

Weston Solutions, Inc.
Suite 420
100 Peachtree Street, NW
Atlanta, GA 30303–1911
404-527-7000 • Fax 404-527-7001
www.westonsolutions.com

Transmitted Electronically

December 31, 2003

Ms. Donna Webster Remedial Project Manager U.S. Environmental Protection Agency, Region 4 61 Forsyth Street, SW, 11th Floor Atlanta, Georgia 30303



Subject:

Final Preliminary Assessment/Site Inspection Report, Revision 1

Gulf States Creosoting

EPA ID No. MSN000407423 EPA Contract No. 68-W-00-123

Technical Direction Document (TDD) No. 4W-02-03-A-003

Document Control Number (DCN) WSI-GSC-0011

Dear Ms. Webster:

Weston Solutions, Inc., Superfund Technical Assessment and Response Team - 2 (START-2) is submitting two copies of the final preliminary assessment/site inspection (PA/SI) report, Revision 1 for the Gulf States Creosoting facility in Flowood, Rankin County, Mississippi and an additional copy of references for the state.

Please contact me at (404) 527-7016 if you have any questions regarding this final PA/SI report.

Sincerely,

Weston Solutions, Inc.

Shanieka Pennamon

START-2 Project Manager

Enclosure

cc:

Matthew Monsees, EPA Project Officer (w/o appendices)

Cindy Gurley, EPA Process Owner (w/o enclosure)

Joseph A. Baer, Deputy START-2 Program Manager (w/o enclosure)

Alexis K. Ullock, START-2 Site Assessment Coordinator (w/o enclosure)

START-2 File

FINAL PRELIMINARY ASSESSMENT/SITE INSPECTION REPORT

GULF STATES CREOSOTING COMPANY FLOWOOD, RANKIN COUNTY, MISSISSIPPI U.S. EPA ID NO. MSN000407423

Revision 1

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY Region 4 Atlanta, Georgia 30303

Contract No. : 68-W-00-123 TDD No. : 4W-02-03-A-003

WESTON Work Order No. : 12587.001.001.0133.00

Document Control No.

Date Prepared

December 31, 2003

EPA Work Assignment Manager : Donna Webster Telephone No. : 404-562-8921

Prepared by : Weston Solutions, Inc.- START-2

Telephone No. : 404-527-7000

Prepared by

Shanieka Y. Pennamon

Reviewed by

y Kowalski Wi

START-2 Project Manager START-2 Technical Reviewer

William R. Doyle

Approved by

START Program Manager

Revision: 1 December 2003

DCN: WSI-GSC-0011

CONTENTS

Sec	<u>tion</u>		Page
1.0	INTRA	DUCTION	
1.0	INTRO	BUCHON	1
2.0	SITE BA	ACKGROUND	2
	2.1	SITE DESCRIPTION AND ENVIRONMENTAL SETTING	2
	2.2	SITE OPERATIONS AND REGULATORY HISTORY	
	2.3	PREVIOUS RELEASES AND INVESTIGATIONS	3
	2.4	POTENTIAL SOURCE AREAS	4
3.0	PA/SI A	CTIVITIES	4
	3.1	SAMPLE COLLECTION METHODOLOGY AND PROCEDURES	
	3.2	ANALYTICAL SUPPORT AND METHODOLOGY	12
	3.3	ANALYTICAL DATA QUALITY AND DATA QUALIFIERS	
4.0	SOURC	E SAMPLING	13
	4.1	SOURCE SAMPLING LOCATIONS AND ANALYTICAL RESULTS	13
	4.2	SOURCE CONCLUSIONS	
5.0	PATHV	WAYS	16
	5.1	GROUNDWATER MIGRATION PATHWAY	16
		5.1.1 Geologic and Hydrogeologic Setting	17
		5.1.2 Groundwater Sampling Locations and Analytical Results	
		5.1.3 Groundwater Targets	19 20
		5.1.4 Groundwater Conclusions	
	5.2	SURFACE WATER MIGRATION PATHWAY	21
		5.2.1 Hydrologic Setting	21
		5.2.2 Sediment Sampling Locations and Analytical Results	
		5.2.3 Surface Water Targets	
		5.2.4 Surface Water Conclusions	

Final Preliminary Assessment/Site Inspection Report Gulf States Creosoting Company Revision: 1 December 2003

DCN: WSI-GSC-0011

CONTENTS (Continued)

Section	Page
	3 SOIL EXPOSURE PATHWAY AND AIR MIGRATION PATHWAY 23
	5.3.1 Physical Conditions245.3.2 Sampling Locations and Analytical Results245.3.3 Soil and Air Targets245.3.4 Soil and Air Conclusions25
6.0 S	IMARY AND CONCLUSIONS
REFE	NCES 28
Table	TABLES Page
1 2 3 4	URFACE SOIL SAMPLING LOCATIONS AND RATIONALE 6 UBSURFACE SOIL SAMPLING LOCATIONS AND RATIONALE 8 ROUNDWATER SAMPLING LOCATIONS AND RATIONALE 10 EDIMENT SAMPLING LOCATIONS AND RATIONALE 11

Final Preliminary Assessment/Site Inspection Report
Gulf States Creosoting Company
Revision: 1
December 2003

DCN: WSI-GSC-0011

CONTENTS (Continued)

APPENDICES

A Analytical Data Tables

<u>Table</u>	<u>Title</u>
5	Summary of Inorganic Analytical Results - Surface Soil Samples
6	Summary of Organic Analytical Results - Surface Soil Samples
7	Summary of Inorganic Analytical Results - Subsurface Soil Samples
8	Summary of Organic Analytical Results - Subsurface Soil Samples
9	Summary of Field Parameters - Groundwater Samples
10	Summary of Inorganic Analytical Results - Groundwater Samples
11	Summary of Organic Analytical Results - Groundwater Samples
12	Summary of Inorganic Analytical Results - Sediment Samples
13	Summary of Organic Analytical Results - Sediment Samples

B Figures

<u>Figure</u>	<u>Title</u>
1	General Site Location Map
2	Site Layout Map

Revision: 1 December 2003

DCN: WSI-GSC-0011

1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) tasked the Weston Solutions, Inc. Superfund Technical

Assessment and Response Team - 2 (START-2) to prepare a preliminary assessment/site inspection (PA/SI)

report for the Gulf States Creosoting Company (Gulf States) facility in Flowood, Rankin County, Mississippi,

EPA ID No. MSN000407423. The PA/SI was conducted under Contract No. 68-W-00-123, Technical

Direction Document (TDD) No. 4W-02-03-A-003.

The primary objective of a PA/SI is to determine whether a site has the potential to be placed on the National

Priorities List (NPL). The NPL identifies sites at which a release, or threatened release, of hazardous

substances poses a serious enough risk to public health or the environment to warrant further investigation

and possible remediation under the Comprehensive Environmental Response, Compensation, and Liability

Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986.

Information gathered during the PA/SI is used to generate a preliminary Hazard Ranking System (HRS)

score. The HRS is the primary criterion EPA uses to determine whether a site should be placed on the NPL.

PA/SIs are generally conducted at sites where environmental sampling and/or monitoring well installation

are necessary to fulfill HRS documentation requirements.

Specifically, the objectives of the PA/SI are as follows:

· Obtain and review relevant file material

- Collect samples to attribute hazardous substances to site operations
- Collect samples to establish representative background levels

 Evaluate target populations for the groundwater migration, surface water migration, soil exposure, and air migration pathways

- · Collect any other missing HRS data
- · Document current site conditions
- · Develop a site layout map

This report documents the results of the PA/SI conducted at the Gulf States facility during the week of April

21, 2003. All sampling was conducted by personnel from EPA's Science and Ecosystem Support Division

(SESD) (Refs. 1; 2). Information reviewed for the PA/SI was gathered from the Mississippi Department of

Environmental Quality (MDEQ) and from the EPA Region 4 CERCLA files.

This document was prepared by Weston Solutions, Inc., expressly for EPA. It shall not be disclosed, in whole or in part, without the express

written permission of EPA.

Revision: 1 December 2003

DCN: WSI-GSC-0011

2.0 SITE BACKGROUND

This section describes the facility, its present and past operations (including waste disposal practices and regulatory history), previous investigations, and potential source areas located at the facility.

2.1 SITE DESCRIPTION AND ENVIRONMENTAL SETTING

The former 141-acre Gulf States Creosoting Company is located at 1625 Flowood Drive (Mississippi Hwy 468), Flowood, Rankin County, Mississippi (Refs. 3; 4, p. v; 5, pp. 1-4). The geographic coordinates of the facility are 32 18 43.8" north latitude and 90 58 38.3" west longitude (Ref 6). The facility is currently operating as a horse farm and as ConSteel Co, Inc.(ConSteel). Both current operations appear to be located on portions of the property where creosoting operations were conducted (Ref. 11). Currently, the southernmost building on the property is owned by ConSteel. The northernmost structures (i.e. metal barn and shed) are used to house tractors and helicopters for a local news station and are part of the horse farm. The horse farm has been operating on the property for approximately 7 years. The facility is bound by railroad tracks to the north and east, an adjacent business to the south, and marshland/tributary of the Pearl River to the west. The facility is bound by natural barriers and is not fenced (Refs. 3; 5). The facility lies within an area comprised of mixed industrial, commercial, and residential uses (Ref. 3).

The climate of Rankin County is characterized by long, hot summers and mild winters. Moist tropical air from the Gulf of Mexico has a moderating influence on maximum temperatures in summer (Ref. 7, p. 1). Normal annual total precipitation for Rankin County is approximately 55 inches, and the mean annual lake evaporation is 44 inches, yielding a net annual precipitation of 10 inches (Ref. 8). The 2-year, 24-hour rainfall is 4.5 inches (Ref. 9).

2.2 SITE OPERATIONS AND REGULATORY HISTORY

Gulf States owned the property as early as 1929 (Ref. 10, p. 11). Gulf States operated as a wood treating facility until the mid 1950s (Ref. 5, pp. 2, 3). In July 1958, American Creosoting Corporation obtained portions of the property (Ref. 10, pp. 7-11). In June 1959, W.G. Avery Body Company obtained portions of the property and operated a body shop on the property (Ref. 4, Deeds, p. 6). There are several tracts of

Revision: 1

December 2003 DCN: WSI-GSC-0011

land on the Gulf States property. The horse farm is owned and operated by Mr. Jim Webb; Webb owns the

portion of the property just north of the main entrance to the property. ConSteel owns a portion of the

property due south of the main entrance. ConSteel appears to be operating on the portion of the property that

it owns. The onsite levee is owned by the Levee Board - which is a joint venture between the state and

Rankin County. Mr. John McGowan owns the marsh area due west of the levee. McGowan has plans of

developing the marsh areas as residential subdivisions (Ref. 30).

During Gulf States operations, railroad cross ties were treated at the facility with coal-tar creosote and

transported on and off-site by means of railroad box cars (Refs. 5, p. 2; 11). Creosote is typically applied

to the wood by commercial pressure treatment or by home and farm dipping (Ref. 12, p. 69). Creosote is a

wood preservative used to treat railroad ties, telephone poles, marine pilings, and fence posts (Ref. 12, pp.

1, 2).

A Phase I investigation of the property in July 1993 included a review of the MDEQ Underground Storage

Tank (UST) division records. No past UST usage on the property was found during the review (Ref. 4, p.

xii). No other environmental permits have been identified for the facility.

2.3 PREVIOUS RELEASES AND INVESTIGATIONS

In June 1993, BCM Engineers, Inc. (BCM) conducted a Phase I Environmental Assessment (Phase I) of the

former Gulf States property on behalf of Trustmark National Bank. The objective of the Phase I was to

identify adverse environmental conditions, suspect activities, and potential hazardous wastes or materials

on or in the vicinity of the subject property. The Phase I included the collection of soil samples from soil

borings ranging in depth from 0 to 8 feet below ground surface (bgs). The seven soil borings were

concentrated in the suspected location of the former creosote operations. Of the seven borings, five samples

were collected and analyzed for semi-volatile organic compounds (SVOC). Constituents detected in the soil

samples were napthalene, 2-methylnapthalene, dibenzofuran, fluorene, phenanthrene, and fluoranthene. The

concentrations ranged from below the detection limit to 604 milligrams per kilogram (mg/kg) (Ref. 4).

In August 1993, BCM conducted a Phase II Environmental Assessment of the former Gulf States property.

The objective of the Phase II was to delineate the extent of the creosote contaminated soil identified during

This document was prepared by Weston Solutions, Inc., expressly for EPA. It shall not be disclosed, in whole or in part, without the express

written permission of EPA.

Revision: 1

December 2003

DCN: WSI-GSC-0011

the Phase I investigation. During the Phase II, several soil borings were advanced and five soil samples were collected for SVOC laboratory analysis. The soil borings ranged in depth from 0 to 8 feet bgs. Sample results indicated the presence of 2-methylnapthalene, naphthalene, dibenzofuran, phenanthrene, fluoranthene, pyrene, and chrysene. Constituents ranged from below the detection limit to 1,057 mg/kg. The data were compared to health-based criteria for exposure via groundwater ingestion. Based on such a comparison, the recommendation for no further action was presented because the soil contaminants were below the target cleanup levels (Ref. 13).

2.4 POTENTIAL SOURCE AREAS

The source considered for the purpose of this PA/SI is contaminated soil.

3.0 PA/SI ACTIVITIES

This section outlines field observations and sampling procedures at the sampling locations. Individual subsections address the sampling investigation and rationale for specific PA/SI activities. The PA/SI was conducted in accordance with the EPA Quality Assurance Project Plan (QAPP) for the Gulf States facility (Ref. 2). The QAPP was prepared by SESD and includes the sample recommendations submitted by START-2 (Refs. 2; 14). The only deviation from the sampling plan involved the addition of a control sample along Prairie Branch in order to attribute contamination to another source upstream of the Gulf States property (Ref. 5, p.11).

3.1 SAMPLE COLLECTION METHODOLOGY AND PROCEDURES

SESD personnel collected 24 surface soil samples, 20 subsurface soil samples, four groundwater samples, and five sediment samples on or near the Gulf States property during the week of April 21, 2003 (Ref. 5). Sample locations are depicted on Figure 1 in Reference 1, Appendix A and are summarized in Tables 1 through 4 of this report.

This document was prepared by Weston Solutions, Inc., expressly for EPA. It shall not be disclosed, in whole or in part, without the express written permission of EPA.

Revision: 1 December 2003

DCN: WSI-GSC-0011

SESD personnel collected the surface soil samples from 0 to 6 inches below ground surface (bgs), and subsurface soil samples were collected from 2 to 3 feet bgs; two of the subsurface soil samples were collected

between 6 and 12 inches. SESD personnel followed sample collection procedures outlined in the EPA

Region 4 SESD, Environmental Investigation Standard Operating Procedures and Quality Assurance

Manual (EISOPQAM) and the Analytical Support Branch Operations and Quality Control Manual

(November 2001).

Date: December 2003 DCN: WSI-GSC-0011

TABLE 1
SURFACE SOIL SAMPLING LOCATIONS AND RATIONALE

Sample Number	Location	Rationale
GS-01-SS	Background; from Jackson Prep School (3100 Lakeland Dr.) located northeast of the property	Background soil sample for comparison to on-site sample results
GS-02-SS	North-central portion of the property	Determine presence or absence of hazardous substances
GS-03-SS	Depression located on the west-central portion of the property, west of the levee	Determine presence or absence of hazardous substances
GS-04-SS	Southwestern portion of the property	Determine presence or absence of hazardous substances
GS-05-SS	Southeastern portion of the property	Determine presence or absence of hazardous substances
GS-06-SS	Southwestern portion of the property	Determine presence or absence of hazardous substances
GS-07-SS	Southeastern portion of the property	Determine presence or absence of hazardous substances
GS-08-SS	Southeastern portion of the property	Determine presence or absence of hazardous substances
GS-09-SS	Southwestern portion of the property	Determine presence or absence of hazardous substances
GS-10-SS	Southeastern portion of the property near the existing ConSteel building	Determine presence or absence of hazardous substances
GS-11-SS	Central portion of the property from the barren area west of the ConSteel building	Determine presence or absence of hazardous substances
GS-12-SS	Western portion of the property, west of the levee	Determine presence or absence of hazardous substances
GS-13-SS	Central portion of the property south of the barn	Determine presence or absence of hazardous substances

TABLE 1 (Continued)

SURFACE SOIL SAMPLING LOCATIONS AND RATIONALE

Sample Number	Location	Rationale
GS-14-SS	Central portion of the property west of the barn	Determine presence or absence of hazardous substances
GS-15-SS	East-central portion of the property	Determine presence or absence of hazardous substances
GS-16-SS	Northeastern portion of the property	Determine presence or absence of hazardous substances
GS-17-SS	Northeastern portion of the property	Determine presence or absence of hazardous substances
GS-18-SS	Northeastern portion of the property	Determine presence or absence of hazardous substances
GS-19-SS	North-central portion of the property	Determine presence or absence of hazardous substances
GS-20-SS	North-central portion of the property	Determine presence or absence of hazardous substances
GS-20-SD	North-central portion of the property; duplicate of GS-20-SS	Determine presence or absence of hazardous substances
GS-21-SS	Northwestern portion of the property	Determine presence or absence of hazardous substances
GS-22-SS	Northern portion of the on-site drainage ditch	Determine presence or absence of hazardous substances
GS-23-SS	Central portion of the on-site drainage ditch	Determine presence or absence of hazardous substances
GS-24-SS	Southern portion of drainage ditch near fenced area	Determine presence or absence of hazardous substances

Notes:

Gulf States Creosoting Company GS

SD - Duplicate surface soil sample

SS Surface soil sample
Surface soil samples were collected from 0 to 6 inches below ground surface (bgs)

Date: December 2003 DCN: WSI-GSC-0011

TABLE 2 SUBSURFACE SOIL SAMPLING LOCATIONS AND RATIONALE

Sample Number	Location	Rationale
GS-01-SB	Background; from Jackson Prep School (3100 Lakeland Dr.) located northeast of the property	Background soil sample for comparison to on-site sample results
GS-02-SB	North-central portion of the property	Determine presence or absence of hazardous substances
GS-03-SB	Depression located on the west-central portion of the property, west of the levee	Determine presence or absence of hazardous substances
GS-04-SB	Southwestern portion of the property	Determine presence or absence of hazardous substances
GS-05-SB	Southeastern portion of the property	Determine presence or absence of hazardous substances
GS-06-SB	Southwestern portion of the property	Determine presence or absence of hazardous substances
GS-07-SB	Southeastern portion of the property	Determine presence or absence of hazardous substances
GS-08-SB	Southeastern portion of the property	Determine presence or absence of hazardous substances
GS-09-SB	Southwestern portion of the property	Determine presence or absence of hazardous substances
GS-10-SB*	Southeastern portion of the property near the existing ConSteel building	Determine presence or absence of hazardous substances
GS-11-SB	Central portion of the property from the barren area west of the ConSteel building	Determine presence or absence of hazardous substances
GS-12-SB	Western portion of the property, west of the levee	Determine presence or absence of hazardous substances
GS-13-SB*	Central portion of the property south of the barn	Determine presence or absence of hazardous substances

TABLE 2 (Continued) SUBSURFACE SOIL SAMPLING LOCATIONS AND RATIONALE

Sample Number	Location	Rationale
GS-14-SB	Central portion of the property west of the barn	Determine presence or absence of hazardous substances
GS-15-SB	East-central portion of the property	Determine presence or absence of hazardous substances
GS-16-SB	Northeastern portion of the property	Determine presence or absence of hazardous substances
GS-17-SB	Northeastern portion of the property	Determine presence or absence of hazardous substances
GS-18-SB	Northeastern portion of the property	Determine presence or absence of hazardous substances
GS-19-SB	North-central portion of the property	Determine presence or absence of hazardous substances
GS-20-SB	North-central portion of the property	Determine presence or absence of hazardous substances
GS-21-SB	Northwestern portion of the property	Determine presence or absence of hazardous substances

Notes:

GS Gulf States Creosoting Company

SB Subsurface soil sample

* Sample collected from 6 inches to 1 foot bgs.

Subsurface soil samples were collected from 2 to 3 feet bgs, except as noted.

December 2003 DCN: WSI-GSC-0011

TABLE 3

GROUNDWATER SAMPLING LOCATIONS AND RATIONALE

Sample Number	Location	Rationale
GS-01-GW	Background; from Jackson Prep School (3100 Lakeland Dr.) located northeast of the property	Background groundwater sample for comparison to on-site sample results
GS-02-GW	North-central portion of the property	Determine presence or absence of hazardous substances
GS-03-GW	Depression located on the west- central portion of the property, west of the levee	Determine presence or absence of hazardous substances
GS-04-GW	Southwestern portion of the property	Determine presence or absence of hazardous substances
GS-05-GW	Southeastern portion of the property	Determine presence or absence of hazardous substances

Notes:

GS

Gulf States Creosoting Company

GW

Groundwater sample

December 2003 DCN: WSI-GSC-0011

TABLE 4 SEDIMENT SAMPLING LOCATIONS AND RATIONALE

Sample Number	Location	Rationale
GS-01-SD	Background; from tributary to Pearl River accessed from Jackson Prep School (3100 Lakeland Dr.) located northeast of the property	Background sediment sample for comparison to downstream marsh sample results
GS-02-SD	Northern portion of tributary to the Pearl River; area north of gated dirt road leading to the tributaries	Determine presence or absence of hazardous substances in the marsh
GS-03-SD	Southern portion of tributary to the Pearl River; area south of gated dirt road leading to the tributaries	Determine presence or absence of hazardous substances in the marsh
GS-04-SD	Half-way to the Pearl River along the southern portion of the tributary to the Pearl River	Determine presence or absence of hazardous substances in the marsh
GS-05-SD	Confluence of the southern tributary to the Pearl River and its tributary	Determine presence or absence of hazardous substances in the marsh
GS-06-SD	Control from Pearl River; approximately 1/8 mile upstream of confluence of Pearl River and Prairie Branch	Control sample for comparison to on-site sample results
GS-07-SD	Pearl River, downstream of the confluence of the tributary adjacent to Gulf States Creosoting and the Pearl River	Determine presence or absence of hazardous substances
GS-08-SD	Prairie Branch	Control sample for comparison to on-site sample results

Notes:

GS Gulf States Creosoting Company

SD Sediment sample

> Revision: 1 December 2003

DCN: WSI-GSC-0011

3.2 ANALYTICAL SUPPORT AND METHODOLOGY

All samples collected during the PA/SI were analyzed through the EPA Contract Laboratory Program (CLP). The laboratories analyzed for EPA Target Compound List (TCL) volatile organic compounds (VOC), extractable semivolatile organic compounds (SVOC), pesticides, and polychlorinated biphenyls (PCB). Certain samples were analyzed for specific SVOC concentrations at lower concentrations than the standard levels of analysis under the CLP. The samples were also analyzed for Target Analyte List (TAL) inorganic substances (metals) and cyanide. EPA Region 4 SESD reviewed all data for compliance with the terms of the CLP.

