INVESTIGATION WORK PLAN

Mount Morris Dump Site
Genesee Township, Michigan

APRIL 1991
REF. NO. 3990 (1)

CONESTOGA-ROVERS & ASSOCIATES

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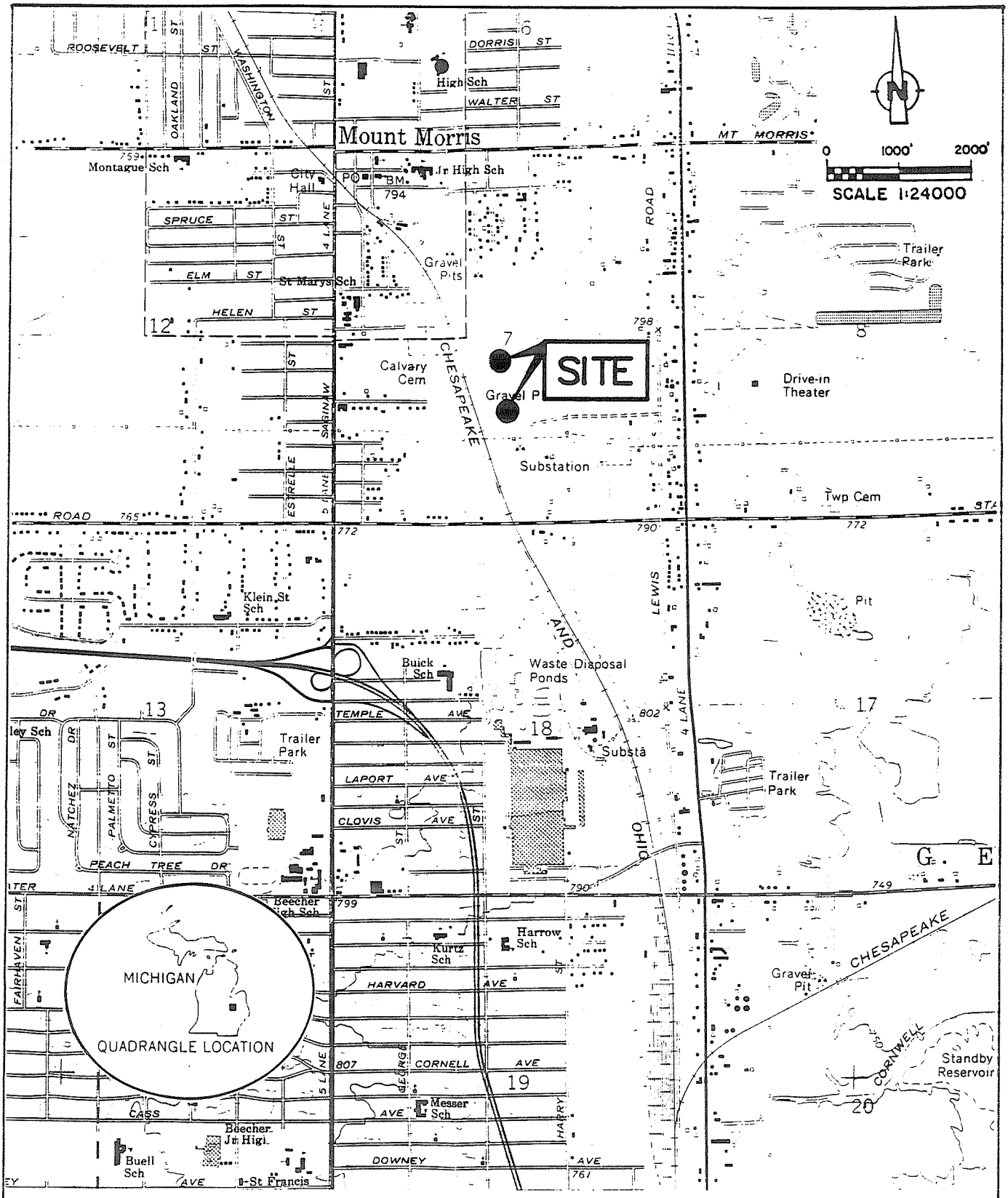
1.0 INTRODUCTION

This document presents an "Investigation Work Plan" for two discrete waste disposal areas in accordance with guidance received from the Michigan Department of Natural Resources (MDNR) for these areas and Michigan Act 307. Together, these areas are referred to as the Mount Morris Dump Site (Site). The Site is located southeast of Mount Morris, east of the Chesapeake and Ohio railroad and north of Stanley Road in Genesee Township, Michigan. The Site location is presented on Figure 1.1. Figure 1.2 presents the approximate locations of the two waste disposal areas which will be investigated. Disposal Area 1 is approximately one acre in size and is reported to contain wood floor blocks and general refuse. Disposal Area 2 is approximately two acres in size and is reported to have been used for the disposal of paint waste.

Samples of the materials which have been disposed at the Site reportedly were analyzed by MDNR in April and May 1990. The results for one of the samples collected from Disposal Area 1 indicate that the material may be a characteristic waste based on the EP Toxicity extraction result for zinc. Several of the wood blocks which were sampled reportedly contained concentrations of polychlorinated biphenyls (PCB) (Arochlor 1254). Data reports for the samples collected by MDNR are presented in Appendix A of this work plan.

Conestoga-Rovers & Associates (CRA) has been retained by the law firm of Warner, Norcross & Judd, acting on behalf of General Motors (GM), to prepare this work plan and to conduct the Site investigation



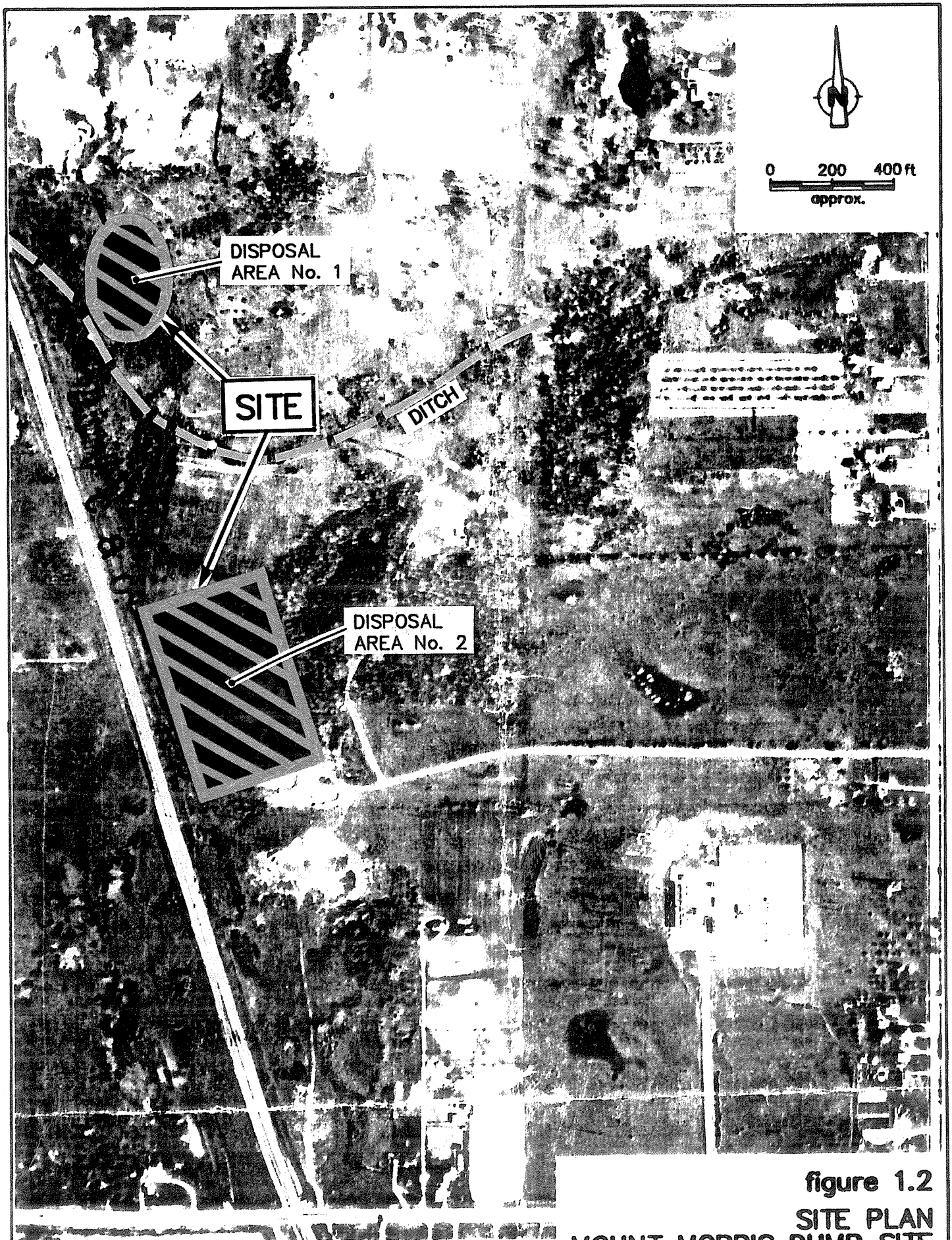
SUORCE: USGS QUADRANGLE
FLINT NORTH, MICH.

figure 1.1

SITE LOCATION
MOUNT MORRIS DUMP SITE
Genesee County, Michigan

CRA

3990-02/04/91-1-0



SOURCE: 1967 AERIAL PHOTOGRAPH

figure 1.2

SITE PLAN
MOUNT MORRIS DUMP SITE
Genesee County, Michigan

CRA

3990-03/04/91-1-0

work. CRA has prepared this work plan without the benefit of a Site visit and inspection due to problems related to obtaining a Site access agreement from the owner of the property on which the Site is located. It is possible that certain aspects of the work plan may have to be adjusted based on actual conditions at the Site which cannot be determined without inspecting the Site.

Section 2.0 of the work plan presents a review of the current situation at the Site and presents a summary of background information about the Site and the Site area.

Section 3.0 presents a description of the investigation work plan tasks based on CRA's current understanding of the Site.

Section 4.0 presents the estimated project schedule and identifies the key members of CRA's project team who have been assigned to this project.

2.0 REVIEW OF CURRENT SITUATION

2.1 ENVIRONMENTAL CONDITIONS

The Site reportedly consists of two discrete areas of waste disposal. Disposal Area 1 is reported by MDNR to contain wood floor blocks which may contain PCBs. Samples collected by MDNR in the Disposal Area 1 also indicate that zinc may be present. Based on the analytical reports provided by MDNR, it is unclear what the sample matrices were or specifically where the samples were collected. The second separate disposal area is referred to as Disposal Area 2. Paint wastes are reported to have been disposed in this area.

The two waste disposal areas are part of a currently undeveloped parcel of property.

2.2 SITE DESCRIPTION

Physiography

Sheet 14 of the United States Department of Agriculture (USDA) Soil Conservation Service General Soil Map for Genesee County (1972) indicates that the Site is located in an area which has surficial soils consisting of loamy fine to medium sands overlying extensive deposits of glacial till. The USDA map also indicates the presence of two soil borrow pits

in the vicinity of the Site. It is possible that the locations of the two waste disposal areas are related to the former soil borrow pit areas.

Surface Water

The Site is located west of a topographic high at an elevation of approximately 800 feet with surface water drainage to the west. A ditch which runs past Disposal Area 1 flows towards the west.

3.0 INVESTIGATION WORK PLAN

3.1 GENERAL

This section presents the work plan tasks for the investigation of the Site. The work plan describes the procedures for implementing an environmental investigation at the Site. As the work plan was prepared without the benefit of a Site inspection, it is possible that certain aspects of the work plan may have to be adjusted to reflect actual field conditions.

3.2 SITE INVESTIGATION OBJECTIVES

The objective of the Site investigation presented in this plan is to characterize the nature and extent of waste materials in the two discrete disposal areas and to determine their effect, if any, on environmental conditions.

Specific objectives are:

i) to define the vertical and horizontal extent of waste materials;

ii) to define the vertical and horizontal extent of soil affected by waste materials;

iii) to characterize the subsurface geologic conditions;

iv) to evaluate the potential for a continuing release of contaminants; and

v) to determine the nature and extent of ditch sediment contamination near the Site, if any.

3.3 WORK PLAN TASKS

The work tasks which will be completed during the Site investigation include:

Task 1 Data review;

Task 2 Site and grid survey;

Task 3 Soil borings and sample collection;

Task 4 Physical testing of selected soil samples;

Task 5 Collection of ditch sediment samples;

Task 6 Laboratory analysis of samples;

Task 7 Data evaluation; and

Task 8 Report preparation.

Supporting documents for this investigation include the following documents which are presented in the Appendices:

1) Sampling Plan (presented in Appendix B);

2) Quality Assurance Project Plan (QAPP) (presented in Appendix C); and

3) Health and Safety Plan (presented in Appendix D).

The following sections describe in more detail each of the identified work plan tasks.

3.3.1 Task 1 - Data Review

CRA has completed an evaluation of information and data that is readily available. Additional sources of data which will be investigated under this task may include, but are not limited to, the following items:

- MDNR files;
- historical aerial photographs;
- USGS maps;
- USDA soil maps;
- Michigan geologic maps;
- local well logs; and
- other pertinent data.

A review of historical aerial photographs of the area, that may be available, will be used to determine the nature and location of waste disposal in the two identified waste disposal areas.

Data collected as part of this task will be included in the Site Investigation Report.

3.3.2 Task 2 - Property and Grid Survey

The current Site plan which is used in this work plan is based on a 1967 aerial photograph of the Site. A current Site map is required to properly record the results of the investigation.

A Site survey will be conducted and a Site plan of the two discrete areas of waste disposal will be prepared. The Site plan will include a topographic survey and will identify key Site features around the two discrete waste disposal areas such as ditches, ponds, swamps, easements and property lines. Results of the Site investigation will be recorded on the new Site maps which will be updated as the investigation proceeds.

A survey grid will be established over the two waste disposal areas. This grid will allow the location of soil borings and field samples to be quickly and accurately established and recorded as the work proceeds.

3.3.3 Task 3 - Soil Borings and Sample Collection

Two matrices, waste and soil, will be investigated by a soil boring program. Soil borings in the waste disposal areas will be used to define both the horizontal and vertical limits of waste disposal and provide an opportunity to select appropriate samples for chemical analysis.

A total of five soil borings will be conducted on and around the edges of Disposal Area 1 and a total of seven soil borings will be conducted on and around the edges of Disposal Area 2. These borings will give an indication of the nature and extent of the waste materials at the Site and will provide an opportunity to collect representative samples. Figure 3.1 presents the proposed soil boring locations.

