Haz. Waste File
Warren Co.

CERTIFIED MAIL
RETURN RECEIPT REQUEST
7000 0520 0025 3772 4037

Vicksburg chemical company

RECEIVED
OCT 1 - 2001
Miss. Dept. of Environmental Quality
Office of Pollution Control

Mr. D. Scott Mills
Env. Engineer
Office of Pollution Control
P.O. Box 10385
Jackson, MS 39289-0385

September 28, 2001

Re: Characterization Results

Dear Mr. Mills:

Please find enclosed characterization results for the two areas you identified for sampling during your recent inspection at the Vicksburg facility. Samples were obtained within each area by combining multiple discreet samples and thoroughly mixing to produce a composite sample. Samples were taken over approximate four-foot centers within each area. The results obtained do not indicate that material from either area exhibits a characteristic of hazardous waste. The areas you identified were, first, within the containment of the activated carbon water treatment units, and, second, adjacent and south of the units between the units and the railroad track. A diagram of the area is shown below. Please contact me with any questions.

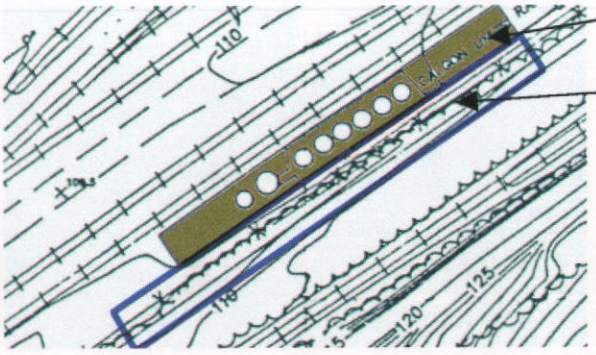
Sincerely,

Steven T. Boswell

Steven T. Boswell
Director of Env. Affairs

STB: pc

xc: Mr. Miles



MSSI Magnolia Scientific Services, Inc.

Report of Analytical Results

Client:	Vicksburg Chemical PO Box 821003 Vicksburg, MS 39180

Lab Number:	MS03822-3823	
Collected:	08/29/01	
Received:	09/04/01	10:30

Analyte/MC	Inside Containment	East of Containment	Date/Time/Analyst	MDL
Arsenic/200.7	**ND**	**ND**	09-12-01/1240/DH	0.05
Barium/200.7	**0.435**	**0.30**	09-12-01/1240/DH	0.01
Cadmium/200.7	**ND**	**ND**	09-12-01/1240/DH	0.01
Chromium/200.7	**ND**	**ND**	09-12-01/1240/DH	0.02
Lead/200.7	**ND**	**ND**	09-12-01/1240/DH	0.05
Mercury/245.1	**ND**	**0.005**	09-10-01/1450/DH	0.001
Selenium/200.7	**ND**	**ND**	09-12-01/1240/DH	0.05
Silver/200.7	**ND**	**ND**	09-12-01/1240/DH	0.01
pH/9045	**8.66**	**8.19**	09-18-01/1510/CRR	1
Reactivity				
Cyanides/9010 mg/g	**0.21**	**0.25**	09-10-01/1100/RWC	0.05
Sulfides/930 mg/g	**ND**	**ND**	09-10-01/1030/RWC	1
Ignitability/1010	**>160**	**>160**	09-06-01-1000/RWC	1

All Data Validated by: Rodney W. Culpepper

Rodney W. Culpepper
Laboratory Manager

MDL - Method Detection Limit
ND - Not Detected

129 Front Street
Purvis MS, 39475
email: mssi@sciseek.com
phone: (601)794-2309
fax: (601)794-2547

Client:	Vicksburg Chemical PO Box 821003 Vicksburg, MS 39180

Lab Number:	MS03822-3823	
Collected:	08/29/01	
Received:	09/04/01	10:30

QA/QC Results

Analyte	MS Rec %	MSD Rec %	RPD %
Arsenic	101.8	101.6	0.2
Barium	103.0	103.5	0.5
Cadmium	103.7	102.9	0.8
Chromium	102.8	103.2	0.4
Lead	104.5	103.8	0.7
Mercury	105.5	104.0	1.8
Selenium	101.5	101.6	0.1
Silver	102.2	102.3	0.1
Cyanides	87.8	93.2	5.4
Sulfides	104.5	97.3	7.2

All Data Validated by: Rodney W. Culpepper

Rodney W. Culpepper
Laboratory Manager

MDL - Method Detection Limit
ND - Not Detected

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Magnolia Scientific Services, Inc.

Report of Analytical Results

Volatile Organics - GC/MS Analytical Data

Sample Location: Inside Containment

Client: Vicksburg Chemical
Lab Sample Number: MS03822
Date/Time Collected: 08/29/01 10:00
Date/Time Extracted: 09/04/01 17:00
Date/Time Analysis: 09/12/01 18:26
Sample Matrix: TCLP

Volatile Organics Component Name	Sample Results ug/L (ppb)	Component MDL ug/L (ppb)
Vinyl Chloride	ND	5
1,1-Dichloroethene	ND	5
2-Butanone (MEK)	ND	5
Chloroform	5.22	5
Carbon Tetrachloride	ND	5
Benzene	ND	5
1,2-Dichloroethane	ND	5
Trichloroethene	ND	5
Tetrachloroethene	ND	5
Chlorobenzene	ND	5
1,4-Dichlorobenzene	ND	5

Surrogate Recovery

Surrogate Compound	Recovery (%)	
Dibromofluoromethane	96.0	QA /QC
Toluene-d8	98.6	
4-Bromofluorobenzene	100.8	

Matrix Spike/Matrix Spike Duplicate Recovery

Matrix Spike Compound	MS (%)	MSD (%)	RPD (%)	
Vinyl Chloride	106.4	107.0	0.6	QA / QC
1,1-Dichloroethene	101.6	103.4	1.8	
2-Butanone (MEK)	65.8	67.2	2.1	
Chloroform	97.8	102.4	4.6	
Carbon Tetrachloride	106.0	106.0	0.0	
Benzene	104.4	107.4	2.8	
1,2-Dichloroethane	85.6	88.0	2.8	
Trichloroethene	94.2	96.2	2.1	
Tetrachloroethene	105.4	103.6	1.7	
Chlorobenzene	104.2	98.0	6.1	
1,4-Dichlorobenzene	101.6	104.0	2.3	

All Data Validated by:

Rodney W. Culpepper
Laboratory Manager

Method Reference: SW846-8260
MDL - Method Detection Limit
ND - Not Detected

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Magnolia Scientific Services, Inc.

Report of Analytical Results

Volatile Organics - GC/MS Analytical Data

Client: Vicksburg Chemical
Lab Sample Number: MS03823
Date/Time Collected: 08/29/01 14:00
Date/Time Extracted: 09/04/01 17:00
Date/Time Analysis: 09/12/01 18:58
Sample Matrix: TCLP

Sample Location: East of Containment

Volatile Organics Component Name	Sample Results ug/L (ppb)	Component MDL ug/L (ppb)
Vinyl Chloride	ND	5
1,1-Dichloroethene	ND	5
2-Butanone (MEK)	ND	5
Chloroform	ND	5
Carbon Tetrachloride	ND	5
Benzene	ND	5
1,2-Dichloroethane	ND	5
Trichloroethene	ND	5
Tetrachloroethene	ND	5
Chlorobenzene	ND	5
1,4-Dichlorobenzene	ND	5

Surrogate Recovery

Surrogate Compound	Recovery (%)	
Dibromofluoromethane	103.8	QA /QC
Toluene-d8	101.7	
4-Bromofluorobenzene	105.0	

Matrix Spike/Matrix Spike Duplicate Recovery

Matrix Spike Compound	MS (%)	MSD (%)	RPD (%)	
Vinyl Chloride	106.4	107.0	0.6	QA / QC
1,1-Dichloroethene	101.6	103.4	1.8	
2-Butanone (MEK)	65.8	67.2	2.1	
Chloroform	97.8	102.4	4.6	
Carbon Tetrachloride	106.0	106.0	0.0	
Benzene	104.4	107.4	2.8	
1,2-Dichloroethane	85.6	88.0	2.8	
Trichloroethene	94.2	96.2	2.1	
Tetrachloroethene	105.4	103.6	1.7	
Chlorobenzene	104.2	98.0	6.1	
1,4-Dichlorobenzene	101.6	104.0	2.3	

All Data Validated by:

Rodney W. Culpepper
Laboratory Manager

Method Reference: SW846-8260
MDL - Method Detection Limit
ND - Not Detected

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fax: (601)794-2547

Pesticide/Herbicide - GC/ECD Analytical Data
TCLP Extracables

Sample Location: Inside Containment

Client: Vicksburg Chemical
Lab Sample Number: MS03822
Date/Time Collected: 08/29/01 10:00
Pest/PCB Analysis: 09/14/01 22:40
Herbicide Analysis: 09/14/01 17:34
Sample Matrix: TCLP

Component Name	Sample Results ug/Kg (ppb)	Component MDL ug/Kg (ppb)
Pesticide Fraction:		
gamma - BHC (Lindane)	ND	0.05
Heptachlor	ND	0.05
Heptachlor epoxide	ND	0.05
Endrin	ND	0.05
Methoxychlor	ND	0.05
Toxaphene	ND	1
Chlordane	ND	1
Herbicide Fraction:		
2,4-D	ND	0.05
2,4-TP (Silvex)	ND	0.05

Method Reference: SW846-8081/8151
MDL - Method Detection Limit
ND - Not Detected

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fax: (601)794-2547

Pesticide/PCB/Herbicide - GC/ECD Analytical Data
TCLP Extractables

Sample Location: Inside Containment

Client: Vicksburg Chemical
Lab Sample Number: MS03822
Date/Time Collected: 08/29/01 10:00
Pest/PCB Analysis: 09/14/01 22:40
Herbicide Analysis: 09/14/01 17:34
Sample Matrix: TCLP

Surrogate Recovery

Surrogate Compound	Recovery (%)	QA /QC
DCAA	96.9	
Decachlorobiphenyl	88.9	

Matrix Spike/Matrix Spike Duplicate Recovery

Matrix Spike Compound	MS (%)	MSD (%)	RPD (%)	QA / QC
Pesticide Fraction:				
gamma - BHC (Lindane)	88	90	2	
Heptachlor	76	75	1	
Heptachlor epoxide	73	77	5	
Endrin	89	90	1	
Methoxychlor	86	92	7	
Toxaphene	102	97	5	
Chlordane	99	85	15	
Herbicide Fraction:				
2,4-D	84	88	5	
2,4-TP (Silvex)	94	98	4	

All Data Validated by:

Rodney W. Culpepper
Laboratory Manager

Method Reference: SW846-8081/8151
MDL - Method Detection Limit
ND - Not Detected

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Pesticide/Herbicide - GC/ECD Analytical Data
TCLP Extracables

Sample Location: East of Containment

Client: Vicksburg Chemical
Lab Sample Number: MS03823
Date/Time Collected: 08/29/01 14:00
Pest/PCB Analysis: 09/14/01 23:24
Herbicide Analysis: 09/14/01 18:18
Sample Matrix: TCLP

Component Name	Sample Results ug/Kg (ppb)	Component MDL ug/Kg (ppb)
Pesticide Fraction:		
gamma - BHC (Lindane)	ND	0.05
Heptachlor	ND	0.05
Heptachlor epoxide	ND	0.05
Endrin	ND	0.05
Methoxychlor	ND	0.05
Toxaphene	ND	1
Chlordane	ND	1
Herbicide Fraction:		
2,4-D	ND	0.05
2,4-TP (Silvex)	ND	0.05

Method Reference: SW846-8081/8151
MDL - Method Detection Limit
ND - Not Detected

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Pesticide/PCB/Herbicide - GC/ECD Analytical Data
TCLP Extractables

Sample Location: East of Containment

Client: Vicksburg Chemical
Lab Sample Number: MS03823
Date/Time Collected: 08/29/01 14:00
Pest/PCB Analysis: 09/14/01 23:24
Herbicide Analysis: 09/14/01 18:18
Sample Matrix: TCLP

Surrogate Recovery

Surrogate Compound	Recovery (%)	QA /QC
DCAA	92.2	
Decachlorobiphenyl	90.2	

Matrix Spike/Matrix Spike Duplicate Recovery

Matrix Spike Compound	MS (%)	MSD (%)	RPD (%)	QA / QC
Pesticide Fraction:				
gamma - BHC (Lindane)	88	90	2	
Heptachlor	76	75	1	
Heptachlor epoxide	73	77	5	
Endrin	89	90	1	
Methoxychlor	86	92	7	
Toxaphene	102	97	5	
Chlordane	99	85	15	
Herbicide Fraction:				
2,4-D	84	88	5	
2,4-TP (Silvex)	94	98	4	

All Data Validated by:

Rodney W. Culpepper
Laboratory Manager

Method Reference: SW846-8081/8151
MDL - Method Detection Limit
ND - Not Detected

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Magnolia Scientific Services, Inc.

Report of Analytical Results

Semi-Volatile Organics - GC/MS Analytical Data
TCLP Extracables

Sample Location: Inside Containment

Client: Vicksburg Chemical Company
Lab Sample Number: MS03822
Date/Time Collected: 08/29/01 10:00
Date/Time Analysis: 09/07/01 11:50
Sample Matrix: TCLP

Semi-Volatile Organics Component Name	Sample Results ug/L (ppb)	Component MDL ug/L (ppb)
Pyridine	ND	5
1,4-Dichlorobenzene	ND	5
2-Methylphenol	ND	5
3-Methyphenol	ND	5
4-Methylphenol	ND	5
Hexachloroethane	ND	5
Nitrobenzene	ND	5
Hexachlorobutadiene	ND	5
2,4,6-Trichlorophenol	ND	5
2,4,5-Trichlorophenol	ND	25
2,4-Dinitrotoluene	ND	5
Hexachlorobenzene	ND	5
Pentachlorophenol	ND	25

Method Reference: SW846-8270
MDL - Method Detection Limit
ND - Not Detected

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phone: (601)794-2309
fax: (601)794-2547

Semi-Volatile Organics - GC/MS Analytical Data
TCLP Extracables

Sample Location: Inside Containment

Client: Vicksburg Chemical Company
Lab Sample Number: MS03822
Date/Time Collected: 08/29/01 10:00
Date/Time Analysis: 09/07/01 11:50
Sample Matrix: TCLP

Surrogate Recovery

Surrogate Compound	Recovery (%)	QA /QC
2-Fluorophenol	64.7	
Phenol-d5	60.1	
2-Chlorophenol-d4	81.6	
1,2-Dichlorobenzene-d4	74.1	
Nitrobenzene-d5	74.5	
2-Fluorobiphenyl	83.7	
2,4,6-Tribromophenol	73.9	
Terphenyl-d14	77.0	

Matrix Spike/Matrix Spike Duplicate Recovery

Matrix Spike Compound	MS (%)	MSD (%)	RPD (%)	QA / QC
Pyridine	93	89	4	
1,4-Dichlorobenzene	92	83	10	
2-Methylphenol	79	82	4	
3-Methyphenol	69	73	5	
4-Methylphenol	71	83	15	
Hexachloroethane	91	84	7	
Nitrobenzene	96	95	1	
Hexachlorobutadiene	91	80	13	
2,4,6-Trichlorophenol	76	72	5	
2,4,5-Trichlorophenol	70	68	3	
2,4-Dinitrotoluene	95	87	9	
Hexachlorobenzene	96	97	1	
Pentachlorophenol	79	83	5	

All Data Validated by:
Rodney W. Culpepper
Laboratory Manager

Method Reference: SW846-8270
MDL - Method Detection Limit
ND - Not Detected

Semi-Volatile Organics - GC/MS Analytical Data
TCLP Extracables

Sample Location: East of Containment

Client: Vicksburg Chemical Company
Lab Sample Number: MS03823
Date/Time Collected: 08/29/01 14:00
Date/Time Analysis: 09/07/01 11:16
Sample Matrix: TCLP

Semi-Volatile Organics Component Name	Sample Results ug/L (ppb)	Component MDL ug/L (ppb)
Pyridine	ND	5
1,4-Dichlorobenzene	ND	5
2-Methylphenol	ND	5
3-Methyphenol	ND	5
4-Methylphenol	ND	5
Hexachloroethane	ND	5
Nitrobenzene	ND	5
Hexachlorobutadiene	ND	5
2,4,6-Trichlorophenol	ND	5
2,4,5-Trichlorophenol	ND	25
2,4-Dinitrotoluene	ND	5
Hexachlorobenzene	ND	5
Pentachlorophenol	ND	25

Method Reference: SW846-8270
MDL - Method Detection Limit
ND - Not Detected

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email: mssi@sciseek.com
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fax: (601)794-2547

Semi-Volatile Organics - GC/MS Analytical Data
TCLP Extracables

Sample Location: East of Containment

Client: Vicksburg Chemical Company
Lab Sample Number: MS03823
Date/Time Collected: 08/29/01 14:00
Date/Time Analysis: 09/07/01 11:16
Sample Matrix: TCLP

Surrogate Recovery

Surrogate Compound	Recovery (%)	QA /QC
2-Fluorophenol	81.6	
Phenol-d5	74.6	
2-Chlorophenol-d4	84.6	
1,2-Dichlorobenzene-d4	75.1	
Nitrobenzene-d5	74.8	
2-Fluorobiphenyl	81.7	
2,4,6-Tribromophenol	79.8	
Terphenyl-d14	116.3	

Matrix Spike/Matrix Spike Duplicate Recovery

Matrix Spike Compound	MS (%)	MSD (%)	RPD (%)	QA / QC
Pyridine	93	89	4	
1,4-Dichlorobenzene	92	83	10	
2-Methylphenol	79	82	4	
3-Methyphenol	69	73	5	
4-Methylphenol	71	83	15	
Hexachloroethane	91	84	7	
Nitrobenzene	96	95	1	
Hexachlorobutadiene	91	80	13	
2,4,6-Trichlorophenol	76	72	5	
2,4,5-Trichlorophenol	70	68	3	
2,4-Dinitrotoluene	95	87	9	
Hexachlorobenzene	96	97	1	
Pentachlorophenol	79	83	5	

All Data Validated by:

Rodney W. Culpepper
Laboratory Manager

Method Reference: SW846-8270
MDL - Method Detection Limit
ND - Not Detected

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email: mssi@sciseek.com
phone: (601)794-2309
fax: (601)794-2547

MSSI
Magnolia Scientific Services, Inc.

CHAIN OF CUSTODY RECORD

CLIENT INFORMATION

COMPANY: Vicksburg Chemical Company

ADDRESS: P.O. Box 821003, 4280 Rifle Range Road
Vicksburg, MS 39182

CONTACT: S.T. Boswell

PHONE: 601-619-0619 FAX: 601-619-0609

PROJECT: CARBON

SAMPLE COLLECTOR: S.T. Boswell

#	DATE	TIME	SAMPLE ID	# Cont.	Matrix	Pres	Analysis Requested: TCLP, Metals	TCLP, Pesticides	TCLP, Organics	TCLP, Volatiles						LABORATORY IDENTIFICATION CODE
1	8/29/01	1000	INSIDE CONTAINMENT	1	GAC	N	X	X	X	X						MS038212
2	8/29/01	1400	EAST OF CONTAINMENT	1	GAC	N	X	X	X	X						MS038213
3																
4																
5																
6																
7																
8																
9																
10																

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
Steven T. Boswell	8/31/01				
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
FED EX			Rodney Culpepper	9/4/01	1030

COMMENTS: ATTENTION: RODNEY CULPEPPER

129 FRONT STREET PURVIS, MS 39475 PHONE: (601) 794-2309 FAX (601) 794-2547 email: info@magnoliascientific.com

Haz. Waste File
Warren Co.
Vicksburg Chemical

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

SEP 20 2001

RECEIVED
SEP 28 2001
Miss. Dept. of Environmental Quality
Office of Pollution Control

4WD-RCRA

Mr. Steven T. Boswell
Director of Environmental Affairs
Vicksburg Chemical Company
Post Office Box 821003
Vicksburg, Mississippi 39182

Subject: Assignment of New Project Coordinator for
Consent Decree, Civil Number W92-0008(B)
Vicksburg Chemical Company, Rifle Range Road
MSD 990 714 081

Dear Mr. Boswell:

Pursuant to Section XIII., Paragraph C. of Consent Decree, Civil Number W92-0008(B), filed April 17, 1992, (Consent Decree), the United States Environmental Protection Agency (EPA), Region 4, is informing you of a change in the Project Coordinator. Effective on September 30, 2001, Ms. Lael Butler of the RCRA Programs Branch has been assigned as the new Project Coordinator for the Consent Decree between EPA and Vicksburg Chemical Company (VCC).

Lael is a native Mississippian who has a great deal of experience with corrective action activities and issues. I am confident that she will make valuable contributions to corrective action at VCC. I will continue to be available to help as a consultant and to review documents. Lael and I will work together with you to ensure a smooth transition. At a time that is convenient for you, Lael and I would like to arrange a visit to VCC to introduce you to Lael and to familiarize Lael with the site.

I appreciate your cooperation and hard work over the years and I look forward to working with you and Lael. I wish the best to you and VCC in both corrective action and business activities.

The address for sending future corrective action documents is:

Ms. Lael Butler
RCRA Programs Branch
Mail Code: 4WD-RCRA
U.S. Environmental Protection Agency, Region 4
Sam Nunn Atlanta Federal Center
61 Forsyth Street, S.W.
Atlanta, GA 30303

If you have any questions, please contact me at (404) 562-8604, or by e-mail: sophianopoulos.judy@epa.gov; or contact Lael Butler at (404) 562-8453 (Telephone); (404) 562-8439 (FAX); or butler.lael@epa.gov.

Sincerely,

Judy Sophianopoulos
Environmental Scientist
South Enforcement and
Compliance Section
RCRA Enforcement and
Compliance Branch

cc: Scott Mills, Chemical Branch of the Environmental Compliance and Enforcement Division, Mississippi Department of Environmental Quality

Vicksburg Chemical

URS

August 23, 2001

Mr. Steve Boswell
Vicksburg Chemical
4280 Rifle Range Road
Vicksburg, Mississippi 39180

Dr. Judy Sophianopoulos
United States Environmental Protection Agency
Region 4
61 Forsyth Street
Atlanta, Georgia 30303-3104

Mr. Scott Mills
Mississippi Department of Environmental Quality
2380 Highway 80 West
Jackson, Mississippi 39204

Re: Vicksburg Chemical
Vicksburg, Mississipi
RFI Draft Final Report
Tables 8-6 and 9-8
URS File 35-092B007C.00 04004

Dear Mr. Boswell, Dr. Sophianopoulos, and Mr. Mills:

Enclosed are two copies for each of you of Tables 8-6 and 9-8 for the RFI Draft Final Report for Vicksburg Chemical. Previous tables sent to you contained word processing errors in the order of listing of the top five chemicals in the tables. I regret the error. The error did not lead to further error; for example, utilization in figures or discussions.

Very truly yours,

Dick Karkkainen

URS Corporation
2822 O'Neal Lane
Baton Rouge, LA 70816
Tel: 225.751.1873
Fax: 225.753.3616

TABLE 8-6

SUMMARY OF GROUNDWATER DATA OBTAINED FROM WELLS MW-18A AND MW-18B

Compound	MW-18A	MW-18B	MDEQ Tier 1 TRG Table µg/L (ppb)
Arsenic	319	194	50
Atrazine	ND	ND	3
Cyanazine	ND	ND	0.0797
Dinoseb	1.3	132	7
Toxaphene	ND	ND	3
Volatile Organics Compound			
Chloromethane	ND	ND	1.49
Bromomethane	ND	ND	8.52
Vinyl Chloride	ND	ND	2.0
Chloroethane	ND	ND	3.64
Methylene Chloride	ND	ND	5.0
Acetone	ND	ND	3,650
Carbon Disulfide	ND	ND	1,040
1,1-Dichloroethene	ND	ND	7.0
1,1-Dichloroethane	ND	ND	798
1,2-Dichloroethene (total)	ND	ND	70
Chloroform	ND	ND	0.152
2-Butanone	ND	ND	1,1910
1,2-Dichloroethane	ND	ND	5.0
1,1,1-Trichloroethane	ND	ND	200
Carbon Tetrachloride	ND	ND	5.00
Bromodichloroemthane	ND	ND	1.08
1,2-Dichloropropane	ND	ND	5.0
c-1,3-Dichloropropene	ND	ND	0.765
Trichloroethene	ND	ND	5.0
Benzene	ND	ND	5.0
Dibromochloromethane	ND	ND	5.0
t-1,3-Dichloropropene	ND	ND	0.0765
1,1,2-Trichloroethane	ND	ND	5.0
Bromoform	ND	ND	2.33
4-Methyl-2-pentanone	ND	ND	2,920
Tetrachloroethene	ND	ND	5.0
1,1,2,2-Tetrachloroethane	ND	ND	0.0527
2-Hexanone	ND	ND	1,460
Toluene	ND	2.38	1,000
Chlorobenzene	ND	ND	100
Ethylbenzene	ND	296	700
Styrene	ND	ND	100
Xylenes (total)	1.52	948	10,000

TABLE 9-8

SUMMARY OF GROUNDWATER DATA OBTAINED FROM WELLS MW-17A, MW-17B, MW-18A AND MW-18B

Compound	MW-17A	MW-17B	MW-18A	MW-18B	MDEQ Tier 1 TRG Table µg/L (ppb)
Arsenic	ND	8	319	194	50
Atrazine	ND	ND	ND	ND	3
Cyanazine	ND	ND	ND	ND	0.0797
Dinoseb	ND	ND	1.3	132	7
Toxaphene	ND	ND	ND	ND	3
Volatile Organics Compound					
Chloromethane	ND	ND	ND	ND	1.49
Bromomethane	ND	ND	ND	ND	8.52
Vinyl Chloride	ND	ND	ND	ND	2.0
Chloroethane	ND	ND	ND	ND	3.64
Methylene Chloride	ND	ND	ND	ND	5.0
Acetone	ND	ND	ND	ND	3,650
Carbon Disulfide	ND	ND	ND	ND	1,040
1,1-Dichloroethene	ND	ND	ND	ND	7.0
1,1-Dichloroethane	ND	ND	ND	ND	798
1,2-Dichloroethene (total)	ND	ND	ND	ND	70
Chloroform	ND	1.43	ND	ND	0.152
2-Butanone	ND	ND	ND	ND	1,910
1,2-Dichloroethane	ND	ND	ND	ND	5.0
1,1,1-Trichloroethane	ND	ND	ND	ND	200
Carbon Tetrachloride	7.25	2.59	ND	ND	5.0
Bromodichloroemthane	ND	ND	ND	ND	1.08
1,2-Dichloropropane	ND	ND	ND	ND	5.0
c-1,3-Dichloropropene	ND	ND	ND	ND	0.765
Trichloroethene	ND	ND	ND	ND	5.0
Benzene	ND	ND	ND	ND	5.0
Dibromochloromethane	ND	ND	ND	ND	5.0
t-1,3-Dichloropropene	ND	ND	ND	ND	0.0765
1,1,2-Trichloroethane	ND	ND	ND	ND	5.0
Bromoform	ND	ND	ND	ND	2.33
4-Methyl-2-pentanone	ND	ND	ND	ND	2,920
Tetrachloroethene	ND	ND	ND	ND	5.0
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	0.0527
2-Hexanone	ND	ND	ND	ND	1,460
Toluene	ND	ND	ND	2.38	1,000
Chlorobenzene	ND	ND	ND	ND	100
Ethylbenzene	ND	ND	ND	296	700
Styrene	ND	ND	ND	ND	100
Xylenes (total)	ND	ND	6.52	948	10,000

Warren
RCRA

URS

August 10, 2001

Dr. Judy Sophianopoulos
United States Environmental Protection Agency
Region 4
61 Forsyth Street
Atlanta, Georgia 30303-3104

Mr. Scott Mills
Mississippi Department of Environmental Quality
2380 Highway 80 West
Jackson, Mississippi 39204

Re: [redacted]
Vicksburg, Mississippi
URS File 35-092B007C.00 04004

Dear Dr. Sophianopoulos and Mr. Mills:

Enclosed are two copies for each of the RFI Draft Final Report for Vicksburg Chemical. When reviewed by you and modified, as necessary, it will be the RFI Final Report.

For review purposes, since the data content is substantial, it might be useful to start at Section Eighteen "Overall Conclusions" and Figures 18-1 through 18-6 to get an overview prior to examining the entire report.

Very truly yours,

Dick Karkkainen
Principal Environmental Engineer

cc Mr. Steve Boswell
Vicksburg Chemical
4280 Rifle Range Road
Vicksburg, Mississippi 39180

URS Corporation
2822 O'Neal Lane
Baton Rouge, LA 70816
Tel: 225.751.1873
Fax: 225.753.3616

URS

Vicksburg Chemical
Warren Co.
Haz. Waste File

March 15, 2001

Mr. Scott Mills
Mississippi Department of Environmental Quality *via:* ***Federal Express***
2380 Highway 80 West
Jackson, Mississippi 39204

Re: RFI Interim Report and Phase II Workplan - Revision 1 - March 16, 2001
URS File Number 35-092B007C.00 03012

Dear Mr. Mills:

Attached are two copies of the referenced report. Steve Boswell asked that I send them directly to you.

There are these differences in Revision 1 - March 16, 2001 over the December 15, 2000 submittal:

- The analytical errors reported for toxaphene and dinoseb are corrected.
- The results of Phase I Jr. are included. The results are presented in the discussion of SWMU 20.
- Both the unrestricted and restricted values from the MSDEQ Tier 1 TRG Table are listed on the various data tables.
- The need to complete the RFI and the GWA and the need to agree on acceptable arsenic clean up standards based on background concentrations are emphasized prior to initiating any corrective action.
- The schedule includes revising the GWA Workplan, approval of that plan, then implementation of the plan as the next logical step after completion of Phase II to sufficiently characterize the soil and groundwater contamination to allow corrective measures to be thoughtfully considered. The Phase II Workplan emphasizes establishing groundwater quality data with 13 borings to groundwater (3 soil samples and 1 groundwater sample per boring) and also 9 new permanent monitor wells.

Let me know, if you need additional copies. I have sent two copies to the U.S.EPA.

Very truly yours,

Dick Karkkainen
URS Corporation
2822 O'Neal Lane
Baton Rouge, LA 70816
Tel: 225.751.1873
Fax: 225.753.3616

3-15-01

URS

January 8, 2001

Mr. Steve Boswell
Vicksburg Chemical
4280 Rifle Range Road
Vicksburg, Mississippi 39180

Re: Potential for Off-Site Transport of Arsenic From SWMU 11, 12 15
URS File No. 35-092B007C.00 03006

Dear Steve:

The Solid Waste Management Unit (SWMU) at Vicksburg Chemical Company referred to as SWMU 11, 12 and 15 is the former manufacturing site of arsenical pesticides. The process has been shut down, equipment removed from the area, and the concrete foundations cleaned with high-pressure water equipment.

A characterization of the soil and groundwater at SWMU 11, 12 and 15 has been made and reported in "RCRA Facility Investigation Interim Report and Phase II Work Plan" dated December 15, 2000. An area of residual contamination of soil by arsenic has been reported. Likewise a groundwater plume of arsenic has been reported beneath the soil contamination.

SWMU 11, 12 and 15 and the soil and groundwater contamination is at least 800 feet from Hennessey's Bayou, the nearest pathway to off-site. Theoretically, soil contaminated with arsenic could be, in time, transported to the bayou. Theoretically, groundwater contaminated with arsenic could be, in time, transported to the bayou. A substantial number of soil and groundwater samples have been obtained in the area between SWMU 11, 12 and 15. This note summarizes the analytical data on arsenic and information on the background concentration of arsenic in soil and groundwater in order to determine if there is imminent danger of off-site transport of arsenic, and therefore potential for exposure, evident in the pattern of data established since the shut down of the arsenical pesticides process approximately 14 years ago.

17-18

ARSENIC IN SOIL

The following data on arsenic concentration (not including SWMU 11, 12 and 15) in soil is obtained from "RCRA Facility Investigation Interim Report and Phase II Work Plan" December 15, 2000. The locations of the SWMUs are noted on Figure 1 of that report.

URS Corporation
2822 O'Neal Lane
Baton Rouge, LA 70816
Tel: 225.751.1873
Fax: 225.753.3616

TABLE 1

ARSENIC CONCENTRATIONS IN SOIL

SWMU Number	Number of Samples Analyzed	Range of Concentrations Reported µg/kg ($_{00}$G)	Average Concentration µg/kg ($_{00}$G)
1, 16, 17	90	1,570 – 27,000	7,400
1, 16, 17	10	7,470 – 11,800	9,372
2 (Hill)	17	<500 – 4,460	2,024
2 (Valley)	14	2,200 – 5,200	3,393
4	6	5,100 – 15,700	8,433
5	16	<500 – 174,000	19,694
5[(1)]	15[(1)]	<500 – 39,200	9,407
7	9	<500 – <500	<500
8	4	<500 – 9,800	3,900
9	16	3,800 – 61,000	19,744
9[(2)]	13[(2)]	3,800 – 30,600	10,531
9	3	7,320 – 9,570	8,650
13	9	2,700 – 8,800	4,356
14	17	<500 – 1,900	665
18	5	<500 – 17,500	7,540
20	32	<500 – 10,900	1,763
23	13	340 – 4,900	1,656

NOTES:

(1) The 174,000 ppb location is within the SWMU 11, 12, 15 boundary.
(2) One location (3 sample points) is probably contaminated soil excavated elsewhere and used as fill.

ARSENIC IN GROUNDWATER

The predominant data on arsenic concentrations in groundwater is from analyses of the monitor wells. The monitor well data is summarized in "Response to July 3, 2000 Comments by the U.S. EPA on the "Amended and Supplemental Groundwater Assessment Work Plan December 1999 dated July 31, 2000". There have been 45 to 50 samples analyzed per well beginning as early as December 1981. Additional data on concentration of arsenic in groundwater is found in "RCRA Facility Investigation Interim Report and Phase II Work Plan dated December 15, 2000."
The data for monitor wells is as follows:

TABLE 2

CONCENTRATION OF ARSENIC IN MONITOR WELLS

Monitor Well Number	Range of Arsenic Concentration µg/l (ppb)	Average Arsenic Concentration µg/l (ppb)
MW-1A	<5 – 54.0	6
MW-2	<5 – 8.0	5
MW-4	<5 – 8.9	5
MW-5	<5 – 70.0	8
MW-6	<5 – 19.0	6
MW-7	<5 – 113.0	14.5
MW-8	<5 – 80.0	32.7
MW-9	<5 – 9.0	6
MW-10	<5 – 15.0	6
MW-11	<5 – 12.0	5.3
MW-12	<5 – 20.0	7.4
MW-13	<5 – 32.0	14.9
MW-14	<5 – 7.0	5.8
MW-16	<5 – 21.0	5.7

Data from piezometers and temporary wells has been obtained on a one-time basis. The following is a table of that data:

TABLE 3

CONCENTRATION OF ARSENIC IN TEMPORARY WELLS OR PIEZOMETERS

Temporary Well or Piezometer Number	Data Obtained During Investigation of SWMU	Concentration of Arsenic µg/l (ppb)
12B	23	0.9
12A	23	1.8
20B	23	1.4
20A	23	0.8

TABLE 3

CONCENTRATION OF ARSENIC IN TEMPORARY WELLS OR PIEZOMETERS

Temporary Well or Piezometer Number	Data Obtained During Investigation of SWMU	Concentration of Arsenic µg/l (ppb)
21A	23	1.4
22B	23	2.0
22A	23	1.8
23B	23	0.4
23A	23	0.4
24B	23	0.4
25B	23	0.4
21A-FB	23	0.4
2-W-TA	1, 16, 17	538
LS1-W	2	<10
LS2-W	2	<10
LS3-W	2	<10
LS4-W	2	<10
LS4-W Dup	2	<10
LS5-W	2	<10
TP-1	9	378

ARSENIC DETERMINATION IN SOILS ON THE VICKSBURG SITE BUT AWAY FROM PRODUCTION AREAS

Three soil samples were obtained adjacent to the parking lot to the north of the north plant administration building. An additional three samples were obtained in Vicksburg Chemical employee park located between the north plant administration building and the Mississippi River. The samples were first reported on Page 27 of the "Expedited RCRA Facility Investigation Report SWMUs 16, 1, 17 dated June 1997."

TABLE 4

CONCENTRATION OF ARSENIC IN SOIL OF NON-MANUFACTURING AREAS

Sample Number	Data Obtained During Investigation of SWMU	Concentration of Arsenic µg/l (ppb)
B1-0, 2-A	16, 1, 17	9,380
B2-0, 2-A	16, 1, 17	7,470
B3-0, 2-A	16, 1, 17	7,270
B4-0, 2-A	16, 1, 17	10,800
B5-0, 2-A	16, 1, 17	11,700
B5-0, 2-A	16, 1, 17	11,800

The average concentration is 9,700 ppb.

SUMMARY OF CONCLUSIONS

Soil

The concentration of arsenic in the soil at the Vicksburg site presents an interesting challenge. There is obvious arsenic contamination in the SWMU 11, 12 and 15 area caused during the manufacture of MSMA. It is not obvious, however, what is background arsenic and what may be caused by contaminant transport from SWMU 11, 12 and 15. The background level of arsenic on the site is variable, but does exceed the values presented in the MSDEQ Tier 1 TRG Table. Examination of the average concentration values presented in Table 1 and Table 4 lead to the following generalizations:

- The south plant manufacturing areas can be characterized as an area where the background concentration of arsenic is about 10,000 ppb. The evidence is the concentration of arsenic in soil at SWMUs 1, 16, 17, 5, 8, 9 and 18.

- The "background" concentrations of arsenic were obtained in areas geologically similar to the south plant manufacturing areas. That concentration is likewise about 10,000 ppb.

- The railroad area (SWMUs 20, 7, 14 and 4), hill upon which SWMU 23 was constructed, hill upon which SWMU 2 was constructed and the southwest drainage ditch (SWMU 13) can be characterized by an arsenic concentration of less than 5,000 ppb. These are the areas nearest to Hennessey's Bayou.

From the data it can be concluded that there has been no erosional mechanism that has transported arsenic from the source at SWMU 11, 12, 15. The background concentration of arsenic in soils in areas where there is no potential for transport by erosion is high. In fact, some of the areas are underneath concrete in buildings where there has never been manufacture or storage of arsenic compounds.

Examination of external sources of information lends support to the thesis that there is a variation in the concentration of arsenic in natural soils and that concentration can exceed remediation goals. The EPA Region 9 has published remediation goals in a program that is in concept similar to the MDEQ Brownfields Program. In the "Region 9 Preliminary Remediation Goals (PRGs) for 1998", background concentrations are addressed as follows:

> "Before embarking on an extensive sampling and analysis program to determine local background concentrations in the area, one should first compile existing data on the subject. Far too often, there is pertinent information in the literature that gets ignored, resulting in needless expenditures of time and money. An illustrative example of this is naturally occurring arsenic in soils which frequently is higher than the risk-based PRG set at one-in-one-million cancer risk (PRG for residential soils is 0.38 mg/kg):

TABLE 5

BACKGROUND CONCENTRATIONS OF SELECTED ELEMENTS IN SOILS

Trace Element	U.S. Study Data[1]			California Data[2]		
	Range	GeoMean	ArMean	Range	GeoMean	ArMean
Arsenic	<.1-97	5.2 mg/kg	7.2 mg/kg	0.59-11	2.75 mg/kg	3.54 mg/kg
Beryllium	<1-15	0.63 mg/kg	0.92 mg/kg	0.10-2.7	1.14 mg/kg	1.28 mg/kg
Cadmium	<1-10	--	<1	0.05-1.7	0.26 mg/kg	0.36 mg/kg
Chromium	1-2000	37	54	23-1579	76.25 mg/kg	122.08 mg/kg
Nickel	<5-700	13	19	9.0-509	35.75 mg/kg	56.60 mg/kg

NOTES:

1 Shackle and Hansford, "Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States", USGS Professional Paper 1270, 1984.

2 Bradford et al, "Background Concentrations of Trace and Major Elements in California Soils", Kearney Foundation Special Report, UC-Riverside and CAL-EPA DTSC, March 1996.

> Where anthropogenic "background" levels exceed PRGs and EPA has determined that a response is necessary and feasible, EPA's goals will be to develop a comprehensive response to the widespread contamination. This will often require coordination with different authorities that have jurisdiction over the sources of contamination in the area.
>
> After considering background concentrations in a local area, EPA Region 9 has at times used the non-cancer PRG for arsenic (22 mg/kg) to evaluate sites recognizing that this value tends to be above background levels yet still falls within the range of soil concentrations (0.38-38 mg/kg) that equate the EPA's "permissible" cancer risk (10E-6 to 10E-4)."

Table 5, which presents the background concentrations of selected elements in soils, references "Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States", Shackle and Hansford, USGS Professional Paper 1270, 1984. On page 14 of that reference, a map depicts the location of the arsenic data points. The four points that are nearest the Vicksburg site range from 4.1 to 97 ppm arsenic. The 97 ppm is the highest value reported in the USGS study.

Aside from the examination of data that indicates no erosional transport of arsenic, the physical layout of the arsenic contamination source area at SWMU 11, 12, 15 also supports the thesis that there is no erosional transport. The area is overlayed with hard packed soil, asphalt and concrete. No erosional areas are evident.

Groundwater

The plume of arsenic contamination reported at SWMU 11, 12, 15 is depicted as Figure 9-4 of the "RCRA Facility Investigation Interim Report and Phase II Work Plan dated December 15, 2000. The question at hand is whether that plume can migrate to Hennessey's Bayou and offsite in the near term.

Examination of the data presented in Tables 2 and 3 can lead to some general conclusions:

- The groundwater is an area where the natural soil is low in arsenic is likewise low in arsenic. The concentration of arsenic in groundwater at SWMU 23 is less than 2 ppb.

- The groundwater in an area where the natural soil is relatively high in arsenic is likewise relatively high in arsenic. MW-4 is the "official" background well. It is

located in the north plant away from manufacturing areas but nearby the area where background concentration of arsenic in soil is 9,700 ppb. The concentration of arsenic in MW-4 has been analyzed as high as 8.9 ppb and averages 5 ppb.

- The detection of an average of 5 to 6 ppb arsenic in groundwater noted in the monitor well network (MW-1A, MW-2, MW-4, MW-5, MW-6, MW-9, MW-10, MW-11, MW-12, MW-14 and MW-16) is not indicative that the plume has reached the well. Concentrations at MW-7, MW-8, and MW-13 may indicate the beginning of impact from the arsenic source at SWMU 11, 12, 15. Moreover, it is noted that MWs 7, 8 and 13 are screened in the shallow zone as opposed to most of the wells in the network.

It can be concluded that there is no danger of imminent impact of the arsenic plume on Hennessey's Bayou and therefore offsite. There is confirmation, however, that additional monitoring should take place. Therefore, the program consisting of installing nested wells MW-17A/MW-17B and MW-18A/MW-18B and shallow zone wells MW-10C, MW-12C and MW-16C should be implemented.

Very truly yours,

Richard D. Karkkainen

RDK:cm

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
7000 0520 0025 3772 7779

Vicksburg Chemical
Cedar Chemical File
Haz. Waste.
Warren Co.

Vicksburg
chemical company

RECEIVED
NOV 27 2000

Dr. Judy Sophianopoulos
Waste Compliance Section
RCRA & FF Branch
U.S. EPA, Region IV
Mailcode 4DW-RCRA
61 Forsyth Street, SW
Atlanta, Georgia 30303

Re: Cedar Chemical Company
Consent Decree Civil Number W92-0008B
SWMU #11, 12 and 15 Interim Revised Corrective Measures Plan

November 21, 2000

Dear Dr. Sophianopoulos:

Please find with this letter a Revised Interim Corrective Measures Plan for the above mentioned SWMUs. This plan envisions a clean-up level for arsenic of 20 mg/kg which is above the Tier I TRG levels set in the Mississippi Brownfields guidance.

The Tier I TRG levels for arsenic are less than one-half mg/kg for un-restricted use and 3.8 mg/kg for restricted use. Both of these levels appear to be below local arsenic levels in this area of Mississippi. As might be imagined, selection of either level increases the volume of material to be remediated substantially and costs to remediate escalate in the same fashion. It may be productive to have an informal discussion with your office and MSDEQ concerning these levels.

Please contact me with any questions there may be concerning this matter.

Sincerely,

Steven T. Boswell
Director of Env. Affairs

STB: pc

xc: Mr. Yoked
Mr. Keen
Mr. Mills, MSDEQ
Mr. Karkkainen, URS-Greiner

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
742 293 412

Vicksburg chemical company

Dr. Judy Sophianopoulos
Waste Compliance Section
RCRA & FF Branch
U.S. EPA, Region IV
Mailcode 4DW-RCRA
61 Forsyth Street, SW
Atlanta, Georgia 30303

Re: Cedar Chemical Company
Consent Decree Cvivil Number W92-0008B)
SWMU #2 Sampling per Letter of July 19, 2000

November 3, 2000

Dear Dr. Sophianopoulos:

Please find with this letter results of samples taken within SWMU #2 at the Cedar Chemical (Vicksburg Chemical) site in Vicksburg, MS. Per your letter of July 19, 2000, the sampling was conducted prior to placing sediments from the South Pond (SWMU #3) on top of the unit as was requested by Vicksburg and discussed in a letter from MSDEQ's Mr. Scott Mills, also dated July 19, 2000 (copy attached.)

The conditions of your letter were met and are discussed below:

1. Sampling was performed by Mr. Richard Karkkainen and Mr. Dean Lowe of URS-Greiner (formerly Woodward-Clyde) in accordance with the requirements of the Decree.

2. The sediments were sampled prior to placement and analyzed for EP toxicity. No hazardous characteristic was detected. A copy of the results is attached.

3. The lagoon bottoms were managed as required by MSDEQ. No leakage or seepage was experienced.

4. There was no need to utilize the alternate settling area.

5. The sediments placed in SWMU #2 remain there and are easily sampled if necessary. Run-off from this area is conducted to the South Pond (SWMU #3.)

6. This letter and the attachments are responsive to Condition 6.

Please contact me with any questions there may be concerning this matter.

