INTERNATIONAL
TECHNOLOGY
CORPORATION

PROJECT NO. 312221
DECEMBER 1991
(REVISION 3)

REPORT

US EPA RECORDS CENTER REGION 5
1002391

RECEIVED
DEC 09 1991
IEPA-DLPC

CLOSURE PLAN
MORTON INTERNATIONAL
INDUSTRIAL CHEMICALS AND ADDITIVES

Submitted To:

MORTON INTERNATIONAL
1645 SOUTH KILBOURN AVENUE
CHICAGO, ILLINOIS 60623

Prepared By:

IT CORPORATION
ITASCA, ILLINOIS

Morton *International*

Industrial Chemicals and Additives

December 6, 1991

RECEIVED
DEC 09 1991
IEPA-DLPC

Illinois Environmental Protection Agency
Division of Land Pollution Control
Permit Section
Attn: Lawrence W. Eastep, P.E., Manager
2200 Churchill Road
Springfield, IL 62794-9276

RE: RCRA Revised Closure Plan
Response to NOD

Dear Mr. Eastep:

Enclosed are one original and three copies of the complete, revised closure plan in response to your NOD, dated November 5, 1991 (#031628006 - Cook County). A table cross-referencing IEPA's deficiency comments with Morton International's general response and a corresponding reference section is included for ease of review.

If you have any further questions concerning Morton's closure or our response to your comments, please contact me at (312)521-7000.

Sincerely,

James E. Opre

James E. Opre
Plant Manager

Enclosures

JEO/cmm

prc-0127.ltr

Morton International, Inc., 1645 South Kilbourn Avenue, Chicago, IL 60623 312/521-7000 Fax 312/522-1734

Illinois Environmental Protection Agency 2200 Churchill Road, Springfield, IL 62706

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

December 3, 1991

Re: Closure Plan Review
Facility Name: Morton International
USEPA ID #: ILD [illegible]

Morton International
1500 Lathem Street
Batavia, Illinois 60510

Morton Chemical, Inc.

Dear Sirs:

As you are aware, we are currently evaluating the request for closure of your facility as referenced above, and which is regulated under the Resource Conservation and Recovery Act (RCRA).

On November 8, 1984, the Hazardous and Solid Waste Amendments of 1984 (the Amendments) were enacted to amend RCRA. Under Section 206 and Section 233 (copies enclosed) of the Amendments, all facilities "seeking a permit" (taken to mean interim status facilities) must provide for corrective action for all releases of hazardous waste or constituents from any solid waste management unit, regardless of the time at which waste was placed in the Unit. Please note that both hazardous and non-hazardous wastes can meet the definition of solid waste under 40 CFR 261.2.

Consequently, we must determine whether such releases have ever occurred at the facility site. If they have, we must ensure that any necessary corrective actions either have been taken, or will be taken, pursuant to a decision on your closure plan. An important part of our determination includes your willingness (or unwillingness) to complete the enclosed certification form. Please read it carefully, complete it, and either sign and return it, or return it to us unsigned with a cover letter of explanation, within 30 days of the date of this letter. Public notice of your request for closure approval, and this request, will be in a newspaper of general circulation in the area of the facility.

Please call Permit Section at 217/782-6762 if you have any questions, or wish to discuss this matter further.

Very truly yours,

Lawrence W. Eastep

Lawrence W. Eastep, P.E., Manager
Permit Section
Division of Land Pollution Control

LWE:CA:tk:5/2/9

Enclosures

cc: [redacted], USEPA - Region V
Permit Section
Division File

IL 532-1428
LPC 217 11/85

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
NOTICE OF DEFICIENCIES (NOV 91) CROSS-REFERENCE
TABLE TO RESPONSES FOR MORTON INTERNATIONAL RCRA-CLOSURE

		RESPONSE	REFERENCE
1.	The closure plan does not provide any information regarding the original container storage unit (S01-20,000 gal.). Please describe the container storage unit at the facility prior to its reconstruction in April, 1989. Include the time period of use, location, dimensions, and other relevant information. Also, provide a description of the structural integrity (i.e., cracks, joints, deterioration), and containment structures (curbs). In addition, provide a description of the procedures utilized to decommission and/or decontaminate the unit prior to its reconstruction. If containment structures were not present, describe the drainage features of the unit and its surroundings, and identify the flow pattern of spilled waste or contaminated runoff. A soil sampling and analysis plan must be developed for those areas that come in contact with hazardous waste and any other areas of concern associated with the unit.	Location, time period, dimensions, containment structures, drainage features with flow pattern, decommissioning decontamination procedures, and relevant drum management practices for the original containers storage areas is described. The soil sampling plan was expanded to encompass the entire area.	Sec 1.2.1, Fig. 2A, Fig 2B, Fig 6, Section 1.6.1.1
2.	According to your closure plan, wastes consisting of pentachlorophenol were temporarily relocated during the reconstruction of the storage pad. Please provide more information regarding the handling of this waste. This should include the location of the "temporary" storage area, the volume of waste stored there, and the dates of storage. This area appears to be a RCRA storage area and must undergo closure in accordance with 35 IAC 725. Guidance pertaining to the information which must be provided in the closure plan regarding this unit, including proposed closure activities, can be found in he document entitled "Instructions for the Preparation of Closure Plans for Interim Status RCRA Hazardous Waste Facilities".	The section now includes description of location, volume and types of waste stored, practices maintained, and dates of storage for the "temporary" storage area used during reconstruction of the hazardous pad. This area is now included within the soil sampling plan.	Sec 1.2.1, Sec 1.6.1.1, Fig 6

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		RESPONSE	REFERENCE
3.	The closure plan provides insufficient information regarding the original hazardous waste storage tank system (S02-8,000 gal.). Please describe the storage tank and secondary containment structure before it was replaced, in April 1989, with the 10,000 gallon tank and containment structure. Include the time period of use, location, dimensions, and any other relevant information. Also, provide a description of the structural integrity (i.e., cracks, joints, deterioration), of the original tank system and containment structure. A soil sampling and analysis plan may be required if this information indicates that releases from the original tank system could have migrated to the underlying and/or surrounding soil.	Discussion of existing waste storage tank now includes details of the original hazardous waste solvent tank, including location, period of use, dimensions, structural integrity, containment and other relevant practices. Soil around the old tank's drainage dike has already been removed (May 91) as part of a soil-removal project and soil directly beneath the tank was removed as part of the replacement.	Sec 1.2.2, Fig. 2A, Fig. 2B
4.	DETAILED DRAWING OF THE UNIT(S) - Figure 3 - Site Assessment Boring Locations and Figure 4 - Post Soil Excavation Sample Locations, included with the closure plan, are not drawn to scale. The scale of the drawing must be specified. Also, the maps should indicate where wastes stored in the hazardous waste management unit shown in the figures would flow if spilled, including the location of any drains, sumps or sewers that could potentially receive such spilled waste or contaminated runoff.	A figure has been added showing the plant sites drainage, flow patterns, and the sewer system (from 1990 RCRA Part B). Fig. 6 was modified to show the drain and sump features specific to the hazardous waste storage pad. Spilled wastes will flow in direction of indicated slopes toward the sump. Figures 3 and 4 were also modified to include an approximate scale.	Fig. 2A, Fig. 6, Fig. 3, Fig. 4
5.	According to our records, released materials from the container storage area could migrate west to a sewer or east to a sump. This information was not provided in the closure plan or in the hazardous waste storage pad drawing (Figure 6). Please describe the drainage features of this unit and its surroundings, and identify where spilled waste would flow. Additional sampling and analysis must be proposed to determine if releases have occurred to soil, groundwater or surface water.	The drainage and flow pattern for spilled wastes or run off within the hazardous waste storage pad is clarified. The sewer to the west collects run off from the non-hazardous drum storage area only. Sampling and analysis for this area was defined because of past use.	Sec. 1.2.1, Fig. 2A, Fig. 2B, Fig. 6, Sec 1.6.1.1, App C

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		RESPONSE	REFERENCE
6.	According to our records, released materials from the storage tank could collect in a concrete sump. This information was not provided in the closure plan or in the storage tank drawing (Figure 7). Please describe the drainage features of this unit and sump. Additional sampling and analysis must be proposed to determine if releases have occurred to soil, groundwater or surface water.	Information on the drainage features and the waste storage tank sump are detailed in the section. Additional sampling and analysis are unnecessary because soil beneath the tank was analyzed and removed at time of installation. Surrounding soil was removed during the summer of 1991. The secondary containment structure remains in excellent condition.	Sec. 1.2.2, Fig. 7, App C, Sec. 1.6.2.
7.	Based on the knowledge of manufacturing processes at Morton International's Chicago Plant, soil samples collected at the container storage area must also be analyzed for silver.	Silver was already included in the list for container storage area soils to be analyzed for.	Sec. 1.6.1.2, Table 8, Table 10
8.	DECONTAMINATION OF TANKS, STRUCTURES AND SOILS (35 IAC 725.212 and 725.214) - The owner/operator should describe all efforts to clean or decontaminate hazardous waste and its residues and constituents from tanks, paved areas, containment areas, equipment, structures, pipes, pumps, sumps and any other appurtenances to the hazardous waste management unit, including the tank pumping station and the dedicated pipe from the station to the tank. The owner/operator may be requested to use any reasonable means to clean or decontaminate, including pressure washing, steam cleaning, scraping or other means. A description of how waste material (rinse water, etc.) from decontamination will be managed should also be provided. Please note that residue from listed hazardous waste must be managed as a hazardous waste unless it is delisted under the provisions of 35 IAC 720.120 and 720.122 or is exempt under 721.013(a)(2)(D).	It was reiterated in the general decontamination section that all reasonable means to decontaminate would be utilized to meet the "clean" closure standards. A description of how decontamination waste material will be managed is included. That residue from decontamination will be managed as a hazardous waste, unless otherwise delisted, has also been reiterated in several locations through the text.	Sec 1.6, 1.6.1.3, 1.6.1.5, 1.6.2.3, 1.6.2.5

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		RESPONSE	REFERENCE
a.	Tanks containing hazardous waste must be subjected to all reasonable means of decontamination before they should be considered "clean". This includes pressure rinses, steam cleaning, manual sludge removal and other means. The independent engineer should certify the methods used and the amount of residue remaining.	Cleaning of all tanks will be provided by contractors, but that tanks shall be decontaminated using all reasonable means, including steam cleaning, was reiterated in the general section. An independent engineer will certify that this is done.	Secs. 1.6, 11.2, 1.6.1.4, 1.6.2.4
b.	Tanks which will be used for temporary storage (not to exceed ninety days) following closure should be drained and inspected. The owner or operator and a registered professional engineer should certify that the tank and its appurtenances are in good working condition and that the wastes which will be stored in the tank are compatible with those which were stored previously. All hazardous waste residues and contaminated containment system components, equipment, structures and soils must be removed or decontaminated to satisfy the closure performance standard (725.212(b)(4), as amended February 5, 1987).	Information repeating all comments made here were incorporated into the closure plan General Decontamination of Equipment, Structures, and Soils, to include management of hazardous waste residues, etc., and decontamination rinsewaters. Secs. 1.6, 1.6.1.4, 1.6.2.4	Secs. 1.6, 1.6.1.4, 1.6.2.4, Secs. 1.6, 1.6.1.4, 1.6.2.4
c.	Disposal of hazardous waste and nonhazardous special waste within the State of Illinois requires a Waste Stream Permit issued by the Illinois EPA. Disposal of hazardous waste is also subject to Section 39(h) of the Environmental Protection Act, which prohibits land disposal without a demonstration from the generator that the waste can't be reasonably recycled for reuse, nor incinerated or chemically, physically or biologically treated to render the waste nonhazardous.	Obtaining required permits (including the Waste Stream Permit) was included as a reminder-procedure within the section. Specific reference to compliance with land-ban restrictions was also added.	
	The application for the Waste Stream Permit is to be filed by the landfill or treatment facility operator. The application for a 39(h) authorization is to be filed by the generator of the waste. For more information on Section 39(h),	For information only. No specific response.	

		RESPONSE	REFERENCE
	contact the Permit Section at 217/782-6762.		
9.	SOIL CLEANUP LEVELS - Clean closure of a storage unit requires removal or decontamination of all wastes, leachate, liners and soils (including groundwater) contaminated with waste or leachate that pose a substantial present or potential threat to human health or the environment. The owner/operator has the options of removing or decontaminating soil to Agency approved detection limits/background levels or site-specific, health-based cleanup levels.	Development of site-specific clean-up levels has been revised to address each specific comment outline below, in order to address all objectives of RCRA clean closure demonstration, add a full range of reasonable exposure scenarios for future land use, and include sufficient detail of assumptions and parameters utilized.	Appendix A
	A site-specific cleanup level proposal must document that the contaminants left in the soil will not adversely impact any environmental media (groundwater, surface water or atmosphere), and that direct contact through dermal exposure, inhalation or ingestion will not result in a threat to human health or the environment. The Agency has reviewed Morton's site-specific health-based cleanup levels, in Appendix A of the closure plan, and it has determined that the proposal is unacceptable in that the development of the cleanup levels is incomplete and lacking in detail. Also, the document fails to address the objectives of the RCRA clean closure demonstration. Specific guidance from the USEPA states that, "(a)rguments based on exposure control measures such as fencing or capping will not be acceptable since the long-term future use of the property cannot be reliably controlled..." In addition, exposures based upon a full range of possible future land uses were not investigated, nor were a complete set of exposure pathways included for the limited number of receptors investigated. Following are detailed comments which may be helpful should Morton decide to revise the cleanup levels after correcting and completing the risk assessment.	Additional exposure pathways considered in the revised risk assessment include inhalation of vapors and inhalation of constituents entrained in dust. Future land use exposure scenarios include residential exposure to soils via incidental ingestion and dermal contact. Residential ingestion of drinking water has also been considered as part of a future land use situation.	

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		RESPONSE	REFERENCE
a.	Page A-1/1.1: A closure by removal demonstration must include all potential exposure pathways which would include the ingestion of contaminated groundwater and the inhalation of vapors and contaminated dust.	Additional exposure pathways have been considered such as inhalation of vapors and inhalation of constituents entrained in dust. Furthermore, a demonstration of constituent concentrations remaining in soils and leaching into groundwater has been made. This demonstration was used to address ingestion of groundwater as an additional exposure pathway.	(APPENDIX A) Sec 1.1
b.	Page A-6/3.2(a): PNAs cannot be excluded as chemicals of concern in this fashion. If they are background, as is stated, this must be demonstrated analytically. To the contrary, the prior use of this site as an oil distribution center (page A-3) suggests that these constituents are site related. Carbon disulfide should not be placed in this class of compounds.	Background levels for PNA's and carbon disulfide will be established analytically during background sampling conducted as part of closure of the HWMUs.	Sec 3.2(a)
c.	Page A-7/3.2(b): Detected constituents cannot be excluded from consideration on the basis of one's not knowing how they got there. This is an invalid assumption.	All constituents detected during past sampling activities will be included in the risk assessment.	Sec 3.2(b)
d.	Page A-7/3.2(c): The exclusion of chemicals based upon their presence in laboratory blanks should be evaluated using factors of ten times the concentration in the blank for common laboratory contaminants and five times for others.	The exclusion of chemicals based on their presence in the laboratory blanks was evaluated using factors of ten times the concentration in the blank for common laboratory contaminants and five times for others.	Sec 3.2(c)
e.	Page a-7/3.2(e): Ethylene thiourea should not be excluded from the cancer risk calculation. An oral cancer slope factor of 3.6E-02 $(mg/kg/day)^{-1}$ is available from the same source utilized by the authors for other cancer slope factors. This paragraph also states that a method detection limit of 0.05 mg/kg will be used as the cleanup level for ethylene thiourea. Add ethylene thiourea and its cleanup level to the list of constituents on page A-24.	Ethylene thiourea has been included in the quantitative risk assessment using an oral cancer slope of 3.6E-02 $(mg/kg/day)^{-1}$ and a cleanup level of 0.05 mg/kg, its method detection limit.	Sec 3.3

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f.	Page A-8/3.2(second a): The authors recommend a cleanup level of 28 mg/kg for DEHP with no explanation of justification. Provide reasoning.	A cleanup level of 13 mg/kg for bis(2-ethylhexyl)phthalate has been selected. The selected cleanup level is the highest detected concentration of bis(2-ethylhexyl)phthalate remaining in the soils at the facility. This method of selecting a cleanup level has been used to select all other cleanup levels for constituents detected in past sampling activities.	(APPENDIX A) Sec 3.2(b)
g.	Page A-8/3.2(second b): This paragraph suggests that pentachlorophenol was stored on-site. Explain the concern for this constituent.	Pentachlorophenol was stored on site, therefore has been included in the quantitative risk assessment.	Sec 3.2(b)
h.	Page A-9/4.1: See Comment 9.a above	See response to comment 9(a) above.	Sec 4.1
i.	Page A-14/5.0: In addition to the inclusion of all potential exposure pathways, the Agency requires investigation of possible future use situations. It is generally regarded that residential use is the possible future land use situation leading to the greatest exposure to contaminants remaining in subsoils. The Agency requires that exposure be estimated for this situation.	See response to comment 9(a) above.	Sec 5.0
j.	Page A-15/5.1.T: Default assumptions for worker exposures to soils include 25 years employment (rather than 10 years) and 50 mg/day rate of soil ingestion (rather than 100 mg/day). These values were presented in the USEPA March 25, 1991 Human Health Evaluation Manual, Supplemental Guidance memorandum.	Default assumptions that have been used in all exposure scenarios are values presented in the U.S. EPA March 25, 1991 Human Health Evaluation Manual, Supplemental Guidance memorandum.	Sec 5.1.1, 5.1.2, Tables 5-1 thru 5-3
k.	Page A-15/5.1.2: The reported worker skin contact area corresponds to the adult default value for hands and arms. This should be explained. The soil adherence value of 1.45 mg/cm^2 is the default value for soil with high humic content. The default adherence value for clayey soils of 2.77 mg/cm^2 would be more appropriate for this site according to the description of area geology in this report (Page A-4).	Because the industrial worker is expected to come into contact with soils via hands and arms, the adult default value of skin surface area for hands and arms has been used. The soil adherence value of 2.77 mg/cm^2, the default value for clayey soils, has been used.	Sec 5.1.2

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		RESPONSE	REFERENCE
	The use of a 10% dermal adsorption factor is unjustified. If chemical specific values cannot be located, a method for developing default values is available from T.E. McKone, 1989 (Risk Analysis 10:407-419.)	Chemical specific values for dermal absorption factors have been used.	(APPENDIX A) Sec 5.1.2
	The use of 2170 cm^2 as a trespasser skin contact surface area must be explained.	Because the trespasser is expected to come into contact with soils via hands and arms, the adult default value of skin surface area for hands and arms, 3,120 cm^2 has been used. Using the adult default value for skin surface area is a conservative approach for the trespassing youth, however no skin surface area values for an 11-17 year old are known to be established.	Sec 5.1.2
l.	Page A-16/5.2: The CDI equation for soil ingestion (non-carcinogenic) should include a factor for exposure period. In this case, the exposure duration of 250 days/year for 25 years should be averaged over the 25 year period (365 days x 25 years).	The CDI equation has been corrected to include a factor for exposure period.	Sec 5.2
m.	Page A-17/5.2: Comment 9.1 also applies to the equation for dermal absorption (non-carcinogenic).	The dermal absorption equation has been corrected to include a factor for exposure period.	Sec 5.2
n.	Page A-19/6.1.1: According to the American Cancer Society, 1 in 3 to 1 in 4 Americans can expect to contract cancer in their lifetimes. Revise or justify the 1 in 200 rate.	The rate for contracting cancer has been revised.	Sec 6.1.1
	Beginning in the next paragraph, exponential are presented in a non-standard and ambiguous manner. We believe this value should be corrected to 1.0E-03 or 10^{-3}. As written, it equals 1.0E-02 or 10^{-2}. This same error appears subsequent in numerous locations.	All exponential values have been corrected throughout the document.	
o.	Page A-20/6.1.2: A hazard index (HI) of less than <u>or equal to</u> 1.0 would indicate little likelihood of risk.	The statement has been revised.	Sec 6.1.2
p.	Page A-22/6.4: The first listed source of uncertainty does not acknowledge that the slope factor for benzene is based upon human data. Furthermore, the statement that slopes are developed for the most potent dose-response relationship is incorrect.	The first, second and fourth entries have been revised.	Sec 6.4

		RESPONSE	REFERENCE (APPENDIX A)
	The second entry should include the absence of data indicating potentiation of effects. The fourth entry incorrectly states that absorption is assumed to be 100 percent. Human absorption is assumed to be the same as the respective animal model. Dermal absorption should be more accurately stated to be assumed to be 10 percent of the oral absorption.		
q.	Page A-24/7.0: Include ethylene thiourea in the constituent list with a cleanup level of 0.05 mg/kg.	Ethylene thiourea has been included in the constituent list with a cleanup level of 0.05 mg/kg.	Sec 7.0
r.	Table 4-1: The route of exposure for ethylbenzene and toluene should be gavage. The uncertainty factor for toluene should be 1000.	Table 4-1 has been corrected and revised.	Table 4-1
s.	Table 4-2: The units for slope factor should be $(mg/kg/day)^{-1}$.	The slope factor unit has been corrected.	Table 4.2
t.	Table 5-1: The soil ingestion assumption should be 50 mg/day, exposure duration should be 25 years, and exposure frequency should be 250 days/year for the worker. For the trespasser, justify the body weight assumption of 52.4 and correct the averaging time for non-carcinogens to 2555 days (7 years).	The parameters in Table 5-1 have been corrected.	Table 5-1
u.	Table 5-2: Same as Comment 9.t. Correct the skin adherence factor to 2.77 mg/cm^2.	The parameters in Table 5-2 have been correct.	Table 5-2

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		RESPONSE	REFERENCE
v.	Table 6-1: Calculations were checked at random. Discrepancies were noted for the trespasser HI for DEHP and all trespasser cancer risk estimation. Recheck all calculations to assure accuracy.	All calculations have been rechecked.	Appendix A
10.	WORKING PLAN AND ANALYTICAL METHODS - Closure of hazardous waste management units must include sampling of soil to demonstrate clean closure or to determine the nature and extent of soil contamination. If possible, your sampling program should be extensive enough to determine the lateral and vertical extent of contamination to the level of the practical Quantitation Limit (PQL) identified in SW-846 (Third Edition) for the constituents of the Waste(s) managed. Samples must be collected between depth intervals of 6"-12" and 18"-24". Soil sampling should also be provided for container or tank storage areas which are founded on soil or gravel or on concrete pads which are not water tight or do not have curbs or other forms of secondary containment (51 FR 16426, May 2, 1986). Because the pumping station and dedicated pipe are part of the "tank system", soil samples should be taken underneath the station and pipe. All samples which are to be taken must be handled in accordance with 40 CFR, Part 261, Appendix III and the soil volatile sampling procedures which are included in the Agency's closure plan instructions as Attachment 7. The analytical methods which will be used must be specified and must be EPA-approved.	Soil sampling was expanded to include the area adjacent to the hazardous waste storage pad because of its possible past use for hazardous storage and its temporary use for hazardous drum storage during the reconstruction period. Soil sampling was also expanded to include the waste storage tank waste accumulation/pump station zone, but sampling beneath the piping is unnecessary, as explained in the section. The depth of sampling selected is explained in the section. EPA-approved analytical methods are already specified.	Secs. 1.6.11, 1.6.2.1, Fig. 6, Fig 7A, Secs. 1.6.2.1, 1.6.2.2

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	RESPONSE	REFERENCE
11. CERTIFICATION STATEMENT - All partial or final (full) closures of hazardous waste management units must be certified by both the owner/operator and independent registered professional engineer (725.215). The closure plan must include a statement acknowledging this requirement. Certification is due sixty (60) days after completion of the closure plan approval (unless otherwise approved). The Illinois Professional Engineering Act (111. Rev. Stat., Ch 111, par. 5101 et. seq.) requires that any person who practices professional engineering in the State of Illinois or implies that he (she) is a professional engineer must be registered under the Illinois Professional Engineering Act (par. 5101, Sec. 1). Therefore, any certification or engineering services which are performed for a closure plan in the State of Illinois must be done by an Illinois P.E. The closure plan must include a statement acknowledging this requirement. Plans and specifications, design, drawings, reports, and other documents rendered as professional engineering services, and revisions of the above must be sealed and signed by a professional engineer in accordance with par. 5119, sec 13.1 of the Illinois Professional Engineering Act. The independent engineer should be present during all major closure activities. These might include soil sampling, soil removal, backfilling, decontamination, final cover placement, etc. The frequency of inspections by the independent engineer must be sufficient to determine the adequacy of each critical activity.	A statement of certification by a Illinois-registered professional engineer has been added.	Sec. 11.2
Pursuant to 35 IAC 725.212(d)(4), you must submit a complete, revised closure plan (ie.e, not just revised or additional pages) (one original and 3 copies) within thirty (30) days which adequately responds to the above noted comments. Failure to submit a revised plan within thirty (30) days of the date of your receipt of this letter will be considered non-compliance with the interim standards of 35 IAC, Part 725, Subpart G--Closure and Post-closure and Subpart H--Financial Requirements.	One original and 3 copies of the complete, revised closure plan which responds adequately to all IEPA comments has been submitted within 30 days of the date of Morton's receipt of IEPA's letter.	

CLOSURE PLAN
MORTON INTERNATIONAL, INCORPORATED
INDUSTRIAL CHEMICALS AND ADDITIVES
CHICAGO PLANT

PREPARED FOR:

MORTON INTERNATIONAL, INCORPORATED
1645 SOUTH KILBOURN AVENUE
CHICAGO, ILLINOIS

PREPARED BY:

IT CORPORATION
333 PIERCE ROAD
ITASCA, ILLINOIS

PROJECT NO.: 312221
DECEMBER 1991 (REVISION 3)

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1.0 CLOSURE PLAN

The following Closure Plan is submitted in accordance with the requirements of 35 IAC 703.183(m), 724.212. The plan will be implemented by an outside contractor, under the supervision of a registered professional engineer. Prior to implementation of the closure plan, Morton International will notify the IEPA of the outside contractor that will implement the closure plan and the registered professional engineer, who will supervise the closure plan activities. This plan identifies all steps that will be necessary to perform final closure of the Hazardous Waste Management Units (HWMUs). No wastes will remain in the permitted HWMUs after performing the closure action, however these areas will be used as accumulation areas after performing the closure action. Morton International will maintain an on-site copy of the approved Closure Plan, and all revisions to the plan, until the certification of closure completeness has been submitted and accepted by the IEPA.

The projected date for closure of the HWMUs is 1992. Upon completion of closure, Morton International will submit to IEPA a certification by both the owner/operator, and by an independent Illinois registered professional engineer, that the HWMUs have been closed in accordance with the specifications in the approved closure plan.

1.1 DESCRIPTION OF FACILITY

The Chicago Plant of Morton International, Industrial Chemicals and Additives is located in western Chicago. The facility address is:

Morton International, Inc.
Industrial Chemicals and Additives
1645 S. Kilbourn Avenue
Chicago, IL 60623

The plant contact is:

James E. Opre
Plant Manager
(312) 521-7000

The plant is located in Cook County, T.39N.R.13E.Sec.22, and covers approximately 2 acres. Presently, there are approximately 20 people employed at this facility. Figure 1 shows the facility location.

The Morton International, Industrial Chemicals and Additives Group manufactures specialty chemicals. The facility produces industrial solid and liquid biocides which are used to retard bacterial and fungal growth in the textile and plastic industries. The facility's Standard Industrial Code is 2879. A plant layout is shown in Figure 2.

The primary raw materials used in formulating biocides and fungicides at the facility are: an organic arsenic compound (10-10-Oxybisphenoxarsine (OBPA)), copper-8 quinolinolate, nickel salts, silver nitrate, 2-Ethylhexylphthalate, Diisodecylphthalate, Benzyl butyl phthalate, 2-2'-methylenbis (4-chlorophenol), nonyl phenol, mineral spirits, methyl ethyl ketone (MEK), and various non-hazardous plasticizers, oils, waxes, gums, emulsifiers, surfactants, and plastic resins. Pentachlorophenol was once used as a raw material in the production of biocides used in wood treating. Two years prior to its use ban, pentachlorophenol was removed from use as a raw material at the facility.

Biocides produced to retard bacterial and fungal growth in the plastic industries are produced at the plant by heating virgin plasticisers in 500-gallon vessels ("kettles"), located in the cook room. The plasticizer is heated, after which an active ingredient, OBPA, is added. The OBPA dissolves in the plasticizer, producing a liquid biocide. Biocides produced to retard bacterial and fungal growth in the textile industries are produced by using Copper-8 quinolinolate as the active ingredient. The active ingredient and oil are placed in a kettle and heated. Another kettle is prepared containing water, solid thickeners and emulsifiers. The contents of the two kettles are combined and pumped through

homogenizers where an oil/water emulsion is produced.

The products manufactured by the plant are produced by formulating and blending the raw materials into the finished product concentrations. No real chemical reactions occur in the production process at the facility; the finished products contain only the pure raw materials in a mixed form. No new materials are produced due to the formulating and blending processes.

Solid products, sold to the plastic industries, are produced by adding OBPA and plastic, both of which are in powder form. The two ingredients are blended, extruded and pelletized.

Hazardous waste generated from formulation of the biocides and fungicides includes separated oil and filters from an oil/water separator, waste solvent from cleaning of equipment, product from hose drippings, spill clean up debris, off-specification products, empty containers from raw materials, obsolete plastic products from extrusion operation, and laboratory retention samples (lab packs). A listing of hazardous waste, stored in the hazardous waste container storage area and in the hazardous waste storage tank is contained in Tables 1 and 2, respectively.

The plant received an Interim Status Part A Permit to operate as a Treatment, Storage and Disposal (TSD) facility from the United States Environmental Protection Agency (EPA) Region V on March 12, 1982. Revisions to the Part A permit were submitted on July 12, 1985 and May 1, 1990. Appendix B contains a copy of the original Part A permit and subsequent submittals. In November, 1988 a Part B Permit Application was originally submitted to the Illinois Environmental Protection Agency (IEPA). In April, 1990, and in September, 1990, Morton International submitted a response to Notice of Deficiencies to the IEPA. The operations reported in the Part A and Part B applications were the accumulation, for periods greater than 90 days prior to off-site disposal, of hazardous waste generated by the facility. The hazardous wastes are stored in drums on a storage pad and in an aboveground bulk storage tank. These are the only two HWMUs at the facility. These operations are now limited to storage for periods less than 90 days. Therefore, the

units described in the Part B application will be closed in accordance with this closure plan, and a Part B permit will not be required for the operations at this facility.

1.1.1 Description of Past Site Assessment and Soil Removal Actions

In February, 1991, a site assessment was performed at the Morton-Chicago plant which included the installation of soil borings and the collection and analysis of soil samples from the borings. A table summarizing the soil sample results is contained in Appendix F. Figure 3 shows boring locations conducted during the site assessment. The results of the assessment identified the following groups of chemicals at the plant:

Arsenic
Petroleum Constituents - benzene, ethylbenzene, toluene, and xylene
Carbon Disulfide
Acetone
Chlorinated Hydrocarbons - 1,2-dichlorethane, chloroform, and trichloroethene
Polynuclear Aromatics
Dibenzofuran
Phthalates

Of the above listed chemicals, arsenic and phthalates are constituents in the raw materials used at the facility. The petroleum constituents can be attributed to the petroleum based solvent used at the facility. The presence of petroleum, arsenic and phthalates in soils at the facility are potentially due to de minimis spills and leaks from handling of raw materials throughout the life of the facility. Carbon disulfide and polynuclear aromatics (PNAs) are background levels in the area. The background levels in area soils for carbon disulfide and PNAs can be attributed to a cinder layer of debris from the Chicago fire and from boiler ash. The chlorinated hydrocarbons, dibenzofuran and acetone are not attributed to any of the activities at the plant, however, may have been historically used or stored on the facility property by past property owners.

Two of the phthalates (bis(2-ethylhexyl)phthalate and di-n-butyl phthalate), constituents of

raw materials, that were found at the site were subject to the land ban disposal regulation, effective June 8, 1991. Di-n-butyl phthalate was not detected above its land disposal concentration of 28.0 mg/kg. The presence of these two phthalates in facility soils are potentially due to de minimis spills and leaks from handling of raw materials throughout the life of the facility. Bis(2-ethylhexyl)phthalate was detected in three areas above its land disposal concentration of 28.0 mg/kg.

Based on the results of the site assessment, Morton International elected to remove the phthalate contaminated soil in May, 1991. The first area excavated was directly south of the hazardous waste drum storage pad (See Figure 4). The soil was removed from between the pad and the aboveground storage tanks (ASTs), south of the pad. The eastern edge of the excavation was the railroad spur, which runs along the eastern side of the property. The western edge of the excavation was near the west dike of the ASTs. The excavation of this area was completed to a depth of approximately 12 feet. The sidewalls of the excavation were sloped at approximately 1:2.

The second area to be excavated was the soil between the hazardous waste storage tank and Building E. This area was excavated from east to west with a depth of approximately 8 feet, and a slope of 1:1. Soil containing phthalates around the phthalate ASTs was excavated at a depth of 14 feet. The sidewall slopes in this area varied between 1:1 and 1:2, depending on the loads of the surrounding structures. The soil existing between the ASTs and Building I was excavated to a depth of approximately eight feet, with sidewall slopes of 1:1. The eastern edge of the excavation was the corner of Building G. Post excavation samples were collected in the three areas of the excavation and are summarized in Table F-2 contained in Appendix F.

A total of 2100 cubic yards of soil was removed during the May, 1991 soil removal project, and was transported to Adams Landfill, a permitted TSD facility in Ft. Wayne, Indiana. The excavation area was backfilled with a stiff, gray and tan, highly plastic clay and was covered with a geotextile and crushed stone to prepare it for paving. Appendix F contains Table F-3 which summarizes analytical data from two samples collected of the backfill material.

1.1.2 Description of Area Geology and Groundwater Use

The geology of northeastern Illinois is characterized by a relatively thick sequence of

unconsolidated glacial deposits unconformably overlying sedimentary bedrock (Niagaran dolomite). The glacial material which is present in the area consists of ground and end moraine till deposited during the Wisconsonian Stage, Woodfordian Substage of Pleistocene glaciation. The till is heterogenous and ranges from clay and silt to sand and gravel. Underlying the till are Silurian to Cambrian aged dolomites, shales, and sandstones. Precambrian igneous rocks underlie this thick sedimentary sequence.

In northeastern Illinois, there are four main aquifer systems utilized for industrial, residential and municipal water sources. These aquifer systems are:

- the sand and gravel deposits of the glacial drift,
- the shallow dolomite formations mainly of Silurian age,
- the Cambrian-Ordovician aquifer of which the Ironton-Galesville and Glenwood-St. Peter Sandstones are the most productive formations,
- the Mt. Simon aquifer consisting of the Mt. Simon and lower Eau Claire sandstone formations.

The glacial drift and shallow dolomite aquifer are generally connected hydrologically. These two aquifers are, over most of the region, separated from the Cambrian-Ordovician aquifer by the relatively impermeable Maquoketa Shale Formation of Silurian Age.

Soil borings installed during the site assessment in February 1991 indicate clay present in surficial, shallow soils throughout the facility. Clay is first encountered between approximately 0.5 feet and four feet below land surface. This clay layer extends to 12 feet, which is the bottom of the soil borings.

Well log data, in the vicinity of the site, dating back to 1897, indicate that the Cambrian-Ordovician aquifer was the aquifer most used as a groundwater source. The well logs indicate that wells were installed for industrial use, such as non-contact cooling water, and for lawn sprinkling of cemeteries. According to the Illinois State Water Survey, no wells exist within a one mile radius of the Morton-Chicago facility. The potable water source for

the City of Chicago and many neighboring suburbs is Lake Michigan, and has been since 1843.

1.1.3 Description of Nearby Surface Waters

The nearest surface water to the Morton-Chicago facility is the Chicago Sanitary and Ship Canal, located approximately two miles south of the facility. The Chicago Sanitary and Ship Canal was built in 1900 by the City of Chicago to divert flow of the Chicago River, located north of the site, away from Lake Michigan. The Chicago Sanitary and Ship Canal is the south branch of the Chicago River and flows into the Illinois River which eventually meets the Mississippi River near Alton, Illinois. Numerous industries exist along the Chicago Sanitary and Ship Canal.

1.2 DESCRIPTION OF HAZARDOUS WASTE MANAGEMENT UNITS (HWMUS)

1.2.1 Hazardous Waste Container Storage Area

Wastes stored in the hazardous waste container storage area include spent filter media (D011, U028, U116, and U159), such as filters from air pollution control equipment and cartridge filters from filtering of liquid raw materials; spill debris material (D011, U028, U116, and U159), such as rags and oil-dri; plastic resin/OBPA blend which includes off-specification product and dust collector cleanout material; tywood sludge (U028), from annual cleaning of pollution control ducts in the cook room; and sludge and solid lab pack waste (D011, U028, U116, and U159). A listing of wastes contained in the hazardous waste container storage area is presented in Table 1.

The hazardous waste container storage area was reconstructed in April, 1989 and placed into service in July 1989. The area was reconstructed to ensure that the storage area design and operation would conform with the requirements of 35 IAC 703.201. The original container storage area (S01, 20,000) was a combination hazardous and non-hazardous container storage pad, located in the northeast corner of the property. The original area used for hazardous drum storage covered approximately 1850 square feet (or 63 feet by 29.4 feet), according to the original 1988 Part B Permit Application. It was designed to contain 20,000 gallons of containerized waste or approximately 360 55-gallon drums. This area

entirely overlaps the new contained concrete storage pad. The non-hazardous drum storage area's dimensions were approximately 63 feet by 40.6 feet (2560 square feet), located directly adjacent to and west of the hazardous storage pad. The original pad area is shown in Figure 2B and Figure 6. The entire storage pad area encompasses the areas shown as the non-hazardous and hazardous drum pads, including the open space in the "L" configuration.

The original drum storage pad (both areas) was used from about the late 1960's until 1989. No known or recorded spills have occurred, except those listed in Appendix E Summary Sheet B, (SWMU G). The entire non-hazardous pad both north and south of the old catch basin was replaced with a new concrete surface in 1984, following an underground storage tank removal in the vicinity. The surface of the hazardous storage area was a collection of various concrete surfaces with some cracks.

Hazardous waste was stored within marked lines in the same area that the new hazardous waste storage pad occupies. Drums were always stored on pallets, arranged in rows with a 30-inch aisle space, and stacked no more than two high, as is the current practice. All liquids were stored in sealed DOT-specification drums or 85-gallon overpack drums, as necessary.

The entire original drum storage pad area drained to a central catch basin which is connected to the plant sewer via a locked valve. The central catch basin not only provided collection of liquid waste spillage but collection of surface water runoff from the entire pad area. The locked valve permitted inspection of the water prior to manual release of the waste waters to the Chicago Metropolitan Water Reclamation District. This is the same practice utilized for the new hazardous concrete storage pad, but with its own dedicated sump. The flow pattern of spilled waste on the original concrete storage pad is depicted in Figure 2B. The old drum storage areas were not curbed, however, the minimum height differential between the outer edges of all concrete surfaces towards the catch basin was six to eight inches. Most hazardous waste stored in the designated hazardous section was solid, with exception of pentachlorophenol which was overpacked in 85-gallon drums. Therefore,

it is highly improbable that liquid hazardous waste would have ever been released outside the original drum storage area. The area has also never been filled with liquid to a capacity that might have caused runoff outside the edges of the sloped containment area.