3.3 ANALYTICAL DATA QUALITY AND DATA QUALIFIERS

All analytical data were subject to a quality assurance review as described in the EPA SESD laboratory data evaluation guidelines. The text and analytical data tables presented in this report show some concentrations of organic and inorganic parameters as qualified with a "J," indicating that the qualitative analysis was acceptable; however, the quantitative value has been estimated. Other compounds may have been qualified with an "N," indicating that they were detected based on the presumptive evidence of their presence. This means that the compound was only tentatively identified, and its detection cannot be considered a positive indication of its presence. Some sample results are reported with a "U" qualifier, meaning that the material was analyzed for but not detected. The reported number is the laboratory-derived sample quantitation limit (SQL) for the constituent in that sample. At times, miscellaneous organic compounds that do not appear on the TCL are reported with the data set. These constituents are qualified as "JN," indicating that they are tentatively identified at estimated quantities. Because these constituents are not routinely analyzed for or reported, background levels of SQLs are not generally available for comparison. Some compounds are qualified with an "R" which indicates the QC evaluation has determined the concentration of the compound is unusable. Compounds qualified with a "C" have been confirmed by gas chromatograph or mass spectrometry. The complete analytical data sheets are presented in Reference 1.

Revision: 1

December 2003 DCN: WSI-GSC-0011

4.0 SOURCE SAMPLING

This section discusses the source area evaluated at the facility and the sampling locations and analytical

results of samples collected from the Gulf States property. The source area at the Gulf States property

evaluated in this PA/SI is contaminated soil.

Surface soil and subsurface soil sampling locations are depicted on the sample location map in Reference

1, Appendix A and described in Tables 1 and 2. Surface soil inorganic and organic analytical results are

summarized in Tables 5 and 6, respectively, and subsurface soil inorganic and organic analytical sampling

results are summarized in Tables 7 and 8, respectively. Tables 5 through 8 are presented following Section

6.0. Elevated concentrations of constituents are shaded in the tables. The concentration of a constituent is

considered to be elevated if the concentration is greater than or equal to three times the concentration

detected in the background or control sample. In the case where a constituent is undetected in the

background or control sample, any concentration equal to or greater than the SQL is considered to be

elevated. The summary analytical data tables are presented as Appendix A.

The following discussion of hazardous constituents detected at elevated levels in soil samples collected at

the facility includes only those hazardous constituents that are associated with site operations and those

hazardous constituents that may pose a threat to human health or the environment.

4.1 SOURCE SAMPLING LOCATIONS AND ANALYTICAL RESULTS

SESD personnel collected 24 surface soil samples and 20 subsurface soil samples (including a duplicate

sample) from various locations on the Gulf States property. One background surface soil sample (GS-01-SS)

and one background subsurface soil sample (GS-01-SB) were collected from a location northeast of the

facility. The background samples were collected from Jackson Preparatory School at 3100 Lakeland Drive.

Locations for surface and subsurface soil samples collected on-site are presented in Tables 1 and 2 of this

report, and in Reference 1, Appendix A, Figure 1.

Soil data is compared to background samples and is considered elevated if the compound is three times the

background concentration. In the case where a constituent is undetected in the background sample, any

This document was prepared by Weston Solutions, Inc., expressly for EPA. It shall not be disclosed, in whole or in part, without the express written permission of EPA.

•

Revision: 1

December 2003

DCN: WSI-GSC-0011

concentration equal to or greater than the SQL is considered to be elevated. Specific findings regarding sample results are summarized below and presented in Tables 5 through 8.

Surface Soil

- SVOCs were detected at elevated concentrations in eleven of the twenty-three on-site surface soil samples. Constituents detected include acenaphthylene, anthracene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, benzo-a-pyrene, carbazole, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene. Elevated constituent concentrations ranged from 380J micrograms per kilogram (μg/kg) to 12,000J μg/kg. The majority of SVOC constituents were detected in surface soil samples GS-05-SS, GS-07-SS, GS-08-SS, GS-10-SS, GS-11-SS, GS-14-SS, GS-15-SS, GS-16-SS, GS-17-SS, GS-23-SS, and GS-24-SS which are located on the northeastern, central, and southeastern portions of the property. Areas of contamination are located where boxcars containing wood treated with creosote were stored on the railroad tracks (Refs. 1, Appendix A, Figure 1; 11).
- Endrin, endrin aldehyde, endrin ketone, and 4,4'-DDT were the only pesticides detected at elevated concentrations in the surface soil samples collected. Pesticide concentrations ranged from 6.4J μg/kg to 150 μg/kg. Pesticides were detected at elevated concentrations in eight of the twenty-three on-site surface soil samples.
- PCBs were not detected in the on-site surface soil samples.
- Methyl ethyl ketone (MEK) is the only volatile organic compounds (VOC) detected at an elevated concentration in the surface soil samples. MEK concentrations in samples GS-02-SS, GS-11-SS, GS-12-SS, GS-15-SS, GS-17-SS, GS-18-SS, GS-19-SS, GS-20-SD, GS-21-SS, and GS-23-SS ranged from 12μg/kg to 31J μg/kg. MEK is a common laboratory contaminant, and cannot be directly attributed to the processes at the facility.
- Inorganic constituents detected at elevated concentrations in on-site surface soil samples include antimony, barium, beryllium, cadmium, copper, lead, manganese, and zinc. Elevated constituent

Revision: 1

December 2003

DCN: WSI-GSC-0011

concentrations ranged from 0.09 milligrams per kilogram (mg/kg) to 5,500 mg/kg. Samples containing elevated levels of one or more constituent include GS-02-SS, GS-03-SS, GS-08-SS, GS-10-SS, GS-11-SS, GS-13-SS, GS-14-SS, GS-15-SS, GS-19-SS, GS-20-SS, GS-21-SS, and GS-24-SS.

Subsurface Soil

- Extractable SVOCs were detected at elevated concentrations in four of the twenty on-site surface soil samples. Constituents detected include acenaphthylene, anthracene, benzo(a) anthracene, benzo(b) fluoranthene, benzo(g,h,i) perylene, benzo(k) fluoranthene, benzo-a-pyrene, bis(2-ethylhexyl) phthalate, carbazole, chrysene, dibenzo(a,h) anthracene, fluoranthene, indeno(1,2,3-cd) pyrene, phenanthrene, and pyrene. Elevated constituent concentrations ranged from 420J μg/kg to 37,000 μg/kg. Elevated constituents were detected in samples GS-05-SB, GS-08-SB, GS-10-SB, GS-14-SB located along the central and southeastern portion of the property.
- The pesticides 4,4'-DDE and 4,4'-DDT were detected in subsurface soil samples GS-13-SB (6.9 μg/kg) and GS-14-SB (16J μg/kg), respectively.
- PCB-1260 was detected in subsurface soil sample GS-18-SB at 42J μg/kg.
- Acetone and MEK were the only VOCs detected at elevated concentrations ranging from 11J μg/kg to 99J μg/kg in samples GS-08-SB, GS-10-SB, GS-14-SB, and GS-15-SB. Both constituents are common laboratory contaminants that cannot be directly attributed to the processes at the facility.
- The majority of elevated inorganic constituents were detected in subsurface soil sample GS-10-SB. Barium, beryllium, cadmium, cobalt, copper, lead, magnesium, nickel, and zinc were detected at concentrations ranging from 0.87 mg/kg to 2,400J mg/kg in this sample. Elevated constituents detected in samples GS-14-SB, GS-15-SB, and GS-19-SB include lead (27 mg/kg), manganese (600 mg/kg to 1,000 mg/kg), and selenium (2.3 J mg/kg).

Several unknown and miscellaneous compounds were detected in surface and subsurface soil samples as detailed in Appendix A.

ulf States Creosoting Company Revision: 1

December 2003

DCN: WSI-GSC-0011

4.2 SOURCE CONCLUSIONS

Based on the analytical results for samples collected during the PA/SI, surficial soil contamination is present

at the Gulf States property. Inorganic constituents detected at elevated concentrations include antimony,

barium, beryllium, cadmium, cobalt, copper, lead, manganese, nickel, and zinc. Organic constituents

detected at elevated levels include, but are not limited to, acenaphthylene, anthracene, benzo(a) anthracene,

benzo(b) fluoranthene, benzo(g,h,i) perylene, benzo(k) fluoranthene, benzo-a-pyrene, bis(2-ethylhexyl)

phthalate, carbazole, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene,

and pyrene. The presence of the aforementioned polynuclear aromatic hydrocarbons (PAHs) are common

constituents in creosote wood-treating operations. Site processes involved treating wood with creosote, a

wood preservative comprised of PAHs, phenol, and cresols (Ref. 12, pp. 1, 67).

5.0 PATHWAYS

This section discusses the groundwater migration, surface water migration, soil exposure, and air migration

pathways. Additionally, this section discusses the targets associated with each pathway and draws pathway-

specific conclusions. Sampling locations and analytical results for samples collected from the specific

pathways are also discussed.

5.1 GROUNDWATER MIGRATION PATHWAY

Four groundwater samples and one background groundwater sample were collected during the PA/SI.

Groundwater sampling locations are depicted on the Sample Location Map found in Reference 1 Appendix

A and are described in Table 3. Field parameters and inorganic and organic analytical results for

groundwater samples are summarized in Tables 9, 10, and 11, respectively, located in Appendix A of this

report following Section 6.0.

This document was prepared by Weston Solutions, Inc., expressly for EPA. It shall not be disclosed, in whole or in part, without the express written permission of EPA.

December 2003

DCN: WSI-GSC-0011

5.1.1 Geologic and Hydrogeologic Setting

The property is located entirely within the East Gulf Coastal Plain province of North America and, more specifically, within the Jackson Prairie Belt physiographic province (Refs. 7, p. 2; 15, p. 269; 16, p. 23). The property is located along the western border of Rankin County, northeast of Jackson, and east of the Pearl River (Ref. 3). The topography of Rankin County ranges from gently rolling to steep with elevations ranging from 612 feet above mean sea level (amsl) to 220 feet amsl, the property is located at approximately 265 feet amsl (Refs. 3; 7, p. 3). The soil that directly underlies the property is comprised of the Cascilla-Arkabutla soil group which is classified as nearly level, well-drained and somewhat poorly drained, silty soil. These soils typically occur along the flood plains of the Pearl River and its tributaries. The nearly linear flood plain surface within the vicinity of the property is irregularly broken by old river runs, natural levees, sloughs, chutes, and scarps. The slope of the soils ranges from 0 to 2 percent and the average thickness of the soil is approximately 40 feet (Refs. 7, p. 8; 17, p. 32). The property is underlain in descending stratigraphic order by the Cockfield Formation, the Cook Mountain Formation, the Kosciusko Formation (also known as the Sparta Sand), the Zilpha and Winona Formations, the Tallahatta formation, and the Wilcox Group (Ref. 18).

The Claiborne Group consists of the Cockfield Formation, the Cook Mountain Formation, the Kosciusko Formation, the Zilpha and Winona Formations, and the Tallahatta formation (Ref. 18). The Cockfield Formation consists of irregularly bedded laminated lignitic clay, sand, and lignite that is slightly glauconitic (Ref. 18). Based on drillers' logs, the top of the Cockfield is located at approximately 40 feet below ground surface (bgs) and is approximately 133 feet thick in the vicinity of the property (Ref. 19). The Cook Mountain Formation underlies the Cockfield and consists of marl, limestone, glauconitic sand, and chocolate colored clay (Ref. 18). The Sparta Sand (Kosciusko Formation) consists of an irregularly bedded sand with clay and some quartzite. The Sparta Sand is approximately 300 feet thick in the area, but can reach a thickness in excess of 800 feet in southwestern Hinds County (Ref. 16, p. 15). The Zilpha and Winona Formations underlie the Sparta Sand and consist of a chocolate colored clay that contains glauconitic sand and a highly glauconitic more or less clayey sand, respectively (Ref. 18). The Zilpha Formation ranges in thickness from 200 feet on the Jackson Dome to 420 feet in the southwestern portion of Rankin County. The Winona Formation ranges from 10 to 15 feet thick over the Jackson Dome to up to 65 feet thick in other

> Revision: 1 December 2003

DCN: WSI-GSC-0011

portions of the county (Ref. 16, p. 190). The Tallahatta Formation underlies the Winona Formation and consists of predominately glauconitic claystone and clay with lenses of sand and some sandstone (Ref. 18). The Wilcox Group underlies the Claiborne Group and consists of irregularly bedded fine to coarse sand, more or less lignitic clay and lignite (Ref. 18). The Wilcox Group varies in thickness from 1,100 feet to 1,300 feet over the Jackson Dome, and attains a thickness of 2,830 feet in southern Rankin County (Ref. 16, p. 188).

Three aquifers are available for the development of moderate to large groundwater supplies in the vicinity of the property. The aquifers in descending stratigraphic order, are the Cockfield Formation, the Sparta Sand, and the Wilcox Group. All of these aquifers are part of the Eocene aquifer system in Mississippi and extend to the west, southwest, and south, and contain freshwater in approximately 50 percent of the State. All of the aquifers are regional in extent and all except the Cockfield and the lower Wilcox merge northward into a single aquifer south of Memphis, Tennessee (Ref. 15, p. 274). The formations dip southwest at approximately 15 to 25 feet per mile toward the Mississippi Embayment and the Mississippi River, and the groundwater flow generally follows this regional trend (Ref. 17, p. 4). Within the geologic column, the water-bearing sand beds are interbedded with shale of both marine and continental origin, fossiliferous limestone, and calcareous sandstone. Strata that were deposited by marine origin generally consist of clay, and they form aquicludes (or confining layers) between the water-bearing sands. The aquicludes are widespread and more uniform in thickness than the aquifers (Ref. 17, p. 4).

The Cockfield Formation is the source of more than half of the municipal water supply in the area, mainly because it is the most shallow aquifer in the area (Ref. 17, pp. 1, 32). The top of the formation is located beneath the alluvial soil deposits at approximately 40 feet bgs in the vicinity of the property, ranges from 80 to 140 feet thick, and is unconfined (Refs. 17, p. 32; 19). Municipal water supplies for several small towns are obtained from the Cockfield, some wells yielding as much as 500 gallons per minute (gpm) (Ref. 17, p. 1). The hydraulic conductivity of the Cockfield is approximately 1×10^{-2} centimeters per second (cm/s) (Ref. 20, p. 29). The Cook Mountain Formation underlies the Cockfield aquifer and consists of marl, limestone, glauconitic sand, and chocolate colored clay (Ref. 18). The Cook Mountain Formation was deposited in a marine environment, exhibits a high clay content, and serves as a confining layer between the overlying

Revision: 1

December 2003

DCN: WSI-GSC-0011

Cockfield Formation and the underlying Sparta Sand (Ref. 17, p. 4).

The Sparta Sand underlies the Cook Mountain Formation in the vicinity of the property and is approximately

300 feet thick in the area, but can reach a thickness in excess of 800 feet in southwestern Hinds County. The

Sparta Sand is the most intensively developed aquifer in the vicinity of the property. The Sparta exhibits a

hydraulic conductivity of approximately 1x10⁻² cm/s (Refs. 17, pp. 15, 32; 20, p. 29).

The Zilpha and Winona Formations underlie the Sparta Sand and consist of a chocolate colored clay that

contains glauconitic sand and a highly glauconitic more or less clayey sand, respectively (Ref. 18). Due to

the high clay content and marine origin of these formations, they serve as the lower confining layer for the

Sparta Sand and the upper confining layer for the Wilcox Group in the vicinity of the property. These

formations underlie the area at depths that range from 650 feet in northeastern Madison County to 2,600 feet

in southwestern Hinds County. The depth of the formations throughout the remainder of the study area

ranges from 420 to 570 feet (Ref. 17, p. 15).

The Wilcox Group contains a large reserve of soft water that has been tapped by only a few small-supply

wells. The water is more highly mineralized and is warmer than that in the more shallow aquifers. The water

in the aquifer is of good quality in Madison and northern Rankin Counties, but the quality deteriorates down

the dip in Hinds County (Ref. 17, p. 1). In counties to the northeast, the results of several pumping tests

indicate that the sands in the Wilcox aquifer are probably as permeable as the Sparta Sand (Ref. 17, p. 15).

5.1.2 Groundwater Sampling Locations and Analytical Results

SESD personnel collected four groundwater samples from temporary monitoring wells installed on the Gulf

States property. The background groundwater sample was collected from the Jackson Preparatory School

at 3100 Lakeland Drive located northeast of the facility. Locations for the groundwater samples are detailed

in Table 3 and depicted in Reference 1, Appendix A, Figure 1. Within this report, Appendix A, Table 9 lists

the field parameters for the groundwater samples. Sample results are summarized in Tables 10 and 11

located in Appendix A of this report.

Inorganic constituents detected at elevated concentrations when compared to background concentrations

This document was prepared by Weston Solutions, Inc., expressly for EPA. It shall not be disclosed, in whole or in part, without the express

written permission of EPA.

Revision: 1

December 2003

DCN: WSI-GSC-0011

include aluminum, barium, cobalt, magnesium, manganese, vanadium, and zinc. Concentrations of inorganic constituents ranged from 1.9 micrograms per liter (µg/L) to 8,200 µg/L. Barium, cobalt, magnesium, manganese, and zinc were also detected at elevated concentrations in on-site soil samples and can therefore be attributed to the site.

- MEK is the only organic compound detected at an elevated concentration in GS-04-GW at 7.2 J μg/L.
- No SVOCs, pesticides, or PCBs were detected in any of the groundwater samples.

5.1.3 Groundwater Targets

During the June 1993 Phase I investigation at the property, substances detected in groundwater samples collected from a temporary monitoring well included 2,4-dimethylphenol, naphthalene, dibenzofuran, fluorene, phenanthrene, fluoranthene, and pyrene at concentrations ranging from 79 micrograms per liter $(\mu g/L)$ to 1,279 $\mu g/L$ (Ref. 4, p. 26).

The majority of local residents obtain drinking water from the City of Flowood Water Department (CFWD). The CFWD obtains its drinking water from six wells screened in the Cockfield Formation and the Sparta Sand aquifers, which have depths ranging from 562 feet to 1,185 feet. Water from the wells is blended prior to distribution within the system. CFWD serves approximately 5,400 connections (Ref. 21). According to the 2000 Census, there are 2.62 people per household in Rankin County (Ref. 22). Based on the number of service connections and the number of people per household, CFWD serves approximately 14,148 people (2.62 people per household x 5,400 connections with an average of 2,358 people served per well) (Refs. 21; 22). The CFWD well distribution is as follows: 0 to 0.25 mile: 0 wells; 0.25 to 0.50 mile: 0 wells; 0.50 to 1 mile: 1 well; 1 to 2 miles: 0 wells; 2 to 3 miles: 1 well; 3 to 4 miles: 1 well. Therefore, the CFWD population distribution is as follows: 0 to 0.25 mile, 0 persons; 0.25 to 0.50 mile, 0 persons; 0.50 to 1 mile, 2,358 persons; 1 to 2 miles, 0 persons; 2 to 3 miles, 2,358 persons; 3 to 4 miles, 2,358 persons (Refs. 3; 21; 22). No private wells were identified in the surrounding neighborhoods during the June 2002 site reconnaissance (Ref. 5, p. 11).

Revision: 1

December 2003

DCN: WSI-GSC-0011

5.1.4 Groundwater Conclusions

The only site-attributable constituents detected in the groundwater samples collected from the surficial aquifer during the PA/SI were barium, cobalt, manganese, and zinc. The majority of people in the area receive their drinking water from the City of Flowood Water Department. CFWD's wells are screened in the Cockfield Formation and the Sparta aquifers below a confining layer. Due to the small number of people served water by the CFWD and the fact that the municipal wells are screened at depths greater than 550 feet, the groundwater pathway does not appear to be a viable migration route.

5.2 SURFACE WATER MIGRATION PATHWAY

Six sediment samples were collected during the PA/SI to document the migration of on-site contaminants into the marsh located west of the Gulf States property, and the Pearl River (Ref. 3).