Sincerely,

Steven T. Boswell
Director of Env. Affairs

STB: pc

xc: Mr. Mills, MSDEQ
Mr. Karkkainen, URS-Greiner

ARGUS ANALYTICAL, INC.
235 Highpoint Drive
Ridgeland, Mississippi 39157
Telephone: 601/957-2676 FAX: 601/957-1887

To: Vicksburg Chemical
PO Box 821003
Vicksburg, MS 39182

Attn: Eric Blush

Date Reported: 08/01/00

Date Sampled: 07/19/00
Time Sampled: 11:00
Sampled by: E. Blush

Date Received: 07/21/00

Project ID/Location: Sludge Analysis Pond 'C'
Fire Results July 20

Project Number:

Sample Description: Pond C Sludge

Sample Number: AA92829

Sample Matrix: SLUDGE

Parameter	Result	Det Limit	Reg Limit	Units	Method	Analysts	Date
TCLP Metals							
Arsenic, TCLP	ND	0.05	5	mg/L	200.7	BTH	07/25/00
Barium, TCLP	0.25	0.01	100	mg/L	200.7	BTH	07/25/00
Cadmium, TCLP	ND	0.02	1	mg/L	200.7	BTH	07/25/00
Chromium, TCLP	ND	0.05	5	mg/L	200.7	BTH	07/25/00
Lead, TCLP	ND	0.05	5	mg/L	200.7	BTH	07/25/00
Mercury, TCLP	ND	0.0002	.2	mg/L	7470	ERM	07/25/00
Selenium, TCLP	ND	0.05	1	mg/L	200.7	BTH	07/25/00
Silver, TCLP	ND	0.005	5	mg/L	200.7	BTH	07/25/00
TCLP Volatile Organics							
Benzene	ND	0.1	.5	mg/L	8260B	MMP	07/28/00
Carbon tetrachloride	ND	0.1	.5	mg/L	8260B	MMP	07/28/00
Chlorobenzene	ND	0.1	100	mg/L	8260B	MMP	07/28/00
Chloroform	ND	0.1	6	mg/L	8260B	MMP	07/28/00
1,2-Dichloroethane	ND	0.1	.5	mg/L	8260B	MMP	07/28/00
1,1-Dichloroethylene	ND	0.1	.7	mg/L	8260B	MMP	07/28/00
Methyl ethyl ketone	ND	1.0	200	mg/L	8260B	MMP	07/28/00
Tetrachloroethylene	ND	0.1	.7	mg/L	8260B	MMP	07/28/00
Trichloroethylene	ND	0.1	.5	mg/L	8260B	MMP	07/28/00
Vinyl chloride	ND	0.1	.2	mg/L	8260B	MMP	07/28/00
TCLP Semivolatile Organics							
2,4-Dinitrotoluene	ND	0.05	.13	mg/L	8270C	RLT	07/25/00
Hexachlorobenzene	ND	0.05	.13	mg/L	8270C	RLT	07/25/00
Hexachlorobutadiene	ND	0.1	.5	mg/L	8270C	RLT	07/25/00
1,4-Dichlorobenzene	ND	0.1	7.5	mg/L	8270C	RLT	07/25/00
Hexachloroethane	ND	0.1	3	mg/L	8270C	RLT	07/25/00

Sample Description: Pond C Sludge **Sample Number:** AA92829

Sample Matrix: SLUDGE

Parameter	Result	Det Limit	Reg Limit	Units	Method	Analysts	Date
Nitrobenzene	ND	0.1	2	mg/L	8270C	RLT	07/25/00
Pyridine	ND	0.1	5	mg/L	8270C	RLT	07/25/00
Cresols, Total	ND	0.1	200	mg/L	8270C	RLT	07/25/00
Pentachlorophenol	ND	0.1	100	mg/L	8270C	RLT	07/25/00
2,4,5-Trichlorophenol	ND	0.1	400	mg/L	8270C	RLT	07/25/00
2,4,6-Trichlorophenol	ND	0.1	2	mg/L	8270C	RLT	07/25/00
TCLP Pesticides							
Chlordane	ND	0.015	.03	mg/L	8081A	MMP	07/31/00
Endrin	ND	0.01	.02	mg/L	8081A	MMP	07/31/00
Heptachlor	ND	0.005	.008	mg/L	8081A	MMP	07/31/00
Heptachlor epoxide	ND	0.005	.008	mg/L	8081A	MMP	07/31/00
Lindane	ND	0.2	.4	mg/L	8081A	MMP	07/31/00
Methoxychlor	ND	1.0	10	mg/L	8081A	MMP	07/31/00
Toxaphene	ND	0.25	.25	mg/L	8081A	MMP	07/31/00
TCLP Herbicides							
2,4-D	ND	5.0	10	mg/L	8150	MMP	07/31/00
2,4,5-TP (Silvex)	ND	0.5	1	mg/L	8150	MMP	07/31/00

ND = Not Detected NC = Not Corrosive
Reg Limits apply to TCLP only;
Reg Limit of "0" indicates not applicable.
Acceptable range for Corrosivity (pH) = 2.0-12.5

Quality Assurance/Quality Control

B. G. Giessner, Ph.D.

ARGUS ANALYTICAL, INC.
235 Highpoint Drive
Ridgeland, Mississippi 39157
Telephone: 601/957-2676 FAX: 601/957-1887

To: Vicksburg Chemical
PO Box 821003
Vicksburg, MS 39182

Attn: Eric Blush

Date Reported: 08/01/00

Date Sampled: 07/19/00
Time Sampled: 11:00
Sampled by: E. Blush

Project ID/Location: Sludge Analysis Pond 'C'
Fire Results July 20

Date Received: 07/21/00

Sample Description: Pond C Sludge

Sample Number: AA92830

Project Number:

Sample Matrix: SLUDGE

Parameter	Result	Det Limit	Units	Method	Analysts	Date
Toxaphene	ND	1	ug/L	8081A	MMP	07/31/00
Dinoseb	0.010	0.002	mg/L	8270C	RLT	07/31/00

ND – Not Detected

EPA 200.7/6010B was used by analysts BTH

argusnd

Quality Assurance/Quality Control

R. G. Glessner, Ph.D.

Haz Waste File
Warren County,

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

SEP 15 2000

4WD-RCRA

Via Facsimile

OPTIONAL FORM 99 (7-90) 9/15/00

FAX TRANSMITTAL # of pages ▸ 2

To Scott Mills	From Judy Sophianopoulos
Dept/Agency MDEQ	Phone # 404-562-8604
Fax # 601-961-5674	Fax # 404-562-8566

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

Mr. Steven T. Boswell
Director of Environmental Affairs
Vicksburg Chemical Company
Post Office Box 821003
Vicksburg, Mississippi 39182

FAX: (601) 636-5767

Subject: RCRA Facility Investigation (RFI) Workplan
Vicksburg Chemical Company, Rifle Range Road
MSD 990 714 081

Dear Mr. Boswell:

The United States Environmental Protection Agency (EPA), Region 4, has completed a review of the RFI Workplan referenced above, including amendments and supplements to the original Workplan; reports on investigations conducted as part of interim measures; and the response by Vicksburg Chemical Company (VCC) to EPA comments on VCC's "Amended and Supplemental Groundwater Assessment Work Plan," dated December 1999.

After consultation with the Mississippi Department of Environmental Quality (MDEQ), EPA has decided to approve the RFI Workplan. The approval includes the following conditions:

(1) As stated in the Workplan, if the results of the Phase I investigation indicate that a second investigation phase is necessary, VCC shall submit a RFI Phase II Workplan to EPA and MDEQ;

(2) As specified in Attachment B of Consent Decree, Civil Number W92-0008B (Consent Decree), "Scope of Work for a RCRA Facility Investigation at Cedar Chemical Corporation, Vicksburg, Mississippi," implementation of the RFI Workplan shall begin within 15 days of notice of approval; action levels for determining releases from Solid Waste Management Units (SWMUs) shall be equal to MDEQ's Target Remediation Goals; and

(3) The draft RFI Report to be submitted within 45 days of the completion of the RFI shall include, as part of the summary data specified in Attachment B of the Consent Decree, a summary table of analytical results for each SWMU, with the page numbers where details are presented. For SWMUs which have been investigated in the past, as part of interim measures, the summary table shall include document titles and dates, as well as page numbers, where details can be found. The RFI Report shall also include the report required in Condition (6) of EPA's letter to VCC, dated July 19, 2000, in which EPA approved the addition of SWMU #3 bottoms to SWMU #2.

If you have any questions, please contact me at (404) 562-8604, or by e-mail: sophianopoulos.judy@epa.gov.

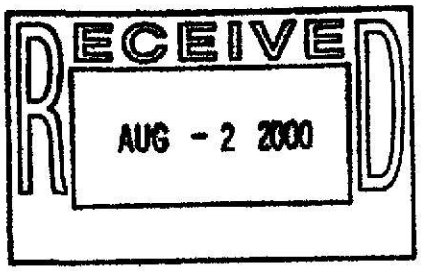
Sincerely,

Judy Sophianopoulos
Project Coordinator

cc: Scott Mills, Chemical Branch of the Environmental Compliance and Enforcement Division, MDEQ, FAX: (601) 961-5674

URS

July 31, 2000



Mr. Scott Mills
Mississippi Department of Environmental Quality
2380 Highway 80 West
Jackson, Mississippi 39204

Re: Vicksburg Chemical
Response Document
URS File No. 35096B007C.00-01006

Dear Mr. Mills:

Attached is a copy of the Response Document. The Response Document provides information in response to Mr. William N. O'Steen's comments on Vicksburg Chemical's "Amended and Supplemental Groundwater Assessment Workplan". Mr. Steve Boswell has directed that I send the copy directly to you.

In addition to providing responses to Mr. O'Steen's comments and thereby modifying the GWA Workplan, the Response Document is an attempt to address the following:

- There has been investigative work and some remediation done on Solid Waste Management Units 1, 9, 11, 12, 15, 16, 17, and 23. The analytical data and description of the completed remediation is summarized in the Response Document.

- The first phase of the investigative work in the RCRA Facility Investigation Workplan will allow us to more adequately define the extent of contamination, if any, in the remaining SWMUs. The RFI Workplan is summarized in the Response Document.

- The Consent Decree contemplated submittal of the RFI Workplan and GWA Workplan in the same time-frame. Both workplans rely on two phases of field work, the rationale being that the extent of contamination, if any, at the SWMUs may vary widely and, therefore, the need for monitoring wells adjacent to SWMUs will vary widely.

URS Corporation
2822 O'Neal Lane
Baton Rouge, LA 70816
Tel: 225.751.1873
Fax: 225.753.3616

We appreciate the opportunity to provide this Response Document.

Very truly yours,

Richard D. Karkkainen
Principal Environmental Engineer

RDK:cm

Attachments

Warren Co.

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
Z 442 293 385

Vicksburg chemical company

Dr. Judy Sophianopoulos
Waste Compliance Section
RCRA and FF Branch
U.S. EPA, Region IV
Mailcode 4WD-RCRA
621 Forsyth Street, SW
Atlanta, Georgia 30303

Re: Consent Decree, Civil Number W92-0008B
Sampling in SWMU 2,
Cedar Chemical Corporation, Vicksburg, MS

July 24, 2000

Dear Dr. Sophianopoulos:

As we have discussed by telephone and letter, Cedar Chemical will conduct sampling on soils and groundwater in SWMU 2, the Old Landfill, located at the "South Plant" area of the Vicksburg facility. Sampling is currently scheduled to begin on August 1, 2000.

At least three borings will be made with composite samples taken in a five-foot interval near the surface, in the middle of the boring and just above groundwater. Additionally, a sample of groundwater from the boring will be obtained. All samples will be analyzed for the components on the TCL/TAL list plus dinoseb and atrazine. Sampling will be conducted using a truck mounted Geoprobe device.

Please contact me with any questions or further needs for this work.

Sincerely,

Steven T. Boswell

STB: pc

Steven T. Boswell
Director of Env. Affairs

xc: Mr. Kelly
Mr. Keen
Mr. Karkkainen
Mr. Malone
Mr. Mills, MSDEQ

FILE COPY

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
James I. Palmer, Jr., Executive Director

December 13, 1999

Steven Boswell
Director of Environmental Affairs
Vicksburg Chemical Corporation
P O Box 821003
Vicksburg, MS 39182

Dear Sir/Madam:

Re: Vicksburg Chemical Corporation
Vicksburg, Warren County, MS
Hazardous Waste EPA ID Ref. No. - MSD990714081

This letter is to acknowledge receipt of your application on December 10, 1999, for the above referenced permit. Within forty-five days after the date of receipt of the request, you will be notified either the submitted information is complete or of the major components required to complete the processing of your request.

If this action involves construction activities, please notify us of your projected schedule for commencement of construction and completion of construction if this information is not already contained in the submitted information.

Should you have any questions, please contact Toby Cook at (601) 961-5067.

Sincerely,

MC

Maggie Carney
Environmental Permits Division

cc: Mr. Russ McLean, U. S. EPA, Region 4

OFFICE OF POLLUTION CONTROL
P.O. Box 10385 Jackson, MS 39289.0385 Phone 601.961.5171 Fax 601.354.6612

URS Greiner Woodward Clyde
A Division of URS Corporation

2822 O'Neal Lane
Baton Rouge, LA 70816
Tel: 225.751.1873
Fax: 225.753.3616
Offices Worldwide

September 8, 1999

Mr. Steve Boswell
Vicksburg Chemical
P. O. Box 821003
Vicksburg, MS 39182-1003

Re: Observations and Sampling of Ditch on August 19, 1999
URSGWC File No. 35092B007C.00.04002

Dear Steve:

This memo is written to document sampling efforts on August 19, 1999.

Vicksburg Chemical installed a new section of underground water drainage piping to replace a section of existing drainage piping. The general location of the drainage piping is noted on Figure 1. A photograph entitled "Looking Southeast Along Length of Ditch Toward Railroad Track Area" further identifies the location. The new drainage pipe is about 10 feet below ground surface, parallel to the drainage pipe it replaces and approximately 10 feet east northeast of that pipe.

The ditch, constructed to allow installation of the new pipe, allowed a good opportunity to view a cross section of the soil. A photograph is provided of the soil profile. The natural soil appears to be uniform, without layering. Groundwater was not observed to be seeping into the ditch at any level. The manmade surface characteristics to about 20 inches below surface consists of:

- Asphalt
- 6 inches of backfill
- Asphalt
- 12 inches of backfill

During construction of the ditch a yellow stain (shown in a photograph) was noticed at the surface. Assuming that the yellow stain was the result of a historic spill of dinoseb, Vicksburg Chemical decided to sample the stained soil and soil at various subsurface intervals. The following samples were obtained:

- A-8 8 feet below ground surface
- A-4 4 feet below ground surface
- A-2 2 feet below ground surface
- A-1 (Backfill) one foot below ground surface
- A-0 (2 to 6 inches) between asphalt layers

Comment on the samples and the results of the analyses are as follows:

Sample ID	Comment	Arsenic (ppm)	Atrazine (ppm)	Dinoseb (ppm)	Toxaphene (ppm)
A-0	Backfill between asphalt layers. Stained yellow.	25.5	0.036	234	0.811
A-1	Backfill.	2.07	ND	6.48	ND
A-2	Top of natural soil; dry.	5.69	ND	7.30	ND
A-4	Natural soil; moist.	4.36	ND	1.15	ND
A-8	Natural soil; saturated.	3.76	ND	ND	ND

It is not possible to make any generalizations on the horizontal extent of the dinoseb contamination. The yellow staining extended about 2 feet horizontally in the backfill between asphalt layers. Vertically, dinoseb was detected, but below action levels at 1, 2 and 4 feet. The dinoseb transport may have originated from the original presumed spill.

Attached are photographs of the sampling sites. Also attached are copies of the chain-of-custody and the laboratory report.

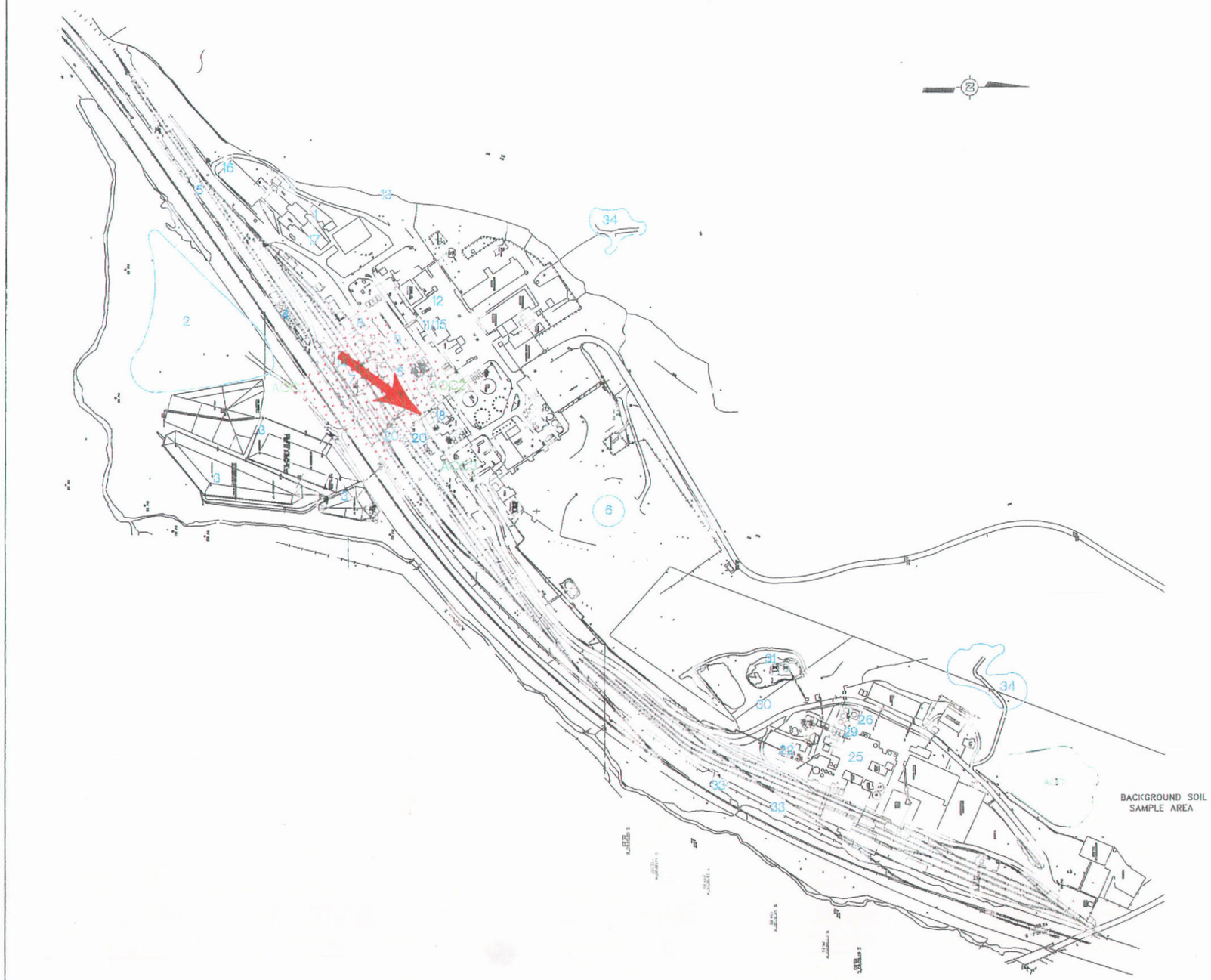
Sincerely,

Richard D. Karkkainen

Enclosures

RDK:wv

W:\VICKSBUR\92B007C\OBSERV-SAMPLING-LTR.DOC



SWMU NUMBER	SOUTH PLANT
1	CONTAINER (DRUM) STORAGE AREA
2	INACTIVE LANDFILL
3	SURFACE IMPOUNDMENT (SOUTH PLANT)
4	ACTIVATED CARBON TREATMENT UNITS
5	SOUTH PLANT DRAINAGE SYSTEMS
6	WASTEWATER STORAGE (HILL) TANKS
7	FORMER DINOSEB PRODUCTION AREA
8	DINOSEB LOADING/UNLOADING AREA
9	DINOSEB DRUMMING AREA
11	FORMER MSMA PRODUCTION AREA
12	FORMER MSMA SALT UNLOADING AREA
13	SOUTH PLANT DRAINAGE DITCHES
14	FORMER TOXAPHENE PRODUCTION AREA
15	FORMER METHYL PARATHION PRODUCTION AREA
16	FORMER ATRAZINE PRODUCTION AREA
17	RETURNED PRODUCT STORAGE AREA
18	FORMER BLUE TANK AREA
20	RAILROAD CAR UNLOADING STATION

	NORTH PLANT
22	NORTH PLANT NEUTRALIZATION SYSTEM
23	EQUALIZATION/NEUTRALIZATION POND (NORTH PLANT)
25	NORTH PLANT WASTEWATER PIPES
26	C-10 SCRUBBER
29	OIL COLLECTION UNIT
30	NORTH PLANT WASTE OIL ACCUMULATION AREA
31	NO. 6 FUEL OIL AREA
33	NORTH PLANT DRAINAGE DITCHES

	BOTH PLANTS
34	SURPLUS EQUIPMENT STORAGE (JUNKYARD)

AOC NUMBER	AOC NAME
1	FISH POND (NORTH PLANT)
2	DRUM STORAGE AREA
3	NEUTRALIZATION TANKS (SOUTH PLANT)
4	CHEMICAL CRYPT (SEPTIC TANKS)

DITCH LOCATION

REV	DESCRIPTION OF REVISION	BY	DATE
△			

VICKSBURG CHEMICAL
VICKSBURG, MISSISSIPPI

Woodward-Clyde Consultants
2822 O'Neal Lane
Baton Rouge, Louisiana 70816

REFERENCE DRAWINGS

SCALE: 1" = 400'
DESIGNED:
DRAWN: GAT
CHECKED: RUK
PEER REVIEWED:
DATE: 1/13/98

SWMU 12, 11 & 15 EXPEDITED RFI

LOCATION OF SOLID WASTE MANAGEMENT UNITS

REVISION: △
PROJECT: 96B315
DRAWING: 1
SHEET OF

LOOKING SOUTHEAST ALONG LENGTH
OF DITCH TOWARD RAILROAD TRACK AREA

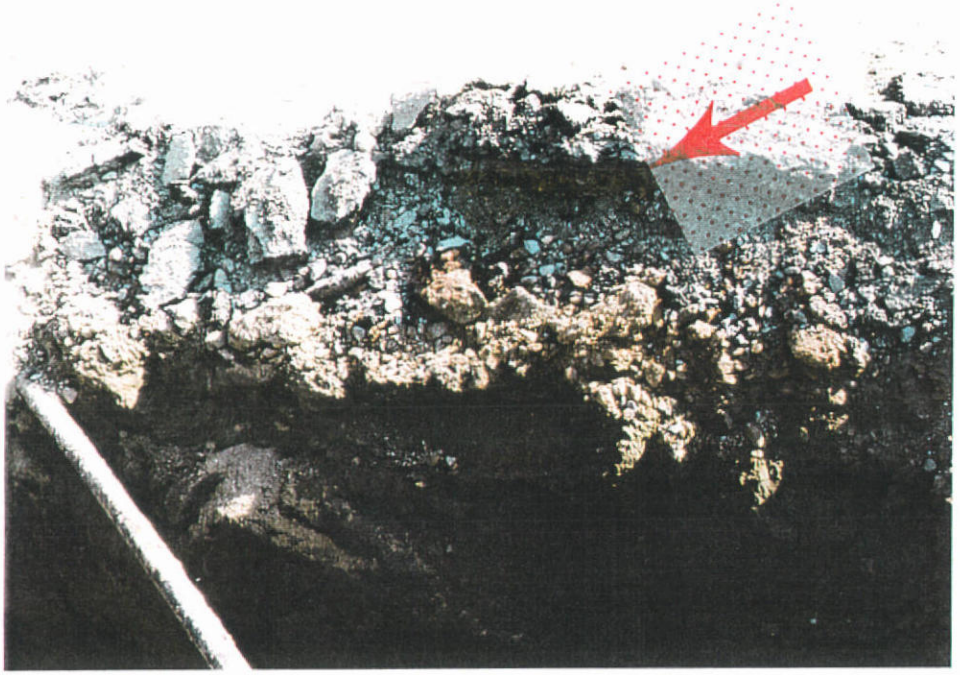
SOIL PROFILE

SAMPLE LOCATION A-1(BACKFILL)

SAMPLE LOCATION A-0 (2" - 6")

SAMPLE LOCATION A-4

SAMPLE LOCATION A-2



SURFACE SOIL SHOWING YELLOW STAINING

SAMPLE LOCATION A-8

ARGUS ANALYTICAL, INC.
235 Highpoint Drive
Ridgeland, Mississippi 39157
Telephone: 601/957-2676 FAX: 601/957-1887

To: Vicksburg Chemical
PO Box 821003
Vicksburg, MS 39182

Attn: Eric Blush

Date Reported: 09/01/99

Date Sampled: 08/19/99
Time Sampled: 11:30
Sampled by: SB/DK

Project ID/Location: New Drainage Pipe South Plant

Date Received: 08/20/99

Sample Description: A-0 (2-6 Inches)

Sample Matrix: SOIL

Sample Number: AA78746

Project Number: 92B007C

Page Number: 1

Parameter	Result	Det Limit	Units	Method	Analysts	Date
Arsenic	25.5	1.666	mg/Kg	7060	SM	08/24/99
Atrazine	0.036	0.033	mg/Kg	8141	MMP	08/30/99
Dinoseb	234.	6.67	mg/Kg	8270C	RLT	08/27/99
Toxaphene	0.811	0.033	mg/Kg	8081A	MMP	08/27/99

ND = Not Detected

EPA 200.7/6010A was used by analysts HTH

argsmpr0

M. Posey
Quality Assurance/Quality Control

B. G. Giessner, Ph.D.

ARGUS ANALYTICAL, INC.
235 Highpoint Drive
Ridgeland, Mississippi 39157
Telephone: 601/957-2676 FAX: 601/957-1887

To: Vicksburg Chemical
PO Box 821003
Vicksburg, MS 39182

Attn: Eric Blush

Date Reported: 09/01/99

Date Sampled: 08/19/99
Time Sampled: 11:20
Sampled by: SB/DK

Project ID/Location: New Drainage Pipe
South Plant

Date Received: 08/20/99

Sample Description: A-1 (Backfill)

Sample Matrix: SOIL

Sample Number: AA78747

Project Number: 92B007C

Page Number: 1

Parameter	Result	Det Limit	Units	Method	Analysts	Date
Arsenic	2.07	0.125	mg/Kg	7060	SM	08/24/99
Atrazine	ND	0.033	mg/Kg	8141	MMP	08/30/99
Dinoseb	6.48	0.667	mg/Kg	8270C	RLT	08/27/99
Toxaphene	ND	0.033	mg/Kg	8081A	MMP	08/27/99

ND = Not Detected

EPA 200.7/6010A was used by analysts BTH

argsmpr0

M. Posey
Quality Assurance/Quality Control

B. G. Giessner, Ph.D.

ARGUS ANALYTICAL, INC.
235 Highpoint Drive
Ridgeland, Mississippi 39157
Telephone: 601/957-2676 FAX: 601/957-1887

To: Vicksburg Chemical
PO Box 821003
Vicksburg, MS 39182

Attn: Eric Blush

Date Reported: 09/01/99

Date Sampled: 08/19/99
Time Sampled: 11:05
Sampled by: SB/DK

Project ID/Location: New Drainage Pipe
South Plant

Date Received: 08/20/99

Sample Description: A-2 (2 Feet)

Sample Matrix: SOIL

Sample Number: AA78748

Project Number: 92B007C

Page Number: 1

Parameter	Result	Det Limit	Units	Method	Analysts	Date
Arsenic	5.69	0.500	mg/Kg	7060	SM	08/24/99
Atrazine	ND	0.033	mg/Kg	8141	MMP	08/30/99
Dinoseb	7.30	0.667	mg/Kg	8270C	RLT	08/27/99
Toxaphene	ND	0.033	mg/Kg	8081A	MMP	08/27/99

ND = Not Detected

EPA 200.7/6010A was used by analysts BTH

argsmpr0

M. Posey
Quality Assurance/Quality Control

B. G. Giessner, Ph.D.

ARGUS ANALYTICAL, INC.
235 Highpoint Drive
Ridgeland, Mississippi 39157
Telephone: 601/957-2676 FAX: 601/957-1887

To: Vicksburg Chemical
PO Box 821003
Vicksburg, MS 39182

Attn: Eric Blush

Date Reported: 09/01/99

Date Sampled: 08/19/99
Time Sampled: 10:50
Sampled by: SB/DK

Project ID/Location: New Drainage Pipe
South Plant

Date Received: 08/20/99

Sample Description: A-4 (4 Feet)

Sample Matrix: SOIL

Sample Number: AA78749

Project Number: 92B007C

Page Number: 1

Parameter	Result	Det Limit	Units	Method	Analysts	Date
Arsenic	4.36	0.250	mg/Kg	7060	SM	08/24/99
Atrazine	ND	0.033	mg/Kg	8141	MMP	08/30/99
Dinoseb	1.15	0.333	mg/Kg	8270C	RLT	08/26/99
Toxaphene	ND	0.033	mg/Kg	8081A	MMP	08/27/99

ND = Not Detected

EPA 200.7/6010A was used by analysts BTH

argumpr0

M. Posey
Quality Assurance/Quality Control

B. G. Giessner, Ph.D.

ARGUS ANALYTICAL, INC.
235 Highpoint Drive
Ridgeland, Mississippi 39157
Telephone: 601/957-2676 FAX: 601/957-1887

To: Vicksburg Chemical
PO Box 821003
Vicksburg, MS 39182

Attn: Eric Blush

Date Reported: 09/01/99

Date Sampled: 08/19/99
Time Sampled: 10:40
Sampled by: SB/DK

Project ID/Location: New Drainage Pipe
South Plant

Date Received: 08/20/99

Sample Description: A-8 (8 Feet)

Sample Number: AA78750

Sample Matrix: SOIL

Project Number: 92B007C

Page Number: 1

Parameter	Result	Det Limit	Units	Method	Analysts	Date
Arsenic	3.76	0.250	mg/Kg	7060	SM	08/24/99
Atrazine	ND	0.033	mg/Kg	8141	MMP	08/30/99
Dinoseb	ND	0.333	mg/Kg	8270C	RLT	08/26/99
Toxaphene	ND	0.033	mg/Kg	8081A	MMP	08/27/99

Note: refer to narrative

ND = Not Detected

RPA 200.7/6010A was used by analysts BTH

argsmpr0

M. Posey
Quality Assurance/Quality Control

B. G. Giessner, Ph.D.

ARGUS ANALYTICAL, INC.
235 Highpoint Drive
Ridgeland, Mississippi 39157
Telephone: 601/957-2676 FAX: 601/957-1887

To: Vicksburg Chemical
PO Box 821003
Vicksburg, MS 39182

Attn: Eric Blush

Date Reported: 09/01/99

Date Sampled: 08/19/99
Time Sampled: 10:40
Sampled by: SB/DK

Project ID/Location: New Drainage Pipe
South Plant

Date Received: 08/20/99

Sample Description: A-8-MS (Matrix Spike)

Sample Number: AA78751

Sample Matrix: SOIL

Project Number: 92B007C

Page Number: 1

Parameter	Result	Det Limit	Units	Method	Analysts	Date
Arsenic	30.6	1.666	mg/Kg	7060	SM	08/24/99
Atrazine	0.50	0.033	mg/Kg	8141	MMP	08/30/99
Dinoseb	2.13	0.333	mg/Kg	8270C	RLT	08/26/99
Toxaphene	0.313	0.033	mg/Kg	8081A	MMP	08/27/99

Note: refer to narrative

ND = Not Detected

EPA 200.7/6010A was used by analysts BTH

argsmpr0

M. Posey
Quality Assurance/Quality Control

B. G. Glessner, Ph.D.

ARGUS ANALYTICAL, INC.
235 Highpoint Drive
Ridgeland, Mississippi 39157
Telephone: 601/957-2676 FAX: 601/957-1887

To: Vicksburg Chemical
PO Box 821003
Vicksburg, MS 39182

Attn: Eric Blush

Date Reported: 09/01/99

Date Sampled: 08/19/99
Time Sampled: 10:41
Sampled by: SB/DK

Project ID/Location: New Drainage Pipe
South Plant

Date Received: 08/20/99

Sample Description: A-8-MSD (Matrix Spike Duplicate)

Sample Matrix: SOIL

Sample Number: AA78752

Project Number: 92B007C

Page Number: 1

Parameter	Result	Det Limit	Units	Method	Analysts	Date
Arsenic	3.38	0.250	mg/Kg	7060	SM	08/24/99
Atrazine	0.50	0.033	mg/Kg	8141	MMP	08/30/99
Dinoseb	2.81	0.333	mg/Kg	8270C	RLT	08/26/99
Toxaphene	0.281	0.033	mg/Kg	8081A	MMP	08/27/99

Note: refer to narrative

ND = Not Detected

EPA 200.7/6010A was used by analysts HTH

arpampr0

Quality Assurance/Quality Control

B. G. Giessner, Ph.D.

Narrative

Vicksburg Chemical

Samples AA78750-752 - South Plant New Drainage Pipe

Samples AA78750-52 were equivalent except AA78751 and AA78752 were labeled "MS" and "MSD". These samples were processed as follows:

Organics

AA78751 (MS) and AA78752 (MSD) were spiked for toxaphene, atrazine, and dinoseb. The reported results for these samples are from the spiked samples.

The spiked results for these samples are also summarized in the attached table.

Metals

AA78751 (MS) was spiked (arsenic) and reported on the spiked basis. AA78752 (MSD) was analyzed as a duplicate (no spike was added). The results are summarized in the attached table.

Argus Analytical September 1, 1999

c:\d\c\n\aa78750.wpd

Argus Analytical, Inc. Vicksburg Chemical

Metal	Unspiked AA78750	Duplicate AA78752	Precision %	Spike Amount	Spike Results AA78751	Recovery %
Arsenic	3.76	3.38	10.6	23.80	30.60	113

d:\d\l\AA72997

Argus Analytical, Inc. Vicksburg Chemical

Analyte	AA78750	Spike Amount	Units	MS AA78751	Recovery %	MSD AA78752	Recovery %	Precision %
Dinoseb	< 0.333	3.33	mg/Kg	2.130	64	2.810	84	28
Toxaphene	< 0.033	0.3	mg/Kg	0.313	94	0.281	84	11
Atrazine	< 0.033	0.667	mg/Kg	0.500	75	0.500	75	0

d:\d\l\aa78750O

ARGUS ANALYTICAL, INC
235 Highpoint Drive
Jackson, MS 39213
Telephone: 601/957-2676 FAX: 601/957-1687

Argus Cooler #

CHAIN-OF-CUSTODY

Client Name: Vicksburg Chemical	Project Name/Location: RPC New Drainage Ditch - South Plant	Project Number: 92B007C
Address: Ryle Range Road, Vicksburg, Mississippi	Sampler (print/signature): S. Boswell/D. Karkkainen	CFS (lab use)

Item #	Field Number	Sample Description	Collection: Date	Time	Initials	QC	#	Analysis Required	Lab Number (for lab use only)
1	A-0	Soil (2"-6")	8/19/99	11:30	D.K			Pesticides (Dinoseb, Atrazine, Toxaphene)	AA78746
2	A-0	Soil (2"-6")	8/19/99	11:30	D.K			Arsenic	
3	A-1	Soil (Backfill)	8/19/99	11:20	D.K			Pesticides (Dinoseb, Atrazine, Toxaphene)	AA78747
4	A-1	Soil (Backfill)	8/19/99	11:20	D.K			Arsenic	
5	A-2	Soil (2')	8/19/99	11:05	D.K			Pesticides (Dinoseb, Atrazine, Toxaphene)	AA78748
6	A-2	Soil (2')	8/19/99	11:05	D.K			Arsenic	
7	A-4	Soil (4')	8/19/99	10:50	D.K			Pesticides (Dinoseb, Atrazine, Toxaphene)	AA78749
8	A-4	Soil (4')	8/19/99	10:50	D.K			Arsenic	

Relinquished by:	Date/Time:	Accepted by:	Date/Time	Relinquished by:	Date/Time:	Accepted by:	Date/Time
D. Karkkainen	8/19/99 2:00	S. Boswell	8/19/99 2:30pm	S. Boswell	8/20/99 8:30am	Lee R	8/20-99 8:35
						J. Grno	8/20/99 16:40

P.O. 01-88457

Rev 02/94

VICKSBURG CHEMICAL END ID:601-638-0890 SEP 02 99 11:27 NO.001 P.14

VICKSBURG CHEMICAL ENG 10:601-638-0890 SEP 02 99 11:20 NO.001 P.10

ARGUS ANALYTICAL, INC

235 Highpoint Drive
Jackson, MS 39213
Telephone: 601/957-2676 FAX: 601/957-1887

Argus Cooler #

CHAIN-OF-CUSTODY

Client Name: Vicksburg Chemical	Project Name/Location: New Drainage Pipe - South Plant	Project Number: 92B0070
Address: Red Ray Road, Vicksburg, Mississippi	Samples (print/signature): S. Bissell / D. Karkkainen	CFS (lab use)

Item #	Field Number	Sample Description	Collection: Date	Time	Initials	QC	#	Analysis Required	Lab Number (for lab use only)
9	A-S	Soil (S')	8/19/99	10:40	D.K.			Arsenic & Pesticides (Tox, Atrazine, Dinoseb)	AA78750
10	A-S-MS	Soil (S') Matrix Spike	8/19/99	10:40	D.K.			Arsenic & Pesticide (Tox, Atrazine, Dinoseb)	AA78751
11	A-S-MSD	Soil (S') Matrix Spike Duplicate	8/19/99	10:40	D.K.			Arsenic & Pesticide (Tox, Atrazine & Dinoseb)	AA78752

Relinquished by:	Date/time:	Accepted by:	Date/time	Relinquished by:	Date/time:	Accepted by:	Date/time
D.K.	8/19/99 12:00	S. T. Bissell	8/19/99 2:00 pm	S. T. Bissell	8/20/99 8:15 am		
Relinquished by:	Date/time:	Accepted by:	Date/time	Relinquished by:	Date/time:	Accepted by:	Date/time
						Lee R	8/20-99 8:53

I:\user\Misc\formdata\coc_s02.wk1

Rev 02/94

PO 01-88457

Vicksburg
chemical company

File RCRA
Cedar Co.

Mr. Steve Bailey
Env. Engineer
Office of Pollution Control
P.O. Box 10385
Jackson, MS 39289-385

MAR 30 1999

March 29, 1999

Re: Cedar Chemical Company
Consent Decree W92-0008(B)
SWMU 9 Investigation

Dear Mr. Bailey:

Please find accompanying this letter one copy of the results on an investigation performed in SWMU 9 at the Vicksburg site. Please contact me with any questions there may be.

Sincerely,

Steven T. Boswell
Director of Env. Affairs

STB: pc

xc: Mr. Keen
Mr. Miles
Mr. Keen
Mr. Karkkainen, Woodward-Clyde

P.O. Box 821003 • Vicksburg, MS 39182
Bus: (601) 636-1231 • Fax: (601) 636-5767

Woodward-Clyde
Engineering & sciences applied to the earth & its environment

July 22, 1998

Mr. Steve Boswell
Vicksburg Chemical Company
P.O. Box 821003
Vicksburg, Mississippi 3912-1003

Re: SWMUs 1 and 17
Corrective Action Observation
Confirmatory Sampling and Analysis
W-C File No. 96B315

Dear Steve:

This is written as documentary record of the confirmation sampling that was performed by me on March 4, 1998 and the analytical results. It is written for submittal to the U.S. Environmental Protection Agency (U.S. EPA) and Mississippi Department of Environmental Quality (MSDEQ) for their review and decision making. If resampling and analysis are required, we are prepared to quickly do so. The following topics are covered in this letter:

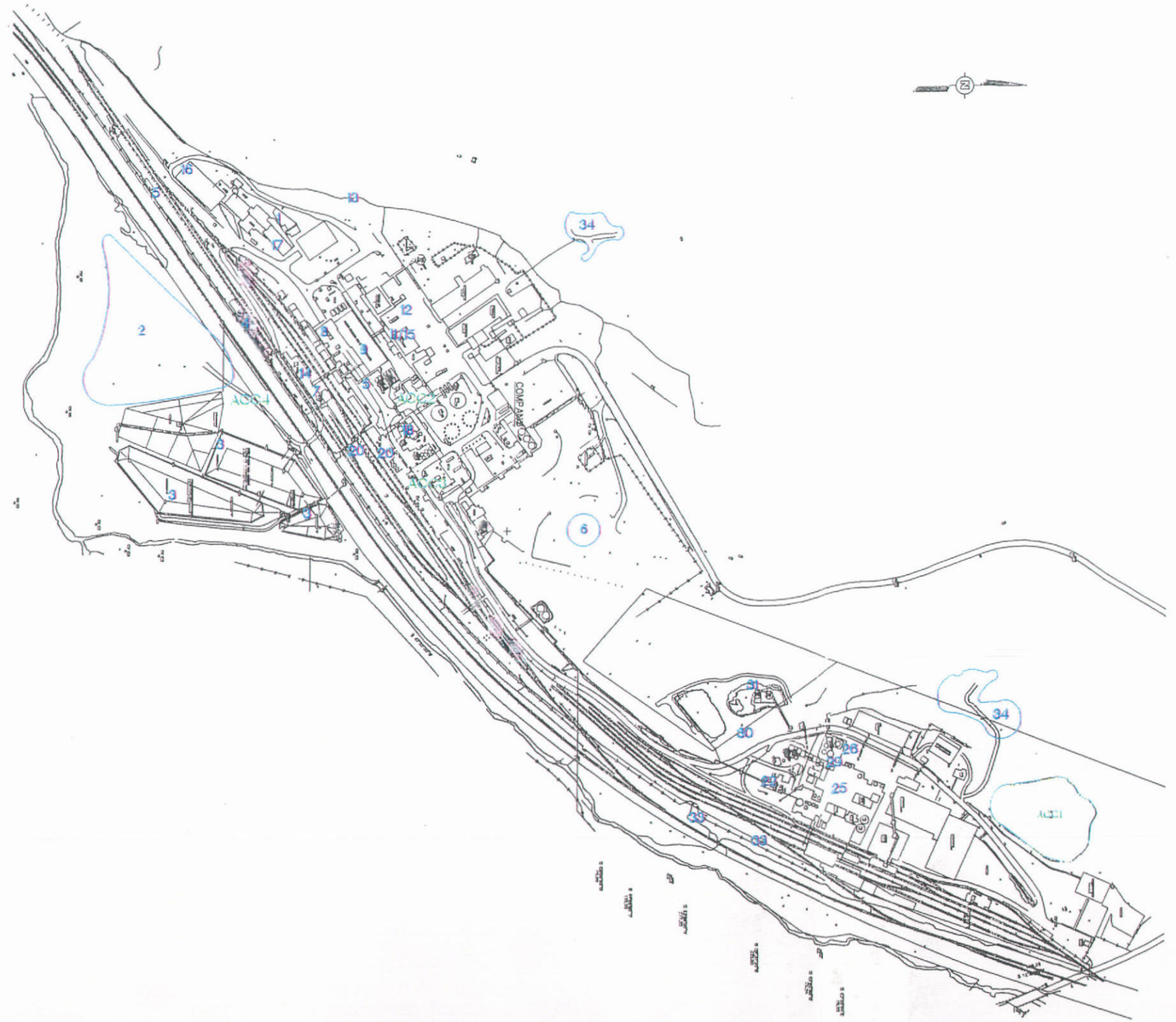
- History of the corrective action program SWMU 1 and 17
- Summary of RFI Report
- Summary of Corrective Measures Implementation Plan
- Documentation of the sampling effort
- Analytical results
- Conclusion

HISTORY

Vicksburg Chemical Company (VCC) retained Woodward-Clyde International-Americas (Woodward-Clyde) to perform activities associated with a RCRA corrective action program. The corrective action program is in response to a Consent Decree effective July 1, 1991. The Consent Decree requires that a RCRA Facility Investigation (RFI) be conducted at the Vicksburg, Mississippi manufacturing facility.

The purpose of the RFI is to determine the nature and extent of releases of hazardous wastes and/or constituents from regulated units. solid waste management units (SWMUs), and other areas of concern (AOCs) at the facility and to gather all necessary data to support any corrective action required.

Woodward-Clyde International-Americas • (formerly Woodward-Clyde Consultants)
2822 O'Neal Lane • Baton Rouge, Louisiana 70816
(504) 751-1873 • Fax (504) 753-3616



SWMU NUMBER	SOUTH PLANT
1	CONTAINER (DRUM) STORAGE AREA
2	INACTIVE LANDFILL
3	SURFACE IMPOUNDMENT (SOUTH PLANT)
4	ACTIVATED CARBON TREATMENT UNITS
5	SOUTH PLANT DRAINAGE SYSTEMS
6	WASTEWATER STORAGE (HILL) TANKS
7	FORMER DINOSEB PRODUCTION AREA
8	DINOSEB LOADING/UNLOADING AREA
9	DINOSEB DRUMMING AREA
11	FORMER MSMA PRODUCTION AREA
12	FORMER MSMA SALT UNLOADING AREA
13	SOUTH PLANT DRAINAGE DITCHES
14	FORMER TOXAPHENE PRODUCTION AREA
15	FORMER METHYL PARATHION PRODUCTION AREA
16	FORMER ATRAZINE PRODUCTION AREA
17	RETURNED PRODUCT STORAGE AREA
18	FORMER BLUE TANK AREA
20	RAILROAD CAR UNLOADING STATION

	NORTH PLANT
22	NORTH PLANT NEUTRALIZATION SYSTEM
23	EQUALIZATION/NEUTRALIZATION POND (NORTH PLANT)
25	NORTH PLANT WASTEWATER PIPES
26	C-10 SCRUBBER
29	OIL COLLECTION UNIT
30	NORTH PLANT WASTE OIL ACCUMULATION AREA
31	NO. 6 FUEL OIL AREA
33	NORTH PLANT DRAINAGE DITCHES

	BOTH PLANTS
34	SURPLUS EQUIPMENT STORAGE (JUNKYARD)

AOC NUMBER	AOC NAME
1	FISH POND (NORTH PLANT)
2	DRUM STORAGE AREA
3	NEUTRALIZATION TANKS (SOUTH PLANT)
4	CHEMICAL CRYPT (SEPTIC TANKS)

NO.	REVISION	DATE	INITIAL

SWMU 16,1,&17 RFI REPORT; CMS; CMIP

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists
and Environmental Scientists
Baton Rouge, Louisiana

CEDAR CHEMICAL CORPORATION
VICKSBURG CHEMICAL DIVISION
VICKSBURG, MISSISSIPPI

SCALE:	MADE BY: GT	DATE: 4/6/92	FILE NO.
1"=200'	CHECKED BY: ROK	DATE: 5 22 92	96B315

LOCATION OF SOLID WASTE MANAGEMENT UNITS — FIGURE 1

Location: Baton Rouge File name: S:\2B007C99.DWG Last edited: 02/21/95 @ 11:13

The RFI constitutes the second phase of the RCRA corrective action program. The program's initial phase consists of the RCRA Facility Assessment (RFA) which is conducted by the EPA and precedes the RFI. The RFI itself is divided into several separate tasks which includes the Preliminary Report (Report of Current Conditions, submitted previously by VCC then resubmitted as the Amended and Restated Preliminary Report and subsequently approved by the U.S.EPA), the RFI Work Plan (submitted in June 1996), the Facility Investigation, and the Investigative Analysis and Reports (RFI Report). In addition to these phases, a Groundwater Assessment Work Plan (submitted in June 1996), a Closure Plan for SWMU 1 and SWMU 17 (submitted and subsequently approved by the U.S. EPA) and Annual Groundwater Assessment Reports are required by the Consent Decree.