Refer to Appendix D-12 of the 1990 RCRA Part B Permit application for a complete description and documentation of certification for decommissioning of the container storage pad. During reconstruction of the container storage pad the following tasks were performed:

1. Off-site disposal of as much waste as possible, to a permitted TSD facility. Wastes that were not able to be disposed of at the time were temporarily relocated, and consisted of pentachlorophenol raw material, wastes, and debris. Details about the temporary storage area are outlined below. These wastes were subsequently shipped off-site for disposal. A report was submitted to the U.S. EPA and the IEPA on August 2, 1990, documenting all activities associated with disposal of the pentachlorophenol wastes. A copy of the transmittal letters accompanying the report to the regulatory agencies is enclosed in Appendix G.

2. Power-washing and decontamination of the concrete pad surface. Rinsewaters were analyzed to ensure removal of "clean" debris and were properly disposed.

3. Removal of the existing concrete storage pad in the hazardous waste storage area.

4. Construction of the new concrete storage pad in the hazardous waste storage area.

5. Any material which exhibited the characteristic of the waste stored on the pad was managed and disposed as hazardous waste.

During the hazardous drum storage pad reconstruction, the pentachlorophenol and other wastes were cleared off the pad and temporarily stored in the non-hazardous container storage area, adjacent to the hazardous waste storage pad. Drums were stored here between December 1988 and July 1, 1989, when the new pad was placed into service. During this temporary storage period, all RCRA hazardous waste handling procedures were adhered to including aisle space, storage on pallets, and weekly inspection.

The following drummed wastes were moved to the non-hazardous area for the reconstruction.

Waste	# of 55-Gal Drums
Pentachlorophenol Wastes	45 (all in overpacks)
Plastic Resin/OBPA Mix	33
Spent Filter Media	9
Oil, Waste and Absorbents	25
Tywood sludge	9

In addition, there were 37 non-hazardous drums stored on the non-hazardous pad.

The new drum pad is "L" shaped and measures 64 x 38 feet on its longest sides. The foundation of the pad is placed on a well-compacted, six (6) inch thick base of crushed stone which overlays a firm natural clay soil. The pad is constructed of 3,000 PSI steel reinforced concrete. The new drum pad secondary containment structure was poured next to existing concrete areas. Two types of joint sealant were used. All seams inside of the secondary containment system were sealed with a corrosion resistant polysulfide Pecora caulk.

The surface of the pad has a hand trowelled abrasion resistant finish. The pad is designed to withstand temperature ranges of -20° F to +120° F without distress. The pad has a four (4) inch curb and is ramped on one side to allow access by forklifts. The slab on which fork trucks operate has adequate steel reinforcement and thickness to distribute the concentrated wheel load to the subsoil.

The storage pad covers approximately 1755 square feet and has a maximum storage capacity of 13,200 gallons (approximately 240 55-gallon (DOT 17H) drums). The drums are stored on pallets and stacked a maximum of two high. The pad specifications are contained in Appendix C.

The drainage features of the hazardous waste storage pad are shown on Figure 6. The new pad has a collection sump along its east edge on the south side. Its dimensions are 36 feet by 2 feet by 15 inches deep. Spilled waste and runoff flows in the direction of slope (shown on Figure 6) east towards the sump. The sump drain leads to a locked valve prior to discharging to the plant sewer. The non-hazardous container storage pad continues to drain west to the existing catch basin. This is the same catch basin used as common drainage for both non-hazardous and hazardous areas prior to reconstruction of the hazardous storage pad. The sloped forklift ramp of the new storage pad now prevents any drainage of spilled hazardous waste or runoff from entering the non-hazardous catch basin on its western edge.

1.2.2 Hazardous Waste Storage Tank

In order to meet the standards specified in 35 Illinois Administrative Code Section 724/725 Subpart J, the hazardous waste storage tank and secondary containment system described in the original Part B Permit Application Submittal dated November 4, 1988 have been taken out of service and replaced with a new tank system. The replacement tank and secondary containment system were designed, installed and operated in complete conformance with the above cited standards. A complete description of the existing tank and secondary containment system is provided below.

During interim status operations of the previous tank system, no waste was spilled or leaked from either the tank or its ancillary equipment, and the integrity of the concrete pad remained intact. Refer to Appendix D-12 of the 1990 RCRA Part B Permit Application for a complete description and documentation of certification for decommissioning of the waste solvent tank. During replacement of the tank system, the following tasks were performed:

1. All waste was removed from the tank for disposal off-site.

2. Sludge remaining in the tank was removed for proper disposal off-site.

3. Steam and detergent pressure-washing and decontamination of the tank interior; condensate and residues from this operation were collected for disposal off-site. Samples of final rinsewaters were analyzed to ascertain "clean" closure. Rinsewaters were properly disposed.

4. The clean tank was removed from its footings and cut up for scrap. Transfer lines were also cleaned, removed, and disposed.

5. The secondary containment structure was removed and disposed off-site.

6. Soil directly beneath the tank was analyzed and completely removed (and properly disposed) down to a level of three feet.

The existing hazardous waste storage tank and secondary containment structure were installed at the Chicago facility in April, 1989. Since the tank was installed after July 14, 1986 it is considered a new tank system and must meet the requirements of 35 IAC 703.202(a). The old hazardous waste solvent tank (S02, 8000, TK-1) was an 8,000 gallon horizontal steel rail tank car on above-ground concrete saddles located in the same location as the new tank. This tank was contained in a diked area along with 5 other similar raw material tanks. A monolithic concrete floor formed the bottom of the secondary containment and a masonry-block wall formed the dike walls. This dike served as the secondary containment for the 5 raw material tanks and the waste solvent tank. The dike drained to a central location to a locked sewer valve which led to an area drain catch basin for discharge to the plant sewer. No waste releases were recorded. Piping for the old waste solvent tank passed over the warehouse roof, following the same path as the new pipe passes. Leaks from the pipe would have been immediately apparent and the roof was inspected regularly. The new tank's replacement piping was relocated to transgress the

interior of the warehouse for easier regular visual inspection.

The waste solvent tank was used from approximately the late 1960's until December 1988 when the waste tank was emptied of waste solvent and disposed at a licensed facility. On December 20, 1988 the tank was cleaned. (Also refer to Appendix D-12 of the September 1990 RCRA Part B Application). On July 2, 1989 the tank was removed, along with the adjacent tank TK-2, and the floor and walls demolished under these two vessels' former positions. The new tank was placed into service on July 1, 1989. During this time waste solvent drums were accumulated at the waste solvent accumulation area located by the Cookroom Canopy (See Figure 2B). Approximately 6 to 8 drums were accumulated. Drums were normally pumped into the waste tank (old vessel) via a pumping station at the existing new accumulation area next to the canopy. It should be noted that all remaining tanks and all soil beneath the tanks in the diked area, were removed as part of the May, 1991 soil removal project (by IT).

The location of the new tank and its associated containment structure is shown in Figure 2.

Waste stored in the current hazardous waste storage tank mainly consists of spent cleaning solvent from tank cleaning but also includes scrubber oil from the tywood air pollution control system, hose drippings, off-spec raw material and product, and pumpable lab pack wastes (D001, U028, and U159); waste plasticizer from hose drippings (U028); and waste Vinyzene product also from hose drippings. A listing of wastes stored in the hazardous waste storage tank are presented in Table 2.

The replacement tank is a horizontal, aboveground stainless steel vessel that is 22 years old. Prior to being installed at the Chicago facility in April, 1989, the tank was used at Morton International's Week's Island facility for storage of hydrazine hydrate, a noncorrosive material. Although constructed as a pressure vessel, the tank is presently operated at atmospheric pressure. The tank's specifications contained in Appendix C are as follows:

A)	Length:	21 Feet
B)	Diameter:	9 feet
C)	Capacity:	10,000 gallons
D)	Shell Thickness:	5/16" nominal
E)	Seams:	Fabricated for pressure vessel
F)	Maximum height of liquid level will be 95% of tank total capacity.	
G)	Safety Features:	flame arresters, emergency pressure relief valves.

The new tank is located within an impervious rubberlined concrete secondary containment structure, which was placed when the tank was installed, and the entire unit is adjacent to the Building G processing area (See Figures 2 and 3). The dimensions of the waste storage tank's secondary containment is approximately 29 feet by 14 feet by 5 feet deep with a capacity of about 12,380 gallons. The tank is located in a containment dike of sufficient capacity to contain the entire tank contents plus a 25-year, 24-hour rainfall. The waste storage tank concrete sump is similar to the hazardous waste storage pad sump, in that it has a locked valve located in the northwest corner of the new tank dike. Rain-fall or potential releases from the storage tank collect in the sub-elevated section (sump) at the lowest northwest corner within the secondary containment area. The "sump" area, containing the locked valve, is about 1.5 feet square (Figure 7).

Drums containing wastes to be pumped into the waste tank system are stored throughout the facility in designated satellite accumulation areas prior to being transported to the waste tank pumping station (See Figure 5). The waste is then pumped to the tank through a dedicated line from the steel canopied area adjacent to the cook rooms. Appendix C contains a figure showing the layout of the tank and containment dike. Each drum is labelled with a Hazardous Material Information System (HMIS) label. This label lists the name of the material contained in the drum and rating code numbers indicating Fire, Health, and Reactivity information.

1.2.3 Units Being Closed

The two HWMUs being closed are the hazardous waste container storage area and the

hazardous waste storage tank. Descriptions of the hazardous waste container storage area and hazardous waste storage tank are in the previous sections, 1.2.1 and 1.2.2, respectively. Once approval of closure for both units is received by the IEPA, the facility will withdraw its Part A permit, and will generate approximately 1300 kg of waste per month. Table 3 presents the estimates of hazardous wastes generation at the facility. The closed units will be reactivated for utilization as accumulation areas for wastes, which will be stored less than 90 days. No permitted units will remain open after an IEPA approved closure plan is implemented by Morton International and approved by the IEPA.

1.2.4 Units Remaining Open

Only two HWMUs exist at the facility, the hazardous waste container storage area and the hazardous waste storage tank, both of which are being closed. No permitted HWMUs will remain open, after approval of closure is granted by the IEPA.

1.3 CLOSURE PERFORMANCE STANDARD

This closure plan is designed to ensure that the facility will not require further maintenance and controls after closure, and that threats to human health and the environment will be eliminated. The closure plan is designed to prevent the escape of hazardous waste, hazardous waste constituents, leachate, contaminated rainfall, or waste decomposition products to the ground and surface waters. Samples will be taken and analyzed for all contaminants stored in the two HWMUs to determine if contamination is present in the soil and, if necessary, the groundwater. The following sections discuss in detail the efforts that will be made by Morton International, Inc. to satisfy the closure performance standard.

1.4 PARTIAL CLOSURE

Morton International does not plan on performing partial closure of either the hazardous

waste container storage or hazardous waste storage tank. The plan calls for the units to undergo final closure according to the specifications provided in the following closure plan. If after the closure action commences it is determined that a clean closure of a unit is infeasible or impractical, a revised closure plan and a Post-Closure Care Plan will be

submitted for closure of the entire unit in place and Post-Closure Care will be implemented.

1.5 MAXIMUM WASTE INVENTORY

The maximum inventory of hazardous waste in the hazardous waste container storage area is 240-55 gallon drums of waste, profiled in Table 1. The maximum inventory in the hazardous waste storage tank is 10,000 gallons of waste, profiled in Table 2. It is anticipated that at closure, each unit will contain less than their maximum waste inventory. However, this Closure Plan has been prepared based on the units containing their maximum waste inventory at the time of closure.

The facility also generated D004 waste which was stored on the pad and in the tank. Since September, 1990 the D004 waste generated by the facility is no longer a characteristic hazardous waste. At that time, the new Toxicity Characteristic Leaching Procedure (TCLP) testing method was required. With this new method, the waste generated is no longer a characteristic hazardous waste.

1.6 INVENTORY REMOVAL, DISPOSAL OR DECONTAMINATION OF EQUIPMENT, STRUCTURES AND SOILS

At the time of closure, the two HWMUs will be decontaminated. The remaining waste residues will be transported off-site to a permitted TSD facility.

General Inventory Removal

The containers stored in the hazardous waste container storage area will be shipped off-site to a permitted TSD facility for disposal. The present waste inventory is listed in Table 1. It is projected that at the time of closure, there will be 240 or less, 55 gallon drums of the present waste inventory which will require removal.

The waste, listed in Table 2, contained in the hazardous waste storage tank will be transported off-site via tanker truck to a permitted TSD facility for treatment or disposal. The tank is projected to contain 10,000 gallons or less of waste which will require removal.

General Decontamination of Equipment, Structures and Soils

All equipment and structures associated with the container storage area and the tank system which have come in contact with hazardous waste will be considered hazardous and will be decontaminated or disposed of at a permitted TSD facility when closure of each unit is completed. The hazardous waste residues and contaminated containment system components, equipment, or soils will be decontaminated using all reasonable means to satisfy the closure performance standards for chemicals of concern outlined in this closure plan. All equipment, structures, and decontamination residue that will require disposal will be managed as hazardous waste and will be containerized in 55-gallon drums or roll off boxes and shipped to a permitted TSD facility. Prior to disposal of any hazardous or non-hazardous special wastes, any appropriate and required permits (e.g., Illinois Waste Stream Permit) will be obtained. Provisions of land disposal restrictions will also be adhered to, in that Morton will demonstrate that any hazardous or decontamination wastes cannot be reasonably recycled prior to land disposal.

Tables 4 and 5 list the equipment and structures associated with the container storage area and the tank system requiring decontamination or disposal along with the anticipated method for accomplishing the required decontamination or disposal. Steam cleaning of the equipment will be performed in a lined and bermed area with all water collected and transferred to 55 gallon drums or a tanker truck for analysis. A water sample from the final steam cleaning water will be collected and analyzed to verify decontamination of equipment. It is estimated that 1000 gallons of wastewater will be generated during decontamination of each unit. Wastewater and/or waste material generated from decontamination may be managed by storing it in an available temporary storage tank. Morton and a registered professional engineer will certify that the tank and its appurtenances are in good working condition and that the decontamination wastes which will be stored in the tank are compatible with those which were stored previously. Tanks used for temporary storage (not to exceed ninety days) following closure will be drained and inspected. Decontamination will be deemed complete, using all reasonable means, when the level of the following constituents found in the final steam cleaning water is less than the EPA-approved method detection limit:

Acetone
Arsenic
Benzene
Bis(2-ethylhexyl)phthalate
2-Butanone (Methyl Ethyl Ketone)
Butylbenzylphthalate
Chloroform
Di-n-butylphthalate
Ethylbenzene
Ethylene Thiourea
Methylene Chloride
Pentachlorophenol
Silver
Toluene
Trichloroethene
Total Xylenes

All equipment used in decontamination will also be decontaminated, and contaminated wash water generated during decontamination will be managed as a hazardous waste. The water (estimated at 1000 gallons, for each HWMU closed) generated during steam cleaning of equipment associated with each unit will be collected. A water sample will be taken and analyzed for parameters required for approval of off-site disposal or treatment at a permitted TSD facility.

Soil sampling and analysis will be conducted in the area adjacent to each of the units to determine if soil contamination has occurred. The samples will be analyzed for all contaminants that are known to be stored or have a history of being stored in each of the two HWMUs. The locations at which the samples will be collected and parameters for which the samples will be analyzed are discussed in Sections 1.6.1 and 1.6.2.

If contaminated soils are present at either unit based on the sampling results, the soil will be hauled off site for treatment or disposal at a permitted TSD facility. The closure plan outlines proposed handling of contaminated soil in the event this is required, which is discussed in Section 1.6.1 and 1.6.2.

The equipment required to perform closure of the Hazardous Container Storage Area and Hazardous Waste Storage Tank along with the ownership of each piece of equipment is shown on Tables 6 and 7. It is anticipated that outside contractors will supply all equipment necessary to perform closure, including personal protective equipment for the personnel involved in the closure operation.

1.6.1 Closure of Containers

The hazardous waste container storage area closure will involve the transportation of a maximum of 240, 55-gallons drums to permitted TSD facility for disposal; decontamination of the liner, base and secondary containment equipment; soil sampling and analysis; and if needed, excavation and disposal of soils, decontamination residue, and concrete debris. The storage area liner and base will be decontaminated by washing with an industrial floor scrubber, and/or by steam cleaning. The wash water will be collected and analyzed to confirm decontamination. If the wash water analysis results indicate that decontamination has not been confirmed, further decontamination, as described above will be conducted, along with wash water analysis.

1.6.1.1 Sampling Plan

A total of forty (40) soil samples will be obtained from soils below and around the storage pad. Six (6) soil samples will be obtained from beneath the pad by coring through the concrete, and fourteen (14) soil samples will be obtained at the perimeter of the existing and previous pad area. This will include the areas utilized in the past, which are:

- The hazardous waste container storage area prior to reconstruction of the pad in 1989 (totally overlaps existing hazardous waste pad).

- The temporary container storage area used during the reconstruction of the existing pad.

There will be no background samples taken, since the industrial nature of the surrounding area would prohibit establishing a consistent base level of constituents in the soil.

The concrete storage pad is L-shaped, with outside dimensions of 63 feet by 33.5 feet. The sampling area and the locations of the soil samples are indicated in Figure 6. The sample locations are determined by establishing grid intervals with the following equation:

$$GI = (A/\pi)^{1/2}/2$$

A = Area to be Sampled (feet^2)

GI = Grid Interval (feet)

The entire area to be sampled can be divided into two rectangular areas of 63 feet by 33.5 feet (general area of previous and existing hazardous waste storage) and 63 feet by 36.5 feet (general area of non-hazardous drum pad used for temporary hazardous storage) for calculating total area as follows:

$$A = A1 + A2 = L1 \times W1 + L2 \times W2$$

$$A = (63' \times 33.5') + (63' \times 36.5')$$

$$A = 4{,}410 \text{ ft}^2$$

Therefore,

$$GI = (A/\pi)^{1/2}/2$$

$$GI = (4{,}410 \text{ ft}^2/\pi)^{1/2}/2$$

$$GI = 18.73 \text{ ft} \approx 18 \text{ ft } 9 \text{ in}$$

The interval between soil samples is 18 feet 9 inches.

Forty (40) soil samples will be obtained from the twenty (20) sampling locations indicated in Figure 6. All samples will be discrete grab samples. Samples from beneath the pad and at the perimeter of the pad will be taken at a depth interval between 6 inches and 18 inches and at a depth interval between 30 and 42 inches. The reason for a 12-inch increment in the first two feet of sampling is the required sample volume for the various analyses conducted on each discrete sample. The depth interval of 30 to 42 inches is believed to be the deepest distance where contamination is expected to be encountered. If sample results from this depth indicate contamination, samples at a deeper depth will be collected. The

deeper depth will be established upon review of the sample results.

Samples collected for VOCs (e.g. Ethylene Thiourea), will be the first samples to be collected, and the following procedure will be followed:

A. The sampler will be prepared and decontaminated according to the following:

1. Wash tubing or sampler with hot water and a nonfoaming detergent.
2. Rinse with hot water.
3. Rinse with a solvent, such as hexane or acetone.
4. Rinse with very hot water to drive off solvent.
5. Rinse with deionized distilled water.
6. Air dry.
7. Store the sampler in aluminum foil until ready for use.

The above decontamination procedure will be used for all sampling equipment used to collect samples for the remaining analyses.

B. The sample collection will be as follows:

1. Using a properly decontaminated sampler (refer to preparation and decontamination instructions), push or drive the sampler to obtain a representative soil sample.
2. DO NOT remove sample from sample tube in the field. The laboratory should remove the sample from the sampling tube.
3. Immediately add clay or other cohesive material (i.e. wetted bentonite) to the ends of the sample to eliminate head space, if necessary.
4. Cover both ends of the sampler with aluminum foil. If possible, cover the aluminum foil with a cap.
5. Put the sample in storage at 4 degrees centigrade immediately.
6. Transport the samples to the laboratory as soon as possible. Most

laboratories require delivery within 24 hours of sampling.

After samples to be analyzed for VOCs are collected, samples for additional analyses will be collected. Compositing of soil samples will not be conducted. Samples for additional analyses obtained from a depth interval between 6 inches and 18 inches will be collected with a stainless steel trowel or stainless steel hand auger and transferred directly into the sample bottle. Soil samples for additional analyses obtained from a depth interval between 30 inches and 42 inches will be collected with a stainless steel hand auger and transferred to the sample bottles using a stainless steel trowel or spoon. All trowels, hand augers, and other sampling equipment will be decontaminated prior to collection of each sample and upon completion of the sampling activities according to the above described procedure. Water from decontaminating equipment will be collected and transferred to drums.

A rinsate sample will be obtained from the decontaminated sampling equipment and shipped to the laboratory with the samples for analysis.

The proper containers for sample collection will be used during sampling. All samples will be preserved and holding times observed as promulgated in 40 CFR 136.3, Table No. 2, Required Containers, Preservation Techniques, and Holding Times. All sampling methods and equipment will be in accordance with U.S. EPA SW-846, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods".

After each sample is collected, a Sample Collection Log, Chain of Custody record, Laboratory Request for Analysis form, and the sample label will be completed. A unique sample number will be assigned to each sample. Excluding the Sample Collection Log, all forms will accompany the sample to the laboratory.

During all closure activities, a field log will be maintained by the site supervisor. The date, time, personnel involved, activities, sampling events, and weather conditions will be recorded in the field log.

To maintain the integrity of the hazardous waste storage pad for continued use during the remainder of closure activities, a mixture of 90% Portland cement with 10% Bentonite powder will be used to backfill each soil boring taken within the concrete structure. Cuttings from the borings will be collected in a 55-gallon drum and properly disposed after analytical results are received.

1.6.1.2 Soil Analysis Plan

The soil samples will be analyzed for the parameters shown in Table 8. Table 10 lists the analytical methods and procedures which will be used for sample analysis.

The proposed levels for the constituents shown in Table 8 above which soil will be considered contaminated is as follows:

Acetone	1.33 mg/kg
Arsenic	1 mg/L TCLP extract
Bis(2-ethylhexyl)phthalate	13 mg/kg
2-Butanone (Methyl Ethyl Ketone)	0.037 mg/kg
Butylbenzylphthalate	5.7 mg/kg
Chloroform	0.109 mg/kg
Dibenzofuran	5.0 mg/kg
Di-n-butylphthalate	1.5 mg/kg
Ethylene Thiourea	0.05 mg/kg (Laboratory Detection Limit)
Methylene Chloride	0.804 mg/kg
Pentachlorophenol	1.6 mg/kg (Laboratory Detection Limit)
Silver	0.01 mg/L (Laboratory Detection Limit Based on TCLP extract)
Trichloroethene	0.005 mg/kg

The cleanup levels for Arsenic and Silver are based on IEPA draft cleanup criteria for metals in soils where local groundwater is not and will not be utilized as a drinking water supply. The proposed cleanup levels for the remaining constituents are based on site-

specific, health-based cleanup levels. Ethylene Thiourea is not included in the development of site-specific, health-based cleanup levels. The development of these site-specific, health-based cleanup levels is found in Appendix A.

1.6.1.3 Removal of Contaminated Soil

If the results of the soil sampling indicate that the soil contamination exists, the contaminated soil will be excavated for disposal to a permitted TSD facility. All the contaminated soil from the container storage area will be excavated with heavy equipment. As part of this soil removal, the overlaying concrete pad will be broken up and decontaminated to clean-closure standards contained in this plan or disposed off-site as hazardous waste. Excavation will extend to the limits of soil contamination determined from soil sampling. Soil sampling will then be conducted at the soil surface of each face of the excavation. Soil samples will be analyzed for the above listed constituents to verify removal of all contaminated soil. If required, based on the initial sampling results, additional soil will be excavated from the area until soil sampling and analysis verifies that all "contaminated" soil, as defined by Morton's site-specific clean-up levels has been removed. When all the contaminated soil has been removed the unit will be deemed clean closed. The excavated soil will then be replaced with a clean fill. All excavated contaminated soil will be loaded onto lined semi-trailers or rail cars and shipped off-site to a permitted TSD facility.

1.6.1.4 Decontamination of Equipment

All equipment will be decontaminated prior to completion of closure activities. Equipment involved in sampling activities will be decontaminated according to the following procedure:

1. Hot tap water and nonfoaming detergent wash.
2. Hot tap water rinse.
3. Solvent rinse, such as hexane or acetone.
4. Hot tap water rinse to drive off solvent.
5. Deionized distilled water rinse.
6. Air dry.

7. Store sampler in aluminum foil until ready for use.

Heavy machinery and construction equipment will be decontaminated by steam cleaning.

Water from the decontamination of equipment will be collected and transferred to drums or a tanker truck. A rinsate sample will be obtained from decontamination procedures and shipped to the laboratory for analysis. Also refer to the Section 1.6 introduction concerning general decontamination procedures.

1.6.1.5 Disposal of Cleaning Waste and Residue

All cleaning wastes and residues will be managed as hazardous waste and shipped off-site for treatment and/or disposal at a permitted TSD facility.

1.6.2 Closure of Tank System

Closure of the hazardous waste storage tank system will consist of disposal of 10,000 gallons of waste listed in Table 2, decontamination of the tank and associated piping, decontamination of the secondary containment system including the liner and base, soil sampling and analysis, and if necessary, disposal of contaminated soils, decontamination residue, and secondary containment debris. The hazardous waste remaining in the tank will be vacuum pumped into tanker trucks and transported off-site to the permitted facility for treatment and/or disposal. The tank, piping and associated equipment will be decontaminated by washing with an industrial detergent and/or by steam cleaning. The wash water will be collected in 55-gallon drums and/or a tanker truck. After collection, the water will be analyzed and then disposed of as a hazardous waste.

The storage tank secondary containment system will be decontaminated by washing with an industrial floor scrubber, compatible with the existing polysulfide liner, and/or by steam cleaning. The wash water will be collected in 55-gallon drums or a tanker truck as described in Section 1.6. A sample of the last wash water will be collected and analyzed to confirm decontamination as described in Section 1.6.

1.6.2.1 Sampling Plan

A total of eighty (80) soil samples will be obtained from the associated storage tank areas. Twenty (20) soil samples will be obtained from beneath the secondary containment structure by coring through the concrete, and 30 soil samples will be obtained from the perimeter of the secondary containment structure. Thirty (30) soil samples will be taken in the pumping station area in conjunction with the hazardous waste storage tank. The dedicated piping leading from the hazardous waste storage tank to the pumping station is all overhead, indoor piping that is visible through its entire length. Any past leakage would have been immediately evident and absorption into the soil prevented by the concrete floor of the warehouse that it runs through. Therefore, sampling beneath this pipe is considered unnecessary unless, at time of closure, visual evidence indicates that a leak from the pipe may have occurred. There will be no background samples taken, since the industrial nature of the surrounding area would prohibit establishing a consistent base level of constituents in the soil.

The concrete secondary containment unit is rectangular, with outside dimensions of 28 feet 8 inches by 14 feet 10 inches. The sampling area and the locations of the soil samples are indicated in Figure 7. The sample locations are determined by establishing grid intervals with the following equation:

$$GI = (A/\pi)^{1/2}/2$$

A = Area to be Sampled (feet^2)

GI = Grid Interval (feet)

The area to be sampled at the secondary containment structure is calculated below.

$$A = L \times W$$

$$A = 28.67 \text{ ft} \times 14.83 \text{ ft}$$

$$A = 425.22 \text{ ft}^2$$

Therefore,

$$GI = (A/\pi)^{1/2}/2$$
$$GI = (425.22\ ft^2/\pi)^{1/2}/2$$
$$GI = 5.82\ ft \approx 5\ ft\ 10\ in$$

The interval between soil samples is 5 feet 10 inches. This interval was modified in areas to collect samples within the containment structure and around the tank.

Fifty soil samples will be obtained from the 25 sampling locations indicated in Figure 7. All samples will be discrete grab samples due to the volatility of the compounds to be analyzed. Samples will be collected between a depth interval of 6 inches and 18 inches to characterize the fill material in the tank area. The reason for a 12-inch sampling increment is the required volume of soil for the various analyses. Samples will also be collected at a depth interval between 60 inches and 72 inches. This depth will characterize the natural soils surrounding the fill material in the tank area. Soils at this depth will be screened with a photoionization detector (PID) for volatile organic compounds (VOCs) prior to sample collection to determine if a deeper sampling depth is required.

The area to be sampled at the pumping station is calculated below.

$$A = L \times W$$
$$A = 15\ ft \times 8\ ft$$
$$A = 120\ ft^2$$

Therefore,

$$GI = (A/\pi)^{1/2}/2$$
$$GI = (120\ ft^2/\pi)^{1/2}/2$$
$$GI = 3.09\ ft \approx 3\ ft.\ 1\ in.$$

The interval between soil samples at the pumping station area is 3 feet 1 inch.

Thirty (30) soil samples will be obtained from the fifteen (15) sampling locations indicated in Figure 7A. Samples will be collected and screened between the same intervals as described above for the storage tank containment area.

Samples collected for VOCs (e.g. BETX), will be the first samples to be collected, and the following procedure will be followed:

A. The sampler will be prepared and decontaminated according to the following:

1. Wash tubing or sampler with hot water and a nonfoaming detergent.
2. Rinse with hot water.
3. Rinse with a solvent, such as hexane or acetone.
4. Rinse with very hot water to drive off solvent.
5. Rinse with deionized distilled water.
6. Air dry.
7. Store the sampler in aluminum foil until ready for use.

The above decontamination procedure will be used for all sampling equipment used to collect samples for the remaining analyses.

B. The sample collection will be as follows:

1. Using a properly decontaminated sampler (refer to preparation and decontamination instructions), push or drive the sampler to obtain a representative soil sample.
2. DO NOT remove sample from sample tube in the field. The laboratory should remove the sample from the sampling tube.
3. Immediately add clay or other cohesive material (i.e. wetted bentonite) to the ends of the sample to eliminate head space, if necessary.
4. Cover both ends of the sampler with aluminum foil. If possible, cover the aluminum foil with a cap.

5. Put the sample in storage at 4 degrees centigrade immediately.
6. Transport the samples to the laboratory as soon as possible. Most laboratories require delivery within 24 hours of sampling.

After samples to be analyzed for VOCs are collected, samples for additional analyses will be collected. Compositing of soil samples will not be conducted. Samples for additional analyses obtained from a depth interval between 6 inches and 18 inches will be collected with a stainless steel trowel or stainless steel hand auger and transferred directly into the sample bottle. Soil samples for additional analyses obtained from a depth interval between 60 inches and 72 inches will be collected with a stainless steel hand auger and transferred to the sample bottles using a stainless steel trowel or spoon. All trowels, hand augers, and other sampling equipment will be decontaminated prior to collection of each sample and upon completion of the sampling activities according to the above described procedure. Water from decontaminating equipment will be collected and transferred to drums.

Water from decontaminating equipment will be collected and transferred to drums.

A rinsate sample will be obtained from the decontaminated sampling equipment and shipped to the laboratory with the samples for analysis.

The proper containers for sample collection will be used during sampling. All samples will be preserved and holding times observed as promulgated in 40 CFR 136.3, Table No. 2, Required Containers, Preservation Techniques, and Holding Times. All sampling methods and equipment will be in accordance with U.S. EPA SW-846, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods".

After each sample is collected, a Sample Collection Log, Chain of Custody record, Laboratory Request for Analysis form, and the sample label will be completed. A unique sample number will be assigned to each sample. Excluding the Sample Collection Log, all forms will accompany the sample to the laboratory.

During all closure activities, a field log will be maintained by the site supervisor. The date, time, personnel involved, activities, sampling events, and weather conditions will be recorded in the field log.

To maintain the integrity of the waste storage tank secondary containment structure for continued use during the remainder of closure activities, a mixture of 90% Portland cement with 10% Bentonite powder will be used to backfill each soil boring taken within the concrete structure. Cuttings from the borings will be collected in a 55-gallon drum and properly disposed after analytical results are received.

1.6.2.2 Analysis Plan

The samples will be collected and placed in glass jars which will be sent directly to a independent IEPA approved laboratory. The soil samples will be analyzed according to EPA Method 8240 and will be analyzed for 2-Butanone, Benzene, Ethylbenzene, Toluene and total Xylenes (BETX). The soil samples will also be tested for Arsenic using a TCLP extraction procedure, and for phthalates using EPA Method 8270. Table 9 lists the rationale for these analyses. Table 11 lists the analytical methods and procedures which will be used for sample analyses.

The proposed levels for the constituents shown in Table 9 above which soil will be considered contaminated are as follows:

Acetone	1.33 mg/kg
Arsenic	1 mg/L TCLP extract
Benzene	0.57 mg/kg
Bis(2-ethylhexyl)phthalate	13 mg/kg
2-Butanone (Methyl Ethyl Ketone)	0.037 mg/kg
Butylbenzylphthalate	5.7 mg/kg
Chloroform	0.109 mg/kg
Dibenzofuran	5.0 mg/kg
Di-n-butylbenzylphthalate	1.5 mg/kg

Ethylbenzene	59.9 mg/kg
Ignitability	> 140° F closed cup
Methylene Chloride	0.804 mg/kg
Toluene	0.73 mg/kg
Total Xylenes	57.0 mg/kg
Trichloroethene	0.005 mg/kg

The cleanup level for Arsenic is the IEPA draft cleanup criteria for metals in soils where local groundwater is not and will not be utilized as a drinking water supply. The cleanup level for ignitability is the regulatory definition of ignitable hazardous waste (D001). The cleanup level for the BETX constituents, phthalates, and 2-Butanone are site-specific, health-based cleanup levels. The development of the site-specific health-based cleanup levels is found in Appendix A.

1.6.2.3 Removal of Contaminated Soil

If the results of the soil sampling indicate that soil contamination exists, the contaminated soil will be excavated for disposal and/or treatment to a permitted TSD facility. All the contaminated soil from the associated storage tank areas will be excavated with heavy equipment. As part of this soil removal, the secondary containment structure and underlying concrete base will be broken up and decontaminated to clean-closure standards contained in this plan or disposed off-site as hazardous waste. Excavation will extend to the limits of soil contamination determined from soil sampling. Soil sampling will then be conducted at the soil surface of each face of the excavation. Soil samples will be screened with a PID for VOCs prior to submittal to the laboratory for analysis. Soil samples sent to the laboratory will be analyzed for constituents listed in Table 9. If soil samples indicate contaminated soil remains, additional soil will be excavated from the area until soil sampling and analysis verifies that all "contaminated" soil, as defined by Morton's site-specific clean-up levels (Appendix A) has been removed. When all the contaminated soil has been removed the unit will be deemed clean closed. The excavated soil will then be replaced with a clean fill. All excavated contaminated soil will be loaded onto lined semi-trailers or rail cars and

shipped off-site to a permitted TSD facility.

1.6.2.4 Decontamination of Equipment

All equipment will be decontaminated prior to completion of closure activities. All equipment involved in sampling activities will be decontaminated according to the following procedure:

1. Hot tap water and nonfoaming detergent wash.
2. Hot tap water rinse.
3. Solvent rinse, such as hexane or acetone.
4. Hot tap water rinse to drive off solvent.
5. Deionized distilled water rinse.
6. Air dry.
7. Store sampler in aluminum foil until ready for use.

Heavy machinery and construction equipment will be decontaminated by steam cleaning.

Water from decontaminating equipment will be collected and transferred to drums and/or a tanker truck. A rinsate sample will be obtained from decontamination procedures and shipped to the laboratory for analysis. Also refer to the Section 1.6 introduction concerning general decontamination procedures.

1.6.2.5 Disposal of Cleaning Waste and Residue

All cleaning waste and residues will be managed as hazardous waste and transported off-site for disposal and/or treatment at a permitted TSD facility.

1.6.3 Closure of Surface Impoundments

No hazardous waste surface impoundments are located at the facility, therefore the closure requirements of 35 IAC 725.328 do not apply.

1.6.4 Closure of Waste Piles

No hazardous waste piles exist at the facility, therefore the closure requirements of 35 IAC 725.358 do not apply.

1.6.5 Closure of Land Treatment Facilities

No land treatment areas exist at the facility, therefore the closure requirements of 35 IAC 725.380(a) through 35 IAC 725.380(e) do not apply. Also refer to the Section 1.6 introduction.

1.6.6 Closure of Thermal Treatment Units

No thermal treatment units exist at the facility, therefore the closure requirements of 35 IAC 725.481 do not apply.

1.6.7 Closure of Chemical, Physical and Biological Treatment Units

No chemical, physical and biological treatment units exist at the facility, therefore the closure requirements of 35 IAC 725.504 do not apply.

1.7 CLOSURE OF DISPOSAL UNITS

There are and have been no hazardous waste disposal units at this facility, therefore the closure requirements of 35 IAC 725.410 do not apply.

1.8 SCHEDULE OF CLOSURE

The closure of the HWMUs is anticipated to occur in the year 1992. The proposed schedule for closure activities for the container storage area and tank system are shown on Tables 12 and 13, respectively. Final closure will be supervised and certified by an independent Illinois registered professional engineer.

Morton International will begin closure activities at each unit within 90 days after receiving the final volume of hazardous waste at each hazardous waste management unit. All hazardous waste in each unit will be transported off site for disposal and/or treatment at a permitted TSD facility within 90 days after receiving the final volume of hazardous waste

at that unit. Closure activities for a unit will be completed in accordance with the approved closure plan within 180 days after receiving the final volume of hazardous waste at the unit.

1.9 EXTENSIONS OF CLOSURE TIME

It is anticipated that Morton International will not require an extension for closure time. If it appears that closure activities will require more than the 180 days allowed, a petition, which provides appropriate justification, will be made to the Illinois EPA at least 30 days prior to the expiration of the original period allowed which requests an extension of closure time. The justification will include information on why the closure activity will require more than 180 days, or that there is a reasonable likelihood that persons other than the current owner will commence operation of the site, or that closure would be incompatible with continued operation. In addition, a demonstration will be made that all steps have and will be taken to prevent threats to human health and the environment from the non-closed units.

1.10 AIR EMISSIONS

There are three types of air emissions that may result from closure activities: airborne particulates (containing metals entrained in dust), volatilization of VOCs contained in soil and VOCs driven off by steam cleaning during decontamination of associated equipment. If remediation is required and the soil is dry during remediation activities, causing an appreciable amount of particulate emissions, the work area will be dampened with water from the plant water supply as a means of emission control. Dampening of the work area will be conducted such that leachate will not result. VOC concentrations in the air at the work area will be monitored using a PID as specified in Section 1.11. The analytical results for the soil samples will give an indication of the amount of VOC emissions to expect. Since the VOCs will be given off as fugitive emissions from soil excavation, a high emission rate is not expected. However, if VOC concentrations are high enough to threaten personnel safety or cause an odor problem in surrounding areas, work will be suspended until engineering controls that will prevent the threat to public health can be implemented. Concentrations at which action will be taken are specified in Section 1.11.