The soil borings will be advanced to a maximum depth of;

1) 2 feet below the waste or soil affected by the waste, or
2) 2 feet into the underlying clay till layer, or
3) to the groundwater water table,

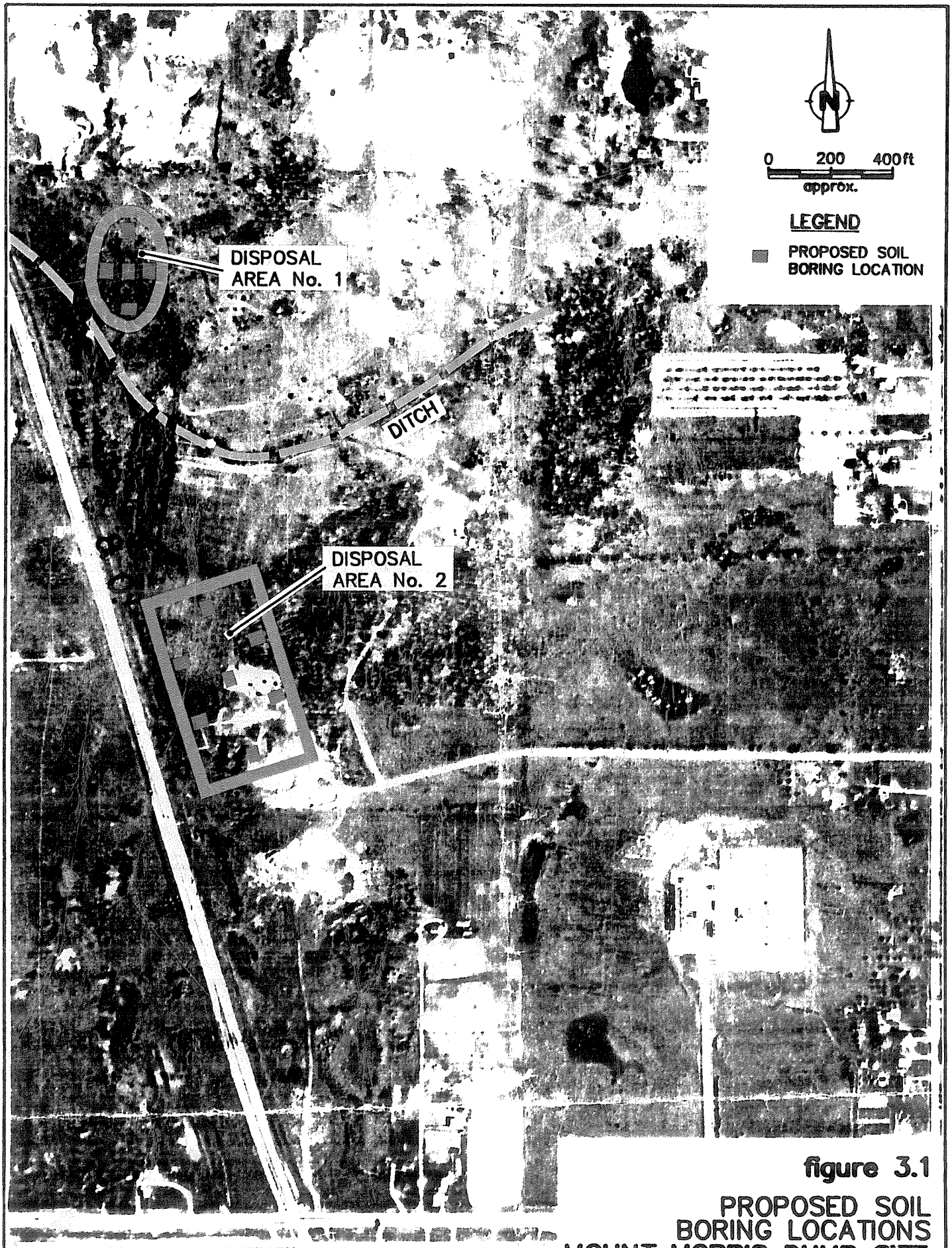
whichever is encountered first.

Continuous soil samples will be collected from each borehole and samples for both geologic record and chemical analysis will be collected. If waste materials are found to be in contact with groundwater, representative samples of the groundwater will also be collected. A detailed sample collection plan is presented in Appendix B.

The following sections describe the sampling plan for each of the two discrete waste disposal areas.

3.3.3.1 Disposal Area 1

A total of ten representative samples of the wood blocks found in Disposal Area 1 will be selected for PCB analysis. Representative



SOURCE: 1967 AERIAL PHOTOGRAPH

CRA

figure 3.1

PROPOSED SOIL BORING LOCATIONS
MOUNT MORRIS DUMP SITE
Genesee County, Michigan

3990-03/04/91-1-0

wood blocks will be selected and cores through each of the selected blocks will be taken as the sample. The core samples will be submitted to the analytical laboratory and will be ground up in accordance with standard accepted methods prior to analysis.

The remainder of the debris in the Disposal Area 1 consists of general refuse. It is expected that collection of soil samples will be the best way of investigating the possible effect of the remainder of the waste materials.

A minimum of ten representative soil samples will be selected for analyses of EP Toxicity Metals (plus copper and zinc), PCB, total cyanide and VOC (Michigan Scan 1 and Scan 2 lists). The soil samples will be selected to provide an indication of both the horizontal and vertical extent of soil contamination in Disposal Area 1. If groundwater is found in contact with waste materials, up to two groundwater samples will be collected for analysis of metals on the EP Toxicity List plus copper and zinc, PCB, total cyanide and VOC (Michigan Scan 1 and Scan 2 lists). Analytical protocols for the proposed analyses are presented in the Quality Assurance Project Plan (QAPP) which is presented in Appendix C.

3.3.3.2 Disposal Area 2

Disposal Area 2 is reported to have received paint wastes . As a result, it is not expected that a discrete waste material will be identified.

As with Disposal Area 1, it is expected that the best way of characterizing the waste disposed in this area will be by collecting soil samples.

A minimum of ten representative soil samples will be selected for analysis of EP Toxicity Metals (plus copper and zinc), PCB, total cyanide, and VOC (Michigan Scan 1 and Scan 2 lists). The soil samples will be selected to give an indication of both the horizontal and vertical extent of soil contamination in Disposal Area 2. If groundwater is found in contact with waste materials, up to two groundwater samples will be collected for analysis of metals on the EP Toxicity List plus copper and zinc, PCB, total cyanide and VOC (Michigan Scan 1 and Scan 2 lists).

3.3.4 Task 4 - Physical Testing of Soil Samples

Physical testing of soil samples will be conducted to determine the grain size distribution in the sand and the clay till and to determine the hydraulic conductivity of the clay till.

A total of up to six samples, collected from the soil borings, will be submitted for grain size distribution analysis. These samples will be selected to represent both the waterbearing and non-waterbearing units encountered below the Site. One undisturbed shelby tube sample of the clay till will be submitted for laboratory hydraulic conductivity testing.

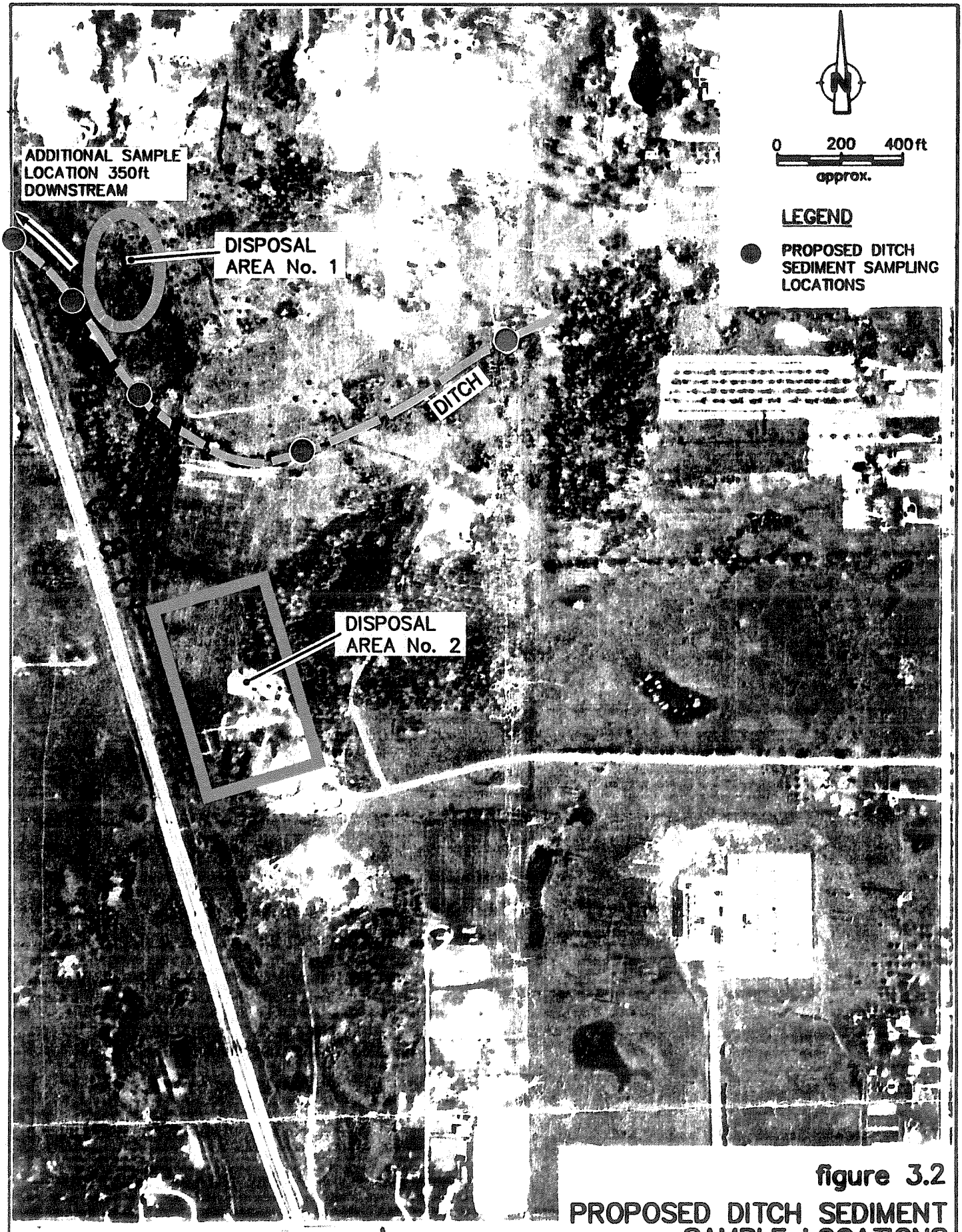
3.3.5 Task 5 - Ditch Sediment

Ditch sediment samples will be collected to characterize sediments which have accumulated in the ditch which receive surface water runoff from the Site. The ditch appears to run past the Disposal Area 1.

A total of six ditch sediment samples will be collected. Two ditch sediment samples from above the Site will be collected to provide background data, one ditch sediment sample will be collected downflow of Disposal Area 2 and three ditch sediment samples will be collected downflow from both disposal areas. Sample spacing will be closer in the vicinity of the Site and at increased spacings further downstream.

Proposed ditch sediment sample locations are presented on Figure 3.2, however, actual locations will be determined in the field. Attempts will be made to collect fine grained sediment, if possible. All ditch sediment sample locations will be located on a map of the Site and surrounding area.

Each of the ditch sediment samples will be analyzed for EP Toxicity Metals (plus copper and zinc), PCB, total cyanide, and VOC (Michigan Scan 1 and Scan 2 lists). Analytical protocols for the proposed analyses are presented in the QAPP which is presented in Appendix C.



SOURCE: 1967 AERIAL PHOTOGRAPH

CRA

figure 3.2

PROPOSED DITCH SEDIMENT SAMPLE LOCATIONS MOUNT MORRIS DUMP SITE

Genesee County, Michigan

3990-03/04/91-1-0

3.3.6 Task 6 - Laboratory Analysis of Samples

Table 3.1 presents a summary of samples which will be submitted for chemical analysis. Parameter lists for the various analyses are described in the QAPP presented in Appendix C. The metals analyses will consist of EP Toxicity metals plus copper and zinc, the PCB analyses will consist of Target Compound List (TCL) PCB, cyanide analyses will consist of total cyanide, and the VOC analyses will consist of the Michigan Scan 1 and Scan 2 lists. If groundwater is found in contact with waste, groundwater samples will be collected and will be analyzed for metals on the EP Toxicity List plus copper and zinc, PCB, total cyanide and VOC (Michigan Scan 1 and Scan 2 lists).

All analytical methods and procedures are presented in the QAPP in Appendix C.

3.3.7 Task 7 - Data Evaluation

Results of the field investigation will be compiled to provide a logical analysis of the extent of waste disposal and waste disposal effects at the Site.

The work in this plan will be used to develop conclusions as to the scope of any additional investigations consistent with Act 307 rules. In its investigation, General Motors proposes to take actions consistent with the Act 307 rules for wastes which are determined to have been generated by

TABLE 3.1

SUMMARY OF LABORATORY ANALYSES

Task	*Description*	*Media*	*Number of Field Samples*	*Parameters*
3	Soil Borings			
			Disposal Area 1	
		Wood Blocks	10	PCB
		Soil	10	EP Toxicity Metals (plus Copper and Zinc), PCB, Total Cyanide, and VOC (Michigan Scan 1 and Scan 2 lists)
		Groundwater	(see Note 1)	Metals on EP Toxicity List (plus Copper and Zinc), PCB Total Cyanid, VOC (Michigan Scan 1 and Scan 2 lists)
			Disposal Area 2	
		Soil	10	EP Toxicity Metals (plus Copper and Zinc), PCB, Total Cyanide, and VOC (Michigan Scan 1 and Scan 2 lists)
		Groundwater	(see Note 1)	Metals on EP Toxicity List (plus Copper and Zinc), PCB Total Cyanid, VOC (Michigan Scan 1 and Scan 2 lists)
5	Ditch Sediment	Soil	6	EP Toxicity Metals (plus Copper and Zinc), PCB, Total Cyanide, and VOC (Michigan Scan 1 and Scan 2 lists)

Notes

(1) Groundwater will be sampled if found to be in contact with waste material.

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The work in this plan will be used to develop conclusions as to the scope of any additional investigations consistent with Act 307 rules. In its investigation, General Motors proposes to take actions consistent with the Act 307 rules for wastes which are determined to have been generated by

General Motors located in Disposal Areas 1 and 2. These actions may include the gathering of additional data by General Motors, including data to determine the appropriate cleanup criteria under the Act 307 Rule.

3.3.8 Task 8 - Report Preparation

A Site Investigation Report will be prepared, defining the procedures used and the results that were obtained.

The report will include the surveyed base plan, all sample locations and results including laboratory reports and a summary of the logic and calculations applied to the definition and characterization.

4.0 PROJECT SCHEDULE AND PROJECT TEAM

Figure 4.1 presents the anticipated project schedule. It is expected that it will take 4 1/2 months to complete the proposed work.

The schedule presented does not allow for the collection of any additional data that may be required to fill any data gaps identified during data evaluation. Any necessary scheduling adjustments would be based on the scope of the additional work.

Figure 4.2 presents the organizational chart for the project team. Mr. Ian Richardson will be CRA's project manager.