An RFI Report, Corrective Measures Study, (CMS), RCRA Corrective Measures Implementation Plan and Application for Corrective Action Management Unit (CAMU) were published for SWMUs 16, 1 and 17 and initially submitted to the U.S. EPA and the MSDEQ in June 1997. The CAMU application, which is pertinent to the plant-wide corrective action program, has been approved.

The SWMUs are identified by name as follows:

- SWMU 16, Former Atrazine Production Area (including warehouse);
- SWMU 1, Container (Drum) Storage Area; and
- SWMU 17, Returned Product Storage Area.

The location of the SMWUs are presented on Figure 1.

The RFI Work Plan for SWMUs 16, 1 and 17 included or incorporated by reference the following plans presented in the RFI Work Plan (the site-wide plan submitted in June 1996):

- Data Collection Quality Assurance Plan
- Data Management Plan
- Health and Safety Plan

The work plan included or incorporated by reference the plans presented in the Closure Plan for SWMU 1 and SWMU 17 (the Closure Plan was approved by the U.S. EPA).

The work plan and subsequent work were expedited because of VCC's plans to construct a new manufacturing facility in the South Plant and utilize some of the area to be investigated for storage, transportation and manufacturing.

The work plan was executed in two phases, and a report of the activity with all of the analytical results was issued in June 1997. On the basis of the data, a corrective action program was planned and that plan reported as a Corrective Measures Implementation Plan (CMIP) issued in June 1997. A summary of the RFI Report and CMIP are presented in the next sections of this letter.

VCC implemented corrective action activity with regard to SWMU 1 and SWMU 17. The activity implemented was more extensive than that outlined in the CMIP; the total concrete surface areas of SWMUs 1 and 17 were ground down and then concrete grindings were stored for treatment and/or disposal.

Confimatory samples for the areas requiring corrective action (represented by sample points A, I, 2 and 18 on Figure 2) were planned for early in the year 1998.

Confirmatory sampling did in fact take place on March 4, 1998. Corrective action had only taken place with regard to SWMU 1 and SWMU 17; therefore, the only sampling done was that associated with points 18 and I. The sampling was performed by me. It was done on the same day that a review meeting was held at VCC on alternative corrective activity with regard to the MSMA area (SWMUs 12, 11 and 15). The details and documentation of the sampling effort are described in a separate section.

The procedures set out in the Consent Decree specify that the U.S. EPA and MSDEQ must be notified seven days in advance. Due to the last minute scheduling of the trip the advance notification did not occur. Because of the nature of events VCC decided to regard the sampling as "unofficial". A complication has arisen in that VCC has proceeded with new plant construction on SWMU 1 and SWMU 17 and the "official" sampling has not taken place. The "official" sampling can take place at any time; however, I believe it worthwhile to ask the MSDEQ and U.S. EPA if they will accept the sampling already done and this letter as the documentation of that event.

SUMMARY OF THE RFI REPORT (FROM RFI REPORT - SWMUs 16, 1 AND 17 JUNE 1997)

The specific sample locations for SWMU 1, SWMU 17, and SWMU 16 are depicted on Figure 2. For each sample point there were two or three samples taken:

- A core of the concrete (if the sample point is a former production or storage area).

- A composite sample of the first 0 to 12 inches of soil beneath the concrete referred to as the shallow sample.
- A sample of soil generally 12 to 24 inches beneath the concrete referred to as the deep sample.

The total number of samples submitted for analysis was as follows:

SWMU Number	Sample Description	Sample Points	Number of Samples	Analyte List
16 Atrazine Warehouse	Concrete and Soil	5 concrete and soil	15	C
	Soil	1 soil	2	B
16 Atrazine Production Area	Concrete and Soil	6	18	C
	Soil	11	22	B
1, 17 Container Storage and Off-Spec Storage	Concrete and Soil	10 concrete and soil	30	A
	Soil	2 soil	4	A

LEGEND:

A Atrazine, Cyanazine, Arsenic, Dinoseb, Toxaphene, Toluene
B TCL, TAL, Atrazine, Cyanazine, Dinoseb
C Atrazine, Cyanazine, Arsenic, Dinoseb, Toxaphene

Upon receiving results of analyses, a Phase II extension of sampling and analysis was executed based on the following criteria for resampling:

- Above action levels - established in Closure Plan for SWMU 1 and SWMU 17 (submitted and subsequently approved by the U.S. EPA).

dinoseb	80 ppm
arsenic	20 ppm
toxaphene	2.6 ppm
atrazine	400 ppm
toluene	16,000 ppm

- If concentration of analytes noted above in sample of 2-foot interval exceeds concentration in sample of 1-foot interval, sample continuously in 4-foot intervals to groundwater. In addition, sample groundwater for analysis of the particular analyte.

- Determine by sampling the background concentration of arsenic.

The total number of samples submitted for analysis in the Phase II effort was as follows:

SWMU Number	Sample Description	Sample Points	Number of Samples	Analyte List
16 Atrazine Warehouse	Soil and Groundwater	2	7	Toxaphene
		1	4	Toxaphene and Arsenic
16 Atrazine Production Area	Soil and Groundwater	1	4	Toxaphene
1, 17 Container Storage and Off-Spec Storage	Concrete	1	1	Dinoseb and Arsenic
Background	Soil	6	6	Arsenic

The Phase II contaminated area sampling points have been identified on Figure 2 by sample numbers.

The background samples were obtained in the following locations:

- Three of the background samples for arsenic were obtained in a level field immediately west of the parking lot serving the main administration building in the North Plant.
- Three of the background samples were obtained from the Vicksburg Chemicals Employee Park located between the plant site and the Mississippi River to the west.

Out of the sampling effort and study the following conclusions were made:

- Regulatory clean closure of SWMU 1 and SWMU 17 can be obtained. A minor hit of 538 ppb arsenic in groundwater occurred in location 2, underneath SWMU 16 (Atrazine Warehouse). Groundwater samples need to be obtained adjacent to the SWMU 15 (Former MSMA Production Area) during Phase I of the site RFI and the GWA.
- A CMS and CMIP is necessary regarding soil and concrete areas surrounding points A, I, 2 and 18.

SUMMARY OF CORRECTIVE MEASURES IMPLEMENTATION PLAN (CMIP) (FROM CMIP - SWMUs 16, 1 AND 17 - JUNE 1997)

The CMS and CMIP were written and submitted concurrently with the RFI Report in June 1997. Additionally, an application for a CAMU was written and submitted in June 1997 to set forth procedures by which onsite treatment and residual disposition could occur. The CAMU application was approved.

The required activity specified in the CMIP was to permanently deal with corrective measures by incorporating elements of the following for each remediation area, as necessary and appropriate:

- Busting out certain sections of concrete, reducing the size of the concrete to gravel size and treating onsite by biodegradation/composting.
- Excavating certain sections of soil and treating onsite by biodegradation/composting.
- Grinding the surface of certain sections of concrete and treating onsite by biodegradation/composting.
- Resurfacing and sealing existing concrete where appropriate.
- Disposing of treated and/or untreated soil and/or concrete either offsite or onsite. The onsite option would be a non-RCRA solid waste disposal option.

The areas requiring corrective action are areas initially limited to 10 feet by 10 feet surrounding sampling points A, I, 2 and 18. Refer to Figure 2 to locate the areas. A description of the corrective action follows:

Sample Point	Analyte of Concern	Action Required
A	Toxaphene	excavate 10-foot x 10-foot x 4-foot section of soil
I	Toxaphene	excavate 10-foot x 10-foot x 1-foot section of soil
2	Arsenic	excavate or grind 10-foot x 10-foot section of concrete excluding portions of the nearby ramp
18	Dinoseb	excavate or grind 10-foot x 10-foot section of concrete

During the corrective action, sampling and screening analysis will take place onsite. After the corrective action has been executed, there will be verification sampling prior to backfilling or pouring concrete.

Corrective action did take place with regard to sample points "I" and 18 within SWMUs 1 and 17. Therefore, the confirmatory sampling took place only for SWMUs 1 and 17.

DOCUMENTATION OF THE SAMPLING EFFORT

The documentation of the sampling effort is provided in Attachment 1. The contents of Attachment 1 are:

- A copy of E-mail messages to the analytical laboratory
  - A January 23, 1998 request for sample containers for confirmation sampling at SWMUs 1, 1 and 17.
  - A February 9, 1998 note on confirmation sampling at SWMUs 16, 1 and 17. (Phase II sampling at SWMUs 12, 11 and 15 did take place but the confirmation sampling at SWMUs 16, 1 and 17 did not occur since corrective action grinding activities were taking place.)
- A copy of an E-mail message to VCC on March 2, 1998 discussing the confirmatory sampling.
- A chain of custody record.

The sampling was uneventful. The sampling at point 18 consisted of obtaining chips of concrete obtained with a chisel and hammer. Three samples were obtained, to the north, west and east of point 18.

The sampling at point "I" consisted of obtaining scopes of soil with a trowel. Three samples were obtained, to the south, west and east of point "I".

A sample point 3 is noted on the chain of custody. That sample point is in the MSMA area and not relevant to SWMUs 1 or 17.

Photographing documentation of the corrective action and the confirmatory sampling is provided as Attachment 2.

ANALYTICAL RESULTS

The samples were analyzed only for the parameters that exceeded the action levels. The results are as follows:

SWMU Number	Sample Point	Analyte of Concern	Sample Results
1	18-N	Dinoseb	ND
1	18-W	Dinoseb	ND
1	18-E	Dinoseb	ND
17	I-S	Toxaphene	ND

SWMU Number	Sample Point	Analyte of Concern	Sample Results
17	I-W	Toxaphene	ND
17	I-E	Toxaphene	ND

SWMU #1 Clean Closed 4T

A copy of the results as received from the laboratory is provided as Attachment 3.

CONCLUSIONS

It can be concluded that the clean closure objectives of the Closure Plan for SWMUs 1 and 17 have been met.

Due to various events, mainly the long passage time, the documentation of the corrective action and confirmatory sample may or may not be sufficient for the MSDEQ and U.S. EPA. I suggest that they be given a copy of this letter and a request for their guidance.

Very truly yours,

Richard D. Karkkainen
Vice President and Principal

Attachments

RDK:tlc

W:\VICKSBUR\96B315\CON-SAMP-LTR.DOC

NOTES:

- SAMPLE ID = LOCATION–TYPE–PARAMETERS

LOCATON:

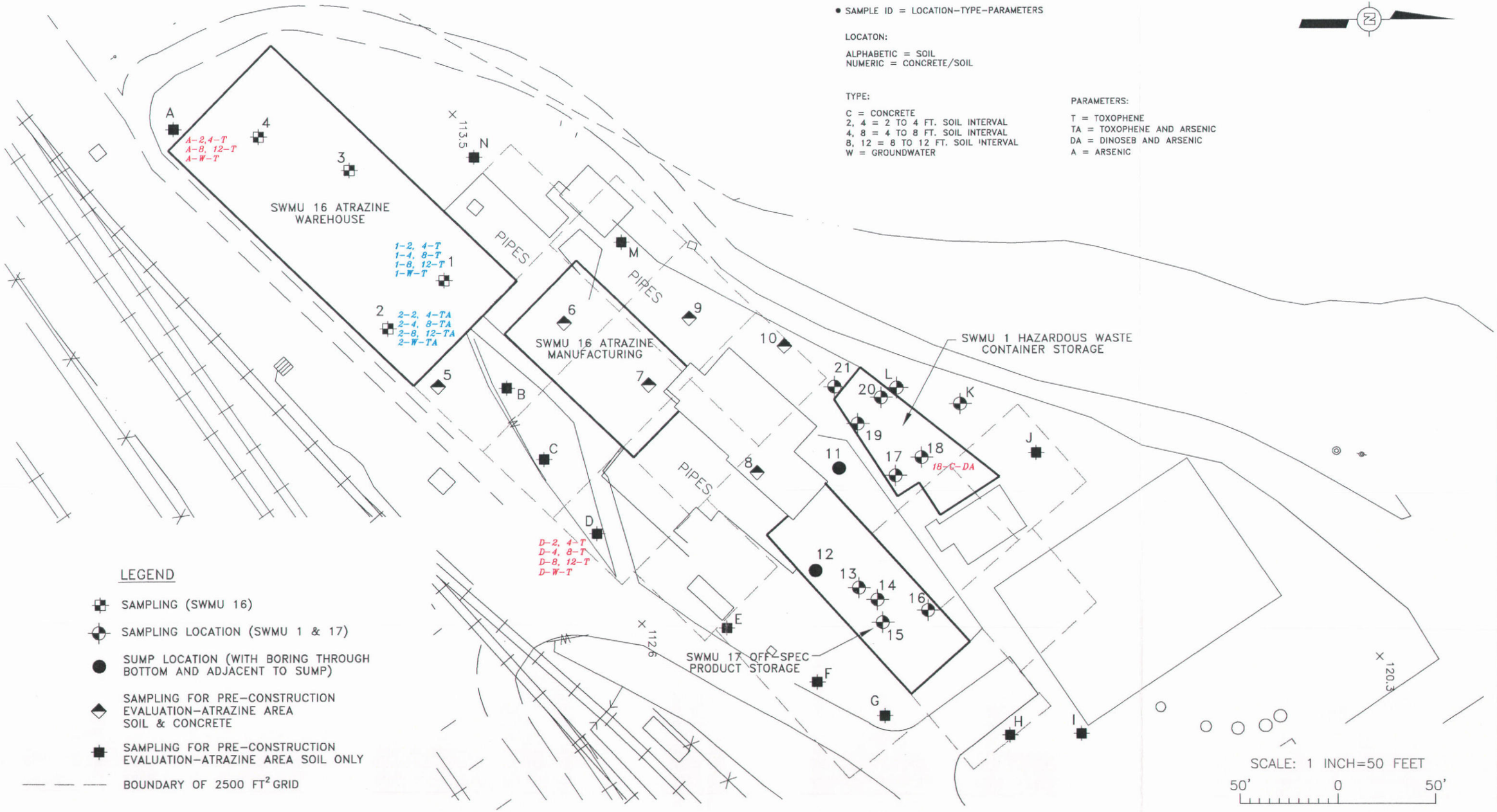
ALPHABETIC = SOIL
NUMERIC = CONCRETE/SOIL

TYPE:

C = CONCRETE
2, 4 = 2 TO 4 FT. SOIL INTERVAL
4, 8 = 4 TO 8 FT. SOIL INTERVAL
8, 12 = 8 TO 12 FT. SOIL INTERVAL
W = GROUNDWATER

PARAMETERS:

T = TOXOPHENE
TA = TOXOPHENE AND ARSENIC
DA = DINOSEB AND ARSENIC
A = ARSENIC



REV	DESCRIPTION OF REVISION	BY	DATE
△			
△			
△			
△			
△			
△	ADD PHASE II SAMPLE ID	RDK	5/97

VICKSBURG CHEMICAL
VICKSBURG, MISSISSIPPI

Woodward-Clyde Consultants
Engineering & sciences applied to the earth & its environment
2822 O'Neal Lane
Baton Rouge, Louisiana 70816

SCALE: AS SHOWN
DESIGNED
DRAWN: PCG
CHECKED
PEER REVIEWED
DATE: 5/27/97

SWMU 16, 1, AND 17

SAMPLE AREA LOCATIONS
(BASE MAP–AS MARKED IN THE FIELD)
AND PHASE II SAMPLE ID

REVISION: △
PROJECT: 96B315–003
DRAWING: 2

K:\CEDAR\92B007\92B007T Wed May 28 09:13:27 1997

Author: RDKARKKO at WC-BATON_ROUGE
Date: 2/2/98 4:29 PM
Priority: Normal
TO: KBurnsPace@aol.com at INTERNET
Subject: C M @ SWMUs 16,1&17 Plus Phase II @ SWMUs 12,11&15
---------- Message Contents ----------

Kathy:

The confirmation sampling for SWMUs 16,1&17 will take place the week of 2-9-98.

Also Phase II sampling will take place for SWMUs 12,11&15. Just a bit of the data is in, but at the least we will need an additional 58 soil samples for arsenic and 13 groundwater samples for arsenic.

I am looking forward to the rest of the data.

Dick K
2-2-98

---------- Forward Header ----------
Subject: Corrective Measures @ SWMUs 16, 1 & 17
Author: RDKARKKO at WC-BATON_ROUGE
Date: 1/23/98 11:22 AM

Kathy:
Vicksburg Chemical will proceed with Corrective Measures as soon as it can be scheduled within the next two weeks. There will be minor excavation of four areas (represented by points A, I, 2 & 18). While that is happening, I will run up to Vicksburg and obtain confirmation samples and take some photographs. I will need a cooler and bottles for the following:

MATRIX:	NUMBER OF SAMPLES:	ANALYTE:
Soil	8	toxaphene
Concrete chips	4	arsenic
Concrete chips	3	dinoseb

I believe that all of the Corrective Action and documentation can take place within one or two days. Please have the containers shipped to Vicksburg. I will alert you to when the laboratory can anticipate the samples as soon as I know.

Dick K
1-23-98

Author: RDKARKKO at WC-BATON_ROUGE
Date: 3/2/98 10:01 AM
Priority: Normal
TO: sboswell@vicksburg.com at INTERNET
Subject: Closure-SWMUs 1&17; SWMU 16
---------- Message Contents ----------

Steve:

I reviewed the SWMU 1 & 17 Closure Plan, which the EPA has approved and the SWMUs 1, 17 & 16 Corrective Measures Implementation Plan (CMIP), which the EPA has not finished reviewing.

SWMUs 1 & 17:
The only contaminated points were:
. 18 - concrete contaminated with Dinoseb
. I - soil contaminated with toxaphene to one foot

We can clean those areas, resample, and, if the areas are clean, file a closure report. If the EPA agrees, this would free up any money you have tied up in a Trust fund for SWMU 1 & 17.

SWMU 16:
The only contaminated points were:
. A - soil contaminated with toxaphene to four feet
. 2 - concrete contaminated with arsenic

I do not know if you are prepared to clean those areas. If you are I could resample and photograph the activity and write a closure report. Unlike the SWMUs 1 & 17, there has been no EPA formal sign off on anything.

For both closure reports I need a MS professional engineer to certify the effort. I had planned to use Russ Killebrew (he is familiar with the site from 1992) but his wife is dying from cancer. Therefore, I plan on using Bob SeGall. (I will need to allow Bob some budget to review the Closure Plan, RFI Report and CMIP.) Bob is our chief landfill designer so, if there is any on-site territory you want to consider for a landfill site for arsenic wastes or other residues, I could bring Bob to Vicksburg at some time to offer an opinion on the suitability.

I will be prepared to stay over on Wednesday night, if there is reason to do so.

Dick K
3-2-98

Pace Analytical

388639

CHAIN-OF-CUSTODY RECORD
Analytical Request

Client: Vicksburg Chemical	Report To: Dick Kankkainen
Address: Rifle Range Road, Vicksburg MS	Bill To: Steve Boswell
Phone: 504-756-1401	P.O. # / Billing Reference
	Project Name / No.: 967315

Turn around Time
- ☐ 24 Hours
- ☐ 48 Hours
- ☐ 3-5 Days
- ☐ 1 Week 2 Weeks
- ☒ Normal 14 Days

Pace Client No.
Pace Project Manager
Pace Project No.
*Requested Due Date:

Sampled By (PRINT): Richard D. Kankkainen
Sampler Signature: Richard D. Kankkainen
Date Sampled: 3/4/98

ITEM NO.	SAMPLE DESCRIPTION	TIME	MATRIX	PACE NO	NO. OF CONTAINERS	PRESERVATIVES: UNPRESERVED	H_2SO_4	HNO_3	VOA (HCL)	NaOH	$Na_2S_2O_3$	ANALYSES REQUEST: Toxaphene	Dioxins	REMARKS
1	I-S	2:20	Soil		1	X						X		
2	I-W	2:10	"		1	X						X		
3	I-E	2:20	"		1	X						X		
4	18-N	2:40	"		1	X							X	
5	18-W	2:50	"		1	X							X	
6	18-E	3:00	"		1	X							X	
7	3	3:30	Soil		1	X							X	
8	3	"	"		1	X						X		

COOLER NOS.	BAILERS	SHIPMENT METHOD OUT/DATE	SHIPMENT METHOD RETURNED/DATE	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
				Richard D. Kankkainen	3/4/98	4pm			

Additional Comments

SAMPLE CONDITION

Temp: ____ °C	Received on Ice: Y / N	Sealed Cooler: Y / N	Samples Intact: Y / N	pH ___

SEE REVERSE SIDE FOR INSTRUCTIONS

ce Analytical

388638

CHAIN-OF-CUSTODY RECORD
Analytical Request

Tuesday Chemical	Report To: Diana Karkkainen	Turn around Time	Pace Client No.
Rt. 1 Range Road	Bill To: Steve Boswell	☐ 24 Hours	Pace Project Manager
Hardwood MS	P.O. # / Billing Reference	☐ 48 Hours	Pace Project No.
504-756-1401	Project Name / No. 960315	☐ 3-5 Days ☐ 1 Week ☐ 2 Weeks ☒ Normal 14 Days	*Requested Due Date:

Sampled By (PRINT): Diana D. Karkkainen

Signature: Diana D. Karkkainen Date Sampled: 3/4/98

SAMPLE DESCRIPTION	TIME	MATRIX	PACE NO.	NO. OF CONTAINERS	PRESERVATIVES: UNPRESERVED	H_2SO_4	HNO_3	VOA (HCL)	NaOH	$Na_2S_2O_3$	ANALYSES REQUEST: Atrazine, Cyanazine	REMARKS
3	3 30	Soil		1	X						X	

COOLER NOS.	BAILERS	SHIPMENT METHOD OUT/DATE	SHIPMENT METHOD RETURNED/DATE	FED EX NUMBER	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
					Diana Karkkainen	3/4/98	400			

Additional Comments

SAMPLE CONDITION

Temp: ____°C	Received on Ice: Y / N	Sealed Cooler: Y / N	Samples Intact: Y / N	pH ___

SEE REVERSE SIDE FOR INSTRUCTIONS

ATTACHMENT 2

LOOKING SOUTH

INTO FRONT OF SWMU 17

LOOKING SOUTH

INTO FRONT OF SWMU 17

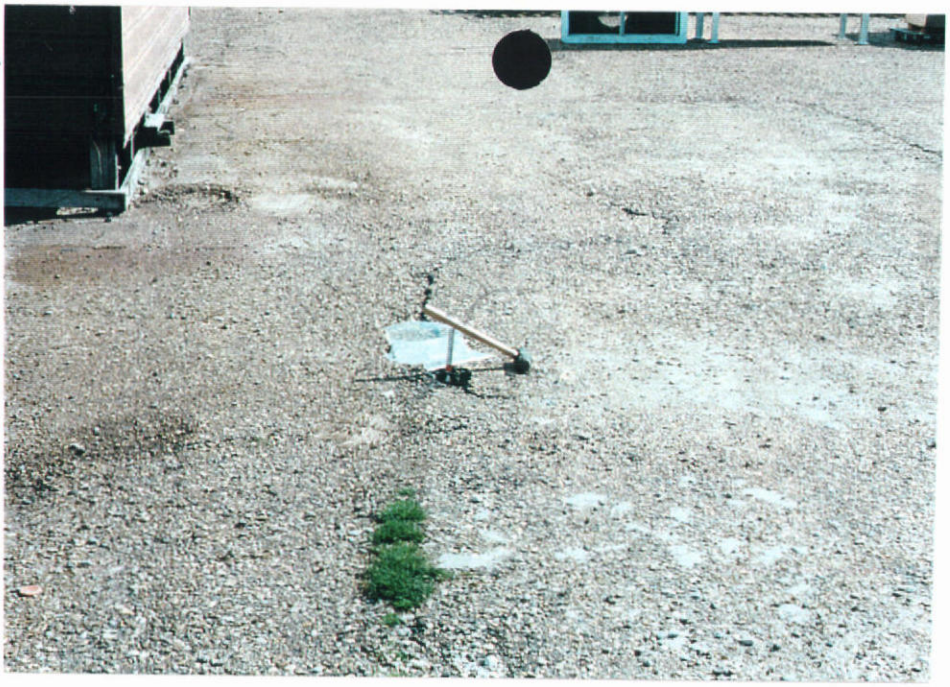
CLOSE UP OF GRINDER

CORRECTIVE ACTION AT SWMU 17

LOOKING EAST AT SOUTH ONE-HALF OF SWMU 17

LOOKING WEST ACROSS SWMU 1

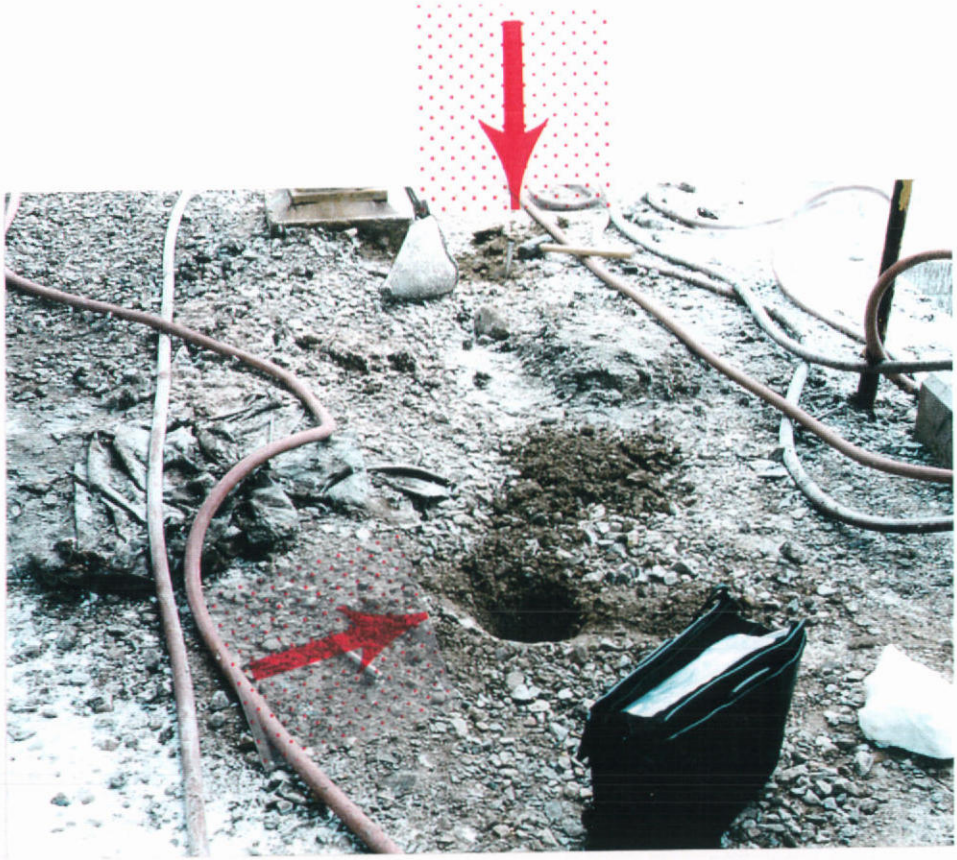
VISUAL RESULTS OF CORRECTIVE ACTION AT SWMU 1 AND SWMU 17



LOOKING NORTH AT SAMPLE 18-E

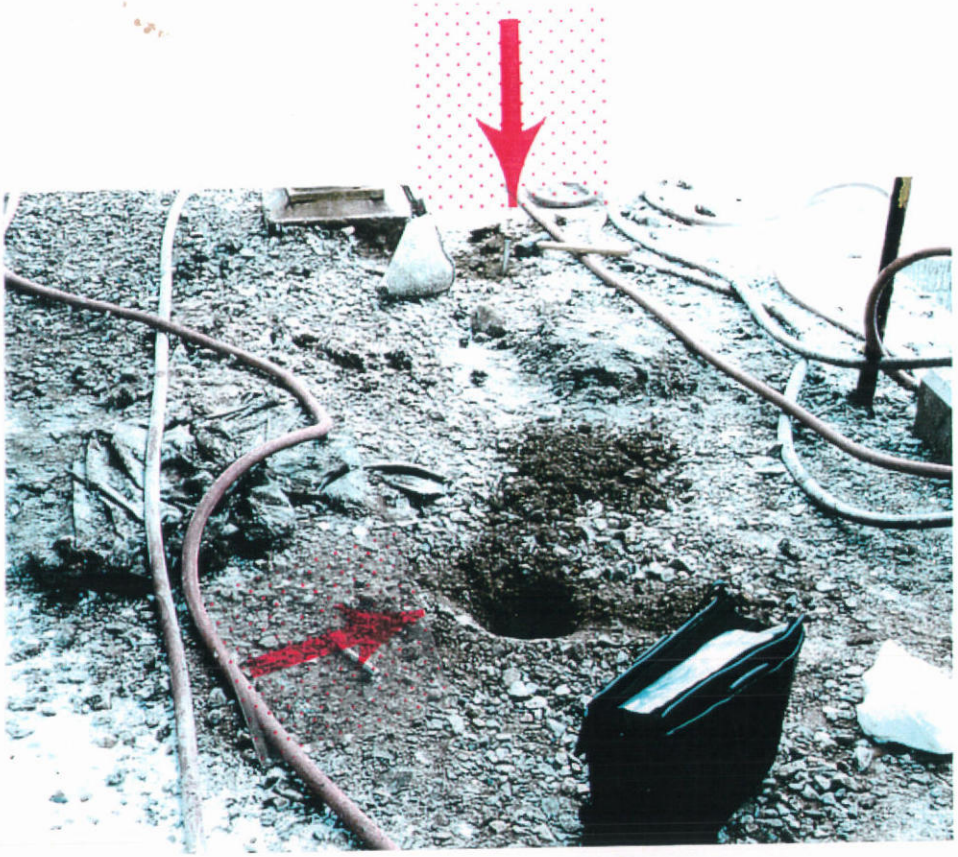
LOOKING NORTH AT 18-N

LOOKING WEST AT SAMPLE 18-W



LOOKING SOUTHWEST AT SAMPLES 18-I AND 18-W

ATTACHMENT 3



LOOKING SOUTHWEST AT SAMPLES I-W AND I-E

CLIENT SAMPLE ID	LAB SAM	MATRIX	COLLECT	PARAMETER NAME
I-S	LFG-001	Soil	3/4/98	Toxaphene
I-W	LFG-002	Soil	3/4/98	Toxaphene
I-E	LFG-003	Soil	3/4/98	Toxaphene
18-N	LFG-004	Other	3/4/98	2-sec-Butyl-4-6-dinitrophenol (Dinoseb)
18-W	LFG-005	Other	3/4/98	2-sec-Butyl-4-6-dinitrophenol (Dinoseb)
18-E	LFG-006	Other	3/4/98	2-sec-Butyl-4-6-dinitrophenol (Dinoseb)
3	LFG-007	Soil	3/4/98	Toxaphene
3	LFG-007	Soil	3/4/98	Atrazine
3	LFG-007	Soil	3/4/98	Cyanazine
3	LFG-007	Soil	3/4/98	2-sec-Butyl-4-6-dinitrophenol (Dinoseb)

SAMPLE RESULT	REPORTING LIMIT	UNITS	METHOD	DILUTION	ANALYZE	PREPARED	
ND	1790	ug/kg	Low Soil S	5	3/31/98	3/11/98	
ND	1790	ug/kg	Low Soil S	5	3/31/98	3/11/98	
ND	1750	ug/kg	Low Soil S	10	3/31/98	3/11/98	
ND	333	ug/kg	Low Soil S	1	3/27/98	3/11/98	
ND	333	ug/kg	Low Soil S	1	3/27/98	3/11/98	
ND	333	ug/kg	Low Soil S	1	3/27/98	3/11/98	
ND	8770	ug/kg	Low Soil S	50	3/31/98	3/11/98	
ND	36.6	ug/kg	Low Soil S	1	3/17/98		
ND	36.6	ug/kg	Low Soil S	1	3/17/98		
ND	1830	ug/kg	Low Soil S	5	3/27/98	3/11/98	

VIA AIRBORNE EXPRESS

Vicksburg chemical company

RCRA Warren

RECEIVED
JUL 23 1998
Dept. of Environmental Quality
Office of Pollution Control

Dr. Judy Sophianopoulos
RCRA and FF Office
United States Environmental Protection Agency, Region IV
Atlanta Federal Center
100 Alabama Street, SW
Atlanta, Georgia 30303

July 20, 1998

Re: Cedar Chemical Company
Consent Decree W92-0008(B)
Expedited Investigation of SWMUs 11, 12 and 15

Dear Dr. Sophianopoulos:

As we discussed briefly by telephone, please find enclosed two copies of a revised CMIP for these SWMUs. The changes made involve the preparation of the "North Pond" prior to the proposed stabilization and placement of the arsenic containing material there. Cedar respectfully requests that these documents receive EPA's attention in order to proceed with the project in a timely fashion. If there are any questions or needs for clarification, please contact me.

Sincerely,

Steven T. Boswell

Steven T. Boswell
Director of Env. Affairs

STB: pc

xc: Mr. Bailey, MSDEQ
Mr. Schalk
Mr. Miles
Mr. Keen
Mr. Karkkainen, Woodward-Clyde

CORRECTIVE MEASURES IMPLEMENTATION PLAN

SWMU 12 - FORMER MSMA SALT UNLOADING AREA
SWMU 11 - FORMER MSMA PRODUCTION AREA
SWMU 15 - FORMER METHYL PARATHION PRODUCTION AREA

Prepared for
Vicksburg Chemical Company
Vicksburg, Mississippi

Cedar Chemical Corporation
Memphis, Tennessee

April 6, 1998 (As amended on July 15, 1998)

Woodward-Clyde

2822 O'Neal Lane
Baton Rouge, Louisiana 70816
(504) 751-1873
96B315-10

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FIGURES

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ACRONYMS

Acronym	Meaning
AOC	Areas of Concern
bgs	below ground surface
CCC	Cedar Chemical Corporation
CMIP	Corrective Measures Implementation Plan
CMS	Corrective Measures Study
EPA	United States Environmental Protection Agency
MSDEQ	Mississippi Department of Environmental Quality
PECMT	Preinvestigation - Evaluation of Corrective Measures Technologies
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RFI Work Plan	Description of Overall Investigative Plan for Facility
RFI Expedited Work Plan	Description of Investigative Plan for SWMUs 12, 11 and 15
RFI Report	Summary of Investigative Analysis for Facility
RFI Expedited Report	Summary of Investigative Analysis for SWMUs 12, 11 and 15
SWMU	Solid Waste Management Unit
SWMU 1	Hazardous Waste Container Storage Area
SWMU 17	Off-specification Product Storage Area
SWMU 2	Inactive Landfill will include AOC 4
SWMU 7	Former Dinoseb Production Area
SWMU 14	Former Toxaphene Production Area
SWMU 4	Activated Carbon Treatment Unit
SWMU 5	South Plant Drainage System
SWMU 8	Dinoseb Loading/Unloading Area
SWMU 9	Dinoseb Drumming Area
SWMU 11	Former MSMA Production Area
SWMU 12	Former MSMA Unloading Area
SWMU 13	South Plant Drainage Ditches
SWMU 15	Former Methyl Parathion Production Area
SWMU 16	Former Atrazine Production Area
SWMU 17	Returned Product Storage Area
SWMU 18	Former Blue Tank
SWMU 20	Railroad Car Loading/Unloading Station
SWMU 22	North Plant Neutralization System Concrete Sump
SWMU 25	North Plant Subsurface Wastewater Pipes
SWMU 29	Floor under North Plan Oil Collection Unit
SWMU 30	North Plant Waste Accumulation Area
SWMU 31	North Plant No. 6 Fuel Oil Area
TCL	Target Compound List

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ACRONYMS (Continued)

Acronym	Meaning
TAL	Target Analyte List
VCC	Vicksburg Chemical Company
Woodward-Clyde	Woodward-Clyde International-Americas (formerly Woodward-Clyde Consultants) a subsidiary of URS Corporation

1.1 PURPOSE AND ORGANIZATION OF REPORT

Vicksburg Chemical Company (VCC) retained Woodward-Clyde International-Americas (Woodward-Clyde) to perform activities associated with a RCRA corrective action program. The corrective action program is in response to a Consent Decree effective July 1, 1991. The Consent Decree requires that a RCRA Facility Investigation (RFI) be conducted at the Vicksburg, Mississippi manufacturing facility.

The purpose of the RFI is to determine the nature and extent of releases of hazardous wastes and/or constituents from regulated units, solid waste management units (SWMUs), and other areas of concern (AOCs) at the facility and to gather all necessary data to support any corrective action required.

The RFI constitutes the second phase of the RCRA corrective action program. The program's initial phase consists of the RCRA Facility Assessment (RFA) which is conducted by EPA and precedes the RFI. The RFI itself is divided into several separate tasks which includes the Preliminary Report (Report of Current Conditions, submitted previously by VCC then resubmitted as the Amended and Restated Preliminary Report and subsequently approved by the U.S. EPA), the RFI Work Plan (submitted in June 1996), the Facility Investigation, and the Investigative Analysis and Reports (RFI Report). In addition to these phases, a Groundwater Assessment Work Plan (submitted in June 1996), a Closure Plan for SWMU 1 and SWMU 17 (submitted and subsequently approved by the U.S. EPA) and Annual Groundwater Assessment Reports are required by the Consent Decree.

The RCRA corrective action program for SWMUs 12, 11 and 15 is very similar to that for SWMUs 16, 1 and 17. An RFI Report, Corrective Measures Study (CMS), RCRA Corrective Measures Implementation Plan and Application for Corrective Action Management Unit (CAMU) were published for SWMUs 16, 1 and 17 and initially submitted to the U.S. Environmental Protection Agency (EPA) and Mississippi Department of Environmental Quality (MSDEQ) in June 1997. The CAMU application, which is pertinent to the plant-wide corrective action program, has been approved. VCC adopts by reference the CMS for SWMUs 16, 1 and 17 (submitted to the EPA and MSDEQ in June 1997).

This document is the Corrective Measures Implementation Plan (CMIP). It is based on the RFI Expedited Report and the CMS adopted by reference. The RFI Expedited Report describes the activities and the results of analyses of samples obtained during the execution of the RFI Expedited Work Plan (December 1997). The CMS identified, screened and developed

alternatives for removal, containment, treatment, and/or other remediation of contamination based on the objectives established for the corrective action. The work plan, reports and plan are limited to the following areas:

- SWMU 12, Former MSMA Unloading Area;
- SWMU 11, Former MSMA Production Area; and
- SWMU 15, Former Methyl Parathion Production Area.

Pursuant to the RCRA Corrective Action Plan (OSWER Directive 9902-3-2A), a CMIP may be submitted rather than the Conceptual Design, Intermediate Plans and Specifications, and Construction Work Plan. This CMIP consists of describing the following tasks:

- CMI Program Plan;
- Corrective Measure Conceptual Design; and
- Corrective Measures Construction.

1.2 SITE DESCRIPTION

VCC is located in Warren County, Mississippi along the Mississippi River immediately on the south area of Vicksburg within the city limits. About 70 acres border on the Mississippi River, however, none of the plant production facilities are located along the river. The address is:

Vicksburg Chemical Company
Post Office Box 821003
Rifle Range Road
Vicksburg, Mississippi 39182-1003

The facility is a manufacturer of chemicals. The 650 acre plant site is divided into two separate and distinct operations known as the North Plant and the South Plant. Active operations are conducted or have been conducted on about 130 acres.

In operation since 1961, the North Plant produces potassium nitrate, liquid chlorine, and liquid nitrogen tetroxide. The raw materials for the North Plant include potassium chloride and nitric acid. The potassium nitrate is sold in varying grades as a chemical fertilizer and for industrial uses. The chlorine is sold for various industrial uses. Most nitrogen tetroxide is sold to the government as an oxidizer for rocket fuels.

The South Plant, in operation since 1953, formerly manufactured chlorinated pesticides, nitrogen based herbicides, and other agricultural chemicals. The only active operations at the South Plant are a nitric acid unit constructed in 1986 and a potassium carbonate (Kcarb) plant constructed in 1995. The manufactured nitric acid is used primarily in the North Plant as a raw material. The potassium carbonate is a commercial product. During various periods prior to 1987, the South Plant produced dinitro butyl phenol (dinoseb or DNBP), monosodium methane arsonate (MSMA), diethyl hexyl phosphoric acid (DEHPA), 1-hydroxy-ethylidene-1,1-diphosphonic acid (UNIHIB), toxaphene, methyl parathion, cyanazine (bladex), and atrazine. Toxaphene and methyl parathion are insecticides, while atrazine, dinoseb, and MSMA are herbicides. Raw materials or solvent for these operating processes included chlorine, camphene, ortho secondary butyl phenol (OSBP), sodium arsenite, sodium hydroxide, methyl chloride, sulfuric acid, sodium paranitrophenolate, phosphorus trichloride, cyanuric chloride, tributylamine, carbon tetrachloride, epichlorohydrin, ortho-cresol, methanol, triethanolamine, xylene, isopropylamine, mono-ethylamine, toluene, poly glycol, diethanolamine and acetone.

Originally, the two plants were completely separate, owned and operated by two different companies. The South Plant was originally constructed by Spencer Chemical in 1953 to produce agricultural chemicals: ammonia, nitric acid, urea, and ammonium nitrate. After purchasing the facility in 1964, Gulf Chemical added a formaldehyde unit in 1966. American Metal Climax Corporation (Amax) constructed the North Plant in 1961 to produce chloride-free potassium nitrate for selected crops.

Vicksburg Chemical Company was formed in early 1972 and purchased both the Gulf Oil and Amax Chemical facilities except the formaldehyde plant on July 12, 1972. Production, under the new management, began in October of the same year. Vicksburg Chemical then operated the nitric acid, potassium nitrate, and nitrate solutions plants about 2 ½ years. By September, 1974 five more facilities were built for atrazine, methyl parathion, dinoseb, toxaphene, and UDMH (Unsymmetrical Dimethyl Hydrazine) production. The UDMH facility was shut down permanently a short time after construction.

In 1978, Vicksburg Chemical Company was merged into Vertac, Inc. Effective September 1, 1979 Vertac, Inc. was merged into Vertac Chemical Corporation (Vertac). In February, 1986 Cedar Chemical Corporation acquired the Vicksburg Chemical plant from Vertac pursuant to a reorganization agreement among Vertac's shareholders and Fermenta A.B. of Sweden. Nine West Corporation, (a wholly owned subsidiary of Trans Resources, Inc.) acquired Cedar Chemical Corporation from Fermenta A.B. in January, 1988. Effective January 1, 1992 Cedar

Chemical Corporation incorporated its Vicksburg, Mississippi facility as Vicksburg Chemical Company, a wholly owned subsidiary of Cedar Chemical Corporation.

A formaldehyde unit owned and operated by Borden Chemical is located inside the boundary of the South Plant. It was previously owned by Gulf and, later, Perkins Company and is referred to in this manner occasionally. The small portion of the South Plant site occupied by the Borden operation is not separated from the rest of the plant. There is no fence or other barrier.

The majority of the SWMUs and AOCs identified in the Consent Decree are located in the South Plant. Production operations at the South Plant have been discontinued except for a nitric acid plant, a newly constructed potassium carbonate plant, and a fertilizer blending facility under construction.

The subject of the CMIP are SWMU 12, SWMU 11 and SWMU 15; a brief summary of the production history is noted below:

SWMU Number	Unit Name	Physical Description	Former Function
12	Former MSMA Salt Unloading Area	Two concrete lined bays (15 to 10 feet) covered by a roof.	MSMA by-product salts were loaded into sludge dumpsters for offsite disposal.
11	Former MSMA Production Area	The unit consists of trenches, sumps and product storage tanks. The unit has been 90% dismantled.	Chemical processing area which produced MSMA.
15	Former Methyl Parathion Production Area	The unit is located on the same site as the Former MSMA Production Area (SWMU 11).	Chemical processing area which produced methyl parathion.

An extensive sampling and analysis program was carried out for SWMUs 12, 11 and 15. The results are reported in the RFI Expedited Report which is submitted simultaneously with the CMIP. The following conclusions can be drawn with regard to contamination of SWMUs 12, 11 and 15:

- The concrete floor comprising the main portion of the MSMA process is substantial (coring terminated at 55 inches, no cracks observed), appeared to have been well coated with concrete paint and is uncontaminated with arsenic. The same cannot be said about surrounding areas.

- The soil and concrete areas immediately adjacent and to the west and north of the process area are contaminated with arsenic. The area to the west is generally contaminated in excess of 20,000 ppb (the background concentration) to a depth of 8 feet; the volume is about 2,700 cubic yards of concrete and soil. The area to the north is generally contaminated in excess of 20,000 ppb to a depth of 1 to 4 feet; the volume is about 800 cubic yards of concrete, asphalt and soil. An estimated delineation of the contamination is presented in Figure 1.

- All of the drainage systems and sumps contain contaminated loose solid material (soil, gravel, etc.). The loose solid material is for the most part contaminated in excess of 20,000 ppb arsenic. The volume of material is estimated to be 5 cubic yards.

- Wipe samples show arsenic contamination of structural beams, corrugated fiberglass wells and steel floors.

- There is a plume of arsenic contamination in what may be the top 1-foot in a zone of the uppermost aquifer from the MSMA site extending generally to the southeast. An estimate of the concentration plume is presented in Figure 2. A potentiometric contour map is presented as Figure 3. The likely main source is the loading station where by-product salts (K031) generated in the production of MSMA were dumped into roll-off boxes. The ultimate disposition of the contents of the roll-off boxes was the Chemical Waste Management hazardous waste landfill in Emelle, Alabama.

  The plume extends well beyond the boundaries of the MSMA site and into areas that are free of surficial arsenic contamination. The nearest monitor wells (1A, 8, 9 and 12) exhibit detection of trace concentrations of arsenic that may be due to background concentrations of arsenic in soil.

2.1 CORRECTIVE ACTION OBJECTIVES

Corrective action objectives are goals for protecting human health and the environment that apply to a specific medium. Objectives for protecting human receptors generally specify both a contaminant criteria and an exposure route because protectiveness may be achieved by either reducing exposure or reducing the contaminant levels.

The clean closure standards are based upon closure of areas with no contamination remaining in place above the health based action levels. This plan is intended to result in a "clean" closure which will eliminate the need for post-closure maintenance and care of the storage areas. The levels of clean-up will be used for the soils underneath the concrete as well as the concrete. The following are the health based closure standards for soils and concrete, assuming that the exposure pathway is ingestion, and the receptors are workers at the site. This assumption will require a restriction on future land use at the site. (See OSWER Directive No. 9355.7-04, Land Use in the CERCLA Remedy Selection Process, May 25, 1995.)