1.11 PERSONNEL SAFETY AND FIRE PREVENTION

Measures will be taken to protect the health of neighbors during closure activities and all personnel, including contractors and visitors, involved in closure activities or personnel potentially exposed to hazardous waste by closure activities.

Measures to protect the health of neighbors during closure activities consists of monitoring and controlling expected air emissions that are described in Section 1.10.

All work performed during closure will meet the applicable requirements of OSHA's Hazardous Waste Operations and Emergency Response Standard. Before work commences, a Health and Safety meeting will be held to review with site workers the possible hazards, personal protective equipment to be worn, and procedures for an emergency. A Health and Safety Plan will be created for closure activities, and will be used as a guide to safe operation during closure activities. A copy of the Health and Safety Plan will be kept on-site during closure activities. All site workers engaged in activities that expose or potentially expose them to hazardous substances will have received a minimum of 40 hours of OSHA health and safety training, plus a minimum of three days of field experience under the direct supervision of a trained supervisor, before engaging in any closure activity that could potentially expose them to hazardous substances. Managers and supervisors at the cleanup site will have received at least an additional eight hours of specialized training on managing hazardous waste operations.

Measures to monitor the breathing space of the cleanup site personnel will consist of a PID that measures organic vapors. Air monitoring will be conducted by designated personnel on an hourly basis. Permissible Exposure Limits (PELs) for the VOCs potentially emitted during closure activities will be listed in the Health and Safety Plan.

If PID readings in the work breathing zone indicate VOC readings exceeding PELs listed in the Health & Safety Plan, respiratory equipment will be used by all personnel working in the breathing zone. If PID readings outside the breathing zone, near property boundaries indicate VOC readings of 10 ppm or greater, work will suspended until engineering controls

that will protect public health can be implemented.

All personnel potentially in contact with hazardous waste will wear appropriate protective clothing. Decontamination of personnel will occur if contact with hazardous waste is made.

The facility fire prevention program will be adhered to at all times during closure activities by all personnel involved.

2.0 POST CLOSURE PLAN

No hazardous waste disposal units exist nor have existed on this site and the container storage pad and the tank system comply with the secondary containment requirements of 35 IAC 724. Therefore, the requirements of this section do not apply to this facility.

3.0 NOTICE IN DEED AND CERTIFICATION

No hazardous waste disposal units exist nor have existed on this site. Therefore, the requirements of 35 IAC Sections 725.216, 725.219 and 725.220 as amended March 24, 1987 do not apply to this facility.

4.0 CLOSURE COST ESTIMATE

The current closure cost estimate for the Hazardous Waste Container Storage area and the Hazardous Waste Storage Tank are shown in Tables 14 and 15, respectively. Closure costs are presented by activity.

The closure cost estimate will be adjusted to accommodate for inflation within 30 days after each anniversary of the date on which the first closure cost estimate was prepared. The adjustment will be made using an inflation factor derived from the annual Implicit Price Deflator for the Gross National Product. It is estimated that $531,649.00 will be required to close both units at 1991 dollar values.

Morton International will keep the latest closure cost estimate, and when adjusted, the latest adjusted closure cost estimate at the facility during the operating life of the facility.

5.0 FINANCIAL ASSURANCE MECHANISM FOR CLOSURE

5.1 CLOSURE TRUST FUND

Morton International has chosen to comply with this section by the Financial Test and Corporate Guarantee for Closure as shown in Section 5.5 below.

5.2 SURETY BOND

Morton International has chosen to comply with this section by the Financial Test and Corporate Guarantee for Closure as shown in Section 5.5 below.

5.3 CLOSURE LETTER OF CREDIT

Morton International has chosen to comply with this section by the Financial Test and Corporate Guarantee for Closure as shown in Section 5.5 below.

5.4 CLOSURE INSURANCE

Morton International has chosen to comply with this section by the Financial Test and Corporate Guarantee for Closure as shown in Section 5.5 below.

5.5 FINANCIAL TEST AND CORPORATE GUARANTEE FOR CLOSURE

Morton International has elected to use the option of the Financial Test and Corporate Guarantee for its financial assurance mechanism for closure of the Hazardous Waste Container Storage area and the Hazardous Waste Storage Tank. See Appendix D.

5.6 USE OF MULTIPLE FINANCIAL MECHANISMS

Morton International has chosen to comply with this section by the Financial Test and Corporate Guarantee for Closure as shown in Section 5.5 above.

5.7 USE OF FINANCIAL MECHANISM FOR MULTIPLE FACILITIES

See Section 5.5 above.

6.0 POST-CLOSURE COST ESTIMATE

The only hazardous waste management units at the facility are a container storage area and tank system both of which comply with the secondary containment requirements and are exempt from the requirement for Post Closure Care plans.

7.0 FINANCIAL ASSURANCE MECHANISM FOR POST-CLOSURE CARE

The only hazardous waste management units at the facility are a container storage area and storage tank system both of which comply with the secondary containment requirements and are exempt from the requirement for Post Closure Care plans.

8.0 LIABILITY REQUIREMENTS

8.1 COVERAGE FOR SUDDEN ACCIDENTAL OCCURRENCES

8.1.1 Endorsement of Certification

Morton International has chosen to comply with the requirements of this section by the Financial Test for Liability Coverage. See Section 8.1.2 below.

8.1.2 Financial Test for Liability Coverage

Morton International has chosen to comply with this section by passing the Financial Test for Liability Coverage. Financial data for this section can be obtained from Appendix D.

8.1.3 Use of Multiple Insurance Mechanisms

Morton International has chosen to comply with the requirements of this section by the Financial Test for Liability Coverage. See Section 8.1.2 above.

8.2 COVERAGE FOR NONSUDDEN ACCIDENTAL OCCURRENCES

Morton International has chosen to comply with the requirements of this section by the Financial Test for Liability Coverage. See Section 8.1.2 above.

8.2.1 Endorsement of Certification

Morton International has chosen to comply with the requirements of this section by the Financial Test for Liability Coverage. See Section 8.1.2 above.

8.2.2 Financial Test for Liability Coverage

Morton International has chosen to comply with this section by passing the Financial Test for Liability Coverage. Financial data for this section can be obtained from Appendix D.

8.2.3 Use of Multiple Insurance Mechanisms

Morton International has chosen to comply with the requirements of this section by the Financial Test for Liability Coverage. See Section 8.1.2 above.

8.3 REQUEST FOR VARIANCE

Morton International has complied with the liability requirements and is not requesting a variance; therefore, this section does not apply.

9.0 STATE REQUIRED FINANCIAL MECHANISM

9.1 USE OF STATE-REQUIRED MECHANISM

The financial assurance mechanism for closure care is sufficient to show compliance with this section. Please refer to Section 5.5 for the completed forms.

9.2 STATE ASSUMPTION OF RESPONSIBILITY

Morton International will not request State Assumption of the legal or financial responsibilities.

10.0 SOLID WASTE MANAGEMENT UNITS

Appendix E contains information on potential releases from solid waste management units.

11.0 SIGNATORY REQUIREMENTS

11.1 Owner Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

ILD096787049 Morton International, Inc.

James E. Opre

James E. Opre
Plant Manager

12/6/91
Date

11.2 Independent Registered Professional Engineer Certification

I certify that this document and all attachments were prepared under my direction or supervision as a registered professional engineer in the State of Illinois, pursuant to the Illinois Professional Engineering Act (par. 5101, Sec 1).

Raymond R. Boyd, P.E.

RAYMOND R. BOYD, II
062-046955
REGISTERED
PROFESSIONAL
ENGINEER
STATE OF ILLINOIS

2.0 SIGNATORY REQUIREMENTS

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Morton International, Inc.

Eugene Murphy

Eugene Murphy
Vice President, Operations

11/26/91
Date

TABLE 1
HAZARDOUS WASTE CONTAINER STORAGE AREA
WASTE INVENTORY

WASTE STREAM NAME	HAZARDOUS WASTE CODE	WASTE COMPONENT
SPENT FILTER MEDIA		
Scrubber Filter Rolls		
Cartridge Filters		
		10,10-OXBISPHENOXARSINE (OBPA, ARSENIC - BASED)
	D011	SILVER COMPLEX
		METHYL ETHYL KETONE (MEK BASED)
	U028	BIS (2-ETHYLHEXYL) PHTHALATE
	U116	ETHYLENE THIOUREA
	U159	METHYL ETHYL KETONE (RAW MATERIAL)
OILY WASTES & ABSORBENTS		
		OBPA (ARSENIC - BASED)
	D011	SILVER COMPLEX
		METHYL ETHYL KETONE
	U028	BIS (2-ETHYLHEXYL) PHTHALATE
	U116	ETHYLENE THIOUREA
	U159	METHYL ETHYL KETONE
PLASTIC RESIN/OBPA MIXTURE		
		OBPA (ARSENIC - BASED)
		OBPA (ARSENIC - BASED)
	U028	BIS (2-ETHYLHEXYL) PHTHALATE

TABLE 1 (continued)

WASTE STREAM NAME	HAZARDOUS WASTE CODE	WASTE COMPONENT
LAB PACKS		
		OBPA (ARSENIC - BASED)
	D011	SILVER COMPLEX
		METHYL ETHYL KETONE
	U028	BIS (2-ETHYLHEXYL) PHTHALATE
	U116	ETHYLENE THIOUREA
	U159	METHYL ETHYL KETONE (RAW MATERIAL)
CONTAMINATED EQUIPMENT		
		OBPA (ARSENIC - BASED)
	U028	BIS (2-ETHYLHEXYL) PHTHALATE
EMPTY ETHYLENE THIOUREA DRUMS		
	U116	ETHYLENE THIOUREA

TABLE 2
HAZARDOUS WASTE STORAGE TANK
WASTE INVENTORY

WASTE STREAM NAME	HAZARDOUS WASTE CODE	WASTE COMPONENT
WASTE SOLVENT Spent Cleaning Solvent Scrubber Oil Hose Drippings Waste Raw Material and Product Liquids from Lab Pack Preparation		
	D001	IGNITABLE OBPA (ARSENIC - BASED) METHYL ETHYL KETONE
	U028	BIS (2-ETHYLHEXYL) PHTHALATE
	U159	METHYL ETHYL KETONE (RAW MATERIAL)
WASTE PLASTICIZER		
	U028	BIS (2-ETHYLHEXYL) PHTHALATE
WASTE VINYZENE (PRODUCT)	U028	OBPA (ARSENIC - BASED)

TABLE 3
ESTIMATED AMOUNT OF HAZARDOUS WASTE GENERATED QUARTERLY

HAZARDOUS WASTE STORAGE AREA

Spent Filter Media	2, 55-gallon drums
Oily Wastes & Absorbents	5, 55-gallon drums
Tywood Sludge	1, 55-gallon drum
Lab Packs	9, 18-gallon drums
Contaminated Equipment	1, 55-gallon drum
Empty Ethylene Thiourea Containers	1, 55-gallon drum

HAZARDOUS WASTE STORAGE TANK

2,500 gallons

TABLE 4
HAZARDOUS WASTE CONTAINER STORAGE AREA EQUIPMENT AND STRUCTURES TO BE DECONTAMINATED

Equipment/Structure	Method of Decontamination
Secondary containment system concrete base and curb	Steam cleaning
Secondary containment system sump and piping	Steam cleaning
Closure equipment (for example)	
- pumps	Steam cleaning
- backhoe	Steam cleaning
- protective gear	Steam cleaning

TABLE 5
HAZARDOUS WASTE STORAGE TANK EQUIPMENT AND STRUCTURES TO BE DECONTAMINATED

Equipment/Structure	Method of Decontamination
10,000 gallon tank and piping	Steam cleaning
Secondary containment system concrete base and walls	Steam cleaning
Leak detection monitor	Steam cleaning
Closure equipment (for example)	
- pumps	Steam cleaning
- crane	Steam cleaning
- backhoe	Steam cleaning
- protective gear	Steam cleaning

TABLE 6
HAZARDOUS WASTE CONTAINER STORAGE AREA EQUIPMENT REQUIRED FOR CLOSURE

Personal Protective Equipment	Contractor
Decontamination Area Liner	Contractor
Steam Cleaner	Contractor
Soil Sampling Equipment	Contractor
Fork Lift Truck	Contractor
Sump Pump	Contractor

TABLE 7
HAZARDOUS WASTE STORAGE TANK EQUIPMENT REQUIRED FOR CLOSURE

Personal Protective Equipment	Contractor
Decontamination Area Liner	Contractor
Steam Cleaner	Contractor
Sump Pump	Contractor
Soil Sampling Equipment	Contractor
Crane	Contractor

TABLE 8
HAZARDOUS WASTE CONTAINER STORAGE AREA
CONTAMINATED SOIL
PARAMETERS AND RATIONALE FOR THEIR SELECTION

Parameter	Rationale
Corrosivity	To ensure no corrosives are stored on the pad and to ensure compatibility standards are maintained.
Arsenic	Based on knowledge of processes and raw materials.
Silver	D011 waste is listed for silver.
Ethylene Thiourea	Based on knowledge of processes and raw materials.
2-Butanone (Methyl Ethyl Ketone)	Based on knowledge of processes and raw materials.
pH	To ensure waste acidity and alkalinity is within acceptable limits.
Phthalates	Based on knowledge of processes and raw materials.
Pentachlorophenol	Based on knowledge of historical processes.
Acetone- Chloroform- Dibenzofuran- Methylene Chloride- Trichloroethene-	Detected in soil samples collected during past sampling activities at the facility.

TABLE 9
HAZARDOUS WASTE STORAGE TANK
CONTAMINATED SOIL
PARAMETERS AND RATIONALE FOR THEIR SELECTION

Parameter	Rationale
Ignitability	D001 waste is listed for ignitability.
Corrosivity	To ensure no corrosives are in the storage tank and to ensure compatibility standards are maintained.
Arsenic	Based on knowledge of processes and raw materials.
pH	To ensure waste acidity and alkalinity is within acceptable limits.
Benzene, Ethylbenzene, Toluene, Total Xylenes, (BETX)	Petroleum constituents in solvents.
2-Butanone (Methyl Ethyl Ketone)	Based on knowledge of processes and raw materials.
Phthalates	Based on knowledge of processes and raw materials.
Acetone- Chloroform- Dibenzofuran- Methylene Chloride- Trichloroethene-	Detected in soil samples collected during past sampling activities at the facility.

TABLE 10
HAZARDOUS WASTE CONTAINER STORAGE AREA PARAMETERS AND TEST METHODS

Parameters	Test	Method*	Detection Limit (ppm)
Acetone	GC/MS	Method 8240	0.05
Arsenic	TCLP Extraction 1311	Method 7060	0.001
Chloroform	GC/MS	Method 8240	0.005
Silver	TCLP Extraction 1311	Method 6010	0.005
Ethylene Thiourea	GC/MS	Method 8240	0.05
Phthalates	GC/MS	Method 8270	0.670
Dibenzofuran	GC/MS	Method 8270	5.0
2-Butanone	GC/MS	Method 8240	0.05
Methylene Chloride	GC/MS	Method 8240	0.025
pH	pH Electrometric	Method 9040	
Pentachlorophenol	GC/MS	Method 8240	1.60
Trichloroethene	GC/MS	Method 8240	0.005

* All Methods from: Test Methods for Evaluating Solid Waste
Physical/Chemical Methods
U.S. EPA SW-846
Third Edition

TABLE 11
HAZARDOUS WASTE STORAGE TANK PARAMETERS AND TEST METHODS

Parameters	Test	Method*	Detection Limit (ppm)
Ignitable	Pensky-Martens closed cup or Setaflash closed cup	Method 1010 Method 1020	
Acetone	GC/MS	Method 8240	0.05
Arsenic	TCLP Extraction 1311	Method 7060	0.001
BETX	GC/MS	Method 8240	0.005
2-Butanone	GC/MS	Method 8240	0.005
Chloroform	GC/MS	Method 8240	0.005
Methylene Chloride	GC/MS	Method 8240	0.025
Phthalates	GC/MS	Method 8270	0.670
Dibenzofuran	GC/MS	Method 8270	5.0
pH	pH Electrometric	Method 9040	
Trichloroethene	GC/MS	Method 8240	0.005

* All Methods from: Test Methods for Evaluating Solid Waste
Physical/Chemical Methods
U.S. EPA SW-846
Third Edition

TABLE 12
HAZARDOUS WASTE CONTAINER STORAGE AREA
SCHEDULE OF CLOSURE ACTIVITIES

DAY	ACTIVITY
-30	Morton notifies IEPA of intention to close container storage area
0	IEPA gives final approval for Closure Plan
0	Hazardous waste no longer placed in container storage area
14	Begin removal of containers of hazardous waste
21	Complete removal of hazardous waste containers
22	Begin decontamination of secondary containment decontamination
25	Completion of secondary containment system decontamination
26	Collection of water samples to verify decontamination
40	Results of decontamination samples received
41	Disposal of decontamination wash water
46	Soil samples collected and analyzed to determine if soil contamination exist
60	Results of soil samples analyses received. If contaminated, IEPA will be notified within 15 days.
65	If necessary, removal and disposal of contaminated soil
90	Completion of contaminated soil removal
180	Certification of Closure by owner/operator and registered PE (independent). Submittal of Final Report to Illinois EPA.

TABLE 13
HAZARDOUS WASTE STORAGE TANK
SCHEDULE OF CLOSURE ACTIVITIES

DAY	ACTIVITY
-30	Morton notifies IEPA of intention to close container storage area
0	IEPA gives final approval for Closure Plan
0	Hazardous waste no longer placed in container storage tank system
14	Begin removal of storage tank hazardous waste
21	Complete removal of hazardous waste in the storage tank
22	Begin decontamination of secondary containment system and tank
25	Completion of secondary containment system and tank decontamination
26	Collection of water samples to verify decontamination
40	Results of decontamination samples received
41	Disposal of decontamination wash water
46	Soil samples collected and analyzed to determine if soil contamination exist
60	Results of soil samples analyses received.
65	If necessary, removal and disposal of contaminated soil
90	Completion of contaminated soil removal
180	Certification of Closure by owner/operator and registered PE (independent). Submittal of Final Report to Illinois EPA.

TABLE 14
HAZARDOUS WASTE CONTAINER STORAGE AREA
CLOSURE COST ESTIMATE

I.	Removal of Containers		
	Loading of drums:	Labor (4 men for 1 day)	$ 2,050
		Equipment (forklift)	1,000
	Transportation:	$10 x 240	2,400
	Disposal:	240 drums x $680	163,200
			$168,650
II.	Decontamination of Secondary Containment System		
	Labor (4 men for 2 days)		$ 4,100
	Equipment (steam cleaner, sump pump)		2,000
	Disposal (2 drums)		1,380
	(wash water - 20 drums)		13,800
	Laboratory analysis (5 samples)		5,155
			26,435
III.	Soil Sampling and Analysis		
	Labor (2 men for 5 days)		$ 7,500
	Sampling equipment		2,500
	Sample shipment		425
	Laboratory analyses (40 samples, plus 7 QA samples)		44,777
			$ 55,202
IV.	Closure Report and Certification		
	Report		$ 5,000
	Certification		4,200
			$ 9,200
	SUBTOTAL		$259,487
	15% Administration		$ 38,923
	15% Contingency		38,923
	TOTAL		$337,333

TABLE 15
HAZARDOUS WASTE STORAGE TANK
CLOSURE COST ESTIMATE

I.	Removal of Tank Contents		
	Loading of tank:	Labor (2 men for 1 day)	$ 1,000
		Equipment	500
	Transportation:	$350/load	700
	Disposal:	10,000 gallons x .32/gal.	3,200
			$ 5,400
II.	Decontamination of Secondary Containment System and Tank System		
	Labor (4 men for 5 days)		$10,250
	Equipment (steam cleaner, vacuum truck, sump pump)		5,000
	(wash water - 20 drums)		13,800
	Laboratory analysis (3 samples)		3,000
			$32,050
III.	Soil Sampling and Analysis		
	Labor (2 men for 8 days)		$12,000
	Sampling equipment		4,000
	Sample shipment		680
	Laboratory analyses (80 samples, plus 12 QA samples)		86,144
			$102,824
IV.	Closure Report and Certification		
	Report		$ 5,000
	Certification		4,200
			$ 9,200
	SUBTOTAL		$149,474
	15% Administration		$ 22,421
	15% Contingency		22,421
	TOTAL		$194,316

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			APPROVED BY	RRB	7-26-91		

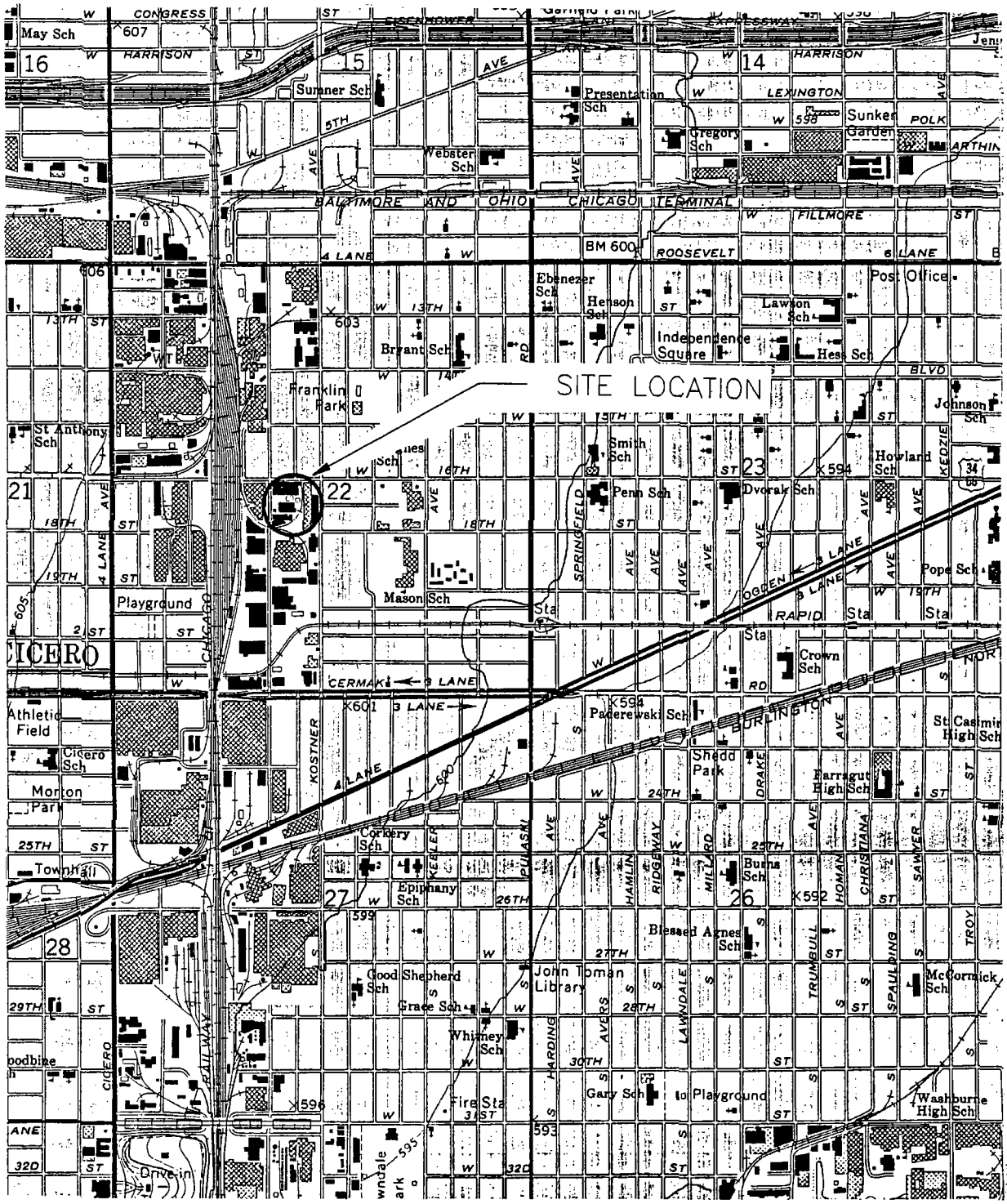

FIGURE 1

SITE LOCATION MAP
MORTON INTERNATIONAL, INCORPORATED
INDUSTRIAL CHEMICALS AND ADDITIVES

PREPARED FOR

MORTON INTERNATIONAL, INCORPORATED
CHICAGO, ILLINOIS

SOURCE:
U.S.G.S. TOPOGRAPHIC MAP ENGELWOOD
QUADRANGLE 7.5 MINUTE SERIES

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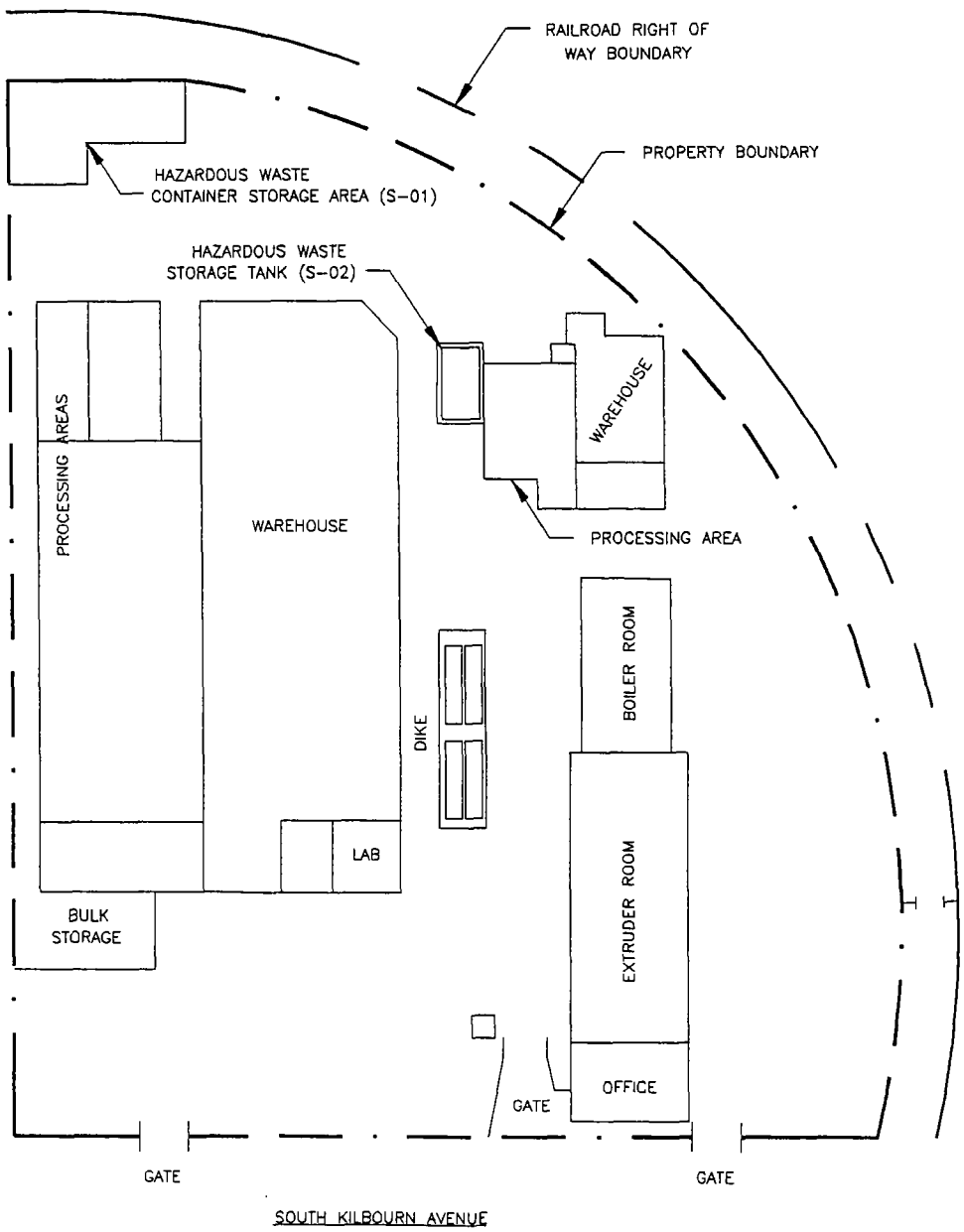

FIGURE 2
PLANT LAYOUT
MORTON INTERNATIONAL, INCORPORATED
INDUSTRIAL CHEMICALS AND ADDITIVES

PREPARED FOR

MORTON INTERNATIONAL, INCORPORATED
CHICAGO, ILLINOIS

(APPROXIMATE SCALE)
0 17 34 51 FEET

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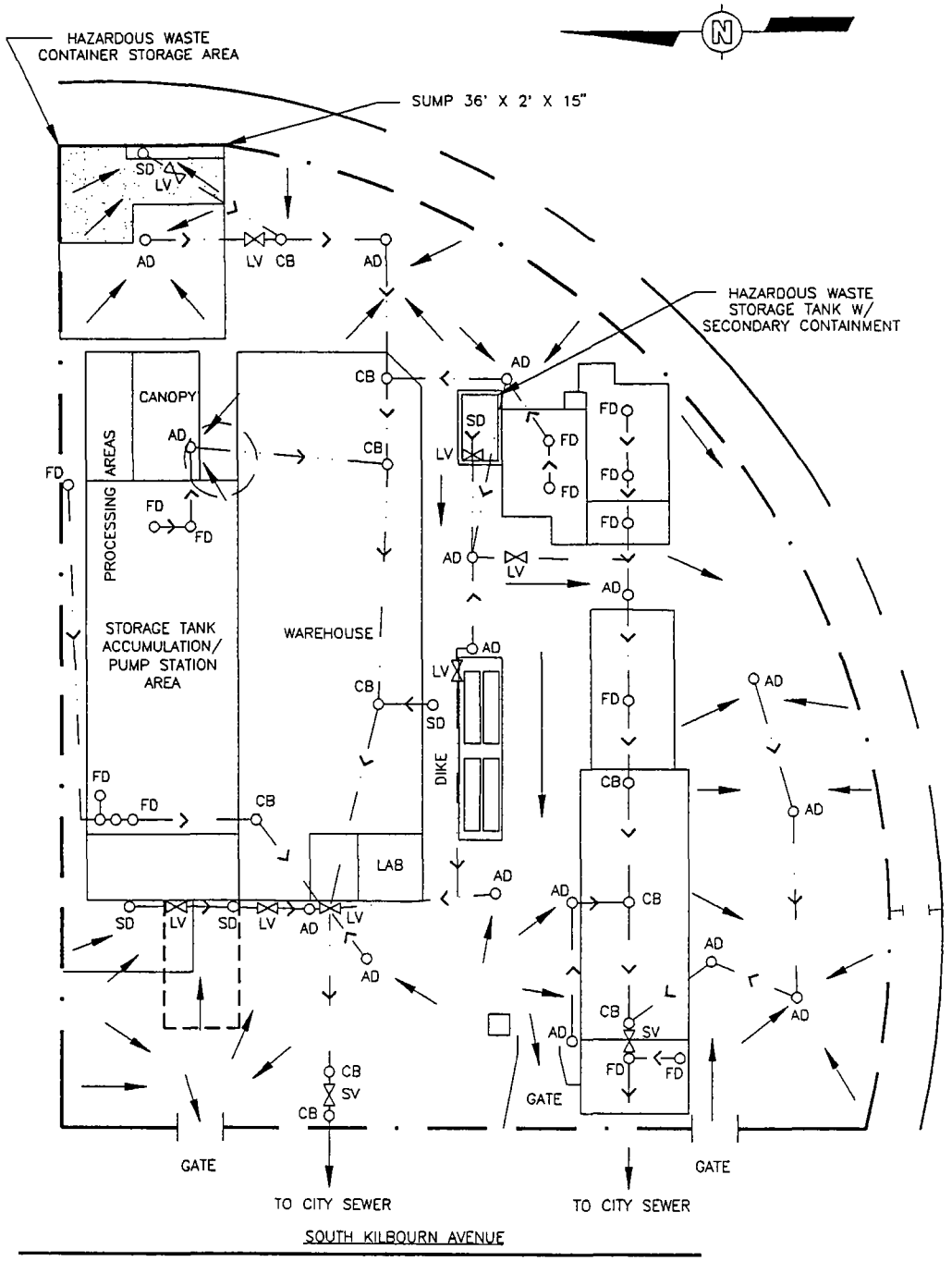

LEGEND

AD	AREA DRAIN
CB	CATCH BASIN
FD	FLOOR DRAIN
SD	SUMP DRAIN
LV	LOCKED VALVE
SV	SHUTOFF VALVE
——→	SURFACE WATER FLOW
— > —	SEWER LINE W/ FLOW DIRECTION

(APPROXIMATE SCALE)

0 17 34 51 FEET

FIGURE 2A

PLANT LAYOUT
SHOWING DRAINAGE FEATURES
MORTON INTERNATIONAL, INCORPORATED
INDUSTRIAL CHEMICALS AND ADDITIVES

PREPARED FOR

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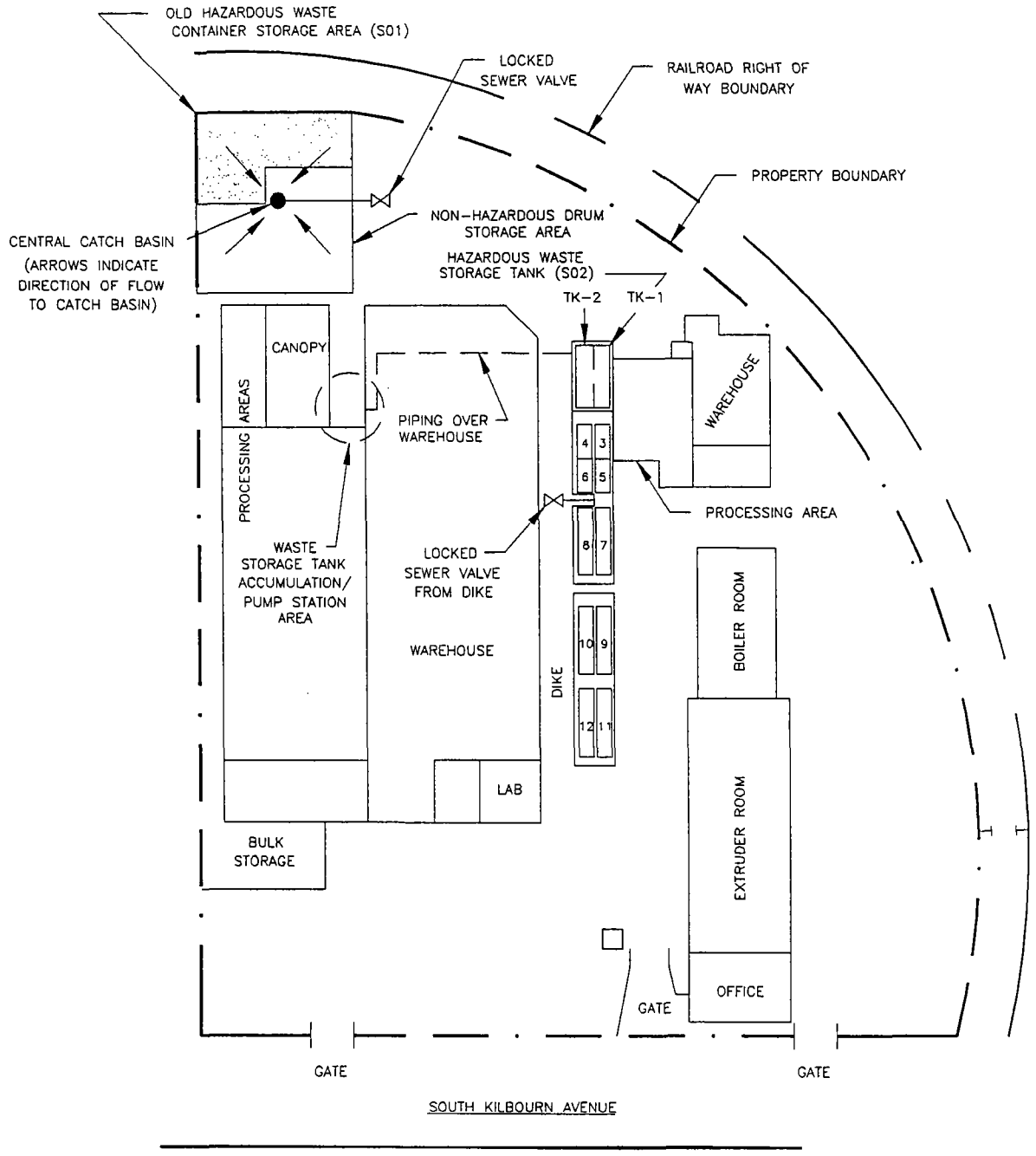

(APPROXIMATE SCALE)

0 17 34 51 FEET

FIGURE 2B

PLANT LAYOUT
ORIGINAL CONTAINER STORAGE PAD AREA
MORTON INTERNATIONAL, INCORPORATED
INDUSTRIAL CHEMICALS AND ADDITIVES

PREPARED FOR

MORTON INTERNATIONAL, INCORPORATED
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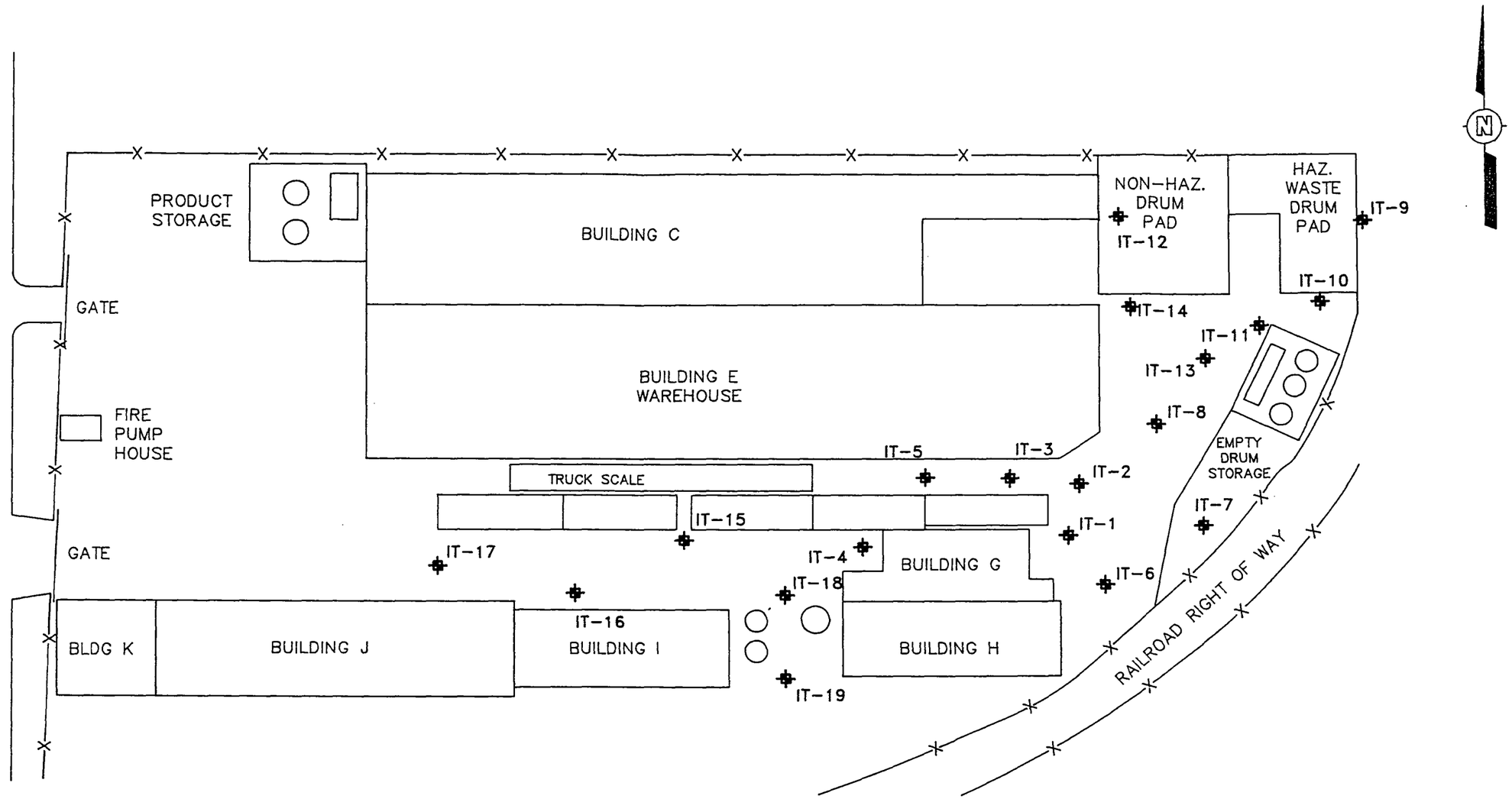