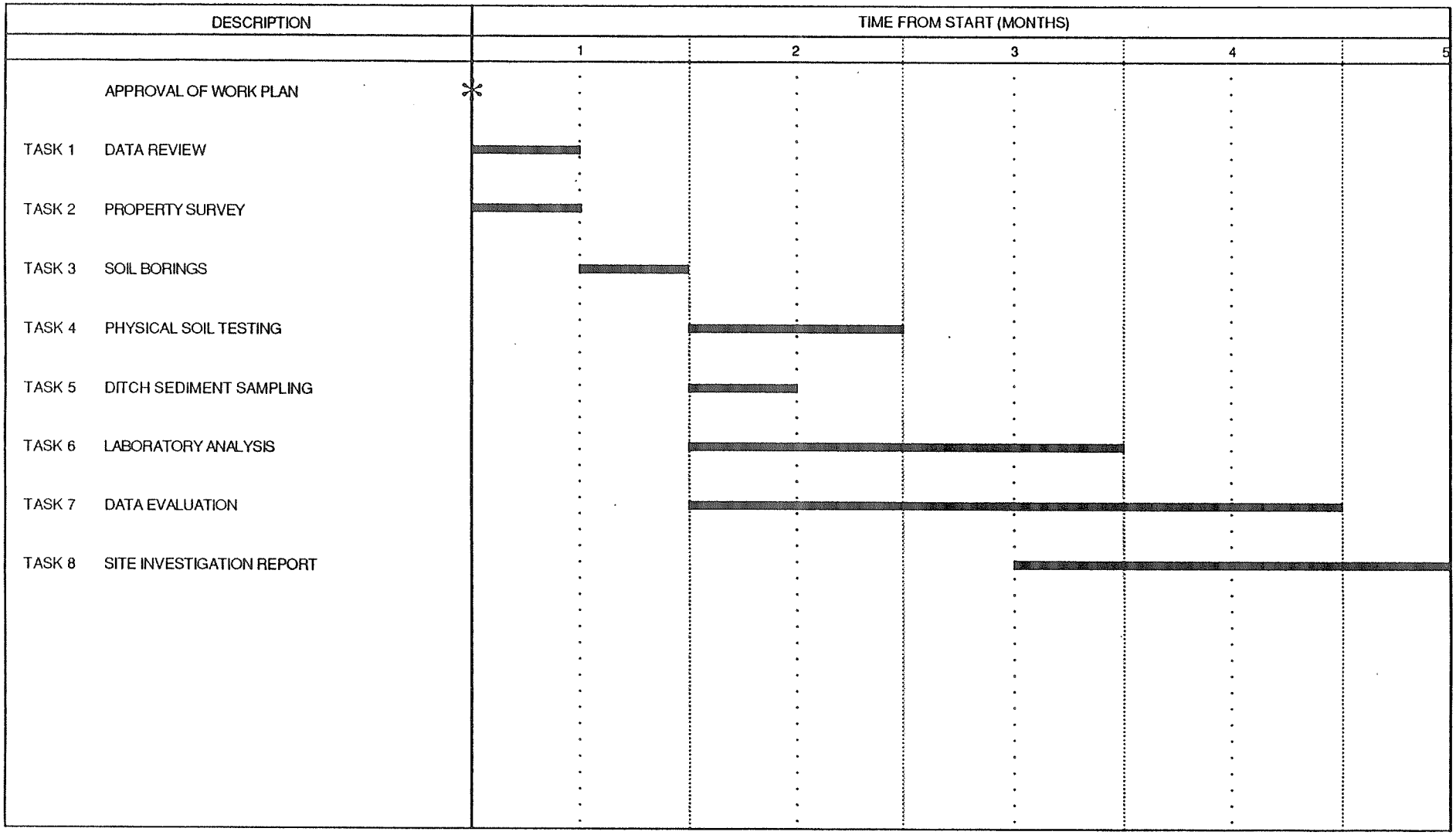

figure 4.1
PROJECT SCHEDULE
MOUNT MORRIS DUMP SITE
Genesee County, Michigan

CRA

3990-09/04/91-MAO-D-1

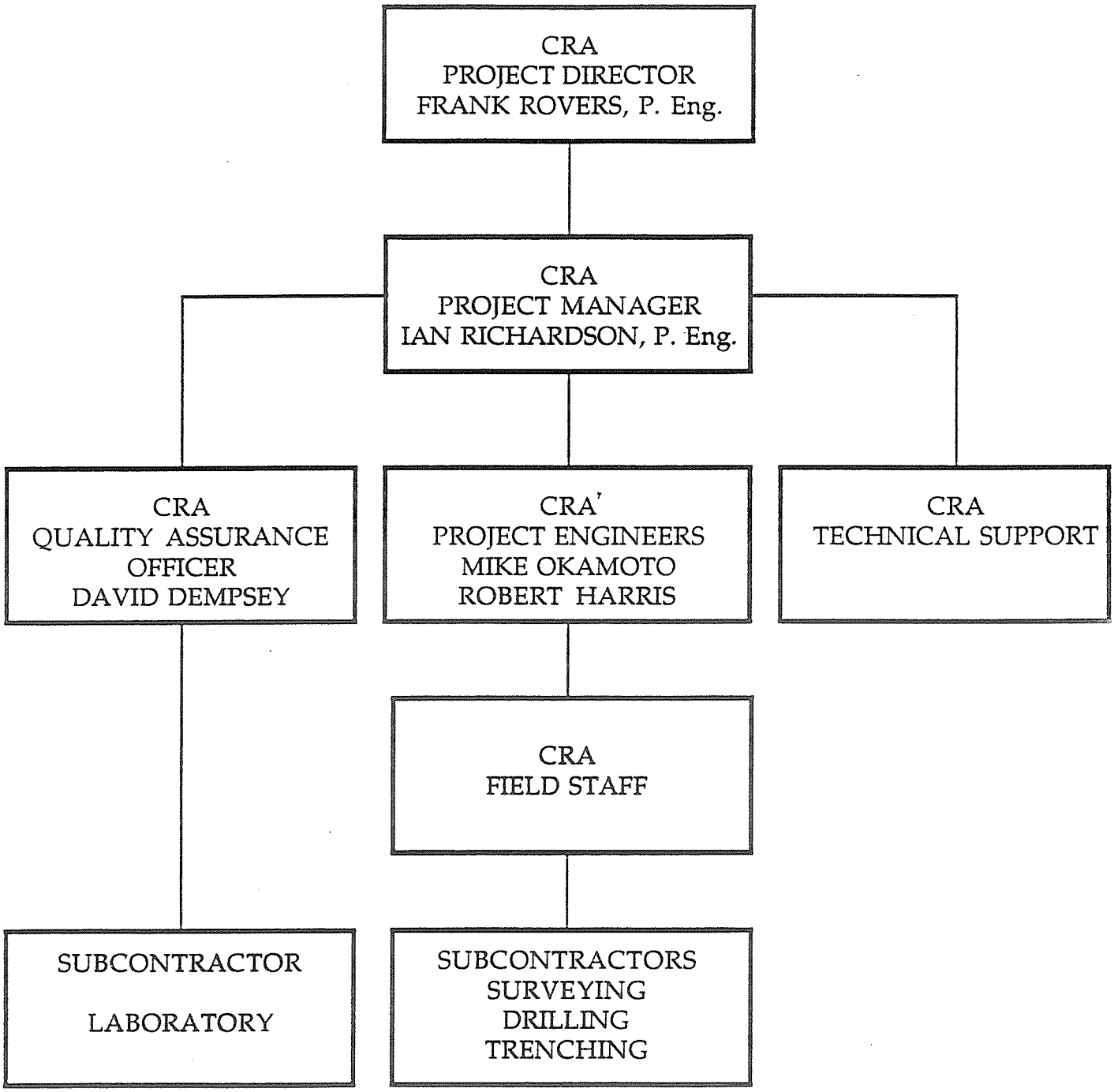

figure 4.2

CRA PROJECT TEAM
MOUNT MORRIS DUMP SITE

Genesee County, Michigan

CRA

3990-31/03/91-MAO-D-1

APPENDIX A

MDNR SAMPLE REPORTS

MICHIGAN DEPT OF NATURAL RESOURCES

ENVIRONMENTAL LABORATORY
ANALYSIS REQUEST SHEET

MATRIX = EP TOX / ASTM LEACHATE

SAFETY WARNING (YES / NO - INFO ON BACK): YES

LAB NUMBER 900408 1 PROJ CODE _____ PRIORITY II RECEIVED AT LAB BY EG DATE TIME 4/12/90 3:22 PM

SUBMITTER DIVISION ERD DISTRICT OR OFFICE Lansing CONTACT PERSON FOR QUESTIONS B. HALL PHONE 1-3221300

SAMPLE LOCATION Genesee Twp. COLLECTED BY B. HALL TRANS TO _____

COST CENTER 4511 3IL98 SEND RESULTS TO ATTENTION OF B. HALL AT ADDRESS (if different than above office) _____

SAMPLE REMARKS _____

SAMPLE NUMBER	FIELD ID OR DESCRIPTION	SAMPLE COLLECTED YY/MM/DD	HH:MM	SAMPLE INFORMATION
01	P-1	90/4/12	1:20	
02	P-2	90/4/12	1:40	
03	P-3	90/4/12	1:50	
04				
05				
06				
07				
08				

GENERAL CHEMISTRY

SS Ortho P, NO2 .. 1 2 3 4 5 6 7 8
.... 1 2 3 4 5 6 7 8
COD 1 2 3 4 5 6 7 8
S 1 2 3 4 5 6 7 8
Y TOC 1 2 3 4 5 6 7 8
.... 1 2 3 4 5 6 7 8
NO3+NO2, NH3 .. 1 2 3 4 5 6 7 8
L 1 2 3 4 5 6 7 8
E KJEL N, Tot P . 1 2 3 4 5 6 7 8
.... 1 2 3 4 5 6 7 8
C Phenolics 1 2 3 4 5 6 7 8
H 1 2 3 4 5 6 7 8
A Total CN 1 2 3 4 5 6 7 8
T 1 2 3 4 5 6 7 8
E % TS 1 2 3 4 5 6 7 8
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INORGANIC

MS ASTM Leaching 1 2 3 4 5 6 7 8
.... 1 2 3 4 5 6 7 8
XTS 1 2 3 4 5 6 7 8
A Cl SO4 Alk 1 2 3 4 5 6 7 8
S Cr+6 .... 1 2 3 4 5 6 7 8
T Ca Mg Na K 1 2 3 4 5 6 7 8
M Cd Cr Cu Ni Pb Zn 1 2 3 4 5 6 7 8
Fe Co Li Mn 1 2 3 4 5 6 7 8
Al Ba Be Mo Ti V 1 2 3 4 5 6 7 8
Hg As Se Sb 1 2 3 4 5 6 7 8

MS EP Tox Extraction .... (1 2) 3 4 5 6 7 8
.... 1 2 3 4 5 6 7 8
E Cd Cr Cu Ni Pb Zn .... (2) 3 4 5 6 7 8
P Ag - Silver 1 2 3 4 5 6 7 8
Ba - Barium 1 2 3 4 5 6 7 8
T Hg - Mercury 1 2 3 4 5 6 7 8
O As - Arsenic 1 2 3 4 5 6 7 8
X Se - Selenium 1 2 3 4 5 6 7 8

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL LABORATORY

REPORT Environmental Response Div.
TO Mason Building
Lansing, MI 48909

ATTEN BEN HALL

LABORATORY WORK ORDER # 90-04-081
WORK ID GENESEE TWP.
P.O. # 31L98 COST $ 346.50
RECEIVED 04/12/90 CLIENT ER
REPORTED _____ NUMBER OF SAMPLES 3
LAB CONTACT IN MATRIX EP TOX

TEST	UNITS	P-1	P-2	P-3	
Arsenic by E. P. Tox	ug/l	K 50	K 50	K 50	
Barium by E. P. Tox	ug/l	K 250	K 250	K 250	
Copper by E. P. Tox	ug/l	635	K 20	57	
Nickel by E. P. Tox	ug/l	1440	814	505	
Lead by E. P. Tox	ug/l	560	294	K 250	
Zinc by E. P. Tox	ug/l	719000	55500	92400	500,000

Report prepared By: D Harlig 5-4-90

RECEIVED
MAY 08 1990
Region III Headquarters

TRANSMITTAL OF EVIDENCE AND LABORATORY ANALYSIS

CASE NUMBER 25028

To: ☒ Canton Police. ☐ Michigan State Police Crime Laboratory ☐ Michigan Dept. of Public Health ☐ DNR Pathologist ☐ DNR Environmental Laboratory

Location: 1150 Elder St. Flint MI

From: Gary Tima P.O. Box 20028 Lansing MI 48909 (517) 322-5122 Conservation Officer Address & Phone No.

Description of Evidence — Describe Fully: Manufacturer's Model No., Serial No., Officer's Marks, Tag or Seal Numbers

25028A- 3 wood blocks from 4-6" Subsurface

25028B- 3 wood blocks from Surface

25028C- 3 wood blocks from 3-4" Subsurface

Type of Analysis Requested:

PCB - Use Standard Wood Block Analysis w/ Boring etc

Composite Blocks in each bag -

Name and Address of Person(s) From Whom Property Seized: (If Known)

Genesee Co. Township Dump Site
South of Chevrolet
Mt. Morris, MI

Received By: Signature & Badge No.	Date	Time	Received by: Signature & Badge No.	Date	Time
Douglas Connelly (Canton)	5/29	12:45PM	[signature]	5/29	12:45P

Final Disposition of Property:

	Date
Returned to Owner By:	
Received By: (Signature of Owner)	
Confiscated By: (Signature and Badge No.)	
Destroyed By: Witnessed:	
How Destroyed:	

White — Retain with evidence
Canary — Investigating Officer
Pink — Lab
Goldenrod — District Office with Prosecution Report

R 9163
Rev. 6/81

M/DNR
CAL REPORT# 7502
GENESEE TOWNSHIP DUMP SITE

SAMPLES RECEIVED 05/29/90

LAB# 9171462 25028A (FACE)
LAB# 9171463 25028A (TOTAL)
LAB# 9171464 25028B (FACE)
LAB# 9171465 25028B (TOTAL)
LAB# 9171466 25028C (FACE)
LAB# 9171467 25028C (TOTAL)

LAB#	9171462	9171463	9171464	9171465	9171466	9171467
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MICHIGAN DNR PCB'S						
PCB-1016	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
PCB-1221	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
PCB-1242	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
PCB-1248	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
PCB-1254	140	620	< 1.0	240	< 1.0	< 1.0
PCB-1260	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
PCB, Total	140	620	< 1.0	240	< 1.0	< 1.0

Canton Analytical Laboratory, Inc.

MDNR PCB

DATE	PARAMETER	CALIBRATION CHECK RESPONSE FACTOR: BLANK	INITIAL CALIBRATION	FINAL CALIBRATION	% DIFFERENCE	SAMPLE #	MATRIX	UNIT	DUPLICATION: TRIAL #1	TRIAL #2	RANGE	MEAN	RELATIVE % DIFFERENCE	SPIKE*: FINAL SPIKE CONC.	OBSERVED CONC. OF SPIKED SAMPLE	% OF SPIKE RECOVERED
			(RF_1)	(RF_2)												
	A1242		1041394	1092584	4.99%											
	A1260		1732469	1798921	4%											
	A1254		1271168	1306251	3.0%				260	230	30	245	12	120	350	88
									26							

RESPONSE FACTOR = Total height/area/concentration PCB injected

*% of SPIKE RECOVERED = [(OBSERVED CONC. of SPIKED SAMPLE - MEAN)/(FINAL SPIKE CONC.)] X 100%

% Difference = $\frac{RF_1 - RF_2}{RF_1}$ x 100; Relative % Difference = $\frac{\text{Range}}{\text{Mean}}$ x 100

DEPARTMENT OF NATURAL RESOURCES
WASTE MANAGEMENT DIVISION

STAFF REPORT

DAY: S | M | T (X) | W | TH | F | S

- [x] Complaint Inspection
- [ ] Compliance Inspection
- [ ] Construction/Closure Inspection
- [ ] Permitting Inspection
- [ ] PEAS Investigation
- [ ] PCB Report/Complaint
- [ ] Sampling Inspection
- [ ] Telephone Call
- [ ] Meeting Notes
- [ ] Other Genesee Co. Health Dept.

WEATHER	Brite Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 up
WIND	Still	Moder.	High	Report No.	
HUMIDITY	Dry	Moder.	Humid.		

- [ ] Act 64 _____
- [ ] Act 136 _____
- [ ] Act 641 _____
- [ ] HSWA _____
- [x] Act 245 _____
- [ ] RCRA _____

DATE: 4-3-90 TIME: 5:48 pm

COMPANY/FACILITY: Mt. Morris Dump Site

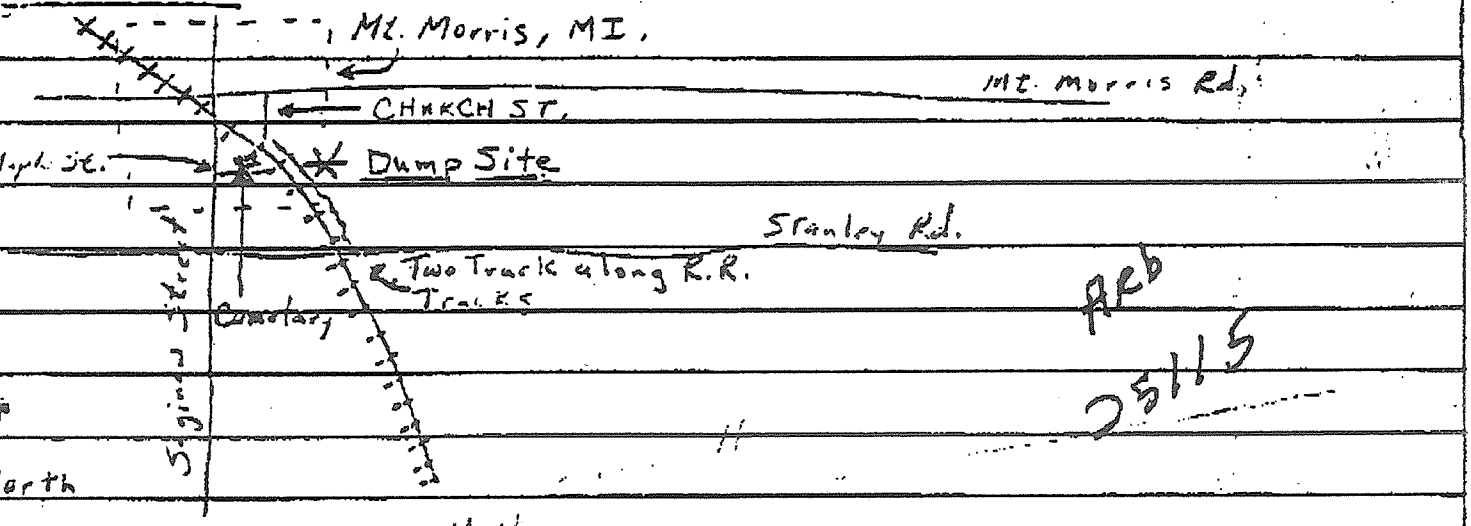
FACILITY NO.:

ADDRESS/LOCATION: Mt. Morris, MI. South of Church St., Along R.R. Tracks

STAFF: Curtis, Slayton, Browne

PARTICIPANTS: Behind Cemetary, East of tracks approx. 80 yards.

