential responsible parties will
4 get basically a notice letter from EPA that says
5 we're intending to spend public money unless
6 someone comes forth with a good faith offer to
7 spend their own money. They generally have sixty
8 days to make that offer. And after that sixty
9 days if an offer has not been made, or the offer
10 is not made in good faith, EPA is free to go ahead
11 and spend public monies to implement the remedy.
12 If a good faith offer is made,
13 negotiations will begin with those potential
14 responsible parties for a period of sixty days,
15 which basically a consent order or consent decree
16 in this case would be negotiated. After that's
17 done it would be entered in a local federal
18 district court and, there again, be public comment
19 on the consent decree.
20 MR. MALONE: What is your feeling
21 about these potential contaminators as far as
22 their contributions, do you have a feel for that,
23 whether they are willing at this time?

MR. TAYLOR: My general feel for this site is that the PRP's will come forth with a good faith offer and enter into negotiations with the agency.

MR. MALONE: The status in which they would make their faith good is not known though, right?

MR. TAYLOR: That's always an unanswered question until you actually enter into negotiations. EPA has a policy, by the way, of -- it's certainly not the only case -- if after the sixty days a good faith offer is not made, typically EPA will issue those potential responsible parties a unilateral administrative order ordering them to implement the remedy. Then they will be given a certain grace period to comply with the remedy. And if they don't, then the EPA will go forward.

If under the terms of the order they don't comply with that order and later in a court of law they are found to be a potential responsible party, or a responsible party, they could suffer fines for not complying with the

1 order on a daily basis, and they could suffer
2 treble damages. Meaning that EPA could bring a
3 lawsuit. And if we spend a dollar, we could sue
4 them and potentially win three dollars back.
5 MR. MALONE: You've looked at a
6 number of options, and one of the options was
7 essentially doing nothing. But we really haven't
8 looked at the other end of the pendulum. And that
9 is, revitalizing to the extent that it will be
10 commercially useful property. What will be the
11 cost on doing that kind of revitalization in the
12 area?
13 MR. TAYLOR: Maybe Felicia knows
14 more about the cost, but we did look at those
15 options early on. For large municipal landfills,
16 which EPA meets quite a few of them on the
17 National Priorities List, it's pretty easy to go
18 through the calculations when you have
19 twenty-three or twenty-seven feet to fill over a
20 seventy acre site and determine what it would cost
21 to bring in a commercial incinerator and
22 incinerate all that waste and then stabilize or
23 solidify the ash and bury it in a RCRA landfill.

Those options were looked at early on.
2 It's just that those aren't really technically
3 feasible to carry out on a site that's this
4 large.
5 MR. STRAUGHN: Is it technical or
6 economical?
7 MR. TAYLOR: It's really both. And
8 it's a matter of implementability, too. Long term
9 -- you were talking about an incinerator that
10 burns so many cubic feet of waste a minute, and
11 you basically would be out there for quite some
12 time doing something like that. So if you are
talking about returning it back to its original
14 use, if you brought an incinerator in and started
15 incinerating it, it wouldn't be in your or my
16 lifetime that it was brought back to its original
17 use.
18 MS. RAINES: Margery Raines. This
19 is a legal question. Who owns this land?
20 MR. TAYLOR: We don't have our
21 attorney here tonight.
22 MS. BARNETT: It is private
23 property.