Constituent	Concentration[1] (mg/kg)
Dinoseb	80
Arsenic	20[2]
Toxaphene	2.6
Atrazine	400
Toluene	16,000

NOTES:

[1] A discussion of the calculation is found in Closure Plan - SWMU 1 and SWMU 17 (February 1995).
[2] Modified because of high concentrations of arsenic in the background samples.

Offsite groundwater migration is also a medium through which human or environmental receptors could potentially be exposed to contaminants from the site. Contaminated vadose zone soils are of concern as a potential contributor of contaminants to the groundwater. Consequently, corrective action objectives are established for vadose zone soils.

Clean closure standards for soil leachate require that concentrations in TCLP extract of the soil shall not exceed MCLs. Where MCLs have not been established, concentrations in the TCLP extract of the soil shall not exceed health based levels calculated, using a consumption rate of 2 liters of leachate per day.

2.2 APPROACH

The approach to corrective action consists of the following course of action:

- Excavate and dispose onsite 3,500 cubic yards of material (the soil, concrete and asphalt contaminated by greater than 20,000 ppb arsenic). The material is not hazardous by listing. After treatment the material is not hazardous by characteristic. Prior to treatment most of the material and perhaps all of the material is not hazardous by characteristic. (A solidification/stabilization study by VCC has been carried out.) A delineation of the excavation area is depicted on Figure 1. Backfill the excavation. The material would be stabilized onsite consistent with the CAMU prior to landfilling onsite;

- Clean all the drainage systems and sumps. Perhaps remove parts of the system;

- Install two sets of nested monitor wells downgradient of the arsenic plume. Conduct aquifer testing. Plan on groundwater recovery as part of an overall groundwater program after the site-wide groundwater assessment; and

- Monitor for airborne arsenic when the superstructure is sandblasted prior to painting.

The corrective measures for the first two bullets are discussed in Section 3.0 "Corrective Measures Conceptual Design".

2.3 PROJECT MANAGEMENT PLAN

The Project Management Plan consists of the following elements:

- Project task definition; and

- Specific personnel positions within the project organizational structure.

2.3.1 Project Task Definition

For the expedited corrective measures, VCC has retained the services of Woodward-Clyde as an independent engineering firm to develop the CMIP. Woodward-Clyde will provide construction management services and inspection to implement the CMIP. VCC will provide internal implementation supplemented by construction contractors (contractors will be contracted directly with VCC).

2.3.1.1 EPA and LDEQ Project Coordinator

The EPA and LDEQ project coordinators or designees will observe corrective measures activities to the extent deemed necessary to confirm that the requirements of the CMIP.

2.3.1.2 Project Director

The Project Director is Mr. Steve Boswell, Director of Environmental Affairs for VCC. He is in charge of administration of the work and the completion of the project. Personnel with VCC and equipment owned by VCC may be utilized for various aspects of the construction. Personnel have received the appropriate OSHA training and all work would be guided by the provisions of the CMIP. Outside construction contractors will report to Mr. Boswell. Woodward-Clyde will act as VCC's agent for that assistance provided for in the implementation of the CMIP.

2.3.1.3 Woodward-Clyde Corrective Measures Task Manager

The Woodward-Clyde Task Manager will develop the plans and oversee remediation work implementing the CMIP on behalf of VCC. The Woodward-Clyde CMIP Task Manager is Mr. Richard D. Karkkainen. He is also the Woodward-Clyde Project Manager to handle day to day coordination and administration.

2.3.1.4 Quality Assurance Observations and Measurements

Woodward-Clyde will provide construction quality assurance for this project. QA duties will be under the supervision of Mr. Bob SeGall, Professional Engineer, registered in the State of Mississippi.

2.3.1.5 VCC's Health and Safety Officer

A Health and Safety (H&S) Officer will be responsible for the administration and implementation of site health and safety. However, the H&S Officer will have the overall responsibility for safety and health and will:

- Ensure that an employee medical surveillance program which meets the requirements of 29 CFR 1910.120 is instituted and maintained.

- Be responsible for the initial pre-construction indoctrination of all on-site personnel with regard to the H&S Plan and other safety requirements to be observed during the construction, including but not limited to:

  - potential hazards
  - personal hygiene principles
  - personal protective equipment
  - respiratory protection equipment usage and fit testing
  - emergency response including site evacuation, dealing with fire and medical situations

Construction contractors are responsible for preparing and following their own Health and Safety Plan which meets the requirements of 29 CFR 1910.120. They may adopt by reference plans prepared by others but must assume responsibility for the health and safety of their own personnel.

2.4 WOODWARD-CLYDE'S HEALTH AND SAFETY PLAN

The Health and Safety Plan establishes guidelines and requirements for the safety of field personnel during the conduct of the field activities associated with the referenced project. The activities addressed by this plan are those described in Section 3.0, the Corrective Measures Conceptual Plan. All employees of Woodward-Clyde involved in this project are required to abide by the provisions of this plan. They are required to read this plan and sign the attached Compliance Agreement. The Health and Safety Plan is attached as Attachment A.

The health and safety guidelines and requirements are based on a review of available information and an evaluation of potential hazards. This plan outlines the health and safety

procedures and equipment required for activities at this site to minimize the potential for exposures of field personnel. This plan may be modified by the project manager, the corporate health and safety officer, and the Baton Rouge health and safety officer in response to additional information obtained regarding the potential hazards to field personnel.

2.5 COMMUNITY RELATIONS PLAN

The Community Relations Plan (CRP) for VCC has been prepared. The CRP presented herein describes the mechanism for the dissemination of information to the public regarding RCRA corrective action activities and results. The CRP describes community relations objectives and techniques for implementing the community relations program. The community relations program will provide the public an opportunity to participate in the decision-making process regarding remedial actions at the site and inform the public of current and future site activities.

This CRP is a working document that serves as a guide for communicating with the affected community. Activities and schedules may be altered according to future circumstances. The CRP is attached as Attachment B.

3.1 REQUIRED ACTIVITY

The required activity is to permanently deal with corrective measures now by incorporating elements of the following for each remediation area, as necessary and appropriate:

- Excavate and dispose onsite 3,500 cubic yards of material. Backfill the excavation. The material would be stabilized onsite consistent with the CAMU prior to landfilling onsite;

- Clean all the drainage systems and sumps. During the excavation noted above some portions of the system may be removed;

- Install two sets of nested monitor wells downgradient of the arsenic plume as part of the overall site groundwater assessment. Conduct aquifer testing. Plan on groundwater recovery as part of an overall groundwater program after the site-wide groundwater assessment; and

- Monitor for airborne arsenic when the superstructure is sandblasted prior to painting.

The following are discussions of the excavation and disposal activities; specifically, the treatment process (Section 3.2), the onsite disposal (Section 3.3) and the disposal site after construction of the landfill (Section 3.4).

3.2 THE TREATMENT PROCESS

The waste that is excavated would all be solidified/stabilized. Solidification/stabilization of toxic waste uses chemical and physical processes to detoxify or immobilize a hazardous waste. The waste is immobilized in a normal earth environmental to form a less leachable product. This can be accomplished by addition of chemicals, surfactants, or complexing agents.

Stabilization refers to processes that reduce the risk posed by a waste by converting the contaminants into a less soluble, mobile, or toxic form. The physical nature of the waste is not necessarily changed.

Stabilization and solidification processes can be applied to a wide range of wastes. Since all the processes depend upon chemical and physical reactions of varying complexity between the wastes and the applied fixation agents, care is required in order to select the most appropriate process or system. The following table lists common kinds of wastes and the solidification/stabilization process that is most effective:

Kinds of Wastes	Stabilization/Solidification Process
Oily wastes, industrial sludges and contaminated soils (containing inorganics with low concentrations of organics), acid mine leachate and tailings, and radioactive liquid scintillation fluids	Sorbents and Surfactants
Contaminated foundry sands and sand-blasting grit; wastes from paint removal, metal finishing, and electroplating; petroleum-contaminated soils	Emulsified Asphalt
Refuse-to-energy plant and medical wastes ash, insulation wastes, metals-smelting dusts, contaminated soils, and metal-contaminated sludges	Soluble Phosphates
Low and medium level radioactive wastes, municipal solid waste ash, medical wastes, and contaminated soils and sludges	Bituminization
Predried particulate wastes, such as, incinerator ash, contaminated soils, sludges, metals, and mill tailings	Modified Sulfur Cement Process
Primary and secondary waste streams produced by waste management and restoration activities, nitrate salt wastes, sludges, ion-exchange resins, incinerator ash, and scrubber blow-down solution	Polyethylene Extrusion
(Specific process variation dependent) metal-containing wastes, auto shredder fluff, incinerator-bottom ash, and contaminated debris	Soluble Silicates (Patented Processes)
Metal-refining wastes, metal-finishing wastes, and metal-bearing sludges	Soluble Silicates (Slags)
Steel pickle liquor, ferric chloride etching waste, oil waste, hydrocarbon waste, incinerator ash, petroleum sludge, phosphoric acid residue, oily wastes, and tars	Soluble Silicates (Lime)
(Specific process variation dependent) metal-containing wastes, auto shredder fluff, incinerator-bottom ash, and contaminated debris	Soluble Silicates (Inorganic Polymers)

Stabilization/solidification techniques sometimes do not successfully bind all organic compounds. Volatile organics such as benzene will be substantially volatilized during the stabilization due to agitation during mixing and temperature increases due to heat of reaction of stabilization reactions.

The particular treatment process to be utilized for stabilization of the arsenic is based on the study "Stabilization of Arsenic Wastes" by Max Taylor and Robert Fuessle prepared for the Hazardous Waste Research and Information Center in October 1994. A copy of the entire study is provided as Attachment C.

The optimum mix (by weight) proposed from the study consists of the following:

- 100 parts waste;
- 9 parts cement;
- 6 parts fly ash cement;
- 24 parts water; and
- 14.4 parts $FeSO_4$ 7 H_2O.

Ferrous sulfate was selected for its capacity to immobilize arsenic. From the consideration of the chemistry of arsenic, iron and cement, various chemical models to explain the stabilization can be proposed. To quote from the study: "The most common of the single chemical models of the concrete matrix is that of an anionic silicate-aluminate lattice with cations bound to lattice sites by ionic attraction. The amorphous water rich regions of the matrix are at very high pH values. In order to hold an anionic material in the matrix, the stabilization process must provide either covalent bonding into the matrix during the curing of the matrix or formation of insoluble compounds inside the matrix. Previous work (Akhter, 1990) indicates that incorporation of the arsenic anions into the silicate-aluminate backbone is not likely. Therefore, the most obvious mechanism for stabilizing arsenic is to form insoluble compounds with iron (II), incorporated in the concrete."

The mix has been tested for VCC by two remediation contractors. Stabilized samples have been sent for Toxicity Characteristics Leaching Procedure and analysis of arsenic. The samples passed. The mix used in the field may vary somewhat from the mix noted.

The sequence of mixing is an important part of the stabilization procedure The elements of that procedure are as follows:

- Mix the waste as thoroughly as possible.
- Add the binders, i.e., cement and fly ash cement and kiln dust to the waste and mix as thoroughly as possible. Preferably perform the mixing in a pug mill or in slurry from with an appropriate pump.
- Mix the ferrous sulfate with water in a separate vessel.
- Add the ferrous sulfate solution to the waste plus binder mix. Mix thoroughly.

- Empty the stabilized waste into a final or intermediate repository. Allow to cure.

- Place the waste in the final repository.

- Cap the final repository with 2 feet of clay and 1 foot of topsoil. Vegetate the top soil.

3.3 ON-SITE DISPOSAL OF THE RESIDUALS

3.3.1 North Pond

The total volume of contaminated soil to be excavated in the MSMA area is approximately 3,500 cubic yards. Once the material is stabilized the total volume will be 4,000 to 5,000 cubic yards (it depends on the amount of concrete which will be separated as construction debris). The onsite repository planned as a landfill for that volume is the North Pond.

The North Pond was investigated as the potential site of new manufacturing operations in 1993. The manufacturing operations were not constructed. A work plan was issued in October 1993 which described the investigative plan for the area. The results of the investigation were published in "North Pond RCRA Facility Investigation Report", February 1994. Both reports were submitted to the U.S. EPA and MSDEQ. Results of the investigation were also incorporated into the "Amended and supplemental Preliminary Report RCRA Facility Investigation" submitted to and subsequently approved by the U.S. EPA and MSDEQ. The results of that investigation are herein utilized to assess the suitability of the North Pond as the repository of the stabilized wastes.

There is approximately 3,240 cubic yards of soil/sludge (to elevation 125 feet MSL) in the bottom of the North Pond that will also be excavated and solidified. The North Pond soil/sludge will be solidified by overexcavting the North Pond area by 4 feet in depth (see Figure 4 - Plan View and Figure 5 - Excavation Plan) and mixing the approximately 3.240 cubic yards of soil with the 3,240 cubic yards of soil/sludge. The mixing will take place on the ground surface using bulldozers and tillers to work the mixture to allow it to solidify and dry. If necessary, fly ash will be added. Once that soil/sludge is solidified the total volume will be approximately 7,000 cubic yards. The solidified soil/sludge will have elevated levels of calcium and magnesium but will have no hazardous constituents. It is planned to use the material as general fill in the former oil tank area immediately north of the North Pond.

3.3.2 North Pond Geology

The North Pond RFI field program confirmed the geologic observations of previous investigations. The North Pond was constructed in an elevated area with a surface elevation at 133 feet msl. The North Pond area is generally bounded by plant coordinates N99750 E100500, N99750 E100250, N10000 E100000, N100250 E10000, and N100250 E100500, its location is noted in Figure 3. As a comparison of elevations, the railroad track area and surface pond are located at surface elevations of approximately 110 feet msl. The South Plant (including the MSMA site) is constructed at surface elevation approximately 120 feet msl and the North Plant is constructed at surface elevation approximately 115 feet msl.

In the North Pond area a silty clay extends from the surface to a depth of about 25 feet. Pleistocene loess (silty clay - clayey silt) extends from about 25 to 75 feet below the surface across the site. Immediately below the loess, a thin layer (1 to 2 feet) of greenish-gray sandy clay is usually present. Underlying the sandy clay is the marl from the Vicksburg formation. The top of the marl varies across the site from 55 to 60 feet mean sea level (msl). This marl serves as the bottom of a shallow confined aquifer.

The sandy-clay deposit grades across the zone to a clayey-sand above the marl. This deposit could be the Citronelle Formation or weathered marl. The Citronelle has been interpreted as Pleistocene terrace deposits. These deposits are absent in some areas underlying the site, but where present are characterized by relatively fine-grained sediments. They do not represent a continuous permeable unit across the site.

The Byram marl has been described as representing mixed clastic and carbonate sedimentation in an open shelf or platform environment. The argillaceous, massive and medium dense character of the marl would inhibit any significant movement of water through this unit, and there is no indication of secondary permeability.

The bedrock underlying the facility is a layer of Glendon limestone of the Vicksburg Formation and, beneath the limestone, is the Jackson Formation. The top of the Glendon limestone is estimated to be 80 to 100 feet beneath the plant site and ranges from 25 to 65 feet thick. The Glendon is a dark gray to brown, dense, fine-grained limestone. The underlying non-permeable Jackson Formation is 40 to 150 feet thick.

3.3.3 North Pond Groundwater Hydrology

The Byram marl in the Vicksburg Formation constitutes the bottom of the uppermost water-bearing zone underlying the facility. The Byram marl is described as representing mixed clastic and carbonate sedimentation in an open shelf or platform environment. The argillaceous, massive and medium dense character of the marl would inhibit any significant movement of water through this unit, and there is no indication of secondary permeability. The uppermost water bearing zone is approximately 40 feet thick consisting almost exclusively of Pleistocene loess (silt). The clayey fill material placed atop the loess is acting as a "cap" inhibiting the vertical migration of the groundwater. The presence of the marl on the bottom of the aquifer creates a slightly artesian confined aquifer which is not hydraulically connected to any potential water-bearing zones at greater depths. The artesian property is characteristic of an aquifer which is under pressure from above and below. The background water quality of this aquifer is marginally acceptable for drinking water, however due to its low lateral flow and yield characteristics its usefulness as a domestic water supply is severely limited.

Figure 3 is a potentiometric contour of the uppermost aquifer with the potentiometric contour of the perched water table in the vicinity of the North Pond superimposed on it. The direction of groundwater flow is generally toward Stouts Bayou or Hennesseys Bayou. The evidence of the perched water table atop the clay lens in the North Pond area was established by the installation of shallow piezometers. The perched water table merges with or stops in the vicinity of the roadway that connects the North Plant with the South Plant.

The upper part of the saturated zone consists primarily of clay and silt-sized particles. This type of fine-grained material typically has a low hydraulic conductivity, resulting in relatively low groundwater and contaminant transport velocities. Such fine-grained material is also often relatively effective at either immobilizing of inhibiting migration of environmental contaminants. Vertical groundwater flow across layered deposits of varying hydraulic properties (such as are apparently present at this facility) may be a slow process for the vertical migration of groundwater contaminants. Because of the generally low hydraulic conductivity of the earth materials, and the possibility of contaminant immobilization or inhibition of vertical groundwater contaminant transport by contaminant-aquifer materials interactions, contaminants which may have leaked or leached from the source may be present mostly in the upper part of the saturated zone.

3.3.4 North Pond Waste Sludge Quality

There is sludge in the bottom of the North Pond. It is known from the history of the manufacturing facility that sludge in the bottom of the North Pond does not contain listed hazardous wastes. The sludge was additionally analyzed by the Toxicity Characteristic Leaching Procedure to determine if it was hazardous by characteristic. Analysis detected 29 parts per billion carbon tetrachloride and 440 parts per billion chloroform. The sludges would be hazardous by characteristic if the carbon tetrachloride concentration exceeded 500 parts per billion or the chloroform exceeded 6,000 parts per billion; therefore, the sludge is not hazardous by characteristic.

3.3.5 North Pond Soil Quality

Complete results of analyses of soil beneath and surrounding the North Pond are tabulated in Table 1 of the North Pond RFI Report, February 1995. Samples are clean with the exception of the following:

Location	Contaminant (Concentration in ppb)	Comment
B-20B Shallow Zone	Chloroform = 45	Action Level in Soil[1] = 100,000 Media Protection Standard[2], Maximum in Industrial Soil = 1,000,000 Preliminary Remediation Goal[3] in Industrial Soil = 1,600
B-20A Deep Zone	Chloroform = 13	See above
B-22B Shallow Zone	Chloroform = 830	See above
B-23A Deep Zone	Chloroform = 26	See above

NOTES:

1 EPA Proposed Corrective Action Rule for Solid Waste Management Units-Appendix A-Federal Register July 27, 1990.

2 EPA Proposed Corrective Action Rule for Solid Waste Management Units-Appendix C-Federal Register July 27, 1990.

3 U.S. EPA Region IX Preliminary Remediation Goals-August 6, 1993.

3.3.6 North Pond Groundwater Quality

Results of analyses of groundwater from piezometers surrounding the North Pond are also tabulated in Table 1 of the North Pond RFI Report, February 1995. Results are summarized below:

Inorganics

From the data it is evident that a plume of calcium, magnesium, potassium and sodium developed during the active use of the North Pond. The potassium is characteristically present in waste water from the North Plant. Potassium nitrate is manufactured in the North Plant. The source of sodium is the sodium hydroxide used to scrub streams containing chlorine and nitrogen oxides or for adjusting the pH of the wastewater stream. The source of the calcium and magnesium was the dolomite placed into the North Pond to adjust the pH of the pond.

Organics

The extent of migration of organics from the North Pond is not extensive. The concentration of organics in groundwater is limited to the shallow zone (perched water table) and the area directly east and adjacent to the North Pond. The following is a summary of results:

Location	Contaminant (Concentration in ppb)	Comment
B-20B Shallow Zone	Chloroform = 1,700	Media Protection Standard[2], Maximum in Water (Industrial Site) = 600 Action Level[1] in Water = 6 Preliminary Remediation Goal[3] in Tap Water = 0.28 MCL Trihalomethanes[4] = 100
	Bromodichloromethane = 36	Maximum Action Level[1] in water = 3.0 Preliminary Remediation Goal[3] in Tap Water = 0.14
	Dibromochloromethane = 14	Preliminary Remediation Goal[3] in Tap Water = 1.0
	Bromoform = 18	Preliminary Remediation Goal[3] in Tap Water = 11.0
	Carbon Tetrachloride = 4.0	Media Protection Standard[2], Maximum in Water (Industrial Site) = 30.0 Action Level[1] in Water = 0.3 Preliminary Remediation Goal[3] in Tap Water = 0.026 MCL = 5.0
	Trichloroethene = 1.0	MCL = 5.0

Location	Contaminant (Concentration in ppb)	Comment
B-22B Shallow Zone	Chloroform = 6,200	See above
	Bromodichloromethane = 66	See above
	Dibromochloromethane = 78	See above
	Bromoform = 160	See above
		MCL Trihalomethanes[4] = 100
B-23B Shallow Zone	Chloroform = 79	See above
	Bromoform = 8	See above
	2 - Butanone	Laboratory Artifact

NOTES:

1 EPA Proposed Corrective Action Rule for Solid Waste Management Units-Appendix A-Federal Register July 27, 1990.
2 EPA Proposed Corrective Action Rule for Solid Waste Management Units-Appendix C-Federal Register July 27, 1990.
3 U.S. EPA Region IX Preliminary Remediation Goals-August 6, 1993.
4 Trihalomethanes (total) including chloroform, bromoform, bromodichloromethane and dibromochloromethane.

3.4 DESCRIPTION OF THE DISPOSAL SITE - POST CONSTRUCTION

A depiction of the appearance of the North Pond area during and after completion of the landfill construction is noted in Figures 4, 5 and 6.

3.4.1 Excavation

The North Pond area allows room for the landfilling of the stabilized waste. The planned excavation is an area approximately 100 feet by 175 feet comprised of the present North Pond location. The first 4 feet of material excavated is soil/sludge to be solidified. An additional 4 feet (to 121 feet msl) of soil would be excavated and mixed with the soil/sludge to form a general fill (it may be necessary to add fly ash).

The general fill will be used in the former oil tank area immediately to the north of the North Pond. The location and use of the general fill is depicted on Figure 6.

3.4.2 Placing the Solidified/Stabilized Waste and Construction of a Cap

The arsenic waste would be solidified/stabilized as generally described in Section 3.2 - The Treatment Process. The solidified/stabilized waste would be placed in the excavation.

After placing all of the wastes in the excavation, the soil set aside from the excavation would be used to construct a cap on both areas. A compacted cap of 2 feet in depth would be constructed over the excavations and surrounding areas. Topsoil, at least 1 foot in depth, would be placed atop the cap. A profile of the capped area is presented as Figure 6.

3.4.3 Groundwater Monitoring of the Landfill

A groundwater monitoring system already surrounds the North Pond area with two nested wells at six locations. The locations are depicted on Figure 3 and Figure 6.

4.1 INTRODUCTION

Previous sections or paragraphs of the CMIP have included the following topics:

- **Site Description** - Section 1.2 - includes a discussion of areas and volumes encompassed by the CMIP;
- **Corrective Action Objectives and Approach** - Sections 2.1 and 2.2 - a discussion of what is to be accomplished by the CMIP;
- **Project Management Plan** - Section 2.3 - a discussion of the construction management approach; and
- **Corrective Measures Conceptual Design** - Sections 3.1, 3.2, 3.3 and 3.4 - a discussion of the required construction sequence of events, the treatment processes to be utilized for some of the material, location for the onsite disposal of the waste, and description of the disposal site - post construction.

Section 4.0 consists of the remaining elements of the CMIP:

- Construction Quality Assurance/Quality Control Programs
- Project Schedule

4.2 CONSTRUCTION QUALITY ASSURANCE/QUALITY CONTROL PROGRAM

4.2.1 Scope of Plan

This Construction Quality Assurance (CQA) Plan parallels the guidelines outlined in the EPA Technical Guidance Document "Construction Quality Assurance for Hazardous Waste Land Disposal Facilities". The plan defines a system of construction quality management to verify, with a justifiable degree of certainty, that the construction activity encompassed by the CMIP will meet or exceed the corrective action objectives.

Construction Quality Management comprises both a planned system of inspection and testing activities that are necessary to monitor and control the quality of a construction project and a

planned system of construction management services that these activities are being properly performed and documented.

4.2.2 Plan Elements

The CQA Plan is comprised of the following elements:

- Responsibility and authority
- CQA personnel qualifications
- Inspection activities
- Sampling requirements
- Certification documentation

These elements are described in detail in the following sections.

4.2.3 Responsible Parties, Lines of Authority and CQA Personnel Qualifications

The management of construction quality is the responsibility of the facility Operator, VCC, and involves the use of scientific and engineering principles and practices to verify, with a justifiable degree of certainty, that the constructed facility meets or exceeds the Corrective Action Objectives. VCC will engage various contractors and material suppliers as required to provide services during construction of the work. The responsibility and lines of authority and communications are described below.

4.2.3.1 Operator

VCC is the Operator of the facility and is responsible for insuring compliance with the terms, conditions, rules and all other applicable regulatory and jurisdictional requirements. The Operator has the authority to select and dismiss parties charged with design, CQA and construction activities.

The Project Director is the official representative of VCC and is in charge of administration of the work and the completion of the project.

4.2.3.2 CQA Firm

Woodward-Clyde will be retained by VCC to provide quality assurance services, and certification. Personnel described below will be utilized:

- The Project Manager is the official representative of Woodward-Clyde and will report to the VCC Project Director. He will function as an agent of VCC to manage schedule and budget.

- The CQA Certifying Engineer will report to the Project Manager and the VCC Project Director. He will be responsible for the implementation of the CQA plan during construction. He will work closely with the Project Manager during construction activities. He will oversee all activities related to the Quality Assurance Program and act as a liaison between the Project Manager and CQA Officer. The CQA Certifying Engineer shall be experienced in construction, materials testing and quality assurance procedures and shall be a Professional Engineer registered in Mississippi.

- The CQA Officer will have day to day responsibility for quality assurance monitoring, inspection, and testing and will report to the CQA Certifying Engineer and the Project Manager. The CQA Officer shall have an engineering or other acceptable technical degree or other adequate formal training and sufficient practical, technical and administrative experience to execute and record inspection, testing and monitoring activities with experience in construction oversight and hazardous waste management projects. Specific responsibilities of the CQA Officer includes:

  - Being physically on-site to observe the critical work actually performed during construction work before accepting work
  - Reviewing and updating drawings and specifications for clarity and completeness
  - Scheduling inspection, monitoring and testing activities
  - Providing reports on monitoring and testing activities
  - Verifying that the CQA Plan is being implemented
  - Observing and documenting all work as it pertains to the CQA Plan
  - Conducting and documenting all field testing required by the quality assurance program

- Performing independent on-site inspections of the work in progress

4.2.3.3 Contractors

The Contractors are responsible for the successful completion of their contractual duties and requirements as pertains to their portion of the work, and for the supervision and overall coordination and scheduling of their portion of the work. The contractors are also responsible for construction quality control during all phases of the contracted work.

4.2.3.4 Project Meetings

Periodic meetings are held during the course of the project to provide an interaction between the various lines of authority and a mechanism for quality assurance information transfer and resolution of uncertainties or deficient work. Types of meetings include:

- Preconstruction meeting
- Progress meetings
- Resolution and work deficiency meetings

A Preconstruction Meeting may be held at the site and shall be attended by all the responsible parties. The purpose of the Preconstruction Meeting is to:

- Review the responsibilities of each organization
- Review lines of authority and communication for each organization
- Discuss the established protocol for observations and tests
- Discuss the established protocol for handling construction deficiencies, repairs and retesting
- Review methods for documenting and reporting inspection data
- Review methods for distributing inspection data
- Review work area security and safety protocol
- Discuss any appropriate modifications of the CQA Plan to verify that site specific considerations are addressed
- Discuss procedures for the protection of materials and for the prevention of damage from inclement weather or other adverse effects
- Conduct a site walk-around to verify that the plans and specifications are understood and to review material and equipment storage locations

Progress Meetings are typically held at least weekly at the work area. As a minimum, the meeting should be attended by the CQA Officer and Contractor(s) representatives, as appropriate. The purpose of the meetings is to:

- Review previous activities and accomplishments
- Review future work locations and activities
- Identify the Contractor's personnel and equipment assignments
- Discuss any potential construction problems

Monitoring and inspection activities and test results will be reviewed in a way to allow the opportunity to provide an assessment of the quality assurance activities.

Resolution and Work Deficiency Meetings shall be held as needed to include the following:

- Define and discuss the uncertainty, problem or deficiency
- Review alternate solutions
- Implement a plan to resolve the uncertainty, problem or deficiency

Documentation of all meetings will be accomplished by minutes taken by the CQA attendee.

4.2.4 Quality Assurance Inspection Activities and Sampling/Testing Requirements

Quality Assurance inspection and sampling/testing activities will be the responsibility of the CQA Officer. The following activities are part of the program:

- Quality Control Verification testing during excavation of the arsenic waste
- Solidification/Stabilization Quality Assurance for arsenic waste and the North Pond sludge
- Earth Materials Quality Assurance for Cap Construction
- Protective Cover Quality Assurance

The work described in these sections will be conducted as part of the certification program. It does not preclude any additional quality control work that may be performed by the contractors at their expense and for their own information. Any results of such additional quality control

work performed by the contractors shall be reported to the CQA Officer by submittal of copies of the test results.

The CQA Officer shall provide independent documentation that the work performed is in accordance with the project corrective measures objective. The quality controls shall be adequate to cover construction operations and will be keyed to the proposed construction sequence. The controls shall include at least three phases of inspection for all definitive features of work as follows:

- Preparatory inspection shall be performed prior to beginning any work or any definable feature of work. It shall include a review of contract requirements, verification that all materials and/or equipment have been tested, submitted, and approved, examination of the work area to verify preliminary work is complete and a physical examination of equipment and/or materials to be used.

- Initial inspection shall be performed as soon as a representative portion of the particular feature of work has been completed. It shall include an examination of the quality of workmanship, a review of control testing for compliance with contract documents, and any use of defective or damaged materials, omissions, and dimensional requirements as applicable.

- Final inspections shall be conducted and test deficiencies corrected.

At the completion of all work or any increment thereof established by a completion time stated in the specification, the CQA Officer shall conduct a completion inspection of the work and develop a "punch list" of items which do not conform to the approved plans and specifications. Such a list shall be included in the CQA documentation, as required below and shall include the estimated date by which the deficiencies will be corrected. The CQA Officer shall make a second completion inspection to ascertain that all deficiencies have been corrected.

4.2.4.1 Quality Control Verification Testing

The corrective action that is required is discussed in Section 3. During the corrective action, sampling and analysis will take place onsite. Verification sampling and analysis is to take place in order to provide assurance that the Corrective Action Objectives summarized in Section 2.1 are met. The verification sampling and analysis is summarized below:

Sample Point	Action Taken	Verification Sampling and Analysis
Every 2,500 ft^2	Obtain a composite sample consisting of four grab samples randomly selected.	Analyze for arsenic.
Four samples. One per color shaded area in Figure 1.	Obtain from composite samples selected for total arsenic analysis.	Analyze for TCLP arsenic.

The above noted verification sampling is for horizontal extent of contamination. Therefore, if the result of a verification sample does not meet the Corrective Action Objectives (Section 2.1) then additional excavation will be implemented in the direction of that sample. An additional verification sample will be obtained for analysis after the reexcavation is completed.

4.2.4.2 Solidification/Stabilization Quality Assurance

The corrective action objective for solidification/stabilization is to meet a compressive strength of at least 1 ton per square feet.

The solidified/stabilized arsenic waste will be tested for:

- unconfined compressive strength of cohesive soils - ASTM D-2166
- TCLP arsenic

The solidified/stabilized North Pond sludge will be tested for:

- unconfined compressive strength of cohesive soils - ASTM D-2166

The treatment will take place in transportable equipment equipped with a high intensity mixer or pumped with a chopper/slurry pump to homogenize and blend contaminated arsenic soil with reagents. The treatment capacity is typically 50 to 100 tons per hour.

Samples will be taken for unconfined compressive strength on the basis of one sample per one-half days production or 500 tons, whichever is less. Samples (for incidental records) will be taken for TCLP extraction on the basis of one sample per 5,000 tons of production or five days production, whichever is less.

4.2.4.3 Earth Materials Quality Assurance for Cap Construction

Assurance that excavation and construction are in accordance with the plans shall be accomplished by the use of quality assurance testing. Specifically, quality assurance testing shall be conducted in two categories:

- Preconstruction testing
- Construction testing

Quality assurance testing within these categories shall consist of the following:

- Material evaluation and hydraulic conductivity evaluation
- Construction quality evaluation

Material Evaluation and Hydraulic Conductivity Evaluation

Material evaluation shall be performed on earth materials to ascertain their acceptability as construction materials. Evaluations shall also be performed during the course of the work. Criteria to be used for determination of acceptability of materials for use during construction is summarized below. All evaluation tests shall be performed by an approved geotechnical laboratory as part of the CQA program.

All materials not meeting the requirements of the specifications will be rejected, removed and replaced or reworked if possible so as to meet the requirements of the specifications.

The following tests shall be performed, as a minimum, to facilitate material evaluation to ensure compaction necessary to minimize infiltration through the cap.

Property Test	Method	Clay Cap Material
Laboratory Determination of Water (Moisture) Content of Rock & Soil Aggregate Mixtures D2216	--	--
Particle-Size Analysis of Soils	ASTM D422	CL/CH
Soil Particle Size Smaller Than the U. S. No. 200 Sieve (Minimum)	ASTM D1140	>70%
Liquid Limit (Minimum)	ASTM D4318	30%
Plasticity Index of Soil	ASTM D4318	20%-55%
Moisture Density Relationships of Soils and Soil Aggregate Mixtures Using 5.5 lb. Rammer and 12 inch Drop (Standard Proctor)	ASTM D698	90%

Property Test	Method	Clay Cap Material
Hydraulic Conductivity $1x10^{-7}$ Test	ASTM D5084 Method C	$1x10^{-7}$ cm/sec

Construction Quality Evaluation

Construction quality evaluation shall be performed on all components of the construction. These evaluations will become part of the certification program.

Construction evaluation testing shall include visual observations of the work, field density/moisture content determinations, surveys of as-built conditions, investigations into the adequacy of layer bonding and special testing. Visual evaluation of the construction work includes, as a minimum, observations of the water content and other physical properties of the soil during processing, placement and compaction.

Quality Control Testing Frequency

Testing frequencies for each of the quality assurance testing categories are summarized below. All quality assurance testing has been related to the construction sequence. To facilitate the CQA program, the following definitions are presented:

- A layer is defined as a compacted stratum composed of several lifts to a total thickness as specified in the plans and specifications.

- A lift is defined as a constructed segment of a layer composed of materials placed in approximately 8 to 10-inch loose thickness and compacted.

All quality assurance testing shall be conducted in accordance with this plan or as directed by the CQA Officer/Inspector. All applicable testing methods for soils as previously identified shall be observed. Documentation and reporting of test results shall be in accordance with the requirements identified in Section 4.2.5

Construction testing for quality assurance shall be conducted on samples taken from the material during the course of the work. Construction quality testing shall consist of material evaluation tests and construction quality evaluation test and frequency as described below:

TESTING FREQUENCY FOR CONSTRUCTION QUALITY CONTROL AND CONSTRUCTION QUALITY CONTROL	
Activity	**Frequency of Test**
Clay Cap*	1 per 2,000 cu yd or 1 minimum/day
Visual Observations	Full time
Clay Cap Density*	50 foot centers or minimum 2 per lift
Clay Cap Permeability**	1 per 25,000 sq. ft./lift or minimum 3 per lift
Surveys	
As built condition	All appurtenant components
Elevation Monitoring	50 feet center to center at a minimum 6 points per grade at a minimum of the following locations: Top of compacted waste layer Top of compacted clay cap Top of Topsoil Layer

* Tests include ASTM D2922, and D3017 or D1556
** Tests include ASTM D1140, D2216, D4318 and Permeability; three samples per test will be taken.

ASTM 2922	Density of Soil and Soil-Aggregate, In-Place, by Nuclear Methods (Shallow Depth).
ASTM 3017	Moisture Content of Soil and Soil-Aggregate, In-Place by Nuclear Methods (Shallow
ASTM D1556	Density of Soil In-Place by Sand Cone Method.
ASTM D1140	Amount of Material in Soils Finer than the No. 200 Sieve.
ASTM D2216	Laboratory Determination of Water (Moisture) Content of Soil Rock and Soil Aggregate Mixtures.
ASTM 4318	Liquid Limit, Plastic Limit and Plasticity Index of Soil.
ASTM D5084	Method C. Hydraulic conductivity test.
ASTM 4643-93	Moisture Content by Micro-Wave.
ASTM 1587-94	Thin Wall Tube Sampling of Soils.

Testing frequency may be changed at the discretion of the CQA Officer when visual observations of construction performance indicate a potential problem.

Protective Cover Quality Assurance

Construction Quality Assurance of the 12-inch top soil and a vegetative cover will be accomplished by evaluation of the materials used and the methods of construction.

Materials Evaluation

Material evaluation of the soils used for the 12-inch top soil layer will be by demonstration that the material is capable of supporting adequate vegetation.
Material evaluation of the vegetative cover materials (seed, fertilizer, mulch) shall be by quality control certificates supplied to the CQA Officer by the Contractor.

Construction Quality Evaluation

Construction quality evaluations shall be performed on all components of the construction. Criteria to be used for determination of the acceptability of the construction work will be by observation of the methods of construction.

Surveys and/or test pits will be performed to assess the as-built conditions and to verify layer thicknesses of the top soil.

Testing Frequency

Testing frequency for the top soil and vegetative cover for material evaluation shall be 1 sample for each material source for the project. These samples shall be retained by the CQA Officer.

4.2.5 Documentation/Certification

The CQA Officer will document all activities associated with the excavation, solidification/stabilization and capping and maintain current records of quality control operations, activities, and tests performed including the work of suppliers and subcontractors. These records shall be on an acceptable form and indicate factors affecting the project, acknowledgment of deficiencies noted along with the corrective actions taken on current and previous deficiencies. In addition, these records shall include factual evidence that required activities or tests have been performed, including but not limited to the following:

- Type and number of control activities and tests involved
- Results of control activities or tests
- Nature of defects, causes for rejection
- Proposed remedial action
- Corrective actions taken

All the above noted will be included in a document which shall include, as a minimum, daily reports of construction activities, a final summary technical report on the construction project, and the closure certification.

4.2.5.1 Construction Records

All daily records shall include a record of observations, test data sheets, identification reports of problems encountered during construction and reports of corrective measures taken.

4.2.5.2 Certification

The CQA Officer will prepare a certification document addressing each item identified above for each phase of construction. Certification will include review of information on the area under construction, analysis of the Contractor's compliance with the plans and specifications and physical sampling and testing. The certification document will also include:

- Scale drawings depicting the location of the construction
- Statements pertaining to the extent of construction, i.e., depths, plan dimensions, evaluations and thickness, including cross sectional drawings

The summary technical report (CQA Report) will provide an evaluation of the construction project. The report will certify the results of the various field tests and laboratory permeability tests performed and assess whether or not the constructed project is in compliance with the plans and specifications. The report will be signed by the CQA Certifying Engineer. The CQA Certifying Engineer shall be a Professional Engineer who is registered in the State of Mississippi. Copies of the reports will be submitted to VCC.

4.3 PROJECT SCHEDULE

The proposed schedule for the project is as follows:

- July 15, 1998 - U.S. EPA and MSDEQ tentatively approve RFI Expedited Report and Corrective Measures Implementation Plan - Addendum 1 for SWMUs 12, 11 and 15.

- August 10, 1998 - Mobilize contractor. Excavate North Pond soil/sludge and then an additional 4 feet. Begin working the mixture. Begin concrete excavation.

- August 17, 1998 - Continue concrete excavation.

- August 24, 1998 - Continue the 8-foot deep excavation of arsenic waste. Obtain verification samples. Haul arsenic waste to North Pond for mixing and solidification/stabilization. Hydroblast concrete and stockpile.

- August 31, 1998 - Begin excavation of areas with 1- to 4-foot deep excavations of arsenic waste. Obtain verification samples. Haul arsenic waste to North Pond for mixing with North Pond sludge and solidification/stabilization.

- September 7, 1998 - Backfill and compact MSMA areas.

- September 14, 1998 - Begin construction of the landfill cap.

- September 21, 1998 - Demobilize.

FIGURES

Woodward-Clyde

Engineering & sciences applied to the earth & its environment

July 14, 1998

Mr. Steve Boswell
Vicksburg Chemical Company
P.O. Box 821003
Vicksburg, Mississippi 39182-1003

Dear Steve:

Attached are six copies of the revised text and figures for the Corrective Measures Implementation Plan for SWMUs 12, 11 and 15.

Please call if you have any questions.