(APPROXIMATE SCALE)

0 17 34 68 FEET

FIGURE 3

SITE ASSESSMENT
BORING LOCATIONS

PREPARED FOR

MORTON INTERNATIONAL, INC.
CHICAGO, ILLINOIS

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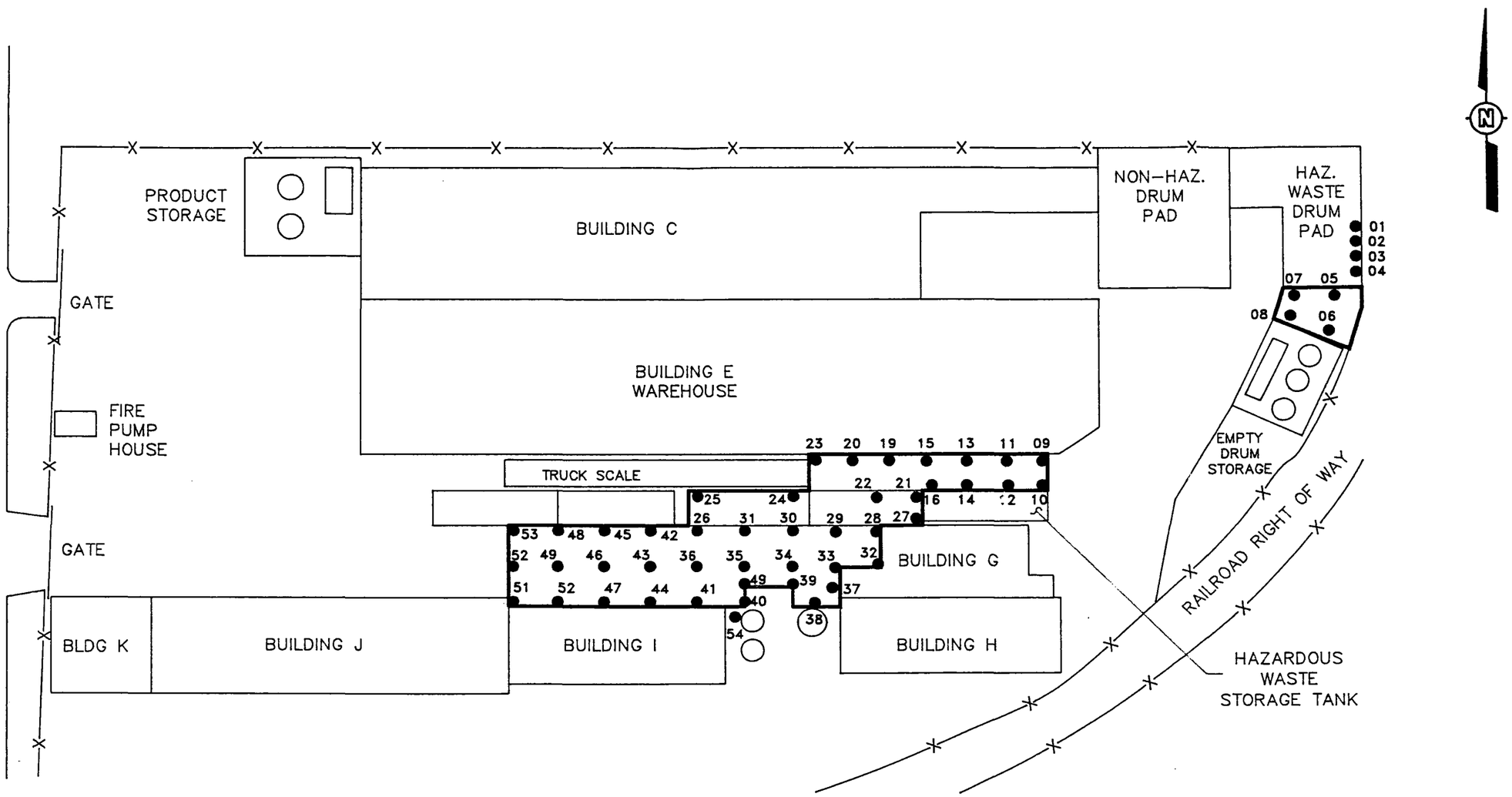

(APPROXIMATE SCALE)

0 17 34 68 FEET

● – SAMPLING LOCATION

— – OUTLINE OF EXCAVATIONS

FIGURE 4

POST SOIL EXCAVATION SAMPLE LOCATIONS

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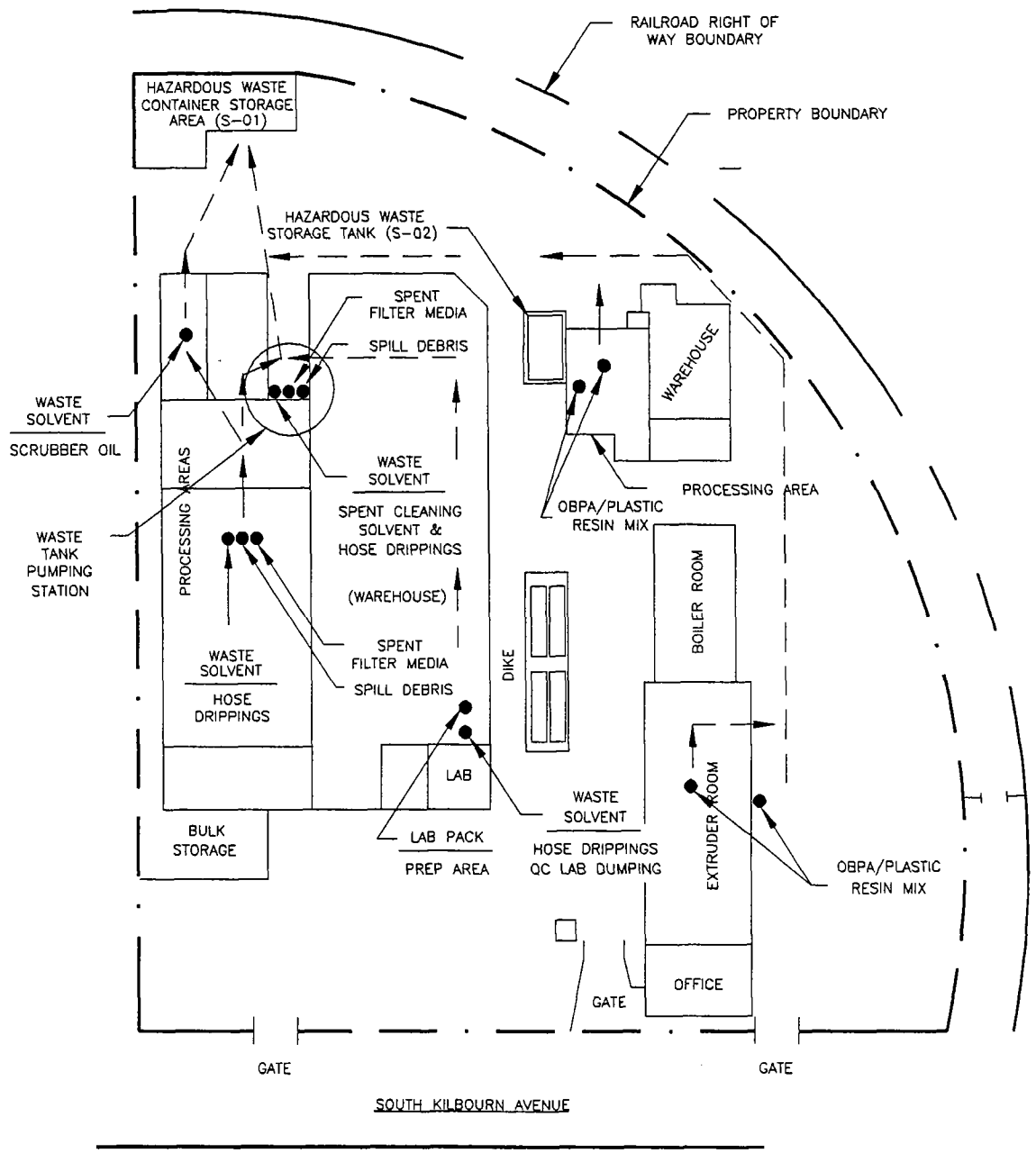

(APPROXIMATE SCALE)
0 17 34 51 FEET

FIGURE 5

WASTE SATELLITE ACCUMULATION AREAS
MORTON INTERNATIONAL, INCORPORATED
INDUSTRIAL CHEMICALS AND ADDITIVES

PREPARED FOR

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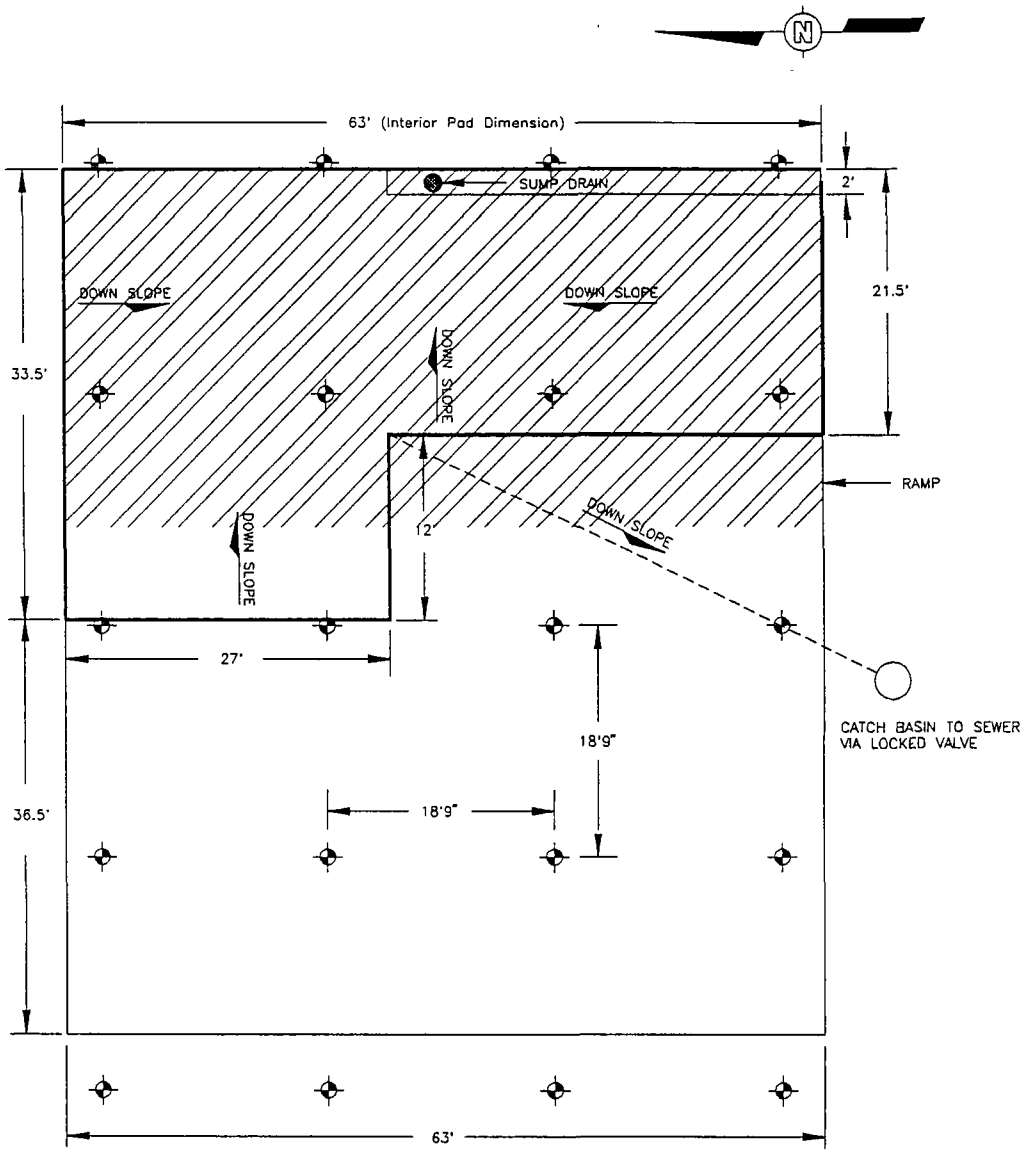

LEGEND

CURB OF EXISTING HAZARDOUS WASTE STORAGE PAD

SOIL SAMPLE LOCATIONS

AREA ENCOMPASSING ORIGINAL AREA USED FOR HAZARDOUS CONTAINER STORAGE

AREA ENCOMPASSING NON-HAZARDOUS CONTAINER STORAGE PAD

SCALE

0 2 4 6 12 FEET

NOTES:

1. RAMP SLOPE VARIES, BUT APPROXIMATELY 1 INCH/FOOT IN DIRECTIONS SHOWN

2. SUMP DIMENEIONS = L 36' X W 2' X D 1.5"

FIGURE 6

HAZARDOUS WASTE STORAGE PAD: SOIL SAMPLE LOCATIONS (CLOSURE)

MORTON INTERNATIONAL CHICAGO PLANT

PREPARED FOR

MORTON INTERNATIONAL CHICAGO, ILLINOIS

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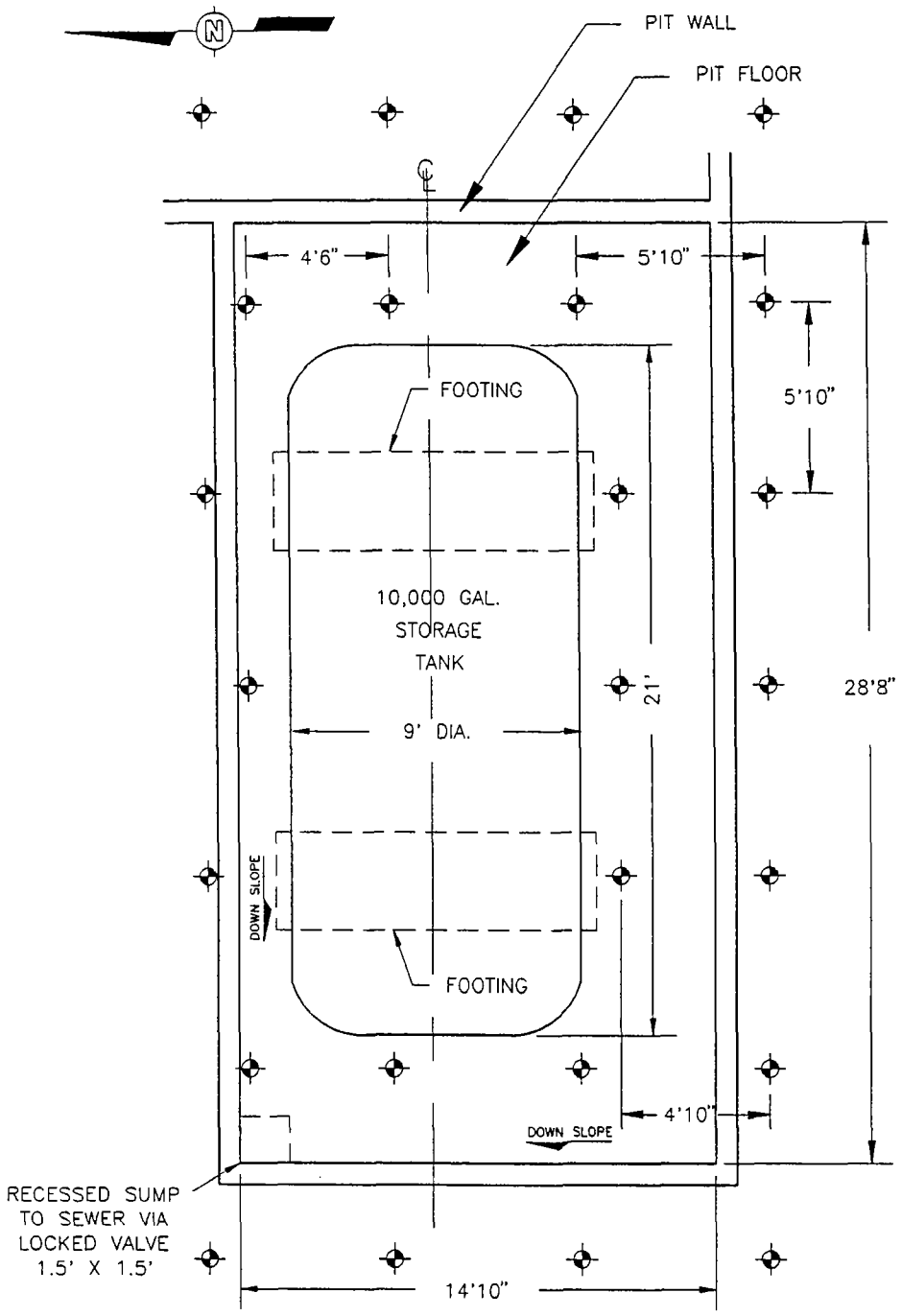

FIGURE 7

HAZARDOUS WASTE STORAGE TANK
SOIL SAMPLE LOCATIONS
(CLOSURE)

PREPARED FOR

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CHICAGO, ILLINOIS

LEGEND

SOIL BORING

(APPROXIMATE SCALE)

0 2.5 5 FEET

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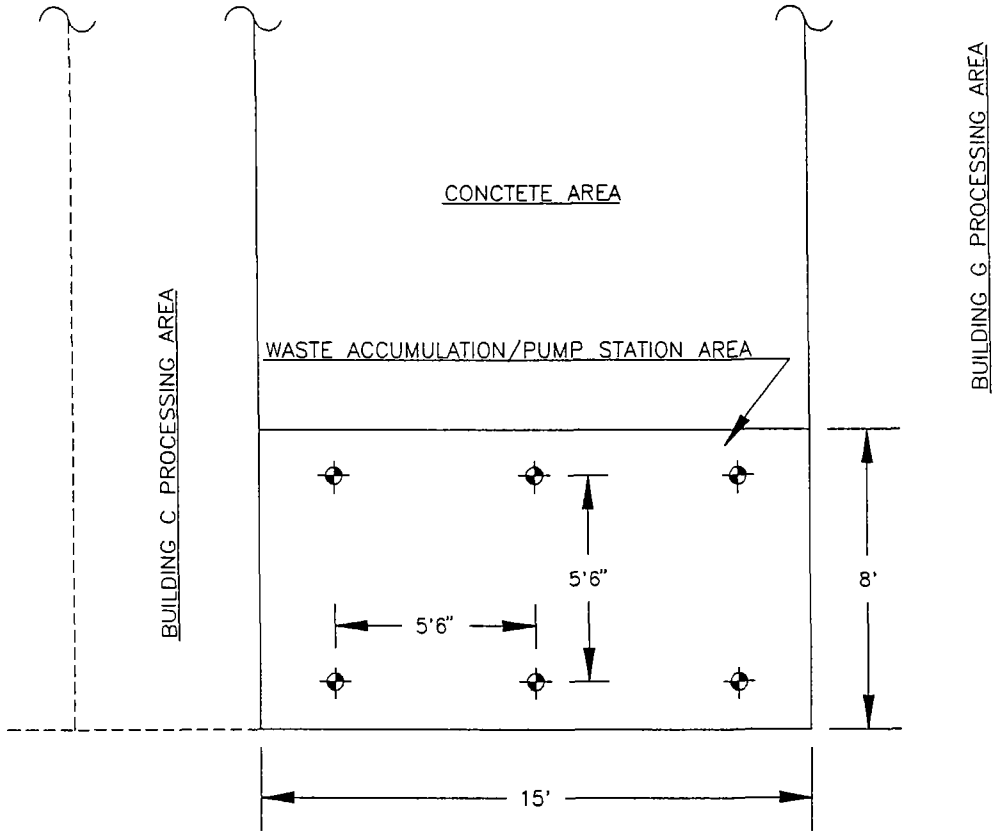

LEGEND

SOIL BORING LOCATIONS

SCALE

0 1 2 3 6 FEET

FIGURE 7A

SOIL SAMPLE LOCATIONS
(CLOSURE)
HAZARDOUS WASTE STORAGE TANK
WASTE ACCUMULATION AREA
AND PUMP STATION AREA

MORTON INTERNATIONAL
CHICAGO PLANT

PREPARED FOR

MORTON INTERNATIONAL
CHICAGO, ILLINOIS

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...Creating a Safer Tomorrow

APPENDIX A

DEVELOPMENT OF SITE-SPECIFIC HEALTH-BASED CLEANUP LEVELS FOR MORTON INTERNATIONAL, INC. CHICAGO PLANT

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7.0 SUMMARY AND CONCLUSIONS

1.0 INTRODUCTION

1.1 SCOPE

This Risk Assessment (RA) was performed to develop site-specific health-based cleanup levels that are site specific to the Morton International facility at 1645 Kilbourn Avenue, Chicago, Illinois. The model used to calculate risk is that used in the U.S. EPA Human Health and Evaluation Manual (U.S. EPA, 1989). The development of health-based cleanup levels is part of the facility's application to obtain clean closure of their RCRA interim status Hazardous Waste Management Units (HWMUs). This document is presented as an Appendix to the Morton International Chicago plant Closure Plan.

The RA will demonstrate that the proposed health-based cleanup level constituent concentrations remaining in the soils will not result in a threat to human health or the environment. Exposure pathways to constituents remaining in the soil, used for this demonstration consist of dermal contact, ingestion, inhalation of vapors and inhalation of constituents entrained in dust. Furthermore, the RA will demonstrate that the proposed health-based cleanup level constituent concentration remaining in soils and leaching into groundwater will not pose a threat to human health and the environment.

1.2 BASIC ASSUMPTIONS ASSOCIATED WITH THE DEVELOPMENT OF SITE-SPECIFIC HEALTH BASED CLEANUP LEVELS

Because the development of health-based cleanup levels is part of the facility's application to obtain clean closure of their RCRA interim status HWMUs, the facility must demonstrate that the proposed health-based cleanup levels will not pose a threat to human health and the environment during and beyond the life of the facility. To perform this demonstration, the following assumptions have been made:

- The potential point of exposure to hazardous waste constituents is directly at or within the facility boundary for all routes of exposure

- Although the facility is tightly controlled (RCRA, Part B Permit Application, Response to NOD, September 1990), a trespasser will be considered an exposure receptor as part of the potential future land use of the property

- Presently, approximately half of the facility property consists of buildings and the remaining half is mainly paved. The future land use potential that all facility area soils will be uncovered, is assumed and included in the RA.

- Ingestion of drinking groundwater beneath the site will be considered as part of a potential future situation, albeit area drinking water has been supplied by Lake Michigan since 1843. In addition, a demonstration will be shown in a later section that groundwater in the area has not been impacted by the constituents present in the facility soils and included in the development of health-based cleanup levels.

- Residential exposure to soils will also be considered as part of the potential future land use of the property.

1.3 ORGANIZATION

This RA follows the steps in the U.S. EPA Human Health Evaluation Manual (U.S. EPA, 1989) guidance document and contains four basic components: data evaluation, toxicity assessment, exposure assessment, and risk characterization. The objective of the data evaluation step is to screen available information on hazardous substances or wastes present at the site and identify chemicals of concern so that subsequent efforts in the RA can be focused on them. The toxicity assessment determines the relationship between chemical exposures and adverse health effects. The objectives of the exposure assessment are to identify actual or potential exposure pathways, to characterize the potentially exposed populations, and to determine the extent of exposure. In the final risk characterization step of the RA process, the potential risk of adverse health or environmental effects are estimated for each of the exposure scenarios derived in the exposure assessment.

2.0 SITE BACKGROUND

This section of the RA provides background information needed to characterize the site in the context of potential exposure. It discusses details that are required to assess the viability of various exposure pathways and to identify potential receptors. The location of the site and its history of activities provides some insight regarding the chemical constituents which might be expected to be found in the soils.

2.1 SITE LOCATION

The Morton International Chicago plant (Morton-Chicago) is located in an industrial area on the west side of the City of Chicago, in Cook County, Illinois. Residential areas exist less than one quarter mile from the plant.

2.2 SITE OPERATIONS AND HISTORY

Morton-Chicago manufactures industrial biocides and fungicides. Liquid products are produced by formulation and blending operations; solid products are produced by extrusion/pelletization processes. Hazardous wastes in both solid and liquid form are generated from cleaning process equipment, pollution control equipment, and off-grade raw material or products. Approximately twenty people are employed at the Morton-Chicago plant.

Prior to being purchased by Morton, the site was an oil distribution facility. Morton-Chicago received an Interim Status Part A Permit to operate as a TSDF from the USEPA on March 12, 1982. The operations reported in the Part A application were the accumulation of hazardous waste generated by the facility for periods greater than 90 days, in either containers (drums) or a bulk storage tank, prior to off-site disposal. The facility has a hazardous waste container storage area covering approximately 1755 square feet where solid and liquid wastes are stored and a single 10,000 gallon storage tank that stores ignitable waste. The facility applied for a RCRA Part B operating permit in November, 1988 and submitted response to Notice of Deficiencies in April, 1990, and in September

1990. The facility has now withdrawn its application and is planning on closing the two HWMUs. The facility plans on storing wastes for less than ninety days, upon closure of the HWMUs and surrender of the Part A permit.

2.3 AREA GEOLOGY AND GROUNDWATER USE

The geology of northeastern Illinois is characterized by a relatively thick sequence of unconsolidated glacial deposits unconformably overlying sedimentary bedrock (Niagaran dolomite). The glacial material which is present in the area consists of ground and end moraine till deposited during the Wisconsonian Stage, Woodfordian Substage of Pleistocene glaciation. The till is heterogenous and ranges from clay and silt to sand and gravel. Underlying the till are Silurian to Cambrian aged dolomites, shales, and sandstones. Precambrian igneous rocks underlie this thick sedimentary sequence.

In northeastern Illinois, there are four main aquifer systems utilized for industrial, residential and municipal water sources. These aquifer systems are:

- the sand and gravel deposits of the glacial drift,
- the shallow dolomite formations mainly of Silurian age,
- the Cambrian-Ordovician aquifer of which the Ironton-Galesville and Glenwood-St. Peter Sandstones are the most productive formations,
- the Mt. Simon aquifer consisting of the Mt. Simon and lower Eau Claire sandstone formations.

The glacial drift and shallow dolomite aquifer are generally connected hydrologically. These two aquifers are, over most of the region, separated from the Cambrian-Ordovician aquifer by the relatively impermeable Maquoketa Shale Formation of Silurian Age.

Soil borings installed during a February 1991 facility site assessment indicate a mixture of clay and silty clay present in surficial, shallow soils throughout the facility. The clay/silty

clay mixture is first encountered between approximately 0.5 and 5 feet below land surface. This layer extends to 12 feet, which is the bottom of the soil borings.

Well log data in the vicinity of the site, dating back to 1897, indicate that the Cambrian-Ordovician aquifer was the aquifer most used as a groundwater source. The well logs indicate that wells were installed for industrial use, such as non-contact cooling water, and for lawn sprinkling of cemeteries. According to the Illinois State Water Survey, no wells exist within a one mile radius of the facility. The potable water source for the City of Chicago and many neighboring suburbs is Lake Michigan, and has been since 1843.

3.0 CHEMICALS OF CONCERN

Chemicals of concern are those chemicals presently, historically, and potentially stored in the HWMUs, and chemicals detected during past sampling of facility soils. Representative concentrations of those chemicals in soils were chosen based on past sampling activities at the site. Soil samples were collected in February 1991, during a facility environmental assessment. Samples were collected from soil borings ranging from 2 to 12 foot depths. Post excavation samples were also collected during soil removal of selected areas at the facility. A summary of analytical data is presented in Section 3.1. The selection process for chemicals of concern is described in Section 3.2 and the final list of selected chemicals of concern is presented in Section 3.3.

3.1 DATA PRESENTATION

A summary of soil sample data collected during the facility environmental assessment is shown in Table 3-1. Each soil sample was tested for 38 Volatile Organic Compounds (VOCs), which included a library search for ethylene thiourea using EPA Methods 8240, 66 base/neutral/acid extractable, semi-volatile compounds (BNAs) using EPA Method 8270, total arsenic using EPA Method 7060 and total copper using EPA Method 7210. A summary of soil sample data collected during soil removal of selected areas at the facility is shown in Table 3-2. Each soil sample was tested for 38 VOCs using EPA Method 8240, 66 BNAs using EPA Method 8270, total arsenic using EPA Method 7060, and total silver using EPA Method 6010.

3.2 SELECTION PROCESS FOR CHEMICALS OF CONCERN

To make a selection of chemicals of concern and their representative detected concentrations, the following decision rules for exclusion were applied:

(a.) All polynuclear aromatic hydrocarbons (PNAs) and carbon disulfide detected during both sampling events were not considered chemicals of concern as they are background constituents in the area. This assumption will be demonstrated

analytically during background sampling conducted as part of closure of the HWMUs. The presence of PNAs and carbon disulfide may be attributed to the existence of a cinder layer containing debris from the Chicago fire and boiler ash. The cinder layer is prevalent throughout the City of Chicago. Background sampling will be conducted in this cinder layer, approximately one to two feet below surface. A total of five soil samples will be collected from this layer, along the south and west property lines. Table 3-3 lists all PNAs detected during both sampling events.

(b.) Constituents that are presently, potentially and were historically stored on the hazardous waste container storage area and in the hazardous waste storage tank and constituents detected during past sampling of facility soils were considered chemicals of concern, i.e. chemicals used to develop site-specific health-based cleanup levels.

(c.) If a common laboratory contaminant was detected in the method blank as well as in the sample, the common laboratory contaminant and its detected concentration was considered if the detected concentration was greater or equal to ten times that detected in the method blank. For all other chemicals detected in the method blank as well as in the sample, the chemical and its detected concentration was considered if the detected concentration was greater or equal to five times that detected in the method blank.

(d.) IEPA draft cleanup criteria for metals will be used for arsenic and silver, which are stored on the hazardous waste storage pad. They will not be included in the development of site-specific health-based cleanup levels and thus will not be included in the risk calculations.

The concentrations used in the risk assessment calculations are the highest detected concentrations remaining in the facility soils. The concentrations are obtained from both sampling events. Exceptions to the above are as follows:

(a.) Since pentachlorophenol was stored on the hazardous waste storage area, it will be included in the risk assessment. Because this constituent was not detected in soil samples collected during either sampling event, the selected concentration is the laboratory detection limit of 0.05 mg/kg.

(b.) Because ethylene thiourea was not detected in the soil samples collected during either sampling event, the selected concentration is the laboratory detection limit of 0.05 mg/kg.

(c.) Although dibenzofuran was detected during soil removal activities, it will not be included in the quantitative RA. Toxicological data for dibenzofuran is inadequate to conduct a quantitative RA, therefore the laboratory detection limit of 5 mg/kg will be used as a cleanup level.

3.3 CHEMICALS OF CONCERN

The chemicals of concern, used to develop site-specific health-based cleanup levels, based on the above criteria are:

Acetone
Benzene (petroleum product derivative)
Bis(2-ethylhexyl)phthalate
2-Butanone (Methyl Ethyl Ketone)
Butyl Benzyl Phthalate
Chloroform
Di-n-Butyl Phthalate
Ethylbenzene (petroleum product derivative)
Ethylene thiourea
Methylene chloride
Pentachlorophenol
Toluene (petroleum product derivative)

Trichloroethene

Total Xylenes (petroleum product derivative)

4.0 TOXICITY ASSESSMENT

This section presents the toxicity assessment of the chemicals of concern found in the soil at the Morton facility and considered for calculation of site-specific health-based cleanup levels. A toxicity assessment considers 1) the types of adverse health effects that may be associated with chemical exposures; 2) the relationship between the magnitude of exposure and associated adverse effects; and 3) the inherent uncertainties in characterizing chemical toxicity. This component of the risk assessment is discussed in the following sections:

- o 4.1 Hazard Identification
- o 4.2 Dose-Response Assessment

4.1 HAZARD IDENTIFICATION

The following fundamental concept is the foundation of any RA. For a risk to be incurred, two conditions must be met: (1) a hazard must be present and (2) an exposure to that hazard must occur. To quantify risk in mathematical terms, risk is equal to the hazard (toxicity level) times exposure level (exposure dose). There is no risk if either factor (hazard or exposure) is not present. This section, combined with dose-response relationships, will furnish the context needed to define hazards in site-specific terms. The exposure assessment (Section 5.0) provides the framework for determination of the exposure.

Hazards associated with chemicals are described toxicologically in terms of an exposure path (mode of entry) and duration. Exposure paths or entry modes pertinent to this RA are categorized as ingestion and direct contact (with dermal absorption) and inhalation. Exposure to soils may be by incidental ingestion (hand to mouth), by ingestion of contaminated dust, by inhalation of vapors and by direct contact with dermal absorption. Exposure to groundwater may be by ingestion and dermal contact from bathing.

Exposures are described as:

- Acute - Exposure entails a short duration measured in seconds, minutes, or hours, and has effects which appear promptly after exposure.

- Subchronic - Exposure of intermediate duration between acute and chronic and may be up to 90 days.

- Chronic - Prolonged or repeated exposures with durations of days, months, or years. It is used to describe ongoing exposures and effects that develop only after a long exposure.

- Lifetime - For this RA, lifetime duration is 70 years.

In general, exposure to toxic chemicals may result in various kinds of harmful or toxic effects, based on their concentrations and toxicological nature. Severe effects may be produced by acute exposure to a chemical at a high concentration, while chronic or long-term toxic effects may be produced by exposure to a lower concentration of the chemical over a longer period of time. Other chemicals have been classified as probable or possible human carcinogens, or cancer-causing agents. When evaluating the toxicity of carcinogens, cancer risk is generally considered to be present at any concentration. In such cases, a toxicologist estimates the increased cancer risk of an exposed population compared to an unexposed population.

The tables presented in Section 3.0 provided a basis for the selection of chemicals of potential concern and considered for development of site-specific health-based cleanup levels. These selected chemicals are representative of all constituents stored on the hazardous waste storage pad and in the aboveground storage tank and constituents detected in past sampling of facility soils that pose a potential health risk, which includes both carcinogenic and noncarcinogenic effects, associated with exposure to soils.

4.1.1 Toxicological Evaluation

In this section, a categorization and description of the toxic effects of the chemicals considered in the development of site-specific health-based cleanup levels is provided. A review of available scientific data in the literature was used to identify the nature and magnitude of the health hazards that are associated with human exposure to the various chemicals found in the soils from the site.

For the purposes of a health risk assessment, toxic effects are classified as either noncarcinogenic (systemic) or carcinogenic health effects. Noncarcinogenic health effects occur only at doses that exceed a "threshold dose," while cancer risk is assumed to be present at any exposure level above zero. Carcinogenic health effects are associated with exposure to a chemical that is capable of either initiating, promoting, or directly causing a malignant tumor.

4.1.2 Weight of Evidence Classification

The weight of evidence classification is applied to the potency of carcinogens based on the strength of epidemiological and/or animal study data. This system, which was originally developed by the International Agency for Research on Cancer, has been adopted by the U.S. EPA (1986). Carcinogens are classified by EPA according to the following weight-of-evidence categories:

A Human Carcinogen: Sufficient evidence from epidemiological studies substantiated by causal association between exposure and carcinogenicity.

B1 Probable Human Carcinogen: Indicates limited evidence of carcinogenicity in humans from available epidemiological data.

B2 Probable Human Carcinogen: Indicates sufficient evidence of carcinogenicity in animals, but inadequate or no evidence in humans.

C Possible Human Carcinogen: Indicates limited evidence of carcinogenicity in animals.

4.2 DOSE-RESPONSE ASSESSMENT

The dose-response component of a risk assessment is the characterization of the relationship between the dose of a toxic substance and the anticipated or corresponding incidence of an adverse health effect in an exposed population. Thus, dose-response relationships provide a means by which potential public health impacts from exposure to toxic substances may be evaluated and quantified.

4.2.1 Noncarcinogenic Effects

The toxicity value that is most often used to evaluate noncarcinogenic effects resulting from exposure to soils at hazardous waste sites is the oral reference dose (RfD). The RfD is defined as an estimate of the daily exposure level for a chemical to humans, including sensitive subpopulations, that is likely to be without appreciable risk of adverse health effects during a subchronic or chronic exposure period. RfDs are developed for subchronic and/or chronic human exposure to hazardous substances and are based on the assumption that threshold levels exist for all toxic effects except carcinogenicity.

Two toxicity parameters used to characterize the chemical constituents at hazardous sites are the lowest observed adverse effect levels (LOAELs) and the no observed adverse effect levels (NOAELs). The LOAEL is the lowest exposure level at which there are statistically and/or biologically significant increases in the severity of adverse effects between the exposed animal population and the control group in a toxicological study. The NOAEL is the exposure level at which there are no demonstrated adverse effects. The application of safety factors to NOAELs and LOAELs to adjust for toxicity data limitations and differences between experimental animal exposure conditions and human exposure is the procedure used to develop RfDs. These safety factors also adjust for variability in human response to chemical agents and for imprecision in extrapolating from laboratory animals to humans.

In the absence of RfDs, one-day, ten-day, and chronic (life-term) health advisories (HAs) may be used as reference values for evaluating potential adverse effects associated with exposures of durations shorter than subchronic or chronic exposure. HAs are guidelines developed by

the U.S. EPA Office of Drinking Water for nonregulatory guidance. These values are concentrations in drinking water at which adverse health effects are not expected to occur for the specified exposure duration. The Health Advisory values are based on data describing noncarcinogenic threshold effects and are derived by dividing a NOAEL or LOAEL by the appropriate safety factors. HAs do not consider the carcinogenic risk that may be associated with a potential cancer-causing agent.