5.2.1 Hydrologic Setting

Currently, a levee separates the Gulf States property from the marsh area located west of the property (Refs. 3; 5, pp. 7, 8). The construction date of the levee is unknown, however, the levee was in existence in 1955 (Ref. 4, p. vii). The surface water migration pathway prior to the construction of the levee, appears to have flowed west toward the marsh and the tributaries which flow into the Pearl River (Ref. 3). There is a drainage ditch on the western portion of the property which flows north to south. The drainage ditch is located to the east of the levee (Ref. 5, pp. 7, 8). Currently, it appears that the on-site drainage flows into this drainage ditch. Prior to the construction of the levee, it appears that creosote was discharged to the marsh areas west of the property, and these areas have been defined as creosote slough by the U.S. Geological Survey (Refs. 3; 5, p. 4). During the operation of the facility, the Pearl River was re-channeled to flow further to the west of the facility and the creosote slough areas (Refs. 3; 11). The surface water pathway includes the marshland and tributaries which flow approximately 0.8 mile to the Pearl River. The 15-mile downstream surface water pathway is completed in the Pearl River which flows at an average rate of 759 cubic feet per second (Refs. 3;23). The property itself is within a flood area that is undefined, perhaps due to the construction of the levee. However, the marsh area adjacent to the facility is within the 100-year flood plain (Ref. 24). A City of Jackson surface water intake is located approximately 0.75-mile northwest

Final Preliminary Assessment/Site Inspection Report

Gulf States Creosoting Company

Revision: 1

December 2003

DCN: WSI-GSC-0011

of the Gulf States property on the Pearl River (Ref. 5, p. 4).

5.2.2 Sediment Sampling Locations and Analytical Results

SESD personnel collected five sediment samples from the marsh adjacent to the Gulf States property and the

Pearl River. Two background sediment samples (one from the Pearl River and one from a marsh) and one

control sediment sample were collected for comparison to the downstream samples. The background and

control sediment sample locations are detailed in Table 4 and depicted in Reference 1, Appendix A, Figure

1. Specific findings regarding sample results are summarized below and presented in Tables 12 through 13.

• Several SVOCs were detected at elevated concentrations in the sediment samples. Such constituents

include acenaphthene, acenaphthylene, anthracene, benzo(a) anthracene, benzo(b) fluoranthene,

benzo(k) fluoranthene, benzo-a-pyrene, chrysene, dibenzo(a,h) anthracene, fluoranthene, fluorene, 2-

methylnaphthalene, naphthalene, phenanthrene, and pyrene. Constituent concentrations ranged from

2 μg/kg to 560J μg/kg. Elevated constituents were detected in all of the sediment samples collected

from the marsh adjacent to the Gulf States property.

· VOCs including acetone, carbon disulfide, and MEK were detected at elevated concentrations in

sediment samples GS-03-SD and GS-04-SD.

• The pesticides 4,4'-DDE (7.9 μg/kg) and beta-BHC (12 μg/kg) were detected in sediment sample GS-03-

SD and GS-04-SD, respectively.

Inorganic constituents detected at elevated concentrations in sediment samples are barium, beryllium,

lead, and zinc. All four constituents were detected in sample GS-03-SD at concentrations ranging from

1.3 mg/kg to 300 mg/kg. An elevated level of beryllium was also detected in sample GS-04-SD (1.2

mg/kg).

Several unknown and miscellaneous compounds were detected in the sediment samples as detailed in

Appendix A of this report.

This document was prepared by Weston Solutions, Inc., expressly for EPA. It shall not be disclosed, in whole or in part, without the express

written permission of EPA.

Revision: 1

December 2003

DCN: WSI-GSC-0011

5.2.3 Surface Water Targets

Federally endangered or threatened species within the Pearl River are the Ringed map turtle (Graptemys

oculifera) and the Gopher tortoise (Gopherus polyphemus) (Refs. 25, p. 2, 26, pp. 20, 21). Although their

exact location is unknown, other endangered/threatened species potentially within the area include the Bayou

darter (Etheostoma rubrum); Pallid sturgeon (Scaphirhynchus albus); Southern combshell (Epioblasma

penita) (Ref. 26, pp. 23, 30, 31). Approximately 2.5 miles of wetland frontage is present along the Pearl

River (Ref. 3). Recreational fishing occurs in both the marsh and Pearl River. Commercial fishing also

occurs along the Pearl River (Ref. 5, pp. 3, 4). There is a fish tissue advisory in effect for the Pearl River

from Highway 25 near Carthage, downstream to the Leake County Water Park. The advisory recommends

limited consumption of largemouth bass and large catfish due to mercury contamination (Ref. 27).

5.2.4 Surface Water Conclusions

Sediment samples collected from the marsh located west of the Gulf States property revealed elevated levels

of site-attributable contaminants. The constituents include acenaphthene, acenaphthylene, anthracene,

benzo(a) anthracene, benzo(b) fluoranthene, benzo(k) fluoranthene, benzo-a-pyrene, chrysene, dibenzo(a,h)

anthracene, fluoranthene, fluorene, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene at

concentrations ranging from 2 µg/kg to 560J µg/kg. These constituents are common constituents in the

composition of creosote and are commonly found at wood treating facilities. Such constituents pose a threat

to the marsh and the Pearl River due to the recreational fishing that occurs in these water bodies. Due to the

detection of the aforementioned constituents in the nearby surface water bodies, the surface water pathway

is a viable migration route for contaminants.

5.3 SOIL EXPOSURE PATHWAY AND AIR MIGRATION PATHWAY

Twenty-three surface soil and 20 subsurface soil samples were collected during the PA/SI at the Gulf States

property. Surface and subsurface soil sample results were discussed in Section 4.0.

This document was prepared by Weston Solutions, Inc., expressly for EPA. It shall not be disclosed, in whole or in part, without the express written permission of EPA.

23

\\dsaga01\Project\12587\001\001\0133 Gulf States Creosoting\si_rv1.wpd

Final Preliminary Assessment/Site Inspection Report

Gulf States Creosoting Company

Revision: 1

December 2003 DCN: WSI-GSC-0011

5.3.1 Physical Conditions

The 141-acre Gulf States property is zoned for heavy industrial use (I-2) (Refs. 5, p. 2; Ref. 13, p. 1). The

property currently consists of a horse farm and a company that sells reinforcing steel and wire mesh (Ref.

5, pp. i, 1). The facility is bound by railroad tracks to the north and east, an adjacent business to the south,

and marshland/tributary to the Pearl River to the west (Ref. 3; 11). The facility is bound by natural barriers

and portions of the facility property are fenced. The fenced portions of the property include the area

surrounding the ConSteel building, and the horse grazing area (Ref. 5, p. 8). Access to the entire property

is unrestricted.

During the 1993 Phase I conducted at the property, seven soil borings were constructed ranging in depth from

0 to 8 feet bgs. Of the seven borings, five samples were collected and analyzed for PAHs. Constituents

detected in the soil samples included napthalene, 2-methylnapthalene, dibenzofuran, fluorene, phenanthrene,

and fluoranthene. Organic concentrations ranged from below the detection limit to 604 (mg/kg) (Ref. 4).

5.3.2 Sampling Locations and Analytical Results

Surface and subsurface soil sampling locations and analytical results are discussed under Source Sampling

in Section 4.1. No air samples were collected at the facility.

5.3.3 Soil and Air Targets

The facility currently houses a horse farm and the ConSteel Company (Ref. 5, p. 1). The nearest residences

are located east of the property across Highway 15 (Ref. 3; 4). There are no schools, daycare facilities, or

residences within 200 feet of the property (Refs. 3; 5, p. 11). However, the two businesses on the property

are operational and the potentially exposed population includes the workers at these two facilities (Ref. 5,

p.1).

According to a LandView® Census Data report and a house count, approximately 805 persons reside within

4 radial miles of the Gulf States property. The estimated population distribution within 4 radial miles of the

Gulf States property is as follows: 0 to 0.25 mile, 118 persons; 0.25 to 0.50 mile, 45 persons; 0.50 to 1 mile,

152 persons; 1 to 2 miles, 87 persons; 2 to 3 miles, 44 persons; and 3 to 4 miles, 359 persons (Ref. 28; 29).

This document was prepared by Weston Solutions, Inc., expressly for EPA. It shall not be disclosed, in whole or in part, without the express

written permission of EPA.

Revision: 1

December 2003

DCN: WSI-GSC-0011

Several federal threatened and endangered species are suspected within the vicinity of the Gulf States

property. Such species may include the Indiana bat (Myotis sodalis). However, their exact locations have

not been identified (Ref. 26, p. 2). Approximately 410 acres of wetlands are located within 4 miles of the

Gulf States property. The wetlands distribution is as follows: 0 to 0.25 mile, 10 acres; 0.25 to 0.50 mile, 15

acres; 0.50 to 1 mile, 185 acres; 1 to 2 miles, 190 acres; 2 to 3 miles, 10 acres; 3 to 4 miles, 0 acres (Ref. 3).

5.3.4 Soil and Air Conclusions

Elevated constituents were detected in the surface soil samples collected from the property; however, the

property is not residential, and has been zoned heavy industrial. Based on the nature of the constituents

detected at the property, the potential exposure to employees and local residences via soil or air is considered

minimal.

6.0 SUMMARY AND CONCLUSIONS

The former 141-acre Gulf States Creosoting Company is located at 1625 Flowood Drive (Mississippi Hwy

468), Flowood, Rankin County, Mississippi. The facility is currently operating as a horse farm and ConSteel.

Both current operations appear to be located on portions of the property where creosoting operations were

conducted. Currently, the southernmost building on the property is owned by ConSteel. The northernmost

structures (i.e. metal barn and shed) are used to house tractors and helicopters for a local news station, and

are part of the horse farm. The horse farm has been operating on the property for approximately 7 years.

Gulf States owned the property as early as 1929 and operated as a wood treating facility until the mid 1950s.

In July 1958, American Creosoting Corporation obtained portions of the property and operated there until

the late 1950s. In June 1959, W.G. Avery Body Company purchased portions of the property and operated

a body shop on the site. There are several tracts of land on the Gulf States property and some are currently

occupied. The horse farm tract is owned and operated by Mr. Jim Webb; Webb owns the portion of the

property just north of the main entrance to the property. ConSteel owns a portion of the property due south

of the main entrance. ConSteel appears to be operating on the portion of the property that it owns. The

This document was prepared by Weston Solutions, Inc., expressly for EPA. It shall not be disclosed, in whole or in part, without the express written permission of EPA.

Tittell permission of Erra

Revision: 1

December 2003

DCN: WSI-GSC-0011

onsite levee is owned by the Levee Board - which is a joint venture between the state and Rankin County. Mr. John McGowan owns the marsh area due west of the levee. McGowan has plans of developing the marsh areas as residential subdivisions.

During Gulf States operations, railroad cross ties were treated at the facility and transported on and off-site by means of railroad box cars. Creosote was applied to the wood by commercial pressure treatment or by home and farm dipping. Creosote is a wood preservative used to treat railroad ties, telephone poles, marine pilings, and fence posts.

Based on the analytical results for the samples collected during the PA/SI, soil contamination is present at the Gulf States property. Inorganic constituents detected at elevated concentrations include antimony, barium, beryllium, cadmium, cobalt, copper, lead, manganese, nickel, and zinc. Organic constituents detected at elevated levels include, but are not limited to, acenaphthylene, anthracene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, benzo-a-pyrene, bis(2-ethylhexyl)phthalate, carbazole, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd) pyrene, phenanthrene, and pyrene. The presence of the aforementioned PAHs are attributable to the site operations.

The only site-attributable constituents detected in the surficial aquifer were barium, cobalt, manganese, and zinc. The majority of people in the area receive their drinking water from the City of Flowood Water Department. CFWD's wells are screened in the Cockfield Formation and the Sparta aquifers beneath a substantial a confining layer. Due to the small number of people served water by the CFWD and the fact that the municipal wells are screened at depths greater than 550 feet, groundwater does not appear to be a viable migration route.

Sediment samples collected from the marsh located west of the Gulf States property exhibited elevated levels of constituents detected in on-site soils and are common constituents used in the wood preserving industry. Such constituents include acenaphthene, acenaphthylene, anthracene, benzo(a) anthracene, benzo(b) fluoranthene, benzo(k) fluoranthene, benzo-a-pyrene, chrysene, dibenzo(a,h) anthracene, fluoranthene, fluorene, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene at concentrations ranging from 2 $\mu g/kg$ to 560J $\mu g/kg$. Such constituents pose a threat to both the marsh and the Pearl River because of the

Final Preliminary Assessment/Site Inspection Report

Gulf States Creosoting Company Revision: 1

December 2003

DCN: WSI-GSC-0011

recreational fishing that occurs on these water bodies. Due to the detection of the aforementioned constituents, the surface water pathway is a viable migration route for contamination.

Surface soil contamination is present at the property. However, because the property is primarily industrial and not residential, and the non-volatile nature of the contamination, the exposure to employees and local residences by means of soil or air is considered to be minimal.

Based on the analytical results for the samples collected during the PA/SI, further CERCLA action is recommended for the Gulf States property.

Final Preliminary Assessment/Site Inspection Report
Gulf States Creosoting Company
Revision: 1
December 2003
DCN: WSI-GSC-0011

REFERENCES

- U.S. Environmental Protection Agency (EPA), Science and Ecosystem Support Division (SESD). Sampling Event Report with attachments for the Gulf States Creosoting Company Sampling Event in April 2003. Project No. 03-0474 and 03-0558. July 22, 2003.
- 2. EPA SESD. Quality Assurance Project Plan for the Preliminary Assessment/Site Inspection of the Gulf States Creosoting Company site. Date unknown.
- 3. DeLorme. "DeLorme Topo QuadsTM Mississippi."Florence, Mississippi; Jackson, Mississippi; Jackson SE, Mississippi; Whitfield, Mississippi Quad Maps. Datum WGS84. Scale 1:24,000. Advanced Topo Tools Print Kit. 2000.
- 4. BCM Engineers, Inc. Phase I Environmental Assessment: W.G. Avery and Body Company on behalf of Trustmark National Bank. July 1993.
- Weston Solutions, Inc. (Weston). Field Logbook (Document Control No. RFW-GSC-0002) for Gulf States Creosoting Company Site Reconnaissance. Work Order No. 12587.001.001.0133. June 3 and 4, 2002.
- 6. Shanieka Pennamon, Engineering Professional, Weston. Project note to file. Subject: Latitude and Longitude determination for Gulf States Creosoting. September 23, 2003.
- 7. U.S. Department of Agriculture Conservation Service. Soil Survey of Rankin County, Mississippi. 1998.
- 8. U.S. Department of Commerce (USDC). Climatic Atlas of the United States. National Oceanic and Atmospheric Administration. Washington DC. 1983.
- 9. USDC. Rainfall Frequency Atlas of the United States. Washington, DC. 1961.
- 10. Rankin County, Mississippi. Deed Book.
- 11. Shanieka Pennamon, Engineering Professional, Weston. Project note to file. Subject: Aerial Photographs for Gulf States Creosoting Company. September 23, 2003.
- 12. U.S. Department of Health and Human Services. "Toxicological Profile for Creosote." Publication No. TP-90-09. December 1990.
- 13. BCM Engineers, Inc. Phase II Environmental Assessment: W.G. Avery and Body Company on behalf of Trustmark National Bank. August 1993.
- 14. Weston. "Sample Recommendations for the Gulf States Creosoting Company Preliminary Assessment/Site Inspection." Document Control Number: WSI-GSC-0005. July 31, 2002.
- 15. U.S. Geological Survey (USGS). National Water Summary 1984. Water Supply Paper 2275. 1984.
- 16. Mississippi Geological, Economic and Topographical Survey. Rankin County Geology and Mineral Resources. Bulletin 115. 1971.

Revision: 1 December 2003

DCN: WSI-GSC-0011

- 17. USGS. Groundwater Resources of Hinds, Madison, and Rankin Counties, Mississippi. State of Mississippi Board of Water Commissioners Bulletin 64-1. April 1964.
- 18. Mississippi Geologic Survey. Geologic Map of Mississippi. 1969, reprinted 1985.
- 19. Allen Sistrunk, Driller, Griner Drilling Services. Formation and Test Hole Information for Test Hole No. K68. Formation log for the Town of Flowood, Well No. 5. October 16, 1981.
- 20. R. Allan Freeze and John A. Cherry. Groundwater. Englewood Cliffs, New Jersey. 1979.
- 21. Garry Miller, Director Public Works, City of Flowood. Letter with attachments to Shanieka Pennamon, Engineering Professional, Weston. Subject: Drinking Water Supply Information. September 11, 2003.
- 22. U.S. Census Bureau. Rankin County, Mississippi QuickFacts from the US Census Bureau. http://quickfacts.census.gov.
- 23. USGS. "Water Resources Data, Mississippi Pearl River at Jackson, MS." Data accessed on-line on September 25, 2003. http://waterdata.usgs.gov.
- 24. ESRI/FEMA Flood plain information. Flowood, Rankin County, Mississippi. Data accessed on-line on July 22, 2003. http://www.esri.com/hazards.
- 25. U.S. Fish and Wildlife Service. Endangered and Threatened Species of the Southeastern United States. Atlanta, Georgia. 1992.
- 26. 50 CFR 17.11 and 17.12. "List of Endangered and Threatened Wildlife." Accessed on-line on December 31, 1999. http://endangered.fws.gov.
- 27. Mississippi State Health Department. "Mississippi's Fish Tissue Advisories and Commercial Fishing Bans August 2001." Information obtained from Mississippi Department of Environmental Ouality's website http://www.mdeg.gov.
- 28. Shanieka Pennamon, Engineering Professional, Weston. Project note to file. Subject: Population within a 4-mile radius of the Gulf States Creosoting Company Site. September 23, 2003.
- 29. Shanieka Pennamon, Engineering Professional, Weston. Project note to file. Subject: House Count within a 1-mile radius of the Gulf States Creosoting Company Site. September 23, 2003.
- Shanieka Pennamon, Engineering Professional, Weston. Record of telephone conversation between Richard Ball, Mississippi Department of Environmental Quality. Subject: Current Ownership of the Gulf States Creosoting Company Site. December 12, 2003.

December 2003 DCN: WSI-GSC-0011

APPENDIX A

ANALYTICAL DATA TABLES

15 Pages

TABLE 5 SUMMARY OF INORGANIC ANALYTICAL RESULTS SURFACE SOIL SAMPLES GULF STATES CREOSOTING FLOWOOD, MISSISSIPPI

									A STATE OF THE PERSON NAMED IN COLUMN NAMED IN					
		"Brokground"	THE RESIDENCE OF THE PERSON NAMED IN	The state of the s		STREET, STREET		0	On-site Samples	pies		Control of the last		
COMPOUND	UNITS	GS01SS	GS02SS	SSEOSD	GS04SS	GS05SS	GS06SS	GS07SS GS08SS	GS08SS	GS09SS	GS10SS	GS11SS	GS12SS	GS13SS
METALS	STEEL STATES	ı	THE PERSON NAMED IN		The state of the s	The same of	100000000000000000000000000000000000000	The state of the s		Service and the service and th				
ALUMINUM	MG/KG	4700 J	7800 J	₽800 €	4300 J	3100 J	C 0029	2800 J	1800 J	2500	4700 J	4400 €	5500 J	4400 ∫
ANTIMONY	MG/KG	0.56 UJ	0.64 H	1	-	1	:	1	ı	1.2 R	18	:	١	0.6 R
ARSENIC	MG/KG	6.3	3.3 J	11	2	13	2	3.6	3.4	0.95 R	6.8	3.7	4.4	6.3
BARIUM	MG/KG	72	120	49	9	37	92	88	21	52	120	ফ্র	83	28
BERYLLIUM	MG/KG	0.33	0.94	0.94	0.37	0.3	0.28	0.2	0.19	0.15	0.46	0.44	0.46	0.54
CADMIUM	MG/KG	0.05 U	E			8 9	-	-	0.09	1	0.34	6,19	-	0.16 H
CALCIUM	MG/KG	1100	069	790	069	200	1200	810	800	340	2600	099	760	1200
CHROMIUM	MG/KG	8.4	6.1	50	9	7.5	7.7	4.5	4	4.1	23	12	8.9	7.8
COBALT	MG/KG	5.8	17	8.1	1.7	9.9	1.4	2	1.5	0.95	4.8	5.4	7.3	4.2
COPPER	MG/KG	9	2 J	:	ı	-			1	-	19.7	:		7.2 J
IRON	MG/KG	10000	8400	27000 J	4500 J	15000-3	5600 J	5400 J	4700 J	2800	14000	11000	11000 J	12000
LEAD	MG/KG	11.1	17	120	18	19	17	11	12	8.8	- 80	290	52	33
MAGNESIUM	MG/KG	520 J	470 기	089	280	180	550	250	180	160 J	L 087	260 J	380	280 J
MANGANESE	MG/KG	069	2800	920	140	610	170	180	230	28	200	880	066	940
POTASSIUM	MG/KG	380 J	240 J	350	200	120	430	170	150	120 J	560 J	330 J	280	390 J
SELENIUM	MG/KG	1.3	0.93 R	1.9			_			-	0.98 R	0.77 R	-	1.2
SILVER	MG/KG	0.39 R	0.71 R	0.63	0.26 R	0.43	0.29		9	0.28 H	0.49	0.38	0.43	0.33 R
SODUIM	MG/KG	270	300	82 J	120 J	58 J	110	63		300	320	200	91	230
VANADIUM	MG/KG		15	48	11	18	13	8.1	7.1	9.9	18	16	22	17
ZINC	MG/KG	29	47	34	27	23	35	24	26	19	160	840	28	72

Notes:

GS - Guff States Creosoting
SS - surface soil sample
MG/MG - milligrams per kilogram
U - value is below the reporting limit
J - estimated value
R - data is unusable
shading - elevated concentrations of constituents

TABLE 5 (CONTINUED) SUMMARY OF INORGANIC ANALYTICAL RESULTS GULF STATES CREOSOTING FLOWOOD, MISSISSIPPI SURFACE SOIL SAMPLES

		Backnound	Name and Address of	The second second	The second	-		O	On-eite Samples	901	Annual Control			
COMPOUND	UNITS	GS01SS	GS14SS	GS15SS	GS15SS GS16SS	GS17SS	GS18SS	GS18SS GS19SS GS20SS	GS20SS	GS20SD*	GS21SS	GS22SS	GS23SS	GS24SS
METAUS	STATE OF THE PARTY	The state of the state of	The state of the s	THE PERSON NAMED IN			Section 1	100000000000000000000000000000000000000	SALAS COMPANY	Continue and	Special Spinish	THE REAL PROPERTY.	CONTRACTOR SERVICE	
ALUMINUM	MG/KG	4700 J	4800 J	L 0008	C 0077	f 0006	4900 J	B500 J	6700 J	6100 J	6800 J	4200 J	7500 J	4900 J
ANTIMONY	MG/KG	0.56 UJ	0.69 J		1	-	1	1	ı	1	ı	ı	:	:
ARSENIC	MG/KG	6.3	6	6.9	5.5 J	5.5	5.4	6.5	5.8	4.5	2.7	þ	5_	6.5
BARIUM	MG/KG	72	65	72	20	120	53	89	410	130	88	42	83	120
BERYLLIUM	MG/KG	0.33	0.44	0.71	0.43	0.94	0.35	0.73	1.2	0.76	0.81	0.43	0.5	0.61
CADMIUM	MG/KG	0.05 U	0.11 FI	0.1		0.07 H	ı	1	21.0	:			0.1 B	0.16
CALCIUM	MG/KG	1100	1800	2000	1200	2300	890	2000	1700	1400	190	280	096	1600
CHROMIUM	MG/KG	8.4	9.6	11	10	89	6.6	8.3	8.2	7.2	5.6	9.4	12	12
COBALT	MG/KG	5.8	7.3	11	4	12	7.6	13	- 12	6.9	14	5.5	6.9	6.8
COPPER	MG/KG	9	1	1	:	:	:	:		-	1	*	12 J	:
IRON	MG/KG	10000	11000	12000	12000	12000	10000	12000	12000	9800	7300	1 0026	13000	17000 J
LEAD	MG/KG	11 J	24	56	15 J	20 J	15 J	L 61	24 J	22 J	13 J	9.6	24	28
MAGNESIUM	MG/KG	520 J	340 J	430 J	510 J	490 J	340 J	530 J	380 J	410 J	270 J	220	P 90 1	450
MANGANESE	MG/KG	630	870	1800	240	2500	290	1900	2600	1800	2200	470	920	890
POTASSIUM	MG/KG	380 J	200 J	P 085	490 €	620 J	180 J	550 J	240 J	250 J	250 J	170	480 J	370
SELENIUM	MG/KG	1.3	0.63 R	1.1 R	1.3	1.5 J	1,1	5;	1.3 J	1.1 B	0.8		1.1 R	;
SILVER	MG/KG	0.39 R	0.37	0.5	0.39 R	0.51 R	0.29	0.53 R	H 6.0	0.42	0.52	0.2	0.46 R	0.47
SODUM	MG/KG	270	300	310	270	280	310	290	062	290	300	*	340	B6 J
VANADIUM	MG/KG	17	21	23	22	23	20	22	22	17	13	21	23	56
ZINC	MG/KG	29	44	48	83	65	34	25	98	63	24	19	49	89

GS - Gulf States Creosoting
SS - surface soil sample
MG/KG - milligrams per kilogram
U - value is below the reporting limit
J - estimated value
R - data is unusable

shading - elevated concentrations of constituents

Sample GS20SD is a duplicate of sample GS20SS.