1 MR. TAYLOR: We know who the
2 property owners are. I don't happen to know them
3 off the top of my head. We have done a final
4 search on the property, on the property owners.
5 MR. KELLY: Have y'all completed
6 your list of principal responsible parties?
7 MR. TAYLOR: As you probably are
8 well aware, that list is an evolving, continuous
9 thing. Do we have a list of PRP's today? Yes, we
10 do.
11 MR. KELLY: Who are they?
12 MR. TAYLOR: Of course the City of
13 Memphis is one for operating the site.
14 MR. KELLY: Shelby County.
15 MR. TAYLOR: A number of PRP's.
16 Basically, a lot of the companies that are
17 surrounding the site.
18 MR. KELLY: Buckman? Kimberly
19 Clark?
20 MR. TAYLOR: Those names sound
21 familiar. To be honest --
22 MR. KELLY: Yeah, they do sound
23 familiar. I want to know who is principally

responsible for the situation to begin with, or
2 who is on your list. If we don't know who is on
3 your list, then how can we submit comments?
4 MR. TAYLOR: We're really not asking
5 for comments on who is a potentially responsible
6 party.
7 MR. KELLY: You've got to get input
8 from somebody on this. You've been fiddling
9 around ten years and you ain't figured out who
10 they are yet. Somebody's going to have to tell
11 you.
12 MR. TAYLOR: Well, if you have
1 information, we appreciate your supplying it. But
14 I promise you we have a list of potentially
15 responsible parties for the site.
16 MR. KELLY: How can we obtain a copy
17 of that list? Do we have to go FOIA?
18 MR. TAYLOR: If you'll just submit a
19 report asking for it, we'll be glad to provide
20 it.
21 MR. KELLY: Free of information or
22 just an across the board request?
23 MR. TAYLOR: Just send us the

1 request. Every request is free of information.
2 MR. POWELL: But will we get an
3 answer for it?
4 MR. TAYLOR: There's no problem
5 sending you a list of potentially responsible
6 parties. Remember, the first word is potentially
7 responsible, and it does not mean that they are
8 responsible parties. It does not mean a court of
9 law is bound to be responsible. It also doesn't
10 mean that two weeks from now we won't have more.
11 It doesn't mean two weeks from now we won't have
12 less. It's a continuous type situation.
13 As you are well aware, the landfill was
14 operated in the 1950's and 1960's.
15 MR. KELLY: And they were dumping in
16 the 1980's out there also.
17 MR. TAYLOR: Well, my point is
18 there's not a lot of records. We've gone back and
19 done extensive studies. We've asked people --
20 we've done enough work to get PRP's. And I'm
21 fairly competent someone will come forth and do
22 the work.
23 Again, if we have questions, if you could

approach the microphone, I know our stenographer
2 would be happier.
3 MR. KELLY: I've got one more and
4 I'm going to shut up.
5 MR. TAYLOR: If we could, just one
6 more question.
7 MR. KELLY: Okay. That's what I
8 said, just one more. It's actually a comment.
9 Every United States Geological Survey performed in
10 the Memphis area since 1964 has stated if
11 contaminants enter into and concentrate in the
12 shallow aquifer, contamination of the Memphis
13 sands will occur. I don't see any reason to allow
14 these contaminants to enter into, to concentrate
15 in, and to just let them sit there. Thank you.
16 MR. TAYLOR: Thank you. Are there
17 any additional comments or questions? Thank you.
18 MS. STAFF: I'm Sharon Fidler with
19 the League of Women Voters, and I serve on the
20 Metropolitan Area Environmental Task Force. I
21 have a few concerns with that. During the
22 lifetime of the task force there were certain
23 studies that were done in which samples were

1 lost. When the reports were given to the task
2 force, the response was I'm sorry we lost the
3 samples. Well, that doesn't inspire a great deal
4 of confidence. Now, I want to know if y'all know
5 whether or not additional work was done to correct
6 this?
7 Secondly, there was a grant given to an
8 organization in the north to provide a technical
9 assistance booklet for people in the area. I
10 think it was a ten thousand dollar grant. At that
11 time Dr. George Wood offered to do the same
12 thing -- he was eminently qualified -- for only
13 the cost of the paper. He was turned down. And
14 that ten thousand dollars grant resulted in
15 nothing.
16 This company spent seven thousand dollars
17 on phone calls, a rough draft, and a couple of
18 plane trips. We never saw anything once we sent
19 the rough drafts back. Finally we convinced the
20 people of EPA to cancel the rest of the three
21 thousand dollars. We had nothing to show for it.
22 We finally ended the task force because
23 nothing was happening. We weren't getting