Sketch Map



Directions: Saginaw St. North to East (Right) on Mt. Morris Rd turn Right on (South) on Church St. Church St. deadends at the railroad tracks follow the east side of railroad tracks approx. 1/2 mile until you see a silver control "railroad" box on your left and the edge of the cemetary (at the end of Maple St.) will be on your right. The dump site is marked by an approximate 100 yards x 200 yard rectangle of no vegetation located approx. 80 yards east of railroad, silver control box.

SIGNED J. L. B.

Distribution: Original - District/Lansing _____ File.
1st copy - Lansing _____ File/District - Ben Hall

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

TRANSMITTAL OF EVIDENCE AND LABORATORY ANALYSIS

RECEIVED APR 16 1990 DNR - REGION III

CASE NUMBER 25018

☒ Canton Environmental

Location: Jolene

☐ Michigan State Police Crime Laboratory — 1550 Elbert ST

☐ Michigan Dept. of Public Health — Flint MI

☐ DNR Pathologist — 48192

☐ DNR Environmental Laboratory

From: LOREN J. CURTIS (517) 322-5067 — Conservation Officer

7150 Harris Drive Dimondale, MI. 48877 — Address & Phone No.

Description of Evidence — Describe Fully: Manufacturer's Model No., Serial No., Officer's Marks, Tag or Seal Numbers

10 4" x 4" x 2" Wooden Blocks, Green to Black in color

Type of Analysis Requested:

PCB only, Composite All Blocks in EACH Bag - USE Standard Wood Block Procedure. DO SEPARATE ANALYSIS ON EACH BAG. DO NOT COMPOSITE SAMPLES from all three Bags together

Name and Address of Person(s) From Whom Property Seized: (If Known)

Genesee Township Dump Site, South of Church Street, Mt. Morris, MI. Along Railroad tracks approx 1/2 mile South and approx 80 yards east of tracks. Owner unknown, as of today.

Received By: Signature & Badge No.	Date	Time	Received by: Signature & Badge No.	Date	Time
[signature]	4/13	2:30 PM			
Douglas Connelly	4/16	2:45 AM			

Final Disposition of Property:

	Date
Returned to Owner By:	
Received By: (Signature of Owner)	
Confiscated By: (Signature and Badge No.)	
Destroyed By: Witnessed:	
How Destroyed:	

White — Retain with evidence
Canary — Investigating Officer
Pink — Lab
Goldenrod — District Office with Prosecution Report

R 9108
Rev. 6/81

M/DNR
CAL REPORT# 6849

SAMPLES RECEIVED 04/19/90

LAB# 9160739 WOODEN BLOCKS 25018A (FACE)
LAB# 9160739 WOODEN BLOCKS 25018A (TOTAL)
LAB# 9160740 WOODEN BLOCKS 25018B (FACE)
LAB# 9160740 WOODEN BLOCKS 25018B (TOTAL)
LAB# 9160741 WOODEN BLOCKS 25018C (FACE)
LAB# 9160471 WOODEN BLOCKS 25018C (TOTAL)

LAB#	9160739	9160739	9160740	9160740	9160741	9160741
DISCRIPTION	Face	Total	Face	Total	Face	Total
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MICHIGAN DNR PCB'S						
PCB-1016	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
PCB-1221	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
PCB-1242	< 0.5	< 0.5	3.2	0.55	< 0.5	< 0.5
PCB-1248	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
PCB-1254	9.3	6.3	17	8.3	5.7	3.4
PCB-1260	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
PCB, Total	9.3	6.3	20	8.9	5.7	3.4

APPENDIX B

SAMPLING PLAN

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B.1.0 GENERAL

This section describes field procedures which will be followed to complete the work described in the work plan. The procedures are designed to ensure that quality data is collected. The field procedures are described in the following subsections.

B.2.0 TASK 2 - PROPERTY AND GRID SURVEY

Surveying will be conducted using ground survey techniques. Surveying will include the property and grid survey.

B.3.0 TASK 3 - SOIL BORINGS AND SAMPLING PROCEDURES

Soil boring locations will be finalized in the field prior to drilling. Soil borings will be located using scale measurements from aerial photographs and observable Site features and based on the survey grid which will be established over the two areas of waste disposal.

The soil borings will be completed using a hollow stem auger drill rig. Following completion of the borehole, soil cuttings from each borehole will be placed on the areas of known waste disposal. The soil borings will be conducted in accordance with the requirements of the health and safety plan which is presented in Appendix D.

Soil borings will be conducted in such a manner that only the hollow stem augers will require decontamination between boreholes. The drill rig will be decontaminated prior to beginning work and prior to demobilization from the Site. Decontamination will follow the protocols presented in Section B.6.

The soil borings will be advanced to a maximum depth of:

1) 2 feet below the waste or soil affected by the waste, or
2) 2 feet into the underlying clay till layer, or
3) to the groundwater table,

whichever is encountered first.

Continuous soil samples will be collected from each borehole and samples for both geologic record and chemical analysis will be collected.

Soil samples will be collected from representative material from the split spoon sampler. Sampling protocols for the soil boring samples will be as follows:

1. An Hnu meter will be used to survey each soil sample for the presence of organic vapors. Organic vapor readings and corresponding sample depths will be noted in the field log. The field log will include observations on soil stratigraphy, apparent or potential interfaces between fill materials and native soil, wet zones if present, and visible indications of soil/water contamination.

2. Pre-cleaned, stainless steel hand tools will be used to collect the sample into a clean stainless steel bowl from the center of the split spoon sampler.

3. Samples will be placed into a clean stainless bowl with clean hand tools and homogenized. Individual aliquots will be collected into sample bottles. The degree of homogenization will be minimized to prevent the loss of volatile organic compounds.

4. The remainder of the sample in the bowl will be stored in plain flint glass containers as a record of the sample taken.

6. A blind field duplicate sample will be collected at a frequency of one per ten soil samples collected.

7. Samples for matrix spike analyses will be collected at a frequency of one per twenty soil samples collected and samples for matrix spike duplicate analyses will also be collected at a frequency of one per twenty soil samples. The analysis request sheets sent to the laboratory will indicate the sample I.D. of the matrix spike, and matrix spike duplicate samples.

8. A rinsate sample will be collected at a frequency of one per ten soil samples collected. The rinsate blank will consist of deionized water poured over the sampling tools after they have been cleaned using the prescribed cleaning sequence (see Section B.6). This will provide a quality assurance check on field decontamination procedures employed for the sampling equipment between sampling locations.

9. Samples will be labeled noting the sampling locations, depth, time and sampler's initials. A separate hard-cover bound field book will be maintained to record all soil samples and sampling events.

10. Samples will be placed on ice or cooler packs in laboratory supplied coolers after collection and labeling. Samples will be delivered to the laboratory by courier under chain-of-custody procedures.

Additional samples will be collected, if deemed appropriate by field personnel, to characterize and delineate zones of visible contamination and/or significant organic vapor readings.

B.4.0 TASK 4 - PHYSICAL TESTING

Physical soil testing consisting of grain size distribution analyses and laboratory hydraulic conductivity tests will be conducted by a geotechnical laboratory.

B.5.0 TASK 5 - DITCH SEDIMENT SAMPLES

A ditch sediment sample will be collected at various locations along the ditch leading from the Site. Sampling protocols for the ditch sediment samples will be as follows:

1. A composite ditch sediment sample will be collected from each location. The composite sample will consist of aliquots from three sampling points at a location.

2. Ditch sediments samples will be collected by pushing a Wildco Hand Core sampler into soft sediments (estimated to be 1 to 6 inches in depth) or by using precleaned hand tools. (The Wildco sampler is a 1 1/2-inch diameter tube with a retaining basket. It permits sampling sediments without washout of finer grained materials.) The objective is to recover sediments rather than underlying soil.

3. The Wildco sampler and all other tools used in extracting the sediment samples for chemical analysis will be precleaned using the prescribed rinse sequence. The tools will not be cleaned between sampling points at each location. A new pair of disposal latex gloves will be used at each sampling location.

4. Composite sediment samples for chemical analysis will be obtained and prepared in the following manner.

The sample from each sampling point will be sectioned and placed with the other samples from the sampling location into a stainless steel bowl and homogenized. The stainless steel bowl will be cleaned between sampling locations. The homogenized sediment will be transferred from the stainless steel bowl into the appropriate sample bottles. All sample bottles will be provided by the laboratory and will be precleaned using standard laboratory validated washing procedures. The sample bottles will be delivered to the Site in sealed containers.

5. A blind field duplicate sample will be collected at a frequency of one per round of sediment samples collected.

6. Samples for matrix spike and matrix spike duplicate analysis will be collected at a frequency of one per round of sediment samples collected. The analysis request sheets sent to the laboratory will indicate the sample I.D. of the matrix spike samples.

7. A rinsate sample will be collected at a frequency of one per round of sediment samples collected. The rinsate blank will consist of deionized water poured over the sampling equipment after it has been cleaned using the prescribed cleaning sequence. This will provide a quality assurance check on the field decontamination procedures employed for the sampling equipment between sampling locations.

8. Sediment samples will be labeled noting the sampling location, depth, time and sampler's initials. A separate hard-cover bound field book

will be maintained to record all sediment samples and sampling events.

9. Samples will be placed on ice or cooler packs in laboratory supplied coolers after collection and labeling. Samples will be delivered to the laboratory by courier under chain-of-custody procedures.

B.6.0 EQUIPMENT CLEANING

The following protocols will be observed for all equipment and tools on Site to prevent cross-contamination.

Drill Rig

Upon mobilization of the drill rig to the Site and prior to commencing drilling, the rig and all associated equipment will be thoroughly brushed and steam cleaned to remove oil, grease, mud and other foreign matter. Subsequently, the augers, cutting bits, sampler, drill steel and associated equipment will be cleaned before initiating drilling at each borehole to prevent cross-contamination from the previous drilling locations. Cleaning will be accomplished by flushing and wiping the components to remove all visible sediments followed by a thorough high-pressure wash and rinsing. Special attention will be given to the threaded sections of the drill rods and split spoons.

Sampling Tools and Equipment

Prior to the collection of samples for chemical analysis all sampling equipment and tools will be decontaminated with the following rinse sequence:

i) wash with detergent to remove all visible foreign matter,

ii) rinse with reagent-grade methanol,

iii) rinse with reagent-grade hexane,

iv) rinse with reagent-grade methanol,

v) air dry for 15 minutes, and

vi) rinse with deionized water.

Fluids used for cleaning will not be recycled. All wash water, rinse water and decontamination fluids will be collected in containers.

APPENDIX C

QUALITY ASSURANCE PROJECT PLAN
MOUNT MORRIS DUMP SITE

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C.1.0 INTRODUCTION

Quality assurance/quality control criteria necessary to achieve the Investigation Work Plan (IWP) objectives are detailed in this quality assurance project plan (QAPP).

C.2.0 PROJECT ORGANIZATION AND RESPONSIBILITY

Conestoga-Rovers & Associates Limited (CRA), as contractor to Warner, Norcross and Judd, has overall responsibility for all phases of the IWP. CRA will perform or supervise all field investigations. All reports based on IWP activities will be produced by CRA.

The project laboratory, as analytical subcontractor to CRA, will perform all chemical analyses of samples collected during the investigation.

All firms will provide project management as appropriate to their responsibilities. CRA will provide administrative oversight and QA/QC for all deliverables. All final project deliverables will be issued by CRA.

Figure 4.2 of the IWP presents the key staff organization. A summary of each of the key person's responsibilities is presented below:

F. Rovers - Project Director, CRA

- Provides overall project management
- Ensures all CRA resources are available on an as-required basis
- Participates in technical/negotiations with MDNR

I. Richardson - Project Manager, CRA

- Provides daily project management
- Participates in technical negotiations with the MDNR and attends project meetings on an as-required basis
- Managerial and technical guidance to CRA staff
- Prepares and reviews final report
- Approval of the QAPP

D. Dempsey - Quality Assurance Officer - Analytical Activities, CRA

- Overview laboratory activities
- Decides laboratory data corrective action
- Assesses and validates analytical data
- Responsible for external performance and system audits
- Prepares and reviews final report
- Approval of the QAPP

M. Okamoto/R. Harris - Quality Assurance Officers - Field Activities, CRA

- Manages field activities and field QA/QC
- Data assessment
- Prepares and reviews final report
- Technical representation of field activities
- Prepares field activities SOPs
- Evidence file custodian

Project Manager, Project Laboratory

- Ensures all laboratory resources are available on an as-required basis
- Overviews final analytical report
- Oversees all laboratory's activities
- Approval of the QAPP
- Coordinate laboratory analyses
- Supervise in-house chain-of-custody
- Schedule sample analyses
- Oversee preparation of analytical reports
- Approve final analytical reports prior to submission to CRA

Quality Assurance Officer, Project Laboratory

- Overview laboratory quality assurance
- Overview QA/QC documentation
- Conduct detailed data review
- Decide laboratory corrective actions, if required
- Technical representation of laboratory QA procedures
- Approval of the QAPP

Sample Custodian, Project Laboratory

- Receive and inspect the incoming sample containers
- Record the condition of the incoming sample containers
- Sign appropriate documents
- Verify chain-of-custody and its correctness
- Notify laboratory manager and laboratory supervisor of sample receipt and inspection

- Assign a unique identification number and customer number and enter each into the sample receiving log
- Initiate transfer of the samples to appropriate lab sections
- Control and monitor access/storage of samples and extracts

Primary responsibility for project quality rests with CRA's QA Officers. Ultimate responsibility for project quality rests with CRA's Project Manager. Independent quality assurance will be provided by the Laboratory Project Manager and QA Officer prior to release of all data to CRA.

C.3.0 QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA

The overall QA objective is to develop and implement procedures for field sampling, chain-of-custody, laboratory analyses and reporting that will provide accurate data. Specific procedures to be used for sampling, chain-of-custody, calibration, laboratory analysis, reporting, quality control, audits, preventive maintenance and corrective actions are presented in other sections of this QAPP.

Data quality objectives (DQO) have been established in accordance with the U.S. EPA guidance document entitled "Data Quality Objectives for Remedial Response Activities", EPA/540/G-87/003, March 1987, dated March 25, 1986, to ensure that the database developed during the Site investigation meets the objectives and quality necessary for its intended use.

The DQO for measurement data can be classified by defining the level of analytical support assigned to each type of measurement data. In general, all groundwater and soil analysis will require Level III analytical support. Field screening activities such as VOC concentration (Hnu) will require Level I analytical support.

The analytical support levels defined above will ensure that the overall objectives for the IWP will be completed.

C.3.1 LEVEL OF QA EFFORT

To assess the quality of data resulting from the field sampling program field duplicate samples, rinsate samples, trip blank samples, and matrix spike samples will be taken (where appropriate) and submitted to the analytical laboratory.

For all field samples collected, field duplicate samples will be collected at a frequency of 1 per 10 or fewer investigative samples per parameter set for each sample matrix. Matrix spike/matrix spike duplicate (MS/MSD) samples will be analyzed at a minimum frequency of 1 in 20 for each organic analysis. For inorganic analyses, one matrix spike and one duplicate sample may be run in place of MS/MSD samples for each set of 20 samples.

Rinsate blank samples will be submitted at a frequency of 1 per 10 or fewer well purging/sampling equipment cleanings or at least once per day of well purging/sampling equipment cleanings. Rinsate blanks shall be collected by routing deionized water through decontaminated sampling equipment.