TABLE 6 SUMMARY OF ORGANIC ANALYTICAL RESULTS SURFACE SOIL SAMPLES GULF STATES CREOSOTING FLOWOOD, MISSISSIPPI

		Sestament							On elle See	-		Managed Andrews		SOUTH STATE OF THE PARTY OF THE
eninenco	ALGANI)	20000			20000									
VOLATILS	Cuito	Callina	007040	agman	Chouse	cacces	Caronina	080/88	G8082	GROPES	GETORE	081188	081258	081388
ACETONE	NGWG	L 001	160 J	25 J	28 J	L IS	623	87.3	74.3		24.5	220 3		200 J
METHYL ACETATE	UGAKG	11.0	The second	-			1	-	-	1	100 m 100000	-	-	
METHYL ETHYL KETONE	DOWG	13 0	2	1	E	1			-	t	-	- AL	167	15.J
MECH ANGOLD VOLATILE ORGANICA			100	State	-								-	
LINDOWN COMPOUNDS/NO.	DOWG	5f 61	51 32	6.441	10.01	17.7	20.42	14, 01	18.3/2		DF 62	St. 85	30.473	14, 61
ACETALDGHYDI	UG/KG	0000												16 NJ
BUTANAL	UGKG	- W-		1000					2000		200		SNO	
BUTAWAL, 3-METHYL.	UGAGG													
H XANAL	UGAKG						84 NJ		200		45 NJ	37 J	18 NJ	
PENTANAL POCOANAL STACTION	UGAKG			1										2
THE STATE STATE IN THE	Danne													
SALTAN ES						-	State of the last							
CANDOR 4 46 DATEMOS	HIGAGG	300 (3									200	The control of the co		-
ACCUADACTURE ACCUADACTURA ACCUADA ACCUADACTURA ACCUADACTURA ACCUADACTURA ACCUADACTURA ACCUADACTURA ACCUADACTURA ACCUADACTURA ACCUADACTURA ACCUADACTURA ACCUADACTU	I I CACO	11 082	I			Ī	Ī	2.			07.1			ŀ
ACENAPHTHYLENE	HOKO	390 14		Ī	Ţ	1.001	Ī	002	490		1000	2000		1 0000
AMPHACEM	UGAKG	360 U			-	470		96.0	1 400		0000	2000		T COOK
BENZALDEIMDE	UGAKG	380 U	,	-							100			T.
BENZOJAJANTHRACENE	INGAKG	380 U	-			270	,	2500	1500	-	2000	9000		0007
INCNZO/09/LUCKAMPHENE	UGWG	380 U			-	11800°J		L 0009	11000.1		9009	5500	,	7300.1
BENZOJGHIPERYLENE	UGAKG	380 U	1	-		380.3		909	3800		1900	460	-	2000
BENZOIGHTUONANTHENE	DOMEG	380 U		The same		2100.3	-	E200 J	12000 3	1	2300	1700		5400.1
BH MZO-A-PYPENE	UGWG	380 U		-	-	610	1	2100	9700	-	3100	900		3100
I,1-BIPIENY.	UGAKG	380 U		1	-	-	-	45.3		1	-	-	1	-
CARBAZOLE	UGKG	380 U		-		200 J	-	610	1.001		097	210.5	1	540.3
CHANGENE	UGKG	360 U	-	1	-	1500		4000	2300		4300	1500	-	8200
DIBENZO(A HJANTHRACENE	UGAKG	380 LU				100 J	-	620	1700		750	310 3	ŧ	1100
CBENCOPUNA	UGAKG	380 0			-			240.3		-	120 J	140 3	1	I
CHOCKE	CONTRA	3000		1		000		9029	0000		400	1900	,	11000
MOTING STOTISTING	SIGARG	111 000		Ī	T		I	100	LIVOR		9000	970	•	2000
PARETHY NAPHTHALENE	CHOACA	11 000			T	200	Ī	1 000	200					2000
MAPHTHALENE	UGAKG	0 08c						87.3		-	110.1			
PHENAMBHENE	UGKG	380 U	S	1	1	320.J		4200	6103		1400	540	the last	1600
PENTACHLOROPHENOL	UGWG	UD 020	-				1			-	C 000	640 J	4	ı
PYPIEME	UGWG	380 0	1			1600		6000	2500		0000	1700	•	9800
MACEL AMEGUS EXTRACTES		0.000	200000000000000000000000000000000000000	AND DESCRIPTIONS	2	A STATE OF THE PERSON NAMED IN	Annual Control	-	Section and section and					The same of the sa
UNION/WHI COMPOUNDS/NO.	UGAKG	1400 J/12	2200 JAS	10	2000 3/7	2700 J/11	2800 J/14 5000	95	23000 J/17	1900 JV10	4100 Jrs	3600 J/12	410 Ja	19000 3/12
STIGMAST 4 EN 3 CME	UGAKG		190 HJ		-	35	460 NJ	100000000000000000000000000000000000000						
UNICOWN ALCOHOL	UGAG				ш					16.				
LIMONOMINI RETORNESANO.	UGAKG				250 3/2									
METHYLANING ACENE	DOWG					190 3	The second second						South Co. of the second	
SALE MANUFACTURE CARPOR	2000					2002		200	-		800 AU	Z90 NO		1000 NU
ENGLISHED STATES	S S S S S S S S S S S S S S S S S S S			I			I		1					NOUL
PHENANTHRENE, 23-DIMETHY.	UGWG					160 M.I	I	870 MJ	Ī					IN OUR
PHEMANTHREME, 4.5-DIMETRY.	UGWG							200 200 200 200 200 200 200 200 200 200	2000					21.000
ANTHRACENE, 3 METHYL	UGAKB							F 0001			8	100000000000000000000000000000000000000		
BENZOFI UORENE	UGAKG		0.00			160 J			\$ 0Z6					
II H-BENZO/APT DOMENE	DOWG			1		470 14	0	740 NJ			2200 NJ			
I MERKUBITUONENE	UGRG													THOO NO

7

TABLE 6 (CONTINUED)
SUMMARY OF ORGANIC AMALYTICAL RESULTS
SURFACE SOL SAMPLES
GULF STATES CRECOSTING
FLOWOOD, MISSISSIPPI

COMPOUND 12.3.4.06ENZPYRENE 12.4.5.06ENZPYRENE 12.4.5.06ENZPYRENE 12.4.5.06ENZPYRENE 12.4.5.06ENZPYRENE FERCANOL							ĺ							
2. BRADATHALENIE 23. 4-00 BENDYRENE 23. 4-0 BENDYRENE BOOCOSER EE ECOSANCI	IOHUB	080188	080288	0.5038	G80488	G\$06\$\$	GBO8SS	G\$0788	G80088	080088	G\$1088	631188	G\$1255	081388
23.4-4-08EHZPYRENE DOCOSENE ECICSANO: HYDOGONEON	UGAKG										560 NJ			560 NJ
24.5-DIBENZYRRENE ENCOSEME ENCOSANOIC ACID	UG/KG								_					
DOCOSENE EICOSÁNOL ENTADECANOIC ACID	LIGARG				1	Ī			880 NJ I					
EICOSÁNOL ENTADECANOIC ACID	HIGAKG					Ī								
ENTADECANOIC ACID	UGAG													
	UGAKG									97 KL				
PERMENE	UGAKG					ľ			3000 NJ		UN 0001			
PYREWE, 1-METHYL.	UGWG					ľ			880 NJ		Z10 NJ	300 NJ		1400 RJ
WRENE, 2-METHYL	UGAKG					250 NJ	Ī	1200 NU	1000 NJ		UN 0071			CA 099
PYRENE 13-DIMETHY	LIGAKG				Ī	280 NJ	-	-						
PVBENE AMETHY	I NOWER							740 NU			7			
CUTACAUTHORCEME 246THM1.	LICACO.		Ī		İ	T		+	Ī					
DENTALANTING CERES 1 19 DIVANCE	040		Ī		İ	Ī	Ī	170 973	I			220 M.I		
ENZAMINACIONAL INCIDANE	2000	T	Ť			†	1		Ī					7an M3
ENCUSINATION CONTROL OF THE SECOND CONTROL O	5 CON C	Ì			1		1		Ī					200
ENZORBINAPHTHOIZ, 1-D) THIOPHENE	UGAKG					380 %		G70 NO						
ENZOLJFLUORANTHENE	UG/KG					-		_						
THEENZ IDE! ANTHRACENT-ONE	UG/KG					310 NJ		850 NJ	910 NJ		1100 NJ	430 NJ		1500 NJ
CARYOPHYLLENE	DG/KG				-			-			0			
CHBYSEME 1-METHYL	HOWG								1200 N.J					
CHRYSCHE FLICTION	I ICACO					ĺ		N COS			٥		10	UN OLO
CADACATIC A METION	0,401	Ī	Ť			27W A11	Ī		Ī					
CONTROLLE, CAMELINES.	040		T	Ì	Í		Ī	İ	Ī		TOTAL BASE	220 111		IN OUR
CLUPEN MUEL) PREMANI MEMUNE	OGWG						1	1				I		Old Color
5.12-NAPHTHACENEDICHE	UGAKG								1400 PG		DAU IN			Z 0//
BENZO(E)PYRENE	UGAKG		-			290 AU		1200 NJ			3300 NJ	1700 NJ		
BENZO(BJTRIPHENYLENE	UGARG											380 NO		
BENZIEJACE PHENANTHAPYLENE	UGMG							-						
1,2:7,8-DIBENZPHENANTHRENE	DOWG		_			CM 092						480 J		
4:9,10) DIBENZPYRENE	UGAG		_			180 NJ								
INDACAN ALKENE	IUGAKG		ï											
INIONOWN CARBOXYLIC ACID	UCAKG							_			720			
JNIGHOWN PAHSAIO.	UGAKG					2700 J/11		5300 Jr7	5400 J/4		P400 Jr	2100 7/6	100000000000000000000000000000000000000	8200 7/8
HEXADECANOIC ACID	UGAKG						300					870 KZ		
9-OCTADECENE (E)	UGAKG						202							
HEFTADECENE	UGAKG						120 KJ							
D:C-FRIEDGOLEANAN-3-ONE	UGAKB						860 NJ	_						
H-PLUOREN-9-ONE	UGAG						I	460 NJ						
CHOLESTEROL	UGAKG			Ī		-		-	Ī					
IPHTHALENE, 2-PHENTL	UGAKG			Ī			Ī	760 NU						
1-TETRADECENE	UGAKG		9			Ī	Ì	-		140 NJ				
1-OCTADECENE	UG/KG			_	Ī	Ī	_	-		Z30 N7				
1-HEPTADECENE	UGAKG									Z30 V7				
3.4-DIFTOROCYCLOPENTA (CD) PYRENE	UGKG			-						•	550 NJ	4		
1-EICOSANOL	UGKG					-								
TESTÖSTERONE	UGWG													
TRIPHENYLENE 2-WETHYL	UGKG										800 NJ	386		
VALENCENE	UGAKG										2			
and delivery for the second							And and the same				-	-	Company of the Control of the Contro	WASHINGTON SHAPE
at but, but	10000	11.6	-		-	Name and Address of the Owner, where	-	1		١				
ALTANBAR	0000	100		Ī	†			1						1.67
	0000	2000	•		T	90	1	Ī					,	1.04
FIND ALL MATCHES	S C	2000			Ī				The second second					5
ALCOHOL DE COME	2000	200		1	1	Ţ	Ī		A		24.97			- 5
7.4.003	CONC	200		1	,						1			200
A CONTRACTOR OF	300	3			<u> </u>				24 411		10			
CITIVATURE	Sunce	2			1				7			l		

Holes:

GS - Gulf Stees Crocoting

SS - eufter act earning

UGKG - retrograms are takentin

U - retur is below the recording finit

J - semination value

R - data ar uneable

R - presumptive evidence of presence of material

shading - elevated communities of constituents

TABLE 6 (CONTINUED)
SUMMARY OF ORGANIC ANALYTICAL RESULTS
SUFFACE SOIL SAMPLES
GULF STATES CREOSOTING
FLOWOOD, MISSISSIPPI

	-													
COMPOUND	S. MALE	980188	G\$1488	0.01583	031688	081788	G81858	0.8196.8	0\$2058	G820SD*	082188	682288	G82388	682488
ACSTONE	I MOARO	. 001			2	. 000	1	, 600	1 000	1		The same of		
EBML ACETATE	LIGAKG	011						3			2003		2	3
AETHYL ETHYL KETONE	UGAKG	11.0		12		28 - 3 - 5	14 2			1.40	Sel Contract		Section 14 contrast	
A.A. A.A														
MATERIAL COMPONING AND STATE OF STATE O	- Control	0.01		1	H.	ш		-	STATE OF THE PARTY	The second	San Statistical		Section Section	
CETAL DELANDE	2000	10.00	1000	10.00	2A7 GR	12 30	500	111111111111111111111111111111111111111		5	12 Jul	3	30 Jr3	150 J
UTAKAL	INTRO			1		20 00		28 20		42 N	4/ NO		N PI	
SUTANAL, SAJETHAL.	UGKG									IN II				
EXANAL	UGAKG				31 NJ		20 NJ							
MANAL	UGAKO										7 14.1			
PROPAMAL, 2-METHYL.	UGAG					7 NJ				7.82				
				N	1	The Control of the Co	100	2000						
DOBACTABLES	State of Parties Belleville	STATE OF STREET	Section 18 and 1	ACTION SHAPE OF	Contraction of the last	Separation of the last	Sec. 15	200	CONTRACTOR SOLD	September 1	Attended to the	State State	Name and Address of the Owner, where	September 1
AND CREATER THREPS NO.	CONCO	380 U	1	1	-	-	1	-	1	=	-	1		
CNAPITHENE	UG/KG	380 0	-		-	-		1		-	1	-		1
ACENAPHTHYLENE	UGAKG	380 U	-	250 J	67.5	270.5		1			1		198	188
ANTHRACINE	UGAKG	380 U	1500	370 J	-	6000	-	1	1		1			300
NZALDEIMDE	UGAKG	360 U			-	-	-				,			
NZOJAJANTHERACENE	UGAKG	360 U	2300	069	260 J	1000	-		58.5	44.7			430	080
UNZOSPI UORANTHEME	UGAKG	380 U	4200	1500	700 7	2600 J	1		160 J	140.1		ŀ		2006
ENZOJSHIPERYLENE	UGAKG	380 U	820	360 J	626	290.3					1		1.00.1	330
SENZOKOLUCINANTHI ME	UGAKG	380 U	2400	0011	730.3	2700 J		,	170.1	150.1	-		530	1 Dec
NZO-A-PYRENE	UGAKB	380 U	2300	650	230 3	000	1	t	48.3				2001	870
1-BPHENYL	UGMG	380 U		1	-	1	1	-	1	-				
CARBAZOLE	UGAKG	380 U	280 3	250 J	F 29	130 J	1	-	1	1			1	
CHAYOUNE Contention to an office of the	DOWG	380 U	9100	1700	300 7	1600	1		1.86	C 69	1	-	510	100
DEPARTMENT OF THE PROPERTY OF	COUNTY	300 00	200	6002	25.	330.3		•	1		1		120 J	260 J
THE PACE AND AND AND AND AND AND AND AND AND AND	DOWN			1		-	1	-	1			1	-	
HORENE	2000	380.0	0000	2100	200	2500	•		73.7	619	ı		920	1300
VDENOT 23-COMPREME	B ICAKG	11000	1700	740	270.1	1000	I	ŀ	1 60		1			-
2-LETT MANY PALENE	LIGARG	380 (-		-	I		200				2000	2000
WAPHTHALENE	DOWG	380 U	-	-	-	-			,			I		
HENANTHALINE	CGAKG	380 U	320 J	1100	310.3	250 J	-	100	1	-		,	F 99	
PENTACHLOROPHENOL	UGARG	970 UU	-	-	500 mm (0.000 mm)	-	-	1	-		-	t	-	ı
THENE	UGAKG	380 U	3300	0000	240	1700		1	f 001	L 63	-	1	480	1600
CONTRACTOR PROPERTY IN THE PARTY														
MINIMUM COMPONING AND	OWON		SEASO 16	PHI COOK	TENS CONTRACTOR OFFI	2000 1000	TOOL IN OLD AND AND AND	301 00000	277		п			
STOWNST 4-EN 3-ONE	HOKO			200	200	200	300	070 000	2000	111 000	3100 0014		- THE PARTY	CINT COME
BACOWN ALCOHOL	UGAKG									200			A COLOR	ZODA N
MONTH KETCHESANO.	UGAKG			W 700 W			1000							
METHYLANTHRACINE	UGAKG							30						
DANTHRACENEDIONE	UGAKG			700 NJ	ال 160		1	10000						
ERANTIMENE, 1-WETHYL							75		2000					
ENAMINATERE, 24ETHIL									1					
TEMMINISTER, 2.3-DIMETHYL.	DOWN					996/2003/996					-			
ANTHORACE SAFTING	I													
BENZOHUORENE	UGJKG													
11 H-BENZCIA/PLICINIM	DGKG		1700 M.I											i
A COLUMN THE PROPERTY AND ADDRESS OF THE PARTY														

TABLE 6 (CONTINUED) SUMMARY OF ORGANIC ANALYTICAL RESULTS SURFACE BOIL SAMPLES GULF STATES CREOSOTING FLOWOOD, MISSISSIPPI