Very truly yours,

Richard D. Karkkainen

Attachment

RDK:tlc

W:\VICKSBUR\96B315\RCRA-CMI-CVL.DOC

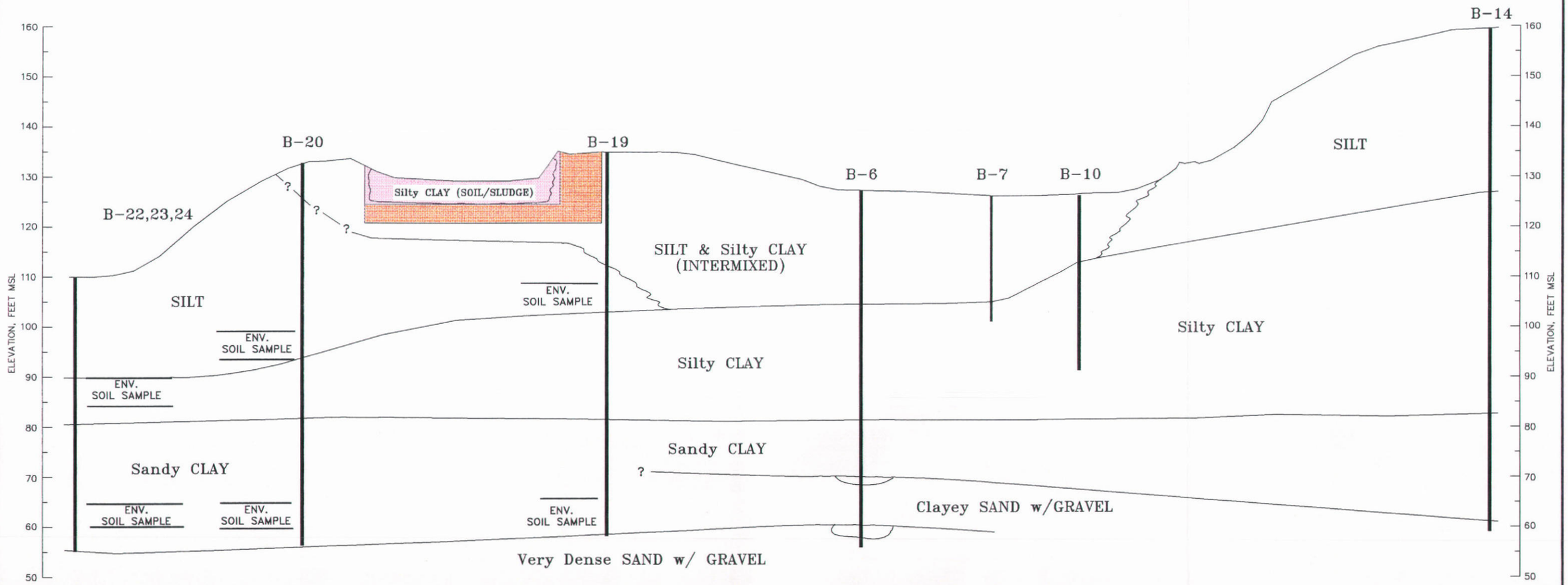
Woodward-Clyde International-Americas • (formerly Woodward-Clyde Consultants)
2822 O'Neal Lane • Baton Rouge, Louisiana 70816
(504) 751-1873 • Fax (504) 753-3616

A

SOUTH

A

NORTH



SCALE:
HORIZ. 1" = 40'
VERT. 1" = 20'

LEGEND:

- WASTE EXCAVATED
- SOIL EXCAVATED AND USED FOR MIXING WITH SOIL/SLUDGE TO FORM GENERAL FILL
- GEOTECHNICAL & ENVIRONMENTAL BORINGS AND PIEZOMETER LOCATIONS

DATE	REVISION	DRWN/CHKD
7/14/98	1	

CORRECTIVE MEASURES IMPLEMENTATION PLAN
SWMUs 11, 12, 15, 23, & 31

Woodward-Clyde Consultants
Consulting Engineers, Geologists and Environmental Scientists
Baton Rouge, Louisiana

VICKSBURG CHEMICAL CORPORATION
VICKSBURG, MISSISSIPPI

SCALE:	MADE BY: GAT	DATE: 3/20/98	FILE NO.
AS SHOWN	CHECKED BY:	DATE:	96B315

NORTH POND AREA
EXCAVATION PLAN

FIGURE 5

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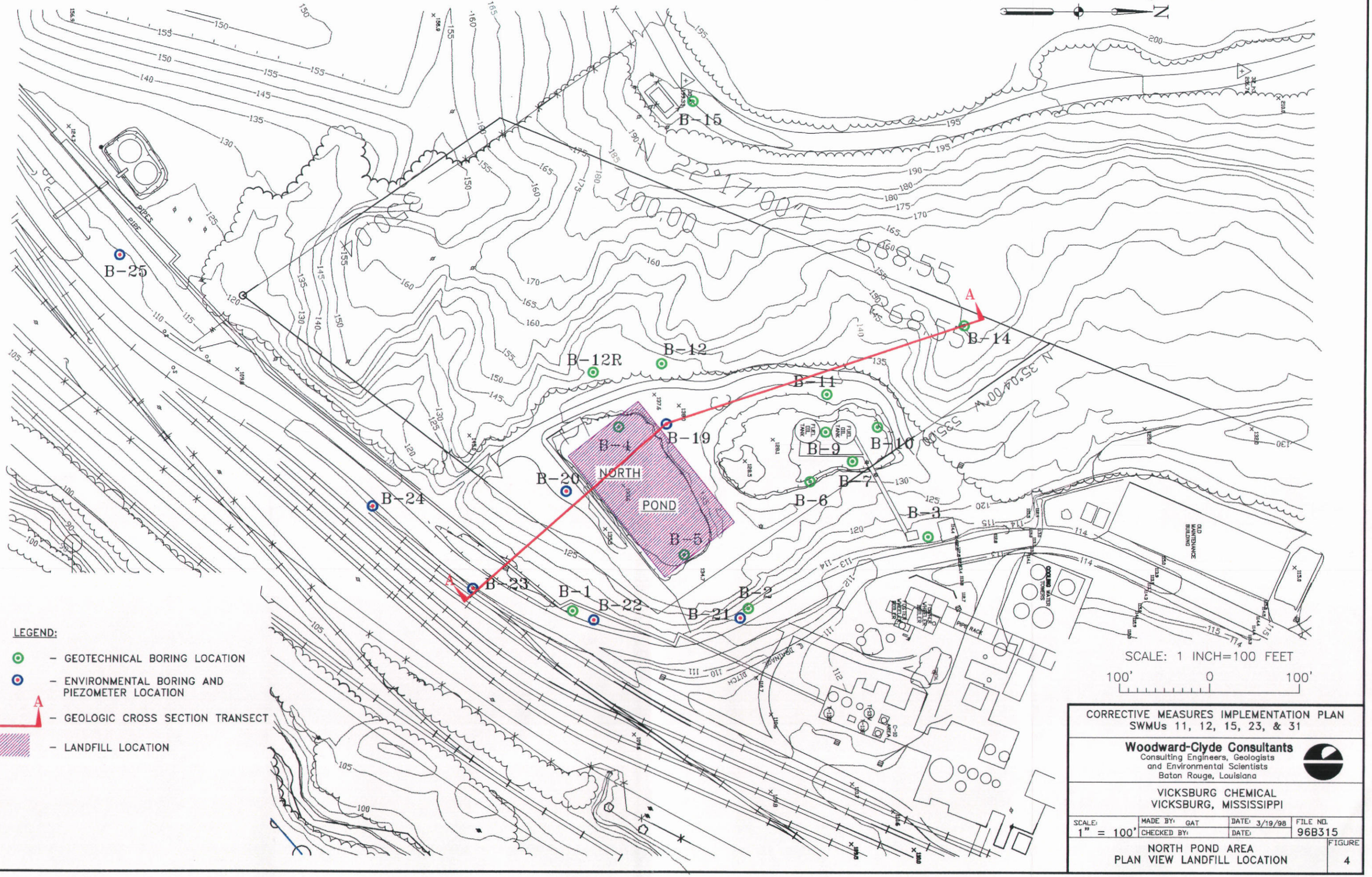


CORRECTIVE MEASURES IMPLEMENTATION PLAN
SWMUs 11, 12, 15, 23, & 31

Woodward-Clyde Consultants
Consulting Engineers, Geologists and Environmental Scientists
Baton Rouge, Louisiana

VICKSBURG CHEMICAL
VICKSBURG, MISSISSIPPI

SCALE:	MADE BY: GAT	DATE: 3/19/98	FILE NO.
1" = 100'	CHECKED BY:	DATE:	96B315

NORTH POND AREA
PLAN VIEW LANDFILL LOCATION

FIGURE 4

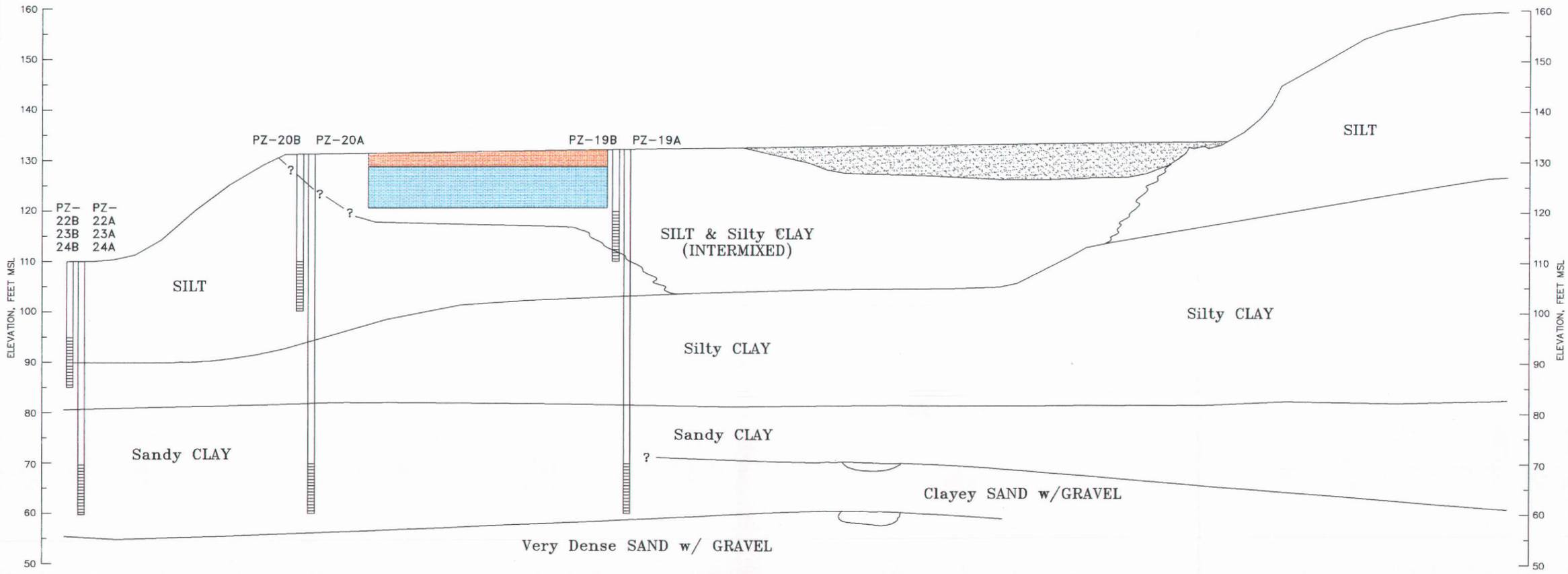
K:\VICKSBUR\96B515\96b515f.dwg Mon Jul 13 16:17:20 1998

A

SOUTH

A

NORTH



SCALE:
HORIZ. 1" = 40'
VERT. 1" = 20'

LEGEND:

- CAP AND TOPSOIL
- SOLIDIFIED/STABILIZED WASTE
- GENERAL FILL
- PIEZOMETER LOCATION
- SCREENED INTERVAL

DATE	REVISION	DRWN/CHKD

CORRECTIVE MEASURES IMPLEMENTATION PLAN
SWMUs 11, 12, 15, 23, & 31

Woodward-Clyde Consultants
Consulting Engineers, Geologists
and Environmental Scientists
Baton Rouge, Louisiana

VICKSBURG CHEMICAL CORPORATION
VICKSBURG, MISSISSIPPI

SCALE:	MADE BY: GAT	DATE: 3/20/98	FILE NO.
AS SHOWN	CHECKED BY:	DATE:	96B315

NORTH POND AREA
LANDFILL

FIGURE 6

K:\VICKSBUR\96B515\96b515H.dwg Mon Jul 13 15:51:44 1998

VIA AIRBORNE EXPRESS

Vicksburg
chemical company

Mr. Kevin Posey
Env. Engineer
Office of Pollution Control
2380 U.S. Highway 80 West
Jackson, MS 39204

June 19, 1997

Re: Cedar Chemical Company
Consent Decree W92-0008(B)
Expedited Investigation of SWMUs 1, 16 and 17

Dear Mr. Posey:

Please find accompanying this letter a copy of the report of the investigation of SWMUs 1, 16 & 17 at the Cedar (Vicksburg) site, a copy of a Corrective Measures Study and Corrective Measures Implementation Plan and an application to designate areas within the Vicksburg facility as a Corrective Action Management Unit (CAMU). Please contact Dr. Judy Sophianopoulos of the U.S. E.P.A, Region IV, and Cedar with any comments there may be.

Sincerely,

Steven T. Boswell

STB: pc

Steven T. Boswell
Director of Env. Affairs

xc: Mr. Politzer
Mr. Miles
Mr. Keen
Mr. Karkkainen, Woodward-Clyde

VIA AIRBORNE EXPRESS

Vicksburg chemical company

Dr. Judy Sophianopoulos
RCRA and FF Office
United States Environmental Protection Agency, Region IV
Atlanta Federal Center
100 Alabama Street, SW
Atlanta, Georgia 30303

June 17, 1997

Re: Cedar Chemical Company
Consent Decree W92-0008(B)
Expedited Investigation of SWMUs 1, 16 and 17

Dear Dr. Sophianopoulos:

Please find accompanying this letter the results of Cedar's investigation of SWMUs 1, 16 & 17, located within its site in Vicksburg, MS. Also with the report are a Corrective Measures Study and Corrective Measures Implementation Plan. Additionally, with these documents is an application to establish a Corrective Action Management Unit (CAMU) at the Vicksburg site for the purpose of segregating, managing and treating remediation wastes.

As we have discussed in the past, Cedar (Vicksburg) desires to utilize the site of the former Atrazine production facility for a new product line which does not involve the production of pesticides. For this reason, the investigation of the site was expedited by Cedar in an effort to provide EPA and MSDEQ with sufficient data to evaluate what actions would be appropriate for the site. Cedar has proposed some remediation within the area to reduce the risk of future releases and exposure.

Cedar respectfully requests that these documents receive EPA's attention in order to proceed with the project in a timely fashion. If there are any questions or needs for clarification, please contact me.

Sincerely,

Steven T. Boswell
Director of Env. Affairs

STB: pc

xc: Mr. Posey, MSDEQ
Mr. Politzer
Mr. Miles
Mr. Keen
Mr. Karkkainen, Woodward Clyde

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
P 875 307 658

Vicksburg chemical company

RECEIVED
FEB - 4 1997
Dept. of Environmental Quality
Office of Pollution Control

Dr. Judy Sophianopoulos
RCRA and FF Office
United States Environmental Protection Agency, Region IV
Atlanta Federal Center
100 Alabama Street, SW
Atlanta, Georgia 30303

January 30, 1997

Re: Consent Decree W92-0008(B)
Cedar Chemical Company RFI,
Investigation of SWMU 1, 16 & 17

Dear Dr. Sophianopoulos:

As we briefly discussed by telephone last week, it is Vicksburg's (Cedar's) desire to proceed with an investigation of SWMUs 1, 16 and 17. We have developed a workplan for these areas and also for SWMU 11 & 15, although work in SWMUs 11 & 15 is not immediately planned. The Workplan was developed with the intent of performing a thorough investigation prior to a planned future use for these areas.

Vicksburg intends to begin work February 10, 1997. Field work will be performed by Woodward-Clyde Consultants. Laboratory analyses of samples obtained will be performed by Pace Analytical Services, Inc., in St. Rose, Louisiana. It is hoped that work will be completed and a report of the investigation will be finished by mid-April, 1997. The results of the investigation will be sent to USEPA and MSDEQ.

Vicksburg understands that this work is being performed in advance of an approved RFI Workplan and that USEPA may required further work in these areas. Please contact me with any questions.

Sincerely,

Steven T. Boswell
Director of Env. Affairs

STB: pc

xc: Mr. Politzer
Mr. Miles
Mr. Malone, Apperson, Crump, Duzanne & Maxwell
Mr. Karkkainen, Woodward-Clyde
Mr. Kevin Posey, MSDEQ

VIA EXPRESS CARRIER

Vicksburg chemical company

Mr. Kevin Posey
Environmental Engineer
Office of Pollution Control
2380 Highway 80 West
Jackson, MS 39204

August 6, 1996

Re: Cedar Chemical Company RFI
Consent Decree Civil Number W92-0008B
RFI Workplan Draft, Groundwater Assessment Workplan Draft and
Preliminary Evaluation of Corrective Measures Technology Report

Dear Mr. Posey:

Please find with this letter a copy of the documents described above as required by the Consent Decree. Please contact me with any questions there may be.

Sincerely,

Steven T. Boswell
Director of Env. Affairs

STB: pc

xc: Mr. Miles
Mr. Malone
Mr. Karkkainen, Woodward-Clyde

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
P 371 [illegible]

Vicksburg chemical company

RECEIVED
AUG - 6 1996
[illegible]

Dr. Judy Sophianopoulos
RCRA and FF Office
United States Environmental Protection Agency, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

August 2, 1996

Re: Cedar Chemical Company RFI
Consent Decree Civil Number W92-0008B
Request for Temporary Unit One-Year Extension

Dear Dr. Sophianopoulos:

As we discussed by telephone recently, Vicksburg Chemical desires to extend the operating period for its Temporary Unit for an additional year. The purpose of the extension is to continue monitoring of toxaphene degradation in the three cells within the unit.

Per our conversation, a Public Notice and Comment period will again be necessary as will a Public Meeting to receive any comments from interested parties. Thank you for your consideration of this matter. Please contact me with any questions there may be.

Sincerely,

Steven T. Boswell
Director of Env. Affairs

STB: pc

xc: Mr. Miles
Mr. Madsen
Mr. Posey, MSDEQ
Mr. Karkkainen, Woodward-Clyde

JUN 19 1996

4WD-RCRA

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Steven T. Boswell
Director of Environmental Affairs
Vicksburg Chemical Company
Post Office Box 821003
Vicksburg, Mississippi 39182

SUBJ: EPA Approval of Proposal for
Further Interim Measures, SWMU No. 9
Vicksburg Chemical Company
MSD 990 714 081
Consent Decree, Civil Number W92-0008(B)

Dear Mr. Boswell:

The U.S. Environmental Protection Agency (EPA), Region 4, hereby notifies you that the Proposal for Further Interim Measures at Vicksburg Chemical Company (VCC), referenced above and in your letter, dated April 9, 1996, has been approved. EPA approves these interim measures in accordance with Paragraphs X. through XII. of Consent Decree, Civil Number W92-0008(B).

Your letter indicated that preliminary results are encouraging for the compost being used in the biotreatment study in VCC's Temporary Unit, approved by EPA in accordance with Subpart S of 40 CFR Part 264, on August 3, 1995, and in a sump adjacent to that unit. EPA approves VCC's proposal to test the compost in the former dinoseb drumming building, Solid Waste Management Unit (SWMU) Number 9, as described in your letter of April 9, 1996, a copy of which is enclosed.

VCC must obtain approval from EPA and the Mississippi Department of Environmental Quality (MDEQ), prior to making the decision that SWMU Number 9 has been decontaminated sufficiently to justify its use as a warehouse for VCC's current products.

If you have any questions, please contact Judy Sophianopoulos, EPA Project Coordinator, at (404) 347-3555, extension 6408.

Sincerely yours,

James D. Kutzman for

Richard D. Green
Acting Director
Waste Management Division

Enclosure

cc: w/enclosure

Mr. Jerry Banks, MDEQ
Mr. Kevin Posey, MDEQ

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
P 875 304 997

Vicksburg
chemical company

Dr. Judy Sophianopoulos
RCRA and FF Office
United States Environmental Protection Agency, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

April 9, 1996

Re: Cedar Chemical Company RFI
Consent Decree Civil Number W92-0008B
Proposal for Further Interim Measures, SWMU No.9

Dear Dr. Sophianopoulos:

As we discussed during your visit on March 8, 1996, Vicksburg Chemical desires to attempt the cleanup of the floor of the "Drumming Building" shown as SWMU No.9 in the Preliminary Report. This floor is contaminated with dinoseb and toxaphene which prevents its use without extra precautions against spreading contamination to materials that could be warehoused there.

The approach proposed is to use fresh composting medium like that currently in use in the Vicksburg Chemical Temporary Unit. A curb to retain the compost would be installed around the building. (See sketch.) The curb would also serve as a form for later concrete pours to level the floor. A layer of compost 6 to 8 inches deep would be placed directly on the floor. The material would be covered and kept wet to generate anaerobic conditions that favor destruction of dinoseb and toxaphene. An area of approximately 5,000 sq. ft. is intended to be treated.

Vicksburg is encouraged by the inspection of contaminated concrete in the Temporary Unit which has been in contact with a one-to-one mix of compost and soil. The concrete shows little remaining visible dinoseb. This particular concrete had been in contact with technical grade dinoseb for a long, but indeterminate time. (The dinoseb, upon discovery, was removed and disposed of in 1991.)

Sampling to determine dinoseb and toxaphene concentrations would be conducted at the four most obviously (by visual inspection) contaminated locations prior to the start of treatment. Analysis of the samples for dinoseb will be by EPA Method 8040. Method 8080 will be used for analysis of toxaphene.

At such time as analysis shows the dinoseb and toxaphene have been reduced to below 2.5 ppm, the compost would be removed from the building an placed in service to reduce contamination in other areas (yet to be selected).

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
P 875 304 997

Please advise Vicksburg Chemical of your decision regarding this request. A copy will also be sent to MSDEQ for their review. Thank you for your consideration of this matter. Please contact me with any questions there may be.

Sincerely,

Steven T. Boswell
Director of Env. Affairs

STB: pc

xc: Mr. Miles
Mr. Keen
Mr. Posey, MSDEQ
Mr. Karkkainen, Woodward-Clyde

CERTIFIED MAIL
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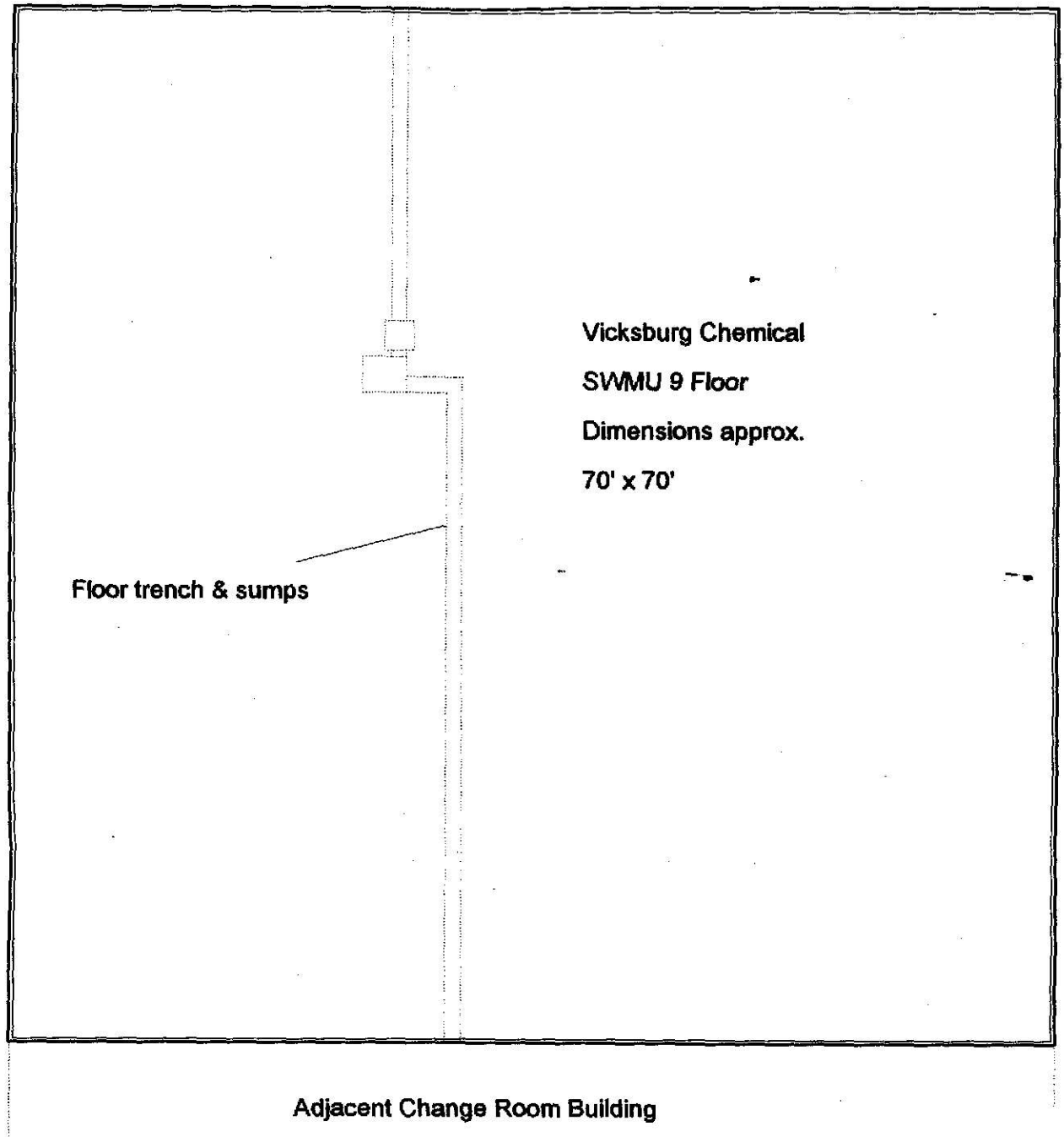
P 875 304 997



4WD-RCRA

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Steven T. Boswell
Director of Environmental Affairs
Vicksburg Chemical Company
Post Office Box 821003
Vicksburg, Mississippi 39182

Closure Plan Approved

SUBJ: EPA Approval of Closure Plan and
RCRA Facility Investigation Task I
Vicksburg Chemical Company
MSD 990 714 081
Consent Decree, Civil Number W92-0008(B)

Dear Mr. Boswell:

The U.S. Environmental Protection Agency (EPA), Region 4, hereby notifies you that the documents referenced above have been approved. EPA approves the revised documents, which Vicksburg Chemical Company (VCC) submitted on November 2, 1995, in response to EPA comments transmitted on October 11, 1995.

As you know, EPA notified the public of its intent to approve the documents referenced above on January 29, 1996, and announced a public comment period from January 30, 1996 to March 30, 1996, and a public meeting on March 5, 1996. No comments were received by EPA, and no members of the public attended the public meeting on March 5, 1996.

The Closure Plan and RCRA Facility Investigation Task I for the Vicksburg Chemical Company site on Rifle Range Road, as revised and submitted on November 2, 1995 are approved. In accordance with Consent Decree, Civil Number W92-0008(B), the following documents must be submitted within 60 days of your receipt of this letter:

1. Draft RFI Workplan
2. Groundwater Assessment Workplan
3. Pre-Investigation Evaluation of Corrective Measures Technologies
4. Summary of Personnel Qualifications

VCC has submitted documents 2 through 4 in the preceding paragraph; some minor updates or revisions may be necessary. The

RCRA Facility Investigation, itself, can begin within fifteen days of final approval of the Draft RFI Workplan.

If you have any questions, please contact Judy Sophianopoulos, EPA Project Coordinator, at (404) 347-3555, x-6408.

Sincerely yours,

Richard D. Green
Acting Director
Waste Management Division

cc: Mr. Jerry Banks, MDEQ
Mr. Kevin Posey, MDEQ

CERTIFIED MAIL
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P 875 304 997

Vicksburg
chemical company

Dr. Judy Sophianopoulos
RCRA and FF Office
United States Environmental Protection Agency, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

April 9, 1996

Re: Cedar Chemical Company RFI
Consent Decree Civil Number W92-0008B
Proposal for Further Interim Measures, SWMU No.9

Dear Dr. Sophianopoulos:

As we discussed during your visit on March 8, 1996, Vicksburg Chemical desires to attempt the cleanup of the floor of the "Drumming Building" shown as SWMU No.9 in the Preliminary Report. This floor is contaminated with dinoseb and toxaphene which prevents its use without extra precautions against spreading contamination to materials that could be warehoused there.

The approach proposed is to use fresh composting medium like that currently in use in the Vicksburg Chemical Temporary Unit. A curb to retain the compost would be installed around the building. (See sketch.) The curb would also serve as a form for later concrete pours to level the floor. A layer of compost 6 to 8 inches deep would be placed directly on the floor. The material would be covered and kept wet to generate anaerobic conditions that favor destruction of dinoseb and toxaphene. An area of approximately 5,000 sq. ft. is intended to be treated.

Vicksburg is encouraged by the inspection of contaminated concrete in the Temporary Unit which has been in contact with a one-to-one mix of compost and soil. The concrete shows little remaining visible dinoseb. This particular concrete had been in contact with technical grade dinoseb for a long, but indeterminate time. (The dinoseb, upon discovery, was removed and disposed of in 1991.)

Sampling to determine dinoseb and toxaphene concentrations would be conducted at the four most obviously (by visual inspection) contaminated locations prior to the start of treatment. Analysis of the samples for dinoseb will be by EPA Method 8040. Method 8080 will be used for analysis of toxaphene.

At such time as analysis shows the dinoseb and toxaphene have been reduced to below 2.5 ppm, the compost would be removed from the building an placed in service to reduce contamination in other areas (yet to be selected).

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
P 875 304 997

Please advise Vicksburg Chemical of your decision regarding this request. A copy will also be sent to MSDEQ for their review. Thank you for your consideration of this matter. Please contact me with any questions there may be.

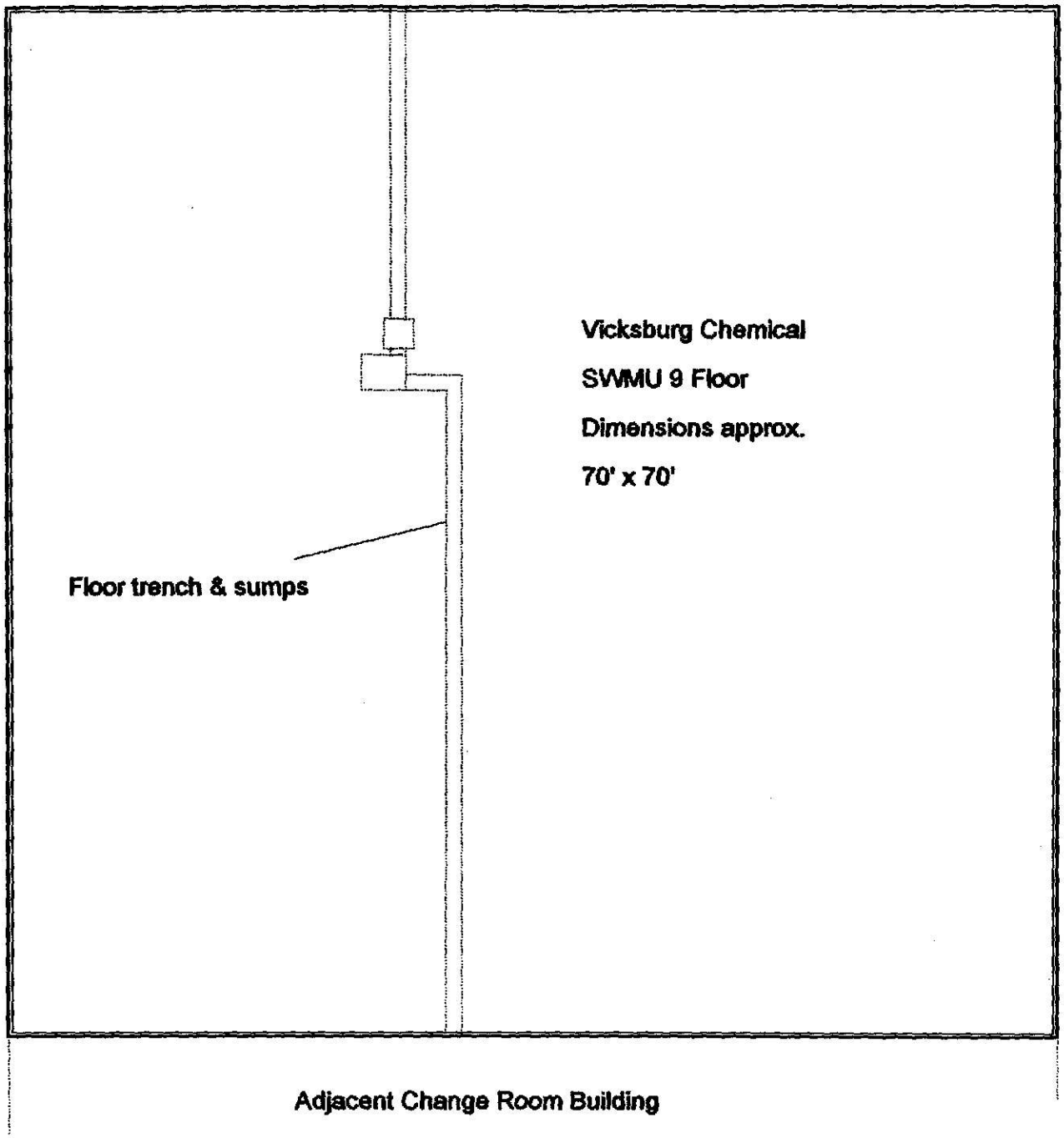
Sincerely,

Steven T. Boswell
Director of Env. Affairs

STB: pc

xc: Mr. Miles
Mr. Keen
[redacted], MSDEQ
Mr. Karkkainen, Woodward-Clyde

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
P 875 304 997



Woodward-Clyde
Engineering & science applied to the earth & its environment

November 2, 1995

Mr. G. Alan Farmer
Chief, RCRA Branch
Waste Management Division
United States Environmental Protection Agency
Region 4
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Re: Amended and Supplemental Preliminary Report
(February 1994) RCRA Facility Investigation Task I;
and Closure Plan (February 1995)
Vicksburg Chemical Company
MSD 990 714 081
Consent Decree, Civil Number W92-0008(B)

Dear Mr. Farmer:

Attached are copies of the referenced documents incorporating U.S. Environmental Protection Agency comments. Mr. Steve Boswell, Director of Environmental Affairs for Vicksburg Chemical, instructed me to send them directly to you. For reference, a tabulation of the comments and corrections is also attached.

Very truly yours,

Richard D. Karkkainen
Vice President and Principal

cc: Mr. Jerry Banks, MDEQ
Mr. Kevin Posey, MDEQ
Mr. Allen Malone
Mr. Steve Boswell

RDK:tlc

Attachment

92B007C\ASPRRCRA.LTR VICKSBUR

Woodward-Clyde Consultants – A Subsidiary of Woodward-Clyde Group, Inc.
2822 O'Neal Lane • Baton Rouge, Louisiana 70816
(504) 751-1873 • Fax (504) 753-3616

TABLE 1

REVISIONS TO RFI TASK I: AMENDED AND SUPPLEMENTAL PRELIMINARY RFI REPORT, FEBRUARY 1994, VICKSBURG CHEMICAL COMPANY MSD 990 714 081

Section number, page number, paragraph number, line number	Revision
Table of Contents, i	List of acronyms added
1.0, 1-2, 1, 3 and 4	"SWMU 16 (Former Atrazine Production Area)"
1.0, 1-2, last, last	"Kearney"
2.1	"SWMUs is shown"
2.2.3, 2-5, 2, last	"The U.S. EPA observed in a meeting with VCC on June 10, 1995 that since phosphorus trichloride was used in the production of methyl parathion there was a possibility of the chlorine atoms in combination with the phenol molecules present to produce traces of dioxin. VCC will sample and analyze the area for dioxins during the field activities associated with the RFI."
2.2.4, 2-6, 2, 1	"processing areas"
2.3.1, 2-8, 3, 2	"come to an"
2.3.1, 2-11, 3, 3	"(SWMU 1)"
2.3.2, 2-13, 2, 3	"reduce"
4.2.2, 4-4, 2 and 3 and table	"Aquifer properties obtained during various investigations prior to 1993 are summarized below: "," 1* "," Notes: * MW-1 was replaced by MW-1A in 1986 (see section 5.1.1)"
4.6.2, 4-8, 3, 4	"of these"
4.6.3, 4-10, 1, last	"affecting"
5.0, 5-1, 1, 4	"regard"
5.1.1, 5-2, 1, 5 and 7	"Results of groundwater sampling associated with these wells is shown in Appendix H. Trace contamination of well number 1 with dinoseb, and wells 5, 6, 7 and 8 with arsenic is noted. Other contamination such as chloroform and trichloroethylene is also detected."
5.1.1, 5-2, last, 1	"well numbers 1-A and 9."
8.2, 8-3, last, 1	"The reason for the piezometers was"
9.1, 9-1, 1, 5	"(AOCs)"

TABLE 1 (Continued)

REVISIONS TO RFI TASK I: AMENDED AND SUPPLEMENTAL PRELIMINARY RFI REPORT, FEBRUARY 1994, VICKSBURG CHEMICAL COMPANY MSD 990 714 081

Section number, page number, paragraph number, line number	Revision
9.1, 9-2, 2, 5	"and was submitted"
9.1, 9-2, 2. *bullet 2*	"The closure plan which contains investigative, remedial and verification steps was submitted in June 1992. It is now proposed to incorporate the elements of the closure plan into the RFI work plan and corrective action process. The proposal is reflected in the Closure Plan submitted in June 1995."
9.3, 9-3, 1, 10	"landfill, the solid waste containment area (SWCA), designed"
9.3, 9-3, 2, 4	"the SWCA."
9.3, 9-3, 2, 6 and 7	"Retrofitting of the Surface Impoundment with geosynthetic liners has been completed."
9.5, 9-5, 2	"de minimus"
9.6, 9-6, 1, 1 and 2	"Sampling will be conducted to confirm this assessment."
9.10, 9-8, 2	"This area will also be sampled and analyzed for the presence of dioxin (see Section 2.2.3 and Section 9.14)."
9.14, 9-10, bullet 2	"The SWMU 11 investigation will include testing for 4-nitrophenol and for dioxin."
9.16, 9-11, 2	"The closure plan which contains investigative, remedial and verification steps was submitted in June 1992. It is now proposed to incorporate the elements of the closure plan into the RFI work plan and corrective action process. The proposal is reflected in the Closure Plan submitted in June 1995."
9.28, 9-17, 1, 4	"evident"
9.28, 9-17, 1, 5	"in the area"
9.29. 9-18 , 1	"Monitoring wells MW-12, MW-1A, MW-16 and MW-19 will continue to be sampled to detect releases from AOC 2 and SWMUs and AOCs mean AOC 2 mean AOC 2."
Appendix B, title page	"DNR Corrective Action Order"

TABLE 1 (Continued)

REVISIONS TO RFI TASK I: AMENDED AND SUPPLEMENTAL PRELIMINARY RFI REPORT, FEBRUARY 1994, VICKSBURG CHEMICAL COMPANY MSD 990 714 081

Section number, page number, paragraph number, line number	Revision
Appendix C, 1	List of wells and piezometers on bottom of page and references to groundwater analytical data have been deleted. Groundwater analytical data is found in Appendix H.
Appendix C, Figure 1	MW-1A is the well that is referenced.
Appendix H, 2	Data on toxaphene for MW-1A through MW-7 was out of order. Refer to page H-52.
Appendix H, H-54	"Sampling, Piezometer Installation and Results of Analyses (North Pond Area)."
Appendix H, H-54	Figures 2, 3, 4 and 5 are for the North Pond Area. Figure 2, 3, 4 and 5 are located in Appendix C of "Amended and Supplemental Preliminary Report RCRA Facility Investigation (this volume) "and also in" North Pond RCRA Facility Investigation Report (February 1994)."
9.30, 9-18, title	"Booster Pumps/Neutralization Tanks"
10.2, 10-5, 1, 3	"(SWMU 2)"
12, 12-2, reference 8	"6-isopropylamino-s-triazine
Tables	Page numbers added to all tables
Table 1, SWMU 3, column 3, 3	"The 10 feet to 15 feet deep ponds have been retrofitted with geosynthetic liners."
Table 1, SWMU 34, column 4, 1	"Temporary"
Table 2	page, has been added
Table 6, 2, item 7	"revised Part B"
Table 7, 1, item 1, 2	"monoxide"
Table 7, 4, item 1, 1	"Miles"
Table 7, 5, item 1, 2	"There was a 30 lb. release of nitrogen dioxide from C-10 to the atmosphere. There problem was due to malfunction of a level controller on the reflux accumulator."

TABLE 1 (Continued)

REVISIONS TO RFI TASK I: AMENDED AND SUPPLEMENTAL PRELIMINARY RFI REPORT, FEBRUARY 1994, VICKSBURG CHEMICAL COMPANY MSD 990 714 081

Section number, page number, paragraph number, line number	Revision
Table 7, 5, item 2	"Jerry Beasley (MSDEQ), The NPDES effluent discharge line was damaged and partially broken near the point of discharge into the Mississippi River. The problem was discovered on February 6 and completely repaired by February 10."
Appendices	Pages in Appendices B-H are now numbered for clarity.

TABLE 2

REVISIONS TO CLOSURE PLAN:
REVISED, FEBRUARY 1995
VICKSBURG CHEMICAL COMPANY
MSD 990 714 081

Section number, page number, paragraph number, line number	Revision
Table of Contents, i	List of acronyms added
3.3.3, 9, 1, 2	"The positions of the 12 proposed sample locations in warehouse areas, noted in Figure 2, are approximate."
3.3.3, 9, 3, 2	"As a point of reference, according to guidance provided in OSWER 9476-00-8.C, a clean closure demonstration may be made with one sample per 2500 ft^2 assuming the area and depth to be sampled are not highly variable."
3.3.3, 10, 1, 3	"If anomalies are found during sampling, additional samples will be taken. When analyses are obtained and reviewed, it may also become evident that a second round of sampling and analysis is required."
3.4, 14, 1, 6	"The following are the health based closure standards for soils and concrete, assuming that the exposure pathway is ingestion, and the receptors are workers at the site. This assumption will require a restriction on future land use at the site. (See OSWER Directive No. 9355.7-04, Land Use in the CERCLA Remedy Selection Process, May 25, 1995)"
3.4, table	Arsenic 1.8
3.4, 14, new paragraph following table	"Clean closure standards for soil leachate require that concentrations in the TCLP extract of the soil shall not exceed MCLs. Where MCLs have not been established, concentrations in the TCLP extract of the soil shall not exceed health based levels calculated, using a consumption rate of 2 liters of leachate per day."
3.4.1.3, 16, 1st table, column 2	"$(mg/kg/day)^{-1}$"
3.4.1.3, 16, 1st table, column 4	"kg/kg/day"
3.4.1.4, 16, 2nd table, column 2	"mg/kg/day"
3.4.2, 19, table, column 2	"unitless"
3.4.2, 19, table, column 3	"(mg/kg/day)-1"
3.4.2, 19, table, column 5	"(kg/kg/day)"

TABLE 2 (Continued)

REVISIONS TO CLOSURE PLAN
REVISED, FEBRUARY 1994,
VICKSBURG CHEMICAL COMPANY
MSD 990 714 081

Section number, page number, paragraph number, line number	Revision
3.4.2, 19, table, new row	Arsenic concentration level calculated with oral slope factor = 1.6 $(mg/kg/day)^{-1}$, risk of 1 E - 06, and because it is an industrial setting EF = 250 and IR = 100.
3.4.3, 20, 1st table, column 6	"400 ppm"
3.4.3, 20, 1st table, column 4 (arsenic)	0.24 E -04
5.0, 23, table, column 4 (sampling labor)	$2,400
Figure 3	Made consistent with Figure 2
Appendix C, 5, 5, 1 through 6	VCC is an operating industrial facility, bounded by a lumber mill, cement plant, Publicly Owned Treatment Works, and buffered by terrain from residential area. Since the assumptions are made that the exposure pathway is ingestion and the receptors are workers at the site, a restriction on future land use at the site will be made.
Appendix C, OSWER Directive 9355.0-30	Readable copy provided
Appendix D	"The Data Collection Quality Assurance Plan and Data Management Plan are attached and incorporated by reference. The plans are from the North Pond RFI Work Plan and are to be used as guidance where parameters and techniques are applicable."
Appendix D, 1, 2, 4	"included"
Appendix D, 1, 2, 7	"meet"
Appendix D, 53, last, next to last	"Systems and"
Appendix D, 55, last, last	"assess"
Appendix D, 58, 2, 1	"be reviewed to"
Appendix D, 58, 2, 7	"WCC"
Appendix D, 59, last, 2 and 3	"if all in", "field"
Appendix E, 14, 4 next to last	"pesticide"

TABLE 2 (Continued)

REVISIONS TO CLOSURE PLAN
REVISED, FEBRUARY 1994,
VICKSBURG CHEMICAL COMPANY
MSD 990 714 081

Section number, page number, paragraph number, line number	Revision
Appendix E, 23, 2, 5	"field"
Appendix G, 1, 1, 1	"Trust Agreement"
Appendix G, 1, 2, 6	"Schedule A"
Appendix G, 5 and 6	Sections 15, 16, 17 and 18 have been replaced with appropriate Sections 15, 16, 17, 18, 19 and 20.
Appendix G, 9	"Schedule A"

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4

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

OCT 1 1 1995

4WD-RCRA

CEERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Steven T. Boswell
Director of Environmental Affairs
Vicksburg Chemical Company
Post Office Box 821003
Vicksburg, Mississippi 39182

SUBJ: Amended and Supplemental Preliminary Report (February 1994) RCRA Facility Investigation Task I; and Closure Plan (February 1995)
Vicksburg Chemical Company
MSD 990 714 081
Consent Decree, Civil Number W92-0008(B)

Dear Mr. Boswell:

The U.S. Environmental Protection Agency (EPA), Region 4, has completed a review of the documents referenced above, which were submitted by Vicksburg Chemical Company (VCC), in accordance with Paragraphs VII.B. and IV.A., respectively, of Consent Decree, Civil Number W92-0008(B) ("Consent Decree").

Enclosed please find comments based on that review. The comments are listed in tabular form in the enclosure, and the majority of the comments are editorial in nature. The Mississippi Department of Environmental Quality (MDEQ) participated in the review, and a copy of this letter is being forwarded to MDEQ.

Approval of the two documents referenced above is contingent upon incorporation by VCC of the enclosed comments into revisions of the documents. Upon receipt of the revised documents, EPA and MDEQ will review them and issue a tentative decision, which is subject to the decision making procedures of 40 CFR Part 124 and the requirements of Consent Decree Section XXIV., Public Access to Information.

In a letter, dated March 1, 1994, VCC requested EPA's approval of a delay in closure of Solid Waste Management Units (SWMUs) 1 and 17, addressed in the above referenced closure plan, in order to include these areas in the overall remediation of the site. EPA agrees that incorporating closure of SWMUs 1 and 17 into the overall remediation of the site will expedite the

remediation process. Section 6.0, Closure Schedule, of the closure plan referenced above, includes delay of closure activities until 10 days after approval of the RFI Workplan. Final approval of the revised closure plan will include approval of this delayed closure.

If you have any questions concerning this letter and the enclosed comments, please contact Judy Sophianopoulos, Project Coordinator at (404) 347-3555, x6408.

Sincerely yours,

G. Alan Farmer
Chief, RCRA Branch
Waste Management Division

Enclosure

cc: Mr. Jerry Banks, Acting Chief, MDEQ
Mr. Kevin Posey, MDEQ

TABLE 1: EPA COMMENTS ON
RFI TASK I: AMENDED & SUPPLEMENTAL
PRELIMINARY RFI REPORT, FEBRUARY 1994
VICKSBURG CHEMICAL COMPANY
MSD 990 714 081

Abbreviations: Pg. # = Page Number; Pr. # = Paragraph Number; Ln. # = Line Number

Section Number	Pg. #	Pr. #	Ln. #	Currently Reads	Should Read and/or Comment
Prior to Section 1.0	i.				Add a page i., containing a list of acronyms, and include page i. in Table of Contents. (See also first row under Closure Plan comments below.)
1.0	1-2	1	3,4	"SWMU 14 (Former Atrazine Production Area)"	"SWMU 16 (Former Atrazine Production Area)"
1.0	1-2	Last	Last	"Kearny"	"Kearney"
2.1	2-3	3	Last	"SWMUs in shown"	"SWMUs is shown"
2.2.3	2-5	2	All		As discussed on 6/10/95, in Warren County Library, this area should be checked for dioxins, because of past use of phosphorus trichloride in production of methyl parathion.
2.2.4	2-6	2	1	"processing area"	"processing areas"
2.3.1	2-8	3	2	"come an"	"come to an"
2.3.1	2-11	3	3	"(SWMU 2)"	"(SWMU 1)"
2.3.2	2-13	2	3	"reduced"	"reduce"

Table 1, Continued
EPA Comments on RFI Task I

Abbreviations: Pg. # = Page Number; Pr. # = Paragraph Number; Ln. # = Line Number					
Section Number	Pg. #	Pr. #	Ln. #	Currently Reads	Should Read and/or Comment
4.2.2	4-4	2, 3, and Table			Confusion between MW-1 and MW-1A, see Figures 6 and 13; clarify that the two wells are explained on page 5-2. The sentence introducing the table needs clarification.
4.6.2	4-8	3	4	"of the these"	"of these"
4.6.3	4-10	1	Last	"effecting"	"affecting"
5.0	5-1	1	4	"regards"	"regard"
5.1.1	5-2	1	5, 7	"is shown" "contamination"	"are shown" "contaminants"
5.1.1	5-2	Last	1	"well numbers 1 and 9"	Was this contamination found in MW-1 or MW-1A, the replacement well?
8.2	8-3	Last	1	"The reason for the piezometers were"	"The reason for the piezometers was"
9.1	9-1	1	5	"(OACs)"	"(AOCs)"
9.1	9-2	2	5	"was submitted"	"and was submitted"
9.1	9-2	2	2 of 2nd bul-leted item	"It is not proposed"	"It is now proposed" See comment on Section 9.16, 2nd paragraph, 2nd bulleted item, page 9-11: These two bulleted items should be identical.
9.3	9-3	1	10	"landfill designed"	"landfill, the solid waste containment area (SWCA), designed"

Abbreviations: Pg. # = Page Number; Pr. # = Paragraph Number; Ln. # = Line Number					
Section Number	Pg. #	Pr. #	Ln. #	Currently Reads	Should Read and/or Comment
9.3	9-3	2	4	"an on-site landfill designed in accordance with RCRA guidelines."	"the SWCA."
9.3	9-3	2	6,7	"The Surface Impoundment has been retrofitted with geosynthetic liners which has been completed."	"Retrofitting of the Surface Impoundment with geosynthetic liners has been completed."
9.5	9-5	2	2 of 2nd bul-leted item	"diminimus"	"de minimus"
9.6	9-6	1	1,2	"WCC...the following reasons:"	Add a sentence to state that confirmatory sampling will be conducted to confirm this assessment.
9.10	9-8	2			Add a sentence ststing that this area will also be checked for presence of dioxin. See comment on Section 2.2.3, page 2-5, above.

Table 1, Continued
EPA Comments on RFI Task I

Abbreviations: Pg. # = Page Number; Pr. # = Paragraph Number; Ln. # = Line Number					
Section Number	Pg. #	Pr. #	Ln. #	Currently Reads	Should Read and/or Comment
9.14	9-10	3	2nd bul-leted item	"4 nitro phenol"	"4-nitrophenol" Add a sentence stating that this area will also be checked for presence of dioxin. See comment on Section 2.2.3, page 2-5, and on Section 9.10, page 9-8, above.
9.16	9-11	2	1 - 4 of 2nd bul-leted item		Make sure that the 2nd bulleted item, 2nd paragraph, Section 9.1, page 9-2, reads the same as this item does. See comment on Section 9.1, page 9-2, line 2 of 2nd bulleted item.
9.28	9-17	1	4	"evidence"	"evident"
9.28	9-17	1	5	"in area."	"in the area."
9.29	9-18	1			Add a sentence indicating that the monitoring wells near this area will continue to be sampled to detect releases from SWMUs and AOCs near AOC 2, as well as AOC 2. (The well numbers should be given; they appear to be MW-9, 13, 14, 16, 1A, 10, 11.)