The sampling and analysis program is summarized in Table C.3.1, which lists the specific parameters to be measured, the number and frequency of sampling and the level of QA effort required for each matrix. Samples will be analyzed for volatile organic compounds (VOC, Michigan Scan 1/Scan 2 analytes), EP Toxicity metals (plus copper and zinc) and polychlorinated biphenyls (PCB) and total cyanide.

TABLE C.3.1

SUMMARY OF SAMPLING AND ANALYSIS PROGRAM
MOUNT MORRIS DUMP SITE

Location	Matrix	Laboratory Parameters (1)	Investigative Samples	QA Samples				Matrix Total Per Round	Frequency	Matrix Total
				Rinsate Blanks	Field Duplicates	VOC Trip Blanks (2)	MS/MSD (3)			
Test Pits	Wood Blocks	PCB by 8080A	10	1	1	--	1	13	1	13
	Soil	VOC by 8010A, 8020A	20	2	2	--	1	25	1	25
		PCB by 8080A	20	2	2	--	1	25	1	25
		EP Tox Metals (plus Cu, Zn) by 7000 series	20	2	2	--	--	24	1	24
		Cyanide by 9010A	20	2	2	--	1	25	1	25
	Groundwater(4)	VOC by 8010A, 8020A	--	--	--	--	--	--	--	--
		PCB by 8080A	--	--	--	--	--	--	--	--
		Metals by 6000/7000 Series	--	--	--	--	--	--	--	--
		Cyanide by 9010A	--	--	--	--	--	--	--	--
Ditch	Sediment	VOC by 8010, 8020	6	1	1	--	1	9	1	9
		PCBs by 8080A	6	1	1	--	1	9	1	9
		EP Tox Metals (plus Cu, Zn) by 7000 series	6	1	1	--	--	8	1	8
		Cyanide by 9010A	6	1	1	--	1	9	1	9

Notes:

(1) Analytical methods are from "Test Methods for Evaluating Solid Waste", SW-846, Third Edition, Final Update I, December 1990.
(2) VOC trip blank is collected with groundwater samples only, if required.
(3) MS/MSD = matrix spike/matrix spike duplicate sample.
(4) Groundwater will be sampled if found in contact with waste materials.

Trip blank samples (prepared by the laboratory and consisting of organic-free water poured into the sample vials) for aqueous VOC analyses will be shipped with each shipment container of VOC sample vials by the laboratory. Trip blanks samples will be handled in a manner consistent with actual field sample handling and will be shipped back to the laboratory each day with the daily field samples. The trip blanks will provide a measure of potential cross contamination of samples during shipment and handling. It is noted, however, that trip blanks will not be opened in the field.

Blank samples will be analyzed to check procedural contamination and/or ambient conditions and/or sample container contamination at the Site that may cause sample contamination.

Upon examining the results obtained by the project laboratory, if any of the aforementioned blanks are found to contain analytes, the following procedure will be followed. First, determine the contamination is real by examining the associated investigative samples and method blanks. If the contamination can be traced to an isolated source, e.g. a highly contaminated sample, the data remain unqualified. Otherwise, the data will be examined to determine the extent of contamination and all associated data will be qualified.

Field duplicate samples will be analyzed to check for sampling and analytical reproducibility. Field duplicate samples are to be used as a measure of precision throughout the sampling event. Comparison

of field duplicate samples will be based upon the analytes, both non-detected and detected, and the relative percent differences (RPD) of each analyte's concentrations. The parameters which do not meet the criteria may only be used as qualitative measurements. Professional judgement shall determine the RPD limits on a sample-to-sample basis.

C.3.2 ACCURACY, PRECISION AND SENSITIVITY OF ANALYSIS

The fundamental QA objective with respect to the accuracy, precision and sensitivity of analytical data is to achieve the QC acceptance criteria of each analytical protocol. The sensitivities required for these organic and inorganic analyses will be at least the targeted detection limits listed in Tables C.3.2 through C.3.4. These tables present targeted quantitation limits for all parameters. Lower method quantitation limits, if achieved by the laboratory, will be substituted for the targeted quantitation limits in the final report.

C.3.3 COMPLETENESS, REPRESENTATIVENESS AND COMPARABILITY

It is expected that all analyses conducted in accordance with U.S. EPA methods will provide data meeting QC acceptance criteria for 80 percent of all samples tested. Any variances will be documented. The corrective actions taken if the completeness goals are not met are outlined in Section C.13.0 of this QAPP.

TABLE C.3.2

TARGETED QUANTITATION LIMITS FOR INORGANIC ANALYTES
MOUNT MORRIS DUMP SITE

Inorganics	*Quantitation Limit**
Water	*(µg/L)*
Arsenic	10
Barium	200
Cadmium	5
Chromium	10
Copper	25
Lead	5
Mercury	0.2
Selenium	5
Silver	10
Zinc	20
Soil	*(mg/kg)*
Cyanide	5

* Quantitation limits are highly matrix dependent. The above values are provided for guidance and may not always be achievable.

TABLE C.3.3

TARGETED QUANTITATION LIMITS FOR PCB
MOUNT MORRIS DUMP SITE

Analyte	*CAS Number*	*Quantitation Limit**	
		Water (µg/l)	*Soil (µg/kg)*
Aroclor-1016	12674-11-2	1.0	33.0
Aroclor-1221	11104-28-2	1.0	33.0
Aroclor-1232	11141-16-5	2.0	67.0
Aroclor-1242	53469-21-9	1.0	33.0
Aroclor-1248	12672-29-6	1.0	33.0
Aroclor-1254	11097-69-1	1.0	33.0
Aroclor-1260	11096-82-5	1.0	33.0

* Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis as required by the contract, will be higher. Quantitation limits are highly matrix dependent. The above values are provided for guidance and may not always be achievable.

TABLE C.3.4

TARGETED QUANTITATION LIMITS FOR VOC
MOUNT MORRIS DUMP SITE

Analyte	*CAS Number*	*Quantitation Limit**	
		Water (µg/l)	*Soil (µg/kg)*
Benzyl Chloride	100-44-7	–	–
Bromobenzene	108-86-1	–	–
Bromodichloromethane	75-27-4	1.0	1.0
Bromoform	75-25-2	2.0	2.0
Bromomethane	74-83-9	3.0	3.0
Carbon Tetrachloride	56-23-5	1.2	1.2
Chlorobenzene	108-90-7	2.5	2.5
Chloroethane	75-00-3	5.2	5.2
2-Chloroethyl Vinyl Ether	110-75-8	1.3	1.3
Chloroform	67-66-3	0.5	0.5
Chloromethane	74-87-3	0.8	0.8
Dibromochloromethane	124-48-1	0.9	0.9
Dibromomethane	74-95-3	–	–
1,2-Dichloroethane	95-50-1	1.5	1.5
1,3-Dichloroethene	541-73-1	3.2	3.2
1,4-Dichloroethane	106-46-7	2.4	2.4
Dichlorodiflouromethane	75-71-8	–	–
1,1-Dichloromethane	75-34-3	0.7	0.7
1,2-Dichloromethane	107-06-2	0.3	0.3
1,1-Dichloroethene	75-35-4	1.3	1.3
trans-1,2-Dichloroethane	156-60-5	1.0	1.0
Dichloromethane	75-09-2	–	–
1,2-Dichloropropene	78-87-5	0.4	0.4
cis-1,3-Dichloropropene	10061-01-5	–	–
trans-1,3-Dichloropropene	10061-02-6	3.4	3.4
1,1,2,2-Tetrachloroethane	79-34-5	0.3	0.3
1,1,1,2-Tetrachloroethane	630-20-6	–	–
Tetrachloroethene	127-18-4	0.3	0.3
1,1,1-Trichloroethane	71-55-6	0.3	0.3
1,1,2-Trichloroethane	79-00-5	0.2	0.2
Trichloroethene	79-01-6	1.2	1.2
Trichlorofluoromethane	75-69-4	–	–
1,2,3-Trichloropropane	96-18-4	–	–
Vinyl Chloride	75-01-4	1.8	1.8
Benzene	71-43-2	2.0	2.0
Chlorobenzene	108-90-7	2.0	2.0
1,4-Dichlorobenzene	106-46-7	3.0	3.0
1,3-Dichlorobenzene	541-73-1	4.0	4.0
1,2-Dichlorobenzene	95-50-1	4.0	4.0
Ethylbenzene	100-41-4	2.0	2.0
Toluene	108-88-3	2.0	2.0
Xylenes (total)	1330-20-7	–	–

* Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis as required by the contract, will be higher. Quantitation limits are highly matrix dependent. The above values are provided for guidance and may not always be achievable.

The sampling networks have been designed to provide data representative of Site conditions. During development of these networks, consideration was given to past disposal practices, existing data from past studies completed for the Site, remedial activities to date and physical setting. The extent to which existing and planned analytical data will be comparable depends on the similarity of sampling and analytical methods. The procedures used to obtain the planned analytical data are documented in this QAPP. However, it may be necessary to verify similar documentation for previous analytical data to adequately establish comparability. Comparability of laboratory analyses will be ensured by the use of consistent units. Following completion of data collection, the existing database will be evaluated for representativeness.

C.4.0 SAMPLING PROCEDURES

The procedures and protocols for collecting samples and for performing all related field activities are described in detail in Appendix B. A summary of sampling bottle requirements appears in Table C.4.1.

TABLE C.4.1

CONTAINER, PRESERVATION, HOLDING TIMES, SHIPPING AND PACKAGING REQUIREMENTS
MOUNT MORRIS DUMP SITE

Analysis	*Sample Containers*	*Preservation*	*Maximum (1) Holding Times*	*Volume of Sample*	*Shipping*	*Normal Packaging*
SOIL/SEDIMENT						
Volatiles	1 x 4 oz. wide mouth glass with teflon liner	cool to 4°C (±2°C)	14 days	fill completely	overnight courier	bubble pack
PCBs	1 x 8 oz. wide mouth glass with telfon liner	cool to 4°C (±2°C)	14 days to extraction 40 days to analysis	fill 3/4 full	overnight courier	bubble pack
Metals	1 x 500 mL plastic, wide mouth with teflon liner	cool to 4°C (±2°C)	180 days to EP Tox extraction (28 days for mercury) 180 days to analysis (28 days for mercury)	fill 3/4 full	overnight courier	bubble pack
Cyanide	1 x 8 oz. wide mouth glass with telfon liner	cool to 4°C (±2°C)	14 days	fill 3/4 full	overnight courier	bubble pack
GROUNDWATER (2)						
Volatiles	2 x 40 mL VOA vials teflon lined septum caps	4 drops conc. HCl to pH <2 cool to 4°C (±2°C)	14 days	fill completely no air bubbles	overnight courier	bubble pack

Note:

(1) Holding times based on sample collection date.
(2) Groundwater will be sampled if found in contact with waste materials.

C.5.0 SAMPLE CUSTODY AND DOCUMENT CONTROL

The following documents procedures used during sampling and analysis to provide chain-of-custody control during transfer of samples from collection through storage. Recordkeeping documentation will include the following:

i) field logbook (bound with numbered pages) to document sampling activities in the field;
ii) labels to identify individual samples;
iii) chain-of-custody record sheet to document analyses to be performed; and
iv) laboratory sample custody logbook.

C.5.1 FIELD LOGBOOK

In the field, the sampler will record the following information in the bound field logbook for each sample collected:

i) site name and address;
ii) project number
iii) sample matrix;
iv) sampler name;
v) sample source;
vi) time and date;
vii) pertinent data (i.e. depth, water surface elevation, pumping method);

viii) details of well construction;

ix) well depth;

x) purge volumes;

xi) equipment types;

xii) analysis to be conducted;

xiii) sampling method (i.e. pump type);

xiv) sample appearance (i.e. color, turbidity, evidence of soil staining);

xv) preservative added, if any;

xvi) sequence of filling sample bottles (VOC will be filled first);

xvii) number of sample bottles collected;

xviii) field analyses [temperature, pH, specific conductance, turbidity (if appropriate)]; and

xix) pertinent weather data.

Each field log book page will be signed by the sampler.

A unique sample numbering system will be used to identify each collected sample. This system will provide a tracking number to allow retrieval and cross-referencing of sample information. A listing of the sample identification numbers with written descriptions of sample location, type and date will be maintained by CRA. The sample numbering system to be used is described as follows:

Example: W-041689-AA-XXXX

Where: W-Designated Sample Type (W-Water, S-Soil/Sediment)

041689: Collection Date (mm/dd/yy)

AA: Sampler Initials

XXXX: Sequential number starting with 001 at the start of the project.

QC samples will also be numbered using this system. Figure C.5.1 shows a typical sample label.

C.5.2 CHAIN-OF-CUSTODY

A chain-of-custody will be maintained to document the transfer of sample containers. Each sample will be properly sealed. Sample container labels will include sample number, place of collection and date and time of collection. Samples shall be placed in the shipping cooler immediately after collection.

Each cooler being shipped to the project laboratory will contain a chain-of-custody form. Figure C.5.2 shows a chain-of-custody form. The chain-of-custody form consists of four copies which are distributed to the shipper, the receiving laboratory, the CRA laboratory and the CRA office file. Each sample number of each sample shipped will be recorded on the sheet. The shipper will maintain his copy while the other three copies are enclosed in a waterproof envelope within the cooler with the samples. The container will then be sealed properly for shipment. The laboratory, upon receiving the samples, will complete the three remaining copies. The laboratory will

CRA Consulting Engineers
CONESTOGA-ROVERS & ASSOCIATES LIMITED

JOB NAME: MT. MORRIS DUMP SITE

JOB NO: 3990 DATE: JULY 4, 1989

LOCATION: W-070489-DD-0001

REMARKS: COLLECTED BY DAVE DEMPSEY
AT 18:10, TCL–VOCs
PRESERVATION = pH <2 WITH HCl

NOTE:

1) SAMPLE LABELS WILL BE FIRMLY AFFIXED TO SAMPLE CONTAINERS.

2) ALL SAMPLE LABELS WILL BE COMPLETED USING WATER INSOLUBLE INK.

figure C.5.1
TYPICAL SAMPLE LABEL
Mt. Morris Dump Site

CRA

3990-1/04/91-M

C.5.2 FORM *Site*

/TIME /TIME

maintain one copy for their records. One copy will be returned to CRA upon receipt of the samples by the laboratory. One copy will be returned to CRA with the data deliverables package.

Upon receipt of the container at the laboratory, the container will be inspected by the designated sample custodian. The condition of the container will be noted on the chain-of-custody record sheet by the sample custodian. The sample custodian will document the date and time of receipt of the container and sign the form.

If damage or discrepancies are noticed, it will be recorded in the remarks column of the record sheet, dated and signed. Any damage or discrepancies will be reported to the laboratory supervisor who will inform the lab manager and QA officer. The lab QA officer will than notify the CRA QA Officer - Analytical Activities.

C.5.3 SAMPLE DOCUMENTATION IN THE LABORATORY

The sample custodian will assign a unique number to each incoming sample for use in the laboratory. The unique number and customer number will then be entered into the sample receiving log. The laboratory date of receipt will also be noted.

The project laboratory will be responsible for maintaining analytical log books and laboratory data, as well as sample (on hand) inventory for submittal to CRA on an "as required" basis. Samples will be

maintained by the laboratory for a period of 30 days following CRA's receipt of the respective sample data under the conditions prescribed by the appropriate U.S. EPA methods for additional analyses, if necessary. Raw laboratory data files will be inventoried and maintained by the project laboratory for a period of five years at which time CRA will advise the project laboratory regarding the need for additional storage.

C.5.4 STORAGE OF SAMPLES

After the sample custodian has prepared the log book, the chain-of custody will be checked to ensure that all samples are stored in the appropriate locations. All samples will be stored within an access controlled location and will be maintained at 4°C until completion of all an analytical work or, as a minimum, for 30 days.

C.5.5 SAMPLE DOCUMENTATION - CRA

Evidential files for the entire project will be inventoried and maintained by CRA and will consist of the following:

- Project plan
- Project logbooks
- Field data records
- Sample identification documents
- Chain-of-custody records

- Correspondence
- Analytical data packages
- Report notes, calculations, etc.
- References, literature
- Miscellaneous - photos, maps, drawings, etc.
- Final Report

The evidentiary file materials will be the responsibility of the evidentiary file custodian with respect to maintenance and document removal. Ian Richardson of CRA will be the evidence file custodian.