Table 4-1 presents available oral RfDs and other pertinent toxicity parameters for the noncarcinogenic effects of chemicals of concern. RfD values for this risk assessment were obtained from both U.S. EPA Health Effects Assessment Summary Tables (HEAST) and U.S. Public Health Service, Agency for Toxic Substances and Disease Registry (ATSDR), Toxicological Profiles.

4.2.2 Carcinogenic Effects

A toxicity value that quantitatively defines the dose-response relationship of a known or suspected carcinogen is called a slope factor. The slope factor (formerly labeled the carcinogenic potency factor) is an estimate of an upper bound lifetime probability of an individual developing cancer following long-term exposure to a potential carcinogen. Slope factors are usually expressed as the upper 95th percentile confidence limit of the slope of the dose-response curve and can be expressed as risk per unit concentration of the substance in the environmental medium of contact. The factors are derived by extrapolation assuming a low-dose linearity and applying a computer model to extrapolate from the relatively high doses administered to experimental animals (or the exposures observed in epidemiological studies) to the lower environmental exposure levels expected for humans.

In general, since the slope factor is the upper 95th percentile confidence limit on the probability of a response per unit intake of a chemical over a lifetime, there is only a five percent chance that the response will be greater than the estimated value. Also, because the dose-response curve is generally linear in the low-dose region, the accuracy of the slope factor is limited to the low-dose region.

Available carcinogenic slope factors toxicity parameters for the carcinogenic effects of chemicals of concern are summarized in Table 4-2. Carcinogenic slope factors for this risk assessment were obtained from HEAST, and from U.S. EPA's Integrated Risk Information System (IRIS).

5.0 EXPOSURE ASSESSMENT

This section summarizes the exposure assessment and is organized as follows:

- o 5.1 Development of Exposure Scenarios
- o 5.2 Calculation of Chronic Daily Intakes (CDIs)

For an actual exposure to occur or a potential exposure to be viable, there must be a completed exposure pathway. Exposure pathways describe how humans and environmental receptors are exposed to hazardous constituents. All of the components of the exposure pathway--namely, a source of the hazard, a completed pathway, and a receptor--are required.

For the development of the site-specific health-based cleanup levels, the source of the hazard are chemicals found in soils due to hazardous materials stored on the pad and in the aboveground storage tank. The pathways for exposure are ingestion, direct contact via dermal exposure, inhalation of vapors and inhalation of particulates entrained in dust from the on-site soils. Exposure circumstance can be defined as either occupational or residential exposure. For the Morton facility, the present exposure circumstance is occupational as it is an operating industrial facility. A future, potential exposure circumstance is residential. In addition, a future, potential exposure circumstance related to residential is a local youth trespassing on-site should the facility operations cease and the site become abandoned. Although the resident is the receptor with a greater degree of exposure than the trespassing youth, quantification of risk to the trespassing youth will be conducted to include all potential exposure scenarios.

Exposure to groundwater via ingestion or dermal contact by local residents or plant employees may also potentially be a future exposure route. Groundwater in the area as described in Section 2.3, is presently not used as a drinking water source.

5.1 DEVELOPMENT OF EXPOSURE SCENARIOS

The discussion below provides the assumptions used to calculate the exposure dose for the above receptors, the on-site industrial worker, the on site resident, and the trespassing youth.

5.1.1 Ingestion of Soils

Industrial Worker

This scenario assumes that an adult will work 250 days/year. The reasonable average exposure duration is estimated at 25 years, and the soil ingestion rate is 50 mg/episode. Average body weight of an adult male is 70 kg. Chemical concentration values are the maximum observed concentrations remaining in the facility soils, with the exception of pentachlorophenol and ethylene thiourea, as explained in Section 3.2.

On Site Resident - Carcinogens

This scenario assumes that an adult will occupy a home for 30 years and will live in that home for 350 days/year. The adult, having a body weight of 70 kg, will ingest 100 mg of soil per day. Chemical concentration values are the maximum observed concentrations remaining in the facility soils, with the exception of pentachlorophenol and ethylene thiourea, as explained in Section 3.2

On Site Resident - Noncarcinogens

This scenario assumes the most sensitive receptor is a child weighing 15 kg. The child will be exposed to constituents in soil for 6 years, 350 days per year, and will ingest 200 mg of soil per day. Chemical concentration values are the maximum observed concentrations remaining in facility soils, with the exception of pentachlorophenol and ethylene thiourea, as explained in Section 3.2.

Trespasser

This scenario assumes that an 11 to 17 year old youth will trespass on the site approximately once per week, or 52 days per year for 7 years. The soil ingestion rate during the visits is 100 mg/episode. Average body weight of the 11 to 17 year span is 52.4 kg (Snyder, 1975). Chemical concentration values are the maximum observed concentrations remaining in the

facility soils, with the exception of pentachlorophenol and ethylene thiourea, as explained in Section 3.2.

5.1.2 Dermal Contact

To calculate the absorbed dose when the following receptors are exposed to semi-volatile chemicals via dermal contact, a matrix interference factor of 15% is applied (Hawley, 1985). To conduct the absorbed dose calculation for all constituents in soils, a soil to skin adherence factor of 2.77 mg/cm^2 is used for the clay/silty-clay soils found at the site. Chemical-specific dermal absorption factors are used in calcualting the absorbed dose.

Industrial Worker

The same scenario as for ingestion is used: number of days of contact, duration of contact, body weight and chemical concentration. The industrial worker is expected to come in dermal contact with soils via his hands and arms. The skin surface area available for contact is therefore 3120 cm^2.

On Site Resident - Carcinogens

The same scenario as for ingestion is used: number of days of contact, duration of contact, body weight and chemical concentration. The adult is expected to come in dermal contact with soils via his hand and arms. The skin surface area available for contact is therefore 3120 cm^2.

On Site Resident - Noncarcinogen

The same scenario as for ingestion is used: number of days of contact, duration of contact, body weight and chemical concentration. The child is expected to come in dermal contact with soils via his hands and arms. The skin surface area available for contact is therefore 1510 cm^2.

Trespasser

The same scenario as for ingestion is used: number of days of contact, duration of contact, body weight and chemical concentration. The trespasser is expected to come in dermal

contact with soils via his hands and arms. The skin surface area available for contact is therefore 3120 cm^2.

5.2 CALCULATION OF CHRONIC DAILY INTAKES

Chronic Daily Intake (CDI) is the standardized measure of exposure dose used in calculating incremental health risks. The equation for calculating CDI takes slightly different forms based on the exposure pathway, but it always contains terms to account for average chemical concentration in transport media, rate of contact between receptor and transport media, transfer rate, receptor size, and exposure duration. Specific forms of the CDI equation required for the exposure scenarios identified above are:

Ingestion of Soils with Carcinogenic Chemicals

$$CDI = \frac{(C)(SIR)(EF)(ED)(K)(FI)}{(BW)(AT)}$$

Where:
- CDI = Chronic Daily Intake, mg/kg/day
- C = Constituent Concentration, mg/kg soil,
- SIR = Soil Ingestion Rate, mg/visit,
- EF = Number of Visits per year,
- FI = Fraction Ingested from Contaminant Source (unitless)
- ED = Number of years of exposure, years,
- BW = Body Weight, kg
- K = Conversion Factor (convert kg soil to mg/soil) (1×10^{-6})
- AT = Averaging time, days (70 years for carcinogens)

Ingestion of soils with Noncarcinogenic Chemicals

$$CDI = \frac{(C)(SIR)(EF)(FI)(K)(ED)}{(BW)(AT)}$$

- C = Constituent Concentration, mg/kg soil
- SIR = Soil Ingestion Rate, mg/visit
- EF = Number of visits per year
- FI = Fraction Ingested from Contaminant Source (unitless)
- K = Conversion Factor (convert kg soil to mg/soil)

(1×10^{-6})
ED = Exposure Duration, years
BW = Body Weight, kg
AT = Averaging time, days (Exposure duration)

Table 5-1 lists all assumptions used in calculating chronic daily intakes due to ingestion of soils for both industrial worker and trespasser receptors. Table 5-2 lists all assumptions used in calculating chronic daily intakes due to ingestion of soils for both the adult and child residential receptors.

Dermal Absorption from Soils with Carcinogenic Chemicals

$$CG - CDI = \frac{(C_i)(K)(SA)(AF)(ABS)(EF)(ED)(MI)}{(BW)\ (AT)}$$

CG - CDI = Dermal Chronic Daily Intake, mg/kg/day
C_i = Constituent concentration, mg/kg soil
SA = Skin area in contact with constituent, cm^2
AF = Skin Retention Rate, mg/cm^2
ED = Number of years of exposure, years
BW = Body weight, kg
EF = Exposure frequency, visits/year
ABS = Absorption factor (unitless)
K = Conversion factor (convert kg soil to mg/soil)
$(1 \times 10^{-6}$ kg/mg)
AT = Averaging time, days
(70 years for carcinogens)
MI = Matrix interference, 15% (Used only for semi-volatile constituents)

Dermal Absorption from Soils with Non-Carcinogenic Chemicals

$$CG - CDI = \frac{(C_i)(K)(SA)(AF)(ABS)(EF)(ED)(MI)}{(BW)(AT)}$$

C_i = Constituent concentration, mg/kg soil
SA = Skin area in contact with constituent, cm^2
AF = Skin Retention Rate, mg/cm^2

BW = Body weight, kg;
EF = Exposure frequency, visits/year
ABS = Absorption factor (unitless)
K = Conversion factor (convert kg soil to mg/soil) (1×10^{-6} kg/mg)
ED = Exposure duration, years
AT = Averaging time, days (exposure duration)
MI = Matrix interference, 15% (Used only for the semi-volatile constituents)

Table 5-3 lists all assumptions used in calculating chronic daily intakes due to dermal contact of soil for both industrial worker and trespasser receptors. Table 5-4 lists all assumptions used in calculating chronic daily intakes due to dermal contact of soil for both the adult and child residential receptors. Table 5-5 lists total chronic daily intakes from soils with carcinogenic chemicals for the industrial worker and the trespasser. Table 5-6 lists total chronic daily intakes from soils with noncarcinogenic chemicals for the industrial worker and the trespasser. Table 5-7 lists total chronic daily intakes from soils with carcinogenic chemicals for the adult resident. Table 5-8 lists total chronic daily intakes from soils with noncarcinogenic chemicals for the child resident.

5.3 Calculations of Vapor Emissions

Vapor emissions were calculated for constituents of concern that will volatilize and consist of the following:

Acetone
Benzene
Chloroform
Dichloroethane
Ethylbenzene
Ethylene thiourea
2-Butanone

Toluene
Trichloroethene
Xylenes, total

A box model was used to estimate off-gassing of volatiles in soils. Attachment A-1 details the vapor emission calculations and assumptions used.

5.4 Calculations of Particulate Emissions

Particulate emissions can be calculated for compounds that are expected to be present in the mobilized air particulates. For the Morton-Chicago plant, those constituents considered in the development of health-based cleanup levels consist of the semi-volatile compounds, which are the following:

Bis(2-ethylhexyl)phthalate
butyl benzyl phthalate
di-n-butyl phthalate
pentachlorophenol

Emission rates can be calculated for wind mobilization of respirable air particulates due to wind erosion and vehicular traffic. Ambient air concentrations can be estimated using these emission rates within the Hanna box model, which is the same as that used for the vapor off-gassing (Attachment A-1).

Hazard index and cancer risk calculations cannot be conducted for the Morton-Chicago plant because there are no established reference concentrations (RfCs) nor are there established inhalation slope factors for the above semi-volatile constituents. Therefore, other exposure routes presented in this RA will be considered in establishing cleanup concentrations for the semi-volatile constituents.

5.5 Groundwater Concentration Estimates

Groundwater concentration estimates were conducted for all chemicals of concern and appear in Attachment A-2. The results of the calculations are shown in Table 5-5.

6.0 RISK CHARACTERIZATION

This section presents the quantitative estimates of cancer risk and of potential health effects due to chronic exposure to all of the chemicals of concern in the site-specific exposure scenarios postulated in the exposure assessment. It combines the quantitative aspects of toxicity levels with the data presented in the exposure assessment section.

6.1 RISK CALCULATION PROCEDURES

Characterization of the health risks associated with the site is separated into two main categories based on health effects: cancer risks and noncancer health risks. Since cancer risk is considered to be present if exposure occurs at any level above zero, incremental risk values are estimated, i.e., the incremental risk faced by an exposed population over an unexposed group. For non-cancer health impacts, exposure levels (CDIs) are compared to reference doses (RfDs) to determine risk.

6.1.1 Cancer Risk Estimates

Cancer risk is stated in terms of additional cancer cases attributed to exposure to the suspect carcinogen at the estimated CDIs. Thus, a 1.0E-06 cancer risk would be equivalent to one additional cancer case expected in an exposed population of one million over that expected in an unexposed population over an exposure period of 70 years. According to the American Cancer Society, the American population faces a lifetime risk of one in three to one in four of contraction any kind of cancer due to any reason (dietary habits, smoking, radiation, occupational exposure, etc.).

Excess cancer risks are calculated using slope factors or carcinogenic potency factors developed by the U.S. EPA Cancer Assessment Group. They are 95 percent upper bound values of the slope of the dose-response curve derived from the results of animal studies, which conservatively reflect the dose-response relationship of the chemical. For low incremental cancer risk (below 1.0E-03), the excess risk is estimated by multiplying the slope factor (SF) for the particular constituent by the CDI estimated in the exposure assessment:

$$P \text{ (cancer risk)} = (SF)(CDI)$$

Cancer risk estimates were made for each carcinogenic chemical. In the absence of specific toxicological data related to the toxic behavior of mixed chemicals, the total cancer risk is assumed to be additive in accordance with the recommended guidelines (U.S. EPA, 1986). Therefore, total cancer risk (TCR) is the sum of the individual risk values:

$$TCR = P_1 + P_2 + ...P_i = (SF_1)(CDI_1) + (SF_2)(CDI_2) + ...(SF_i)(CDI_i)$$

The criterion used to evaluate carcinogenic health risks is a range of 1.0E-04 to 1.0E-07 incremental cancer risk with 1.0E-06 used as a point of departure before considering site-specific circumstances.

6.1.2 Noncancer Health Risk Estimates

Risk of a noncarcinogenic health impact occurring due to chronic exposure to a chemical is evaluated in terms of a hazard index. Hazard index (HI) is the ratio of the estimated exposure dose (Chronic Daily Intake) to the threshold chronic daily exposure level at which no adverse health effects are observed (reference dose or RfD):

$$HI = CDI/RfD$$

Noncancer health risks are also considered to be additive where exposure to multiple chemicals is possible. The equation for calculating risks from exposure to a mixture of chemicals is:

$$HI = CDI_1/RfD_1 + CDI_2/RfD_2 + ...CDI_i/RfD_i$$

An HI less than or equal to 1.0 indicates that health impacts are unlikely with a margin of safety; an index greater than 1.0 suggests a cause for concern. Integral to this procedure is the premise that there are no synergistic interactions among the constituents and that they all have the same chronic effects and mechanisms of action. This protocol is useful in evaluating the relative degree of hazard and is a conservative approach for risk characterization of a noncarcinogen. This approach also assumes that one exposure/week

frequency is sufficient to elicit the response, even though animal data are based on daily exposure via the diet.

6.2 QUANTITATIVE RISK ASSESSMENT FOR CARCINOGENS

The slope factors for the carcinogenic chemicals of concern were multiplied by appropriate CDIs for the four quantitative soil exposure scenarios developed in Section 5.0 to calculate individual and total incremental cancer risks listed in Table 6-1. For all exposure scenarios, total exposure was estimated as the combination of soil ingestion and absorption through dermal contact with soil. Because cancer risk is averaged over a lifetime, cancer risk estimates for the child were not conducted.

The total cancer risks (TCRs) for each alternative evaluated are:

	TCR for Worker, added occurrences	TCR for Trespasser, added occurrences
Site Soils	4.72E-07	4.22E-08

	TCR for Adult Resident, added occurrences
Site Soils	9.11E-07

The total cancer risk from inhalation of vapors containing constituents that are expected to volatilize, as calculated in Attachment A-1 is 3.9E-13.

Predicted groundwater concentrations shown in Table 5-9 can be compared to cancer risk level concentrations of 1.0E-06 to 1.0E-04, and appear in Table 6-3. The predicted groundwater concentrations are first compared to proposed and established MCLs, listed in Table 6-3. In so doing, none of the predicted constituent groundwater concentrations are above the constituent's MCL value. For constituents without MCL data, concentrations resulting in a cancer risk level of 1.0E-06 to 1.0E-04 are calculated using U.S.EPA guidance

(Federal Register, July 27, 1990). The predicted groundwater concentration for the carcinogenic constituent is then compared with the calculated concentrations resulting in a cancer risk level of 1.0E-06 to 1.0E-04. Of the carcinogenic constituents without a MCL value, the predicted groundwater concentration for ethylene thiourea results in a cancer risk of above 1.0E-04.

6.3 QUANTIFICATION OF HAZARD INDICES FOR CHEMICALS OF CONCERN

Hazard indices for the same four soil exposure scenarios as described above were calculated by dividing the CDI for each chemical by its reference dose (RfD) and then summing the individual HIs to get the total HI for each site area. As with calculation of TCRs, the HIs shown in Table 6-1 and Table 6-2 are the sum of soil ingestion and dermal contact exposures. The total hazard indices (THIs) are summarized below:

	THI for Worker, added occurrences	THI for Trespasser, added occurrences
Site Soils	.0565	.0160

	THI for Child Resident, added occurrences
Site Soils	.204

The total hazard index from inhalation of vapors as calculated in Attachment A-1 is 2.4E-10.

The predicted groundwater concentrations shown in Table 5-9 are first compared to proposed and established MCLs, listed in Table 6-3. In so doing, none of the predicted constituent groundwater concentrations are above the constituent's MCL value. The constituents without established MCLs can be compared to the constituents' RfD levels (Federal Register, July 27, 1990), also shown in Table 6-3. Of the constituents without established MCLs, none exceed their respective RfDs.

6.4 ASSUMPTIONS IN RISK ASSESSMENT PROCEDURES

The quantitative risk characterization described above has many built-in assumptions that are related to toxicological factors and the appraisal of exposure. A conservative approach has been taken to estimate the exposure levels and their duration and to characterize the hazards associated with the chemicals stored on-site. The important assumptions are itemized below.

Assumptions

- Carcinogenic potency is based on a 95 percent upper bound limit and assumes a linear response for low dose extrapolation from higher doses in animal studies, interspecies (animal to man) correlation based on body area, and the conditional probability that a chemical that exhibits carcinogenicity in animals will have the same health impact on humans. However, carcinogenic potency for benzene is based on human data.

- In the absence of specific information regarding synergistic or potentiating effects, the dose response for exposure to multiple chemicals is assumed to produce an additive response.

- For the chemicals that exhibit a threshold below which the adverse effect is not expected to occur, LOAELs or NOAELs are used to develop RfDs for chronic and subchronic exposure for the most appropriate exposure mode.

- Ingestion absorption rates are assumed to be 100% in calculating the intake dose. Dermal absorption rates are chemical specific in calculating the absorbed dose.

- The constituents are assumed to have infinite mass and the transport mechanisms are assumed to have reached equilibrium, i.e., the levels will not decrease due to exhaustion of the source and the levels will not reach a higher concentration.

- In quantifying exposure levels, the constituents are assumed to be uniformly distributed over the site to result in a uniform exposure level. This assumption of uniform distribution tends to greatly overestimate risk.

- Attenuation of the selected chemicals is not considered in the risk assessment.

- It is assumed that all receptors come in contact with soils via hands and arms, which is a conservative assumption. In addition, the trespassing youth's skin surface area available for contact is assumed to be equal to an adult's since set values for specific body parts skin surface areas for an 11 to 17 year old youth are not known to be established.

- In calculating absorbed doses when a receptor is exposed to semi-volatile chemicals in soils via dermal contact, a matrix interference factor of 15% is used (Hawley, 1985).

7.0 SUMMARY AND CONCLUSIONS

The risk characterization for exposure to soils via incidental ingestion and dermal contact indicates that for the chemicals of concern at the proposed cleanup levels, the cumulative hazard index is less than unity for all exposure receptors, the most sensitive of which is the child resident. The risk characterization indicates a cumulative increase in cancer risk of 4.72E-07 for the industrial worker and a cumulative increase in cancer risk of 4.22E-08 for the trespasser. The risk characterization also indicates a cumulative increase in cancer risk of 9.11E-07 for adult resident. All three exposure scenarios result in a cummulative cancer risk of less than 1.0E-06, which is a reference point for a level of conern. The constituents having the greatest contribution to the cancer risk are pentachlorophenol and methylene chloride.

The risk characterization also indicates that inhalation of vapors from soils, based on the calculated air concentration of each volatile constituent results in a total hazard index of 2.4E-10 and a total cancer risk of 3.9E-13. The resulting total hazard index and total cancer risk are well below their respective reference levels of concern of 1.0 and 1.0E-06.

Predicted groundwater concentrations for the chemicals of concern show that ethylene thiourea's concentration of 0.05 mg/kg, the method detection limit in the soil may pose a cancer risk of greater than 1.0E-04. However, past sampling activities at the site resulted in no detections of ethylene thiourea above the method detection limit in the on-site soils. In addition, ingestion of groundwater is strictly a potential future use consideration, since the potable water source for the area is presently Lake Michigan, and has been for almost 150 years.

The following lists the constituents and the proposed level for clean closure of the hazardous waste storage pad and the aboveground storage tank based on the preceding risk assessment:

Constituent	Cleanup Level (mg/kg)
Acetone	1.33
Benzene	0.57
Bis(2-ethylhexyl)phthalate	13.0
2-Butanone (Methyl Ethyl Ketone)	0.037
Butylbenzylphathalate	5.7
Chloroform	0.19
Di-n-butylphathalate	1.5
Ethylbenzene	59.9
Ethylene thiourea	0.05
Methylene chloride	0.804
Pentachlorophenol	1.6
Trichloroethene	0.005
Toluene	0.73
Total xylenes	57.0

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TABLE 3-1
CHEMICALS DETECTED AND LABORATORY METHODS USED DURING FACILITY ENVIRONMENTAL ASSESSMENT SOIL SAMPLING

CONSTITUENT	FREQUENCY OF[1] DETECTION	RANGE IN DETECTED CONCENTRATION[2] (mg/kg)
VOLATILE ORGANIC COMPOUNDS - SW846 EPA Method 8240		
CARBON DISULFIDE	7/19	.007 - 0.136
ACETONE	10/19	.064 - 1.33
METHYLENE CHLORIDE	4/19	.804 - 10.90
1,1-DICHLOROETHANE	1/19	.005
CIS-1,2-DICHLOROETHENE	1/19	.765
CHLOROFORM	8/19	.006 - .109
BENZENE	1/19	.083
TRICHLOROETHENE	1/19	.005
TOLUENE	13/19	.005 - .925
ETHYLBENZENE	14/18	.007 - 59.90
TOTAL XYLENES	3/3	.084 - 57.0
BASE/NEUTRAL/ACID TARGET COMPOUNDS - SW846 EPA METHOD 8270		
NAPHTHALENE	4/17	1 - 68
2-METHYLNAPHTHALENE	4/17	1 - 660
DIBENZOFURAN	1/17	18.0
PHENANTHRENE	2/17	2 - 9
FLUORANTHENE	1/17	1.0
PYRENE	2/17	6.0
BUTYLBENZYL PHTHALATE	3/17	9 - 110.0
BIS(2-ETHYLHEXYL)PHTHALATE	9/17	3 - 147.0
METALS - SW846 EPA METHOD 7060		
TOTAL ARSENIC	13/13	3.2 - 18.0

(1) Frequency of Detection - Number of samples in which the chemical was positively detected over the number of samples available.
(2) Lowest and highest concentration.

TABLE 3-2
CHEMICALS DETECTED AND LABORATORY METHODS USED DURING SOIL REMOVAL SAMPLING

CONSTITUENT	FREQUENCY OF[1] DETECTION	RANGE IN DETECTED[2] CONCENTRATION (mg/kg)
VOLATILE ORGANIC COMPOUNDS - SW846 EPA METHOD 8240		
Acetone	42/52	.012 - .440
2-Butanone	7/52	.022 - .037
Benzene	2/52	.036 - .57
Ethyl Benzene	4/52	.048 - .79
Methylene Chloride	30/52	.005 - .13
Toluene	7/52	.014 - .73
Total Xylenes	10/52	.01 - 4.7
BASE/NEUTRAL ACID TARGET COMPOUNDS - SW846 EPA METHOD 8270		
BIS(S-ETHYLHEXYL)PHTHALATE	30/52	.35 - 13
DI-N-BUTYLPHTHALATE	5/52	.40 - 1.5
NAPHTHALENE	6/52	.42 - 39
BUTYLBENZYL PHTHALATE	9/52	.38 - 5.7
2-METHYLNAPHTHALENE	9/52	.37 - 150
DIBENZO(A,H,) ANTHRACENE	1/52	.33
ANTHRACENE	3/52	1.7 - 24
BENZO(A)ANTHRACENE	3/52	1.4 - 24
BENZO(A)PYRENE	2/52	1.2 - 4.4
BENZO (B)FLUORANTHENE	3/52	1.8 - 34
BENZO(GHI)PYRLENE	2/52	.45 - .75
BENZO(K)FLUORANTHENE	2/52	.49 - 2.2
CHRYSENE	3/52	1.0 - 26
FLUORENE	3/52	1.0 - 26
INDENO(1,2,3-CD)PYRENE	2/52	.49 - 1.0
ACENAPHTHENE	1/52	1.4
FLUORANTHENE	3/52	.34 - 65
PHENANTHRENE	2/52	6.7 - 130
PYRENE	2/52	6.5 - 75
DIBENZOFURAN	2/52	1.0 - 18
DI-N-BUTYLPHTHALATE	4/52	.45 - 1.8

CONSTITUENT	FREQUENCY OF[1] DETECTION	RANGE IN DETECTED[2] CONCENTRATION (mg/kg)
METALS - SW846 EPA METHOD 7060		
Total Arsenic	50/52	1.8 - 9.6

(1) Frequency of Detection - Number of samples in which the chemical was positively detected over the number of samples available.
(2) Lowest and highest detected concentration.

TABLE 3-3
POLYNUCLEAR AROMATIC HYDROCARBONS
DETECTED IN SOILS

Naphthalene
2-Methylnaphthalene
Dibenzo(a,h)anthracene
Anthracene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)pyrene
Benzo(k)fluoranthene
Chrysene
Fluorene
Ideno(1,2,3-CD)pyrene
Ancenaphthene
Fluoranthene
Phenanthrene
Pyrene

TABLE 4-1
NONCARCINOGENIC EFFECTS TOXICITY PARAMETERS
MORTON INTERNATIONAL, INC.
CHICAGO PLANT

Target Compound List Constituent	Oral Reference Dose RfD (mg/kg/day)	Inhalation RfC (mg/kg/day)	Test Species in Study	Exposure Route	Uncertainty Factor		Reported Adverse (or Health) Effect	
			Oral RfD	Inhalation RfC	Oral RfD	Inhalation RfC	Oral RfD	Inhalation RfC
Acetone	1.0E-01+	NA	Rat/Gavage	NA	1000	NA	Inc. liver & kidney wt. nephrotoxicity	NA
Benzene	7.0E-04+	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl) phthalate	2.0E-02+	NA	Guinea Pig/Diet	NA	1000	NA	Inc. relative liver Wt.	NA
2-Butanone	5.0E-02+	9.0E-02+	Rat/Gavage	Rat/Inhal	1000	1000	Fetotoxicity	CNS
Butyl Benzyl Phthalate	2.0E-01+	NA	Rat/Diet	NA	1000	NA	Body wt. gain, testes, liver, kidney	NA
Chloroform	1.0E-02+	NA	Dog/Diet	NA	1000	NA	Liver lesions	NA
Di-n-Butyl Phthalate	1.0E-01+	NA	Rat/Diet	NA	1000	NA	Mortality	NA
Ethylbenzene	1.0E-01+	1+	Rat/Gavage	Rat,Rabbit/Inhal.	1000	300	Hepatoxicity & Nephrotoxicity	Developmental Toxicity
Ethylene Thiourea	8.0E-05**	NA	Rat/Diet	NA	NA	3000	Thyroid lesions	NA
Methylene Chloride	6.0E-02+	3.0+	Rat/Drinking Water	Rat/Inhal	100	100	Liver toxicity	NA
Pentachloro-phenol	3E-02	NA	Rat/Gavage	NA	100	NA	Fetotoxicity	NA
Toluene	2.0E-01+	2.0+	Rat/Gavage	Human/Inhal	1000	100	Changes in liver and kidney wts.	CNS effects, eyes & nose irritation

TABLE 4-1
NONCARCINOGENIC EFFECTS TOXICITY PARAMETERS
MORTON INTERNATIONAL, INC.
CHICAGO PLANT
(Continued)

Trichloro-ethene	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes, Total	2.0+	3E-01+	Rat/Gavage	Human/Inhal	100	100	Hyperactivity, dec body wt., Inc. mort @ higher dose	CNS effects nose & throat irritation

References & Notes:
+ = Parameters obtained from Health Effects Assessment Summary, Tables, Fiscal year - 1991 Annual
** = Parameters obtained from EPA's Integrated Risk Information System (IRIS), November 22, 1991
NA = Not Available

TABLE 4-2
CARCINOGENIC EFFECTS TOXICITY PARAMETERS
MORTON INTERNATIONAL, INC.
CHICAGO PLANT

Target Compound List Constituent	Oral Slope Factor CpF $(mg/kg/day)^{-1}$	Inhalation Slope Factor CpF $(mg/kg/day)^{-1}$	Test Species in Study	Exposure Route	Tumor Site/	Type
			Oral CpF	Inhalation CpF	Oral CpF	Inhal CpF
Acetone	Noncarcinogen	Noncarcinogen	NA	NA	NA	NA
Benzene (A)	2.9E-02++	2.9E-02++	Human/Inhal	Human/Inhal	Lukemia	Lukemia
Bis(2-ethylhexyl) phthalate(B2)	1.4E-02+	NA*	Mouse/Diet	NA*	Liver	NA*
2-Butanone	Noncarcinogen	NA	NA	NA	NA	NA
Butyl Benzyl Phthalate (C)	NA*	NA*	NA*	NA*	NA*	NA*
Chloroform (B2)	6.13E-03+	8.1E-02+	Mouse,Rat/ Drinking Water	Mouse/Gavage	Kidney	Liver
Di-n-Butyl Phthalate	Noncarcinogen	NA	NA	NA	NA	NA
Ethylbenzene	Noncarcinogen	NA	NA	NA	NA	NA
Ethylene thiourea (B2)	3.6E-02+	NA*	Rat	NA*	Thyroid	NA*
Methylene Chloride (B2)	7.5E-03+	4.7E-07+ (ug/m3)	Mouse/ Drinking Water	Mouse/Inhal	Liver	Lung, liver
Pentachloro-phenol	1.2E-01+	NA	Mouse/Diet	NA	Liver/adrenal circulatory system	NA

TABLE 4-2
CARCINOGENIC EFFECTS TOXICITY PARAMETERS
MORTON INTERNATIONAL, INC.
CHICAGO PLANT

Toluene	Noncarcinogen	NA	NA	NA	NA	NA
Trichloro ethene (B2)	1.1E-02+	1.7E-02+	Mouse/Gavage	Mouse/Inhal	Liver	Lung
Xylenes, Total	Noncarcinogen	NA	NA	NA	NA	NA

References & Notes:
++ = Parameters obtained from Agency of Toxic Substance and Disease Registry (ATSDR) Toxicologicol Profiles, U.S. Public Health Service
+ = Parameters taken from Health Effects Assessment Summary, Tables, Fiscal Year - 1991 Annual
NA = Not Applicable
NA*= Not Available

TABLE 5-1

ASSUMPTIONS USED IN EXPOSURE SCENARIOS ON MORTON-KILBOURN AVE. SITE
INGESTION OF SOILS, INDUSTRIAL WORKER AND TRESPASSER

PARAMETER		INDUSTRIAL WORKER	TRESPASSER
1.	Chemical Concentration In soil (mg/kg)	Health-based Cleanup Level	Health-based Cleanup Level
2.	Ingestion Rate (mg soil/day)	50	100
3.	Exposure Frequency (days/year)	250	52
4.	Exposure Duration (years)	25	7
5.	Body Weight (kg)	70	52.4
6.	Fraction Ingested From Contaminant Source (unitless)	1	1
7.	Conversion Factor	1.0E-06	1.0E-06
8.	Averaging Time Period (days)		
	Carcinogens (70 years)	25550	25550
	Non-Carcinogens (exposure duration)	9125	2555

TABLE 5-2

ASSUMPTIONS USED IN EXPOSURE SCENARIOS
ON MORTON-KILBOURN AVE. SITE
INGESTION OF SOILS, ONSITE RESIDENTS

PARAMETER		ADULT RESIDENT	CHILD RESIDENT
1.	Chemical Concentration In soil (mg-kg)	Health-based Cleanup Level	Health-based Cleanup Level
2.	Ingestion Rate (mg soil/day)	100	200
3.	Exposure Frequency (days/year)	350	350
4.	Exposure Duration (years)	30	6
5.	Body Weight	70	15
6.	Fraction Ingested From Contaminant Source (unitless)	1	1
7.	Conversion Factor (kg/mg)	1.0 E-06	1.0 E-06
8.	Averaging Time Period (days)		
	Carcinogens (70 years)	25550	25550
	Non-Carcinogens (exposure duration)	10950	2190

TABLE 5-3

ASSUMPTIONS USED IN EXPOSURE SCENARIOS ON MORTON-KILBOURN AVE. SITE
DERMAL CONTACT WITH SOILS, INDUSTRIAL WORKER AND TRESPASSER

PARAMETER		INDUSTRIAL WORKER	TRESPASSER
1.	Chemical Concentration In soil (mg/kg)	Health-based Cleanup Level	Health-based Cleanup Level
2.	Skin Surface Area Available for Contact (cm2/event)	3120	3120
3.	Exposure Frequency (days/year)	250	52
4.	Exposure Duration (years)	25	7
5.	Body Weight (kg)	70	52.4
6.	Soil to Skin Adherence Factor (mg/cm2)	2.77	2.77
7.	Absorption Factor (unitless)	Chemical Specific	Chemical Specific
8.	Conversion Factor (kg/mg)	1.0E-06	1.0E-06
9.	Averaging Time (days)		
	Carcinogens (70 years)	25550	25550
	Non-Carcinogens (exposure duration)	9125	2555

TABLE 5-4

ASSUMPTIONS USED IN EXPOSURE SCENARIOS
ON MORTON-KILBOURN AVE. SITE
DERMAL CONTACT WITH SOILS, ONSITE RESIDENT

PARAMETER		ADULT RESIDENT	CHILD RESIDENT
1.	Chemical Concentration In soil (mg-kg)	Health-based Cleanup Level	Health-based Cleanup Level
2.	Ingestion Rate (mg soil/day)	3120	1510
3.	Exposure Frequency (days/year)	350	350
4.	Exposure Duration (years)	30	6
5.	Body Weight	70	15
6.	Soil to Skin Adherence Factor (mg/cm2)	2.77	2.77
7.	Adsorption Factor (unitless)	Chemical Specific	Chemical Specific
8.	Conversion Factor (kg/mg)	1.0 E-06	1.0 E-06
9.	Averaging Time Period (days)		
	Carcinogens (70 years)	25550	25550
	Non-Carcinogens (exposure duration)	10950	2190

TABLE 3-5
ESTABLISHMENT OF HEALTH-BASED CLEANUP LEVELS
DIRECT CONTACT WITH SURFACE SOILS
CHRONIC DAILY INTAKES FROM SOILS WITH CARCINOGENIC CHEMICALS
INDUSTRIAL WORKER AND TRESPASSER RECEPTORS
MORTON INTERNATIONAL, INC.
CHICAGO, ILLINOIS

CAS No.	TARGET COMPOUND LIST CONSTITUENT	REFERENCE DOSE (RFD) (HEAST) (mg/kg/day)	CARCINOGENIC POTENCY FACTOR (CPF) (HEAST) (mg/kg/day)-1	TOTAL CDI CARC. WORKER (mg/kg/day)	TOTAL CDI CARC. TRESPASSER (mg/kg/day)
67-64-1	ACETONE	1.00E-01	0.00E+00	4.04E-05	3.16E-05
71-43-2	BENZENE (A)	7.00E-04	2.90E-02	1.34E-07	1.82E-08
117-81-7	bis(2-ETHYLHEXYL) PHTHALATE (B2)	2.00E-02	1.40E-02	6.39E-06	6.74E-07
78-93-3	2-BUTANONE (METH.ETH.KETONE)	5.00E-02	0.00E+00	1.12E-06	8.79E-08
85-68-7	BUTYL BENZYL PHTHALATE (C)	2.00E-01	0.00E+00	1.63E-05	1.36E-06
67-66-3	CHLOROFORM (B2)	1.00E-02	6.10E-03	3.31E-06	2.59E-07
84-74-2	DI-n-BUTYL PHTHALATE	1.00E-01	0.00E+00	4.34E-06	3.58E-07
100-41-4	ETHYLBENZENE	1.00E-01	0.00E+00	1.82E-03	1.42E-04
96-45-7	ETHYLENE THIOUREA (B2)	8.00E-05	3.60E-02	1.52E-06	1.19E-07
75-09-2	METHYLENE CHLORIDE (B2)	6.00E-02	7.50E-03	2.44E-05	1.91E-06
87-86-5	PENTACHLOROPHENOL (B2)	3.00E-02	1.20E-01	1.00E-06	9.99E-08
108-88-3	TOLUENE	2.00E-01	0.00E+00	2.22E-05	1.74E-06
79-01-6	TRICHLOROETHENE (B2)	0.00E+00	1.10E-02	3.86E-08	3.07E-09
1330-20-7	TOTAL XYLENES	2.00E+00	0.00E+00	4.44E-05	4.23E-06

TABLE 3-6
ESTABLISHMENT OF HEALTH-BASED CLEANUP LEVELS
DIRECT CONTACT WITH SURFACE SOILS
CHRONIC DAILY INTAKES FROM SOILS WITH NONCARCINOGENIC CHEMICALS
INDUSTRIAL WORKER AND TRESPASSER RECEPTORS
MORTON INTERNATIONAL, INC.
CHICAGO, ILLINOIS