information, and this is far worse. It is to
2 their credit that a group of people from the city
3 and some chemical companies got together and
4 formed a TAG group and covered the dump at that
5 time because nothing was being done. However,
6 there is also some concern that this is, of
7 course, a party that is deeply concerned because
8 they are potentially responsible parties.
9 Now, what I want to know also is how much
10 input do those parties have on what your
11 determination is of how you will go about
12 correcting this problem? I mean, it seems logical
that if the parties are responsible, they are
14 going to want to have the least expensive
15 alternative available. And I want to know, how
16 much credence do you give to their input to this
17 alternative?
18 MR. TAYLOR: All the alternatives
19 that EPA selects for any site are selected by EPA
20 and not the potential responsible parties. The
21 cleanup plan is non-negotiable. It is not subject
22 to negotiations. It is not done with that intent
23 in mind. It's an independent EPA and federal

1 decision, and state, as to what needs to be done
2 to the site.
3 MS. FIDLER: Also, how about the
4 Technical Assistance Grant, would you consider
5 giving it to a local organization that has the
6 credentials rather than some group up in Wisconsin
7 who does this as a matter of course and obviously
8 didn't do well by us the first time?
9 MR. TAYLOR: I believe I'll let
10 Suzanne address this, but the Technical Assistance
11 Grants have only been in life for maybe two years
12 now. In fact, I was involved in the first one
13 against this issue in Region IV.
14 MS. FIDLER: Well, that may have
15 been, but it was a ten thousand dollar grant to
16 this company.
17 MR. TAYLOR: Again, that was
18 something prior to my time certainly with the
19 agency also. Now we really have to go through a
20 pretty rigorous procedure to make sure the group
21 is affected by the site, that they are indeed a
22 local group, and they're the only local group that
23 actually wants the TAG grant. As part of the

procedure that Suzanne is describing, it takes
2 about four months before a grant can be issued.
3 Are there any other questions tonight?
4 If there aren't, that will conclude the meeting.
5 We'll be up front here if anybody would like to
6 come up and ask us individual questions.
7 (Whereupon, said public hearing was
8 concluded at approximately 9:15 p.m.)
9
10
11
12
1
14
15
16
17
18
19
20
21
22
23

1 COURT REPORTER'S CERTIFICATE

2 STATE OF TENNESSEE:

3 COUNTY OF SHELBY:

4 I, LAURA L. RHODES, Reporter and Notary

5 Public, Shelby County, Tennessee, CERTIFY:

6 1. The foregoing public hearing was

7 taken before me at the time and place stated in

8 the foregoing styled cause with the appearances as

9 noted;

10 2. Being a Court Reporter, I then

11 reported the public hearing in Stenotype to the

12 best of my skill and ability, and the foregoing

13 pages contain a full, true and correct transcript

14 of my said Stenotype notes then and there taken;

15 3. I am not in the employ of and am not

16 related to any of the parties, and I have no

17 interest in the matter involved.

18 WITNESS MY SIGNATURE, this, the 19th day

19 of July, 1990.

20

21 LAURA L. RHODES
Registered Professional Reporter

22 Notary Public for the
State of Tennessee

23

My commission expires: 8/17/91

NORTH HOLLYWOOD DUMP SITE

LETTERS FROM SUPPORT AGENCIES

STATE OF TENNESSEE
DEPARTMENT OF HEALTH AND ENVIRONMENT
SOUTHWEST TENNESSEE REGIONAL OFFICE
225 SUMMAR AVENUE
JACKSON, TENNESSEE 38301-3964

September 9, 1990

Ms. Felicia Barnett
U.S. EPA
KY/TN Section, NSRB
345 Courtland St., NE
Atlanta, GA 30365

Re: North Hollywood Dump Site
Draft Record of Decision

Dear Ms. Barnett:

The Tennessee Division of Superfund has received and reviewed the Draft Final Record of Decision (and supporting documentation) for the North Hollywood Dump Site as enclosed with your letter dated September 5, 1990. Comments are provided below:

1. This Division has verbablly indicated its agreement with the remedy for the surface water impoundments. As indicated in previous comments, we do not feel it necessary to restock the dredge pond with fish but will have no objection if EPA feels such action is needed.