		Taxable (a)						Oneth Sameter	Amoine				Total organical	Contraction of the
COMPOUND	UNITS	030183	0\$1438	081688	081085	G\$175S	981188	381180	082088	G\$20\$0*	082188	0\$22\$\$	880280	G\$2488
					-									Ī
1.2:3,4-DIBENZPYRENE				190 NJ		290 NU						_		
1.2.4.5.DIBENZPYRENE														
1-DOCOSEME					1					23 23 23	171			T
DEMONSTRATE	Ì				1						COLO MO			
DEBY ENE	Ť		710 N.1	Ī	200		Ī							260
Systems institut	Ī	Ī	TWO WIT	Ī	1.0000									160 NJ
	UGAKG		20 N		1400 J		Ī						130 KJ	
HML	UGAKG								9					
BENZJAJANTHRACENE, 7-METHYL.													240 NJ	
BENZIAJANTHRACENE-7, 12-DIONE				260 P.U										
	UGWG		550 RJ		1400 J	310 72								
													2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	100
WACEN-7-ONE	UGAKB		200	7 C	1600 3	ON DOS							N OLV	STORY STORY
CAHTOMITLENE	Ī	Ī		111	Ĭ		Ī							
CHATGENE, LACTION	Ì	Ī		200	1 0000	350 140	Ī							T
CHARLE STREET	ICAKG.	I												
T.			470 NJ		Ī								140 NJ	
S. 12-NAPHTHACENEDIONE	NG/KG		380 NJ		2600 J	800 NJ							210 NJ	
	UGAKG		2600 NJ			880 NJ							240 NJ	840 NJ
BENZOIBITRIPHENYLENE														
BENZIEJACEPHENANTHRYLENE											ī		110 NU	
	UGAKG		UM 008											
RENE	UGKG			Ī			=							
UNKNOWN ALKENE														200 J
LICACID														
=	UG/KG		5800 J/B	2000 JV4	560 J/1	D70 J/3								1700 Jve
HEXADECANOIC ACID	Ī						2	160.1	200	2		200		Ī
P-OCTADECEME.(E)		Ī												Ī
THEFTADECENE	I	Ī		T	Ī									Ī
DOCTRIEDUCULANDAME	Ī				Ī									Ī
CHOI ERTEROIL						850 AL								
MAPHTHALENE 2-PHENT.						210 NJ								
1-TETRADECENE					Ī									
1-OCTADECENE														Ī
			1	Ī		Ī								Ī
1. ENCORANCE	Ī		2	Ī					190 AU					Ī
TESTOSTERONE								390 NJ						
TRIPHENY ENG. 2-46-THM.	Ī		GAO NU											
VALENCENE					1200 NU									
PENTICOESPOS		The second second				Address of the Party of the Par					-			
	USANG C	0.20	ı	1			!	1				1	2	Ī
	DAY O	300		97 621		A CO	1			1 1	1 1			T
FUNDAM KELOME	LIGAKG	380		1	THE PASSES	20.7	,	,	,		,	ŀ	69.1	ļ
	JOKG	38.0	10 NJ	30 M	1	-	ı	t	1	1		1	1 .	1
	UGAKG	380	,	,	2.5	1	ı	1	4.1 NJ	3.3 KU		ı	1	1
METHOXYCHLOR	JOKG	20 U	38.82		ı	ı	1	1	1	1	1	1	1	ı
	l													

Motes:

GS - Cud States Crocoting
GS - entres of asmohe
GS - entres of asmohe
GS - entres of asmohe
GS - entres of asmohe
U - entre to the entre of the entre
U - entre to the entre
U - entre to the entre
U - entre to the entre
U - entre to the entre
U - entre to the entre
U - entre to the entre
U - entre to the entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - entre
U - ent

SUMMARY OF INORGANIC ANALYTICAL RESULTS SUBSURFACE SOIL SAMPLES **GULF STATES CREOSOTING** FLOWOOD, MISSISSIPPI TABLE 7

	2 - 12	Background					On:8	On-site Samples				
COMPOUNDS	UNITS	GS01SB	GS02SB	GS03SB	GS04SB	GS05SB	GS06SB	GS07SB	GS08SB	GS09SB	GS10SB	GS11SB
METALS	STATE OF STREET	TO SERVICE AND ADDRESS OF THE PARTY OF THE P	THE PARTY OF	STATE OF THE PARTY	SKINE STATE	Secretary of the last of the l	THE PERSON NAMED IN		The second			A 100 100 100 100 100 100 100 100 100 10
ALUMINUM	MG/KG	7300 J	J 0087	8600 J	6600 J	5300 J	L 0077	9400 J	8100 J	5800 J	B600 J	f 0096
ANTIMONY	MG/KG	0.59 UJ	-	-	1			1		1	0.96 R	1.6 R
ARSENIC	MG/KG	6.7	3.4 J	9.4	1.9	0.91	2.7	2.7	3.5	:	13	9.9
BARIUM	MG/KG	62	34	63	57	59	48	50	45	53	430	41
BERYLLIUM	MG/KG	0.31	0.36	0.64	0.41	0.27	0.24	0.35	0.59	0.35	1,3	0.49
CADMIUM	MG/KG	0.05 U	-	7 7					1	ı	0.87	
CALCIUM	MG/KG	820	170	1400	670	580	066	670	450	540	9400	320
CHROMIUM	MG/KG	12	9.5	14	9.9	4.9	7.5	8	9.2	5.3	19	17
COBALT	MG/KG	3.3	2.6	4.3	1.4	0.78 R	1.2	1.6	9.4	- -	12	3.2 R
COPPER	MG/KG	6.4	-				-	-	:	:	₽ 04	
IRON	MG/KG	13000	13000	22000 J	7500 J	2300 J	5800 J	8200 J	12000 J	3800	20000	20000
LEAD	MG/KG	8.2 J	9.9	15	9.5	6.7	11	F	5.7	8.4	7.1	6.7
MAGNESIUM	MG/KG	580 J	480 J	770	370	220	580	550	370	290 J	2400 J	F 089
MANGANESE	MG/KG	180	200	200	9	16	18	19	1000	9.3	1800	120
NICKEL	MG/KG	5.2 U	:						:	:	20	:
POTASSIUM	MG/KG	320 J	320 J	360	190	170	240	260	350	190 J	P 046	430 J
SELENIUM	MG/KG	0.7	1.4	1.6	1	1	-	-			1.2	1.1 R
SILVER	MG/KG	0.38	0.38 R	0.49 R			0.28 R		0.32		0.76	1.1 R
SODIUM	MG/KG	290	290	98 J	300	190 J	250	220	46	440	490	350
VANADIUM	MG/KG	22	20	33	14	6.7	17	18	22	8.4	30	33
ZINC	MG/KG	18	50	23	15	7.3	12	15	25	12	280	44

Notes:

GS - Gulf States Creosoting

SB - subsurface soil sample
MG/KG - milligrams per kilogram
U - value is below the reporting limit

J - estimated value

H - data is unusable

shading - elevated concentrations of constituents

SUMMARY OF INORGANIC ANALYTICAL RESULTS SUBSURFACE SOIL SAMPLES GULF STATES CREOSOTING FLOWOOD, MISSISSIPPI TABLE 7 (CONTINUED)

A CONTRACTOR OF THE PERSON NAMED IN COLUMN TO PERSON NAMED IN COLUMN T		Background	THE PROPERTY OF THE PARTY OF				On	On-site Samples	88	No. of Persons		THOUSAND IN
COMPOUNDS	UNITS	GS01SB	GS12SB	GS13SB	GS14SB	GS15SB	GS16SB	GS17SB	GS18SB	GS19SB	GS20SB	GS21SB
METALS	No. of Concession, Name of Street, or other Persons, Name of Street, or ot	THE REAL PROPERTY.	CONTRACTOR OF STREET	STATE OF THE PARTY	The second second				SCHOOL STREET, SQUARE,	Section Property lies	Sec. Marie and Sec.	The second second
ALUMINUM	MG/KG	7300 J	3700 J	8400 J	4600 J	11000 J	12000 J	6700 J	L 0077	12000 J	4700 J	F 0098
ANTIMONY	MG/KG	0.59 UJ	1	0.58 R	•		1	1	-		**	*
ARSENIC	MG/KG	6.7	4.6	4.7	7.4	8.1	7.3	1.5	4.1	8.3	2.3	4.5
BARIUM	MG/KG	62	19	23	54	45	49	61	26	43	24	28
BERYLLIUM	MG/KG	0.31	0.3	0.34	0.48	0.59	0.49	0.39	0.31	0.46	6.0	0.3
CADMIUM	MG/KG	0.05 U	-		-	-	:			***		:
CALCIUM	MG/KG	850	160	400	620	710	390	620	190	190	120	140
CHROMIUM	MG/KG	12	8.5	11	7.1	21	17	2	8.7	12	4.7	14
COBALT	MG/KG	3.3	1.4	1.7	12	2.9	2.1	1.5	3.4	9.6	2.2	1.9
COPPER	MG/KG	6.4	1	:	-	l f 2	7.7	-	-	***		3.6
IRON	MG/KG	13000	13000 J	14000	14000	24000	23000	2900	12000	20000	0069	13000
LEAD	MG/KG	8.2 J	6.7	5.1	27	9.5	8.7 J	9.1 J	B J	12 J	Ր 9	6.8 J
MAGNESIUM	MG/KG	580 J	170	470 J	250 J	640 J	650 J	310 J	470 J	680 J	210 J	420 J
MANGANESE	MG/KG	180	55	82	1909	410	52	22	192	600	140	95
NICKEL	MG/KG	-			-		:	:	1	-	1	;
POTASSIUM	MG/KG	320 J	170	410 J	180 J	f 064	470 J	280 J	220 J	480 J	L 071	300 J
SELENIUM	MG/KG	0.7	1.4		1	2.3	1.7 J	ŧ	-	1.7 J	1	0.95 R
SILVER	MG/KG	0.38	0.47	0.39	0.42	99.0	0.45	0.32 R	0.32 R	0.53	0.25 R	0.4
SODIUM	MG/KG	290	96	310	260	290	.290	340	540	280	340	310
VANADIUM	MG/KG	22	26	22	23	96	33	13	18	31	14	21
ZINC	MG/KG	18	8.4	20	20	36	25	12	16	30	11	16

Notes:

GS - Gulf States Creosoting

SB - subsurface soil sample

U - value is below the reporting limit MG/KG - milligrams per kitogram

J • estimated value R • data is unusable

shading - elevated concentrations of constituents

A-8

TABLE 8
SUMMARY OF ORGANIC ANALYTICAL RESULTS
SUBSURFACE SOIL SAMPLES
GULF STATES CREOSOTING
FLOWOOD, MISSISSIPPI

	-	Section and section in										
COMPOUNDS	UMTS	GSOTSB	080288	080088	G804SB	G\$058B	GSO6SB	GS0788	GSOSSB	GSOBSB	G\$10\$B	GS116B
VOLATILIS	10000	뵱	STREET, SQUARE, SQUARE,	STATE OF THE PARTY.	を 日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日	Particular Collection	Section and Personal Property lies	The second second second	September 1	- Co.	The second secon	State of Participation
ACETONE	UG/KG	39 W.	ž,	35 J	1	1	21 3	-	7 00 mm	-	C 82	24.3
BENZENE	UG/KG		1	1		-	(44)	-		-	2.3	1
THAT ETHYL KETONE	UGAKG			-	1	1	500		ST ALL LUNGSHAME	- 1		-
				Compagn Compagn				2000		1000		
SCREEN STOCATILE OF GAMES					Special property and property a	The same of	STATE OF PERSONS	Contraction of the last		STATE STATE	STATE OF THE PERSON NAMED IN	
W. HOWN COMPOUNDS/NO.	UGNG						10, 8		11 8		26 J/2	
CALCACIAN	000000		1	ALCO DE LA COLOR D	ACTION OF STREET		100	The same of the sa		Section of the latest l	The second second	
PHYACENE	USAKG	0.00	1	-				1	74.3	-	12000	49.0
ALE NATIONAL PROPERTY.	1	400 0		-	1	1	-	E		1	210 J	
ENAPHINEENE		400 0		1	1	'	-	-	1	1	6100	1
NZO/A)ANTHRACENE	DOWG		1	1	1			1	120 J	1	23000	
NZO/BJFLUORANTHENE	UGAKG	400 0	1	1		ŧ	-	47 J	1000	1	37000	- 100
NZOJO,HIJPERYLENE		1				200 m w 1650	1	1	320 J	- 1	6200	-
NZOWI FLUORANTHENE	UGVKG		0 - DO - DO	The Second		- 100	- 10	45	086		26000	48.3
420-A-PYRENE	DOWE	400 U	1	1		Į.			240 J	-	25000	-
ISI2-ETHYLHEXYLJPHTHALATE		400 U	1	200		450	-	1	-	t	-	
CARBAZOLE	200	400 U	-	-		paragram again		-	1		18900	1
TYSENE	UGAKG	400 G			1	-	1	t	220 J		00090	-
DIBENZOYA, HIANTHRACENE	1	400 U	,	1	-	-		1	150.3	1	2000	
ENZOFURAN		L							-		1 976	
CRANTHENE	FIGARG		-			,	1		out i		- Supply	
MARMO (1.5 % CON BVBENE	COVC	L							No.		20000	
ACMANITADE NE	200	l				1			No.		CONTRACTOR	
MANIFORME	USING	4000		1		-	-				2700	
ENTACHLOROPHENOL		1000 E	-	1		1	1	1	t		F 089	1
PYRENE	UGAKG	700 P	,	1	-			1	230.3	1	37000	,
0.0000000000000000000000000000000000000					Carry Company	20000						
CONTROL STRACTABLES	CONTROL OF	OCCUPATION NAMED IN COLUMN	Lague Control of the Party	Managing Spinster, or other			the state of the state of	SANJANCHISCHER STREET	SCREEN STATES	Street, Springer, or	THE RESIDENCE OF THE PARTY NAMED IN	
1-PHENANTHRENECARBOXYLIC ACID	3	92 NJ	20-00-00-00	Copper Security								
UNICHOWN CARBOXYLIC ACID			-			-						98
NOWN COMPOUNDS/NO.		840 JVS	220 7/2	250 1/2				190 JV1	1500 J/7	370 1/3	17000 1/4	530
NOWN AMIDE									110.1	l	L	
UNIONOWIN PARSANO							100		CA CAS		SEATON LV13	
MACNOWN PHTHAI ATES												
NI ENE						1			111 000		110 OCOSP	١
DVBCuc - sactovi	-								AND NO.		10000 I	١
THE PASSING	1	I				1					ON OWN	
ENE, D-MEINTL						1					CACOU PL	
ANTHRACENEDIONE	1										2	
ZAJANTHRACENE, 6-METHYL	**	Applications of the second	25.00	**				STATE OF STREET	2000		2800 NJ	
SENZIDEJANTHRACENEDIONE											4600 NJ	
7H-BENZIDEJANTHRACEN-7-ONE												
-BENZOBIT LORENE											SOON N.	
ZORBIA PATRACIO 4.01 THIOPIAINI						T					ARMO ALL	
Conference and an or of the conference of the co	1					1					SOUTH IN	
SENSON MANUFACTURE OF THE PROPERTY OF THE PROP	1	I				1						
SOURCE STATE OF TH	-					1					111	
MENCOLE PROPERTY OF THE PROPER											GZOU NU	
SENZENEDICARBOXYUC ACIO												
DINAPPORAL ENE											3100 NJ	
CYCLOPENTA (DEF) PHENANTHRENONE					3						4700 NJ	
3.4.DIBENZPYRENE	1000000			8					190 MJ			
7.8-DIBENZPHENANTHRENE		200	27			20,000,000000	200				7400 NJ	
D,4-DIHYDROCYCLOPENTA (CD) PYRENE							100 PM 100 PM				Z800 NJ	
IPTICINE			100000000000000000000000000000000000000				500000000000000000000000000000000000000					100
NAPTHO (1,2,3,4-DEF) CHRYSENE					- 0.00				120 NJ			
2-NAPHTACENEDIONE	0.00			36	20,00						4600 NJ	
VALENCENE			-		1	Sept.		Designations, Special	Acceptance of the	Section ()	Section of the section of	
STODESPES	Section Section	Į		patroles and patro	analytical pro-	Section of the Section of	A Principal Prin	differential control of	Company of the Control of the Contro	Contract of the latest of	CANADA STREET, SANSAGO	STATE OF STREET
4,4-00T	UGAKG		A		100 - 000		1	1	4 100 000	1	110 N	
400%	UGIKG			-	- 44		- MA C			***	-	1
DRIN KETONE	UGWG	40	1	1		t			1	- 100	180 M	
AMA-BHC (LINDANE)	UGWG	100	- mar	2 88				1	1	1	1	-
F-1254 (AROCLOR 1254)	UGKG	1000		-	-		1		1			1
PCB-1260 (AROCLOR 1260)	DGWG		1	1	1	1	Manager +		-	-	1	-
	1	I										

GS - Guif States Crossating

BS - substantiates und sample

USNG - micrograms par biogram

U - value is below the reporting limit

- setimated valve

shading - elevated conventations of constituents

TABLE 8 (CONTINUED) SUMMARY OF ORGANIC ANALYTICAL RESULTS SUBSURFACE SOIL SAMPLES GULF STATES CREOSOTING FLOWOOD, MISSISSIPPI

	I	Background					On elle Samples	amples				
COMPOUNDS	UNITB	GS018B	GS12SB	QS138B	G8145B	G\$158B	GS165B	GS175B	GS165B	G81988	GS20SB	GS21SB
VOLATILES.	0,10	The same of	The second second	S. Saldenberger	200	The second second		The Control of Control of	the age of the particular	The state of the s	The sandy sandy sandy sandy sandy	
ACETONE	OGNEG	3:	2	1	20	- 01	:	:		. 1	1	
METHY FTHY KETONE	ORKO	11 15	,	,					1		1	Ţ,
MISCELLANCOUS VODATILE ORIGINATES		SCHOOL STREET	- Calcala	Section of the last	Section 1995		No. of Persons	Statement of the last	The second	The same of the letter of the	できる 日本の日本の日本の日本の日本日本の日本の日本の日本の日本の日本の日本の日本の日本	delicate and a second
UNKNOWN COMPOUNDS/NO.	UGAKG				14, 8	20 DZ				1000		-
ANTHORCENE	FIRANCO	11007			909	1	1	1				
ACENAPHTHENE	Q VO	007									,	
ACENAPHTHYLENE	DG/KG	400 U	1	ı	330	ı	t	1	1	:	,	0
BENZOVANANTHRACENE	UGVKG	400 U	,	- PS	Ħ		:	1	t	,	1	Į,
BENZO(B)FLUORANTHENE	UG/KG	400 U	1	160	2400	:		41 J	ı	ı	1	1
SENZO(G,H,I)PERYLENE	UGAKG	400 U	t	ŀ	17.840	ı	1	1	:		:	
SENZO;KJFL UORANTHENE	UG/KG	400 U	:	170 J	\$000	-	1	43	1			**
BENZO-A-PYRENE	UGVKG	400 U	4	•	Seri-Money	Ī	ŧ	t	1	4	1	:
BIS(2-ETHYLHEXYL)PHTHALATE	UGAKG	O 007	den	ı	1	1	1	2	:	:	t	44
SARBAZOLE	UG/KG	7007	:	ì	210 J	ŀ	ı	1	1	1	:	
CHRYSENE	UGVKG	400 £	1	7 6	2100	:	:		,	ľ	1	1
JIBENZO(A.H)ANTHRACENE	UGAKG	400 U	t	ı	380	t	1	1	**	1	:	
JISENZOFURAN	UG/KG	400 0		;		'	ı	ı	ı	1	,	
PLUCHANIMENE	DANG	0.004		3	3400	1	:	ı ı	1 (3	1		
MENANTHERE	LIG/KG	400 11		5 1	610	: :	: 1				: :	:
FUTACHI ORODHENOI	IIICARG	10001		Γ	-	,	,	1	1	,	,	,
PYRENE	UGAKG	400 U	1	89	5400	,	;	;			:	:
				П								
Sections External Es		SCHOOL SECTION	STATE OF STREET	1	STREET, SQUARE, SALES	Section Contracts	Name and Address of the Owner, where	San Character Court	-	The state of the s	Statement of the last	Special property
II-PHENANTHRENECARBOXYLIC ACID	UG/KG											
MANOWA CARBON TO ACID	200			C/1 0001	OFT CADE	2101	601 066		155	0.6 0.9	130 64	RA 1/19
HANDEN ANDE	HAKA			3	200	2	2000		3			3
INKNOWN PAHSNO	UGVKG				3200 3/7							
NKNOW'N PHTHALATES	UGAKG								230 JV2			
PERYLENE	UGAKG				420 NJ							
YRENE, 1-METHYL	UGAKO				340 %							I
YRENE, S-METHYL.	CONCO				7000 811							
JU-ANI MIRACENEDIONE	DONG				350 NO	1						
ALRENZINETANTHRACENETICNE	I ICAKO											
H-BENZIDE ANTHACEN 7: ONE	CONKG				S00 NJ							
1 H-BENZO(BIFLUORENE	UGAKG											
ENZOBJNAPHTHO(2,3-D) THIOPHENE	UCVKG											
ENZO(B)NAPHTHOJ 1, 2-D) THIOPHENE	CGAKG				270 NJ							
ENZORITHIPHENYLENE	200				2000							
2-RENZENEDICARROXYIIC ACID	D K				AL COM				120 NJ			
2-BINAPHTHALENE	CG/XG											
YCLOPENTA (DEF) PHENANTHRENONE	UGVKG				320 NJ							
,23,4-DIBENZPYRENE	UGAG											
2:7,8-DIBENZPMENANTHRIENE	DGWG				1000							
CALINION COLORENS (CO) PINENE	D COLOR				270 N.I							
NAPTHO (1,2,3,4-DEF) CHRYSENE	UGAKG											
,12-NAPHTACENEDIONE	UG/KG				290 N.							
VALENCENE	UGAKG										120 NJ	
SET CONTRACTOR	ONON				100							
4 00E	DANG.			90	7.0		1	1		1	֓֡֓֜֝֜֓֜֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֡֓֓֓֓֓֓֓֓	Ī
WORINKETONE	UGAKG	7	,	:	,	1	1	1	,	,	'	
SAMMA-BHC (LINDANE)	UGVKG	2.1 U	1	1		t	1.3 J	1	1.7.3	ŀ	ı	1
PCB-1254 (AROCLOR 1254)	UGAKG	O 07	ľ	ı	١	1	1	1	1		-	
CB-1260 (ARDICLOR 1260)	UG/KG	70 P	1	1	ı	1	1	1	42.0	30	1	

CO. Couf States Creecing
SB - subsurince and sample
USAG: - minorparms per laborarm
U - value is below the reporting firmil
J - estimated value
shading - elevisid concentrations of constituents

A-10

TABLE 9 SUMMARY OF FIELD PARAMETERS FOR GROUNDWATER SAMPLES GULF STATES CREOSOTING FLOWOOD, MISSISSIPPI

Sample Number	PR	Conductivity (µS/cm)	Turbidity (NTU)	Temperature °C
GS01GW	5.41	218	5.97	18.5
GS02GW	4.95	724	3.7	18.4
GS03GW	5.93	180	9.84	17.5
GS04GW	5.81	59	11	18.9
GS05GW	5.32	608	6.23	17.6