Table 1, Continued
EPA Comments on RFI Task I

Abbreviations: Pg. # = Page Number; Pr. # = Paragraph Number; Ln. # = Line Number

Section Number	Pg. #	Pr. #	Ln. #	Currently Reads	Should Read and/or Comment
9.30	9-18	Section title		"BUMPS"	"PUMPS" Figure 2 and this section should have the same name for this AOC. Both should say "Booster Pumps/Neutralization Tanks (South Plant)."
10.2	10-5	1	3	"(SWMU 1)"	"(SWMU 2)"
12.0	12-2	8th Reference	2	"-6-isio"	"6-iso"
Table 1	SWMU 3	Column 3	3	"10 to 15 deep"	"10 ft to 15 ft deep" Add page numbers to Tables 1, 3, 4, and 5.
Table 1	SWMU 34	Column 4	1	"Temporarily"	"Temporary"
Table 2	2				Page 1 is missing; therefore, SWMU 2, and others are missing from Table 2.
Table 6	2	7th Item		"revised part in"	"revised Part B"
Table 7	1	1st Item	2	"dioxide"	"monoxide"
Table 7	4	1st Item	1	"miles"	"Miles"
Table 7	5	1st Item	2	"reflex"	"reflux"

Table 1, Continued
EPA Comments on RFI Task I

Abbreviations: Pg. # = Page Number; Pr. # = Paragraph Number; Ln. # = Line Number

Section Number	Pg. #	Pr. #	Ln. #	Currently Reads	Should Read and/or Comment
Table 7	5	1st and 2nd Items	1		This item should be rewritten to clarify exact meaning, and to clarify whether MSDEQ letter writer is "Jenny" or "Jerry" Beasley. Page 4 lists leter writer as "Jenny" Beasley.
All Appendi-ces					Pages in each Appendix should be numbered, for clarity.
Appendix B	Title Page				Only the Order, not corrective action information, is included, although the title page says both are included.
Appendix C	1, 2	Last, Fig-ure 1			MW-1, rather than MW-1A appears in Figure 1; Figure 1 shows MW-12 and MW-3, while these are not included in list at bottom of page 1.
Appendix H	2	Table			No data for MW-1A - MW-7
Appendix H	54	Table	Samp-ling, Piez-ome-ter Inst-alla-tion & Re-sults of Anal-ysis		Clarify that these data and Figures 2, 3, 4, and 5 are for North Pond Area.

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Section Number	Pg. #	Pr. #	Ln. #	Currently Reads	Should Read and/or Comment
Appendix H	Last	Notes			The Appendices in these notes are in another report; the report should be identified.

TABLE 2: EPA COMMENTS ON
CLOSURE PLAN: REVISED, FEBRUARY 1995
VICKSBURG CHEMICAL COMPANY
MSD 990 714 081

Abbreviations: Pg. # = Page Number; Pr. # = Paragraph Number; Ln. # = Line Number

Section Number	Pg. #	Pr. #	Ln. #	Currently Reads	Should Read and/or Comment
Prior to Section 1.0	i.				Add a page i., containing a list of acronyms, and include page i. in Table of Contents.
3.3.1, 3.3.3	8,9	Next to Last, 1st	1,2	"SWMU will have eight sample points and SWMU 17 will have four sample points." "The sampling locations of the 14 proposed sample locations in warehouse"	There appears to be a discrepancy in the number of sampling locations on these two pages. Also, the second sentence quoted should probably read: "The 14 proposed sampling locations in warehouse"

Abbreviations: Pg. # = Page Number; Pr. # = Paragraph Number; Ln. # = Line Number

Section Number	Pg. #	Pr. #	Ln. #	Currently Reads	Should Read and/or Comment
3.3.3	9	3	2-4	"As...one sample per 2500 ft^2."	Note that Appendix B., page B-1, Item 3., of OSWER Directive No. 9476.00-8, *Surface Impoundment Clean Closure Guidance Manual*, states that the number of samples will depend on the degree of variability within the surface impoundment. Although a minimum of 4 samples per depth could result in one sample per 2500 ft^2, page 2-3, Section 2.2.1 of the directive, also states that the sample must be representative, and the number of sampling sites necessary will depend on variability of wastes with time, area, and depth.

Abbreviations: Pg. # = Page Number; Pr. # = Paragraph Number; Ln. # = Line Number

Section Number	Pg. #	Pr. #	Ln. #	Currently Reads	Should Read and/or Comment
3.4	14	1	6	"The following are the health based closure standards for soils and concrete."	"The following are the health based closure standards for soils and concrete, assuming that the exposure pathway is ingestion, and the receptors are workers at the site. This assumption will require a restriction on future land use at the site. (See OSWER Directive No. 9355.7-04, Land Use in the CERCLA Remedy Selection Process, May 25, 1995.)"
3.4	14	Add a 2ndPr.	After Last Line of 1st Pr.		Add: "Clean closure standards for soil leachate require that concentrations in the TCLP extract of the soil shall not exceed MCLs. Where MCLs have not been established, concentrations in the TCLP extract of the soil shall not exceed health based levels calculated, using a consumption rate of 2 liters of leachate per day."
3.4.1.3	16	1stTa-ble	2nd Col-umn	"$(kg/kg/day)^{-1}$"	"$(mg/kg/day)^{-1}$"
3.4.1.3	16	1st Ta-ble	4th Col-umn	"mg/kg/day"	"kg/kg/day"

Table 2, Continued
EPA Comments on Closure Plan

Page T2-4

Abbreviations: Pg. # = Page Number; Pr. # = Paragraph Number; Ln. # = Line Number

Section Number	Pg. #	Pr. #	Ln. #	Currently Reads	Should Read and/or Comment
3.4.1.4	16	2nd Table	2nd Column	"kg/kg/day"	"mg/kg/day"
3.4.1.4	16	2nd Table	4th Column	"mg/kg/day"	"kg/kg/day"
3.4.2	19	Table	2nd Column	"(mg/kg)"	Delete, as the risk is unitless.
3.4.2	19	Table	3rd Column	"$(mg/kg/day^1)$"	"$(mg/kg/day)^{-1}$"
3.4.2	19	Table	5th Column	"(mg/kg/day)"	"(kg/kg/day)"
3.4.3	20	1st Table	6th Column	"40 ppm"	"400 ppm"
3.4.3	20	1st Table	4th Column, Arsenic Row	"0.8E-04"	"0.24E-04" Note, arsenic concentration level should also be calculated, based on the fact that it is a human carcinogen. EPA's Draft Soil Screening Guidance (EPA/540/R-94/101, December 1994, OSWER Directive No. 9355.4-14FS) suggests 0.4 ppm for risk of 1E-06 in residential setting, where EF = 350, IR = 114, and oral slope factor = 1.6 $(mg/kg/day)^{-1}$.

Table 2, Continued
EPA Comments on Closure Plan

Abbreviations: Pg. # = Page Number; Pr. # = Paragraph Number; Ln. # = Line Number

Section Number	Pg. #	Pr. #	Ln. #	Currently Reads	Should Read and/or Comment
5.0	23	Table	4th Column, 9th Row	"3,400"	"2,400"
Figure 3					The number of sampling locations appears to be greater than in Figure 2.
Appendix C	5 of OSWER 9355.0-30	5	1-6		VCC is not a site that is "surrounded by operating industrial facilities." See comment on Section 3.4, page 14, above.
Appendix C	10 of OSWER 9355.0-30	Table	Notes	(Unreadable)	(Provide readable copy of OSWER Directive No. 9355.0-30)
Appendix D					Just before this 1st paragraph, indicate that the plan for the North Pond is an example plan, by repeating the 1st 2 sentences of 5th paragraph of Section 3.3.3, page 10.
Appendix D	1	2	4	"include"	"included"
Appendix D	1	2	7	"meets"	"meet"

Table 2, Continued
EPA Comments on Closure Plan

Abbreviations: Pg. # = Page Number; Pr. # = Paragraph Number; Ln. # = Line Number

Section Number	Pg. #	Pr. #	Ln. #	Currently Reads	Should Read and/or Comment
Appendix D	53	Last	Next to Last	"System sand"	"Systems and"
Appendix D	55	Last	Last	"access"	"assess"
Appendix D	58	2	1,7	"be review to" "wcc"	"be reviewed to" "WCC"
Appendic D	59	Last	2,3	"if al in" "filed"	"if all in" "field"
Appendix E	14	4	Next to Last	"pestiide"	"pesticide"
Appendix E	23	2	5	"filed"	"field"
Appendix G	1	1	1	"This Agreement"	"Trust Agreement" [Wording must be exactly the same as the wording in MHWMR § 264.151(a).
Appendix G	1	2	6	"Exhibit A"	"Schedule A"
Appendix G	5				Section 15. *Notice of Nonpayment* is missing. (See page 197 of 40 CFR § 254.161, 7-1-94 Edition.)
Appendix C	6				Section 19. *Choice of Law* and Section 20. *Interpretation* are missing. (See page 198 of 40 CFR § 254.161, 7-1-94 Edition.)

Table 2, Continued
EPA Comments on Closure Plan

Page T2-7

Abbreviations: Pg. # = Page Number; Pr. # = Paragraph Number; Ln. # = Line Number					
Section Number	Pg. #	Pr. #	Ln. #	Currently Reads	Should Read and/or Comment
Appendix G	9		1	"Exhibit A"	"Schedule A"

VIA AIRBORNE EXPRESS

Vicksburg chemical company

Ms. Jeaneanne Gettle, Acting Chief
Waste Compliance Section
RCRA and FF Branch
U.S. EPA, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

March 8, 1995

Attention: Dr. Judy Sophianopoulos

Re: Cedar Chemical Corporation, MSD990714081
Consent Decree and RCRA Facility Investigation
Revised Closure Plan for SWMU No.1

Dear Dr. Sophianopoulos:

As required by EPA's letter dated November 9, 1994, please find two copies of the revised Closure Plan for SWMU No. 1 at the Vicksburg facility. Please contact Cedar with any comments or objections you may have concerning this report.

Sincerely,

Steven T. Boswell
Director of Env. Affairs

STB: pc

xc: Mr. Miles
Mr. Madsen
Mr. Malone, Apperson, Crump, Duzane & Maxwell
Mr. Karkkainen, Woodward-Clyde
Mr. Jerry Banks, MSDEQ

File

VICKSBURG CHEMICAL WARREN CO. RCRA / HSWA

VIA AIRBORNE EXPRESS

Vicksburg chemical company

Mr. John Dickinson, Chief
Waste Compliance Section
RCRA and FF Branch
USEPA, Region IV
345 Courtland Street, N.E.
Atlanta, GA 30365

November 7, 1994

Re: Cedar Chemical Corporation, MSD990714081
Consent Decree and RCRA Facility Investigation
SWMU Nos. 9 & 16

Dear Mr. Dickinson:

Please find with this letter two copies of a report of an investigation performed in SWMU Nos. 9 and 16, at the Cedar Chemical site in Vicksburg, MS. The report consists of two documents prepared by Cedar's contractor, Woodward-Clyde Consultants, Inc. The documents are the Investigation Workplan and Investigation Report. These items were prepared with the intent of accelerating the requirements of the Consent Decree and its associated Scopes of Work. This report is supplied for the same reasons indicated in my letter to you dated March 1, 1994, with regard to SWMU 23 (the North Pond); i.e., Cedar's need to complete the facility investigation and in some cases remedial measures in those areas of the facility needed for expansion of current operations while EPA's approval of a facility-wide RFI Workplan is pending.

Cedar intends to perform remediation in SWMU 9 at this time. The work will consist of removal of contaminated concrete flooring and some underlying soil. Removed materials will be disposed off-site in accordance with regulations. Removed soil will be replaced with clean fill and the floor in this unit will be sealed with a water stopping agent and an impermeable membrane. A new, four-inch thick, fiber-reinforced concrete floor will be installed over the original floor and will overlap the edge of the original floor to prevent migration of any remaining hazardous constituents. Joints between newly poured sections of floor will be sealed. Following this work, Cedar intends to use this unit for warehousing purposes.

P.O. Box 821003 • Vicksburg, MS 39182
Bus: (601) 636-1231 • Fax: (601) 636-5767

VIA AIRBORNE EXPRESS

Please contact me with your comments or objections by not later than November 30, 1994.

Sincerely,

Steven T. Boswell

STB: pc

Steven T. Boswell
Director of Env. Affairs

xc: Mr. Miles
Mr. Madsen
Mr. Malone, Apperson, Crump, Duzane and Maxwell
Mr. Mabry, MSDEQ

VICKSBURG CHEMICAL COMPANY

P.O. Box 821003 • Vicksburg MS 39182 • 601-636-1231 • FAX 601-636-5767

VIA EXPRESS DELIVERY

Mr. John Dickinson, Chief
Waste Compliance Section
RCRA & FF Branch
United States Environmental Protection Agency
345 Courtland Street, NE
Atlanta, Georgia 30365

Mr. Sam Mabry, Chief
Hazardous Waste Division
Bureau of Pollution Control
Mississippi Department of Environmental Quality
P.O. Box 10385
Jackson, MS 39209

Re: Cedar Chemical Corporation
MSD 990714081, Consent Decree
Entered April 17, 1992 in
United States of America v.
Cedar Chemical Corporation,
Civil No. W92-0008(B)

March 1, 1994

Gentlemen:

Since entry of the referenced Consent Decree nearly two years ago, we have continued to dismantle and dispose of idle equipment which formerly was associated with the production of pesticides. We also commissioned our environmental consulting firm, Woodward-Clyde, to carry out a thorough investigation of SWMU 23 (an equalization/neutralization pond known as the North Pond) in connection with the proposed siting of a new potassium carbonate facility which is about to be constructed on the Vicksburg Chemical Plant site.

In view of these activities and the additional information developed since our delivery of the Preliminary (Current Conditions) Report in May, 1992, we asked Woodward-Clyde to prepare an Amended & Supplemental Current Conditions Report which is enclosed herewith for your review and approval. We have also enclosed for your review and approval Woodward-Clyde's North Pond RCRA Facility Investigation Report (Volumes 1 and 2) together with the North Pond RFI Field Investigation Workplan, Data Collection

Quality Assurance Plan, Data Management Plan, and Health and Safety Plan, all of which formed the basis for the two volume report. As you know, the Consent Decree comtemplates that the RFI Workplan and Groundwater Assessment Program Workplan will be delivered to EPA for approval following the Agencies' approval of the Current Conditions Report.

Sincerely,

Steven T. Boswell
Director of Env. Affairs

STB: pc

xc: Mr. Miles
Mr. Madsen
Mr. Politzer
Mr. Malone, Apperson, Crump
Mr. Karkkainen, Woodward-Clyde

VICKSBURG CHEMICAL COMPANY

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VICKSBURG CHEMICAL COMPANY

P.O. Box 821003 • Vicksburg MS 39182 • 601-636-1231 • FAX 601-636-5767

VIA EXPRESS DELIVERY

Mr. John Dickinson, Chief
Waste Compliance Section
RCRA & FF Branch
United States Environmental Protection Agency
345 Courtland Street, NE
Atlanta, Georgia 30365

Mr. Sam Mabry, Chief
Hazardous Waste Division
Bureau of Pollution Control
Mississippi Department of Environmental Quality
P.O. Box 10385
Jackson, MS 39209

Re: Cedar Chemical Corporation
MSD 990714081, Consent Decree
Entered April 17, 1992 in
United States of America v.
Cedar Chemical Corporation,
Civil No. W92-0008(B)

March 1, 1994

Gentlemen:

Since entry of the referenced Consent Decree nearly two years ago, we have continued to dismantle and dispose of idle equipment which formerly was associated with the production of pesticides. We also commissioned our environmental consulting firm, Woodward-Clyde, to carry out a thorough investigation of SWMU 23 (an equalization/neutralization pond known as the North Pond) in connection with the proposed siting of a new potassium carbonate facility which is about to be constructed on the Vicksburg Chemical Plant site.

In view of these activities and the additional information developed since our delivery of the Preliminary (Current Conditions) Report in May, 1992, we asked Woodward-Clyde to prepare an Amended & Supplemental Current Conditions Report which is enclosed herewith for your review and approval. We have also enclosed for your review and approval Woodward-Clyde's North Pond RCRA Facility Investigation Report (Volumes 1 and 2) together with the North Pond RFI Field Investigation Workplan, Data Collection

Quality Assurance Plan, Data Management Plan, and Health and Safety Plan, all of which formed the basis for the two volume report. As you know, the Consent Decree comtemplates that the RFI Workplan and Groundwater Assessment Program Workplan will be delivered to EPA for approval following the Agencies' approval of the Current Conditions Report.

Sincerely,

Steven T. Boswell
Director of Env. Affairs

STB: pc

xc: Mr. Miles
Mr. Madsen
Mr. Politzer
Mr. Malone, Apperson, Crump
Mr. Karkkainen, Woodward-Clyde

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xc: Mr. Miles
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Mr. Karkkainen, Woodward-Clyde

STATE OF MISSISSIPPI
DEPARTMENT OF ENVIRONMENTAL QUALITY
JAMES I. PALMER, JR.
EXECUTIVE DIRECTOR

FILE COPY

May 11, 1993

Mr. G. Alan Farmer
Chief, RCRA Branch
Waste Management Division
U. S. EPA
345 Courtland St., NE
Atlanta, GA 30365

Dear Mr. Farmer:

Re: Cedar Chemical Corporation
Vicksburg, Mississippi
Consent Decree

The following are our comments regarding the Preliminary Report RCRA Facility Investigation for Cedar Chemical Corporation, Vicksburg, Mississippi, which was submitted on June 15, 1992, as required by their Consent Decree. We have recently received inquiries from them concerning approval of the report so they may proceed. Your earliest review would be appreciated since they have already told us that they consider final approval/disapproval to be from you.

A general comment concerning Sections 1, 2, and 3 is that chemicals used, chemical reaction by-products, and combustion products are not completely and adequately identified for all chemical processes at the facility. All chemicals used, products, and by-products formed for each chemical process must be identified to assure that investigation of the site does not overlook potential contamination. A table or tables listing the processes and such chemicals might be appropriate. Examples are:

1. Page 2-5;
First Paragraph - What are the products of incomplete combustion of methyl parathion and paranitrosodium phenolate since there is never complete combustion; especially, in uncontrolled fire.

2. Page 3-2;
Last Paragraph - Empty drums containing cyanuric chloride, tributylamine, and epichlorophydrin are mentioned as being disposed of in SWMU 2. These compounds are not mentioned as raw materials, products, or by-products on pages 2-1 and 2-2. What were they?

3. Page 3-7;
First Paragraph - What is the source of the carbon tetrachloride, bromoform, and chlorobenzene (raw materials, products, or by-products)?

4. Page 3-10;
First Paragraph - The manufacture of dinitro-ortho-cresol is stated as being produced in the dinoseb plant. What are the raw materials, products, and by products?

5. Page 3-10;
Last Paragraph - Where does the carbon tetrachloride contamination come from?

6. Page 3-11;
Second Paragraph - Methanol, triethanolamine, and xylene are referenced as ingredients for dinoseb formulations.

7. Page 3-16;
Second Paragraph - Same comment as No. 1.

8. Page 3-16;
Last Paragraph - References ispropylamine as a reactant to produce S-propylaminotriazine which then reacts with mono-ethylamine. None of these chemicals are previously mentioned on pages 2-1 and 2-2.

9. Page 3-17;
First Paragraph - Where did the acetone come from?

10. Page 3-19;
Third Paragraph - What is Premerge 3? What were the toluene, isopropyl alcohol, versene, polyglycol, flomo 8x, diethanolamine, and triethanolamine used for? In what process? What are versene and flomo 8x?

Other comments are:

11. Page 2-1;
Last Paragraph - What is an IRFNA unit?

12. Page 2-13;
First Paragraph - Is chlorine still monitored near the North Plant on Warrington Road?

13. Page 3-21/22;
Last/First Line - Appears to be information left out!

14. Page 3-21/22; - What is the potential for bromine compounds contamination from the North Plant?

15. Page 5-1;
Section 5.1 - States that there are fifteen (15) wells and two (2) piezometers on Figure 6; however Figure 6 only shows fourteen (14) wells.

16. Page 6-1/2; Last/
First Sentence States the "current groundwater contamination appears to be the result of a broken drainage system pipe which was discharging water to the Surface Impoundment for treatment". This area appears relatively near the railroad car unloading and dinoseb area where contamination was known to exist in the past and may be the source of the contamination.

17. Page 8-2;
First Paragraph - If visible contamination has surfaced in the Inactive Landfill, then investigation of the constituents surfacing should be done.

18. Page 9-5;
Section 9.6 - What is the condition of the remaining tank foundation (cracks, deterioration, etc.)? Could neutralized process wastewater from the dinoseb process leaked through cracks in the foundation? If yes, then investigation of soils under the foundation is needed?

19. Page 9-7;
Section 9.9 - Same question concerning foundation and need for further investigation as above?

20. Page 9-7;
Section 9.10 - Same questions concerning foundation and need for further investigation as above? This area is of great concern due to previous fire in the methyl parathion plant.

21. Page 9-17;
Section 9.29 - Is there documentation as to how visually contaminated soil was removed? Was any sampling conducted to confirm removal of contaminants? To what depth was soil removed?

22. Page 10-2;
Table - For each Major/Minor SWMU Field Investigation you should incorporate the other SWMU's or AOC's that the investigation will include into the list. (Example: SWMU 11 minor investigation will include SWMU 15.)

23. Appendix C;
Plate 1 - All monitoring wells do not appear to be located on the map!

If you have any questions, please contact me at 601-961-5221.

Sincerely,

Jerry B. Banks, P.E.
Chief, RCRA Section

JBB:gd
cc: Steven T. Boswell

CEDAR CHEMICAL CORPORATION

24th Floor • 5100 Poplar Avenue • Memphis, TN 38137 • 901-685-5348

REPLY TO: P.O. BOX 821003
VICKSBURG, MS 39182
(601) 636-1231

VIA FEDERAL EXPRESS

Mr. Sam Mabry, Chief
Hazardous Waste Division
Bureau of Pollution Control
MS Dept. of Env. Quality
P.O. Box 10385
Jackson, MS 39209

May 15, 1992

Re: Cedar Chemical Corporation, MSD990714081
Consent Decree and RCRA Facility Investigation
Interim Measures Workplan and Description of
Current Conditions

Dear Mr. Mabry:

Please find enclosed a copy of the referenced Reports as required by Section VII of the Decree and related Scopes of Work. Appendix "E" is an included volume pertaining the Surface Impoundment Retrofit of the Cedar Chemical "South Pond", an dis required by the Interim Measures Scope of Work.

Please contact Cedar Chemical with any comments or objections there may be.

Sincerely,

Steven T. Boswell
Dir. of Env. Affairs

STB: pc

xc: Mr. Miles
Mr. Madsen
Mr. Malone, Apperson, Crump
Mr. Karkkainen, Woodward-Clyde

File

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(601) 636-1231

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
P 413 276 278

Mr. Sam Mabry, Chief
Hazardous Waste Division
Bureau of Pollution Control
MS Dept. of Env. Quality
P.O. Box 10385
Jackson, MS 39209

April 23, 1992

Re: Cedar Chemical Corporation, MSD990714081
Consent Decree and RCRA Facility Investigation
Notification of Intention to Select Contractor Laboratory

Dear Mr. Mabry:

Please find attached a copy of the letter sent to Mr. John Dickinson at USEPA, Region IV, informing of Cedar's intent to select Analytical Technologies, Inc., as Cedar's contractor laboratory for the RCRA Facility Investigation.

Please contact Cedar if there are any comments or objections to this selection.

Sincerely,

Steven T. Boswell
Dir. of Env. Affairs

STB: pc

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CERTIFIED MAIL
RETURN RECEIPT REQUESTED
P 413 276 277

Mr. John Dickinson, Chief
Waste Compliance Section
RCRA and FF Branch
U.S. EPA, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

April 23, 1992

Re: Cedar Chemical Corporation, MSD990714081
Consent Decree and RCRA Facility Investigation
Notification of Intention to Select Contractor Laboratory

Dear Mr. Dickinson:

As required by Section IX., Quality Assurance, Quality Control and Sampling, of the recently effective Consent Decree between the USEPA and Cedar Chemical Corporation, Cedar intends to select Analytical Technologies, Inc., 11 East Olive Road, Pensacola, Florida 32514, telephone number 1-(904)-474-1001, to be its contractor laboratory for chemical analyses to be performed as required under the Decree.

Cedar will furnish Analytical Technologies with a copy of the Decree as required, and require by contract that Analytical Technologies abide by the requirements of the Decree including the requirements of Section IX.

Please contact Cedar with any comments or objections you may have concerning this selection.

Sincerely,

Steven T. Boswell

Steven T. Boswell
Dir. of Env. Affairs

STB: pc

xc: Mr. Miles
Mr. Madsen
Mr. Malone, Apperson, Crump
Mr. Karkkainen, Woodward-Clyde
Ms. Michelotti, ATI

CHARLES W. METCALF, 1840-1924
WILLIAM P. METCALF, 1872-1940
JOHN W. APPERSON, 1898-1988

CHARLES METCALF CRUMP
JERRE G. DUZANE
JOHN B. MAXWELL, JR.
ALLEN T. MALONE
PHILIP G. KAMINSKY
ROBERT L. DINKELSPIEL
MICHAEL E. HEWGLEY
JAMES F. RUSSELL
JOHN L. RYDER
THOMAS R. BUCKNER
MELODY W. OLIVER
WILLIAM B. MASON, JR.
STEVEN N. DOUGLASS
RANDY S. GARDNER

SAMUEL RUBENSTEIN
OF COUNSEL

LAW OFFICES
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EAST OFFICE
SUITE 100
KIRBY CENTRE
1755 KIRBY PARKWAY
MEMPHIS, TENNESSEE 38119
901/757-6300
TELECOPY 901/757-1296

January 26, 1990

Mr. Steve Boswell
203 Silvercreek Drive
Vicksburg, Mississippi 39180

VIA FEDERAL EXPRESS

Dear Steve:

Enclosed as discussed today is a copy of the "work plan" and a copy of my letter to Dick Karkkainen.

Dick, Randal and I need to meet with you and the state representatives prior to the meeting at EPA's office. I suggest a late morning conference and lunch at the Atlanta airport. We will discuss the details next week. In the meantime, I look forward to your comments and suggest that we set up a conference call with Steve Spengler and/or Toby Cook early next week to hear what the state has to say.

Sincerely yours,

Allen T. Malone

ATM:jw

Enclosure

cc: Mr. Toby Cook (w/encl.) VIA FEDERAL EXPRESS
Mr. J. Randal Tomblin

To: Allen Malone

January 24, 1990

This is a summary of interim corrective measures already taken or planned at the Vicksburg plant.

Measures already taken:

1. Excavation and solidifcation of the majority of contaminated sediments in the South Pond. This measure is in progress and approximately one-third complete. About thirteen thousand yards of material has been processed and placed in a lined holding area.

2. Excavation and disposal off-site of about 60 yards of contaminated soil from an area adjacent to the dinoseb plant.

3. Placement of about 100 yards of fill on erosion features on the "Old Landfill" and overseeding to reestablish vegetative cover.

Measures planned:

1. Installation of a "blanket drain" to intercept the flow of groundwater into the area of the South Pond construction and provide treatment of any contamination present in the water.

2. Conversion of monitor well 1A to a recovery well with water from this well to be treated in the same system planned or the "blanket drain".

3.

taken or planned at the Vicksburg plant.

ATTACHMENT A

SCOPE OF WORK FOR INTERIM MEASURES (IM)

AT

CEDAR CHEMICAL CORPORATION, VICKSBURG, MISSISSIPPI

ATTACHMENT A

SCOPE OF WORK FOR INTERIM MEASURES (IM)

AT

CEDAR CHEMICAL CORPORATION, VICKSBURG, MISSISSIPPI

PURPOSE

The purpose of Interim Measures (IM) is to mitigate the potential threat to human health and the environment. Interim measures must be consistent with and integrated into any long term solution at the Facility.

SCOPE

The Interim Measures program consists of the following four tasks:

- Interim Measures Workplan
  - A. Interim Measures Objectives
  - B. Health and Safety Plan
  - C. Community Relations Plan
- Interim Measures Design Program
  - A. Design Plans and Specifications
  - B. Operations and Maintenance Plan
  - C. Project Schedule
  - D. Final Design Documents
- Interim Measures Construction Quality Assurance Plan
  - A. Construction Quality Assurance Objectives
  - B. Inspection Activities
  - C. Sampling Requirements
  - D. Documentation
- Reports and Other Submissions
  - A. Progress Reports
  - B. Interim Measures Workplan
  - C. Final Design Documents
  - D. Draft Interim Measures Report
  - E. Final Interim Measures Report

INTERIM MEASURES WORKPLAN

The Defendant shall prepare an Interim Measures Workplan. The Workplan shall include the development of several plans which shall be prepared concurrently.

A. Interim Measures Objectives

The Workplan shall specify the objectives of the interim measures, demonstrate how the interim measures will abate releases and threatened releases, and to the extent possible, be consistent and integrated with any long-term solution at the Facility. The Interim Measures Workplan will include a discussion of the technical approach, engineering design, engineering plans, schedules, budget, and personnel. The Workplan will also include a description of qualifications of personnel performing or directing the interim measures, including contractor personnel. This plan shall also document the overall management approach to the interim measure. Specific interim measures shall include, but not be limited to:

1. Management of containers

a. Overpack/Redrum

Beginning immediately, Defendant shall overpack or redrum each leaking, significantly corroded, damaged, uncovered, and bulged container located at the hazardous waste container (drum) storage area, returned product storage area, drumming area, and any other locations at the north and south plant where drums are stored and contain hazardous wastes and/or hazardous constituents. This action shall be completed in thirty (30) calendar days of the effective date of the Consent Decree. All drums containing hazardous wastes and/or hazardous constituents shall be shipped off-site for disposal within ninety (90) calendar days in accordance with 40 CFR Part 262 and other applicable regulations. Within thirty (30) calendar days of the effective date of the Consent Decree and every seven (7) calendar days thereafter, Respondent shall examine every container located in the hazardous waste container (drum) storage area, returned product storage area, and drumming area to detect any leakage, significant corrosion, or structural damage likely to lead to leakage. Each such leaking, significantly corroded, damaged, uncovered, or bulged container that may leak or burst shall be overpacked or redrumed within 24 hours of discovery and shipped off-site for disposal within ninety (90) calendar days in accordance with 40 CFR Part 262 and other applicable regulations. Defendant shall, within five (5) calendar days of detection, report to EPA and Mississippi Bureau of Pollution Control (MBPC) any leak or inadequate container which has been identified and the measures taken to correct the problem.

b. Evaluate and Modify Storage Area

Within Thirty (60) calendar days of the effective date of this Order, Defendant shall submit to EPA and MSDEQ a closure plan for the storage area which meets the standards of 40 CFR 264 and 265.

2. Management of tanks

a. Leak Detection/Repair/Partial or Complete Removal

Within thirty (30) calendar days ofentry of the decree, Defendant shall inspect all tanks containing, or which have previously contained, hazardous waste at the north and south plant, including valves, pumps, and pipes, (especially joints and connectors) to detect leaks or cracks. For tanks being used, Defendant shall repair leaks and tanks that exhibit structural failure (e.g. cracks). Defendant shall immediately remove the substances from the tanks into other tanks and replace the tanks if leaks and cracks cannot be effectively and permanently repaired in situation. Defendant shall initiate closure of the empty or unused tanks in accordance with a Closure Plan prepared in accordance with 40 CFR Part 265 standards.

3. Management of surface impoundments

Defendant shall prepare a report, within thirty (30) days of the effective date of this Order providing information on the current status of the surface impoundment, including but not limited to, engineering drawings and specifications depicting the closure or planned closure of the unit. Additionally, the report shall include a schematic showing from what parts of the facility the surface impoundment receives run-off and the mechanism by which that run-off reaches the surface impoundment.

4. Management of the landfill

a. Runon/Runoff Control (Diversion or Collection Devices)

The IM Workplan shall include details for the construction and installation of devices to control surface runon and runoff so that runon and runoff do not enter or leave the landfill at the south plant. The Workplan shall include the design of diversion and collection devices to effect runon/runoff control. These devices may consist of, but are not necessarily limited to: dikes and berms, ditches, diversions, waterways, bench terraces, chutes, and downpipes. The design criteria shall consider 100-year precipitation events and floods, and flow rates.

b. Temporary Cover

The IM Workplan shall include details for the construction and installation of a temporary device or devices to prevent infiltration and ponding from precipitation, control of water and wind erosion and dispersion, and isolation and containment of contaminated wastes and volatiles from the landfill. The device should assure that precipitation is channelled away

from the landfill and does not permit ponding. These temporary devices can consist of but are not limited to a cap or other kind of cover. The design of the device shall have adequate permeabi- lity, thickness, slope, and shall be compatible with the chemical and physical characteristics of the waste being covered, local climate, hydrogeology and other design characteristics of the units, including any berms or other appurtenances, to achieve its goal.

5. Management of surface water release

a. Prevent Migration of Contaminants

The IM Workplan shall include details for the construction and installation of device(s) to prevent the migration of contaminated sediments downstream. The device(s) can include but are not limited to filter fences. The device(s) shall be installed at, but are not limited to, the following locations (see Figure A-1):

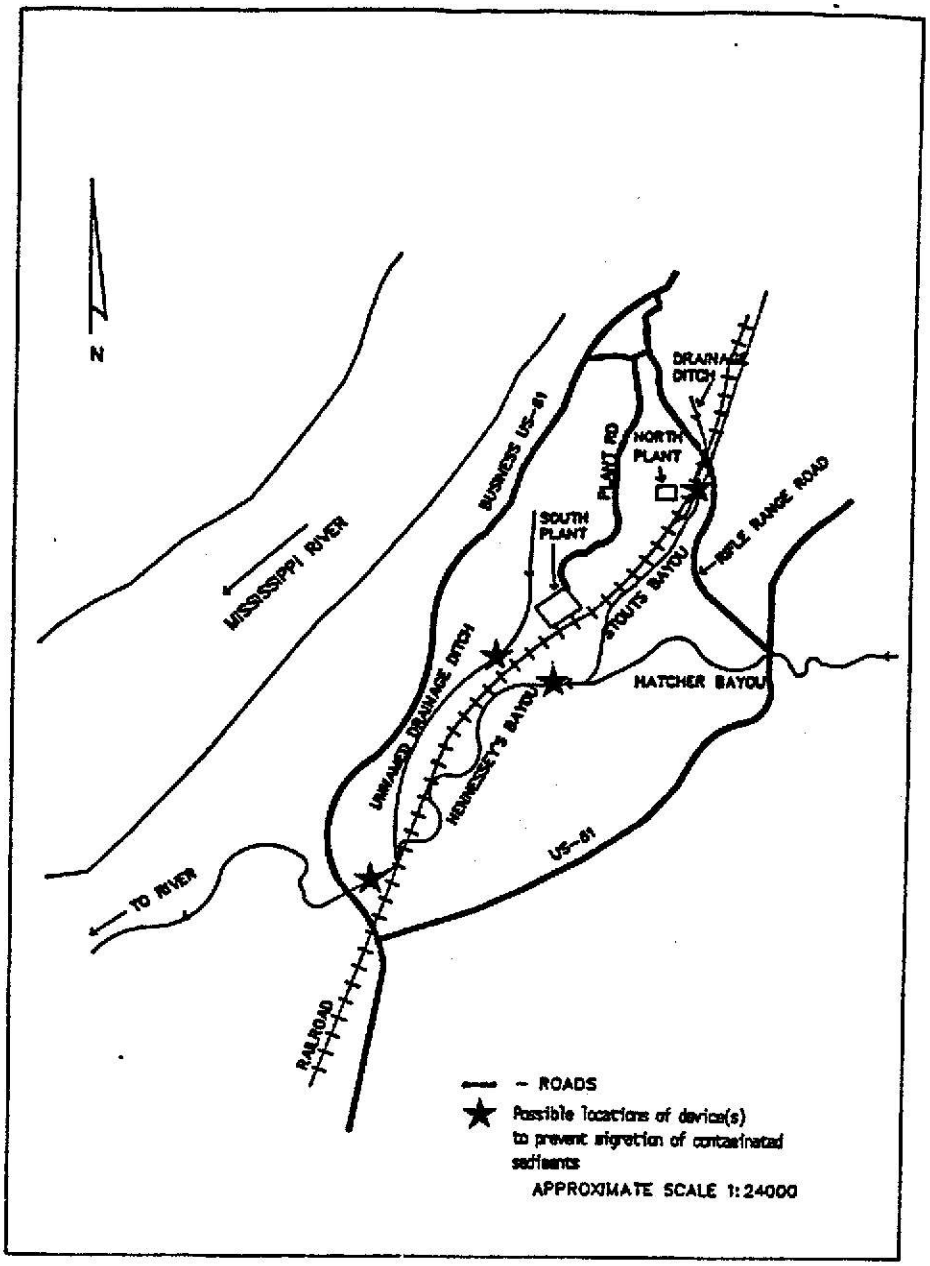
- The drainage ditch at the north plant between the Illinois Central Railroad and the confluence of the drainage ditch with Stouts Bayou.
- In Hennesseys Bayou downstream and south of the landfill.
- The unnamed drainage ditch which runs southwest and drains the north and west areas of the south plant. The location of ... fence should be between the south plant and its confluence with Hennesseys Bayou.
- In Hennesseys Bayou between State Business Route 61 and the confluence of Hennesseys Bayou with the unnamed drainage ditch.

b. Sample and Analyze Surface Waters

To monitor the migration of contaminants, the IM Workplan shall include details for sampling and analyzing surface water and sediments at the approximate locations of the devices to prevent migration of contaminants. The sample analyses shall include but not be limited to: polyaromatic hydrocarbons, polychlorinated biphenyls (PCBs), dinoseb, toxaphene, mercury, arsenic, atrazine, cyanide, purgeable organic compounds, extractable organic compounds, and cyanazine.

FIGURE A-1

APPROXIMATE LOCATION OF DEVICE(S) TO PREVENT MIGRATION OF CONTAMINATED SEDIMENTS



Modified from U.S. Environmental Protection Agency, February, 1987. RCRA Environmental Investigation, Cedar Chemical Company, Vicksburg, Mississippi.

6. Management of Areas With Contaminated Soils

Areas where soils have been sampled and that contained contaminants shall be managed to prevent infiltration or migration. These areas include but are not limited to those identified in Table A-1. The management techniques may include but are not be limited to runon/runoff control (diversion or collection devices) and temporary cap/cover.

a. Runon/Runoff Control (Diversion or Collection Devices)

The IM Workplan shall include details for the construction and installation of devices to control surface runon and runoff so that runon and runoff do not enter or leave areas with contaminated soils. The Workplan shall include details for the design of diversion and collection devices to effect runon/runoff control. These devices may consist of, but are not limited to: dikes and berms, ditches, diversions, waterways, bench terraces, chutes, and downpipes. The design criteria shall consider 100-year precipitation events and floods, liquid volume and flow rates.

The IM Workplan shall include details for the construction and installation of a temporary device or devices to prevent infiltration and ponding from precipitation, to control water and wind erosion and dispersion, and to isolate and contain contaminated wastes and volatiles from the areas of contaminated soils. The device(s) should assure that precipitation is channelled away from the area of contaminated soils and does not permit ponding. These temporary devices can consist of but are not limited to a cap or other kind of cover. The design of the device shall have adequate permeability, thickness, slope, and compatibility with the chemical and physical characteristics of the waste being covered, local climate, hydrogeology and other design characteristics of the units, including any berms or other appurtenances, to achieve its goal.

7. Management of sumps, catch basins and drains

a. Immediate removal of hazardous wastes and/or hazardous constituents.

Within seven (7) calendar days of the effective date of this Order, Respondent shall remove spilled or leaked hazardous wastes and/or hazardous constituents from sumps, catch basins, and drains. Accumulated precipitation shall also be removed from these sumps, catch basins, and drains, if these units are not intended to be used for drainage of precipitation. [Note: if the collected material is a hazardous waste under 40 CFR 261, it is subject to management as a hazardous waste in accordance with all applicable requirements of 40 CFR 260

TABLE A-1

AREAS OF CONTAMINATED SOILS AT VICKSBURG CHEMICAL CORPORATION

Number	Location	Sample Reference ID
	Small valley (mud flat) at the west corner of the landfill	CC-01a, VL-003b
	Eroded area east of the landfill	VL-002
	Area adjacent to the hazardous container (drum) storage area	CC-02, Fc
	Junkyard north of the south plant	CC-03
	Area north of the dinoseb production area	CC-04, G
	Area between the dinoseb area and the Illinois Central Railroad	CC-05
	Area between the surface impoundment at the south plant and the Illinois Central Railroad	CC-06

Notes:

The descriptions of the locations in this table are the best available descriptions from the source documents that were used. These documents are listed below.

a. Source of information for samples numbered CC-01 through CC-06 -- U.S. Environmental Protection Agency, February 1987. RCRA Environmental Investigation, Cedar Chemical Company, Vicksburg, Mississippi.

b. Source of information for samples numbered F and G -- Jack McCord, MDNR, September 22, 1986. Memorandum to file. Subject: September 3, 1986 Sampling Trip to Vicksburg Chemical.

c. Source of information for samples numbered VL-002 and VL-003 -- U.S. Environmental Protection Agency, January 26, 1982. Report: Hazardous Waste Site Investigation, January 22, 1982, Vertac Chemical Corporation, Vicksburg, Mississippi.

through 270. If the collected material is discharged through a point source to waters of the United States, it is subject to the requirements of Sections 301, 304, and 402 of the Clean Water Act, as amended. If the collected material is discharged to a Publicly Owned Treatment Works, it is subject to the requirements of Section 307 of the Clean Water Act, as amended. If the collected material is released to the environment, it may be subject to the reporting requirements of 40 CFR 302.]

b. Further Management of Sumps, Catch Basins and Drains

The IM Workplan shall include details for the management of sumps, catch basins, and drains. These details shall include but not be limited to the following:

- o Spilled and leaked hazardous wastes and/or hazardous ...nts must be removed from catch basins, sumps, and drains within 24 hours of the occurrence, or in as timely a manner as is possible to prevent overflow or harm to human health and the environment, if the owner or operator can demonstrate to the Regional Administrator that removal of the released waste cannot be

- o Runon and runoff control so that runon and runoff does not enter or leave sumps, catch basins, and drains.

8. Monitoring of Ground Water

The IM Workplan shall incorporate the existing program, update the existing program, or create a program for operating the groundwater wells in compliance with RCRA interim status requirements.

B. Health and Safety Plan

Defendant shall prepare a facility Health and Safety Plan.

1. Major elements of the Health and Safety Plan shall include:

a. Facility description including availability of resources such as roads, water supply, electricity, and telephone service;

b. Description of the known hazards and an evaluation of the risks associated with each activity conducted, including, but not limited to on- and off-site exposure to contaminants during the implementation of interim measures at the Facility.

c. A list of key personnel and alternates responsible for site safety, response operations, and for protection of public health;

d. Delineation of the work area;

e. Protection levels to be worn by personnel in work area;

f. Procedures to control site access;

g. Decontamination procedures for personnel and equipment;

h. Site emergency procedures;

i. Emergency medical care for injuries and toxicological problems;

j. Description of requirements for an environmental surveillance program;

k. Specifications for any routine and special training required for responders; and

l. Procedures for protecting workers from weather-related problems.

2. The Facility Health and Safety Plan shall be consistent with:

a. NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);

b. United States Environmental Protection Agency (EPA) Order 1440.1 - Respiratory Protection;

c. EPA Order 1440.3 - Health and Safety Requirements for Employees engaged in Field Activities;

d. Facility Contingency Plan;

e. EPA Standard Operating Safety Guide (1984);

f. OSHA regulations, particularly in 29 CFR 1910 and 1926;

g. State and local regulations; and

h. Other EPA guidance as provided.

C. Community Relations Plan

Defendant shall prepare a plan, for the dissemination of information to the public, regarding interim measure activities and results. These activities shall include the preparation and distribution of fact sheets and participation in public meetings.

INTERIM MEASURES DESIGN PROGRAM

The Interim Measures Design Program shall be incorporated in the Interim Measures Workplan to implement the interim measure(s) at the Facility. The Interim Measures Design Program includes four activities: design plans and specifications, operations and maintenance plans, project schedules, and final design documents. The design program shall include runon/runoff control devices and temporary caps or covers as discussed in the Interim Measures Workplan objectives.

A. Design Plans and Specifications

Defendant shall develop clear and comprehensive design plans and specifications which include but are not limited to the following:

1. Discussion of the design strategy and the design basis, including:

   a. Compliance with all applicable or relevant environmental and public health standards; and

   b. Minimization of environmental and public impacts.

2. Discussion of the technical factors of importance including:

   a. Use of currently accepted environmental control measures and technology;

   b. The constructability of the design, and

   c. Use of currently acceptable construction practices and techniques.

3. Description of assumptions made and detailed justification of these assumptions;

4. Discussion of the possible sources of error and references to possible operation and maintenance problems;

5. Detailed drawings of the proposed design including:

   a. Qualitative flow sheets;

   b. Quantitative flow sheets;

   c. Facility layout; and

   d. Utility locations.

6. Tables listing materials, equipment and specifications;

7. Tables giving material balances; and

8. Appendices including:

   a. Sample calculations (one example presented and explained clearly for significant or unique design calculations);

   b. Derivation of equations essential to understanding the report; and

   c. Results of laboratory or field tests.

General correlation between drawings and technical specifications is a basic requirement of any set of working construction plans and specifications. Before submitting the project specifica- tions, Respondent shall coordinate and cross-check the specifica- tions and drawings and complete the proofing of the edited specifications and required cross-checking of all drawings and specifications.

B. Operation and Maintenance Plans

Defendant shall prepare an Operation and Maintenance Plan to cover both implementation and long-term maintenance of the interim measure. The plan shall be composed of the following elements:

1. Equipment start-up and operator training:

   Defendant shall prepare and include in the technical specifi- cations governing treatment systems, contractor requirements for providing: appropriate service visits by experienced personnel to supervise the installation, adjust- ment, start-up and operation of the treatment systems, and training covering appropriate operational procedures once the start-up has been successfully accomplished.

2. Description of normal operation and maintenance (O&M):

   a. Description of tasks for operation;

   b. Description of tasks for maintenance;

   c. Description of prescribed treatment or operation conditions;

   d. Schedule showing frequency of each O&M task; and

   e. Common and/or anticipated remedies.

3. Description of routine monitoring and laboratory testing:

   a. Description of monitoring tasks;

   b. Description of required laboratory tests and their interpretation;

c. Required QA/QC; and

d. Schedule of monitoring frequency and date, if appropriate, when monitoring may cease.

4. Description of equipment:

a. Equipment identification;

b. Installation of monitoring components;

c. Maintenance of site equipment; and

d. Replacement schedule for equipment and installed components; and

5. Records and reporting mechanisms required:

a. Daily operating logs;

b. Laboratory records;

c. Mechanism for reporting emergencies;

d. Personnel and maintenance records; and

e. Monthly/annual reports to Federal/State agencies.