CAS No.	TARGET COMPOUND LIST CONSTITUENT	REFERENCE DOSE (RfD) (HEAST) (mg/kg/day)	CARCINOGENIC POTENCY FACTOR (CPF) (HEAST) (mg/kg/day)-1	TOTAL CDI NONCARC. WORKER (mg/kg/day)	TOTAL CDI NONCARC. TRESPASSER (mg/kg/day)
67-64-1	ACETONE	1.00E-01	0.00E+00	1.13E-04	3.16E-05
71-43-2	BENZENE (A)	7.00E-04	2.90E-02	3.75E-07	1.82E-07
117-81-7	bis(2-ETHYLHEXYL) PHTHALATE (B2)	2.00E-02	1.40E-02	1.79E-05	6.74E-06
78-93-3	2-BUTANONE (METH.ETH.KETONE)	5.00E-02	0.00E+00	3.15E-06	8.79E-07
85-68-7	BUTYL BENZYL PHTHALATE (C)	2.00E-01	0.00E+00	4.62E-05	1.36E-05
67-66-3	CHLOROFORM (B2)	1.00E-02	6.10E-03	9.27E-06	2.59E-06
84-74-2	DI-n-BUTYL PHTHALATE	1.00E-01	0.00E+00	1.21E-05	3.58E-06
100-41-4	ETHYLBENZENE	1.00E-01	0.00E+00	5.09E-03	1.42E-03
96-45-7	ETHYLENE THIOUREA (B2)	8.00E-05	3.60E-02	4.25E-06	1.19E-06
75-09-2	METHYLENE CHLORIDE (B2)	6.00E-02	7.50E-03	6.84E-05	1.91E-05
87-86-5	PENTACHLOROPHENOL (B2)	3.00E-02	1.20E-01	2.81E-06	9.99E-07
108-88-3	TOLUENE	2.00E-01	0.00E+00	6.21E-05	1.74E-05
79-01-6	TRICHLOROETHENE (B2)	0.00E+00	1.10E-02	1.08E-07	3.07E-08
1330-20-7	TOTAL XYLENES	2.00E+00	0.00E+00	1.24E-04	4.23E-05

TABLE 5-7
ESTABLISHMENT OF HEALTH-BASED CLEANUP LEVELS
DIRECT CONTACT WITH SURFACE SOILS
CHRONIC DAILY INTAKES FROM SOILS WITH CARCINOGENIC CHEMICALS
ONSITE RESIDENTIAL RECEPTOR
MORTON INTERNATIONAL, INC.
CHICAGO, ILLINOIS

CAS No.	TARGET COMPOUND LIST CONSTITUENT	REFERENCE DOSE (RfD) (HEAST) (mg/kg/day)	CARCINOGENIC POTENCY FACTOR (CPF) (HEAST) (mg/kg/day)-1	CONSTITUENT MAX.OBSERVED CONCENTRATION (mg/kg)	TOTAL CDI CARC. ADULT (mg/kg/day)
67-64-1	ACETONE	1.00E-01	0.00E+00	1.33E+00	6.83E-05
71-43-2	BENZENE (A)	7.00E-04	2.90E-02	5.70E-01	3.92E-07
117-81-7	bis(2-ETHYLHEXYL) PHTHALATE (B2)	2.00E-02	1.40E-02	1.30E+01	1.46E-05
78-93-3	2-BUTANONE (METH.ETH.KETONE)	5.00E-02	0.00E+00	3.70E-02	1.90E-06
85-68-7	BUTYL BENZYL PHTHALATE (C)	2.00E-01	0.00E+00	5.70E+00	2.94E-05
67-66-3	CHLOROFORM (B2)	1.00E-02	6.10E-03	1.09E-01	5.59E-06
84-74-2	DI-n-BUTYL PHTHALATE	1.00E-01	0.00E+00	1.50E+00	7.73E-05
100-41-4	ETHYLBENZENE	1.00E-01	0.00E+00	5.99E+01	3.07E-03
96-45-7	ETHYLENE THIOUREA (B2)	8.00E-05	3.60E-02	5.00E-02	2.57E-06
75-09-2	METHYLENE CHLORIDE (B2)	6.00E-02	7.50E-03	8.04E-01	4.13E-05
87-86-5	PENTACHLOROPHENOL (B2)	3.00E-02	1.20E-01	1.60E+00	2.16E-06
108-88-3	TOLUENE	2.00E-01	0.00E+00	7.30E-01	3.75E-05
79-01-6	TRICHLOROETHENE (B2)	0.00E+00	1.10E-02	5.00E-03	6.64E-08
1330-20-7	TOTAL XYLENES	2.00E+00	0.00E+00	5.70E+01	9.13E-05

TABLE 3-8
ESTABLISHMENT OF HEALTH-BASED CLEANUP LEVELS
DIRECT CONTACT WITH SURFACE SOILS
CHRONIC DAILY INTAKES FROM SOILS WITH NONCARCINOGENIC CHEMICALS
ONSITE RESIDENTIAL RECEPTOR
MORTON INTERNATIONAL, INC.
CHICAGO, ILLINOIS

CAS No.	TARGET COMPOUND LIST CONSTITUENT	REFERENCE DOSE (RfD) (HEAST) (mg/kg/day)	CARCINOGENIC POTENCY FACTOR (CPF) (HEAST) (mg/kg/day)-1	CONSTITUENT MAX.OBSERVED CONCENTRATION (mg/kg)	TOTAL CDI NONCARC. CHILD (mg/kg/day)
67-64-1	ACETONE	1.00E-01	0.00E+00	1.33E+00	3.73E-04
71-43-2	BENZENE (A)	7.00E-04	2.90E-02	5.70E-01	7.59E-06
117-81-7	bis(2-ETHYLHEXYL) PHTHALATE (B2)	2.00E-02	1.40E-02	1.30E+01	2.03E-04
78-93-3	2-BUTANONE (METH.ETH.KETONE)	5.00E-02	0.00E+00	3.70E-02	1.04E-05
85-68-7	BUTYL BENZYL PHTHALATE (C)	2.00E-01	0.00E+00	5.70E+00	2.10E-04
67-66-3	CHLOROFORM (B2)	1.00E-02	6.10E-03	1.09E-01	3.05E-05
84-74-2	DI-n-BUTYL PHTHALATE	1.00E-01	0.00E+00	1.50E+00	5.53E-05
100-41-4	ETHYLBENZENE	1.00E-01	0.00E+00	5.99E+01	1.68E-02
96-45-7	ETHYLENE THIOUREA (B2)	8.00E-05	3.60E-02	5.00E-02	1.40E-05
75-09-2	METHYLENE CHLORIDE (B2)	6.00E-02	7.50E-03	8.04E-01	2.25E-04
87-86-5	PENTACHLOROPHENOL (B2)	3.00E-02	1.20E-01	1.60E+00	2.69E-05
108-88-3	TOLUENE	2.00E-01	0.00E+00	7.30E-01	2.05E-04
79-01-6	TRICHLOROETHENE (B2)	0.00E+00	1.10E-02	5.00E-03	3.98E-07
1330-20-7	TOTAL XYLENES	2.00E+00	0.00E+00	5.70E+01	1.03E-03

TABLE 5-9
PREDICTED GROUNDWATER CONCENTRATIONS
MORTON INTERNATIONAL, INC.
CHICAGO, IL.

Constituent	C_s (mg/Kg)	K_d (ml/g)	C_p (mg/l)	Predicted Water Concentration (mg/l)
Benzene	0.57	3.33	0.17	0.005
Bis(2-ethylhexyl) phthalate	28.0	2,422	0.012	0.0004
Butyl benzyl phthalate	110.0	1,573	0.07	0.002
Di-n-butyl phthalate	1.8	6,970	0.0003	0.00001
2-Butanone	0.037	1.36	0.03	0.0009
Ethylbenzene	59.9	34.84	1.72	0.05
Toluene	0.925	20.48	0.05	0.002
Xylenes	57.0	44.88	1.27	0.04
Pentachlorophenol	1.6	3,811	0.0004	0.00001
Ethylene thiourea	0.05	0.01	5.00	0.15
Acetone	0.44	0.72	0.61	0.02
Dibenzofuran	18	--	--	--
Methylene chloride	0.804	4.56	0.18	0.006
Chloroform	0.109	11.24	0.01	0.003
Trichloroethene	0.005	18.8	0.0003	0.00001

TABLE 5-1
ESTABLISHMENT OF HEALTH-BASED CLEANUP LEVELS
DIRECT CONTACT WITH SURFACE SOILS
CANCER RISK AND HAZARD INDEX ESTIMATES
INDUSTRIAL WORKER AND TRESPASSER RECEPTORS
MORTON INTERNATIONAL, INC.
CHICAGO, ILLINOIS

CAS No.	TARGET COMPOUND LIST CONSTITUENT	REFERENCE DOSE (RFD) (HEAST) (mg/kg/day)	CARCINOGENIC POTENCY FACTOR (CPF) (HEAST) (mg/kg/day)-1	HAZARD INDEX WORKER (dimensls)	HAZARD INDEX TRESPASSER (dimensls)	CANCER RISK WORKER (dimensls)	CANCER RISK TRESPASSER (dimensls)
67-64-1	ACETONE	1.00E-01	0.00E+00	1.13E-03	3.16E-04	0.00E+00	0.00E+00
71-43-2	BENZENE (A)	7.00E-04	2.90E-02	5.36E-04	2.60E-04	3.89E-09	5.87E-10
117-81-7	bis(2-ETHYLHEXYL) PHTHALATE (B2)	2.00E-02	1.40E-02	8.95E-04	3.37E-04	8.95E-08	9.44E-09
78-93-3	2-BUTANONE (METH.ETH.KETONE)	5.00E-02	0.00E+00	6.29E-05	1.76E-05	0.00E+00	0.00E+00
85-68-7	BUTYL BENZYL PHTHALATE (C)	2.00E-01	0.00E+00	2.31E-04	6.80E-05	0.00E+00	0.00E+00
67-66-3	CHLOROFORM (B2)	1.00E-02	6.10E-03	9.27E-04	2.59E-04	2.02E-08	1.58E-09
84-74-2	DI-n-BUTYL PHTHALATE	1.00E-01	0.00E+00	1.21E-04	3.58E-05	0.00E+00	0.00E+00
100-41-4	ETHYLBENZENE	1.00E-01	0.00E+00	5.09E-02	1.42E-02	0.00E+00	0.00E+00
96-45-7	ETHYLENE THIOUREA (B2)	8.00E-05	3.60E-02	0.00E+00	0.00E+00	5.47E-08	4.28E-09
75-09-2	METHYLENE CHLORIDE (B2)	6.00E-02	7.50E-03	1.14E-03	3.19E-04	1.83E-07	1.43E-08
87-86-5	PENTACHLOROPHENOL (B2)	3.00E-02	1.20E-01	9.37E-05	3.33E-05	1.21E-07	1.20E-08
108-88-3	TOLUENE	2.00E-01	0.00E+00	3.10E-04	8.68E-05	0.00E+00	0.00E+00
79-01-6	TRICHLOROETHENE (B2)	0.00E+00	1.10E-02	0.00E+00	0.00E+00	4.25E-10	3.38E-11
1330-20-7	TOTAL XYLENES	2.00E+00	0.00E+00	6.21E-05	2.11E-05	0.00E+00	0.00E+00
				5.65E-02	1.60E-02	4.72E-07	4.22E-08

TABLE 5-2
ESTABLISHMENT OF HEALTH-BASED CLEANUP LEVELS
DIRECT CONTACT WITH SURFACE SOILS
CANCER RISK AND HAZARD INDEX ESTIMATES
ONSITE RESIDENTIAL SCENARIO
MORTON INTERNATIONAL, INC.
CHICAGO, ILLINOIS

CAS No.	TARGET COMPOUND LIST CONSTITUENT	REFERENCE DOSE (RFD) (HEAST) (mg/kg/day)	CARCINOGENIC POTENCY FACTOR (CPF) (HEAST) (mg/kg/day)-1	CONSTITUENT MAX.OBSERVED CONCENTRATION (mg/kg)	HAZARD INDEX CHILD (dimensls)	CANCER RISK ADULT (dimensls)
67-64-1	ACETONE	1.00E-01	0.00E+00	1.33E+00	3.73E-03	0.00E+00
71-43-2	BENZENE (A)	7.00E-04	2.90E-02	5.70E-01	1.08E-02	1.14E-08
117-81-7	bis(2-ETHYLHEXYL) PHTHALATE (B2)	2.00E-02	1.40E-02	1.30E+01	1.01E-02	2.04E-07
78-93-3	2-BUTANONE (METH.ETH.KETONE)	5.00E-02	0.00E+00	3.70E-02	2.07E-04	0.00E+00
85-68-7	BUTYL BENZYL PHTHALATE (C)	2.00E-01	0.00E+00	5.70E+00	1.05E-03	0.00E+00
67-66-3	CHLOROFORM (B2)	1.00E-02	6.10E-03	1.09E-01	3.05E-03	3.41E-08
84-74-2	DI-n-BUTYL PHTHALATE	1.00E-01	0.00E+00	1.50E+00	5.53E-04	0.00E+00
100-41-4	ETHYLBENZENE	1.00E-01	0.00E+00	5.99E+01	1.68E-01	0.00E+00
96-45-7	ETHYLENE THIOUREA (B2)	8.00E-05	3.60E-02	5.00E-02	0.00E+00	9.24E-08
75-09-2	METHYLENE CHLORIDE (B2)	6.00E-02	7.50E-03	8.04E-01	3.75E-03	3.09E-07
87-86-5	PENTACHLOROPHENOL (B2)	3.00E-02	1.20E-01	1.60E+00	8.96E-04	2.59E-07
108-88-3	TOLUENE	2.00E-01	0.00E+00	7.30E-01	1.02E-03	0.00E+00
79-01-6	TRICHLOROETHENE (B2)	0.00E+00	1.10E-02	5.00E-03	0.00E+00	7.30E-10
1330-20-7	TOTAL XYLENES	2.00E+00	0.00E+00	5.70E+01	5.17E-04	0.00E+00
					2.04E-01	9.11E-07

TABLE 6-3
REFERENCE DATA FOR CONSTITUENTS IN GROUNDWATER
MORTON INTERNATIONAL, INC.
CHICAGO, IL

	MCL (mg/l)	RfD Level (mg/l)	Cancer Risk at 10^{-6} - 10^{-4} Level (mg/l)	Cancer Group
Benzene	0.005	--	--	A
Bis(2-ethylhexyl)phthalate	0.004[a]	--	0.0025-0.25	B2
Butylbenzyl phthalate	0.1[a]	7.0	--	--
Di-n-butyl phthalate	NA[b]	3.5	--	--
2-Butanone	NA	1.75	--	--
Ethyl benzene	0.7	--	--	--
Toluene	1.0	--	--	--
Xylenes	10.0	--	--	--
Pentachlorophenol	0.001	--	--	B2
Ethylene thiourea	NA	--	0.0010-0.10	B2
Acetone	NA	3.5	--	--
Dibenzofuran	NA	--	--	--
Methylene chloride	0.005	--	--	B2
Chloroform	0.1	--	--	B2
Trichloroethene	0.005	--	--	B2

[a] Proposed MCL Values
[b] Not Available

ATTACHMENT A-1

VAPOR EMISSION CALCULATIONS

Vapor Emission Calculations are conducted only for constituents of concern that will volatilize and consist of the following:

Acetone
Benzene
Chloroform
Dichloroethane
Ethylbenzene
Ethylene Thiourea
2-Butanone
Toluene
Trichloroethene
Xylenes, Total

A number of models have been developed for estimating air emission from soil. The model described by Shen (1982) was used to estimate the air emission rates from soils at the Morton-Chicago plant. The model estimates volatilization as a function of chemical and physical properties of the material and the properties of the soil.

The air-related fate of volatile organic chemicals is dependant upon soil conditions. Highly organic soils retard diffusion and mass transport because of the sorptive interactions between the soil particles and organics. Highly porous and dry soils have a higher diffusion rate because there is more air space through which the organics can move. The soil porosity at the Morton-Chicago plant was assumed to be 0.35.

The following calculations demonstrate vapor emissions from volatile constituents in soils at the Morton-Chicago plant:

The concentration of a contaminant released to the air spaces within the soil is defined as:

$$C_{sa} = \frac{C_i P_i MW_i}{RT}$$

Where

C_{sa} = concentration in air spaces of soil (g/cm^3),

C_i = Concentration in the soil (weight fraction) (mg/mg),

P_i = vapor pressure (mm Hg),

MW_i = molecular weight (g/mole),

R = gas constant (6.24 x 10^4 cm^3-mm Hg/mol-^{0}x), and

T = absolute temperature (298°K).

The emission rate from the soil is calculated by

$$E_i = \frac{C_{sa} D_i A \, O_T^{4/3}}{Z}$$

Where

E_i = emission rate of compound (g/sec)

D_i = diffusion coefficient (cm^2/sec) (See Table A-1)

A = exposed area

O_T = total soil porosity

z = effective depth of soil cover

Table A-1 presents the chemical and physical properties of the volatile organic compounds that are used in the model.

The emission model predicts the rate at which a material diffuses through the soil to the surface. Once the volatile chemicals are released, they will be transported downwind to the potential receptors. The emission rate calculated above can be used in an atmospheric transport model to predict the concentration at the downwind receptors. A simple box model is used for the Morton-Chicago Plant instead of a Gussian-type dispersion model because the downwind receptors are assumed to be less than one-eighth (e.g., industrial worker, site trespasser, on-site resident) of a mile from the site.

The box model adapted from Hanna et al. (1982) assumes that there are no reductions in concentrations as a result of meterological effectsd (e.g., dispersion) or topographical features (e.g., trees and shrubs). These assumptions are valid for the Morton-Chicago plant. The average concentration of each contaminant in the air is calculated using the emission rate, E_i (calculated above), as follows:

$$C_{air} = \frac{E_i}{(r)\,(U)\,(L)}$$

Where

r = atmospheric mixing zone

U = average wind speed

L = length of soil area

The cancer risk for each chemical can be calculated as follows:

$$\text{Cancer Risk} = (\text{Dose})\ (\text{Slope Factor})$$
$$= C_{air} \times \frac{20m^3}{day} \times \frac{1}{kg} \quad (\text{Slope Factor})$$

The hazard index for each chemical can be calculated as follows:

$$\text{Hazard Index} = \frac{C_{air}}{RfC}$$

A summary of all the assumptions used in the above calculations are the following:

- The diffusion coefficient of methylene chloride was estimated from chloroethane using:

  $$D_i = D^1 \frac{MW^1}{MW_i}$$

  Where, D_i = Diffusion coefficient of the compound to be estimated from known D^1

  D^1 = Diffusion coefficient of a compound that can be found in Table A-1, the molecular weight and atomic diffusion volume of which are close to that of the unknown.

  MW^1 = molecular weight of the selected compound D^1

  MW_i = molecular weight of the compound to be estimated.

- The temperature selected was that of a warm day value, 30°C.
- Emission area is assumed to be one acre, which considers the buildings on the facility.
- Total soil porosity used in 0.35 for compacted soil.
- The contaminant is in the water fraction of the soil. The moisture content used is a 20% average. The moisture content was obtained from past soil sampling at the facility.
- Depth of soil cover is assumed to be 3 feet.
- The box model assumes no dispersion.
- Atmospheric data was obtained from local climatological data (NOAA, 1990).
- Hazard index and cancer risk calculations were conducted only for those constituents that have established reference concentrations or inhalation slope factors.

TABLE A-1

DIFFUSION COEFFICIENTS OF SELECTED ORGANIC COMPOUNDS

Compound	Formula	Molecular Weight	Atomic Diffusion Volume	Diffusion coefficients (cm^2/sec) at 10°C	at 30°C	at 50°C
Acetone	C_3H_6O	58	56.86	.09899	.0930	.12223
Benzene	C_6H_6	78	90.88	.08195	.09234	.10327
Chloroethane	C_2H_5Cl	85	62.40	.09780	.11031	.12338
Chloroform	$CHCl_3$	120	78.80	.08348	.09404	.10517
Dichloroethane	$C_2H_4Cl_2$	99	75.98	.08557	.09843	.10784
Ethylbenzene	C_8H_{10}	106	151.80	.06274	.07070	.07906
Methyl Ethyl Ketone	C_4H_8O	72	87.32	.08417	.09485	.10807
Tetrachloroethane	$C_2H_2Cl_4$	155	1143.96	.05835	.07729	.08843
Toluene	C_7H_8	92	111.14	.07387	.05301	.00285
Xylene	C_5H_{10}	108	131.50	.08742	.07587	.08495

ATTACHMENT A-2

GROUNDWATER CONCENTRATION ESTIMATES

The Vertical and Horizontal Spread Model (VHS) was developed by the U.S. EPA to be applied in predicting the maximum concentration of the diluted chemicals of potential concern at a compliance point (receptor well). The VHS model considers:

1) the generation of a leachate from the waste,
2) the migration of the leachate to an underlying groundwater aquifer at the site; and,
3) the potential migration of groundwater in the impacted aquifer to the point of compliance (i.e., a receptor drilling water well).

The following equations are applied:

Using $C_s = (K_d)(C_p)$ Equation (1)

Where, C_s = soil concentration (mg/kg)

C_p = concentration in the leachate (mg/l)

K_d = soil/water equilibrium partition coefficient (ml/g)

Also, $K_d = (Koc)(foc)$ Equation (1A)

Where, K_{oc} = water/organic carbon equilibrium partition coefficient (ml/g), calculated for each chemical of concern (U.S. EPA, October 1989).

f_{oc} = fraction orgainic carbon in soil (unit less)

Solving for Cp in Equation (1) above:

$C_p = C_s/K_d$ Equation (2)

Where, C_s = is the measured concentration in soil

f_{oc} = is given as 0.04 for silty clay soil

Using Equation (1A) and the given f_{oc} value of 0.04, K_d can be calculated for each chemical of concern. By using Equation (2), C_p (or the concentration of each constituent in the leachate) may be determined. The predicted leachate concentration of the organic constituents in groundwater can then be calculated by applying the attenuation factor. For the Morton-Chicago plant, the maximum attenuation factor of 32.31 was used.

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APPENDIX B

ORIGINAL PART A APPLICATION

AND APPROVED REVISIONS

Please print or type with ELITE type *(12 characters/inch)* in the unshaded areas only.

Form Approved OMB No. 158-S79010
GSA No. 0246-EPA-OT

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

NOTIFICATION OF HAZARDOUS WASTE ACTIVITY

INSTRUCTIONS: If you received a preprinted label, affix it in the space at left. If any of the information on the label is incorrect, draw a line through it and supply the correct information in the appropriate section below. If the label is complete and correct, leave Items I, II, and III below blank. If you did not receive a preprinted label, complete all items. "Installation" means a single site where hazardous waste is generated, treated, stored and/or disposed of, or a transporter's principal place of business. Please refer to the INSTRUCTIONS FOR FILING NOTIFICATION before completing this form. The information requested herein is required by law *(Section 3010 of the Resource Conservation and Recovery Act).*

INSTALLATION'S EPA I.D. NO.	ILD00018721~~1~~ changed to ILD096787049
I. NAME OF INSTALLATION	~~VENTRON CORPORATION~~
II. INSTALLATION MAILING ADDRESS	1645 S KILBOURNE CHICAGO, IL 60623
III. LOCATION OF INSTALLATION	1645 S KILBOURNE CHICAGO, IL 60623

DETACH

FOR OFFICIAL USE ONLY

COMMENTS: C

INSTALLATION'S EPA I.D. NUMBER	APPROVED	DATE RECEIVED (yr., mo., & day)
S F 1 T/A C 1		

I. NAME OF INSTALLATION

THIOKOL CORPORATION/VENTRON DIVISION

II. INSTALLATION MAILING ADDRESS

STREET OR P.O. BOX: 3

CITY OR TOWN	ST.	ZIP CODE
4		

III. LOCATION OF INSTALLATION

STREET OR ROUTE NUMBER: 5

CITY OR TOWN	ST.	ZIP CODE
6		

IV. INSTALLATION CONTACT

NAME AND TITLE *(last, first, & job title)*	PHONE NO. *(area code & no.)*
2 OPRE JAMES PLANT MANAGER	312.521.7000

V. OWNERSHIP

A. NAME OF INSTALLATION'S LEGAL OWNER: 8 THIOKOL CORPORATION

B. TYPE OF OWNERSHIP *(enter the appropriate letter into box)*

F = FEDERAL
M = NON-FEDERAL

M

VI. TYPE OF HAZARDOUS WASTE ACTIVITY *(enter "X" in the appropriate box(es))*

- [X] A. GENERATION
- [ ] B. TRANSPORTATION *(complete item VII)*
- [X] C. TREAT/STORE/DISPOSE
- [ ] D. UNDERGROUND INJECTION

VII. MODE OF TRANSPORTATION *(transporters only – enter "X" in the appropriate box(es))*

- [ ] A. AIR
- [ ] B. RAIL
- [ ] C. HIGHWAY
- [ ] D. WATER
- [ ] E. OTHER *(specify)*:

VIII. FIRST OR SUBSEQUENT NOTIFICATION

Mark "X" in the appropriate box to indicate whether this is your installation's first notification of hazardous waste activity or a subsequent notification. If this is not your first notification, enter your Installation's EPA I.D. Number in the space provided below.

- [X] A. FIRST NOTIFICATION
- [ ] B. SUBSEQUENT NOTIFICATION *(complete item C)*

C. INSTALLATION'S EPA I.D. NO.

IX. DESCRIPTION OF HAZARDOUS WASTES

Please go to the reverse of this form and provide the requested information.

I.D. – FOR OFFICIAL USE ONLY

W

IX. DESCRIPTION OF HAZARDOUS WASTES *(continued from front)*

A. HAZARDOUS WASTES FROM NON–SPECIFIC SOURCES. Enter the four–digit number from 40 CFR Part 261.31 for each listed hazardous waste from non–specific sources your installation handles. Use additional sheets if necessary.

1	2	3	4	5	6
7	8	9	10	11	12

B. HAZARDOUS WASTES FROM SPECIFIC SOURCES. Enter the four–digit number from 40 CFR Part 261.32 for each listed hazardous waste from specific industrial sources your installation handles. Use additional sheets if necessary.

13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30

C. COMMERCIAL CHEMICAL PRODUCT HAZARDOUS WASTES. Enter the four–digit number from 40 CFR Part 261.33 for each chemical substance your installation handles which may be a hazardous waste. Use additional sheets if necessary.

31 P090	32	33	34	35	36
37	38	39	40	41	42
43	44	45	46	47	48

D. LISTED INFECTIOUS WASTES. Enter the four–digit number from 40 CFR Part 261.34 for each listed hazardous waste from hospitals, veterinary hospitals, medical and research laboratories your installation handles. Use additional sheets if necessary.

49	50	51	52	53	54

E. CHARACTERISTICS OF NON–LISTED HAZARDOUS WASTES. Mark "X" in the boxes corresponding to the characteristics of non–listed hazardous wastes your installation handles. *(See 40 CFR Parts 261.21 – 261.24.)*

- [X] 1. IGNITABLE (D001)
- [ ] 2. CORROSIVE (D002)
- [ ] 3. REACTIVE (D003)
- [X] 4. TOXIC (D000)

X. CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

SIGNATURE	NAME & OFFICIAL TITLE *(type or print)*	DATE SIGNED
James E. Opre	James E. Opre, Plant Manager	8/14/80

Please print or type in the unshaded areas only
(fill-in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved OMB No. 158-R0175

FORM 1 GENERAL

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER: F ILD096787049

LABEL ITEMS

I. EPA I.D. NUMBER	ILD096787049
III. FACILITY NAME	Morton Thiokol, Inc. Ventron Division
V. FACILITY MAILING ADDRESS	1645 S. Kilbourn Avenue Chicago, IL 60623
VI. FACILITY LOCATION	1645 S. Kilbourn Avenue Chicago, IL 60623

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI *(except VI-B which must be completed regardless)*. Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED
A. Is this facility a **publicly owned treatment works** which results in a **discharge** to **waters of the U.S.**? (FORM 2A)		X	
C. Is this a facility which currently results in discharges to **waters of the U.S.** other than those described in A or B above? (FORM 2C)		X	
E. Does or will this facility treat, store, or dispose of **hazardous wastes**? (FORM 3)	X		X
Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X	
I. Is this facility a proposed **stationary source** which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED
B. Does or will this facility *(either existing or proposed)* include a **concentrated animal feeding operation** or **aquatic animal production facility** which results in a **discharge** to **waters of the U.S.**? (FORM 2B)		X	
D. Is this a proposed facility *(other than those described in A or B above)* which will result in a **discharge** to **waters of the U.S.**? (FORM 2D)		X	
F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
J. Is this facility a proposed **stationary source** which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP MORTON THIOKOL INC., VENTRON DIVISION

IV. FACILITY CONTACT

A. NAME & TITLE *(last, first, & title)*	B. PHONE *(area code & no.)*
2 OPRE JAMES PLANT MANAGER	312 521 7000

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX: 3 1645 S KILBOURN AVENUE

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 CHICAGO	IL	60623

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER: 5 1645 S KILBOURN AVENUE

B. COUNTY NAME: COOK

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE *(if known)*
6 CHICAGO	IL	60623	

EPA Form 3510-1 (5-80)

CONTINUE ON REVERSE

VII. SIC CODES (4-digit, in order of priority)

A. FIRST	B. SECOND
7 2 8 7 9 (specify) Formulates Biocides & Fungicides	7 (specify)
C. THIRD	**D. FOURTH**
(specify)	7 (specify)

VIII. OPERATOR INFORMATION

A. NAME: MORTON THIOKOL, INC.

B. Is the name listed in Item VIII-A also the owner? ☒ YES ☐ NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.)
F = FEDERAL
S = STATE
P = PRIVATE
M = PUBLIC (other than federal or state)
O = OTHER (specify)

Answer: P (specify)

D. PHONE (area code & no.): A 312 621 5200

E. STREET OR P.O. BOX: 110 N. WACKER DRIVE

F. CITY OR TOWN: CHICAGO

G. STATE: IL

H. ZIP CODE: 60606

IX. INDIAN LAND

Is the facility located on Indian lands? ☐ YES ☒ NO

EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water): 9 N	**D. PSD** (Air Emissions from Proposed Sources): 9 P
B. UIC (Underground Injection of Fluids): 9 U	**E. OTHER** (specify): 9 7 4 1 2 0 0 6 8 (specify) Illinois Operating Permit
C. RCRA (Hazardous Wastes): 9	**E. OTHER** (specify): 9 2 8 2 9 - I L - 1 (specify) FIFRA

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements. Submitted with original application.

XII. NATURE OF BUSINESS (provide a brief description)

Manufacture of specialty chemicals - formulates biocides& fungicides

XIII. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
es E. Opre, Plant Manager	James E. Opre	7/12/85

COMMENTS FOR OFFICIAL USE ONLY

FORM 3510-3 RCRA

U.S. ENVIRONMENTAL PROTECTION AGENCY

HAZARDOUS WASTE PERMIT APPLICATION

Consolidated Permits Program

(This information is required under Section 3005 of RCRA.)

I. EPA I.D. NUMBER: F I L D 0 9 6 7 8 7 0 4 9 | T/A/C 1

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED (yr., mo., & day)	COMMENTS

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below *(mark one box only)* to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter your facility's EPA I.D. Number in Item I above.

A. FIRST APPLICATION *(place an "X" below and provide the appropriate date)*

[X] 1. EXISTING FACILITY *(See instructions for definition of "existing" facility. Complete item below.)*

FOR EXISTING FACILITIES, PROVIDE THE DATE *(yr., mo., & day)* OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*

[ ] 2. NEW FACILITY *(Complete item below.)*

FOR NEW FACILITIES, PROVIDE THE DATE *(yr., mo., & day)* OPERATION BEGAN OR IS EXPECTED TO BEGIN

B. REVISED APPLICATION *(place an "X" below and complete Item I above)*

[X] 1. FACILITY HAS INTERIM STATUS

[ ] 2. FACILITY HAS A RCRA PERMIT

III. PROCESSES – CODES AND DESIGN CAPACITIES

A. PROCESS CODE – Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process *(including its design capacity)* in the space provided on the form *(Item III-C)*.

B. PROCESS DESIGN CAPACITY – For each code entered in column A enter the capacity of the process.

1. AMOUNT – Enter the amount.
2. UNIT OF MEASURE – For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER *(barrel, drum, etc.)*	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D79	GALLONS OR LITERS
LANDFILL	D80	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D81	ACRES OR HECTARES
OCEAN DISPOSAL	D82	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D83	GALLONS OR LITERS

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER *(Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Item III-C.)*	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G	LITERS PER DAY	V	ACRE-FEET	A
LITERS	L	TONS PER HOUR	D	HECTARE-METER	F
CUBIC YARDS	Y	METRIC TONS PER HOUR	W	ACRES	B
CUBIC METERS	C	GALLONS PER HOUR	E	HECTARES	Q
GALLONS PER DAY	U	LITERS PER HOUR	H		

EXAMPLE FOR COMPLETING ITEM III *(shown in line numbers X-1 and X-2 below)*: A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

C DUP T/A/C 1

LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	B. 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY	LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT	B. 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
X-1	S02	600	G		5				
X-2	T03	20	E		6				
1	S01	20,000	G		7				
2	D02	8,000	G		8				
3					9				
4					10				

III. PROCESSES *(continued)*

C. SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESSES *(code "T04")*. FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

IV. DESCRIPTION OF HAZARDOUS WASTES

A. EPA HAZARDOUS WASTE NUMBER — Enter the four—digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. If you handle hazardous wastes which are not listed in 40 CFR, Subpart D, enter the four—digit number*(s)* from 40 CFR, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

B. ESTIMATED ANNUAL QUANTITY — For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non—listed waste*(s)* that will be handled which possess that characteristic or contaminant.

C. UNIT OF MEASURE — For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:
   For listed hazardous waste: For each listed hazardous waste entered in column A select the code*(s)* from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.
   For non—listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code*(s)* from the list of process codes contained in Item III to indicate all the processes that will be used to store, treat, and/or dispose of all the non—listed hazardous wastes that possess that characteristic or toxic contaminant.
   Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code*(s)*.

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER — Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B,C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
2. In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.
3. Repeat step 2 for each other EPA Hazardous Waste Number that can be used to describe the hazardous waste.

EXAMPLE FOR COMPLETING ITEM IV *(shown in line numbers X-1, X-2, X-3, and X-4 below)* — A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non—listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO.	A. EPA HAZARD. WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESSES 1. PROCESS CODES *(enter)*	D. PROCESSES 2. PROCESS DESCRIPTION *(if a code is not entered in D(1))*
X-1	K054	900	P	T03 D80	
X-2	002	400	P	T03 D80	
X-3	D001	100	P	T03 D80	
X-4	D002				*included with above*

CONTINUE ON PAGE

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

Form Approved OMB No. 158-S80004

EPA I.D. NUMBER (enter from page 1)	FOR OFFICIAL USE ONLY
W IL D 0 9 6 7 8 7 0 4 9 T/A/C 1	W DUP T/A/C 2 DUP

D. DESCRIPTION OF HAZARDOUS WASTES (continued)

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
1	D001	30,000	P	S02	
2	D004				Included with above
3	D004	3,200	P	S01	
4	F021	4,000	P	S01	
5	F027	5,000	P	S01	
6					
7.					
8					
9					
10					
11					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

Continued from the front.

IV. DESCRIPTION OF HAZARDOUS WASTES *(continued)*

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM ITEM D(1) ON PAGE 3.

EPA I.D. NO. *(enter from page 1)*

I L D 0 9 6 7 8 7 0 4 9 6

V. FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail).*

VI. PHOTOGRAPHS

All existing facilities must include photographs *(aerial or ground—level)* that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas *(see instructions for more detail).*

VII. FACILITY GEOGRAPHIC LOCATION

LATITUDE *(degrees, minutes, & seconds)*	LONGITUDE *(degrees, minutes, & seconds)*
41 51 030	087 44 015

VIII. FACILITY OWNER

[X] A. If the facility owner is also the facility operator as listed in Section VIII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. *(area code & no.)*

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE
	C G		

IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED
James E. Opre	James E. Opre	7/12/85

X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED

CONTINUE ON PAGE 5

FORM 1 GENERAL

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER: F I L D 0 9 6 7 8 7 0 4 9 | D

LABEL ITEMS

I. EPA I.D. NUMBER

II. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI *(except VI-B which must be completed regardless)*. Complete all Items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED	SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X		B. Does or will this facility *(either existing or proposed)* include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)		X		D. Is this a proposed facility *(other than those described in A or B above)* which will result in a discharge to waters of the U.S.? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)	X		X	F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X		J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP MORTON INTERNATIONAL, INC.

IV. FACILITY CONTACT

A. NAME & TITLE *(last, first, & title)*	B. PHONE *(area code & no.)*
2 OPRE JAMES PLANT MANAGER	312 521 7000

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 1645 SOUTH KILBOURN AVENUE

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 CHICAGO	IL	60623

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 1645 SOUTH KILBOURN AVENUE

B. COUNTY NAME

COOK

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE *(if known)*
6 CHICAGO	IL	60623	

CONTINUED FROM THE FRONT

VII. SIC CODES *(4-digit, in order of priority)*

A. FIRST	B. SECOND
2879 (specify) Formulates Biocides & Fungicides	7 (specify)
C. THIRD	**D. FOURTH**
(specify)	7 (specify)

VIII. OPERATOR INFORMATION

A. NAME: MORTON INTERNATIONAL

B. Is the name listed in Item VIII-A also the owner? [X] YES [ ] NO

C. STATUS OF OPERATOR *(Enter the appropriate letter into the answer box; if "Other", specify.)*
F = FEDERAL
S = STATE
P = PRIVATE
M = PUBLIC *(other than federal or state)*
O = OTHER *(specify)*

P (specify)

D. PHONE *(area code & no.)*: A 312 621 5200

E. STREET OR P.O. BOX: 110 N. WACKER DRIVE

F. CITY OR TOWN: CHICAGO

G. STATE: IL

H. ZIP CODE: 60606

IX. INDIAN LAND

Is the facility located on Indian lands? [ ] YES [X] NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES *(Discharges to Surface Water)*: N	D. PSD *(Air Emissions from Proposed Sources)*: P
B. UIC *(Underground Injection of Fluids)*: U	E. OTHER *(specify)*: 74120068 (specify) Illinois Operating Permit
C. RCRA *(Hazardous Wastes)*: R	E. OTHER *(specify)*: 2829-IL-1 (specify) FIRFRA

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS *(provide a brief description)*

Manufacture of specialty chemicals - formulates biocices and fungicides

XIII. CERTIFICATION *(see instructions)*

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE *(type or print)*	B. SIGNATURE	C. DATE SIGNED
James Opre Plant Manager	James E. Opre	5/1/90

COMMENTS FOR OFFICIAL USE ONLY

C

FORM 3 3 RCRA

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

HAZARDOUS WASTE PERMIT APPLICATION

Consolidated Permits Program

(This information is required under Section 3005 of RCRA.)

I. EPA I.D. NUMBER: F T L D 0 9 6 7 8 7 0 4 9

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED (yr., mo., & day)	COMMENTS

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below *(mark one box only)* to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter your facility's EPA I.D. Number in Item I above.

A. FIRST APPLICATION *(place an "X" below and provide the appropriate date)*

[X] 1. EXISTING FACILITY *(See instructions for definition of "existing" facility. Complete item below.)*

C 8 — FOR EXISTING FACILITIES, PROVIDE THE DATE (yr., mo., & day) OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*

[ ] 2. NEW FACILITY *(Complete item below.)*

FOR NEW FACILITIES PROVIDE THE DATE (yr., mo., & day) OPERATION BEGAN OR IS EXPECTED TO BEGIN

B. REVISED APPLICATION *(place an "X" below and complete Item I above)*

[X] 1. FACILITY HAS INTERIM STATUS

[ ] 2. FACILITY HAS A RCRA PERMIT

III. PROCESSES — CODES AND DESIGN CAPACITIES

A. PROCESS CODE — Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process *(including its design capacity)* in the space provided on the form *(Item III-C)*.