2. The present interpretation of the Tennessee UIC regulations suggests that all groundwater be suitable for drinking purposes unless otherwise classified. EPA has indicated its willingness to request a change (or variance) in the classification so that drinking water would not be an acceptable use of groundwater at the North Hollywood Dump site and drinking water wells could be restricted. This Division is aware that CERCLA allows the use of ACLs at this site so the proposed limitations are appropriate. This Division agrees with the proposed remedy for the Landfill Wastes and Shallow Groundwater Providing that EPA obtains a variance from the Tennessee Water Quality Control Board. If the Board does not approve such a change, this Division will request that the matter be reviewed and consideration be given to requiring groundwater treatment (as described in Alternative 3).

In summary, the State of Tennessee concurs with EPA in its selection of remedial alternatives for the North Hollywood site. This concurrence is contingent on the action of the Water Quality Control Board regarding the groundwater classification. The Record of Decision appears to provide a sound basis for finally remediating this site.

This Division appreciates EPA's efforts in this matter and in providing for State involvement. This Division fully intends to continue its support agency role during future actions at this site.

Sincerely,

Richard Holland
Manager, Jackson Field Office
Division of Superfund

RMH/lk

cc: DSF, Nashville

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEP 7 1990

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

MEMORANDUM

SUBJECT: Consultation on the Containment - Only Remedy for the North Hollywood Dump, Memphis, Tennessee

FROM: Sally Mansbach, Acting Director
CERCLA Enforcement Division, OWPE

TO: Patrick M. Tobin, Director
Waste Management Division
Region IV

My staff has consulted with your staff on the preferred remedy for the North Hollywood Dump Site. OWPE concurs with the remedy selected by the Region.

Should you have any questions, please contact Neilima Senjalia of my staff at FTS 475-7027.

cc: Bruce Diamond
Bill Hanson, OERR
Harold Taylor, Region IV

Printed on Recycled Paper

If you have any additional questions or concerns, please contact me at (404) 347-7791.

Sincerely,

Felicia Barnett

Felicia Barnett
Remedial Project Manager
KY/TN Section, NSRB

cc: Richard Holland, State of Tennessee

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET NE
ATLANTA GEORGIA 30365

AUG 30 1990

Mr. Jon P. McCalla
Heiskell, Donelson, Bearman, Adams, Williams & Kirsch
Twentieth Floor
First Tennessee Building
165 Madison Avenue
Memphis, Tennessee 38103

Dear Mr. McCalla:

This letter is in response to your letter of August 27, 1990, commenting on the North Hollywood Dump NPL site Remedial Investigation/Feasibility Study (RI/FS) and Proposed Plan for site remediation. Your letter specifically commented on the identification and use of copper as a "major contaminant" at the site.

Generally, EPA concurs with the Dames & Moore review and with the summary prepared by Heiskell, Donelson, Bearman, Adams, Williams & Kirch, dated August 24, 1990, which concluded that there is presently no health risks attributable to copper at the site.

The ACL for copper is based on a very protective environmental value for freshwater organisms of 5.6 ug/l in the Wolf River. This is equivalent to a ground water concentration of 1088 ug/l, which has not been approached in the monitoring wells at the site. However, should the site not be closed with an appropriate cover, future conditions could create a possible exposure to copper at levels that could be a health concern.

Copper was included as a "major contaminant" because it is normally included in the "heavy metals" classification of hazardous substances and it was <u>frequently</u> measured at above the minimum detection level during the investigation of the site.