The Operation and Maintenance Plan shall be submitted with the Final Design Documents.

C. Project Schedule

Defendant shall develop a detailed Project Schedule for construction and implementation of the interim measure(s) which identifies timing for initiation and completion of all critical path tasks. Defendant shall specifically identify dates for completion of the project and major interim milestone(s) which are enforceable terms of this Order. A Project Schedule shall be submitted simultaneously with the Final Design Documents.

D. Final Design Documents

The Final Design Documents shall consist of the Final Design Plans and Specifications (100% complete), the Final Draft Operation and Maintenance Plan, and Project Schedule. Defendant shall submit the final documents 100% complete with reproducible drawings and specifications. The quality of the design documents should be such that Defendant would be able to include them in a bid package and invite contractors to submit bids for the construction project.

INTERIM MEASURES CONSTRUCTION QUALITY ASSURANCE PLAN

The Interim Measures Construction Quality Assurance (CQA) Plan shall be incorporated in the Interim Measures Workplan to ensure, with a reasonable degree of certainty, that a completed interim measure(s) meets or exceeds all design criteria, plans, and specifications. The CQA Plan must be submitted to EPA for approval prior to the start of construction. This CQA Plan shall include the following elements: construction quality assurance objectives, inspection activities, and documentation. Upon EPA and Mississippi Bureau of Pollution Control (MBPC) review, and EPA approval of the CQA Plan, Defendant shall construct and implement the interim measures in accordance with the approved design, schedule, CQA plan, and operation and maintenance plan.

A. Construction Quality Assurance Objectives

In the CQA Plan, Defendant shall identify and document the objectives and framework for the development of a construction quality assurance program including, but not limited to, the following: responsibility and authority, personnel qualifications, inspection activities, sampling requirements, and documentation. The responsibility and authority of all organizations (i.e. technical consultants, construction firms, etc.), and key personnel involved in the construction of the interim measure shall be described fully in the CQA Plan. Defendant must identify a CQA officer and the necessary supporting inspection staff.

B. Inspection Activities

The observations and tests that will be used to monitor the construction and/or installation of the components of the interim measure(s) shall be summarized in the CQA Plan. The Plan shall include the scope and frequency of each type of inspection. Inspections shall verify compliance with all environmental requirements and include, but not be limited, to air quality and emissions monitoring records, waste disposal records (e.g., RCRA transportation manifests), etc. The inspection should also ensure compliance with all health and safety procedures. In addition to oversight inspections, Defendant shall conduct the following activities:

1. Preconstruction inspection and meeting

Defendant shall conduct a preconstruction inspection and meeting to:

a. Review methods for documenting and reporting inspection data;

b. Review methods for distributing and storing documents and reports;

c. Review work area security and safety protocol;

d. Discuss any appropriate modifications of the construction quality assurance plan to ensure that site-specific considerations are addressed; and

e. Conduct a site walk-around to verify that the design criteria, plans, and specifications are understood and to review material and equipment storage locations.

The preconstruction inspection and meeting shall be documented by a designated person, and minutes should be transmitted to all parties.

2. Prefinal inspection

Upon preliminary project completion, Defendant shall notify EPA and MBPC for the purposes of conducting a prefinal inspection. The prefinal inspection shall consist of a walk-through inspection of the entire project site. The inspection is to determine whether the project is complete and consistent with the contract documents and the EPA-approved interim measure. Any outstanding construction items discovered during the inspection will be identified and noted. Additionally, treatment equipment will be operationally tested by Defendant. Defendant will certify that the equipment has performed to meet the purpose and intent of the specifications. Retesting will be completed where deficiencies are revealed. The prefinal inspection report should outline the outstanding construction items, actions required to resolve items, completion date for these items, and date for final inspection.

3. Final inspection

Upon completion of any outstanding construction items, Defendant shall notify EPA and MSDEQ for the purposes of conducting a final inspection. The final inspection shall consist of a walk-through inspection of the project site. The prefinal inspection report shall be used as a checklist, with the final inspection focusing on the outstanding construction items identified in the prefinal inspection. Confirmation shall be made that outstanding items have been resolved.

4. Sampling and testing requirements

The CQA Plan shall present sampling and testing activities, sample size, sample and test locations, frequency of testing, acceptance and rejection criteria, and plans for correcting problems.

C. Documentation

Reporting requirements for CQA activities shall be described in detail in the CQA Plan. This plan shall include such items as daily summary reports, inspection data sheets, problem identification and interim measures reports, design acceptance reports, and final documentation.

Provisions for the final storage of all records shall be presented in the CQA Plan.

REPORTS

The Interim Measures Workplan shall include reporting requirements. The reports shall include, but not be limited to the following: progress reports, the Interim Measures Workplan, design plans and specifications, operation and maintenance plan, final design documents, and the draft and final interim measures report.

A. Progress Reports

Defendant shall, at a minimum, provide EPA and MSDEQ with signed, monthly progress reports containing:

1. A description and estimate of the percentage of the interim measures completed;

2. Summaries of all findings;

3. Summaries of all changes made in the interim measures during the reporting period;

4. Summaries of all contacts with representatives of the local community, public interest groups, or State government during the reporting period;

5. Summaries of all problems or potential problems encountered during the reporting period;

6. Actions being taken to rectify problems;

7. Changes in personnel during the reporting period;

8. Projected work for the next reporting period; and

9. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

B. Interim Measures Workplan

Defendant shall submit an Interim Measures Workplan to EPA and MSDEQ as discussed in this attachment within sixty (60) calendar days of the effective date of this Order.

C. Final Design Documents

Defendant shall submit Final Design Documents as discussed in this attachment within thirty (30) calendar days of the effective date of this Order.

D. Draft Interim Measures Report

At the "completion" of project construction (except for long-term operation, maintenance and monitoring), Defendant shall submit an Interim Measures Implementation Report to EPA and MSDEQ. The Report shall document that the project is consistent with the design specifications, and that the interim measures are performing adequately. The Report shall include, but not be limited to, the following elements:

1. Synopsis of the interim measures and certification of the design and construction;

2. Explanation of any modifications to the plans and why these were necessary for the project;

3. Listing of the criteria, established before the interim measures were initiated, for judging the *functioning* of the interim measures and also explaining any modification to these criteria;

4. Results of facility monitoring, indicating that the interim measures will meet or exceed the performance criteria; and

5. Explanation of the operation and maintenance (including monitoring) to be undertaken at the Facility.

This report shall include but not be limited to: inspection summary reports, inspection data sheets, problem identification and corrective measure reports, block evaluation reports, photographic reporting data sheets, design engineers' acceptance reports, deviation from design and material specifications (with justifying documentation), and as-built drawings.

E. Final Interim Measures Report

Defendant shall finalize the Interim Measures Workplan and the Interim Measures Implementation Report incorporating comments received on draft submissions.

Facility Submission Summary

A summary of the information reporting requirements contained in the Interim Measures Scope of Work is present below:

FACILITY SUBMISSIONS	DUE DATE *
INTERIM MEASURES Workplan - Interim Measures Objectives - Health and Safety Plan - Community Relations Plan	Within sixty (30) calendar days
FINAL DESIGN DOCUMENTS - Design Plans and Specifications - Operation and Maintenance Plan - Project Schedule	Within thirty (30) calendar days
CONSTRUCTION QUALITY ASSURANCE PLAN - Construction Quality Assurance Objectives - Inspection Activities	Within sixty (30) calendar days
Draft Interim Measures Report	Upon completion of construction
Final Interim Measures Report	Fifteen (15) days after receipt of EPA and MSDEQ comments on Draft Interim Measures Report
Progress Reports	Monthly

*All dates are calculated from the effective date of this Order unless otherwise specified.

ATTACHMENT B

SCOPE OF WORK FOR A RCRA FACILITY INVESTIGATION

AT

CEDAR CHEMICAL CORPORATION, VICKSBURG, MISSISSIPPI

ATTACHMENT B

SCOPE OF WORK FOR A RCRA FACILITY INVESTIGATION (RFI)

AT

CEDAR CHEMICAL CORPORATION, VICKSBURG, MISSISSIPPI

PURPOSE

The purpose of this RCRA Facility Investigation hereafter RFI is to determine the nature and extent of releases of hazardous wastes and/or hazardous constituents from regulated units, solid waste management units, and other source areas at the facility and to gather all necessary data to support the Corrective Measures Study. Defendant shall furnish all personnel, materials, and services necessary for, or incidental to, performing the RCRA facility investigation at Cedar Chemical Corporation, in Vicksburg, Mississippi.

The Defendants shall prepare plans and conduct investigations that satisfy the tasks listed below, which are more specifically developed in the following pages. Such plans and investigations shall be submitted in accordance with the requirements of the Consent Decree, using the applicable guidance listed therein, or as designated by EPA and MSDEQ. All documents shall be certified by appropriate individuals, as specified in the regulations.

SCOPE

The RCRA Facility Investigation consists of seven tasks:

Task I: Description of Current Conditions

- A. Facility Background
- B. Nature and Extent of Contamination
- C. Implementation of Interim Measures

Task II: Pre-Investigation Evaluation of Corrective Measures Technologies

Task III: RFI Workplan Requirements

- A. Project Management Plan
- B. Data Collection Quality Assurance Plan
- C. Data Management Plan
- D. Health and Safety Plan
- E. Community Relations Plan

Task IV: Groundwater Assessment

Task V: Implementation of the Facility Investigation

A. Environmental Setting
B. Source Characterization
C. Contamination Characterization
D. Potential Receptor Identification

Task VI: Investigation Analysis

A. Data Analysis
B. Protection Standards

Task VII: Laboratory and Bench-Scale Studies

Task VIII: Reports and Other Submissions

A. Preliminary and Final Workplan Submissions
B. Progress Reports
C. Draft and Final RFI Reports
D. Groundwater Assessment Workplan and Report

TASK I: DESCRIPTION OF CURRENT CONDITIONS

Defendant shall submit for EPA and Mississippi Department of Environmental Quality review and EPA approval a report providing the background information pertinent to the facility, contamination, and interim measures as set forth below. The data gathered during any previous investigations or inspections and other relevant data shall be included.

A. Facility Background

Defendant's report shall summarize the regional location, pertinent boundary features, general facility physiography, hydrogeology, and historical use of the facility for the treatment, storage, or disposal of solid and hazardous wastes and/or hazardous constituents including but not limited to (see Figures B-1 and B-2):

- Activated carbon treatment units
- Container (drum) storage area
- Returned product storage area
- Surface impoundment (south plant)
- Wastewater storage tank(s)
- Dinoseb drumming area
- Dinoseb loading/unloading area
- Dinoseb production area
- Landfill (inactive disposal area) and pits used inside the boundaries of the landfill including the area of the former dinoseb wastewater pond
- Equalization/neutralization pond (north plant)
- Pond (north plant)
- Drains, sumps, and catch basins and piping
- Drum storage areas

- o Waste (junk) piles
- o Pre-neutralization area (north plant)
- o Neutralization tanks (south plant)
- o Junkyard
- o Chemical crypt

Defendant's report shall include:

1. Map(s) depicting the following:

   Note: The North area must point to the top of the page

   a. General geographic location;

   b. General Cross-sectional map, including but not limited to, Cross-sections of solid and hazardous waste management units;

   c. Property lines, with the owners of all adjacent property clearly indicated;

   d. Topography and surface drainage depicting all waterways, wetlands, floodplains, water features, drainage patterns, and surface-water containment areas. The map shall show contours at intervals sufficient to clearly show the pattern of surface water flow in the vicinity of and from each operational unit and solid waste management unit;

   e. A soil survey map of the entire site with a scale sufficient to clearly show changes in soil;

   f. All tanks, buildings, utilities, paved areas, easements, right-of-ways, and other features; within the property boundaries;

   g. All solid or hazardous waste treatment, storage, or disposal areas active after November 19, 1980, including but not limited to the areas identified in Task I Section A or in Figures B-1 and B-2;

   h. All known past solid or hazardous waste treatment, storage, or disposal areas regardless of whether they were active on November 19, 1980, including but not limited to the areas identified in Task I Section A or in Figures B-1 and B-2;

   i. All known past and present product and waste underground tanks or piping;

   j. Surrounding land uses (residential, commercial, agricultural, recreational);

   k. The location of all production recovery and ground-water monitoring wells, including but not limited to, RCRA and

FIGURE B-1

CEDAR CHEMICAL CORPORATION
LAYOUT OF THE NORTH PLANT INCLUDING PAST AND PRESENT FEATURES

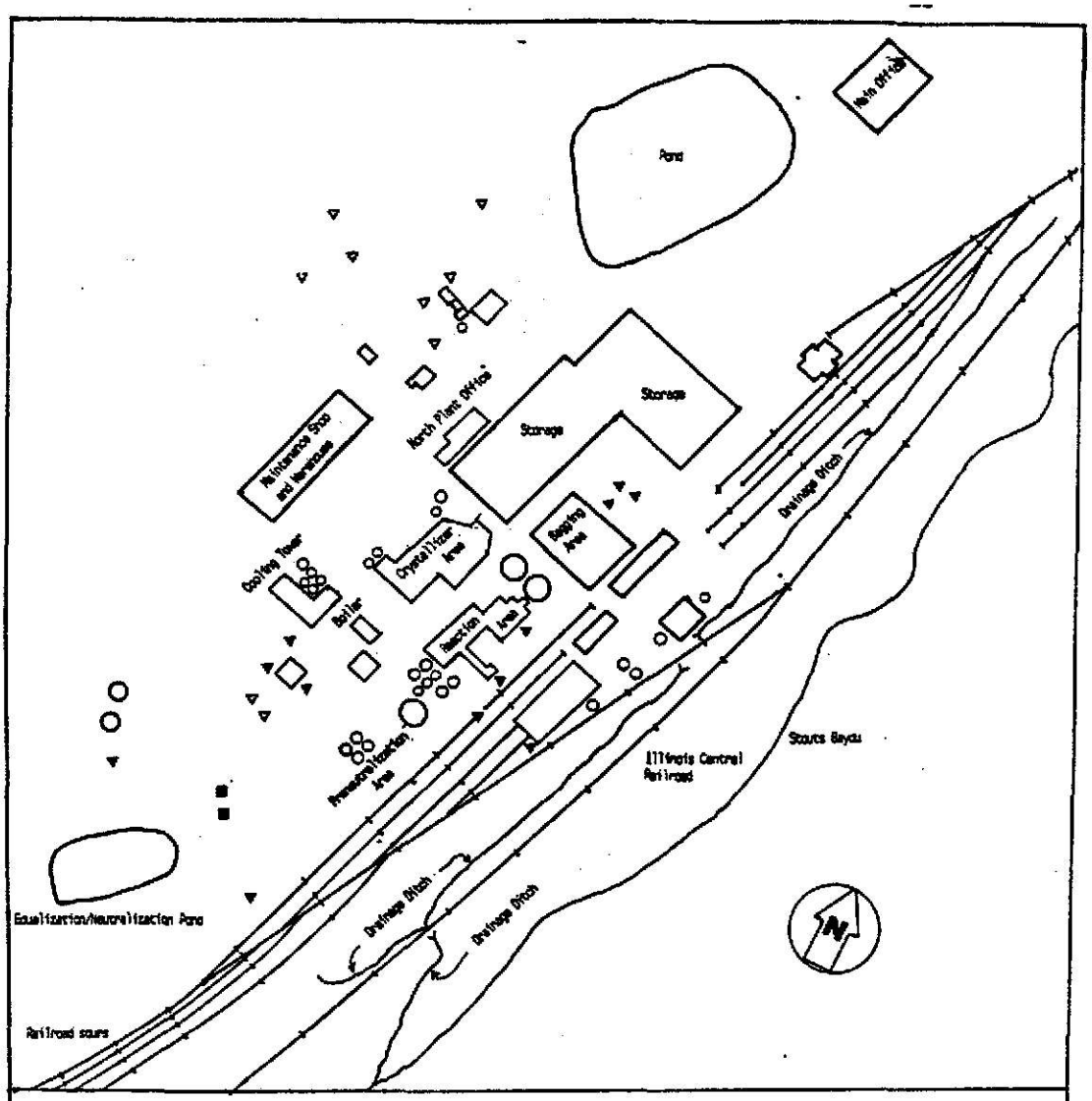
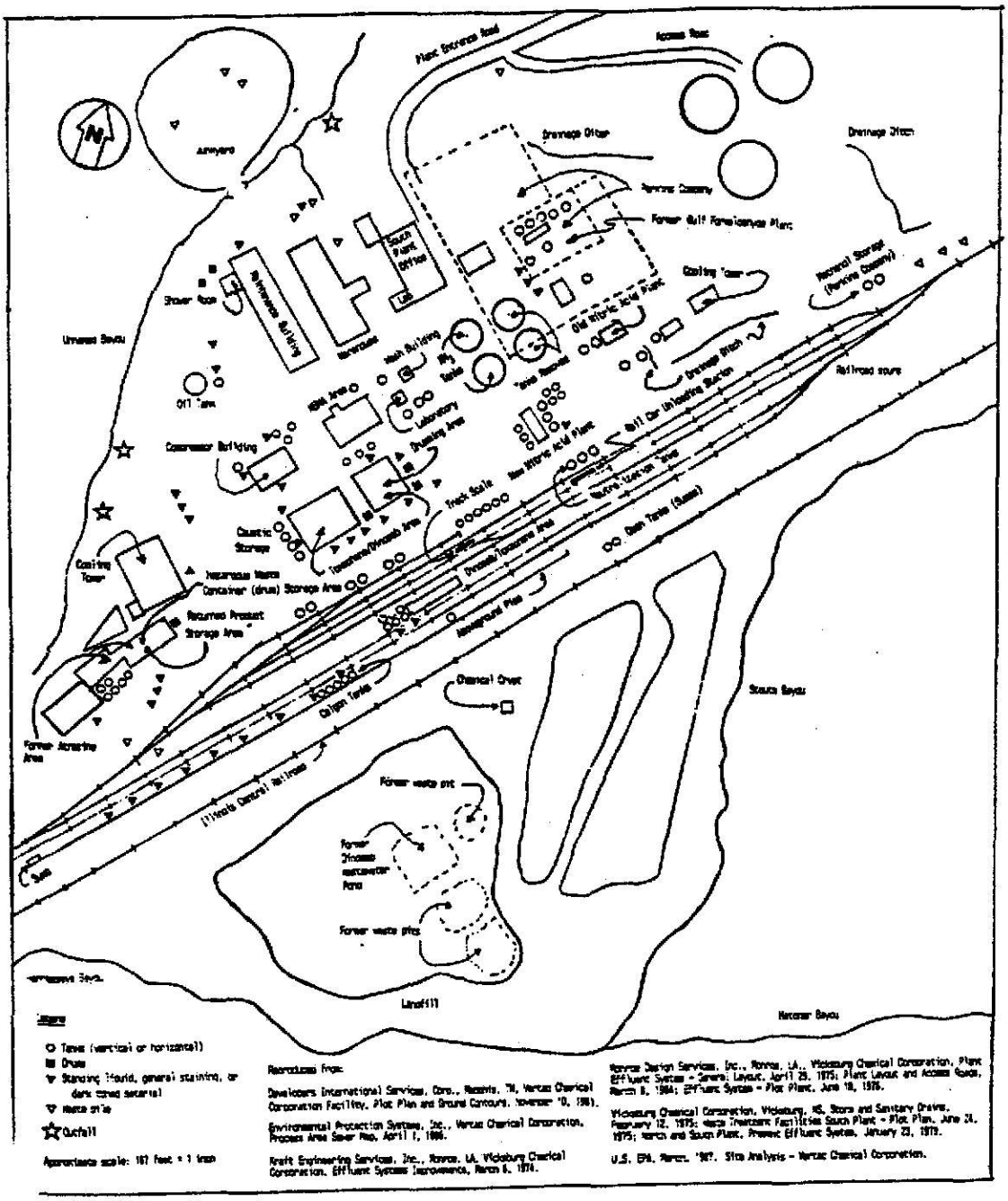


FIGURE B-2

CEDAR CHEMICAL CORPORATION
LAYOUT OF THE SOUTH PLANT INCLUDING PAST AND PRESENT FEATURES



CERCLA wells. These wells shall be clearly labeled, and ground and top of casing elevations and construction details included (these elevations and details may be included as an attachment);

1. Aerial photographs of the entire facility, one taken in normal light and one taken by infrared photography.

All maps shall be consistent with the requirements set forth in 40 CFR Part 270.14 and be of sufficient detail and accuracy to locate and report all current and future work performed at the site; all maps shall be aligned with the north direction arrows perpendicular to the edge of the page;

2. A history and description of facility ownership and operation, and solid and hazardous waste generation, treatment, storage, and disposal activities at the facility;

3. Dates or periods of past product and waste spills, identification of the materials spilled, the amount spilled, the location where spilled, and a description of the response actions conducted (local, State, or Federal response units or private parties), including any inspection reports or technical reports generated as a result of the response; and

4. A summary of past permits requested and/or received, any enforcement actions and their subsequent responses, and a list of documents and studies prepared for the facility.

B. Nature and Extent of Contamination

Defendant shall prepare and submit for EPA and MSDEQ review and EPA approval a preliminary report describing the existing information on the nature and extent of contamination at or from the facility.

1. Defendant's report shall summarize all possible source areas of contamination. This, at a minimum, should include all regulated units, solid waste management units, spill areas, and other suspected source areas of contamination. For each management unit, Defendant shall submit to EPA and MSDEQ a list identifying all waste streams and waste materials subject to storage, treatment, or disposal in each waste management unit. This list shall include all wastes whether it is hazardous or non-hazardous which are destined for the unit. These source areas of contamination may include but are not limited to those identified in Table A-1, Task I Section A or in Figures B-1 and B-2. For each area, Defendant shall, at a minimum, identify the following:

   a. Location of unit/area (which shall be depicted on a facility map);

   b. Quantities of solid and hazardous wastes;

c. Hazardous wastes and/or hazardous constituents, to the extent known; and

d. Identification of areas where additional information is necessary.

2. Defendant shall prepare an assessment and description of the existing degree and extent of contamination at or from the facility. This shall include:

a. Available monitoring data and qualitative information on locations and levels of contamination at the facility, including but not limited to reports, memorandum, and an aerial and cross-sectional view of any plume(s) with a definition of a zero line for each.

b. A minimum of three cross-sectional maps with at least 2 of the transects at right angles to each other delineating local geology, with the extent of the plume(s) superimposed (define a zero line for the plume[s]).

c. All potential migration pathways including information on geology, pedology, hydrogeology, physiography, hydrology, water quality, meteorology, and air quality; and

d. The potential impact(s) on human health and the environment, including demography, ground-water and surface-water use, and land use.

C. Implementation of Interim Measures

Defendant's report shall document interim measures which were or are being undertaken at the facility in accordance with the Interim Measures Workplan in Attachment A. This shall include a discussion of:

1. Objectives of the interim measures: how the measure is mitigating a potential threat to human health and the environment and/or is consistent with and integrated into any long-term solution at the facility;

2. Design, construction, operation, and maintenance requirements;

3. Schedules for design, construction, and monitoring; and

4. Schedule for progress reports.

TASK II: PREINVESTIGATION EVALUATION OF CORRECTIVE MEASURE TECHNOLOGIES

Prior to starting the facility investigation, Defendant shall submit to EPA and MSDEQ a report that identifies the potential corrective measures

technologies that may be used on-site or off-site for the containment, treatment, remediation, and/or disposal of contamination. This report shall also identify any field, laboratory, bench, or pilot scale data that needs to be collected during the facility investigation to facilitate the evaluation and selection of the final corrective measure or measures (e.g., compatibility of waste and construction materials, information to evaluate effectiveness, treatability of wastes, etc.).

TASK III: RFI WORKPLAN REQUIREMENTS

Defendant shall prepare a RCRA Facility Investigation (RFI) Workplan. This RFI Workplan and submit it within sixty (60) days of the entry of the Decree. The RFI Workplan shall include the development of several plans, which shall be prepared concurrently. During the RCRA Facility Investigation, it may be necessary to revise the RFI Workplan to increase or decrease the detail of information collected to accommodate the facility specific situation. The RFI Workplan shall include the report described in Task I and the following:

A. Project Management Plan

Defendant shall prepare a Project Management Plan which shall include a discussion of the technical approach, schedules, budget, and personnel. The Project Management Plan shall also include a description of qualifications of personnel performing or directing the RFI, including contractor personnel. This Plan shall also document the overall management approach to the RCRA Facility Investigation.

1. Summary of Personnel Qualifications

The Summary of Personnel Qualifications section of the Project Management Plan shall include at a minimum the following:

a. Name, title and qualifications of the engineer and/or geologist directing the project.

b. Name, title and qualifications of any contractors, subcontractors and their personnel involved with the project

B. Data Collection Quality Assurance Plan

Defendant shall prepare a plan to document all monitoring procedures sampling, field measurements, and sample analysis performed during theinvestigation to characterize the environmental setting, source, and contamination, so as to ensure that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented.

1. Data Collection Strategy

The strategy section of the Data Collection Quality Assurance

Plan shall include, but not be limited to, the following:

a. Description of the intended uses for the data, and the necessary level of precision and accuracy for these intended uses;

b. Description of methods and procedures to be used to assess the precision, accuracy, and completeness of the measurements data;

c. Description of the rationale used to assure that the data accurately and precisely represent any characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition. Examples of factors which shall be considered and discussed include:

    i) Environmental conditions at the time of sampling;

    ii) Number of sampling points;

    iii) Representativeness of selected media; and

    iv) Representativeness of selected analytical parameters.

d. Description of the measures to be taken to assure that the following data sets can be compared to each other:

    i) RFI data generated by Defendant over some time period;

    ii) RFI data generated by an outside laboratory or consultant versus data generated by Defendant;

    iii) Data generated by separate consultants or laboratories, and

    iv) Data generated by an outside consultant or laboratory over some time period.

e. Details relating to the schedule and information to be provided in quality assurance reports. The reports should include but not be limited to:

    i) Periodic assessment of measurement data accuracy, precision, and completeness;

    ii) Results of performance audits;

    iii) Results of system audits;

    iv) Significant quality assurance problems and

recommended solutions; and

v) Resolutions of previously stated problems.

2. Sampling Strategy and Procedures

The sampling section of the Data Collection Quality Assurance Plan shall discuss:

a. Selecting appropriate sampling locations, depths, etc.;

b. Providing a statistically sufficient number of sampling sites;

c. Measuring all necessary ancillary data;

d. Determining conditions under which sampling should be conducted;

e. Determining which media are to be sampled (e.g., ground water, air, soil, sediment, etc.);

f. Determining which parameters are to be measured and where;

g. Selecting the frequency of sampling and length of sampling period;

h. Selecting the types of samples (e.g., composite vs. grab) and number of samples to be collected;

i. Implementing measures to prevent contamination to the sampling equipment and cross contamination between sampling points;

j. Documenting field sampling operations and procedures, including:

i) Documentation of procedures for preparing reagents or supplies which become an integral part of the sample (e.g., filters, preservatives and adsorbing reagents);

ii) Procedures and forms for recording the exact location and specific considerations associated with sample acquisition;

iii) Documentation of specific sample preservation methods;

iv) Calibration of field devices;

v) Collection of replicate samples;

vi) Submission of field-biased blanks, where

appropriate;

vii) Potential interferences present at the facility;

viii) Construction materials and techniques, associated with monitoring wells and piezometers;

ix) Field equipment listing and and type of sample containers;

x) Sampling order; and

xi) Decontamination procedures.

k. Selecting appropriate sample containers;

l. Preserving samples; and

m. Implementing Chain-of-custody procedures, including;

i) Standardized field tracking reporting forms to establish sample custody in the field prior to and during shipment; and

ii) Pre-prepared sample labels containing all information necessary for effective sample tracking.

3. Field Measurements

The field measurements section of the Data Collection Quality Assurance Plan shall discuss:

a. Selecting appropriate field measurement locations, depths, etc.;

b. Providing a statistically sufficient number of field measurements;

c. Measuring all necessary ancillary data;

d. Determining conditions under which field measurements should be conducted;

e. Determining which media are to be addressed by appropriate field measurements (e.g., ground water, air, soil, sediment, etc.);

f. Determining which parameters are to be measured and where;

g. Selecting the frequency of field measurements and length of each field measurement period; and

h. Documenting field measurement operations and procedures, including:

i) Procedures and forms for recording raw data and the exact location, time, and facility-specific considerations associated with the data acquisition;

ii) Calibration of field devices;

iii) Collection of replicate measurements;

iv) Submission of field-biased blanks, where appropriate;

v) Potential interferences present at the facility;

vi) Construction materials and techniques associated with monitoring wells and piezometers used to collect field data;

vii) Field equipment listing;

viii) Order in which field measurements are to be made; and

ix) Decontamination procedures.

4. Sample Analysis

The sample analysis section of the Data Collection Quality Assurance Plan shall specify the following:

a. Chain-of-Custody procedures, including:

i) Identification of a responsible party to act as sample custodian at the laboratory facility and authorized to sign for incoming field samples, obtain documents of shipment, and verify data entered onto the sample custody records;

ii) Provision for a laboratory sample custody log consisting of serially numbered standard lab-tracking report sheets; and

iii) Specification of laboratory sample custody procedures for sample handling, storage, and dispersement for analysis.

b. Sample storage procedures and storage times;

c. Sample preparation methods;

d. Analytical procedures, including:

i) Scope and application of the procedure;

ii) Sample matrix;

iii) Potential interferences;

iv) Precision and accuracy of the methodology; and

v) Method detection limits.

e. Calibration procedures and frequency;

f. Data reduction, validation and reporting;

g. Internal quality control checks, laboratory performance and systems audits and frequency, including:

i) Method blank(s);

ii) Laboratory control sample(s);

iii) Calibration check sample(s);

iv) Replicate sample(s);

v) Matrix-spiked sample(s);

vi) "Blind" quality control sample(s);

vii) Control samples;

viii) Surrogate samples;

ix) Zero and span gases; and

x) Reagent quality control checks.

EPA shall conduct a performance audit of the laboratories selected by the Defendant. This audit must be completed and approved prior to the facility investigation.

h. Preventive maintenance procedures and schedules;

i. Corrective action (for laboratory problems); and

j. Turn-around time.

C. Data Management Plan

Defendant shall develop and initiate a Data Management Plan to document and track investigation data and results. This plan shall identify and establish data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the investigation.

1. Data Record

The data record shall include the following:

a. Unique sample or field measurement code;

b. Sampling or field measurement location and sample or measurement type;

c. Sampling or field measurement raw data;

d. Laboratory analysis identification number;

e. Property or component measured; and

f. Results of analysis (e.g., concentration).

2. Tabular Displays

The following data shall be presented in tabular displays:

a. Unsorted (raw) data;

b. Results for each medium, or for each constituent monitored;

c. Data reduction for statistical analysis;

d. Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and

e. Summary data.

3. Graphical Displays

The following data shall be presented in graphical format (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three-dimensional graphs, etc.):

a. Display sampling location and sampling grid;

b. Indicate boundaries of sampling area, and areas where more data are required;

c. Displays levels of contamination at each sampling location;

d. Display geographical extent of contamination;

e. Display contamination levels, averages, and maxima;

f. Illustrate changes in concentration in relation to distance from the source, time, depth or other parameters; and

g. Indicate features affecting intramedia transport and show potential receptors.

D. Health and Safety Plan

Defendant shall prepare a facility Health and Safety Plan which ensures the health and safety of workers and other individuals within the immediate area.

1. Major elements of the Health and Safety Plan shall include:

a. Facility description including availability of resources such as roads, water supply, electricity, and telephone service;

b. Description of the known hazards and evaluation of the risks associated with the incident and with each activity conducted, including but not limited to on- and off-site exposure to contaminants during the implementation of interim measures at the facility;

c. List of key personnel and alternates responsible for site safety, response operations, and for protection of public health;

d. Delineation of the work area;

e. Protection levels to be worn by personnel in work area;

f. Procedures to control work area access;

g. Decontamination procedures for personnel and equipment;

h. Site emergency procedures;

i. Emergency medical care for injuries and toxicological problems;

j. Requirements for an environmental surveillance program;

k. Any routine and special training required for responders; and

l. Procedures for protecting workers from weather-related

problems.

2. The Facility Health and Safety Plan shall be consistent with:

   a. NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);

   b. EPA Order 1440.1 -- Respiratory Protection;

   c. EPA Order 1440.3 -- Health and Safety Requirements for Employees Engaged in Field Activities;

   d. Facility Contingency Plan;

   e. EPA Standard Operating Safety Guide (1984);

   f. OSHA regulations particularly in 29 CFR 1910 and 1926;

   g. State and local regulations; and

   h. Other EPA guidance as provided.

E. Community Relations Plan

Defendant shall prepare and adhere to a plan for disseminating information to the public regarding investigation activities and results.

TASK IV: GROUNDWATER ASSESSMENT PROGRAM

The Defendants shall prepare and submit to EPD and MSDEQ, a Groundwater Assessment Program Workplan (GWA) and an Annual Groundwater Assessment Report. The GWA Workplan shall be due to EPA and MSDEQ within thirty (30) days of the entry of the Decree. The Annual Groundwater Assessment Report will be due no later than March 1 of each year.

A. Groundwater Assessment Workplan

The Defendant's Groundwater Assessment Program must be capable of determining: 1) Whether hazardous waste or hazardous waste constituents have entered the groundwater; 2) The rate and extent of migration of hazardous waste or hazardous waste constituents in the groundwater; and 3) The concentrations of hazardous waste or hazardous waste constituents in the groundwater. Defendant's Groundwater Assessment Workplan shall include:

1. The number, location, depth of wells, and the rationale for the well placement;

2. Construction logs for each monitoring well;

3. A list of the monitoring parameters, this list shall include indicator parameters as well as the hazardous wastes or hazardous constituents in 40 CFR 261, Appendix VIII;

4. Geologic cross-sections;

5. Sampling and analytical methods for those hazardous wastes or hazardous constituents at the facility;

6. Evaluation procedures, including any use of previously-gathered groundwater quality information; and

7. A schedule of implementation.

The Groundwater Assessment Program Workplan is subject to approval by EPA and MSDEQ.

B. Annual Groundwater Assessment Report

The Annual Groundwater Assessment Report shall evaluate the groundwater quality, monitoring system and program, as well as the abatement system at the facility. Pursuant to this Decree, wells shall be sampled according to an EPA approved sampling plan as outlined in Section IV.A.3 of the "Scope of Work". The Defendant's Annual Groundwate Assessment shall include, but not be limited to:

1. Groundwater surface elevations measured on a quarterly basis, for each well specified in the Groundwater Assessment Program Workplan;

2. Annual determination of the groundwater flow rate and directionin the uppermost aquifer;

a 3. Concentrations or values of the indicator parameters obtained form quarterly analysis at each groundwater monitoring well;

4. Evaluation of the indicator parameters as outlined within the Facility's Groundwater Assessment Program Workplan.

5. Results of the analysis from each groundwater monitoring well as indicated in the Groundwater Assessment Program Workplan;

6. Calculated hydraulic conductivity and effective porosity; and

7. Summary of results.

TASK V: IMPLEMENTATION OF THE FACILITY INVESTIGATION

Upon notice of approval or modification, the Defendant shall have fifteen (15) days to begin the implementation of the RFI Workplan as approved or modified, pursuant to the approved schedules contained therein. The Defendant shall conduct those investigations necessary to: characterize

the potential pathways of contamination migration (Environmental Setting); define the source(s) of contamination (Source Characterization); define the degree and extent of contamination (Contamination Characterization); identify actual or potential receptors; and to support the development of alternatives from which corrective measures will be selected. The implementation ("Facility Investigation") shall provide data of adequate technical quality to support the development and evaluation of the corrective measures alternative or alternatives during the Corrective Measures Study.

The RFI activities shall follow the plans set forth in Task III, RFI Workplan Requirements. All sampling and analysis shall be conducted in accordance with the Data Collection Quality Assurance Plan. All sampling locations shall be documented in a log and identified on a detailed site map.

A. Environmental Setting

Defendant shall collect information to supplement and verify existing information on the environmental setting at the facility. Defendant shall characterize the following:

1. Hydrogeology

Defendant shall conduct a program to evaluate hydrogeologic conditions at the facility. This program shall provide the following information:

a. A description of the regional and facility-specific geologic and hydrogeologic characteristics affecting ground-water flow beneath the facility, including:

i) Regional and facility-specific stratigraphy: description of strata including strike and dip, identification of stratigraphic contacts;

ii) Structural geology: description of local and regional structural features (e.g., folding, faulting, tilting, jointing, etc.).

iii) Depositional history;

iv) Identification and characterization of areas and amounts of recharge and discharge;

v) Regional and facility-specific ground-water flow patterns, both horizontally and vertically; and

vi) Seasonal variations in the ground-water flow regime.

b. An analysis of any topographic features that might influence the ground-water flow system. (Include stereographic analysis

of aerial photographs, both normal light and infrared).

c. Based on field data, tests, and cores, a representative and accurate classification and description of the hydrogeologic units which may be part of the migration pathways at the facility (i.e., the aquifers and any intervening saturated and unsaturated units), including:

   i) Hydraulic conductivity and porosity (total and effective);

   ii) Lithology, grain size, sorting, and degree of cementation;

   iii) An interpretation of hydraulic interconnections between saturated zones including but not limited to the depths, thickness, and degree of lateral continuity and hydraulic characteristics of any discernible confining units between water-bearing zones underneath the facility; and

   iv) The attenuation capacity and mechanisms of the natural earth materials (e.g., ion exchange capacity, organic carbon content, mineral content etc.).

d. Based on field studies and cores, structural geology and hydrogeologic cross sections showing the extent (depth, thickness, and lateral extent) of hydrogeologic units which may be part of the migration pathways identifying:

   i) Sand and gravel deposits in unconsolidated deposits;

   ii) Zones of fracturing or channeling in consolidated or unconsolidated deposits;

   iii) Zones of relatively high or low permeability that might direct and restrict the flow of contaminants;

   iv) The uppermost aquifer: geologic formation, group of formations, or part of a formation capable of yielding a significant amount of ground water to wells or springs and

   v) Water-bearing zones above the first confining layer that may serve as a pathway for contaminant migration, including perched zones of saturation.

e. Based on data obtained from ground-water monitoring wells and piezometers installed upgradient and downgradient of the potential contaminant source, a representative description of water level or fluid pressure monitoring including:

i) Water-level contour and/or potentiometric maps;

ii) Hydrologic cross sections showing vertical gradients;

iii) The flow system, including the vertical and horizontal components of flow; and

iv) Any temporal changes in hydraulic gradients, due for example, to tidal or seasonal influences.

f. A description of man-made influences that may affect the hydrogeology of the site, identifying:

i) Active and inactive local water-supply and production wells with an approximate schedule of pumping; and

ii) Man-made hydraulic structures (pipelines, french drains, ditches, unlined ponds, septic tanks, NPDES outfalls, retention areas, etc.).

2. Soils

Defendant shall conduct a program to characterize the soil and rock units above the water table over the entire site. Such characterization shall include but not be limited to, the following information:

a. Unified soil classification;
b. Surface soil distribution (in map form);
c. Soil profile, including ASTM classification of soils;
d. Transects of soil stratigraphy;
e. Hydraulic conductivity (saturated and unsaturated);
f. Relative permeability;
g. Bulk density;
h. Porosity;
i. Soil sorptive capacity;
j. Cation exchange capacity (CEC);
k. Soil organic content;
l. Soil pH;
m. Particle size distribution;
n. Depth of water table;
o. Moisture content;
p. Effect of stratification on unsaturated flow;
q. Infiltration;
r. Evapotranspiration;
s. Storage capacity;
t. Vertical flow rate; and
u. Mineral content.

3. Surface Water and Sediment

Defendant shall conduct a program to characterize the surface water bodies in the vicinity of the facility. Such characterization shall include, but not be limited to, the following activities and information:

a. Description of the temporal and permanent surface water bodies including:

i) For open water (e.g. lakes and estuaries): location, elevation, surface area, inflow, outflow, depth, temperature stratification, and volume;

ii) For impoundments: location, elevation, surface area, depth, volume, freeboard, and purpose of impoundment;

iii) For rivers, streams, creeks, springs, ditches, drains, swamps and channels: location, elevation, flow, velocity, depth, width, seasonal fluctuations, discharge points general content and flooding tendencies (i.e., 100-year event);

iv) Drainage patterns; and

v) Evapotranspiration.

b. Description of the chemistry of the natural surface water and sediments. This includes, but is not limited to, determining the pH, total dissolved solids, total suspended solids, biological oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients (NH3, NO3-/NO2-, PO4-3), chemical oxygen demand, total organic carbon, and specific contaminant concentrations, etc.

c. Description of sediment characteristics including:

i) Deposition area (including a map);

ii) Thickness profile (including structural features); and

iii) Physical and chemical parameters (e.g., grain size, density, organic carbon content, ion exchange capacity, pH, etc.).

4. Air

Defendant shall provide information characterizing the climate in the vicinity of the facility. Such information shall include, but not be limited to:

a. A description of the following parameters:

i) Annual and monthly rainfall averages;

ii) Monthly temperature averages and extremes;

iii) Wind speed and direction;

iv) Relative humidity/dew point;

v) Atmospheric pressure;

vi) Evaporation data;

vii) Development of inversions; and

viii) Climate extremes that have been known to occur in the vicinity of the facility, including frequency of occurrence.

b. A description of topographic and man-made features which affect air flow and emission patterns, including:

i) Ridges, hills or mountain areas;

ii) Canyons or valleys;

iii) Surface water bodies (e.g., rivers, lakes, bays, streams, surface impoundments, etc.);

iv) Wind breaks and forests; and

v) Buildings.

B. Source Characterization

Defendant shall collect analytical data to completely characterize the wastes and the areas where wastes have been placed, collected, or removed including: type; quantity; physical form; disposition (containment or nature of deposits); and facility characteristics affecting release (e.g., facility security, engineered barriers, and NPDES outfalls, etc.). This shall include quantification of the following specific characteristics, at each source area, subsequent to November 1980 and to the extent know or ascertainable for the period prior thereto. Specific areas to characterize shall include, but not be limited to, those identified in Table A-1, Task I Section A or in Figures B-1 and B-2.

1. Unit/Disposal Area Characteristics:

a. Location of unit/disposal area;
b. Type of unit/disposal area;

c. Design features and dimensions;
d. Operating practices (past and present);
e. Period of operation;
f. Age of unit/disposal area;
g. General physical conditions; and
h. Method used to close the unit/disposal area.

2. Waste Characteristics:

a. Type of waste placed in the unit:

i) Hazardous classification (e.g., flammable, reactive, corrosive, oxidizing or reducing agent, or listed hazardous waste);

ii) Quantity; and

iii) Chemical composition.

b. Physical and chemical characteristics:

i) Physical form (solid, liquid, gas);

ii) Physical description (e.g., powder, oily sludge);

iii) Temperature;

iv) pH;

v) General chemical class (e.g., acid, base, solvent);

vi) Molecular weight;

vii) Density;

viii) Boiling point;

ix) Viscosity;

x) Solubility in water;

xi) Cohesiveness of the waste;

xii) Vapor pressure; and

xiii) Flash point.

c. Migration and dispersal characteristics of the waste:

i) Sorption;

ii) Biodegradability, bioconcentration, biotransfor-

mation;

iii) Photodegradation rates;

iv) Hydrolysis rates; and

v) Chemical transformations.

Defendant shall document the procedures used in making the above determinations.

C. Contamination Characterization

Defendant shall collect analytical data on ground-water, soils, surface water, sediment, and subsurface gas contamination in and around the facility. This data shall be sufficient to define the extent, origin, direction, and rate of movement of contaminant plumes. Data shall include time and location of sampling, media sampled, concentrations found, conditions during sampling, and the identity of the individuals performing the sampling and analysis. Specific areas to characterize shall include, but not be limited to, the following:

- Areas identified in Table A-1, Task I Section A, and Figures B-1 and B-2;
- Wells MW-1, MW-1A, MW-5, MW-6, MW-7, MW-8, MW-9, and MW-16;
- The sediment in the sumps and areas around the sumps at the returned product storage area;
- The soil and sumps northwest of the dinoseb plant and in and around the dinoseb production area; and
- The areas identified in the RCRA Environmental Investigation, February 1987.

Defendant shall address the following types of contamination at the facility:

1. Ground-Water Contamination

Defendant shall conduct a Ground-Water Investigation to characterize any plumes of contamination at the facility. This investigation shall, at a minimum, provide the following information:

a. A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the facility;

b. The horizontal and vertical direction of contaminant movement;

c. The velocity of contaminant movement;

d. The horizontal and vertical concentration profiles of Appendix IX compounds. These compounds are to be measured by EPA approved procedures;

e. An evaluation of factors influencing the plume movement; and

f. An extrapolation of future contaminant movement.

Defendant shall document the procedures used in making the above determinations (e.g., well design, well construction, geophysics, modeling, etc.).

2. Soil Contamination

Defendant shall conduct an investigation to characterize the contamination of the soil and rock units above the water table in the vicinity of the contaminant release(s). The investigation shall include the following information:

a. A description of the vertical and horizontal extent of contamination.

b. A description of contaminant and soil chemical properties within the contaminant source area and plume. This includes contaminant solubility, speciation, adsorption, leachability, exchange capacity, biodegradability, hydrolysis, photolysis, oxidation, and other factors that might affect contaminant migration and transformation.

c. Specific contaminant concentrations.

d. The velocity and direction of contaminant movement.

e. An extrapolation of future contaminant movement.

Defendant shall document the procedures used in making the above determinations.

3. Surface-Water and Sediment Contamination

Defendant shall conduct a surface water investigation to characterize contamination in surface water bodies resulting from contaminant releases at the facility. The investigation shall include, but not be limited to, the following information:

a. A description of the horizontal and vertical extent of any plume(s) originating from the facility, and the extent of

contamination in underlying sediments;

b. The horizontal and vertical direction of contaminant movement;

c. The contaminant velocity;

d. An evaluation of the physical, biological, and chemical factors influencing contaminant movement;

e. An extrapolation of future contaminant movement; and

f. A description of the chemistry of the contaminated surface waters and sediments. This includes but is not limited to determining the pH, total dissolved solids, total suspended solids, biological oxyge demand, alkalinity, conductivity, dissolved oxygen profiles, nutrient (NH3, NO3-/NO2-, PO4-3), chemical oxygen demand, total organic carbon, and specific contaminant concentrations.

Defendant shall document the procedures used in making the above determinations.

4. Air Contamination

Defendant shall conduct an investigation to characterize the particulate and gaseous contaminants released into the atmosphere or any structure or building. This investigation shall provide the following information:

a. A description of the horizontal and vertical direction and velocity of contaminant movement;

b. The rate and amount of the release; and

c. The chemical and physical composition of the contaminants released, including horizontal and vertical concentration profiles.