Notes:

GS - Gulf States Creosoting

GW - Groundwater sample

(µS/cm) - microsiemens per centimeter

NTU - Nephelometric turbidity units

°C - degrees Celsius

TABLE 10 SUMMARY OF INORGANIC ANALYTICAL RESULTS GROUNDWATER SAMPLES GULF STATES CREOSOTING FLOWOOD, MISSISSIPPI

		Background		On-site 9	Samples	
COMPOUND	UNITS	GS01GW	GS02GW	GS03GW	GS04GW	GS05GW
METALS		ALC: N. J. CO.		- H _ 10 A G		
ALUMINUM	UG/L	320 UJ	450 J	850 J	1700 J	370 J
BARIUM	UG/L	20	120	29	26	32
BERYLLIUM	UG/L	0.11	0.14	0.11		0.9
CALCIUM	UG/L	4600	16000	3600	3500	15000
CHROMIUM	UG/L	1.8 R	0.92	1.8	1.6	
COBALT	UG/L	1.2	1.2 R			10
IRON	UG/L	1500	1400	2100	1900	12000
MAGNESIUM	UG/L	1500	5500	940	930	8200
MANGANESE	UG/L	23	1,60	110	30	320
POTASSIUM	UG/L	520	1500	870	1800	1900
SODIUM	UG/L	40000	120000	29000	5000	86000
VANADIUM	UG/L	0.6 U	0.82 R	2	1.9	-
ZINC	UG/L	11 U	13	18		42

Notes:

GS - Gulf States Creosoting

GW - groundwater sample

UG/L - micrograms per liter

U - value is below the reporting limit

J - estimated value

R - data is unusable

shading - elevated concentrations of constituents

SUMMARY OF ORGANIC ANALYTICAL RESULTS **GULF STATES CREOSOTING GROUNDWATER SAMPLES** FLOWOOD, MISSISSIPPI **TABLE 11**

		Background		On-site	On-site Samples	
COMPOUND	UNITS	GS01GW	GS02GW	GS03GW	GS04GW	GS05GW
VOLATILE ORGANICS					THE RESERVED	
METHYL ETHYL KETONE	NG/L	6.1 UJ		-	7.2.3	
MISCELLANEOUS VOLATILE ORGANICS		San San San San San San San San San San	STREET, STREET		THE RESERVENCE	
INDANE	NG/L			1.3 NJ		
EXTRACTABLES	STEEL STREET,	STATE OF THE PERSON				
None						
					The second second	
MISCELLANEOUS EXTRACTABLES						100 日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日
D-LIMONENE	NG/L	2.2 NJ				
LIMONENE	UG/L		2.2 NJ	2.1 NJ		
UNKNOWN COMPOUNDS/NO.	UG/L					4.7 J/2
		10 F				
PESTICIDES/POBS						
None					A CONTRACTOR OF THE PARTY OF TH	

Notes:

- GS Gulf States Creosoting
- GW groundwater sample UG/L micrograms per liter
- value is below the reporting limit
 - estimated value
- presumed presence of constituent
- shading elevated concentrations of constituents

A-14

SUMMARY OF INORGANIC ANALYTICAL RESULTS **GULF STATES CREOSOTING** FLOWOOD, MISSISSIPP! SEDIMENT SAMPLES **TABLE 12**

	-10		A COUNTY OF THE PARTY OF THE PA	Warsh Samples	Particle Springers	State of the last	Pearl	PearliRiver	Prairie Branch
	4.0	Background	Section 1	Downstream Semples	n Samples		Control	Downstream	Control
COMPOUND	UNITS	GS01SD	GS02SD	GS03SD	GS04SD	GS05SD	GS06SD	GS07SD	GS08SD
AETALS				THE PERSON NAMED IN	The same of the same of	National Property of	The state of the s	1000年の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の	THE PERSON NAMED IN
LUMINUM	MG/KG	8200 J	4700 J	16000 J	9100 J	4900 J	450 J	140 기	510 J
ANTIMONY	MG/KG	1.2 UJ	:			2.1 R	0.7 R	1	
ARSENIC	MG/KG	5.7	1.8 R	7.9 R	5.5	2.9 R		:	
BARIUM	MG/KG	68	14	300	120	71	6.8	3.2	15
BERYLLIUM	MG/KG	0.39	0.56	1.3	1.2	0.51	:	:	0.1
CALCIUM	MG/KG	1500	880	2000	2000	1200	250	:	180
CHROMIUM	MG/KG	13	7.8	24	15	8.4		:	1.4
COBALT	MG/KG	4.4	4.7	12	11	5.5	0.61 R	0.47	1
HON	MG/KG	15000	6400	24000	13000	8400	950	340	5200 J
LEAD	MG/KG	12 J	20 J	41 J	21	12	1.8	1.2 J	3.6
MAGNESIUM	MG/KG	1000 J	410 J	1200 J	1000 J	660 J	64 J	-	81
MANGANESE	MG/KG	340	200	720	280	320	52	53	44
POTASSIUM	MG/KG	700 J	410 J	1100 J	811 J	480 J	F 06	52 J	99
SELENIUM	MG/KG	1.9 R	1	4.2	-	1		:	**
SILVER	MG/KG	0.68 R	0.45 B	1.1 B	1.1 B	0.71 R	0.24 R		*
SODIUM	MG/KG	069	580	1500	1200	009	330	330	68
VANADIUM	MG/KG	24	13	41	23	13	1.6 R	0.57 R	2.4
ZINC	MG/KG	36	33	130	84	39	3.6	-	4.6
T.O.C.	%	2	2.1	918	EN.	1.8	:	EN EN	••

SP - Sonford Products

SS - surface soll sample

MG/KG - milligrams per kilogram
U - value is below the reporting limit
J - estimated value

R - data is unusable

NR - no reading shading - elevated concentrations of constituents

T.O.C. - Total Organic Carbon (%)

TABLE 13 SUMMARY OF ORGANIC ANALYTICAL RESULTS SEDIMENT SAMPLES GULF STATES CREOSOTING FLOWOOD, MISSISPPI

	40	1000		Membronis			The second	Pasefilter	Prairie Branchi
- Control	I ONTEN	Beckgnound		Domination	123		Control	Downetnesm	Control
VOW 155	CHILD	Gener	067060	nemen	COOKST	020020	Deaner	neoven	Casosa
ACETONE	UGAKG	. M	130	350.1	12003	51.3	22 J	40.1	7 00
CARBON DISULFIDE	UGAKG	5.3	1	619	-	1	13.0	ı	0.71
METHYL ETHYL KETONE	UG/KG I	37 W	1	L	68.1	1	U3 E1	ŀ	14 W
SIGNATURE VOICENT FOR STANSON		1							-
CANDSANO	UGAKG				14.081	1.05			P. B.
ACETALDEHYDE	UG/KG				71 NJ				
EXTRACT ABULE	00001		Mary Declarate Colleges (Co.)	000					The control of the co
ACENADATA VENE	2000	0.00	-	30	000	6.0	0.80	1	0.80
ANTHRACENE	D C			140		-	0.80	_	0.80
BENZALDEHYDE	UGVKG	F 69	1	110.1	130		330 U		0.000
BENZO(A)ANTHRACENE	UGAKG	1)	7	110	10	12	80	ı	10
BENZO(B)FLUORANTHENE	UGAKG	440 U		540.3	1	-	330 U	,	330 C
BENZO(GHI)PERYLENE	OGKG	92 J	1	î	-	1	330 U	1	330 U
BENZO(K)FLUORANTHENE	UCYKG	440 U	1	P. 099		-	330 U	-	330 U
BENZO-A-PYRENE	UG/KG	2	4	120	A	16	4 Ü	1	0.8 U
CHRYSENE	UGWG	۲,	10	200	36	92	7.0	1	2 U
DIBENZO(A, H)ANTHRACENE	OCKG	2	-	40	9	STREET, SHOW	-	1	0.8 U
FLUCKANIMENE	DC/KG	2	12	180	93		12 U		20
FLUCHENE AUDITAIO 22 00 PADITAI	9	0.5.0	DAZ	2	C. C. C. C. C. C. C. C. C. C. C. C. C. C	17	0.3 3	1	0.8 U
NUMBERO (1.2.3-C.U) PTHENE	SANG SANG	440	1	180 3	1		330 0	,	330 D
AMERICAN ENE	5 CA CA	200	60		7	0.6.0	0.4.3	0.4	0.80
DENTACH OBODHENO	D CANON	1 70	200		4	C A.O	200	0.00	7 6
TO THE PROPERTY OF THE PROPERT	D WO		100	St. Commercial Street, St.	1000		2		2 0
PVRENE	I ICAKG	,	31	100		69	•		
	Connection	*	Commence of the commence of th	140	2	27.	000	1	2
A SCHOOL STREET		ALC ALC DESCRIPTION OF THE PERSON NAMED IN	S. S. S. S. S. S. S. S. S. S. S. S. S. S	September 1				STREET, STREET	0.000
HEXADECANOIC ACID	JUGKG	420 NJ							
1-HEXADECENE	UGAKG	540 NJ		1000 NJ					
ERGOST -S-N-3-OL	UG/KG	1500 NJ			LN 0071				
GALMAASITOSTEROL	DOKG	1400 NJ	1400 NJ						
SINSWASIEHUL STICHAST 4 EN 2 CAIC	DENG.	1100 NJ				1			
B NUCKOWAN COMPONING WITH COMPONING THE PROPERTY OF THE PROPER	2 0	CAL DOORS		- 000 P	CZ00 NJ	N 000	00 100	17.00	100
LINIDENTIFIED COMPOUNDS/NO	D JONES	ACU. UDUCA	1 UUUCO	20000	24000 3/54	П	100	Left Ro	1/0 0/1
BENZO(E)PYRENE	UGAKG			CM 065					
CHOLESTANOL	UGKG				1600 NJ				
JAKNOWN ALCOHOL	UGKG				9200 J				
UNKNOWN KETONE	UG/KG				1800 J				
BENZENE, 1-METHYL-2-ISOPROPYL	UG/KG					1200 NJ			
UNKNOWN CARBOXYLIC ACID	DGWG					F009			
PHENANTHRENONE DERIVATIVE	DGWG					2500 NJ			
100 000 000 000									
	0.00000	100	100		CONTRACTOR OF THE PERSON NAMED IN			The Real Property lies, the Persons in case of the Persons in case o	Spinish shapes and the
100 - 100 E	DOM:	7.00	(1)	-	1	t	4.10	1	4.10
DE DA-DONG	5 000	3.60	- 39	15	ï	'	2.10	1	2.10
ENDOSMEAN SINEATE	IOAKO	730	7 G2	14 N		1	7	1 1	
the state of the s	1	140	** **	24 1 140	-		2.10	-	2

(S. - Gulf States Creoscring
SD - sediment sample
US/KD - micrograms per blogram
U - value is below the reporting limit
J - setimated value
shading - elevated concentrations of constituents

A-15

Final Preliminary Assessment/Site Inspection Report Gulf States Creosoting Company

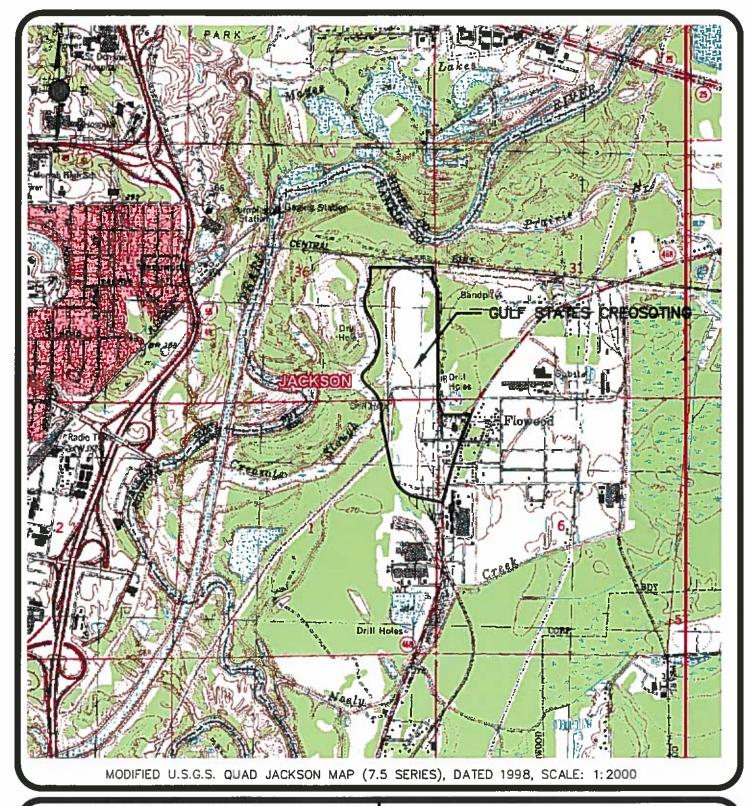
Revision: 1 December 2003 DCN: WSI-GSC-0011

APPENDIX B

FIGURES

2 Pages





GULF STATES CREOSOTING 1625 FLOWOOD DRIVE FLOWOOD, RANKIN COUNTY, MISSISSIPPI

GENERAL SITE LOCATION MAP

FIGURE 1



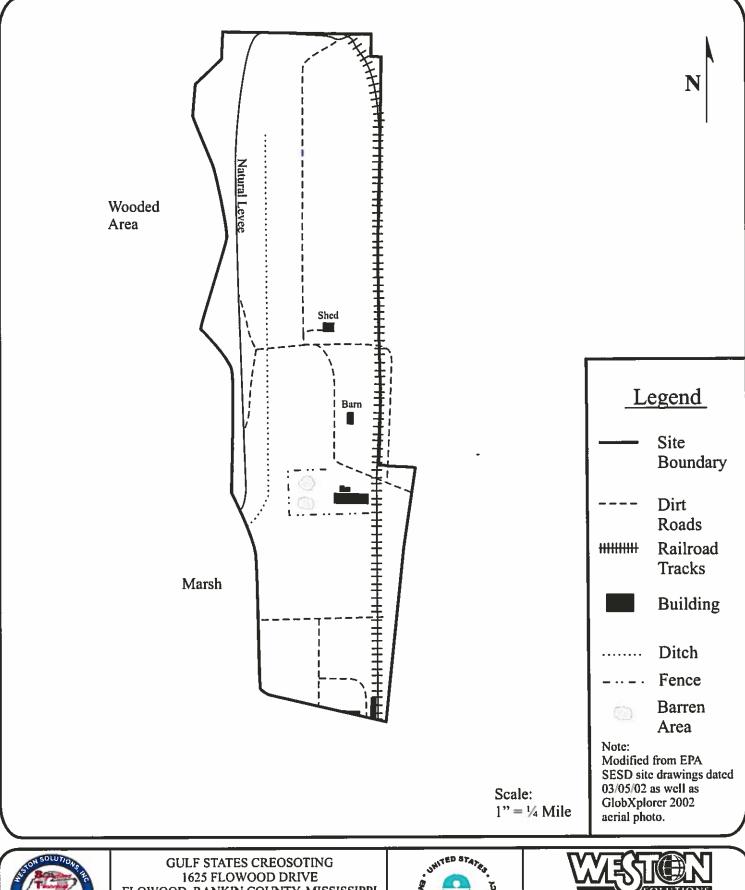


DRAWN: DATE: W.O. NO.: gulf.dwg

J.MILLER 7/24/02 12587-001-001-0133

SCALE: EPA ID NO: TDD NO:
AS SHOWN MSN000407423 4W-02-03-A-003







FLOWOOD, RANKIN COUNTY, MISSISSIPPI

SITE LAYOUT MAP FIGURE 2





KNS 07/12/ 12587-001-001-0133-00 07/12/02 4W-02-03-A-003

CONFIDENTIAL

HAZARD RANKING SYSTEM PRELIMINARY SCORE

FOR

GULF STATES CREOSOTING COMPANY FLOWOOD, RANKIN COUNTY, MISSISSIPPI EPA ID No. MSN000407423

Pathways evaluated using the Site Inspection (SI) Worksheets were groundwater migration, surface water migration, soil exposure, and air migration.

Pathway Scores

 $S_{gw} = 5.88$

 $S_{sw} = 100$

 $S_{se} = 0.64$

 $S_{air} = 0.96$

OVERALL SCORE = 50.09

Sources and Waste Characteristics

The site score for the Gulf States property is based on a hazardous waste quantity (HWQ) of 10 for the groundwater migration, surface water migration, soil exposure, and air migration pathways. The HWQ is based on the area of contaminated soil (55.7 acres) located on the Gulf States property. The former 141-acre Gulf States Creosoting Company is located at 1625 Flowood Drive (Mississippi Hwy 468), Flowood, Rankin County, Mississippi. The facility is currently operating as a horse farm and ConSteel Co, Inc. Both current operations appear to be located on portions of the property where creosoting operations were conducted. Currently, the southernmost building on the property is owned by ConSteel Co, Inc. The northernmost structures (i.e. metal barn and shed) are used to house tractors and helicopters for a local news station, and are part of the horse farm. The horse farm has been operating on the property for approximately 7 years.

Polyaromatic hydrocarbons (PAHs) have been detected on the property during several previous investigations as well as the preliminary assessment/site inspection (PA/SI). PAH concentrations detected in soil samples during the PA/SI ranged from 380J micrograms per kilogram (µg/kg) to 37,000 µg/kg. PAHs were detected on the northeastern, central, and southeastern portions of the property. Areas of contamination are primarily evident in the areas next to the railroad tracks where boxcars containing creosote treated wood were staged. Certain constituents such as benzo(a) anthracene, benzo(b) fluoranthene, benzo(a) pyrene, dibenzo(a,h) anthracene, and indeno(1,2,3-cd) pyrene are above Region III Industrial Cleanup Goals. PAHs are common constituents of creosote and are site attributable.

Groundwater Migration Pathway

During the 2003 PA/SI, the groundwater pathway was evaluated for all three aquifers beneath the property, the surficial aquifer, the Cockfield Formation, and the Sparta aquifer. An observed release of barium, cobalt, manganese, and zinc was discovered in the surficial aquifer. However, no targets are associated with the surficial aquifer and the pathway score is zero. Alternately, the Cockfield Formation and the Sparta aquifer (two additional aquifer systems) were evaluated based on the potential to release to the aquifers. One municipal well that is screened within the Cockfield Formation is located within the 0.5 to 1 mile radius ring of the Gulf States property. Two municipal wells are located within a 4-mile radius of the property that are screened within the Sparta aquifer; one within the 2 to 3 mile radial ring, and the other within the 3 to 4 mile radial ring. All three municipal wells are owned by the City of Flowood and serve approximately 7,074 persons. The City of Flowood blends the water from the wells prior to distribution to the public. The groundwater pathway score was calculated for all three aquifers and the highest score was used. Based on the low number of targets and the fact that the municipal wells are screened at depths greater than 550 feet, groundwater does not appear to be a viable migration route.

Surface Water Migration Pathway

The surface water migration pathway was evaluated based on an observed release to the marsh adjacent to the Gulf States property. The surface water migration pathway prior to construction of the levee, appears to have flowed west toward the marsh and the tributaries which flow to the Pearl River. There is a drainage

CONFIDENTIAL

Gulf States Creosoting Company Preliminary Assessment/Site Inspection
December 2003

ditch located on the western portion of the property, east of the levee, that flows north to south. Currently, it appears that on-site drainage flows to this drainage ditch. Prior to the construction of the levee, it appears that creosote was discharged to the marsh areas west of the property. Such areas have been defined as creosote slough by the U.S. Geological Survey. During the operation of the creosote facilities, the Pearl River was re-channeled to flow further west of the facility and the areas impacted by discharged creosote slough. The surface water pathway includes the marshland and tributaries which flow approximately 0.8 mile into the Pearl River. The 15-mile downstream surface water pathway is completed in the Pearl River. The property is located within a flood area that is undefined, perhaps due to the construction of the levee. However, the marsh area adjacent to the facility is within the 100-year flood plain. A City of Jackson surface water intake is upstream approximately 0.75-mile northwest of the Gulf States property on the Pearl River.

The observed release to the surface water pathway includes constituents such as; barium, beryllium, lead, zinc, acenaphthylene, anthracene, benzo(a) anthracene, benzo(b) fluoranthene, benzo(k) fluoranthene, benzo(a) pyrene, chrysene, dibenzo(a,h) anthracene, fluoranthene, phenanthrene, and pyrene. Several of the PAH are attributable to the site operations, because they are common components of creosote. Such constituents a threat to the marsh and the Pearl River because they are fished for recreationally and/or commercially. During the June 2002 site reconnaissance, a creosote odor was detected in an area west of the levee that leads to the marsh.

The component that drives the surface water migration pathway is the human food chain threat. The majority of samples collected along the surface water pathway that contained PAHs were collected within the marsh. Attribution is clear due to the documentation of PAHs (from previous investigations and the PA/SI) in the on-site soils and the marsh adjacent to the property. Due to the observed release to the marsh, the surface water pathway is of concern.

Gulf States Creosoting Company Preliminary Assessment/Site Inspection
December 2003

Soil Exposure and Air Migration Pathways

The soil exposure pathway was evaluated based on the likelihood of exposure to inorganic constituents and extractable semivolatile organic compounds (SVOC). The air migration pathway was evaluated on the potential to release inorganic and organic constituents detected in the source samples. The PAHs detected in on-site soils are at a significant concentration; however, both the soil exposure and air migration pathway scores were limited by low target values. The exposure to employees on the property and nearby residences by means of soil or air is considered to be minimal because of the non-volatile nature of the contaminants. An estimated 221 persons live within 1 radial mile of the Gulf States property and approximately 805 persons live within 4 radial miles. Based on these low target values, the soil exposure and air migration pathways are considered to be of minimal concern.