C.6.0 CALIBRATION PROCEDURES AND FREQUENCY

The procedures indicated below will be performed for all samples delivered for analysis to the project laboratory. Specific instructions relevant to a particular type of analysis are given in the analytical procedures which are referenced in Section C.7.0.

All quality control data and records produced from calibrating instruments will be retained by the laboratory and will be made available to CRA on an "as-required" basis.

The following specific analytical quality control procedures area related to each analytical batch.

C.6.1 INSTRUMENT PERFORMANCE

Prior to initiating analysis, it is required to establish that a given instrument meets the specifications required.

C.6.1.1 Organic Analyses

Instrument performance criteria will be determined by the project laboratory.

C.6.2 CALIBRATION

Instruments will be calibrated using procedures specified in analytical methods. Criteria verifying instrument calibration will be determined by the project laboratory.

C.6.2.1 Gas Chromatograph Calibration

The GC systems used for organic analyses will be calibrated using a five-point curve. Criteria to verify the calibration will be determined by the project laboratory.

C.6.2.2 Standard Curves for Inorganic Analysis

Criteria establishing instrument calibration for inorganic analyses will be determined by the project laboratory. All EP Toxicity analysis will be conducted using method of standard addition.

C.6.2.3 Field Instrument Calibration

1) Hnu

- Hnu calibration checks will be done daily in the field prior to the commencement of field activities.

A) Hnu Calibration Checks

Calibration checks will be performed in accordance with the following procedures:

1) Connect the analyzer to the regulator and cylinder with a short piece (butt connection) of tubing. The calibration gas in the cylinder consists of a mixture of isobutylene and zero air. Isobutylene is non-toxic and safe to use in confined areas. There are no listed exposure levels at any concentration.

   It is important the tubing be clean since contaminated tubing will affect the calibration reading. Do not use cylinder below about 30 psig as a reading below that level can deviate up to ten percent from the rated value.

   Safely discard the disposable cylinder when empty. Do not refill this cylinder.

2) With the SPAN setting and the function switch at the same positions as listed in the Application Data Sheet or Calibration Report, open the valve on the cylinder until a steady reading is obtained.

3) If the reading is the same as the recorded data, the analyzer calibration for the original species of interest is still correct.

4) If the reading has changed, adjust the SPAN setting until the reading is the same.

5) Shut off the cylinder as soon as the reading is established.

6) Record and maintain this new SPAN setting.

C.7.0 ANALYTICAL PROCEDURES

This section presents the analytical methods which will be employed by the project laboratory to complete all required analyses.

C.7.1 OVERVIEW

All sediments, soil and groundwater samples collected for chemical analyses will be analyzed using SW-846 methods. The methods for performing these analyses are presented in Table C.7.1. All analyses will be performed consistent with SW-846 methods.

C.7.2 IDENTIFICATION

Analyte identification will be accomplished with an authentic standard of the analyte. When authentic standards are not available identification will be considered tentative.

For gas chromatographic determinations of specific analytes, the relative retention time of the unknown will be compared with that of an authentic standard. Since a true identification using GC is not possible, an analytical run for compound confirmation will be followed according to the specifications in the methods. Peaks must elute within daily retention time windows established for each indicator parameter to be declared a tentative or confirmed identification. Retention time windows are

TABLE C.7.1

SUMMARY OF ANALYTICAL METHODS[1]
MOUNT MORRIS DUMP SITE

Parameter	*Extraction* [2]	*Analysis*
VOC	5030	8010A 8020A
PCB	3510/3520 (water) 3530 (soil)	8080A
Metals	1310 (soil) (water)	7000 series 6000/7000 series
Cyanide	--	9010A

Notes:

1. Analytical methods are from "Test Methods for Evaluating Solid Wastes", SW-846, Third Edition, Final Update I, December 1990.

2. Method 1310 = EP Tox

determined via a standard 72-hour study defined in each method. Results of the study are to be filed in the laboratory and available for inspection during a QC audit.

C.7.3 QUANTITATION

The procedures for quantitation of analytes are discussed in the appropriate specific analytical methods.

C.7.4 QUANTITATION LIMIT

The data will have quantitation limits that are consistent with the appropriate U.S. EPA methods. The targeted quantitation limits for chemical analyses were previously presented in Tables C.3.2 through C.3.4. Specific quantitation limits are highly matrix dependent. Therefore, these quantitation limits are provided for guidance and may not always be technically achievable.

C.8.0 DATA REDUCTION, VALIDATION ASSESSMENT AND REPORTING

The project laboratory will perform analytical data reduction and validation in-house under the direction of the laboratory QA officer. The laboratory QA officer will be responsible for assessing data quality and advising of any data which were related "preliminary" or "unacceptable" or other qualifications. Figure C.8.1 illustrates the analytical data flow through the laboratory. Data reduction, validation and reporting by the laboratory will be conducted as detailed in the following. It should be noted, however, that "signing off" will be required following completion of each step.

- Another analyst reviews raw data produced and checked by the responsible analyst.
- Area supervisor reviews that data for attainment of quality control criteria presented in the referenced analytical methods.
- Laboratory operations manager reviews that data and a report will be generated and sent to the laboratory quality assurance officer.
- Laboratory quality assurance officer will complete a thorough inspection of all reports.
- Area supervisor and QA officer will decide whether any sample reanalysis is required.
- Upon acceptance of the preliminary reports by the laboratory QA officer, the project laboratory manager will sign final reports.

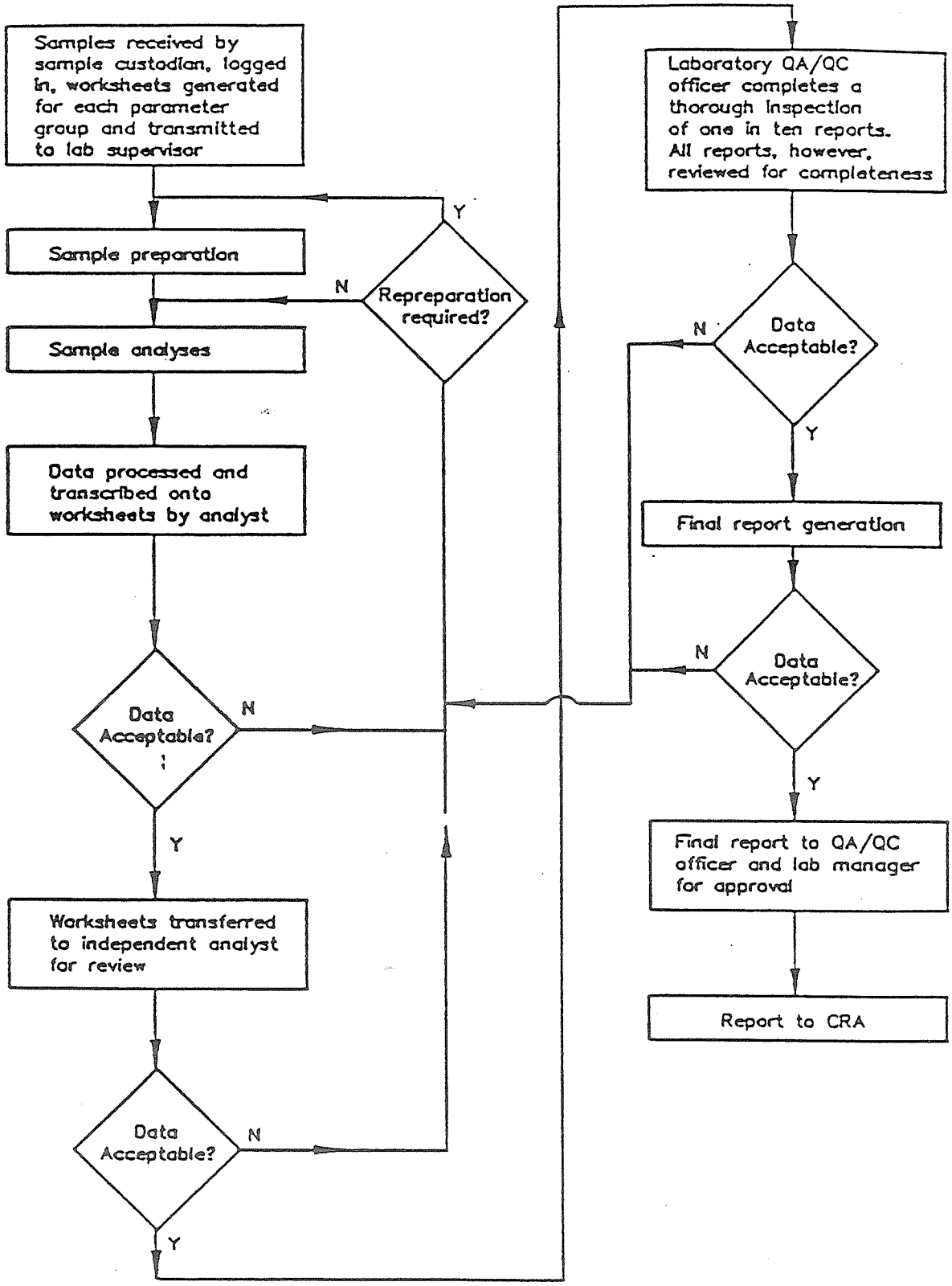

figure C.8.1

ANALYTICAL DATA FLOW
ANALYTICAL SUBCONTRACTOR
Mt. Morris Dump Site

CRA

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CRA's QA Officer - Analytical Activities will conduct an evaluation of data reduction and reporting by the laboratory. These evaluations will consider the finished data sheets, rinsate data, field duplicate data, and recovery data for surrogate and matrix spikes. The material will be checked for legibility, completeness, correctness, and the presence of requisite dates, initials and signatures. The result of these checks will be assessed and reported to the project managers noting any discrepancies and their effect upon the acceptability of the data. All information gathered from QA/QC checks will be discussed in the final RI Report.

Analytical validation will be performed by the CRA QA Officer - Analytical Activities. Assessing analytical and field data will include checks for data consistency by looking for comparability of duplicate analyses, potential sample contamination as indicated by results of blank sample criteria, transmittal errors, and anomalously high or low parameter values. The results of data validations will be reported to the project managers, noting any discrepancies and their effect upon acceptability of the data.

Raw data from field measurements and sample collection activities that are used in project reports will be appropriately identified and appended to the report. Where data have been reduced or summarized, the method of reduction will be documented in the report. In addition, field data will be audited for anomalously high or low values that may appear to be inconsistent with other data.

Data packages will contain the following items:

- Analytical methods summary,
- Case narrative detailing any difficulties and corrective actions taken,
- Extractions and analyses dates,
- Method blank sample data,
- Surrogate compounds percent recoveries,
- MS/MSD percent recoveries, and
- Control sample recoveries

C.9.0 INTERNAL QUALITY CONTROL CHECKS AND FREQUENCY

C.9.1 FIELD QC

Quality control procedures for field measurements will be limited to checking the reproducibility of the measurement by obtaining multiple readings and by calibrating the instruments (where appropriate).

Quality control of field sampling will involve collecting field duplicates and rinsate blanks.

C.9.2 LABORATORY QC

Specific procedures related to internal laboratory QC samples (namely, matrix spikes, surrogate spikes, blanks, and QC check samples) are detailed in the following subsections.

C.9.2.1 Reagent Blank

A reagent blank will be analyzed by the laboratory at a frequency of one per twenty analyses or, in the event that an analytical round consists of less than twenty samples, one reagent blank will be analyzed. The reagent blank, an aliquot of analyte-free water or solvent, will be carried through the entire analytical procedure. For EP Tox analyses, a reagent blank and blank sample that underwent the EP Tox will be analyzed.

C.9.2.2 Matrix Spikes/Matrix Spike Duplicate (MS/MSD) Sample

A MS/MSD sample will be analyzed at a minimum frequency of one in twenty for each method per matrix, excluding EP Toxicity metals analyses. Acceptable criteria and compounds that will be used for matrix spikes. Control limits will be established by the project lab. Percent spike recoveries will be used to evaluate analytical accuracy while percent relative standard deviation between the spike and matrix spike duplicate will be used to assess analytical precision.

As EP Toxicity metals analyses will be performed using methods of standard addition, no MS/MSD samples are required.

C.9.2.3 Surrogates

Surrogates are used in all organic analyses. Every blank, standard and environmental sample, including MS/MSD samples, will be spiked with surrogate compounds prior to purging volatiles or extracting semi-volatiles.

Surrogates will be spiked into samples according to the appropriate analytical methods. Surrogate spike recoveries will fall within the control limits set by procedures specific in the method for analytes falling within the quantification limits without dilution. Diluting samples to bring

the analyte concentration into the linear range of calibration may dilute the surrogates below the quantification limit; assessment of analytical quality in these cases will be based on the quality control embodied in the check and MS/MSD samples. Surrogate control limits will be established by the project lab.

C.9.2.4 Check Samples

Each sample batch will contain a control sample, which is a known standard solution excluding the calibration standards. In this manner, the overall method performance is measured. Percent recoveries for these samples must be within laboratory established limits.

C.10.0 PERFORMANCE AND SYSTEM AUDITS AND FREQUENCY

For external evaluation purposes, performance evaluation check samples from the U.S. EPA and various state agencies are analyzed periodically by the project laboratory.

Internally, the data evaluation from these samples is done on a continuing basis over the duration of this project.

The CRA QA Officer - Analytical Activities may carry out performance and/or systems audits to insure that data produced during this program are of known and defensible quality.

System audits are qualitative evaluations of field and laboratory components of quality control measurement systems. Audits determine if the measurement systems are being used appropriately. The audits may be carried out before all systems are operational, during the program, or after the completion of the program. Such audits typically involve a comparison of the activities given in the QAPP with activities actually scheduled or performed. A special type of system audit is the data management audit. This audit addresses only data collection and management activities.

The performance audit is a quantitative evaluation of the measurement system used for a monitoring program. It requires testing the measurement systems with samples of known composition or behavior to evaluate precision and accuracy. A performance/system audit may be carried

out by or under the auspices of the MDNR, without the knowledge of the analyst during each sampling event for this program. The scheduling of such audits will be at the discretion of the MDNR.

In addition, one external performance audit may be conducted by CRA prior to analysis of investigative samples. However, any additional external performance audits will only be performed if deemed necessary by either the client, CRA project director or the CRA QA Officers.

C.11.0 PREVENTATIVE MAINTENANCE

All analytical instruments used in this project will be serviced by laboratory personnel at regularly scheduled intervals in accordance with the manufacturer's recommendations. Instruments may also be serviced at other times due to failure. Requisite servicing beyond the abilities of project laboratory personnel will be performed by the equipment manufacturer or their designated representative.

Daily checks of each instrument will be by the analyst who has been assigned responsibility for that instrument. This will include changing GC inlet liners, checking operation of data systems, checking for leaks, etc. Manufacturer's recommended procedures will be followed in every case.

The Hnu will be calibrated in the field as described in Section 7.2.3. In addition, the following preventive maintenance measures will be taken in the field:

Hnu - sent for recalibrating and cleaning annually.

C.12.0 SPECIFIC ROUTINE PROCEDURES USED TO ASSESS DATA PRECISION, ACCURACY AND COMPLETENESS

C.12.1 QA MEASUREMENT QUALITY INDICATORS

C.12.1.1 Precision

Precision will be assessed by comparing the analytical results between MS/MSD analyses and/or duplicate sample analyses.

C.12.1.2 Accuracy

Accuracy will be assessed by comparing a set of analytical results to the accepted or "true" values that would be expected. In general, surrogate, MS/MSD analyses and check sample recoveries will be used to assess accuracy.

C.12.1.3 Outliers

Procedures discussed previously will be followed for documenting deviations. In the event a result deviates significantly from established control limits set by the project laboratory, this deviation will be noted and its effect on the quality of the remaining data assessed and documented.

C.12.2 STATISTICAL EVALUATIONS

Standard statistical formulae shall be used in examination of the data and determination of their precision and accuracy. Additional statistical formulae which will be applied include:

i) Relative Percent Difference (RPD)

$$RPD = \left| \frac{X_1 - X_2}{\frac{X_1 + X_2}{2}} \right| \times 100$$

Note: RPD will be used to assess analytical precision

X_1 = result of original analysis

X_2 = result of replicate analysis

ii) Matrix Spike Percent Recovery

Matrix spike recoveries will be used to establish analytical accuracy and will be evaluated as follows:

$$\text{Matrix Spike Recovery} = \left[\frac{A - B}{C} \right] \times 100$$

Where:

A = the analyte concentration determined experimentally from the spiked sample;

B = the background level determined by a separate analysis of the unspiked sample; and

C = the amount of the spike added.