Defendant shall document the procedures used in making the above determinations.

5. Subsurface Gas Contamination

Defendant shall conduct an investigation to characterize subsurface gases emitted from buried hazardous wastes and/or hazardous constituents in the ground water. This investigation shall include the following information:

a. A description of the horizontal and vertical extent of subsurface gases migration;

b. The chemical composition of the gases being emitted;

c. The rate, amount, and density of the gases being emitted; and

d. Horizontal and vertical concentration profiles of the subsurface gases emitted.

Defendant shall document the procedures used in making the above determinations.

D. Potential Receptors

Defendant shall collect data describing the human populations and environmental systems that are susceptible to contaminant exposure from the facility. Chemical analysis of biological samples will be needed. Data on observable effects in ecosystems shall also be obtained. The following characteristics shall be identified:

1. Local uses and possible future uses of ground water:

   a. Type of use (e.g., drinking water source: municipal or residential, agricultural, domestic/non-potable, and industrial); and

   b. Location of ground-water users including wells and discharge areas.

2. Local uses and possible future uses of surface waters draining the facility:

   a. Domestic and municipal (e.g., potable and lawn/garden watering);

   b. Recreational (e.g., swimming, fishing);

   c. Agricultural;

   d. Industrial; and

   e. Environmental (e.g., fish and wildlife propagation).

3. Human use of or access to the facility and adjacent lands, including, but not limited to:

   a. Recreation;

   b. Hunting;

   c. Residential;

   d. Commercial;

   e. Zoning; and

f. Relationships between population locations and prevailing wind direction.

4. A description of the biota in surface water bodies on, adjacent to, or affected by the facility.

5. A description of the ecology overlying and adjacent to the facility.

6. A demographic profile of the people who use or have access to the facility and adjacent land, including but not limited to age, sex, and sensitive subgroups.

7. A description of any endangered or threatened species near the facility.

TASK VI: INVESTIGATION ANALYSIS

Defendant shall prepare and submit to EPA and MSDEQ, for approval by EPA, an analysis and summary of all Facility investigations and their results. The objective of this task shall be to ensure that the investigationdata are sufficient in quality (e.g. quality assurance procedures have been followed) and quantity to describe the nature and extent of contamination, potential threat to human health and/or the environment, and to support the Corrective Measures Study.

A. Data Analysis

Defendant shall analyze all Facility investigation dat outlined in Task V and prepare a report on the type and extent of contamination at the Facility including sources and migration pathways. The report shall describe the extent of contamination (qualitative/quantitative) in relation to background levels indicative for the area. listed under item B below.

B. Protection Standards

1. Ground-Water Protection Standards

For regulated units, Defendant shall provide information to support EPA's selection/development of Groundwater ProtectionStandards for all of the Appendix IX constituents found in the ground water during the Facility Investigation (Task V).

a. The Ground-Water Protection Standards shall consist of:

i) For any constituents listed in Table 1 of 40 CFR 264.94, the respective value given in that table (Maximum Concentration of Constituents for Ground-Water Protection) if the background level of the constituent is below the one given in Table

1; or

ii) The background level of that constituent in the groundwater; or

iii) An EPA-approved Alternate Concentration Limit (ACL).

b. Information to support EPA's subsequent selection of Alternate Concentration Limits (ACLs) shall be developed by Defendant in accordance with EPA's guidance. For any proposed ACLs, Defendant shall include a justification based upon the criteria set forth in 40 CFR 264.94(b).

c. Within ninety (90) calendar days of receipt of any proposd ACL's, EPA shall notify Defendant in writing of approval, disapproval, or modifications. EPA shall specify in writing the reason(s) for any disapproval or modification.

d. Within sixty (60) calendar days of receipt of EPA's notification or disapproval of any proposed ACL, Defendant shall amend and submit revisions to EPA.

2. Other Relevant Protection Standards

Defendant shall identify all relevant and applicable standards for the protection of human health and the environment (e.g., National Ambient Air Quality Standards, Federally-approved State Water Quality Standards, etc.).

TASK VII: LABORATORY AND BENCH-SCALE STUDIES

Defendant shall conduct laboratory and/or bench-scale studies to determine the applicability of a corrective-measure technology or technologies to facility conditions. Defendant shall analyze the technologies, based on literature review, vendor contracts, and past experience, to determine the testing requirements.

Defendant shall develop a testing plan identifying the types(s) and goal(s) of the study(ies), the level of effort needed, and the procedures to be used for data management and interpretation.

Upon completion of the testing, Defendant shall evaluate the testing results to assess the technology or technologies with respect to the site-specific questions identified in the test plan.

Defendant shall prepare a report summarizing the testing program and its results, both positive and negative.

TASK VIII: REPORTS AND OTHER SUBMISSIONS

A. Preliminary Reports and Workplan Submissions

Defendant shall submit to EPA and MSDEQ for review and EPA approval, reports on Tasks I and II when it submits the RCRA Facility Investigation Workplan (Task III).

b. Progress Reports

Defendants shall at minimum provide EPA with signed, monthly progress reports containing:

1. A description and estimate of the percentage of the RFI completed;

2. Summaries of all findings;

3. Summaries of all changes made in the RFI during the reporting period;

4. Summaries of all contacts with representatives of the local community, public interest groups, or State government during the reporting period;

5. Summaries of all problems or potential problems encountered during the reporting period;

6. Actions being taken to rectify problems;

7. Changes in personnel involved with the RFI during the reporting period;

8. Projected work for the next reporting period; and

9. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

C. Draft and Final Reports

Defendant shall prepare a Draft RCRA Facility Investigation Report to present and document the findings of Tasks V and VI. The RCRA Facility Investigation Report shall be developed in draft form for EPA and MSDEQ review. The RCRA Facility Investigation Report shall be developed in final format incorporating comments received on the Draft RCRA Facility Investigation Report. Task VII shall be submitted as a separate report when the Final RCRA Facility Investigation Report is submitted. All reports become final upon EPA approval.

Three copies of all reports, including the Task I report, Task II report, Task III Workplan, Task IV report, Task VI report and both the Draft and Final RCRA Facility Investigation Reports (Tasks V and VI) shall be provided by Defendant to EPA. Two copies of these reports shall be submitted to MSDEQ.

Facility Submission Summary

An abbreviated summary of the information reporting requirements contained in the RCRA Facility Investigation Scope of Work is presented below.

Facility Submission	Due Date *
Description of Current Situation (Task I)	Within ninety (60) calendar days
Pre-Investigation Evaluation of Corrective Measure Technologies (Task II)	Within ninety (60) calendar days
RFI Workplan (Task III)	Within ninety (60) calendar days
Implementation of approved RFI Workplan (Task V)	Immediately upon approval of RFI Workplan
Draft RFI Report (Task V and VI)	One hundred eighty (180) days after RFI Workplan approval
Final RFI Report (Tasks V and VI)	Thirty (30) days after EPA and MSDEQ Comment on Draft RFI Report
Laboratory and Bench-Scale Studies (Task VII)	Concurrent with Final RFI Report
Progress Reports on Tasks I through VI	Monthly

* All dates are calculated from the effective date of this order unless otherwise specified.

ATTACHMENT C

SCOPE OF WORK FOR A CORRECTIVE MEASURES STUDY

AT

CEDAR CHEMICAL CORPORATION, VICKSBURG, MISSISSIPPI

ATTACHMENT C

SCOPE OF WORK FOR A CORRECTIVES MEASURE STUDY

AT

CEDAR CHEMICAL CORPORATION, VICKSBURG, MISSISSIPPI

PURPOSE

The purpose of this Corrective Measures Study (hereafter "CMS") is to develop and evaluate the corrective action alternative or alternatives and to recommend the corrective measure or measures to be taken at Chemical Chemical Corporation in Vicksburg, Mississippi. The Defendant will furnish the personnel, material, and services necessary to prepare the corrective measure study, except as otherwise specified. The Defendant shall submit to EPA and MSDEQ, ninety (90) calendar days after submittal of the Final RFI Report, a Draft CMS Report. This report shall contain all information requested in the tasks outlined below. EPA and MSDEQ will review the Draft CMS Report and provide comments to the Respondent. Within thirty (30) calendar days of receipt of EPA and MSDEQ comments, Defendant shall modify the Draft CMS Report to incorporate such comments and shall submit the revised CMS Report to EPA and MSDEQ. EPA will approve the revised CMS Report or modify it. The revised CMS Report as approved or modified by EPA shall become the Final CMS Report. Upon receipt of the Final CMS Report, EPA shall announce its availability to the public for review and comment and then inform the Defendant of its final decision as to the approved Corrective Measures to be implemented.

SCOPE

The Corrective Measures Study consists of four tasks:

Task I: Identification and Development of the Corrective Measures Alternative or Alternatives

- A. Description of Current Situation
- B. Establishment of Corrective Action Objectives
- C. Screening of Corrective Measures Technologies
- D. Identification of the Corrective Measures Alternative or Alternatives

Task II: Evaluation of the Corrective Measures Alternative or Alternatives

- A. Technical/Environmental/Human Health/Institutional
- B. Cost Estimate

Task III: Justification and Recommendation of the Corrective Measure or Measures

A. Technical
B. Environmental
C. Human Health

Task IV: Reports and Other Submissions

A. Progress Reports
B. Draft Reports
C. Final Reports
D. Public Notice and Final Selection of Corrective Measure

TASK I: IDENTIFICATION AND DEVELOPMENT OF THE CORRECTIVE ACTION ALTERNATIVE OR ALTERNATIVES

Based on the results of the RCRA Facility Investigation and consideration of the identified Preliminary Corrective Measures Technologies (Task II), the Defendant shall identify, screen, and develop the alternatives for removal, containment, treatment, and/or other remediation of the contamination based on the objectives established for the corrective action.

A. Description of Current Situation

Defendant shall submit an update to the information describing the current situation at the facility and the known nature and extent of the contamination as documented by the RCRA Facility Investigation Report. Defendant shall provide an update to information presented in Task I of the RFI to the United States Environmental Protection Agency (EPA) and Mississippi Bureau of Pollution Control (MBPC) regarding previous response activities and any interim measures which have been or are being implemented at the facility. The Defendant's shall include a statement of the RCRA Facility Investigation findings identifying the actual or potential exposure pathways that shall be addressed by corrective measures.

B. Establishment of Corrective Action Objectives

Defendant in conjunction with EPA and MSDEQ shall establish site-specific objectives for the corrective action. These objectives shall be based on public health and environmental criteria, information gathered during the RCRA Facility Investigation, EPA guidance, and the requirements of any applicable Federal statutes. At a minimum, all corrective actions concerning ground-water releases from regulated units must be consistent with, and as stringent as, those required under 40 CFR 264.100.

C. Screening of Corrective Measures Technologies

Defendant shall review the results of the RCRA Facility Investigation, reassess the technologies specified in Task II of the RCRA Facility Investigation, and identify additional technologies which are applicable for corrective measures at the facility. Defendant shall screen the preliminary corrective measures technologies identified in Task II of the RCRA Facility Investigation and any supplemental technologies to eliminate those that may prove infeasible to implement, that rely on technologies unlikely to perform satisfactorily or reliably, or that do not achieve the corrective measures eliminating those technologies which have severe limitations for a given set of waste and site-specific conditions. The screening step may also eliminate technologies based on inherent technology limitations.

Site, waste, and technology characteristics which are used to screen inapplicable technologies are described in more detail below:

1. Site Characteristics

Site data should be reviewed to identify conditions that may limit or promote the use of certain technologies. Technologies whose use is clearly precluded by site characteristics should be eliminated from further consideration;

2. Waste Characteristics

Identification of waste characteristics that limit the effectiveness or feasibility of technologies is an important part of the screening process. Technologies clearly limited by these waste characteristics should be eliminated from consideration. Waste characteristics particularly affect the feasibility of in-situ methods, direct treatment methods, and land disposal (on/off-site); and

3. Technology Limitations

During the screening process, the level of technology development, performance record, and inherent construction, operation, and maintenance problems should be identified for each technology considered. Technologies that are unreliable, perform poorly, or are not fully demonstrated may be eliminated in the screening process. For example, certain treatment methods have been developed to a point where they can be implemented in the field without extensive technology transfer or development.

D. Identification of the Corrective Measures Alternative or Alternatives

Defendant shall develop the Corrective Measures Alternative or Alternatives based on the Corrective Action Objectives and analysis of Preliminary Corrective Measures Technologies, as presented in Task II

of the RCRA Facility Investigation and as supplemented following the preparation of the RFI Report. Defendant shall rely on engineering practice to determine which of the previously identified technologies appear most suitable for the site. Technologies can be combined to form the overall corrective action alternative or alternatives.

The alternative or alternatives developed should represent a workable number of options that each appear to adequately address all site problems and Corrective Action Objectives. Each alternative may consist of an individual technology or a combination of technologies. Defendant shall document the reasons for excluding technologies previously identified in Task II of the RFI.

TASK II: EVALUATION OF THE CORRECTIVE MEASURES ALTERNATIVE OR ALTERNATIVES

Defendant shall describe each corrective measures alternative that passes through the Initial Screening in Task I and evaluate each corrective measures alternative and it's components. The evaluation shall be based on technical, environmental, human health, and institutional concerns. Defendant shall also develop cost estimates for each corrective measures alternative.

A. Technical/Environmental/Human Health/Institutional

Technical

1. The Defendant shall evaluate each corrective measures alternative based on technical concerns, including performance, reliability, implementability and safety.

    a. Defendant shall evaluate performance based on the effectiveness and useful life of the corrective measure:

        i) Effectiveness shall be evaluated in terms of the ability to perform intended functions, such as containment, diversion, removal, destruction, or treatment. The effectiveness of each corrective measure shall be performance evaluation. Any specific waste or site the effectiveness of combinations of technologies; and

        ii) Useful life is defined as the length of time the level of effectiveness can be maintained. Most corrective measures technologies, with the exception of destruction, deteriorate with time. Often, deterioration can be slowed through proper system operation and maintenance, but the technology eventually may require replacement. Each corrective measure shall be evaluated in terms of the projected service lives of its component technologies. Resource availability in the future life of the

technology, as well as appropriateness of the technologies, must be considered in estimating the useful life of the project.

b. Defendant shall provide information on the reliability of each corrective measure including its operation and maintenance requirements and its demonstrated reliability:

   i) Operation and maintenance requirements include the frequency and complexity of necessary operation and maintenance activities. Technologies requiring frequent or complex operation and maintenance activities should be regarded as less reliable than technologies requiring little or straightforward operation and maintenance activities. The availability of labor and materials to meet these requirements shall also be considered.

   ii) Demonstrated and expected reliability is a way of evaluating the risk and effect of failure. Defendant shall evaluate whether the technologies have been used effectively under analogous conditions; whether the combination of technologies have been used together effectively; whether failure of any one technology has an immediate impact on receptors; and whether the corrective measure has the flexibility to deal with uncontrollable changes at the site.

c. Defendant shall describe the implementability of each corrective measure including the relative ease of installation (constructability) and the time required to achieve a given level of response:

   i) Constructability is determined by conditions both internal and external to the facility conditions and include such items as location of underground utilities, depth to water table, heterogeneity of subsurface materials, and location of the facility (i.e., remote location vs. a congested urban area). Defendant shall evaluate what measures can be taken to facilitate construction under these conditions. External factors which affect implementation include the need for special permits or agreements, equipment availability, and the location of suitable off-site treatment or disposal facilities; and

   ii) Time has two components that shall be addressed: the time it takes to implement a corrective measure and the time it takes to actually see beneficial results. Beneficial results are defined as the reduction of contaminants to some acceptable,

pre-established level.

d. Defendant shall evaluate each corrective measure alternative with regard to safety. This evaluation shall include threats to the safety of nearby communities and environments as well as those to workers during implementation. Factors to consider are fire, explosion, and exposure to hazardous substances.

2. Environmental

Defendant shall perform an Environmental Assessment for each alternative. The Environmental Assessment shall focus on the facility conditions and pathways of contamination actually addressed by each alternative. The Environmental Assessment for each alternative will include, at a minimum, an evaluation of: the short- and long-term beneficial and adverse effects of the response alternative; any adverse effects on environmentally sensitive areas; and an analysis of measures to mitigate adverse effects.

3. Human Health

Defendant shall assess each alternative in terms of the extent to which it mitigates short and long term potential exposure to any residual contamination and protects human health both during and after implementation of the corrective measures. The assessment will describe the concentrations and characteristics of the contaminants on-site, potential exposure routes, and potentially affected population. Each alternative will be evaluated to determine the level of exposure to contaminants and the reduction over time. The relative reduction of impact will be determined by comparing residual levels of contaminants for each alternative with existing criteria, standards, or guidelines for levels of contaminants acceptable to EPA.

4. Institutional

Defendant shall assess relevant institutional requirements for each alternative. Specifically the effects of Federal, state and local environmental and public health standards, regulations, guidance, advisories, ordinances, or community relations on the design, operation, and timing of each alternative.

B. <u>Cost Estimate</u>

Defendant shall develop an estimate of the cost of each corrective measures alternative (and for each phase or segment of the alternative). The cost estimate shall include both fixed capital and working capital (operation and maintenance) costs. The fixed capital cost estimate will be used to compare corrective measures alternatives.

1. Capital costs consist of direct (construction) and indirect (nonconstruction and overhead) costs.

   a. Direct capital costs include:

      i) Construction costs: Costs of materials, labor (including fringe benefits and worker's compensation), and equipment required to install the corrective measure;

      ii) Equipment costs: Costs of treatment, containment, disposal, and/or service equipment necessary to implement the action; these materials remain until the corrective action is complete;

      iii) Land and site-development costs: Expenses associated with purchase of land and development of existing property; and

      iv) Building and services costs: Costs of process and nonprocess buildings, utility connections, purchased services, and disposal costs.

   b. Indirect capital costs include:

      i) Engineering expenses: Costs of administration, design, construction supervision, drafting, and testing of corrective measures alternatives;

      ii) Legal fees and license or permit costs: Administrative and technical costs necessary to obtain licenses and permits for installation and operation;

      iii) Start-up and shake-down costs: Costs incurred during corrective measures start-up; and

      iv) Contingency allowances: Funds to cover costs resulting from unforeseen circumstances, such as adverse weather conditions, strikes, and inadequate facility characterization.

2. Operation and maintenance costs are post-construction costs necessary to ensure continued effectiveness of a corrective measure. Defendant shall consider the following operation and maintenance cost components:

   a. Operating labor costs: Wages, salaries, training, overhead, and fringe benefits associated with the labor needed for post-construction operations;

   b. Maintenance materials and labor costs: Costs for labor, parts,

and other resources required for routine maintenance of facilities and equipment;

c. Auxiliary materials and energy: Costs of such items as chemicals and electricity for treatment plant operations, water and sewer service, and fuel;

d. Purchased services: Sampling costs, laboratory fees, and professional fees for which the need can be predicted;

e. Disposal and treatment costs: Costs of transporting, treating, and disposing of waste materials, such as treatment plant residues, generated during operations;

f. Administrative costs: Costs associated with administration of corrective measures operation and maintenance not included under other categories;

g. Insurance, taxes, and licensing costs: Costs of such items as liability and sudden accidental insurance; real estate taxes on purchased land or rights-of-way; licensing fees for certain technologies; and permit renewal and reporting costs;

h. Maintenance reserve and contingency funds: Annual payments into escrow funds to cover (1) costs of anticipated replacement or rebuilding of equipment and (2) any large unanticipated operation and maintenance costs; and

i. Other costs: Items that do not fit any of the above categories.

TASK III: JUSTIFICATION AND RECOMMENDATION OF THE CORRECTIVE MEASURES

Defendant shall justify and recommend a corrective measures alternative using technical, human health, and environmental criteria. This recommendation shall include summary tables which allow the alternative or alternatives to be understood easily. Trade offs among health risks, environmental effects, and other pertinent factors shall be highlighted. EPA will select the corrective measures alternative or alternatives to be implemented based on the results of Tasks II and III. At a minimum, the following criteria will be used to justify the final corrective measure or measures.

A. Technical

1. Performance - Corrective measures which are most effective at performing their intended functions and maintaining the performance over extended periods of time will be given preference;

2. Reliability - Corrective measures which do not require frequent or complex operation and maintenance activities and that have

proven effective under waste and facility conditions similar to those anticipated will be given preference;

3. Implementability - Corrective measures which can be constructed and operated to attain or exceed applicable standards in the shortest period of time will be preferred; and 4. Safety - Corrective measures which pose the least threat to the safety of nearby residents and environments as well as workers during implementation will be preferred.

4. Safety - Corrective measures which pose the least threat to the safety of nearby residents and environments as well as workers during implementation will be preferred.

B. Environmental

The corrective measures posing the least adverse impact (or greatest improvement) over the shortest period of time on the environment will be favored.

C. Human Health

The corrective measures must comply with existing EPA and State criteria, standards, or guidelines for the protection of human health. Corrective measures which provide the minimum level of exposure to contaminants and the maximum reduction in exposure with time will be preferred.

TASK IV: REPORTS AND OTHER SUBMISSIONS

Defendant shall prepare a Corrective Measures Study Report presenting the results of Tasks I through III and recommending a corrective measures alternative. Three copies of the preliminary report shall be provided by the Defendant to EPA, and two copies to MSDEQ for review and EPA approval within ninety (90) calendar days after the Defendant's receipt of notification of approval of the RFI Report.

A. Progress Reports

Defendant shall submit to EPA and MSDEQ signed, monthly progress reports which provide, at a minimum:

1. A description and estimate of the percentage of the CMS completed;

2. Summaries of all findings;

3. Summaries of all changes made in the CMS during the reporting period;

4. Summaries of all contacts with representatives of the local community, public interest groups, or State government during the reporting period;

5. Summaries of all problems or potential problems encountered during the reporting period;

6. Actions being taken to rectify problems;

7. Changes in personnel involved with the CMS during the reporting period;

8. Projected work for the next reporting period; and

9. Copies of daily reports, inspection reports, laboratory/ monitoring data, etc.

B. Draft Reports

The Corrective Mesures Study Report shall at a minimum include:

1. A description of the facility;

   Site topographic map and preliminary layouts.

2. A summary for each corrective measures alternative, of the descriptions, assessments and evaluations made in Tasks I and II, above;

3. A summary of the corrective measures;

   a. Description of the corrective measures and rationale for selection;

   b. Performance expectations;

   c. Preliminary design criteria and rationale;

   d. General operation and maintenance requirements; and

   e. Long-term monitoring requirements.

4. A summary of the RCRA Facility Investigation findings and impact on the recommended corrective measure or measures:

   a. Field studies (ground water, surface water, soil, air); and

   b. Laboratory studies (bench scale, pilot scale).

5. Design and implementation precautions for the recommended Corrective Measures:

   a. Special technical problems;

   b. Additional engineering data required;

c. Permits and regulatory requirements;

d. Access, easements, right-of-ways;

e. Health and safety requirements; and

f. Community relations activities.

6. Cost Estimates and Schedules for the recommended Corrective Measures;

a. Fixed Capital cost estimate;

i) Study Cost Estimates for the comparisons of corrective measure technologies (±30% of projected final cost)

ii) Project Control Capital Cost Estimate for the chosen corrective measure technology (±10% of projected final cost)

b. Working Capital cost estimate (operation and maintenance); and

c. Preliminary project schedule (design, construction, operation).

Copies of the draft shall be provided by the Defendants to EPA and MSDEQ.

C. Final Reports

Defendant shall finalize the Corrective Measures Study Report, incorporating comments received from EPA and MSDEQ on the Draft Corrective Measures Study Report.

D. Public Review and Final Selection of Corrective Measures

Upon approval of the Final Corrective Measures Study Report, EPA shall announce its availability to the public for review and comment. At the end of the comment period, EPA shall review the comments and then inform Defendant of its final decision as to the approved corrective measures to be implemented.

Facility Submission Summary

A summary of the information reporting requirements contained in the Corrective Measures Study Scope of Work is presented below:

Facility Submission	Due Date
Draft CMS Report (Tasks VIII, IX, and X)	Within ninety (90) calendar days after submittal of the Final RFI
Final CMS Report (Tasks VIII, IX, and X)	Within thirty (30) calendar days after EPA and MSDEQ comment on the Draft CMS
Progress Reports (Tasks VIII, IX, and X)	Monthly

EPA will make the Final CMS Report available to the public for review and comment for thirty (30) calendar days. At the end of the thirty (30) day period, EPA will inform Defendant of its final decision of the approved corrective measures to be implemented.

ATTACHMENT D

SCOPE OF WORK FOR THE CORRECTIVE MEASURES IMPLEMENTATION

AT

CEDAR CHEMICAL CORPORATION, VICKSBURG, MISSISSIPPI

ATTACHMENT D

SCOPE OF WORK FOR THE CORRECTIVE MEASURES IMPLEMENTATION

AT

CEDAR CHEMICAL CORPORATION, VICKSBURG, MISSISSIPPI

PURPOSE

The purpose of this Corrective Measures Implementation (hereafter "CMI") program is to design, construct, operate, maintain, and monitor the performance of the corrective measure or measures selected to protect human health and the environment at the Cedar Chemical Facilty. The Defendant shall furnish all personnel, materials, and services necessary for the implementation of the corrective measure or measures at the Facility. Reports and plans will be submitted to EPA and MSDEQ. These reports and plans will be subject to review, modification and approval by EPA and MSDEQ.

SCOPE

The Corrective Measures Implementation program consists of four tasks:

Task I: Corrective Measures Implementation Program Plan

- A. Program Management Plan
- B. Community Relations Plan

Task II: Corrective Measures Design

- A. Design Plans and Specifications
- B. Operation and Maintenance Plan
- C. Cost Estimate
- D. Project Schedule
- E. Construction Quality Assurance Objectives
- F. Health and Safety Plan
- G. Design Phases

Task III: Corrective Measures Construction

- A. Responsibility and Authority
- B. Construction Quality Assurance Personnel Qualifications
- C. Inspection Activities
- D. Sampling Requirements
- E. Documentation

Task IV: Reports and Other Submissions

- A. Progress Reports
- B. Draft Reports and Submissions
- C. Final Reports and Submissions

TASK I: CORRECTIVE MEASURES IMPLEMENTATION PROGRAM PLAN

The Defendant shall prepare a Corrective Measures Implementation Program Plan. This program will include the development and implementation of several plans, which require concurrent preparation. It may be necessary to revise plans as the work is performed to focus efforts on a particular problem. The Program Plan includes the following:

A. Program Management Plan

The Defendant shall prepare a Program Management Plan which will document the overall management strategy for performing the design, construction, operation, maintenance, and monitoring of corrective measure(s). The plan shall document the responsibility and authority of all organizations and key personnel involved with the implementation. The Program Management Plan shall also include a description of qualifications of key personnel directing the Corrective Measures Implementation Program, including contractor personnel.

B. Community Relations Plan

The Defendants shall revise the Facility Community Relations Plan during design and construction activities to include any changes in the level of information needed due to the concerns of the community.

1. Specific activities which must be conducted during the design stage are as follows:

   a. Revise the facility Community Relations Plan to reflect knowledge of citizen concerns and involvement at this stage of the process; and

   b. Prepare and distribute a public notice and an updated fact sheet at the completion of engineering design.

2. Depending on citizen interest at this point in the corrective action process, specific activities to be conducted during the construction stage could range from conducting group meetings to preparing fact sheets on the technical status.

TASK II: CORRECTIVE MEASURES DESIGN

The Defendant shall prepare final construction plans and specifications to implement the corrective measures at the facility as defined in the Corrective Measures Study. These plans and specifications shall be incorporated into a Corrective Measures Design Plan, which shall also include the following:

A. Design Plans and Specifications

The Defendant shall develop clear and comprehensive design plans and specifications which include, but are not limited to, the following:

1. Discussion of the design strategy and the design basis, including:

   a. Compliance with all applicable or relevant and appropriate environmental and public health standards; and

   b. Minimization of environmental and public impacts.

2. Discussion of the technical factors of importance including:

   a. Use of currently accepted environmental control measures and technology;

   b. The constructability of the design; and

   c. Use of currently acceptable construction practices and techniques.

3. Description of assumptions made and detailed justification of these assumptions;

4. Discussion of the possible sources of error and references to possible operation and maintenance problems;

5. Detailed drawings of the proposed design including;

   a. Qualitative flow sheets; and

   b. Quantitative flow sheets.

6. Tables listing equipment and specifications;

7. Tables giving material and energy balances;

8. Appendices including:

   a. Sample calculations (one example presented and explained clearly for significant or unique design calculations);

   b. Derivation of equations essential to understanding the report; and

   c. Results of laboratory or field tests.

B. Operation and Maintenance Plan

The Defendant shall prepare an Operation and Maintenance Plan to cover both implementation and long-term maintenance of the corrective measures. The plan shall be composed of the following elements:

1. Description of normal operation and maintenance (O&M):

   a. Description of tasks for operation;

b. Description of tasks for maintenance;

c. Description of prescribed treatment or operation conditions; and

d. Schedule showing frequency of each O&M task.

2. Description of potential operating problems:

a. Description and analysis of potential operating problems;

b. Sources of information regarding problems; and

c. Common and/or anticipated remedies.

3. Description of routine monitoring and laboratory testing:

a. Description of monitoring tasks;

b. Description of required laboratory tests and their interpretation;

c. Required QA/QC; and

d. Schedule of monitoring frequency and date, if appropriate, when monitoring may cease.

4. Description of alternate O&M:

a. Should systems fail, alternate procedures to prevent undue hazard; and

b. Analysis of vulnerability and additional resource requirements should a failure occur.

5. Safety plan:

a. Description of precautions, necessary equipment, etc., for site personnel; and

b. Safety tasks required in the event of systems failure.

6. Description of equipment:

a. Equipment identification;

b. Installation of monitoring components;

c. Maintenance of site equipment; and

d. Replacement schedule for equipment and installed components.

7. Records and reporting mechanisms required:

   a. Daily operating logs;

   b. Laboratory records;

   c. Records for operating costs;

   d. Mechanism for reporting emergencies;

   e. Personnel and maintenance records; and

   f. Monthly/annual reports to state agency.

A Draft Operation and Maintenance Plan shall be submitted simultaneously with the Prefinal Design Documents submission. The Final Operation and Maintenance Plan shall be submitted with the Final Design Documents.

C. Capital and Operating and Maintenance Construction Cost Estimate

The Defendant shall develop cost estimates for the purpose of assuring that the facility has the financial resources necessary to construct and implement the corrective measure. The cost estimate developed in the Corrective Measures Study shall be refined to reflect the more detailed, accurate design plans and specifications being developed. The cost estimate shall include both capital and operation and maintenance costs. A draft Cost Estimate shall be submitted simultaneously with the Prefinal Design Documents submission, and the Final Cost Estimate shall be submitted with the Final Design Documents.

D. Project Schedule

The Defendant shall develop a Project Schedule for constructing and implementing the corrective measure or measures which identifies timing for initiation and completion of all critical path tasks. The Defendant shall specifically identify dates for completion of the project and major interim milestones. A draft Project Schedule shall be submitted simultaneously with the Prefinal Design Documents submission, and the Final Project Schedule shall be submitted with the Final Design Documents.

E. Construction Quality Assurance Objectives

The Defendant shall identify and document the objectives and framework for the development of a construction quality assurance program including, but not limited to, the following: responsibility and authority, personnel qualifications, inspection activities, sampling requirements, and documentation. The draft Construction Quality Assurance Plan shall be submitted simultaneously with the Prefinal Design Documents submission, and the Final Construction Quality Assurance Plan shall be submitted with the Final Design Documents.

F. Health and Safety Plan

The Defendant shall modify the Health Safety Plan developed for the RCRA Facility Investigation to address the activities to be performed at the facility to implement the corrective measure(s). The draft revised Health and Safety Plan shall be submitted simultaneously with the Prefinal Design Document submission and the final revised Health and Safety Plan shall be submitted with the Final Design Documents.

G. Design Phases

The design of the corrective measure(s) should include the phases outlined below:

1. Preliminary design

The Defendant shall submit the preliminary design when the design effort is approximately 30% complete. At this stage, the Defendant shall have field-verified the existing conditions of the facility. The preliminary design shall reflect a level of effort such that the technical requirements of the project have been addressed and outlined so that they may be reviewed to determine if the final design will provide an operable and usable corrective measure. Supporting data and documentation shall be provided with the design documents defining the functional aspects of the program. The preliminary construction drawings by the Defendants shall reflect organization and clarity. The scope of the technical specifications shall be outlined in a manner reflecting the final specifications. The Defendant shall include, with the preliminary design submission, calculations reflecting the same percentage of completion as the design they support.

2. Intermediate design

Complex project design may necessitate review of the design documents between the preliminary and the prefinal/final design. At the discretion of the Agencies, a design review may be required at 60% completion of the project. The intermediate design submittal should include the same elements as the prefinal design.

3. Correlation of plans with specifications

General correlation between drawings and technical specifications is a basic requirement of any set of working construction plans and specifications. Before submitting the project specifications, the Defendant shall:

a. Coordinate and cross-check the specifications and drawings, and

b. Proof the edited specifications and cross-check all drawings and specifications.

These activities shall be completed prior to the 95% prefinal submittal to EPA and MSDEQ.

4. Equipment start-up and operator training

The Defendant shall prepare and include in the technical specifications governing treatment systems, contractor requirements for providing: appropriate service visits by experienced personnel to supervise the installation, adjustment, start-up, and operation of the treatment systems and training covering appropriate operational procedures once the start-up has been successfully accomplished.

5. Additional studies

Corrective Measures Implementation may require additional studies to supplement the available technical data, and this need for additional studies may be identified by the Agencies or the settling defendant. For any such studies required, the Defendant shall furnish all services, including field work, materials, supplies, plants, labor, equipment, investigations, studies, and superintendents. Sufficient sampling, testing, and analysis shall be performed to optimize the required treatment and/or disposal operations and systems. When additional studies are required, there shall be an initial meeting of all principal personnel involved in the development of the program. The purpose will be to discuss objectives, resources, communication channels, roles of personnel involved, and orientation of the site, etc. The interim report shall present the results of the testing with the recommended treatment or disposal system (including options). A review conference shall be scheduled after the interim report has been reviewed by all interested parties. The final report of the testing shall include all data taken during the testing and a summary of the study results.

6. Prefinal and final design

The Defendant shall submit the prefinal/final design documents in two phases. The first submission shall be at 95% completion of design (i.e., prefinal). After approval of the prefinal submission, the Defendants shall execute the required revisions and submit the final documents 100% complete with reproducible drawings and specifications.

The prefinal design submittal shall consist of the Design Plans and Specifications, Operation and Maintenance Plan, Capital and Operating and Maintenance Construction Cost Estimate, Project Schedule, Quality Assurance Plan, and the revised Health and Safety Plan.

The final design submittal shall consist of the Final Design Plans and Specifications (100% complete), the Defendant's Final Construction Cost Estimate, the Final Operation and Maintenance Plan, Final Quality Assurance Plan, Final Project Schedule, and Final Health and Safety Plan. The quality of the design documents

a. to review methods for documenting and reporting inspection data;

b. to review methods for distributing and storing documents and reports;

c. to review work area security and safety protocol;

d. to discuss any appropriate modifications of the construction quality assurance plan to ensure that site-specific considerations are addressed; and

e. to conduct a site walk-around to verify that the design criteria, plans, and specifications are understood and to review material and equipment storage locations.

The preconstruction inspection and meeting shall be documented by a designated person, and minutes should be transmitted to all parties.

2. Prefinal inspection

Upon preliminary project completion, the Defendant shall notify EPA and MSDEQ so that they may conduct a prefinal inspection. The prefinal inspection will consist of a walk-through inspection of the entire project site. The inspection is to determine whether the project is complete and consistent with the contract documents and the approved corrective measures. Any outstanding construction items discovered during the inspection will be identified and noted. Additionally, treatment equipment will be operationally tested by the Defendants. The Defendant will certify that the equipment has performed to meet the purpose and intent of the specifications. Retesting will be completed where deficiencies are revealed. The prefinal inspection report shall outline the outstanding construction items, actions required to resolve items, completion date for these items, and date for final inspection.

3. Final inspection

Upon completion of any outstanding construction items, the Defendant shall notify EPA and MSDEQ so that they may conduct a final inspection. The final inspection will consist of a walk-through inspection of the project site. The prefinal inspection report will be used as a checklist with the final inspection focusing on the outstanding construction items identified in the prefinal inspection. Confirmation shall be made that outstanding items have been resolved.

D. Sampling Requirements

The sampling activities, sample size, sample locations, frequency of testing, acceptance and rejection criteria, and plans for correcting problems as addressed in the project specifications should be presented in the CQA plan.

E. Documentation

Reporting requirements for CQA activities shall be described in detail in the CQA plan. This should include such items as daily summary reports, inspection data sheets, problem identification and remedy reports, design acceptance reports, and final documentation. Provisions for the final storage of all records also should be presented in the CQA plan.

TASK IV: REPORTS AND OTHER SUBMISSIONS

The Defendant shall prepare plans, specifications, and reports as set forth in Task I through Task IV, to document the design, construction, operation, maintenance, and monitoring of the corrective measures. These reports shall be provided by the Defendant to EPA and MSDEQ as specified in the Consent Decree.

A. Progress Reports

The Defendants shall provide EPA and MSDEQ with progress reports according to the time frames specified in the Consent Decree. The reports shall contain at a minimum:

1. A description and estimate of the percentage of the CMI completed;

2. Summaries of all findings;

3. Summaries of all changes made in the CMI during the reporting period;

4. Summaries of all contacts with representatives of the local community, public interest groups or state government during the reporting period;

5. Summaries of all problems or potential problems encountered during the reporting period;

6. Actions being taken to rectify problems;

7. Changes in personnel during the reporting period;

8. Projected work for the next reporting period; and

9. Copies of daily reports, inspection reports, and laboratory/ monitoring data.

B. Draft Reports and Submissions

1. The Defendant shall submit a draft Corrective Measures Implementation Program Plan as outlined in Task I within ninety (90) calendar days of receipt of notification of the Agencies final selection of the corrective measures;

2. The Defendant shall submit draft Design Plans and Specifications, Design Reports, Operation and Maintenance Plan, Capital and Operating and Maintenance Construction Cost Estimates, Construction Quality Assurance Objectives, Health and Safety Plan, Schedules for Design Phases, and Study Reports as outlined in Task II;

3. The Defendant shall submit a draft Construction Quality Assurance Program Plan and Documentation as outlined in Task III, and

4. At the "completion" of the construction of the project, the Defendants shall submit a Corrective Measures Implementation Report to EPA and MSDEQ. The Report shall document that the project is consistent with the design specifications and that the corrective measures are performing adequately. The Report shall include, but not be limited to, the following elements:

   a. Synopsis of the corrective measures and certification of the design and construction;

   b. Explanation of any modifications to the plans and why these were necessary for the project;

   c. Listing of the criteria, established before the corrective measures were initiated, for judging the functioning of the corrective measures and also explaining any modification to these criteria;

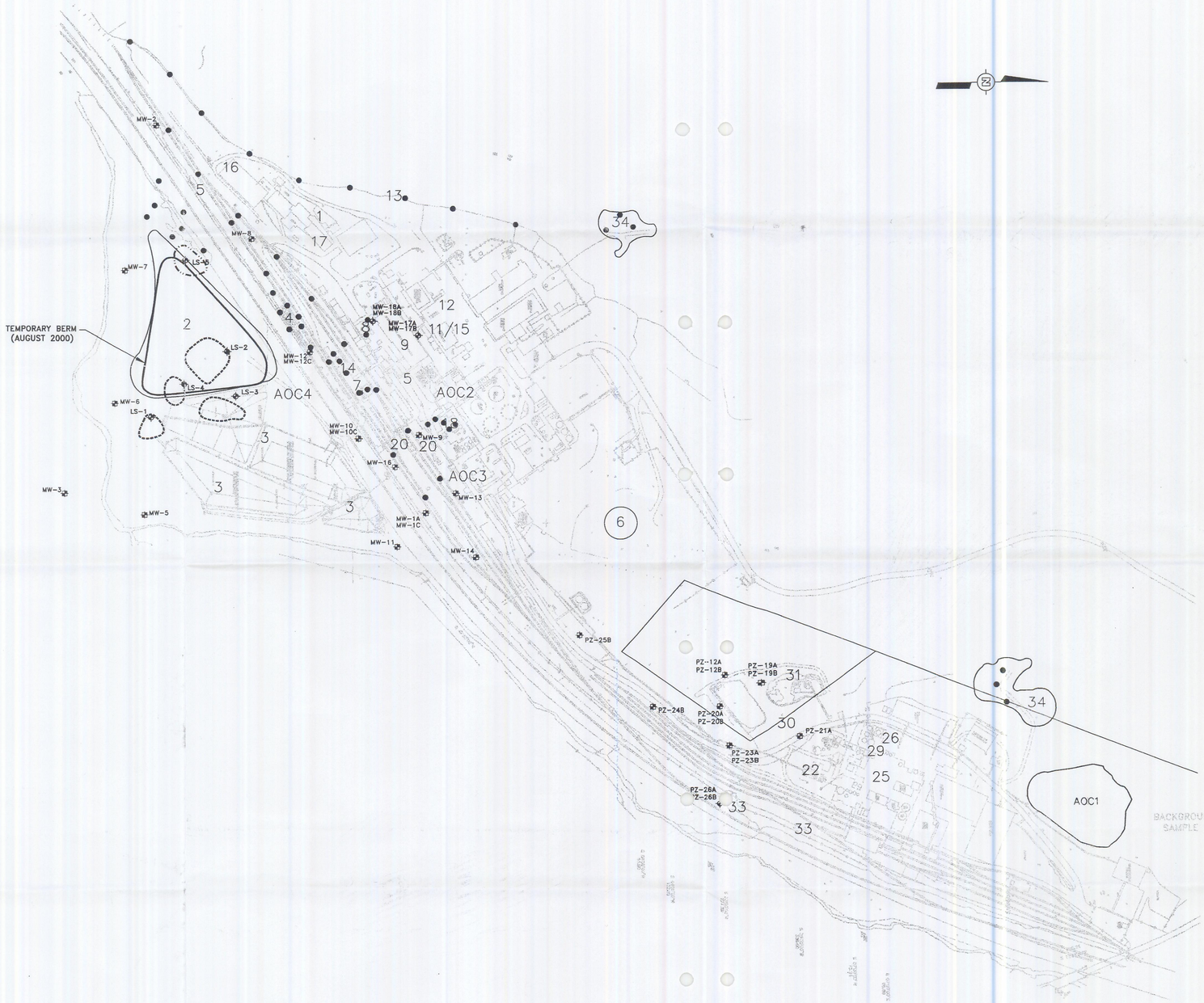
   d. Results of facility monitoring, indicating that the corrective measures will meet or exceed the performance criteria; and

   e. Explanation of the operation and maintenance (including monitoring) to be undertaken at the facility.

   This report should include all of the daily inspection summary reports, inspection data sheets, problem identification and remedy reports, block evaluation reports, photographic reporting data sheets, design engineers' acceptance reports, deviations from design and material specifications (with justifying documentation), and as-built drawings.

C. Final Reports and Submissions

The Defendant shall finalize the Corrective Measures Implementation Program Plan, the Corrective Measures Design Plan including, Design Plans and Specifications, the Operation and Maintenance Plan, the Capital and Operating and Maintenance Construction Cost Estimate, the Project Schedule, the Construction Quality Assurance Objectives, the Health and Safety Plan, the Design Phases, any additional studies which were conducted, and the Corrective Measures Implementation Report. This report shall include the final design and incorporate changes or explanations necessary to address comments received on draft submissions. The Defendant shall submit the Final Report to EPA and MSDEQ in accordance with the approved schedule.



SWMU NUMBER — SOUTH PLANT

1	CONTAINER (DRUM) STORAGE AREA
2	INACTIVE LANDFILL
3	SURFACE IMPOUNDMENT (SOUTH PLANT)
4	ACTIVATED CARBON TREATMENT UNITS
5	SOUTH PLANT DRAINAGE SYSTEMS
6	WASTEWATER STORAGE (HILL) TANKS
7	FORMER DINOSEB PRODUCTION AREA
8	DINOSEB LOADING/UNLOADING AREA
9	DINOSEB DRUMMING AREA
11	FORMER MSMA PRODUCTION AREA
12	FORMER MSMA SALT UNLOADING AREA
13	SOUTH PLANT DRAINAGE DITCHES
14	FORMER TOXAPHENE PRODUCTION AREA
15	FORMER METHYL PARATHION PRODUCTION AREA
16	FORMER ATRAZINE PRODUCTION AREA
17	RETURNED PRODUCT STORAGE AREA
18	FORMER BLUE TANK AREA
20	RAILROAD CAR UNLOADING STATION

NORTH PLANT

22	NORTH PLANT NEUTRALIZATION SYSTEM
23	EQUALIZATION/NEUTRALIZATION POND (NORTH PLANT)
25	NORTH PLANT WASTEWATER PIPES
26	C-10 SCRUBBER
29	OIL COLLECTION UNIT
30	NORTH PLANT WASTE OIL ACCUMULATION AREA
31	NO. 6 FUEL OIL AREA
33	NORTH PLANT DRAINAGE DITCHES

BOTH PLANTS

34	SURPLUS EQUIPMENT STORAGE (JUNKYARD)

AOC NUMBER — AOC NAME

1	FISH POND (NORTH PLANT)
2	DRUM STORAGE AREA
3	NEUTRALIZATION TANKS (SOUTH PLANT)
4	CHEMICAL CRYPT (SEPTIC TANKS)

LEGEND

- DEEP BORINGS LS-1, LS-2, LS-3, LS-4, LS-5
- MW-17A, MW-17B, MW-18A, MW-18B, MW-10C MW-12C, MW-1C, & PZ-26A/PZ-26B ARE PROPOSED LOCATIONS.
- SHALLOW BORINGS
- EXISTING MONITOR WELLS
- CLOSED PONDS
- CLOSED LANDFILL

SCALE
200 0 200 400 FEET

REV	DESCRIPTION OF REVISION	BY	DATE
2	SHOW SWMU 2 INVESTIGATION AUGUST 2000	PCG	8/11/00
1	SHOW NORTH POND WELLS; RELOCATE MW-18A/MW-18B; ADD MW-1C, PZ-26A/PZ-26B	RDK	7/18/00

VICKSBURG CHEMICAL COMPANY
VICKSBURG, MISSISSIPPI

URS Greiner Woodward Clyde
2822 O'Neal Lane
Baton Rouge, Louisiana 70816
225/751-1873

REFERENCE DRAWINGS

SCALE: 1"=200'
DESIGNED:
DRAWN: PCG
CHECKED: RDK
PEER REVIEWED: 11/15/99
DATE: 7/18/00

RCRA FACILITY INVESTIGATION

SWMU LOCATIONS, RFI SOIL AND CONCRETE SAMPLE POINTS, GWA MONITOR WELL LOCATIONS

REVISION: 2
PROJECT: 35092B007C
DRAWING: 1