Conclusion

The overall site score for the Gulf States property is 50.09, which is above the cutoff value of 28.5. The overall site score was driven by an observed release to the surface water pathway. Based on the available file information and sample data, START-2 recommends further evaluation for the Gulf States property at the federal level under the Comprehensive Environmental Response, Compensation, and Liability Act.

Gulf States Creosoting Company

Location:

Flowood, Mississippi

FINAL

December 2003

AIR MIGRATION PATHWAY SCORESHEET

Factor Categories and Factors

	<u>Likelihood of Release</u>	Maximum Value	Value Assigned
1. 2.	Observed Release Potential to Release	550	500*
	2a. Gas Potential to Release	500	Of the second second
	2b. Particulate Potential to Release2c. Potential to release higher of	500	
	lines 2a and 2b)	500	
3.	Likelihood of Release		
	(higher of lines 1 and 2c)	550	500*
	Waste Characteristics		
4.	Toxicity/Mobility	a	200
5.	Hazardous Waste Quantity	1	10
6.	Waste Characteristics	100	6
			aperty gawana
	<u>Targets</u>		
7. 8.	Nearest Individual Population	50	20
٥.	8a. Level I Concentrations	b	0
	8b. Level II Concentrations	b	0
	8c. Potential Contamination	b	5.21
	8d. Population (lines 8a + 8b + 8c)	b	5.21
9.	Resources	5	0
10.	Sensitive Environments		
	10a. Actual Contamination	c	0
	10b. Potential Contamination	c	<u> </u>
	10c. Sensitive Environments	c	
1.1	(lines 10a + 10b)	b	1.13
11.	Targets (lines $7 + 8d + 9 + 10c$)	1.50	26.34
	Air Migration Pathway Score		
12.	Air Migration Pathway Score (Sair)d		
	([lines 3 x 6 x 11]/82,500)	100	0.96

^a Maximum value applies to waste characteristics category.

b Maximum value not applicable.

No specific maximum value applies to factor. However, a pathway score based solely on sensitive environments is limited to a maximum value of 60.

d Do not round to nearest integer.

⁻ Not evaluated.

^{*} Default value.

Site Name: Gulf States Creosoting Company Location: Flowood, Mississippi

FINAL

December 2003

SOIL EXPOSURE PATHWAY SCORESHEET, Concluded

	or Categories and Factors ARBY POPULATION THREAT (Concluded)	Maximum Value	Value Assigned	
	Targets			
18. 19. 20.	Nearby Individual Population Within 1 Mile Targets (lines 18 + 19)	1 b	<u>1</u> 0.5	1.5
	Nearby Population Threat Score			
21.	Nearby Population Threat ([lines 14 x 17 x 20]/82,500)	ь		0.04
SOI	L EXPOSURE PATHWAY SCORE			
22.	Soil Exposure Pathway Score (S _{soit}) ^c (lines 11 + 21, subject to a maximum of 100)	100		0.64

^a Maximum value applies to waste characteristics category.

Maximum value not applicable.

Do not round to nearest integer.

No specific maximum value applies to factor. However, a pathway score based solely on sensitive environments is limited to a maximum value of 60.

Site Name: Gulf States Creosoting Company

Location: Flowood, Mississippi

FINAL

December 2003

SOIL EXPOSURE PATHWAY SCORESHEET

Fact	or Categories and Factors		Maximum Value	Value Assigned	
RES	SIDENT POPULATION THR	EAT			
	Likelihood of Exposure				
1.	Likelihood of Exposure		550	THE VECTOR IN	550
	Waste Characteristics				
2.	Toxicity		a	10,000	
3.	Hazardous Waste Quantity		a	10	
4.	Waste Characteristics		100		18
	Targets				
5.	Resident Individual		50	0	
6.	Resident Population				
	6a. Level I Concentrations		b	0	
	6b. Level II Concentrations		ь	0	
	6c. Resident Population				
	(lines 6a + 6b)		ъ	0	
7.	Workers		15	5	
8.	Resources		5	0	
9.	Terrestrial Sensitive Environments		d	0	
10.	Environments Targets (lines $5 + 6c + 7 + 8 + 8 + 6c + 8 + 8 + 8 + 8 + 8 + 8 + 8 + 8 + 8 + $	0)	b	0	5
10.	Targets (filles 3 + 0c + 7 + 6 +	• 9)			5_
	Resident Population Threat So	core			
11.	Resident Population Threat				
	([lines 1 x 4 x 10]/82,500)		ь		0.6
NEA	ARBY POPULATION THREA	AT			
	<u>Likelihood of Exposure</u>				
12.	Attractiveness/Accessibility		100	100	
13.	Area of Contamination		100	10	
14.	Likelihood of Exposure		500		125
	Waste Characteristics				
15.	Toxicity		a	10,000	
16.	Hazardous Waste Quantity		a	10	
17.	Waste Characteristics		100	a eff armed	18

Site Name: Gulf States Creosoting Company Location:

Flowood, Mississippi

FINAL

December 2003

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET, Concluded

Facto	or Categories and Factors	Maximum Value	Value Assigned
ENV	IRONMENTAL THREAT (Concluded)		
	Waste Characteristics		
23.	Ecosystem Toxicity/Persistence/ Bioaccumulation Hazardous Waste Quantity	a	<u>5x10</u> 8 100
24. 25.	Waste Characteristics	1,000	320
	Targets		
26.	Sensitive Environments 26a. Level I Concentrations 26b. Level II Concentrations 26c. Potential Contamination	b b b	<u>0</u> <u>50</u> 0.15
27	26d. Sensitive Environments (lines 26a + 26b + 26c)	b	50.15
27.	Targets (value from line 26d)	b	50.15
	Environmental Threat Score		
28.	Environmental Threat Score ([lines 22 x 25 x 27]/82,500, subject to a maximum of 60)	60	60+
SUR	FACE WATER OVERLAND/FLOOD MIGR	ATION COMPONEN	TSCORE FOR A WATERSHED
29.	Watershed Score ^c (lines 13 + 21 + 28, subject to a maximum of 100)	100	100
SUR	FACE WATER OVERLAND/FLOOD MIGI	RATION COMPONEN	NT SCORE
30.	Component Score (S _{of}) ^c (highest score from line 29 for all watersheds evaluated,		
	subject to a maximum of 100)	100	<u>100</u>

Maximum value applies to waste characteristics category.

Maximum value not applicable.

c Do not round to nearest integer.

Not evaluated.

Default value.

Site Name: Gulf States Creosoting Company

Location: Flowood, Mississippi

FINAL

December 2003

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET, Continued

Fact	or Categories and Factors	Maximum Value	Value Assigned	100
DR	INKING WATER THREAT (Concluded)			
	Drinking Water Threat Score			
13.	Drinking Water Threat Score ([lines 5 x 8 x 12]/82,500, subject to a maximum of 100)	100	VALUE OF STREET	1.07
HU	MAN FOOD CHAIN THREAT			
	Likelihood of Release			
14.	Likelihood of Release (value from line 5)	550		550
	Waste Characteristics			
15. 16. 17.	Toxicity/Persistence/Bioaccumulation Hazardous Waste Quantity Waste Characteristics	a 1,000	5x10 ⁸ 100	320
	<u>Targets</u>			
18. 19.	Food Chain Individual Population	50	45	
	19a. Level I Concentrations19b. Level II Concentrations19c. Potential Human Food	b b	0	
20.	Chain Contamination 19d. Population (lines 19a + 19b + 19c) Targets (lines 18 + 19d)	b b b	0	45
	Human Food Chain Threat Score			
21.	Human Food Chain Threat Score ([lines 14 x 17 x 20]/82,500, subject to a maximum of 100)		romand the agreement of	96
ENV	VIRONMENTAL THREAT			
	Likelihood of Release			
22.	Likelihood of Release (value from line 5)	550	_	550

Site Name: Gulf States Creosoting Company

Location:

Flowood, Mississippi

FINAL

December 2003

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET

	or Categories and Factors NKING WATER THREAT	Maximum Value	Value Assigned
	Likelihood of Release		
i. 2.	Observed Release Potential to Release by Overland Flow	550	550
	 2a. Containment 2b. Runoff 2c. Distance to Surface Water 2d. Potential to Release by 	10 25 25	
3.	Overland Flow (lines 2a x [2b + 2c]) Potential to Release by Flood	500	
	3a. Containment (Flood)3b. Flood Frequency3c. Potential to Release	10 50	
4.	by Flood (lines 3a x 3b) Potential to Release (lines 2d + 3c, subject to	500	
5.	a maximum of 500) Likelihood of Release	500	
	(higher of lines 1 and 4) Waste Characteristics	550	550
6.	Toxicity/Persistence	а	10,000
7. 8.	Hazardous Waste Quantity Waste Characteristics	100	32
	Targets		
9. 10.	Nearest Intake Population 10a. Level I Concentrations 10b. Level II Concentrations 10c. Potential Contamination 10d. Population (lines 10a + 10b + 10c)	50 b b b	<u>0</u> <u>0</u> <u>0</u>
11. 12.	Resources Targets (lines 9 + 10d + 11)	5 b	5

Site Name: Gulf States Creosoting Company
Location: Flowood, Mississippi

FINAL

December 2003

GROUNDWATER MIGRATION PATHWAY SCORESHEET

Fact	or Categories and Factors			Sparta Aquifer	
	Likelihood of Release to an Aqui	ifer	Maximum Value	Value Assigned	
1. 2.	Observed Release Potential to Release		550	0	
	2a. Containment		10	10	
	20. Ret Precipitation		10	6	
	2c. Depth to Aquifer		5	The Name of the State of the St	
	2d. Travel Time		35	<u> </u>	
	2e. Potential to Release		500	100	
	(lines $2a \times [2b + 2c + 2d]$)		500	120	
3.	Likelihood of Release				
	(higher of lines 1 and 2e)		550	5000	120
	Waste Characteristics				
4.	Toxicity/Mobility		ā	10,000	
5.	Hazardous Waste Quantity		a	10	
6.	Waste Characteristics		100	The state of the same of the s	18
	Targets				
7.	Nearest Well		50	<u> </u>	
8.	Population		b		
	8a. Level I Concentrations		b	0	
	8b. Level II Concentrations8c. Potential Contamination		b	34.3	
	8d. Population (lines 8a + 8b +	- 8c)	b	34.3	
9.	Resources	00)	5	0	
10.	Wellhead Protection Area		20	0	
11.	Targets (lines $7 + 8d + 9 + 10$)		b		37.3
	Groundwater Migration Score for	r an Aquifer			
12.	Aquifer Score ([lines 3 x 6 x 11]/	/82,500) ^c	100	marin marin Marin	0.98
	Groundwater Migration Pathway	Score			
13.	Groundwater Migration Pathway	Score (S _{gw}) ^c			
	(highest value from line 12 for al aquifers evaluated)	II.	100		5.88
	-				

Maximum value applies to waste characteristics category.

Maximum value not applicable.

Do not round to nearest integer.

Not evaluated.

Site Name: Gulf States Creosoting Company

Location: Flowood, Mississippi

FINAL

December 2003

GROUNDWATER MIGRATION PATHWAY SCORESHEET

Fact	or Categories and Factors		Cockfield Formation
	Likelihood of Release to an Aquifer	Maximum Value	Value Assigned
1. 2.	Observed Release Potential to Release	550	0
	2a. Containment	10	10
	2b. Net Precipitation	10	<u>6</u>
	2c. Depth to Aquifer	5	3
	2d. Travel Time	35	35
	2e. Potential to Release		
	(lines $2a \times [2b + 2c + 2d]$)	500	440
3.	Likelihood of Release		
	(higher of lines 1 and 2e)	550	440
	Waste Characteristics		
4.	Toxicity/Mobility	a	10,000
5.	Hazardous Waste Quantity	a	10
6.	Waste Characteristics	100	18
	<u>Targets</u>		
7.	Nearest Well	50	9
8.	Population	100	
	8a. Level I Concentrations	b	0
	8b. Level II Concentrations	b	0
	8c. Potential Contamination	ь	52.3
	8d. Population (lines 8a + 8b + 8c)		52.3
9.	Resources	5	0
10.	Wellhead Protection Area	20	
11.	Targets (lines $7 + 8d + 9 + 10$)		61.3
	Groundwater Migration Score for an Aquifer		
12.	Aquifer Score ([lines 3 x 6 x 11]/82,500) ^c	100	5.88
	Groundwater Migration Pathway Score		
13.	Groundwater Migration Pathway Score $(S_{gw})^c$		
	(highest value from line 12 for all aquifers evaluated)	100	5.88

Maximum value applies to waste characteristics category.
 Maximum value not applicable.
 Do not round to nearest integer.

⁻ Not evaluated.

JERVICE, MYC.

TELEPHONE 601/736-6347 POST OFFICE DRAWER 825 COLUMBIA, MISS. 39429

TEST HO	~ -	S Well No. 5 LE LOCATION NFL NWL SFL NFL Sec 12	
NO K68		TION AND TEST HOLE INFORM	
TOTAL DEPTH	THICKNESS EACH STRATUM	FORMATION	REMARKS
3	3	Top soil	
39	36	Clay with thin sand streaks	
172	133	Clay	
213	41	Sand, fine	
444	231	Clay & rocks	
460	16	Sand & clay streaks	
468	8	Clay	
570	102	Sand, medium	
604	34	Clay	
628	24	Sand	
661	. 33	Clay & sand streaks	
725	64 .	Sand with Thin clay streaks	
806	81	Clay & rocks	
	Cashan Market		
		CALLERY STATE OF THE STATE OF T	
	ent Kir		
			ikil Ulumpen
3_2_2			
-1			
- 4			
MT 4.	113		
a Cinn N	10.10		
Started	10-12-		-16 19 ⁸

Reference No.: 19

GRINER DRILLING SERVISE

TELEPHONE 601/736-6347 POST OFFICE DRAWER 825 COLUMBIA, MISS. 39429

LOG FORM

NAME Town of Flowood
LOCATION NE/4, NW/4, SE/4, NE/4, Section 12,
TSN.RlE. Rankin County, Ms.
ENGINEER Lester Engineering Co.
DRILLER Allen Sistrunk LOG. NO K68
COMPLETED April 30 19 82 ACCEPTED
Sales Engineer T.N. SHOWS Field Supervisor F. SISTRUNK

WELL DATA

Length surface casing N/A; size surface casing N/A
Cemented N/A No. Sacks N/A Size Drilled Hole 21"
Depth drilled hole 562 Size well casing 16" Type Welded
Length well casing 472' cemented Yes No. Sacks 600
Size underreamed hole 32" length underreamed hole 82"
Size screen 8" type Bar Weld mfg. by Houston Well S
Slot size .016 material 304 S.S. length screen 82'
Lap pipe size 8" lap pipe length 62 type Welded
Type gravel Rateliff No. yds 12 Distance to lap 422
Distance to screen top 482 distance to gravel
Distance to screen bottom 562 type bottom Back Wash Valve
Distance to screen bottom 562 type bottom Back Wash Valve Connection top of lap8" R&L Collar static water level 185.78
PUMP DATA
Type Turbine make Floway Serial No 8220415
Size bowls 1011 No. stages 12 Curve No. DKH Length bowls 91611
Size bowls 10 ¹¹ No. stages 12 Curve No. DKH Length bowls 9 ¹ 6 ¹¹ Length column 280 ¹ size column 8 ¹¹ type column T & C Size oil tube N/A size shaft 13 length suction 20 ¹
Size bowls 10 ¹¹ No. stages 12 Curve No. DKH Length bowls 9 ¹ 6 ¹¹ Length column 280 ¹ size column 8 ¹¹ type column T & C Size oil tube N/A size shaft 13 length suction 20 ¹
Size bowls 10 ¹¹ No. stages 12 Curve No. DKH Length bowls 9 ¹ 6 ¹¹ Length column 280 ¹ size column 8 ¹¹ type column T & C Size oil tube N/A size shaft 1½ length suction 20 ¹ Size suction 8 ¹¹ size discharge 8 ¹¹ Head No. C-16½ ¹¹ ×8 ¹¹ ;
Size bowls 10" No. stages 12 Curve No DKH Length bowls 9'6" Length column 280 size column 8" type column T & C Size oil tube N/A size shaft 1½ length suction 20' Size suction 8" size discharge 8" Head No C-16½"x8"; Overall pump length 289'6" Length headshaft 10'3"
Size bowls 1011 No. stages 12 Curve No. DKH Length bowls 91611 Length column 2801 size column 811 type column T & C Size oll tube N/A size shaft 13 length suction 201 Size suction 811 size discharge 811 Head No. C-163111x8113 Overall pump length 2891611 Length headshaft 101311 Type lubrication Water type oiler N/A length air line N/A
Size bowls 10" No. stages 12 Curve No DKH Length bowls 9'6" Length column 280 size column 8" type column T & C Size oil tube N/A size shaft 1½ length suction 20' Size suction 8" size discharge 8" Head No C-16½"x8"; Overall pump length 289'6" Length headshaft 10'3"
Size bowls 1011 No. stages 12 Curve No. DKH Length bowls 91611 Length column 2801 size column 811 type column T & C Size oll tube N/A size shaft 13 length suction 201 Size suction 811 size discharge 811 Head No. C-163111x8113 Overall pump length 2891611 Length headshaft 101311 Type lubrication Water type oiler N/A length air line N/A
Size bowls 10" No. stages 12 Curve No. DKH Length bowls 9'6" Length column 280' size column 8" type column T & C Size oil tube N/A size shaft 1½ length suction 20' Size suction 8" size discharge 8" Head No. C-16½"x8"; Overall pump length 289'6" Length headshaft 10'3" Type lubrication Water type oiler N/A length air line N/A Rated capacity 750 GPM Total Head 385 RPM 1770 Size foundation 2' x 2' Height 2'
Size bowls 10" No. stages 12 Curve No. DKH Length bowls 9'6" Length column 280¹ size column 8" type column T & C Size oil tube N/A size shaft 1½ length suction 20¹ Size suction 8" size discharge 8" Head No. C-16½"x8"; Overall pump length 289'6' Length headshaft 10¹3'' Type lubrication Water type oiler N/A length air line N/A Rated capacity 750 GPM Total Head 385 RPM 1770 Size foundation 2' x 2' Height 2' ELECTRIC MOTOR DATA
Size bowls 10" No. stages 12 Curve No. DKH Length bowls 9'6" Length column 280' size column 8" type column T & C Size oll tube N/A size shaft 13 length suction 20' Size suction 8" size discharge 8" Head No. C-163"x8"; Overall pump length 289'6" Length headshaft 10'3" Type lubrication Water type oiler N/A length air line N/A Rated capacity 750 GPM Total Head 385 RPM 1770 Size foundation 2' x 2' Height 2' ELECTRIC MOTOR DATA Type VHS Make G.E. Serial NoTJ422103
Size bowls 10" No. stages 12 Curve No. DKH Length bowls 9'6" Length column 280¹ size column 8" type column T & C Size oil tube N/A size shaft 1½ length suction 20¹ Size suction 8" size discharge 8" Head No. C-16½"x8"; Overall pump length 289'6" Length headshaft 10¹3" Type lubrication Water type oiler N/A length air line N/A Rated capacity 750 GPM Total Head 385 RPM 1770 Size foundation 2' x 2' Height 2' ELECTRIC MOTOR DATA Type VHS Make G.E. Serial NoTJ422103 HP 125 Voltage 480 RPM 1800 Frame 8405TP16
Size bowls 10" No. stages 12 Curve No.DKH Length bowls 9'6" Length column 280' size column 8" type column T & C Size oil tube N/A size shaft 1½ length suction 20' Size suction 8" size discharge 8" Head No.C-16½"x8"; Overall pump length 289'6" Length headshaft 10'3" Type lubrication Water type oiler N/A length air line N/A Rated capacity 750 GPM Total Head 385 RPM 1770 Size foundation 2' x 2' Height 2' ELECTRIC MOTOR DATA Type VHS Make G.E. Serial NOTJ422103 HP 125 Voltage 480 RPM 1800 Frame 8405TP16 Style P Phase 3 Cycle 60 AMPS 144
Size bowls 10" No. stages 12 Curve No. DKH Length bowls 9'6" Length column 280¹ size column 8" type column T & C Size oil tube N/A size shaft 1½ length suction 20¹ Size suction 8" size discharge 8" Head No. C-16½"x8"; Overall pump length 289'6" Length headshaft 10¹3" Type lubrication Water type oiler N/A length air line N/A Rated capacity 750 GPM Total Head 385 RPM 1770 Size foundation 2' x 2' Height 2' ELECTRIC MOTOR DATA Type VHS Make G.E. Serial NoTJ422103 HP 125 Voltage 480 RPM 1800 Frame 8405TP16

SWITCH DATA

3

Size relays___

225 Amp Breaker

200 Атр

Make Control Systems

Relay type Quick Trip

_ Cycles___

_ Size wire.