Note: Accuracy will also be assessed from spike percent recoveries and audit sample performance.

C.13.0 CORRECTIVE ACTION

The need for corrective action may be identified by system or performance audits or by standard QC procedures. The essential steps in the corrective action system will be:

- Checking the predetermined limits for data acceptability beyond which corrective action is required;
- Identifying and defining problems;
- Assigning responsibility for investigating the problem;
- Investigating and determining the cause of the problem;
- Determining corrective action to eliminate the problem (this may include resampling and reanalyses);
- Assigning and accepting responsibility for implementing the corrective action;
- Implementing the corrective action and evaluating the effectiveness;
- Verifying that the corrective action has eliminated the problem; and
- Documenting the corrective action taken.

For each measurement system, the CRA QA Officer - Analytical Activities will be responsible for initiating the corrective action and the laboratory supervisor will be responsible for implementing the corrective action. The corrective action taken will depend upon the QA/QC criteria that did not meet the necessary criteria, and may range from qualifying the data to resampling the Site.

C.14.0 QUALITY ASSURANCE REPORT TO MANAGEMENT

Management will receive reports on the performance of the measurement system and the data quality following each sampling round and at the conclusion of the report.

Minimally, these reports will include:

- Assessment of measurement and quality indicators, i.e. data accuracy, precision and completeness;
- Results of system audits; and
- QA problems and recommended solutions.

The CRA QA Officer - Analytical Activities will be responsible within the organizational structure for preparing these periodic reports. The final report for the project will also include a separate QA section which will summarize data quality information contained in the periodic QA/QC reports to management, and details and overall data assessment and validation in accordance with the data quality objectives outlined in this QAPP.

APPENDIX D

HEALTH AND SAFETY PLAN

TABLE OF CONTENTS

D.1 INTRODUCTION

The Site investigative work to be conducted for the Site Investigation at the Mount Morris Disposal Site is described in the work plan. Such work may involve contact with soil, surface water, ditch sediment and groundwater which potentially contain low levels of hazardous substances including PCB, metals, cyanide and/or low level volatile organic compounds (VOCs). It is anticipated that the concentration levels of these contaminants will be much less than that of their pure product form.

To ensure that any direct contact with potentially contaminated material by Site personnel is prevented, a Site Specific Health and Safety Plan has been developed as presented herein. This Health and Safety Plan has been developed to ensure the following:

i) that personnel working on Site are not significantly exposed to hazardous substances,

ii) that the health and safety of the general public and the surrounding environment is not compromised by the potential off-Site migration of contaminated materials due to this project, and

iii) compliance with applicable governmental and non-governmental (American Conference of Governmental Industrial Hygienists) regulations and guidelines. In particular, the amended rules of the Occupational Health and Safety Act for Subpart H of Part 1910 (29 CFR 1910.120) will be implemented for all Site work.

For the purpose of this Health and Safety Plan, all drilling activities performed on the Site involving contact with potentially contaminated materials will be considered contaminated operation requiring personal protective equipment. A detailed description of the personal protective equipment required is presented in Section D.11.

The Health and Safety Plan specified herein will provide for a safe and minimal risk working environment for on-Site personnel. It also provides for emergency response procedures and attempts to minimize the potential adverse impact of investigative activities on the general public and the surrounding environment.

Sampling activities at the Site will involve contact with soils, sediments and groundwater which may contain hazardous chemicals. All Site personnel will be required to comply with all provisions of this Health and Safety Plan.

D.2 ENVIRONMENTAL CONDITIONS

Waste disposal is reported to have occurred in two discrete waste disposal areas. Parameters identified to be present at the Site by samples collected by MDNR include PCB and heavy metals. Reports also indicate that cyanide and VOCs may be present at the Site.

D.3 BASIS

The Occupational Safety and Health Administration (OSHA) Standards and Regulations contained in Title 29, Code of Federal Regulations, Parts 1910 and 1926 (29 CFR 1910 and 1926) and current Threshold Limit Values (TLVs) as provided by the American Conference of Governmental Industrial Hygienists (ACGIH) will provide the basis for the safety and health program. Additional specifications within this Section are supplementary to OSHA regulations and reflect the positions of both the United States Environmental Protection Agency (U.S. EPA), the National Institute for Occupational Safety and Health (NIOSH), and the United States Coast Guard (USCG) regarding procedures required to ensure safe operations at abandoned hazardous waste disposal sites.

The health and safety of the public and Site personnel and the protection of the environment will take precedence over cost and schedule considerations for all project work. The Site Safety Officer will be responsible for decisions regarding when work will be stopped or started for health or safety reasons.

D.4 RESPONSIBILITIES AND ADMINISTRATION

CRA will designate a Site Safety Officer who will supervise the implementation of the HSP and will be responsible for all decisions regarding operations and work stoppages due to health and safety considerations. The Site Safety Officer will be on Site on a full-time basis.

The Site Safety Officer will:

1) Be responsible for implementation of the health and safety plan at the initiation of Site work;

2) Conduct the initial briefing sessions for all on-Site personnel with regard to this HSP and other safety requirements to be observed during the investigation, including:

   i) potential hazards,
   ii) personal hygiene principles,
   iii) personnel protective equipment,
   iv) respiratory protection equipment, and
   v) emergency procedures dealing with fire and medical situations;

3) Review and modify the HSP as more information becomes available concerning the hazardous materials involved, review all monitoring reports, and provide the initial qualitative respirator fit test.

4) Supervise and enforce safety equipment cleaning;

5) Conduct the air monitoring program;

6) Coordinate emergency procedures;

7) Have the authority to make on-Site Health and Safety-related decisions.

D.5 SITE SPECIFIC HEALTH AND SAFETY PLAN

A site-specific Health and Safety Plan will be completed prior to performing any work on Site that may involve the contact with potentially contaminated material. A copy of this plan will be maintained on the Site at all times. A copy of the outline of this Site-specific HSP is provided in Appendix D.1.

D.6 MEDICAL SURVEILLANCE

In accordance with requirements detailed in 29 CFR 1910.120 and 29 CFR 1910.134, all Site personnel will have received, within a year prior to starting field activities, medical surveillance by a licensed physician or physician's group.

Medical records for all on-Site sampling personnel will be maintained by their respective employers. The medical records will detail the tests that were taken and will include a copy of the consulting physician's statement regarding the tests and the employee's suitability for work.

The medical records will be available to the employee or his designated representative upon written request, as outlined in OSHA Regulation 1910.120, Section (f).

Each employer will ensure that their personnel involved in on-Site sampling will have all the necessary medical examinations prior to commencing work which requires respiratory protection. Personnel not obtaining medical certification will not perform work within potentially contaminated areas.

Interim medical surveillance will be completed if an individual exhibits poor health or high stress responses due to on-Site activity or when accidental exposure to elevated concentrations of contaminants occur.

D.7 TRAINING

CRA will require that all sampling personnel, prior to entering the Site, complete training sessions in accordance with 29 CFR 1910.120. This training shall consist of a minimum of 40 hours of instruction off Site and three days of actual field inspection under direct supervision. Each employer will maintain documentation stating that their on-Site personnel have complied with this regulation.

Prior to commencing Site activities, a Site-specific initiation session will be conducted. This session will be used to instruct the on-Site personnel as to what the potential Site hazards are, level of PPE required, Site-specific requirements, and the basis of the Health and Safety Plan. At this session, all on-Site personnel will be questioned as to whether they have the 40 hours of training required in accordance with 29 CFR 1910.120. All personnel who attend this session will sign a Training Acknowledgment Form, of which an example is presented in Appendix D.2.

D.8 WORK AREAS

CRA will clearly layout and identify work areas in the field and will limit equipment, operations and personnel in the areas as defined below.

1) Temporary Exclusion Zones will be established when conducting investigative activities such as drilling. Flag lines will be erected to define the limits of the Temporary Exclusion Zones. Polyethylene sheeting will be spread down on the ground to prevent contamination of the ground surface.

   Access to the Temporary Exclusion Zones will be restricted to personnel who are wearing the proper personal protective equipment, have received the required medical examination, and have undergone the safety and health training. Eating, drinking, or smoking is prohibited in this area.

2) A temporary Contaminant Reduction Zone will be located at the edge of each Temporary Exclusion Zone. Access to the Temporary Contaminant Reduction Zone will be restricted to personnel who are wearing the proper personal protective equipment, have met the medical surveillance requirements, and have met the required training. Eating, drinking, or smoking is prohibited in this area.

3) Support Zone - This area is the remainder of the working Site. Procedures will be implemented to prevent active or passive contamination from the drilling locations.

D.9 RESPIRATOR PROGRAM

Prior to arriving at the Site, all on-Site personnel will have received training in the use of, and have been fit tested for half- or full-facepiece respirators.

The Hnu will be used to determine if organic vapors and some inorganic gases are present. A background reading will be established prior to commencing work activities at each drilling location.

Action levels for organic monitoring which will determine the level of respiratory protection required during field activities will be:

Hnu Organic Vapor Reading Above Background	Action Taken
0 - 5 ppm	no respirator
5 - 25 ppm	half-facepiece air purifying respirator
25 - 50 ppm	full-facepiece air purifying respirator
>50 ppm	shut down activities and re-evaluate

If excessive dust is generated during investigative activities, a particulate air filter will be worn.

Work will be stopped, and the work area will be allowed to vent if monitoring indicates that any of the following conditions exist:

1) toxic gases and/or particulates are present at concentrations which present Immediate Danger to Life and Health (IDLH) conditions, or in excess of the protection factor afforded by the air purifying respirator (whichever is lower), or

2) the oxygen content of the air is less than 19.5 percent, or

3) flammable gas, vapors, or mist are present in concentrations in excess of 10 percent of their lower explosive limit (LEL).

D.10 REAL-TIME AIR MONITORING

CRA will conduct real-time air monitoring during investigative activities at the Site. Monitoring for organic vapors will be completed with the use of an Hnu photoionization unit with an 11.7eV probe. Readings will be taken periodically within the breathing zones of Site personnel to evaluate the appropriate level of respiratory protection.

The Hnu will be calibrated in accordance with manufacturer's specifications. Calibration procedures will be documented in the field log book.

D.11 PERSONNEL PROTECTIVE EQUIPMENT

CRA will require that all Site personnel are equipped with the appropriate personal safety equipment and protective clothing for the nature of the work.

Safety equipment and apparel as required for investigative activities within the Temporary Exclusion Zones will be at Modified Level C and will consist of the following:

1. Half-facepiece or full-face air-purifying respirators (NIOSH approved), with appropriate cartridges will be available for immediate use if required. Selection of facepiece is dependent on Hnu air monitoring. (See Section D.9 for additional guidance),

2. Disposable outer coveralls (Tyveks),

3. Gloves, outer, chemical-resistant, (nitrile)

4. Gloves, inner, chemical-resistant and/or cotton,

5. Boots, chemical-resistant steel toe and shank,*

6. Hard hat,

7. Hearing Protection**, and

8. Eye Protection.

* If leather boots are worn, a chemical resistant outer boot is suitable.
** Optional, as applicable.

It is anticipated that work conducted outside of the Temporary Exclusion Zones will require the use of boots, gloves and normal safety wear as appropriate. Safety equipment and apparel will be upgraded as necessary for specific conditions based on air monitoring and the type of activity. Entry into wet trenches or drilling of wet boreholes will require the use of liquid resistant disposable outerwear and faceshields, respectively. Additional protective equipment usage guidelines to be implemented include:

1) All prescription eyeglasses in use on the Site will be safety glasses. Contact lenses will be not be permitted.
2) All reusable gloves (inner and outer) will be disposed of daily.
3) During periods of respirator usage, respirator cartridges and filters will be changed daily or upon breakthrough, whichever occurs first.
4) Site personnel unable to pass a qualitative respirator fit test will not enter or work in the Temporary Exclusion Zones.
5) All personal protective equipment worn on Site will be decontaminated or discarded at the end of each work day.
6) Duct tape will be used to ensure that glove-to-cuff and boot-to-leg interfaces are tightly secured when personnel are wearing tyvek suits.

D.12 HEAT STRESS/COLD STRESS

D.12.1 Heat Stress

Heat stress is one of the most common hazards encountered at a Site, and there are a number of factors which have an effect in determining the amount of heat stress experienced by an individual worker. These factors include environmental conditions, type of clothing worn, workload, and individual characteristics.

All employees will have received training in the following:

1) Individual factors which influence an individual's susceptibility to heat.
2) Environmental characteristics such as temperature, humidity, wind speed, and cloud cover.
3) Body response to heat.
4) Effect of personal protective equipment and workload.
5) The various types of heat disorders and their associated symptoms.
6) Heat stress program - acclimatization, monitoring, work/rest regimen, and fluid intake (balanced electrolytic fluids).

Monitoring will be initiated when the ambient air temperature is above 70°F. The monitoring frequency will depend upon the temperature and the type of protective clothing worn. As the temperature increases, the monitoring will become more frequent. Also, if an employee is

wearing impermeable protective clothing, the frequency of monitoring will increase. For example at 72.5°F (adjusted temperature)[1] and wearing an impermeable suit, an employee will be monitored after every 120 minutes of work. If the temperature increases to 87.5°F (adjusted temperature), the workers will be monitored after every 60 minutes of work.

The monitoring will include:

1) heart rate,
2) body temperature (oral), and
3) body water loss (if practicable).

The heart rate will be determined for 30 seconds as soon as practicable during the rest period. If this heart rate exceeds 110 beats per minute, the next work cycle will be shortened by one third.

The oral temperature will also be taken at the end of the work period. If the oral temperature exceeds 99.6°F, then the next work cycle will be shortened by one third.

If the heat stress conditions become severe, then the Site Safety Officer will recommend that body water loss be determined. The employee will be weighed, and the total body water loss will be kept below 1.5 percent body weight loss in a work day.

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[1] Adjusted Temperature = Air temperature + (13x%sunshine)

The length of the work cycle will depend upon the monitoring cycle. The length of the rest cycle depends upon the physical monitoring results. The initial rest period will be 15 minutes (minimum) in duration. During this time period the body will usually return to its homeostatic condition. If the body does not return to homeostasic during the 15-minute rest period, then the rest period will be increased to ensure that a homeostatic condition is reached.

D.12.2 Cold Stress

If work is performed during cold months at the Site, workers may be exposed to cold stress during remedial investigation work. Workers will be required to have the appropriate cold weather clothing. Workers who are exposed to temperatures below -10°F with wind speeds less than 5 mph will be medically certified as suitable for such exposure. All workers certified for exposure will adhere to the work warm-up schedule as specified in the current ACGIH standards as outlined in the current edition of the booklet entitled "Threshold Limit Values and Biological Exposure Indices".

All workers who may be subjected to cold stress will have received training in the following:

1) Environmental characteristics such as temperature, humidity, wind speed, and cloud cover.

2) Body response to cold.

3) The various types of cold stress and their associated symptoms.

4) Cold stress program.

D.13 PERSONAL HYGIENE

Workers will be required to observe and adhere to the personal hygiene-related provisions of this section. Site personnel found to be disregarding the personal hygiene-related provisions of this plan will be barred from the Site.

The following equipment/facilities will be available for the personal hygiene of all Site personnel:

1) Suitable disposable outerwear, gloves, and footwear on a daily basis for the use of on-Site personnel.

2) Contained storage and disposal for used disposable outerwear.

3) Potable water and a suitable sanitation facility.

4) A boot wash for decontamination of footwear.

The following regulations for personnel working within the Temporary Exclusion Zones, will also be enforced:

1) Site personnel will wear personal protective equipment as appropriate whenever entering or working in the Temporary Exclusion Zone.

2) Used disposable outerwear will not be reused if deemed to be unsuitable to provide the necessary protection, and when removed, will be placed inside disposable containers provided for that purpose.

3) Smoking, eating and drinking will be prohibited within the Temporary Exclusion Zone.

4) On-Site personnel will thoroughly cleanse their hands, face, neck area and other exposed ares before smoking, eating or drinking and before leaving the Site daily.

The following procedures for donning and doffing will be followed.