B. PROCESS DESIGN CAPACITY — For each code entered in column A enter the capacity of the process.

1. AMOUNT — Enter the amount.
2. UNIT OF MEASURE — For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER *(barrel, drum, etc.)*	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D79	GALLONS OR LITERS
LANDFILL	D80	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D81	ACRES OR HECTARES
OCEAN DISPOSAL	D82	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D83	GALLONS OR LITERS

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR OR GALLONS PER HOUR OR LITERS PER HOUR
OTHER *(Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Item III-C.)*	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G	LITERS PER DAY	V	ACRE-FEET	A
LITERS	L	TONS PER HOUR	D	HECTARE-METER	F
CUBIC YARDS	Y	METRIC TONS PER HOUR	W	ACRES	B
CUBIC METERS	C	GALLONS PER HOUR	E	HECTARES	Q
GALLONS PER DAY	U	LITERS PER HOUR	H		

EXAMPLE FOR COMPLETING ITEM III *(shown in line numbers X-1 and X-2 below)*: A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

C DUP 1

LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	B. 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY	LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT	B. 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
X-1	S 0 2	600	G		5				
X-2	T 0 3	20	E		6				
1	S 0 1	13,200	G		7				
2	S 0 2	10,000	G		8				
3					9				
4					10				

CONTINUE ON REVERSE

C. SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESSES (code "T04"). FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

IV. DESCRIPTION OF HAZARDOUS WASTES

A. EPA HAZARDOUS WASTE NUMBER — Enter the four—digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. If you handle hazardous wastes which are not listed in 40 CFR, Subpart D, enter the four—digit number(s) from 40 CFR, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

B. ESTIMATED ANNUAL QUANTITY — For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non—listed waste(s) that will be handled which possess that characteristic or contaminant.

C. UNIT OF MEASURE — For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:
For listed hazardous waste: For each listed hazardous waste entered in column A select the code(s) from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.
For non—listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code(s) from the list of process codes contained in Item III to indicate all the processes that will be used to store, treat, and/or dispose of all the non—listed hazardous wastes that possess that characteristic or toxic contaminant.
Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code(s).

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER — Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B,C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
2. In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "Included with above" and make no other entries on that line.
3. Repeat step 2 for each other EPA Hazardous Waste Number that can be used to describe the hazardous waste.

EXAMPLE FOR COMPLETING ITEM IV *(shown in line numbers X-1, X-2, X-3, and X-4 below)* — A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non—listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
X-1	K054	900	P	T03 D80	
X-2	D002	400	P	T03 D80	
X-3	D001	100	P	T03 D80	
X-4	D002				included with above

 CONTINUE ON PAGE 3

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

Form Approved OMB No. 158-S80004

EPA I.D. NUMBER (enter from page 1)	FOR OFFICIAL USE ONLY
W I L D 0 9 6 7 8 7 0 4 9 — T/A/C 1	W DUP — T/A/C 2 DUP

IV. DESCRIPTION OF HAZARDOUS WASTES (continued)

WASTE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
1	D001	10,000	G	S02	
2	D004			S02	included in above
3	D004	4800	G	S01	
4	D011	220	G	S01	
5	U116	55	G	S01	
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

IV. DESCRIPTION OF HAZARDOUS WASTES *(continued)*

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM ITEM D(1) ON PAGE 3.

EPA I.D. NO. *(enter from page 1)*

F I L D 0 9 6 7 8 7 0 4 9 T/M C 6

V. FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail)*.

VI. PHOTOGRAPHS

All existing facilities must include photographs *(aerial or ground—level)* that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas *(see instructions for more detail)*.

VII. FACILITY GEOGRAPHIC LOCATION

LATITUDE *(degrees, minutes, & seconds)*	LONGITUDE *(degrees, minutes, & seconds)*
41 51 31	87 43 15

VIII. FACILITY OWNER

[X] A. If the facility owner is also the facility operator as listed in Section VIII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. *(area code & no.)*
E	

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE
F	G		

IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED
James Opre	James E. Opre	5/1/90

X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

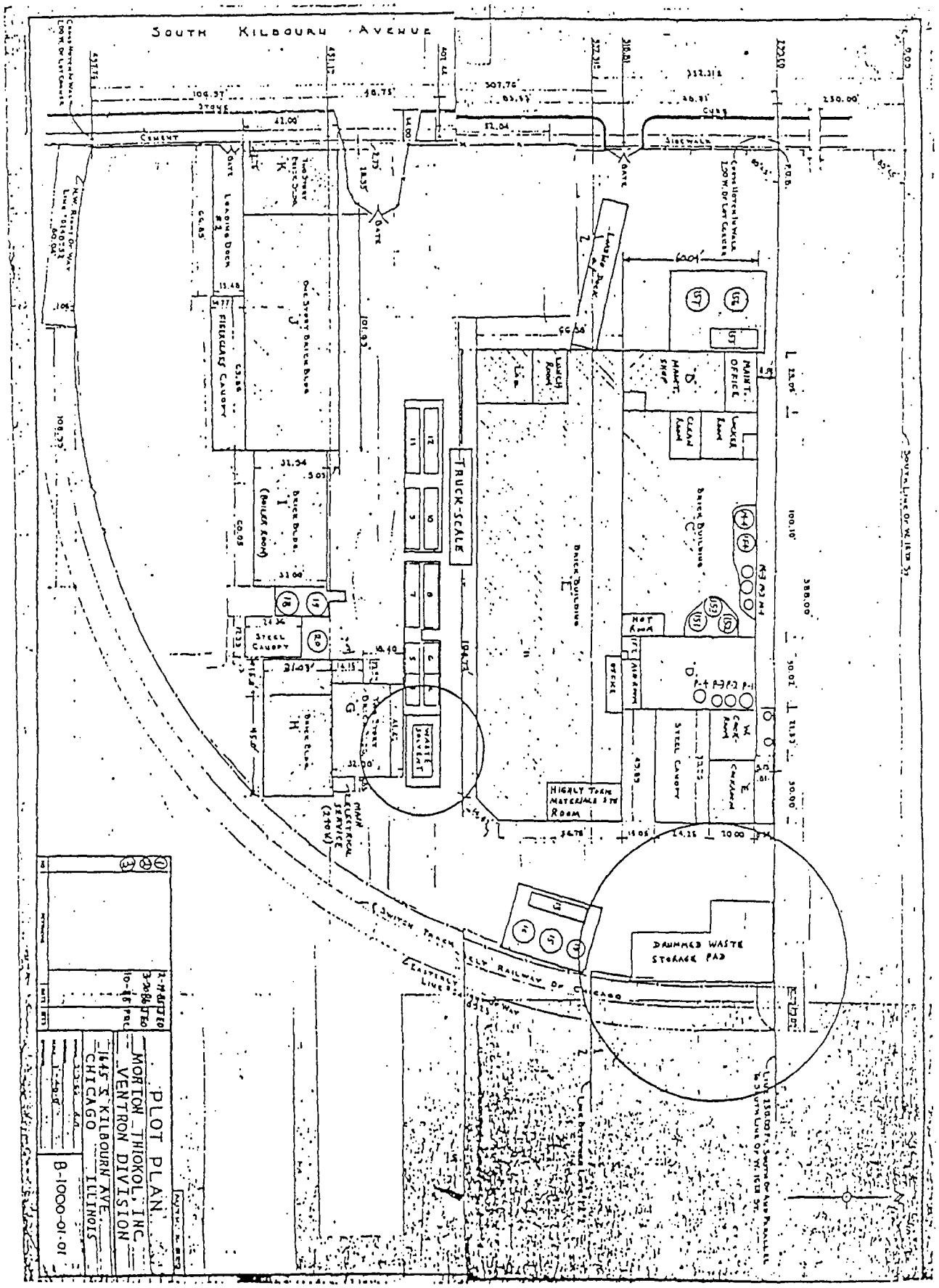
A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED
James Opre	James E. Opre	5/1/90

CONTINUE ON PAGE 5

Continued from page 4.

Form Approved OMB No. 158-S80004

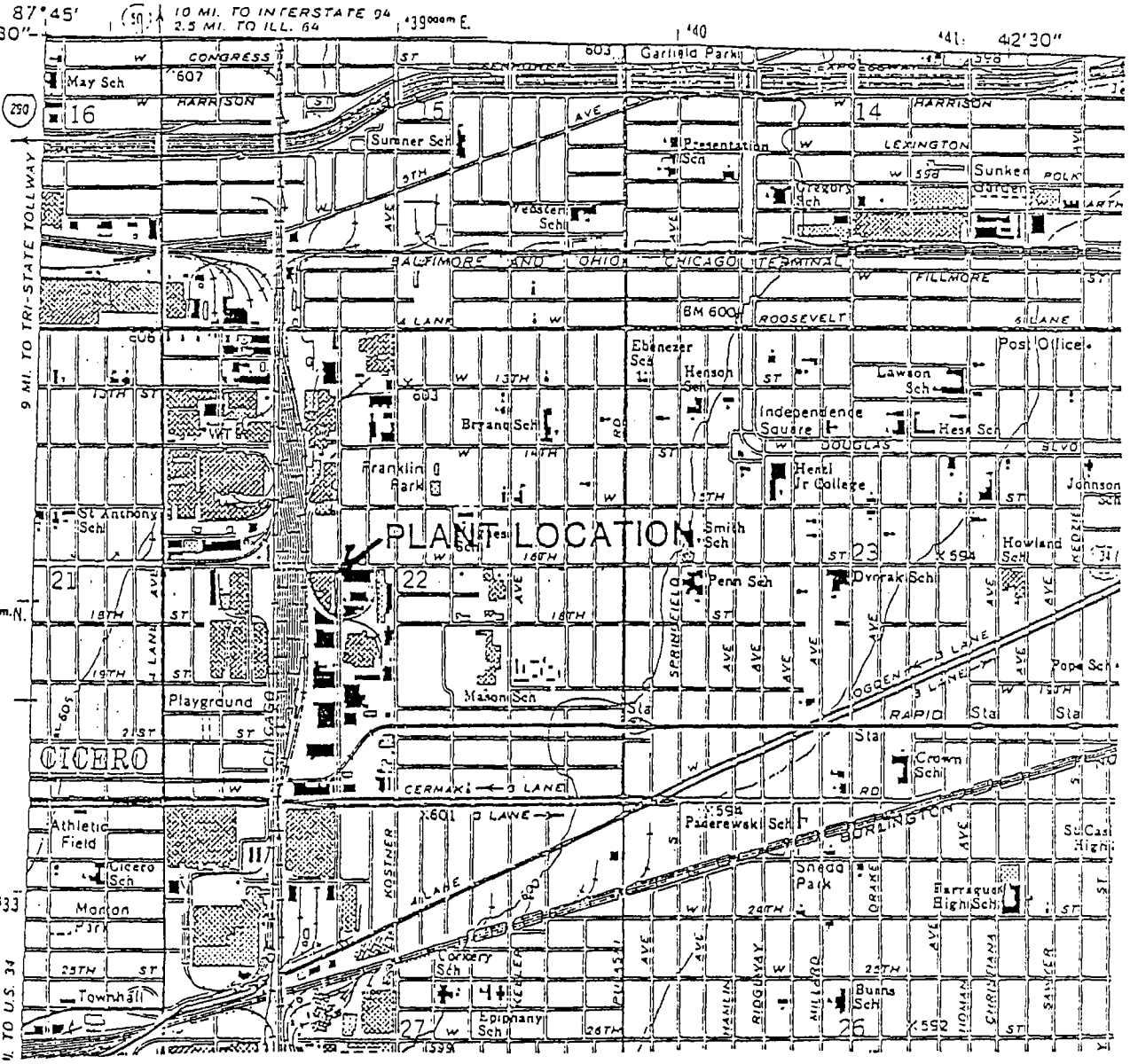
V. FACILITY DRAWING (see page 4)



3467 IV NE (RIVER FOREST)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

ENGLEWOOD QUADRANGLE
ILLINOIS–COOK CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)



THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
AND ILLINOIS GEOLOGICAL SURVEY, CHAMPAIGN, ILLINOIS 61820
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

ENGLEWOOD, ILL.
N4145—W8737.5/7.5

1963
PHOTOREVISED 1972 AND 1980
DMA 3467 I SW—SERIES V863

TOPOGRAPHIC MAP

DR | CHECKED BY | APPROVED BY | DRAWING NUMBER 31-B6

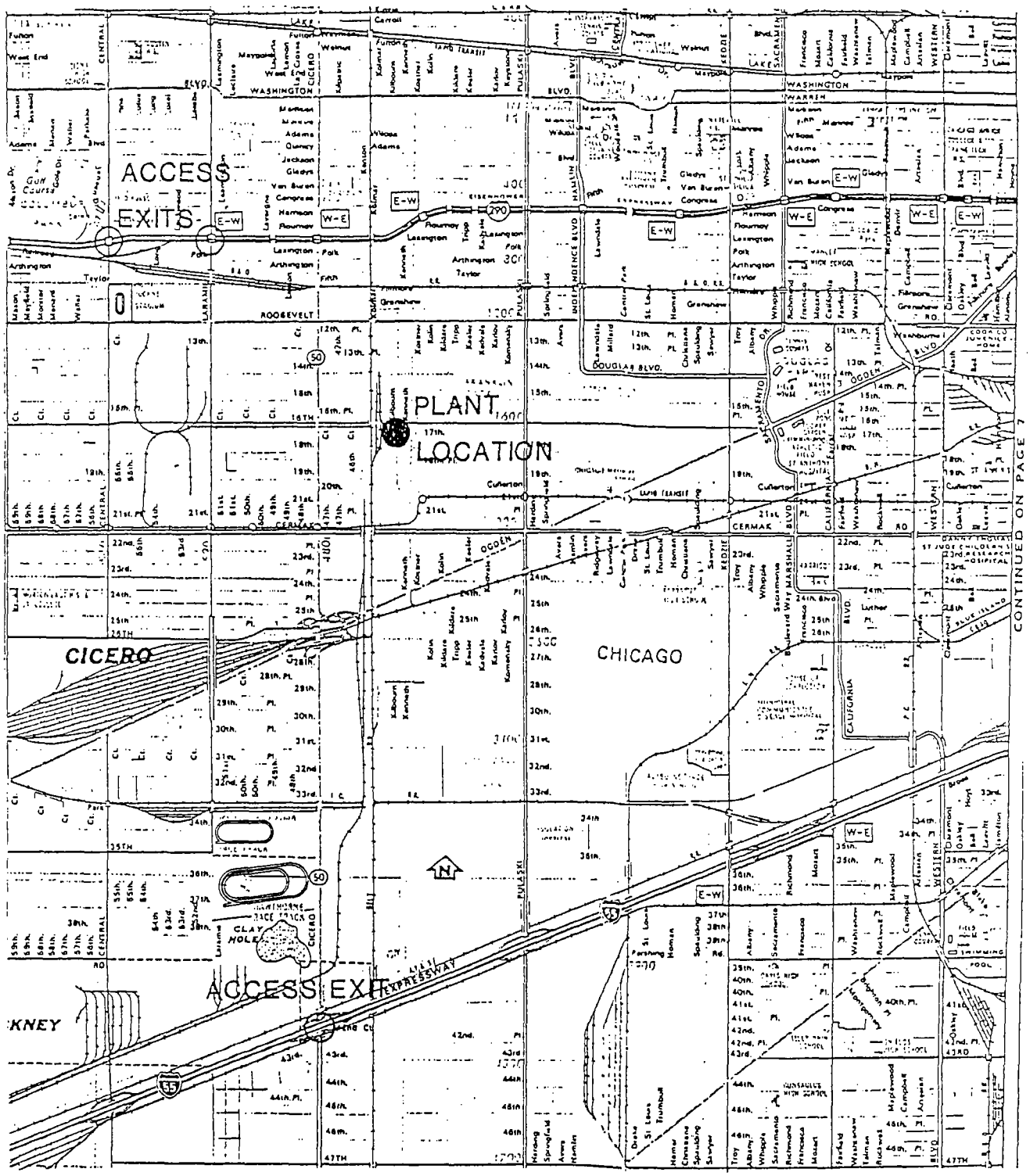


FIGURE B-6
TRAFFIC ACCESS
CHICAGO PLANT
PREPARED FOR
MORTON INTERNATIONAL
CHICAGO, ILLINOIS

© 1984 IT CORPORATION
ALL COPYRIGHTS RESERVED

IT ... Creating a Safer Tomorrow

APPENDIX C

HAZARDOUS WASTE STORAGE TANK CONTAINMENT DIKE

AND

HAZARDOUS WASTE CONTAINER STORAGE AREA SPECIFICATIONS

BARTKUS AND ASSOCIATES, INC. · MEMBER BERGER GROUP
CONSULTING ENGINEERS · 819 SOUTH WABASH, CHICAGO, ILLINOIS 60605-2188 · TEL. (312) 663-4141 · FAX (312) 341-5685

September 11, 1990

Mr. Philip R. Camera
Morton International
Ventron Products
1645 S. Kilbourn Ave.
Chicago, IL 60623

RE: Containment Dike
and Pad
BAI Ref. 1192.1

Dear Mr. Camera:

We have designed the secondary containment structure and foundation for the 10,000 gallon storage tank as shown on Drawing D-1038-05-01 and the drummed waste storage dike as shown on Drawing D-1038-05-02. The storage tank is designed and fabricated in accordance with Sections II, VII and IX of the ASME UFPV Code (National Board No. NB-577).

The tank's material of construction is 304 stainless steel. The waste stored in the tank is predominantly naphtha based solvent which has been used for cleaning pipe lines and equipment. The components which become incorporated into the solvent as a result of the cleaning are the following:

10, 10', Oxybisphenoxarsine
Methyl Ethyl Ketone
bis 2 Ethyl Hexyl Phthalate

All of the above can be stored safely in carbon steel and the use of 304 stainless steel provides additional corrosion protection capability. A more detailed composition analysis of the waste is attached.

The naphtha waste exhibits the hazardous waste characteristic of ignitability. For this reason both the drummed waste storage area and the tank area have their foundations placed on a well compacted, 6" thick base of crushed stone which overlays a firm clay soil. The dike areas are constructed of 3,000 P.S.I. concrete and have polyvinyl chloride waterstops and polysulfide rubber sealants in all joints. Both materials have excellent anti-corrosion properties for the liquids to be contained. The dike areas are designed to prevent any leakage into the soil. The dike walls are designed for the full hydrostatic pressure of liquid against them and have the necessary

concrete thickness and reinforcing steel to resist all compression, tension, and shear.

The slab on which fork trucks will operate has adequate steel reinforcing and thickness to distribute the concentrated wheel loads to the subsoil. The surface will have a hard troweled abrasion resistant finish. Both areas are designed to withstand temperature ranges of -20 F to +120 F without distress. Calculations for the dike wall are attached.

The dike areas were designed according to the requirements of the American Concrete Institute Building Code 318-83 and the City of Chicago Building Code. The dike for the 10,000 gallon tank has a total holding capacity of 12,616 gallons. The floor slabs are sloped to a shallow sump area which has a normally closed and locked drain valve. The waste areas will be covered by a roof and gutter system to avoid precipitation accumulation. Any leakage will be retained. If testing indicates waste materials are present, the diked areas will be pumped into hazardous waste disposal tanks. Electronic liquid level indicators will signal when liquid is present in the dike sumps.

Very truly yours,

Otto Teske/wjm

Otto Teske
Vice President

OT/br

PROJECT DESIGN BASIS:

A. APPLICABLE SPECIFICATION.

1. AMERICAN CONCRETE INSTITUTE (ACI) STANDARD BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318).
2. REINFORCED CONRETE DESIGN HANDBOOK WORKING STRESS METHOD (ACI - SP-3)
3. CITY OF CHICAGO BUILDING CODE.
4. CONCRETE REINFORCING STEEL INSTITUTE (CRSI) HANDBOOK.

STATE OF ILLINOIS EUGENE A. BARTKUS 2158 CHICAGO REGISTERED STRUCTURAL ENGINEER

B. DESIGN DATA

1. CONCRETE SHALL HAVE MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.
2. REINFORCING BARS SHALL COMPLY WITH AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)-615 GRADE 60, MINIMUM YIELD STRENGTH OF 60000 PSI.

SEP 12 1990

3. EARTH PRESSURE ON RETAINING WALLS - RANKINE THEORY

$$e = \gamma K H \quad \text{PSF}$$

WHERE $K = \frac{1 - \sin\phi}{1 + \sin\phi} = \frac{1}{3}$

γ = WEIGHT OF EARTH = 100 PCF

4. LIQUID PRESSURE = 62.4 H PSF
5. FACTOR OF SAFETY AGAINST SLIDING 1.5
   FACTOR OF SAFETY AGAINST OVERTURING 1.5
6. MAXIMUM ALLOWABLE SOIL PRESSURE 3 KSF

UNITS LEGEND

A_s	AREA OF STEEL BARS.
CONC.	CONCRETE.
d	CONCRETE DEPTH.
e	EARTH OR LIQUID PRESSURE.
F.O.S.	FACTOR OF SAFETY.
GAL.	GALLON.
H	HORIZONTAL PRESSURE.
Hp	PASSIVE HORIZONTAL EARTH PRESSURE.
IN	INCH.
IN^2	SQUARE INCH.
IN^2/ft	SQUARE INCH PER FOOT.
K	KIPS EQUAL TO 1000 POUNDS.
K/'	KIPS PER FOOT.
KSF	KIPS PER SQUARE FOOT.
K-Ft/'	KIP-FOOT PER FOOT.
M	MOMENT.
M_O	OVERTURNING MOMENT.
M_R	RESISTING MOMENT.
MAX.	MAXIMUM.
MIN.	MINIMUM.
PSF	POUND PER SQUARE FOOT.
REINF	REINFORCEMENT.
t	CONCRETE THICKNESS.
W OR P	WEIGHT.
WGT	WEIGHT.
σ	SOIL PRESSURE.
$\sigma_{MAX.}$	MAXIMUM SOIL PRESSURE.
#	BAR NUMBER.
"	INCH.
γ	WEIGHT OF EARTH.
ϕ	ANGLE OF REPOSE OF EARTH.
Σ	SIGMA, THE SUM OF.
PSI	POUND PER SQUARE INCH.

STATE OF ILLINOIS EUGENE A. BARTKUS 2158 CHICAGO REGISTERED STRUCTURAL ENGINEER

BY _____ DATE 9-11-90 SUBJECT MORTON THIOKOL INC. SHEET NO. 1 OF 2
CHKD. BY _____ DATE _____ VENTRON PRODUCTS JOB NO. 1192.1
WASTE TANK

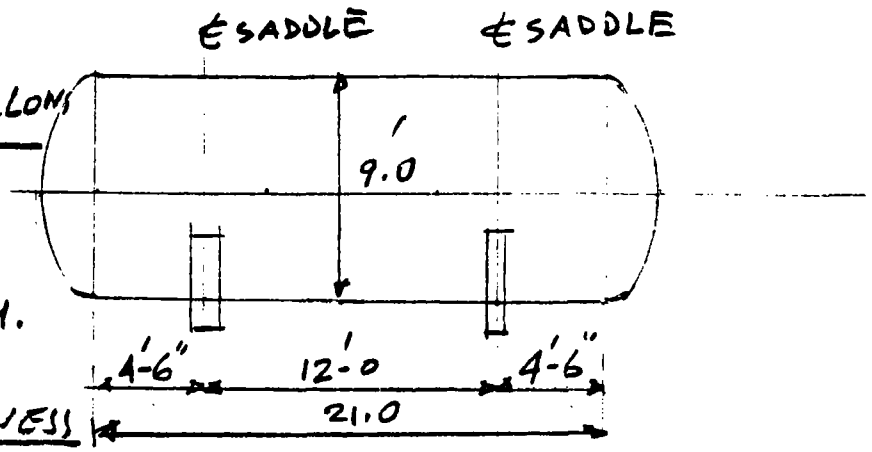
TANK

CAPACITY = 10,000 GALLONS

MINIMUM TANK SHELL

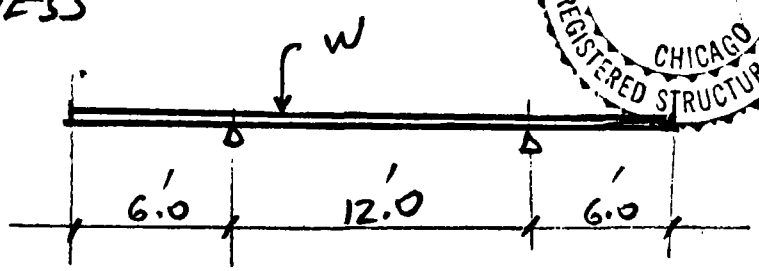
THICKNESS = 0.315 INCH.

CHECK SHELL THICKNESS



REF. AMERICAN IRON AND STEEL INSTITUTE
DESIGN OF PLATE STRUCTURES
(VOLUME 2 PART VI)

USE METAL THICKNESS
= 0.30 IN



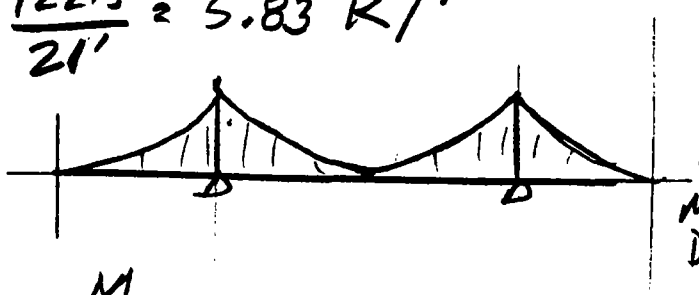
STATE OF ILLINOIS
EUGENE A. BARTKUS
2158
CHICAGO
REGISTERED STRUCTURAL ENGINEER
SEP 12 195

TANK weight LIQUID = 10,000 × 0.1337 × 1.3 × 0.0624 = 108.5 K
TANK STEEL weight = 14.0 K

TOTAL = 122.5 K

w (weight per ft) $= \frac{122.5}{21'} = 5.83$ K/'

$M = \frac{wL^2}{2} = \frac{5.83 \times (6)^2}{2}$
$= 105$ K-ft



BENDING MOMENT DIAGRAM

LONGITUDINAL BENDING STRESS $F_b = \frac{M}{S}$

WHERE S = SECTION MODULUS $= \pi \frac{D^2}{4} t = \pi \times \frac{108^2}{4} \times 0.3 = 2748$ IN^3

$F_b = \frac{105 \times 12}{2748} = 0.46$ KSI VERY SMALL

CHECK SHELL THICKNESS

THE COMPRESSION STRESS SHOULD NOT EXCEED ONE HALF OF THE COMPRESSION YIELD POINT OF MATERIAL (36000 KSI) OR THE VALUE GIVEN BY

$$\left(\frac{E}{29}\right)\frac{t}{r}\left[2-\frac{2}{3}(100)\frac{t}{r}\right]$$

E = MODULUS OF ELASTICITY OF STEEL (29000 KSI

$$=\left(\frac{29000}{29}\right)\frac{0.30}{54}\left[2-\frac{2}{3}(100)\frac{0.30}{54}\right]=9.0 \text{ KSI}$$

ACTUAL STRESS = $\underline{0.46}$ KSI $\ll$ $\underline{9.0}$ O.K.

SHEAR STRESS

MAX. SHEAR AT SADDLE = $\frac{122.5}{2} - 5.83 \times 6 = 26.27$

SHEAR STRESS = $\frac{26.27}{0.30 \times \pi \times 54 \times 2} = \underline{0.26}$ KSI $\ll$ $\underline{10 \text{ KSI}}$ O.K.

TANK SHELL THICKNESS OF 0.30 INCH.

IS ADEQUATE AND ACTUAL BENDING AND SHEAR STRESSES ARE WELL BELOW THE ALLOWABLES.

STATE OF ILLINOIS EUGENE A. BARTKUS 2158 CHICAGO REGISTERED STRUCTURAL ENGINEER

SEP 12 1990

Taussig
Associates, Inc.

Metallurgical Engineers 7530 Frontage Road ■ Skokie, Illinois 60077 ■ 708 676-2100 ■ FAX 708 676-2132

Report No. 94234/September 13, 1990

MORTON INTERNATIONAL
Specialty Chemicals Group
1645 South Kilbourn Avenue
Chicago, IL 60623

Attention: Mr. Philip R. Camera

S U B J E C T

Ultrasonic Wall Thickness Measurement
of In-Plate Storage Tank

Per Purchase Order No. C-108434

BACKGROUND

Taussig Associates, Inc. was requested by Morton International to obtain wall thickness measurements from an in-place 10,000 gallon storage tank at their Specialty Chemical Group facility located at 1645 South Kilbourn Avenue, Chicago, Illinois. The 24 year old tank was originally fabricated from 5/16" (nominal) thick type 304L stainless steel plate material. Morton International personnel removed the outer insulating cover from the tank in the areas where thickness measurements were desired. Taussig Associates, Inc. performed the requested work on September 7, 1990

TEST PROCEDURE

A Krautkramer Branson "DME" digital ultrasonic thickness gauge was used to obtain wall thickness readings from the external tank surface. The as-found condition of the tank surface was sufficient to obtain good transducer coupling and required no additional preparation. Measurements were made at approximately 1-1/2 foot intervals around the tank circumference, 6 feet from both tank ends. The results were recorded and reported to Morton International personnel on-site.

TEST DATA

The following tank wall thickness measurements were obtained.

Location	Northeast	Northwest	Southeast	Southwest
1	.318	.318	.319	.320
2	.320	.319	.319	.320
3	.319	.323	.322	.319
4	.316	.322	.325	.320
5	.315	.322	.316	.328
6	.316	.322	.321	.328
7	.318	.329	.315	.329
8	.317	.325	.317	.330
9	.318	.328	N/A	N/A

NOTES

1. Tank surface was divided into four quadrants - Northeast, Northwest, Southeast, and Southwest.

2. Measurements progress from tank bottom to tank top.

3. All measurements recorded in inches.

CONCLUSIONS

The tank wall thickness measurements obtained were in substantial accordance with the 5/16" (.3125") nominal thickness plate used in fabrication. No indication of tank wall erosion was evident in the areas measured.

Respectfully Submitted,

TAUSSIG ASSOCIATES, INC.

Lawrence E. Smetana
CWI, NDE Level III
NDE/Welding Supervisor

Respectfully Submitted,

TAUSSIG ASSOCIATES, INC.

Mark A. Hineman
Senior Metallurgical Engineer

LES/MAH/nb

APPENDIX D

FINANCIAL TEST AND CORPORATE GUARANTEE FOR CLOSURE

c. PRC
10/7

Morton *International*

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

September 27, 1991

RECEIVED
OCT 08 1991
Morton International
CHICAGO FACILITY

Mr. Andrew Vollumer, Director
Illinois Environmental Protection Agency
2200 Churchill Road
Springfield, IL 62706

Dear Mr. Vollumer:

Updated financial test documentation including financial information for the Fiscal Year ending June 30, 1991 is enclosed.

Very truly yours,

Harry J. Kopp
Manager, Environmental Affairs

HJK/al
FA-4

cc: J. Opre
K. Walanski

Enclosure: Letter from Chief Financial Officer
Morton International, Inc. 1991 Annual Report
Form 10K
Report from Ernst & Young

Morton International, Inc., Morton International Building
100 N. Riverside Plaza, Randolph Street at the River
Chicago, IL 60606-1596 312/807-2000

Morton *International*

John R. Bowen
Senior Vice President and Chief
Financial Officer

September 27, 1991

Mr. Andrew Vollumer, Director
Illinois Environmental Protection Agency
2200 Churchill Road
Springfield, IL 62706

Dear Mr. Vollumer:

I am the chief financial officer of Morton International, Inc., 100 North Riverside Plaza, Chicago, Illinois 60606. This letter is in support of the use of the financial test to demonstrate financial responsibility for liability coverage and closure and/or post-closure care as specified in Subpart H of 40 CFR Parts 264 and 265 and/or Subpart H of 35 Illinois Administrative Code Parts 724 and 725.

The firm identified above is the owner or operator of the following facilities for which liability coverage for both sudden and non-sudden accidental occurrences is being demonstrated through the financial test specified in Subpart H of Illinois Administrative Code 724 and 725.

Morton International, Inc.
Specialty Chemicals
335 McLean Boulevard
Paterson, NJ 07504
NJD051274348

Morton International, Inc.
Industrial Chemicals & Additives
1645 S. Kilbourne Avenue
Chicago, IL 60623
ILD096787049

Morton International, Inc.
Specialty Chemicals
P. O. Box 666
5724 Elder Ferry Road
Moss Point, MS 39563
MSD008186587

Morton International, Inc.
Electronic Materials
P. O. Box 12047
2631 Michelle Drive
Tustin, CA 92680
CAD008334260

Morton International, Inc., Morton International Building
100 N. Riverside Plaza, Randolph Street at the River
Chicago, IL 60606-1596 312/807-2308

This firm identified above guarantees, through the corporate guarantee specified in Subpart H of 35 Illinois Administrative Code 724 and 725, liability coverage for sudden and nonsudden accidental occurences at the following facilities owned or operated by the following subsidiaries of the firm: None.

1. The firm identified above owns or operates the following facilities for which financial assurance for closure and/or post-closure care is demonstrated through the financial test specified in Subpart H of 35 Illinois Administrative Code Parts 724 and 725. The current closure and/or post-closure cost estimates covered by the test are shown for each facility:

USEPA I.D. No. - ILDO 9678 7049	Closure Amount	Closure and Post-Closure Amounts
Morton International, Inc. Industrial Chemicals & Additives 1645 S. Kilbourne Avenue Chicago, IL 60623 CAD008334260	$484,867	$484,867

2. The firm identified above guarantees, through the corporate guarantee specified in Subpart H of 35 Illinois Administrative Code Parts 724 and 725, the closure and/or post-closure care of the following facility owned or operated by its subsidiaries. The current cost estimates for closure or post-closure care so guaranteed are shown for each facility: None.

3. In states where IEPA is not administering the financial requirements of Subpart H of 40 CFR Parts 264 and 265, this firm is demonstrating financial assurance for the closure or posrt-closure care of the following facilities through the use of a test equivalent or substantially equivalent to the financial test specified in Subpart H of 40 CFR Parts 264 and 265. The current closure or post-closure cost estimates covered by such a test are shown for each facility:

USEPA I.D. No. - MSDO 0818 6587	COST-ESTIMATES Closure	Post-Closure Care
Morton International, Inc. Specialty Chemicals P. O. Box 666 5724 Elder Ferry Road Moss Point, MS 39563	$1,238,346	$1,065,751

USEPA I.D. No. - CADO 0833 4260	COST-ESTIMATES Closure	Post-Closure Care
Morton International, Inc. Electronic Materials P. O. Box 12047 2631 Michelle Drive Tustin, CA 92680	$84,700	$84,700

4. The firm identified above owns or operates the following hazardous waste management facilities for which financial assurances for closure or, if a disposal facility, post-closure care, is not demonstrated either to IEPA, USEPA or a State through the financial test or any other financial assurance mechanisms specified in Subpart H of 40 CFR Parts 264 and 265 or equivalent or substantially equivalent state mechanisms. The current closure or post-closure cost estimates not covered by such financial asurance are shown for each facility: None.

5. This firm is the owner or operator of the following UIC facilities for which financial assurance for plugging and abandonment is required under Part 144. The current closure cost estimates as required by 40 CFR 144.62 or Subpart A of Illinois Administrative Code 704 are shown for each facility.

	Closure Amount
Morton International, Inc. Specialty Chemicals P. O. Box 666 5724 Elder Ferry Road Moss Point, MS 39563 MSD008186587 UIC Permit No. MSI1005	$176,039
Morton International, Inc. Morton Salt Group 1000 Morton Road So. Hutchinson, KS 67505 KSD007235948 UIC Permit No. KS-01-155-004	$ 20,000

This firm is required to file a form 10K with the Securities and Exchange Commission (SEC) for the latest fiscal year.

The fiscal year of this firm ends on June 30. The figures for the following items marked with an asterisk are derived from this firm's independently audited, year-end financial statements for the latest completed fiscal year, ended June 30, 1991.

ALTERNATIVE II

1. Sum of current closure and post-closure cost estimates (total of all cost estimates lisred above . . $2,893,664

2. Amount of annual aggregate liability coverage to be demonstrated $8,000,000

3. Sum of lines 1 and 2 . . . . . $10,893,664

4. Current bond rating of most recent issuance and name of rating service (Standard & Poor's) AA-

5. Date of issuance of bond . . . . June 1, 1990

6. Date of maturity of bond . . . . June 1, 2020

*7. Tangible net worth (if any portion of the closure and post-closure cost estimates is included in "total liabilities" on your firms financial statements, you may add the amount of that portion to this line) . . . $722,232,000

*8. Total assets in U.S. (required only if less than 90% of firms assets are located in the U.S.). $1,464,800,000

		YES	NO
9.	Is line 7 at least $10 Million?.	X	
10.	Is line 7 at least 6 times line 3?	X	
*11.	Are at least 90% of firms assets located in the U.S.? If not, complete line 10.		X
12.	Is line 6 at least 6 times line 1?	X	

I hereby certify that the wording of this letter is identical to the wording specified in Mississippi Hazardous Waste Regulations Part 264.151(g) as such regulations were constituted on the date shown immediately below.

John R. Bowen
Senior Vice President
and Chief Financial Officer

Dated: September 27, 1991
FA-4

APPENDIX E

CERTIFICATION REGARDING RELEASES FROM SOLID WASTE MANAGEMENT UNITS

Attachment 2

CERTIFICATION REGARDING POTENTIAL RELEASES FROM
SOLID WASTE MANAGEMENT UNITS
(CLOSURE PLAN REVIEW)

RECEIVED
DEC 09 1991
IEPA-DLPC

FACILITY NAME: MORTON INTERNATIONAL, INC.

EPA I.D. NUMBER: ILD096787049

LOCATION CITY: CHICAGO

STATE: ILLINOIS

1. Are there any of the following solid waste management units (existing or closed) at your facility? NOTE - DO NOT INCLUDE HAZARDOUS WASTES UNITS CURRENTLY SHOWN IN YOUR PART A APPLICATION and in your closure plan.

	YES	NO
• Landfill		X
• Surface Impoundment		X
• Land Farm		X
• Waste Pile		X
• Incinerator		X
• Storage Tank (Above Ground)		X
• Storage Tank (Underground)		X
• Container Storage Area	X	
• Injection Wells		X
• Wastewater Treatment Units		X
• Transfer Stations	X	
• Waste Recycling Operations		X
• Waste Treatment, Detoxification		X
• Other SEE ATTACHED SUMMARY A		

2. If there are "Yes" answers to any of the items in Number 1 above, please provide a description of the wastes that were stored, treated or disposed of in each unit. In particular, please focus on whether or not the wastes would be considered as hazardous wastes or hazardous constituents under RCRA. Also include any available data on quantities or volume of wastes disposed on the dates of disposal. Please also provide a description of each unit and include capacity, dimensions, location at facility, provide a site plan if available.

SEE ATTACHED SUMMARY SHEET A

NOTE: Hazardous waste are those identified in 40 CFR 261. Hazardous constituents are those listed in Appendix VIII of 40 CFR Part 261.