4 Rating 125 H.P.

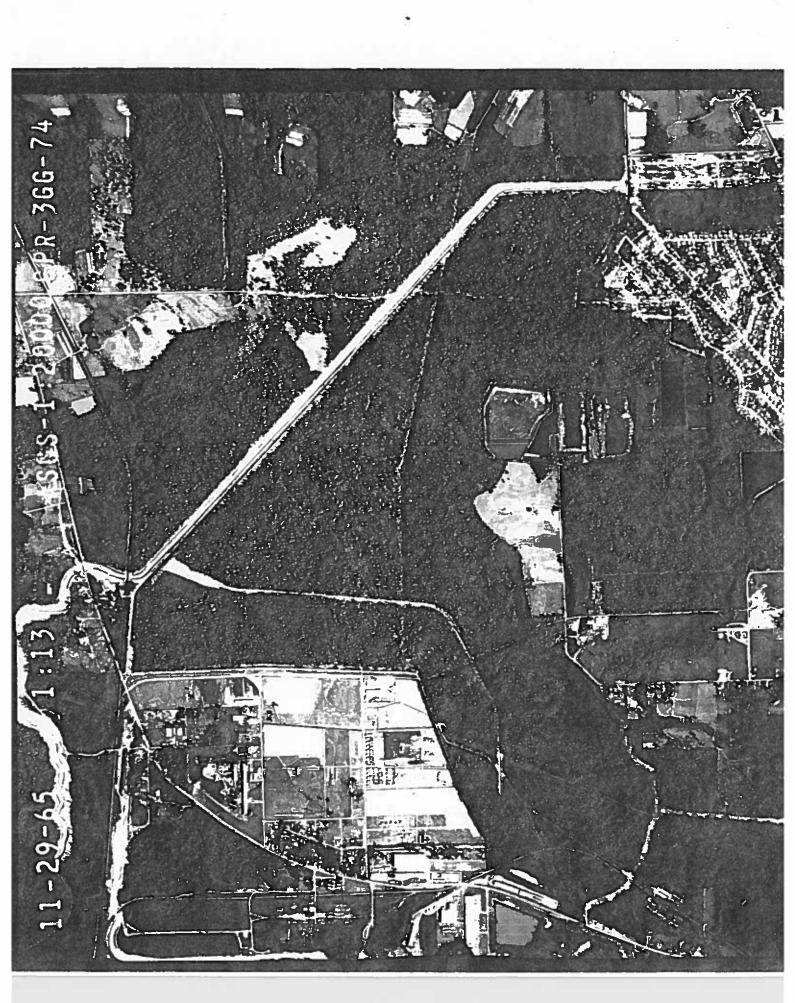
Type Pumping Plant Panel

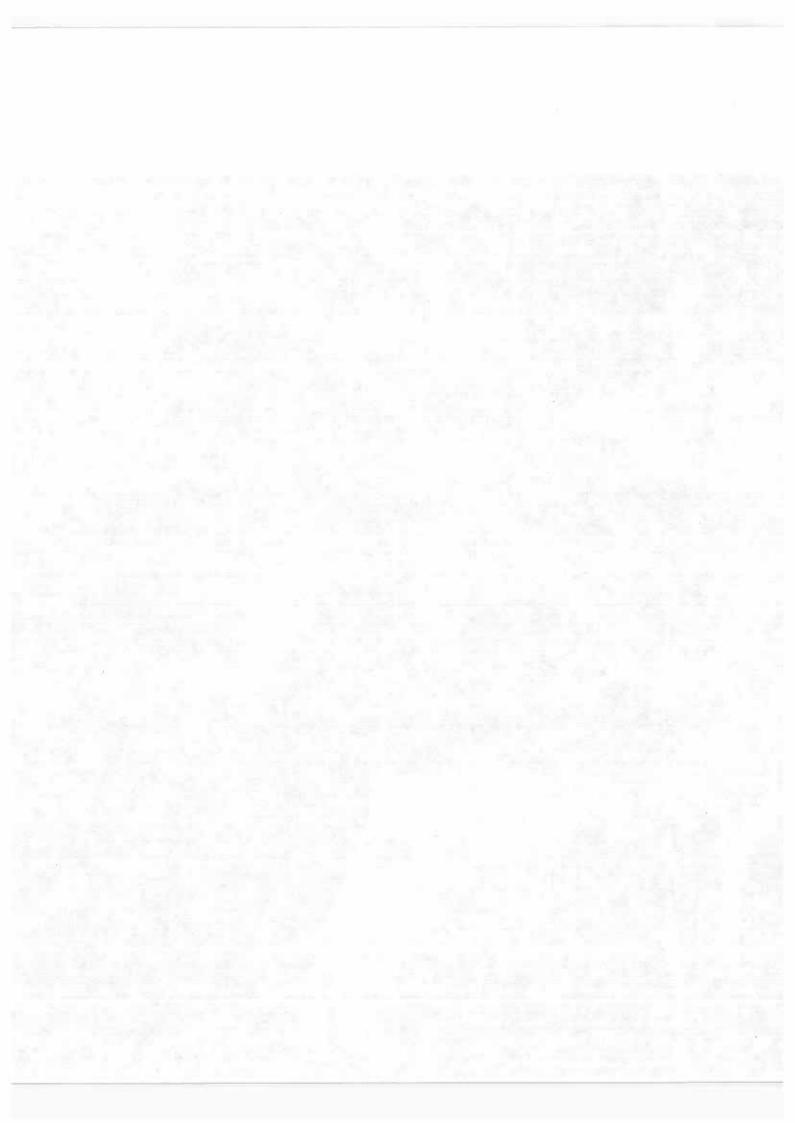
Catalog No N/A
Volts 480

HP rating 125

Entrance switch_

Fuse size & type_





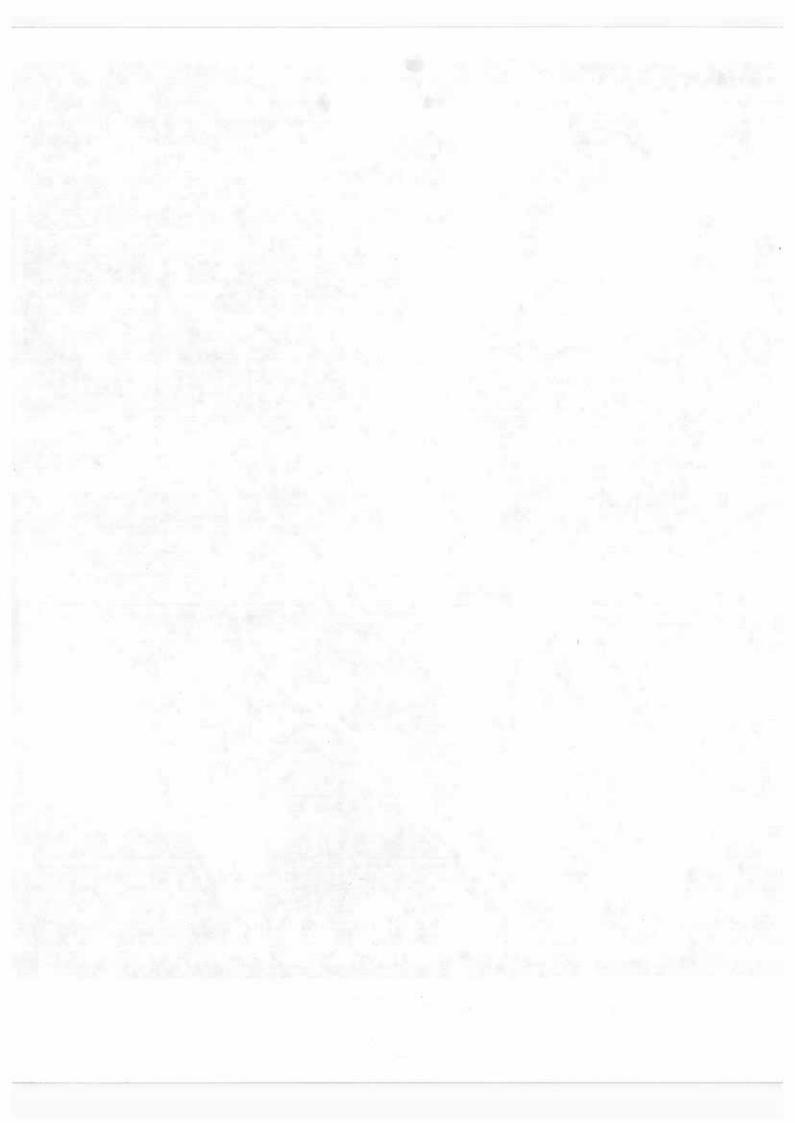


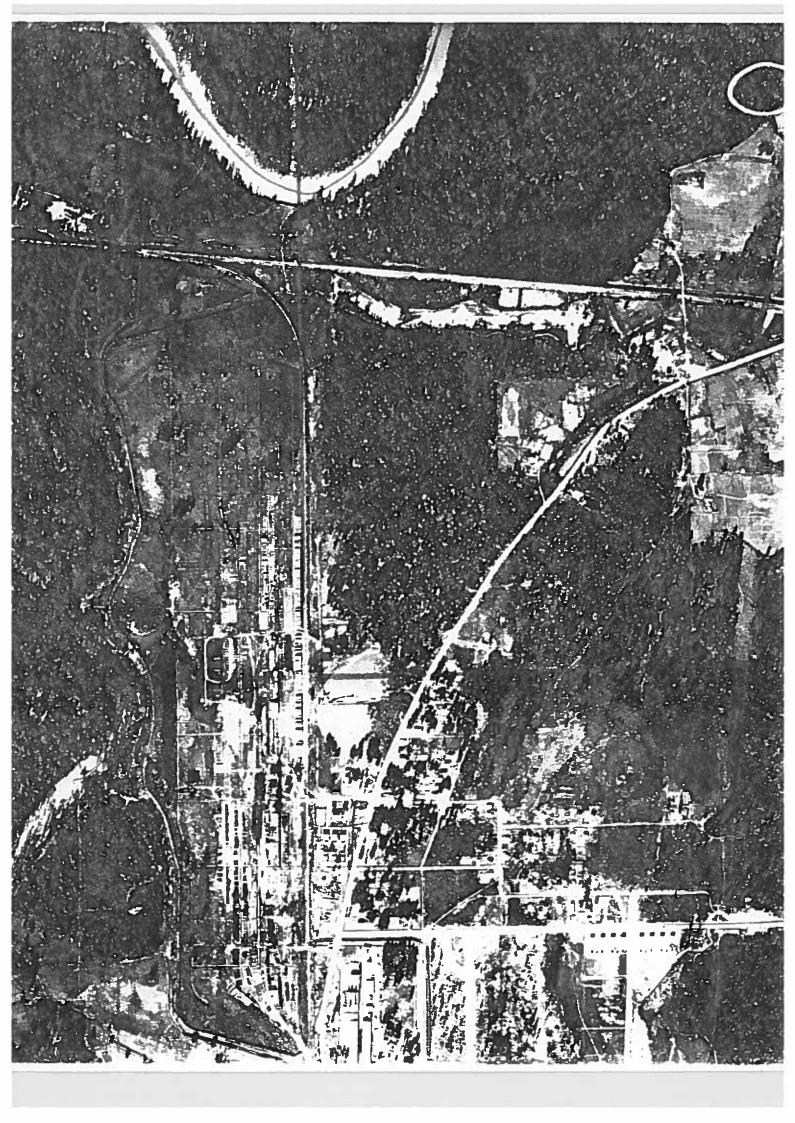
CCK - 36G - 105 (1965)

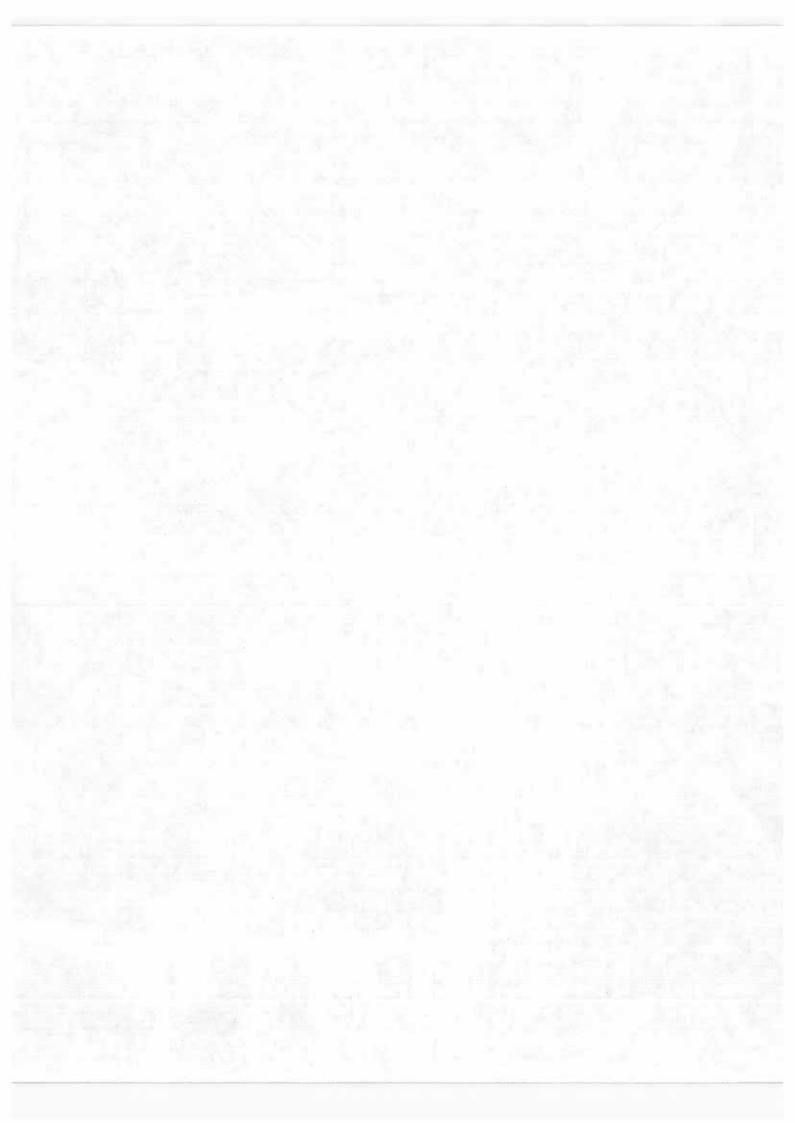


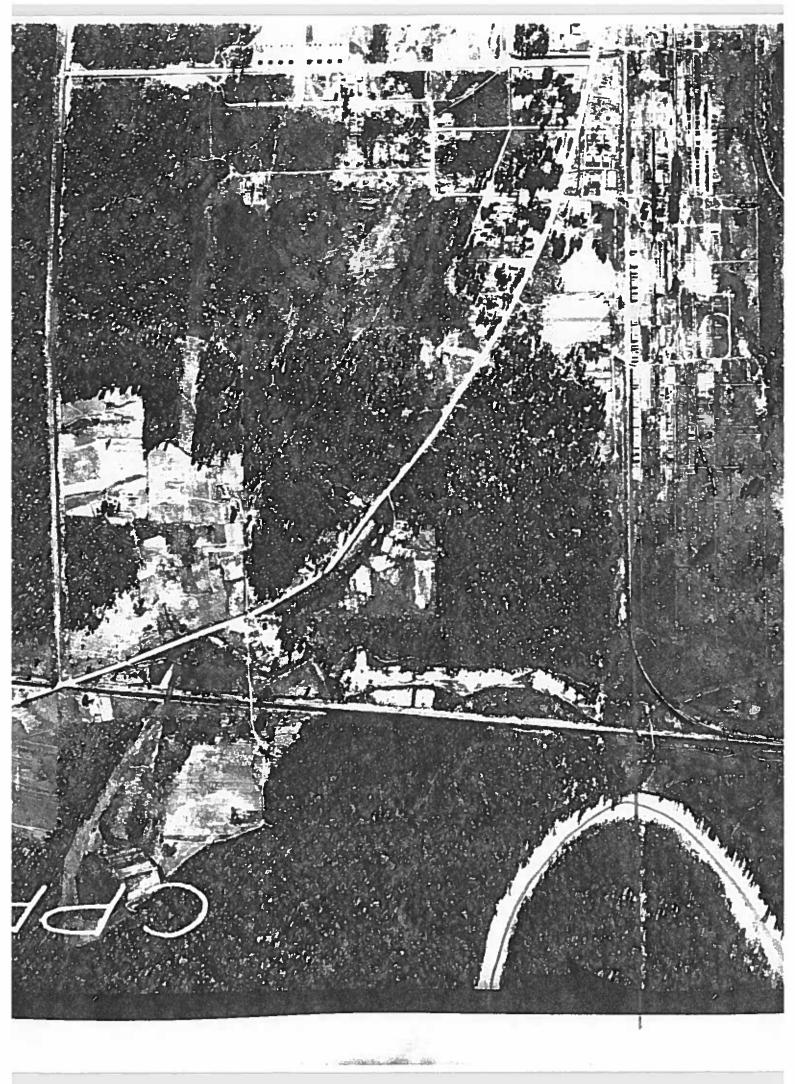


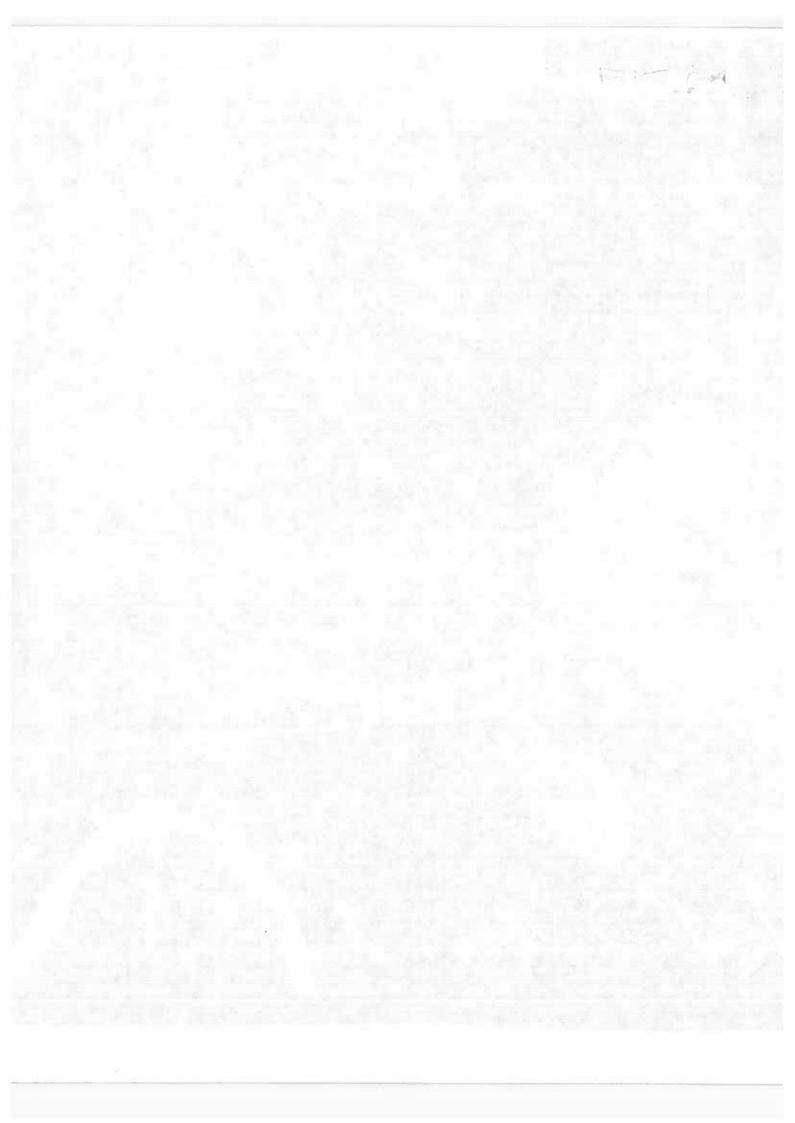
CCR- 3GG - 104 (1965)



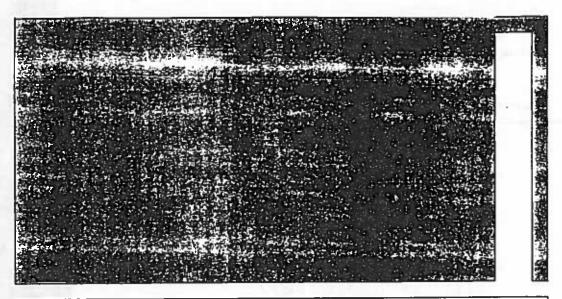








Reference No.: 20



R. Allan Freeze

Department of Geological Sciences University of British Columbia Vancouver, British Columbia

John A. Cherry

Department of Earth Sciences University of Waterloo Waterloo, Ontario

GROUNDWATER

Prentice-Hall, Inc. Englewood Cliffs, New Jersey 07632

Table 2.2 Range of Values of Hydraulic Conductivity and Permeability

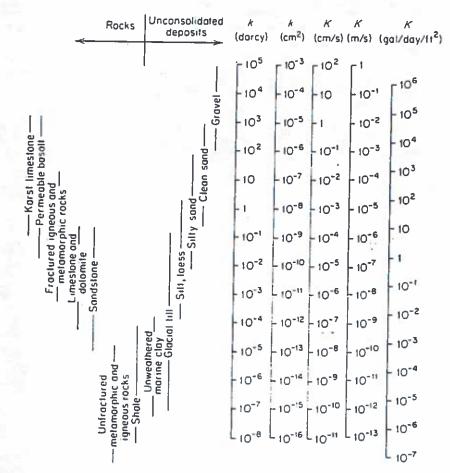


Table 2.3 Conversion Factors for Permeability and Hydraulic Conductivity Units

	Permeability, k*			Hydraulic conductivity, K		
	cm ²	ft2	darcy	m/s	ft/s	U.S. gai/day/ft²
cm²	1	1.08 . 10-3	1.01 10 ⁸	9.50 - 10:	3.22 × 10 ³	1.85 . 109
ft²	9.29 / 102	1	9.42 + 1010	9.11 105	2.99 - 106	1.71 × 1012
darcy.	9.87 : 10-9	1.06 10-11	1	9.66 × 10-6	3.17 × 10 ⁻⁵	1.82 × 101
ms	1.02 - 10-1	1.10 2 10-6	1.04 101	1	3.28	2.12 - 106
ft/s	3.11 × 10-4	3,35 10-	3.15 - 104	3.05 - 10-1	1	6.46 × 105
U.S. gal day	ft2 5,42 × 10-10	5.83 10-13	5.49 . 10-3	4.72 10-7	1.55 10~6	1

[•]To obtain k in ft², multiply k in cm² by 1.08 \times 10⁻³.