Donning:

1) All equipment to be personally inspected by wearer.

2) Adjust hard hat for proper fit.

3) Standing or sitting, step into legs of suit; ensure proper placement of legs and feet within suit, then gather suit around the waist.

4) Put on boots; tape leg cuff of suit over the tops of the boots using duct tape.

5) Don respirator and adjust it; perform positive and negative pressure fit tests.

6) Put sleeves of suit over arms.

7) Put on inner gloves

8) Put on hard hat.

9) Raise hood, if required, over head.

10) Secure the suit by closing all fasteners. Tape over fasteners if protective flap is not already provided.

11) Put on outer gloves; tape cuff of sleeve to tops of gloves.

12) Have an assistant check to determine if all equipment is secure and functioning normally and that there are no other problems.

Doffing:

1) Wearer of equipment must first be decontaminated. Boots will be washed off in a boot wash with a soapy water solution.

2) Remove any extraneous or disposable clothing, boots, outer gloves, hood, hard hat, and tape.

3) Remove arms, one at a time, from suit. Be careful not to have any contact between the outer surface of the suit and the wearer's body. Keep the inner gloves on.

4) Remove both legs from suit.

5) Remove inner gloves by rolling them off the hand, inside out.

6) Remove respirator, throw away cartridges and wash in disinfecting solution. Suspend respirator to dry (completed only at end of work day).

7) Remove inner clothing, and thoroughly wash exposed parts of the body (completed only at end of work day).

D.14 EQUIPMENT AND PERSONNEL DECONTAMINATION

Any item used or taken into the Temporary Exclusion Zones will be considered to be contaminated. However, procedures will be implemented to reduce the amount of contamination of both personnel and equipment. These procedures are:

1. Proper work practices that would lead to minimal direct contact with contaminated material,

2. All monitoring and sampling equipment will be protected by plastic bagging,

3. Plastic sheeting will be used where practicable to prevent contamination of ground surfaces, and

4. Use of disposable equipment and clothing where practicable.

All equipment will be decontaminated using a pressurized hot water or steam rinse.

Personnel decontamination will consist of boot wash with detergent, outer glove rinse (if necessary), tape removal, outer glove removal, removal of boots, gloves, disposable suit, respirator, hard hat, and inner gloves.

D.15 CONTAMINANT MIGRATION CONTROL

All vehicles and equipment used in the Temporary Exclusion Zone will be decontaminated prior to leaving the Site at the end of the program. CRA's Site Safety Representative will inspect each piece of equipment to check that it has been decontaminated prior to removal from Site. Downhole equipment will be decontaminated between successive boreholes. In addition, the drilling will be operated in a manner to prevent contamination during work at active boring locations.

Decontamination will consist of the thorough cleaning of equipment with a high pressure hot water or steam cleaner.

Personnel engaged in vehicle decontamination will wear protective equipment including disposable clothing, respiratory protection and face shields, as appropriate.

D.16 EMERGENCY RESPONSE PLAN

Prior to commencing Site activities, CRA will coordinate emergency response procedures.

In the event of injury to Site personnel or contact with hazardous materials, the following protocol will be followed (as appropriate):

1) In the event of injury, notify the Site Safety Officer.

2) In the event of serious injury, contact the designated hospital and describe the injury.

3) Decontaminate personnel if possible and administer appropriate first aid. If personnel cannot be decontaminated, alert hospital to possible problems of contamination.

4) Transport personnel to the defined medical facility (if necessary) along a predefined route.

Fire fighting equipment (extinguishers) will be maintained in strategic locations within the Site to combat localized fires. Personnel will be trained in fire fighting procedures and will be equipped with full faced masks when involved in such operations.

D.17 EMERGENCY AND FIRST AID EQUIPMENT

The safety equipment listed below will be located and maintained immediately adjacent to active work areas as directed by the Site Safety Officer.

1) portable emergency eye wash,
2) two twenty pound ABC type dry chemical fire extinguishers, and
3) approved First-Aid Kit for a minimum of ten personnel.

D.18 COMMUNICATIONS

Telephone service will be provided during investigative activities. The telephone may be a mobile phone or alternative arrangements may be made with an adjacent property in the event a direct line is not readily available. Emergency numbers including police, fire, ambulance, hospital, and appropriate Regulatory agencies will be prominently posted near the phone.

D.19 SAFETY MEETINGS

The Site Safety Officer will conduct safety meetings if required which will be mandatory for all Site personnel.

APPENDIX D.1

SITE SPECIFIC HEALTH AND SAFETY PLAN

MOUNT MORRIS DISPOSAL SITE

SITE SPECIFIC HEALTH AND SAFETY PLAN
MOUNT MORRIS DISPOSAL SITE

1.0 SITE DESCRIPTION

Location Mount Morris, Genesee Township, Michigan Date: April 1991

Approximate Size of Site _____

Anticipated Health Hazards Metals, PCB, Cyanide, VOC

Duration of Planned Activity _____

Surrounding Population _____

Topography _____

Weather Conditions _____

Pathways for Hazardous Substance Dispersion _____

Previous studies completed MDNR Sampling

Additional Information _____

2.0 ENTRY OBJECTIVES

The objective of entry into the contaminated area is to: characterize the waste and environmental effects associated with the waste.

3.0 ON-SITE ORGANIZATION AND COORDINATION

The following personnel are designated to carry out the stated job functions on Site. (Note: One person may carry out more than one job function).

CLIENT CONTACT: _____

PROJECT MANAGER: Ian Richardson (519)884-0510

PROJECT COORDINATOR/SITE SAFETY OFFICER:
Mike Okamoto (519)884-0510

SITE SAFETY OFFICER ALTERNATE: _____

CRA FIELD PERSONNEL: _____

Each of the groups denoted below will provide their own Health and Safety Plan which compliments this plan specifically.

SECURITY SERVICES: Site Security maintained by Site Safety Officer during RI activities

CONTRACTOR(S) AND SUBCONTRACTORS: (NOT ESTABLISHED YET)

FEDERAL AGENCY REPRESENTATIVE(S): _____

STATE AGENCY REPRESENTATIVE(S): _____

LOCAL AGENCY REPRESENTATIVE(S): _____

All personnel arriving or departing the Site will log in and out. All on-Site activities will be cleared through the CRA Project Coordinator.

4.0 HAZARD EVALUATION AND HEALTH RISK ANALYSIS

The following substance(s) are known or suspected to be on site. The primary hazards of each are identified.

Chemical Substances Involved	Concentrations (If Known)	Primary Hazards
Zinc	not known	
PCB	630 ppm (max)	
VOC	not known	
Cyanide	not known	

5.0 MEDICAL SURVEILLANCE

The CRA field personnel designated below have or will have a baseline physical prior to completing on-Site activities. These physicals are on file at the Waterloo Office, and were completed for each of the following individuals.

Name	Date

If any on-Site personnel suffers excessive exposure to the chemicals of concern, additional medical attention will be required to determine the extent of exposure (also proof that they are fit to do work (ie. copy of doctors certificate)).

Non-CRA personnel must provide the Project Coordinator with documentation that each individual has undergone appropriate medical surveillance and that they are fit to do the work prior to being allowed entrance to the Site.

6.0 TRAINING

The minimum number of training hours required for this job is 40 hours.

Field personnel designated below have completed appropriate training as per their job description.

Name	Date

Non-CRA personnel must provide proof of adequate training to the Project Coordinator before approval is granted to work on Site.

7.0 PERSONAL PROTECTIVE EQUIPMENT

Based on evaluation of potential hazards, the following levels of personal protection have been designated for the applicable work areas or tasks:

Location	Job Function	Level of Protection Required
Temporary Exclusion Zones	Drilling	A B C D
		A B C D
		A B C D
		A B C D
Rest of Site	Decontamination	A B C D
	Sampling	A B C D
		A B C D

Specific protective equipment for each designated level of protection is as follows. Level C: Half-facepiece or full-facepiece air purifying respirators, disposable outer coverall, inner and outer chemical resistant gloves, inner gloves, and outer chemical resistant boots, hard hat, hearing protection (optional), eye protection. Face shields will be required for vehicle decontamination. Level D: boots, gloves and normal safety wear.

8.0 RESPIRATOR PROGRAM

Action levels for organic monitoring which will determine the level of respiratory protection required during field activities will be:

HNu Organic Vapor Reading Above Background	Action Taken
0 - 5 ppm	no respirator
5 - 25 ppm	half-facepiece air purifying respirator
25 - 50 ppm	full-facepiece air purifying respirator
>50 ppm	shut down activities and re-evaluate

If excessive dust is generated during investigative activities, a particulate air filter will be worn.

9.0 PERSONAL HYGIENE PRACTICIES

1) RI site personnel will wear personal protective equipment as appropriate whenever entering or working in the Temporary Exclusion Zones,

2) Used disposable outerwear will not be reused if deemed to be unsuitable to provide the necessary protection, and when removed, will be placed inside disposable containers provided for that purpose, and

3) Smoking, eating and drinking will be prohibited within the Temporary Exclusion Zones.

10.0 ON-SITE CONTROL AND WORK AREAS

The Site Safety Officer has been designated to coordinate access control and security on Site. The Temporary Exclusion Zones will be marked by flagging tape.

No unauthorized person will be allowed within these areas.

11.0 ONSITE WORK PLANS

Work party(s) consisting of a minimum of 2 persons will perform the following tasks:

Project Coordinator	_____	_____
		_____
		_____
Work Party #1	_____	_____
		_____
		_____
		_____
Work Party #2	_____	_____
		_____
Rescue Team (required for entries to IDLH environments)	_____	_____
		_____
		_____
Decontamination Team	_____	_____
		_____
		_____

The work party(s) were briefed on the contents of this plan at the On-Site Offices.

12.0 COMMUNICATION PROCEDURES

Telephone communication to the Support Zone is established as soon as practicable. The phone number is (not yet established). Telephone communication will beprovided on Site with use of a cellular telephone, or alternative arrangements may be made with a nearby property.

Personnel in the Temporary Exclusion Zones should remain in constant radio communication or within sight of the Project Coordinator. Any failure of radio communication requires an evaluation of whether personnel should leave the Temporary Exclusion Zones.

Three horn blasts is the emergency signal to indicate that all personnel should leave the Temporary Exclusion Zones.

The following standard hand signals will be used in case of failure of radio communications:

Hand gripping throat	Out of air, can't breath
Grip partner's wrist or both hands around waist.....	Leave area immediately
Hands on top of head	OK, I am all right, I understand
Thumbs down	No, negative

13.0 DECONTAMINATION PROCEDURES

Personnel and equipment leaving the Temporary Exclusion Zones shall be thoroughly decontaminated. The standard level C decontamination protocol shall be followed:

1. boot wash with detergent, outer glove rinse (if necessary), tape removal, outer glove removal, removal of boots, gloves, disposable suit, respirator, hard hat, and inner gloves.

Emergency decontamination will include the following stations: Wash station, emergency eye wash

The following decontamination equipment is required: Wash station, containers for disposal of outer garments and respirator cartridges

14.0 SITE SAFETY AND HEALTH PLAN

1. Mike Okamoto is the designated Project Coordinator/Site Safety Officer and is directly responsible to the Project Manager for safety recommendations on Site.

   Ian Richardson will serve as his alternate.

   Emergency Medical Care

2. List of emergency phone numbers:

Agency/Facility	Phone #	Contact
Police		
Fire		
Hospital		
Ambulance		

3. Hospital Route

   Transport personnel (if necessary) along following route.

   Emergency medical information for substances present:

   See Hazardous Information Forms attached to this report as Appendix A.3.

4. On-Site Emergency Procedures and Contingency Planning

   The following standard emergency procedures will be used by onsite personnel. The Site Safety Officer shall be notified of any on-Site emergencies and be responsible for ensuring that the appropriate procedures are followed.

   Personnel Injury in the Temporary Exclusion Zones: Upon notification of an injury in the Temporary Exclusion Zones, the designated emergency signal (three horn blasts) shall be

sounded. All Site personnel shall assemble at the decontamination line. The rescue team will enter the Temporary Exclusion Zones (if required) to remove the injured person to the hotline. The Site Safety Officer and Project Team Leader should evaluate the nature of the injury, and the affected person should be decontaminated to the extent possible prior to movement to the Support Zone. The on-Site EMT shall initiate the appropriate first aid, and contact should be made for an ambulance and with the designated medical facility (if required). No persons shall re-enter the Temporary Exclusion Zones until the cause of the injury or symptoms is determined.

Personnel Injury in the Support Zone: Upon notification of an injury in the Support Zone, the Project Team Leader and Site Safety Officer will assess the nature of the injury. If the cause of the injury or loss of the injured person does not affect the performance of site personnel, operations may continue, with the on-Site EMT initiating the appropriate first aid and necessary follow-up as stated above. If the injury increases the risk to others, the designated emergency signal (three horn blasts) shall be sounded and all Site personnel shall move to the decontamination line for further instructions. Activities on Site will stop until the added risk is removed or minimized.

Fire/Explosion: Upon notification of a fire or explosion on Site, the designated emergency signal (three horn blasts) shall be sounded and all Site personnel assembled at the decontamination line. The fire department shall be alerted and all personnel moved to a safe distance from the involved area.

Personal Protective Equipment Failure: If any Site worker experiences a failure or alteration of protective equipment that affects the protection factor, that person and his buddy shall immediately leave the Temporary Exclusion Zones. Re-entry shall not be permitted until the equipment has been repaired or replaced.

Other Equipment Failure: If any other equipment on Site fails to operate properly, the Project Team Leader and Site Safety Officer shall be notified and then determine the effect of this failure on continuing operations on Site. If the failure affects the safety of personnel or prevents completion of the Work Plan tasks, all personnel shall leave the Temporary Exclusion Zones until the situation is evaluated and appropriate actions taken.

The following emergency escape routes are designated for use in those situations where egress from the Temporary Exclusion Zones cannot occur through the decontamination line:

_____

_____

_____

In all situations, when an on-Site emergency results in evacuation of the Temporary Exclusion Zones, personnel shall not re-enter until:

1. The conditions resulting in the emergency have been corrected.
2. The hazards have been reassessed.
3. The Site Safety Plan has been reviewed.
4. Site personnel have been briefed on any changes in the Site Safety Plan.

5. Off-Site Emergency Procedures and Contingency Planning

6. Environmental Monitoring

The following environmental monitoring instruments shall be used on Site at the specified intervals.

HNu - continuous

Calibration procedures will be completed each day that an instrument is in use.

7. Personnel Monitoring

Heat stress is not anticipated during Site activities.

15.0 CONFINED SPACE ENTRY

NOT APPLICABLE TO CLOUSE PROPERTY

16.0 TRAINING ACKNOWLEDGEMENT LOG

All CRA Site personnel have read the above plan and are familiar with its provisions. Site subcontractors' training acknowledgement logs and CRA personnel's documentation are presented as Appendix A.2.

	(print name)	(signature)
Project Coordinator/		
Site Safety Officer	Mike Okamoto	
Project Manager	Ian Richardson	
Other Site Personnel	Robert Harris	
	Tom Gutpell	

APPENDIX D.2

TRAINING ACKNOWLEDGEMENT LOG

TRAINING ACKNOWLEDGEMENT LOG

NAME: _____
ADDRESS: _____
SOCIAL SECURITY: _____
EMPLOYER: _____
PROJECT NAME/LOCATION: _____

I have completed and understand the applicable training program, for work to be carried out during the above referenced project, including the following topics:

a. Work Rules and Safety Requirements
b. Personal Protection Equipment,
c. Potentially Hazardous Chemicals,
d. Emergency Equipment,
e. Reporting Injuries and Illnesses,
f. Emergency Procedures
g. Job Assignments,
h. Personal hygiene,
i. Medical Tests,
j. Motor Tests, and
k. Standard Operating Procedures.

I further confirm that a respirator qualitative fit test was performed and that I have been issued a respirator of the same type.

By signing this form, I relieve the Contractor, the signatories to the Consent Order and their officers, employees and agents of the liability of consequences related to potential hazards associated with Site entry.

Site Personnel

Signature:_____ Date:_____

I certify that this Site Person has received adequate safety training and instruction and that this person is proficient in the use of protective clothing and equipment and knowledgeable in all aspects of this Health and Safety Plan.

Safety Officer

Signature:_____ Date:_____