3. For the units noted in Number 1 above and also those hazardous waste units in your Part A application and in your closure plan, please describe for each unit any data available on any prior or current releases of hazardous wastes or constituents to the environment that may have occurred in the part or still be occurring.

   Please provide the following information

   a. Date of release
   b. Type of waste released
   c. Quantity or volume of waste released
   d. Describe nature of release (i.e., spill, overflow, ruptured pipe or tank, etc.)

   SEE ATTACHED SUMMARY SHEET B

4. In regard to the prior releases described in Number 3 above, please provide (for each unit) any analytical data that may be available which would describe the nature and extent of environmental contamination that exists as a result of such releases. Please focus on concentrations of hazardous wastes or constituents present in contaminated soil or groundwater.

   SEE ATTACHED SUMMARY SHEET B

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the submittal is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. (42 U.S.C 6902 et seq. and 40 CFR 270.11(d))

James E. Opre, Plant Manager
Typed Name and Title

James E. Opre
Signature

12/6/91
Date

SOLID WASTE MANAGEMENT UNITS
SUMMARY SHEET A
MORTON INTERNATIONAL, INC. - CHICAGO FACILITY
ILD09678704

SWMU NAME	WASTE DESCRIPTION	WASTE CLASS	SWMU DESCRIPTION	ACTIVE/ CLOSED
A) Waste Tank Pumping Station/ Accumulation Area	1) Waste Solvent (1-55 gal. drum)	Hazardous D001, D004, U028, U159	Outdoor corner of Cookroom Processing Area. Impervious concrete surface with corrosion resistant epoxy coating.	Active
	2) Spent Filter Media (1-55 gal. drum)	Hazardous D004, D011, U028, U116, U159	Rainwater drainage toward catch basin located to northeast under cookroom canopy. Entire area consists of an impervious concrete surface with a corrosion resistant epoxy coating. Lockable valves have been installed on the catch basin tie-in to the plant sewer. See Figure E-1.	
	3) Oily Waste & Absorbents (1-55 gal. drum)	Hazardous D004, D011, U028, U116, U159		
	4) Cyclone Dust Collector, Accumulation Drum (1-55 gal. drum)	Non-Hazardous Clay Fillers, Emulsifiers, Thickeners, Copper Compounds		

SOLID WASTE MANAGEMENT UNITS
SUMMARY SHEET A (CON'T.)
MORTON INTERNATIONAL, INC. - CHICAGO FACILITY
ILD09678704

SWMU NAME	WASTE DESCRIPTION	WASTE CLASS	SWMU DESCRIPTION	ACTIVE / CLOSED
B) Tywood Waste Solvent Accumulation Area	1) Waste Solvent (1-55 gal. drum)	Hazardous D001, U028 D004	Separate room north of the cookroom area houses the Tywood Scrubber/Filter Pollution Control Device which has been in operation since the early 1980's. Organic Vapors/Particulate matter from the cookroom kettles is passed through the Tywood Water Spray Scrubber and Filtering Section. Scrubbed oil and water is pumped from a sump into a separation tank. The oil layer is drained in the Water Solvent Accum. Drum. The water layer is pumped to a treatment tank for pH and copper precipitation prior to sewering. The entire area has an impervious concrete floor with drainage that exits room toward outdoor non-haz. container storage area.	Active
C) Drumming Room Accumulation Area	1) Waste Solvent (1-55 gal. drum)	Hazardous D004, U028	Indoor processing area where liquid products are pumped into drum containers. Area is impervious concrete floor with no floor drains in entire room.	Active

SOLID WASTE MANAGEMENT UNITS
SUMMARY SHEET A (CON'T.)
MORTON INTERNATIONAL, INC. - CHICAGO FACILITY
ILD09678704

SWMU NAME	WASTE DESCRIPTION	WASTE CLASS	SWMU DESCRIPTION	ACTIVE / CLOSED
	2) Spent Filter Media (1-55 gal. drum)	Hazardous D004, U028	See C,1	
	3) Oil Waste & Absorbents (1-55 gal. drum)	Hazardous D004, U028	See C,1	
D) Lab Waste Accumulation Area	1) Waste Solvent (1-55 gal. drum)	Hazardous D001, D004, U028, U159	Area inside of warehouse. Impervious concrete floor with sealed floor drains.	Active
	2) Lab Packs (1-16 gal. drum)	Hazardous D004, D011, U028, U116, U159	See D,1	
E) SB-1 Extrusion Accumulation Area	1) Plastic Resin/OBPA Mixture (2-55 gal. drums)	Hazardous D004	Area inside of Extension Building. One drum is accumulation of tailings from a dust collector, the other is an accumulation of floor sweepings and off grade extrusion resin premix. All areas have an impervious concrete floor with local floor drains.	Active
F) NY Extrusion Accumulation Area	See E,1	See E,1	See E,1	See E,1

SOLID WASTE MANAGEMENT UNITS
SUMMARY SHEET A (CON'T.)
MORTON INTERNATIONAL, INC. - CHICAGO FACILITY
ILD09678704

SWMU NAME	WASTE DESCRIPTION	WASTE CLASS	SWMU DESCRIPTION	ACTIVE / CLOSED
G) Non-Haz. Container Storage Area	1) Compacted OBPA Fiber Drums (160-55 gal. drums)	Non-Hazardous Empty Fiber Drums	Empty OBPA fiber drums are compacted in a drum compactor into an all plastic 55 gal. drum with lid. These all plastic containers are stored on pallets on the non-haz. pad. Closed drums of cyclone dust collector tailings are also stored on pallets in this area. Drums of non-hazardous offgrade solid or liquid raw materials and/or finished goods are stored on pallets. All of the above are subsequently transported from the facility to disposal. The area is a 50 ft. by 70 ft. outdoor, impervious concrete surface which is sloped toward an area catch basin. This basin is connected to the plant sewers via an underground line which has a valve located inline. This valve is always locked for spill containment.	Active
	2) Cyclone Dust Collector Tailings (2-55 gal. drums)	Non-Hazardous Clay fillers, Emulsifiers, Thickeners, Copper Compounds	See G,1	

SOLID WASTE MANAGEMENT UNITS
SUMMARY SHEET A (CON'T.)
MORTON INTERNATIONAL, INC. - CHICAGO FACILITY
ILD09678704

SWMU NAME	WASTE DESCRIPTION	WASTE CLASS	SWMU DESCRIPTION	A C T I V E / CLOSED
	3) Offgrade Raw Materials or Product Drums (40-55 gal. drums)	Non-Hazardous Non-haz. Raw Material or Product Containers	See G,1	
H) Empty Drum Storage Area	1) Empty, Steel Drums (60-55 gal. drums)	Non-Hazardous RCRA Empty Containers	Empty steel liquid raw material or intermediate product drums are stored in the area. All drums are RCRA empty and are closed. A drum reconditioner removes them periodically. The outdoor area is about 40 ft. by 40 ft. and consists of concrete slabs with exposed seems which slope to an area drain.	Active
I) Extruded Plastic Waste Dumpster	1) Extruder Plastic Purge Material (1-20 CY dumpster)	Non-Hazardous Plastic Purge Material (Special Illinois Non-Haz. Waste Code No. 821608	Solid extruder plastic purge material is dumped into a steel dumpster located on the gravel surface north of the extruder room, drainage to local area drain.	Active
J) Industrial Rubbish Dumpsters	1) Industrial Rubbish (1-6 CY dumpster) (2-2 CY dumpster)	Non-Hazardous Paper and food Waste	Office and plant paper waste and food waste from the lunchroom are dumped into these steel dumpsters. These rest on the gravel surface west of the tank farm. Area drains to a local drain.	Active

SOLID WASTE MANAGEMENT UNITS
SUMMARY SHEET A (CON'T.)
MORTON INTERNATIONAL, INC. - CHICAGO FACILITY
ILD09678704

SWMU NAME	WASTE DESCRIPTION	WASTE CLASS	SWMU DESCRIPTION	ACTIVE / CLOSED
K) Trash Burner	1) Paper Waste (Unknown Volume)	Non-Hazardous Empty Fiber Drums Cardboard Paper Waste	Old paper trash burner located inside the boiler room. The burner itself and any records do not exist today. The boiler room's floor is an impervious concrete surface which drains to room area drains.	Closed

SOLID WASTE MANAGEMENT UNITS
SUMMARY SHEET B
MORTON INTERNATIONAL, INC. - CHICAGO FACILITY
ILD09678704

SWMU NAME		WASTE RELEASE INFORMATION	VOLUME	RELEASE DESCRIPTION	ANALYTICAL DATA
A)	Waste Tank Pumping Station/ Accumulation Area	No Releases on Record	---	---	---
B)	Tywood Waste Solvent Accumulation	1) 9/10/84 - Solvent (D001, D004, U028)	50 gallons	A waste solvent accumulation drum was stored outside of the Tywood room to the west on the concrete surface north of building D. The drum developed a leak and accumulated material leaked onto the concrete and some ran off the concrete to the neighboring property to the north. The material was cleaned up off the concrete and contaminated gravel and soil from the neighboring property was removed.	None

SOLID WASTE MANAGEMENT UNITS
SUMMARY SHEET B (CON'T.)
MORTON INTERNATIONAL, INC. - CHICAGO FACILITY
ILD09678704

SWMU NAME	WASTE RELEASE INFORMATION	VOLUME	RELEASE DESCRIPTION	ANALYTICAL DATA
	2) 6/25/85 - Air Mist (U028)	Mist	The Tywood scrubber system's demister pad had plugged which allowed scrubbed mist to be emitted to the atmosphere. Small droplets of mist covered the roofs of surrounding buildings. No cleanup performed.	None
	3) 11/3/85 - AirMist (U028)	Mist	See B,2	None
	4) 6/8/88 - 6/10/88 AirMist (U028)	Mist	See B,2	None

SOLID WASTE MANAGEMENT UNITS
SUMMARY SHEET B (CON'T.)
MORTON INTERNATIONAL, INC. - CHICAGO FACILITY
ILD09678704

SWMU NAME		WASTE RELEASE INFORMATION	VOLUME	RELEASE DESCRIPTION	ANALY-TICAL DATA
		5) 10/12/88 - Oil Overflow (D001, D004, U028)	10 gallons ?	The Tywood is a water scrubber which removes organics from the Cookroom Kettle process. The scrubbed water and oil is collected in a sump where it is automatically pumped to a separation tank. The oil layer is manually drained from the separator tank. The water layer is pumped to a treatment tank. The scrubber's water sprays had been inadvertently left on over the weekend which resulted in over filling of the Separator Tank. Some of the oil layer overflowed out the top tank vent, spilling onto the concrete floor and a small amount flowed out the east door onto the Non-Haz. Storage Pad. The flow never reached the Non-Haz. area drain. The material was cleaned up off the concrete surfaces.	None
C)	Drumming Room Accumulation Area	No Releases on Record	---	---	---

SOLID WASTE MANAGEMENT UNITS
SUMMARY SHEET B (CON'T.)
MORTON INTERNATIONAL, INC. - CHICAGO FACILITY
ILD09678704

SWMU NAME		WASTE RELEASE INFORMATION	VOLUME	RELEASE DESCRIPTION	ANALY-TICAL DATA
D)	Lab Waste Accumulation Area	No Releases on Record	---	---	---
E)	SB-1 Extrusion Accumulation Area	No Releases on Record	---	---	---
F)	NY Extrusion Accumulation Area	No Releases on Record	---	---	---
G)	Non-Haz. Container Storage Area	1) 5/22/87 - Oil Overflow (D001, D004, U028)	165 gallons	The adjacent Tywood Scrubber system's scrubbed oil and water sump malfunctioned causing oil and water to over flow the sump, spilling material on the concrete floor. This flowed out the east door of the Tywood room onto the Non-Haz. Pad and into its area drain. This drain had been previously locked to prevent flow into the plant sewers. The spilled material was pumped out of the drain and cleaned up off the concrete surface.	See Appendix F

SOLID WASTE MANAGEMENT UNITS
SUMMARY SHEET B (CON'T.)
MORTON INTERNATIONAL, INC. - CHICAGO FACILITY
ILD09678704

SWMU NAME		WASTE RELEASE INFORMATION	VOLUME	RELEASE DESCRIPTION	ANALY-TICAL DATA
		2) 1/7/88 - Oil Overflow (D001, D004, U028)	5 gallons	A Tywood Waste Solvent Accumulation drum had been stored on the Non-Haz. Pad. Ambient air temperature increased causing the full drum content's to expand and overflow out the unsecured bung fitting. Spilled material was cleaned off the concrete surface.	See Appendix F
		3) 6/28/89 - Oil Overflow (D001, D004, U028)	3 gallons	See G,2	See Appendix F
H)	Empty Drum Storage Area	No Release on Record	---	---	---
I)	Extruded Plastic Waste Dumpster	No Release on Record	---	---	---
J)	Industrial Rubbish Dumpsters	No Release on Record	---	---	---
K)	Trash Burner	No Release on Record	---	---	---
L)	RCRA Waste Solvent Tank	No Release on Record	---	---	See Appendix F

SOLID WASTE MANAGEMENT UNITS
SUMMARY SHEET B (CON'T.)
MORTON INTERNATIONAL, INC. - CHICAGO FACILITY
ILD09678704

SWMU NAME	WASTE RELEASE INFORMATION	VOLUME	RELEASE DESCRIPTION	ANALY-TICAL DATA
M) RCRA Container Storage Pad	No Release on Record	---	---	See Appendix F

DRAWING NUMBER	312221-A7
CHECKED BY	
APPROVED BY	
J. JOHNSON	5 DEC 91
DRAWN BY	

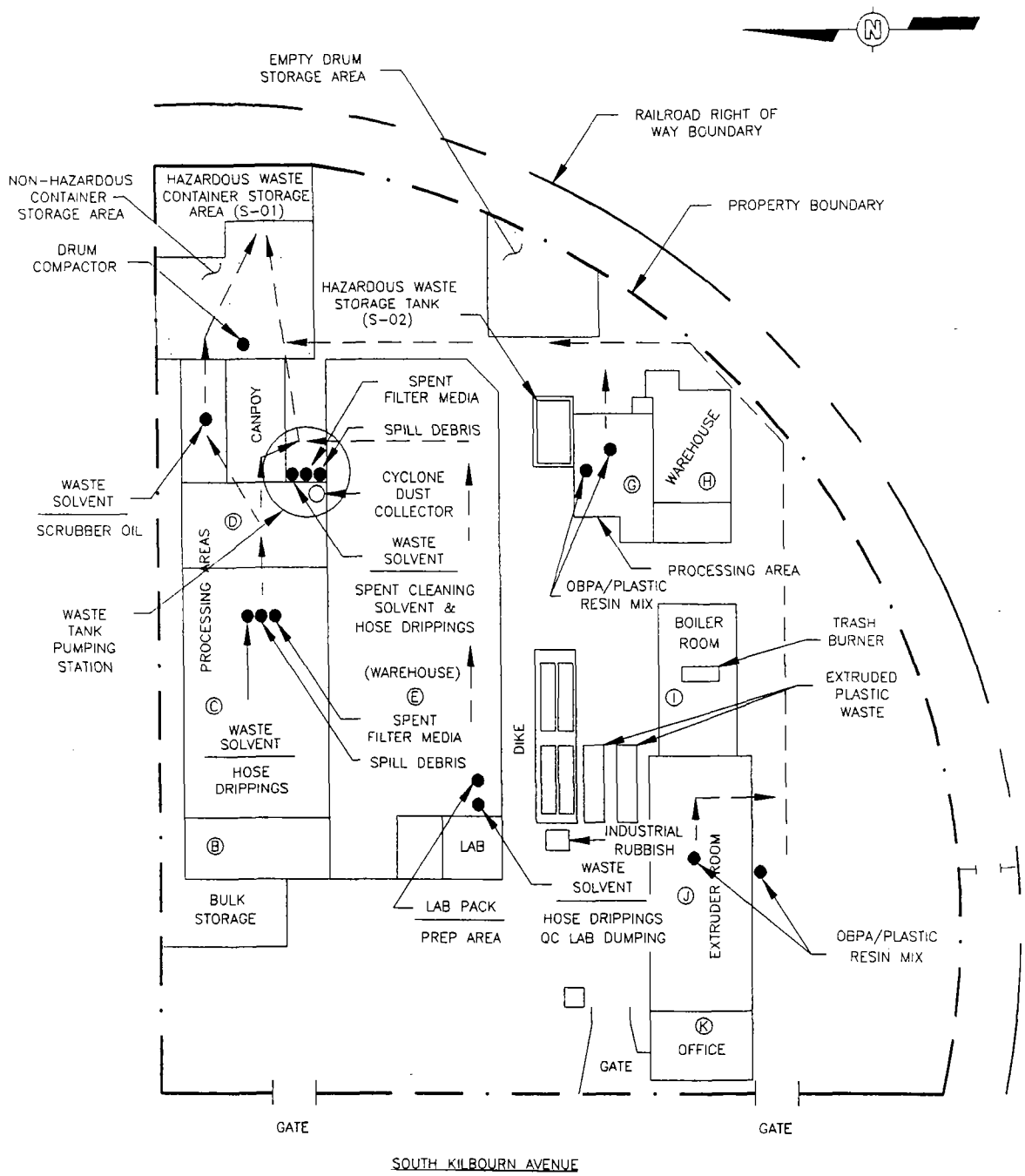


FIGURE E-1

SOLID WASTE MANAGEMENT UNITS
MORTON INTERNATIONAL, INCORPORATED
INDUSTRIAL CHEMICALS AND ADDITIVES

PREPARED FOR

MORTON INTERNATIONAL, INCORPORATED
CHICAGO, ILLINOIS

(APPROXIMATE SCALE)
0 17 34 51 FEET

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...Creating a Safer Tomorrow

"Do Not Scale This Drawing"

APPENDIX F

LABORATORY DATA SUMMARIES FROM PREVIOUS SOIL SAMPLING EVENTS

SAMPLE LOCATION INTERPRETATION FOR TABLE F-1

The following numbering system is used to cross-reference Figure 3, sample locations:

Sample Number: MI01-01

sample location (Figure 3)

sample collection vertical depth range (See below for range)

The following is an example:

Table F-1 Sample Number	Figure 3 Sample Location	Sample Collection Vertical Depth Range (feet)
MI01-01	IT-1	0-4
MI02-02	IT-2	4-8
MI03-03	IT-3	8-12

TABLE F-1
SUMMARY OF SOIL SAMPLE ANALYSES
FOR SOIL SAMPLES COLLECTED DURING FACILITY SITE ASSESSMENT
MORTON INTERNATIONAL, INC.
CHICAGO, ILLINOIS

Sample No.	Percent Solids (%)	Arsenic (ug/g)
MI01-01	81.4	5.0
MI02-01	77.7	5.3
MI03-01	79.1	3.2
MI04-01	76.5	6.5
MI09-01	78.5	7.4
MI10-01	76.7	13.0
MI11-01	75.0	6.1
MI12-01	85.6	7.0
MI15-01	79.1	4.5
MI16-01	89.3	4.4
MI17-01	83.5	18.0
MI18-01	76.8	4.7
MI19-01	79.5	9.0

TABLE F-1 (CONT)
SUMMARY OF SOIL SAMPLE ANALYSES
FOR SOIL SAMPLES COLLECTED DURING FACILITY SITE ASSESSMENT
MORTON INTERNATIONAL
CHICAGO, ILLINOIS

VOLATILE ORGANIC COMPOUNDS ug/Kg	MI01-01	MI01-02	MI02-01	MI03-01	MI03-02	MI03-03	MI04-01	MI08-03	MI09-01	MI09-02	MI09-03	MI10-01	MI10-03	MI11-01	MI11-02	MI12-01	MI12-03	MI16-02	MI18-02
Chloromethane	<100	<50	<10000	<100	<100	<5.0	<50	<50	<50	<50	<50	<3000	<50	<50	<50	<3000	<50	<50	<500
Vinyl Chloride	<100	<50	<10000	<100	<100	<50	<50	<50	<50	<50	<50	<3000	<50	<50	<50	<3000	<50	<50	<500
Bromomethane	<100	<50	<10000	<100	<100	<50	<50	<50	<50	<50	<50	<3000	<50	<50	<50	<3000	<50	<50	<500
Chloroethane	<100	<50	<10000	<100	<100	<50	<50	<50	<50	<50	<50	<3000	<50	<50	<50	<3000	<50	<50	<500
1,1-Dichloroethene	<10	<5.0	<1000	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<50
Carbon Disulfide	66.0	30.0	<1000	136	93.8	<5.0	<5.0	<5.0	<5.0	7.2	<5.0	<300	<5.0	<5.0	20.0	<300	<5.0	<5.0	7.5
Acetone	1330	318	<10000	552	317	<50	197	<50	<50	63.6	<50	<3000	<50	142	258	<3000	<50	86.4	154
Methylene Chloride	<50	<25	<5000	<50	<50	<25	<25	1950	<25	<25	9360	<1500	10,900	<25	<25	<1500	804	<25	<250
trans-1,2-Dichloroethene	<10	<5.0	<1000	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<50
1,1-Dichloroethane	<10	<5.0	<1000	<10	<10	5.02	<5.0	<5.0	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<50
Vinyl Acetate	<100	<50	<10000	<100	<100	<50	<50	<50	<50	<50	<50	<3000	<50	<50	<50	<3000	<50	<50	<500
2-Butanone	<100	<50	<10000	<100	<100	<50	<50	<50	<50	<50	<50	<3000	<50	<50	<50	<3000	<50	<50	<500
cis-1,2-Dichloroethene	<10	<5.0	<1000	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	765	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<50
Chloroform	61.2	<5.0	<1000	50.5	42	<5.0	<5.0	<5.0	<5.0	<5.0	40.3	<300	6.1	<5.0	<5.0	<300	109	27.3	21.6
1,1,1-Trichloroethane	<10	<5.0	<1000	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<50
1,2-Dichloroethane	<10	<5.0	<1000	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<50
Benzene	<10	<5.0	<1000	<10	<10	<5.0	<5.0	82.8	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<50
Carbon Tetrachloride	<10	<5.0	<1000	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<50
1,2-Dichloropropane	<10	<5.0	<1000	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<50
Trichloroethene	<10	<5.0	<1000	<10	<10	<5.0	<5.0	<5.0	5.4	<5.0	<5.0	<300	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<50
Bromodichloromethane	<10	<5.0	<1000	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<50
2-Chloroethylvinyl ether	<100	<50	<10000	<100	<100	<5.0	<50	<5.0	<50	<50	<5.0	<3000	<5.0	<50	<50	<3000	<5.0	<50	<500
trans-1,3-Dichloropropene	<10	<5.0	<1000	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<50
4-Methyl-2-pentanone	<100	<50	<10000	<100	<100	<50	<50	<25	<50	<50	<25	<3000	<50	<50	<50	<3000	<25	<50	<500
Toluene	13.3	<5.0	<1000	21.1	<10	<5.0	<5.0	91.6	5.4	11.2	171	925	12.5	8.6	14.8	872	92.9	7.9	<50
cis-1,3-Dichloropropene	<10	<5.0	<1000	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<50
1,1,2-Trichloroethane	<10	<5.0	<1000	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<50
Dibromochloromethane	<10	<5.0	<1000	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<50
2-Hexanone	<100	<50	<10000	<100	<100	<50	<50	<50	<50	<50	<50	<3000	<50	<50	<50	<3000	<50	<50	<500
Tetrachloroethene	<10	<5.0	<1000	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<50
Chlorobenzene	<10	<5.0	<1000	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<50
Ethylbenzene	38.0	<5.0	24500	281	619	<5.0	<5.0	5440	<5.0	17.5	30.8	4470	8.9	7.9	6.9	911n	59,300	11.1	8.3
meta & para-Xylene	121	18.6	6500	1870	1030	<5.0	23.9	19,100	<5.0	29.4	60.7	31,900	24.0	21.1	24.7	67,200	38,900	67.3	26.0
Bromoform	<10	<5.0	<1000	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<300	5.0	<5.0	<5.0	<300	<5.0	<5.0	<50
Styrene	<10	<5.0	<1000	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<50
ortho-Xylene	40.4	6.4	<1000	60.5	12.3	<5.0	8.3	3600	<5.0	10.2	22.8	11,400	<5.0	9.5	24.7	27,100	18,100	12.8	8.7
1,1,2,2-Tetrachloroethane	<10	<5.0	<1000	<10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<5.0	<300	<5.0	<5.0	<50
Xylenes, Total	NT	NT	NT	NT	NT	NT	NT	22,700	NT	NT	83.5	NT	NT	NT	NT	NT	57,000	NT	NT

Note: NT- compound(s) was not tested.

TABLE F-1 (CONT)
SUMMARY OF SOIL SAMPLE ANALYSES
FOR SAMPLES COLLECTED DURING FACILITY SITE ASSESSMENT
MORTON INTERNATIONAL
CHICAGO, ILLINOIS

BASE NEUTRAL TARGET COMPOUNDS ug/g	MI01-01	MI02-01	MI03-01	MI03-03	MI04-01	MI09-01	MI10-01	MI10-03	MI11-01	MI12-01	MI15-01	MI15-02	MI15-03	MI16-01	MI17-01	MI18-01	MI19-01
Aniline	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Bis-(2-chloroethyl)ether	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
1,3-Dichlorobenzene	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
1,4-Dichlorobenzene	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
1,2-Dichlorobenzene	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Benzyl alcohol	<5.0	<1.0	<10	<1.0	<5.0	<10	<20	<1.0	<1.0	<10	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Hexachloroethane	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
N-Nitrosodi-n-propylamine	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Bis(2chloroisopropyl)ether	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Nitrobenzene	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
N-Nitrosodimethylamine	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Isophorone	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Bis(2-chloroethoxy)methane	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
1,2,4-Trichlorobenzene	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Napthalene	12	2.0	<10	<1.0	<5.0	<5.0	68	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	1.0	<5.0	<5.0
4-Chloroaniline	<5.0	<1.0	<10	<2.0	<5.0	<10	<20	<2.0	<1.0	<10	<20	<2.0	<100	<5.0	<1.0	<5.0	<10
Hexachlorobutadiene	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
2-Methylnaphthalene	<5.0	7.0	<10	<1.0	<5.0	<5.0	660	<1.0	1.0	<5.0	<20	<1.0	<50	<5.0	2.0	<5.0	<5.0
2-Chloronaphthalene	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
3-Nitroaniline	<25	<5.0	<50	<5.0	<25	<25	<100	<5.0	<5.0	<25	<100	<5.0	<250	<25	<5.0	<25	<25
2-Nitroaniline	<25	<5.0	<50	<5.0	<25	<25	<100	<5.0	<5.0	<25	<100	<5.0	<250	<25	<5.0	<25	<25
4-Nitroaniline	<25	<5.0	<50	<5.0	<25	<25	<100	<5.0	<5.0	<25	<100	<5.0	<250	<25	<5.0	<25	<25
Acenaphthylene	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Dimethyl phthalate	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Acenaphthene	<5.0	<1.0	<10	<1.0	<5.0	<5.0	55	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Fluorene	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
4-Chlorophenylphenyl ether	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Dibenzofuran	<5.0	<1.0	<10	<1.0	<5.0	<5.0	18	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Diethyl phthalate	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
N-Nitrosodiphenylamine	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Hexachlorocyclopentadiene	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
2,6-Dinitrotoluene	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
2,4-Dinitrotoluene	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
4-Bromophenyl phenyl ether	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Hexachlorobenzene	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Phenanthrene	9.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	2.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Anthracene	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Di-n-butylphthalate	<5.0	<1.0	<10	ND	<5.0	<5.0	<20	ND	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Fluoranthene	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Pyrene	6.0	<1.0	<10	<1.0	6.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Benz(a)anthracene	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Chrysene	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Benzidine	<25	<5.0	<50	<5.0	<25	<25	<100	<5.0	<5.0	<25	<100	<5.0	<250	<25	<5.0	<25	<25
3,3-Dichlorobenzidine	<10	<2.0	<20	<2.0	<10	<10	<40	<2.0	<2.0	<10	<40	<2.0	<100	<10	<2.0	<10	<10
Butyl benzyl phthalate	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	110	<1.0	64	<5.0	<1.0	9.0	<5.0
Bis(2-ethylhexyl)phthalate	<5.0	<1.0	147	7.0	<5.0	<5.0	33	3.0	<1.0	11	60	<1.0	61	29.0	5.0	<5.0	<5.0
Benzo(b)fluoranthene	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Benzo(k)fluoranthene	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	3.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Benzo(a)pyrene	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Indeno(1,2,3-cd)pyrene	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Dibenzo(a,h)anthracene	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Benzo(ghi)perylene	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0
Di-n-octylphthalate	<5.0	<1.0	<10	<1.0	<5.0	<5.0	<20	<1.0	<1.0	<5.0	<20	<1.0	<50	<5.0	<1.0	<5.0	<5.0

Note: ND-compound was not detected.

TABLE F-1 (CONT)
SUMMARY OF SOIL SAMPLE ANALYSES
FOR SOIL SAMPLES COLLECTED DURING FACILITY SITE ASSESSMENT
MORTON INTERNATIONAL
CHICAGO, ILLINOIS

ACID TARGET COMPOUNDS ug/g	MI01-01	MI02-01	MI03-01	MI04-01	MI09-01	MI10-01	MI11-01	MI12-01	MI15-01	MI16-01	MI17-01	MI18-01
2-Chlorophenol	<5.0	<1.0	<10	<5.0	<5.0	<20	<1.0	<5.0	<20	<5.0	<1.0	<5.0
Phenol	<5.0	<1.0	<10	<5.0	<5.0	<20	<1.0	<5.0	<20	<5.0	<1.0	<5.0
2-Methylphenol	<5.0	<1.0	<10	<5.0	<5.0	<20	<1.0	<5.0	<20	<5.0	<1.0	<5.0
4-Methylphenol	<5.0	<1.0	<10	<5.0	<5.0	<20	<1.0	<5.0	<20	<5.0	<1.0	<5.0
Benzoic Acid	<25	<5.0	<50	<25	<25	<100	<5.0	<25	<100	<25	<5.0	<25
2-Nitrophenol	<25	<5.0	<50	<25	<5.0	<100	<5.0	<5.0	<100	<25	<5.0	<25
2,4-Dimethylphenol	<5.0	<1.0	<10	<5.0	<5.0	<20	<1.0	<5.0	<20	<5.0	<1.0	<5.0
2,4-Dichlorophenol	<5.0	<1.0	<10	<5.0	<5.0	<20	<1.0	<5.0	<20	<5.0	<1.0	<5.0
4-Chloro-3-Methylphenol	<5.0	<1.0	<10	<5.0	<5.0	<20	<1.0	<5.0	<20	<5.0	<1.0	<5.0
2,4,6-Trichlorophenol	<5.0	<1.0	<10	<5.0	<5.0	<20	<1.0	<5.0	<20	<5.0	<1.0	<5.0
2,4,5-Trichlorophenol	<25	<5.0	<50	<25	<5.0	<100	<5.0	<5.0	<100	<25	<5.0	<25
2,4-Dinitrophenol	<25	<5.0	<50	<25	<25	<100	<5.0	<25	<100	<25	<5.0	<25
4-Nitrophenol	<25	<5.0	<50	<25	<25	<100	<5.0	<25	<100	<25	<5.0	<25
2-Methyl-4,6-dinitrophenol	<25	<5.0	<50	<25	<25	<100	<5.0	<25	<100	<25	<5.0	<25
Pentachlorophenol	<25	<5.0	<50	<25	<25	<100	<5.0	<25	<100	<25	<5.0	<25

SAMPLE LOCATION INTERPRETATION FOR TABLE F-2

The following numbering system is used to cross-reference Figure 4, sample locations:

Sample Number: SS-01-02

sample location (Figure 4)

sample collection vertical depth (feet)

The following is an example:

Table F-2 Sample Number	Figure 4 Sample Location	Sample Collection Vertical Depth (feet)
SS-15-07	15	7

TABLE F-2
SOIL SAMPLE ANALYSES
POST SOIL EXCAVATION SAMPLING
MORTON INTERNATIONAL
CHICAGO, ILLINOIS

	Bis-(2-ethylhexyl) phthalate	Butyl Benzyl Phthalate	Di-n-Butyl Phthalate	Napthalene	2-Methyl-napthalene	Benzene	Ethyl-benzene	Toluene	Xylenes	Arsenic	MEK
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
SS-01-02	ND	ND	0.56B	ND	ND	ND	ND	0.44	ND	4.2	.025B
SS-02-03	ND	ND	0.54B	ND	ND	ND	ND	ND	ND	3.8	.017B
SS-03-03	ND	ND	0.74B	ND	ND	0.57	ND	0.62	ND	3.0	0.33B
SS-04-03	0.35B	ND	0.52B	ND	ND	.036	ND	0.73	ND	3.3	0.031B
SS-05-10	ND	ND	0.56B	ND	ND	ND	ND	0.014	ND	3.8	0.022
SS-06-10	0.35	ND	0.54B	ND	ND	ND	ND	0.018	0.093	3.0	0.021
SS-07-08	ND	ND	ND	ND	ND	ND	ND	0.10	ND	4.5	.026
SS-08-08	ND	ND	ND	ND	ND	ND	ND	0.44	ND	2.6	.03B
SS-09-04	ND	ND	0.42B	ND	0.38	ND	ND	ND	ND	3.5	.011B
SS-10-05	ND	ND	0.40B	2.2	ND	ND	0.45	ND	0.68	4.0	0.051B
SS-11-05	2.5	ND	0.43B	2.7	0.55	ND	0.73	ND	1.5	3.8	0.026
SS-12-06	3.7	ND	0.71B	ND	ND	ND	ND	ND	0.011	2.1	.023
SS-13-05	4.8	ND	0.4	0.97	ND	ND	0.048	ND	0.57	3.8	.056B
SS-14-06	ND	ND	0.43	ND	ND	ND	ND	ND	ND	5.3	0.037
SS-15-07	4.4	ND	ND	2.7	0.36	ND	0.79	ND	4.7	4.1	0.056B
SS-16-07	0.43	ND	0.75	ND	ND	ND	ND	ND	0.010	3.1	0.031
SS-19-10	0.45	ND	1.5B	ND	ND	ND	ND	ND	0.009	2.7	.029B
SS-20-10	ND	ND	0.40B	ND	ND	ND	ND	ND	ND	4.9	.034B
SS-21-12	0.48	ND	0.51B	ND	ND	ND	ND	ND	ND	3.0	ND

mg/kg = milligrams per kilogram or parts per million.

	Bis(2-ethylhexyl) Phthalate	Butyl Benzyl Phthalate	Di-n-butyl Phthalate	Napthalene	Methyl-Napthalene	Benzene	Ethyl-benzene	Toluene	Xylenes	Arsenic	MEK
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
SS-22-12	8.2	0.38	0.46B	ND	ND	ND	ND	ND	0.017	3.6	.027B
SS-23-11	5.0	ND	ND	ND	ND	ND	ND	ND	ND	4.8	.032B
SS-24-12	13	1.2	2.8B	ND	ND	ND	ND	ND	ND	7.0	.033B
SS-25-10	2.3	ND	0.49B	ND	ND	ND	ND	ND	ND	9.4	.024B
SS-26-12	1.2	ND	0.59B	ND	ND	ND	ND	ND	ND	3.1	.024
SS-27-04	0.96	ND	1.8	ND	ND	ND	ND	ND	ND	2.4	ND
SS-28-06	ND	ND	0.54	ND	4.2	ND	ND	ND	ND	2.0	ND
SS-29-08	ND	ND	0.45	ND	ND	ND	ND	ND	ND	3.0	ND
SS-30-08	ND	ND	1.6	ND	ND	ND	ND	ND	ND	3.1	ND
SS-31-08	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.9	ND
SS-32-04	0.47	ND	ND	ND	ND	ND	ND	ND	ND	2.6	0.015B
SS-33-05*	ND	0.94	ND	0.42	0.37	ND	ND	ND	ND	2.6	ND
SS-34-06	0.42	ND	ND	ND	ND	ND	ND	ND	ND	2.7	0.022
SS-35-06*	2.3	2.4	ND	ND	0.37	ND	ND	ND	0.019	2.3	ND
SS-36-06	ND	1.8	ND	ND	ND	ND	ND	ND	ND	2.9	ND
SS-37-04	1.8	1.0	ND	ND	ND	ND	ND	ND	ND	3.6	.016B
SS-38-04	1.8	0.51	ND	ND	ND	ND	ND	ND	ND	3.7	0.015B
SS-39-05	0.89	ND	ND	ND	ND	ND	ND	ND	ND	2.9	0.018B
SS-40-04	0.68	ND	ND	ND	ND	ND	ND	ND	ND	2.6	0.015B
SS-41-05	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.6	0.031B
SS-42-04	ND	1.9	ND	ND	ND	ND	ND	ND	ND	2.7	0.017B
SS-43-06	1.0	0.67	ND	ND	ND	ND	ND	ND	ND	2.6	.023B
SS-44-04	0.64	ND	ND	ND	1.1	ND	ND	ND	ND	2.5	.02B

mg/kg = milligrams per kilogram or parts per million.

TABLE F-2 (CONT)

	Bis(2-ethylhexyl) Phthalate	Butyl Benzyl Phthalate	Di-n-butyl Phthalate	Napthalene	2-Methyl-napthalene	Benzene	Ethyl-benzene	Toluene	Xylenes	Arsenic	MEK UNITS
SS-45-04	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.8	.067B
SS-46-06	0.89	ND	ND	ND	ND	ND	ND	ND	ND	3.4	ND
SS-47-06	2.2	5.7	0.60B	ND	ND	ND	ND	ND	ND	3.9	.024B
SS-48-06	.95	ND	.53B	ND	ND	ND	ND	ND	ND	3.2	.018B
SS-49-07	ND	ND	1.3B	ND	ND	ND	ND	ND	ND	2.2	ND
SS-50-05	1.0	ND	0.50B	ND	ND	ND	ND	ND	ND	2.5	.021B
SS-51-05	.37	ND	1.18	ND	ND	ND	ND	ND	ND	2.9	0.023B
SS-52-06	.74	ND	ND	ND	ND	ND	ND	ND	ND	1.8	0.061B
SS-53-05	0.99	ND	ND	ND	ND	ND	ND	ND	ND	2.3	ND
SS-54-01*	75	ND	ND	39	150	ND	ND	ND	ND	ND	--

NOTE - Many samples contained trace amounts of Acetone, Methylene Chloride, and 2-Butanone, which are common laboratory contaminants.
B - Also found in Method Blank
ND - Not detected at method detection limit
* - Contained Polynuclear Aromatic Compounds (PAHs) - see full laboratory data
Units - mg/kg (ppm)

Analytical Methods:
Volatile Organic Compounds - SW846 EPA Method 8240
Base/Neutral Acid Target Compounds - SW846 EPA Method 8270
Total Arsenic - SW846 EPA Method 7060

mg/kg = milligrams per kilogram or parts per million.

TABLE F-3
BACKFILL MATERIAL ANALYTICAL DATA SUMMARY
MORTON INTERNATIONAL
CHICAGO, ILLINOIS

	Di-n-butyl Phthalate	Methylene Chloride	Acetone	2-Butanone	Xylenes	Chloroform	Arsenic
Fill-02*	0.70	0.029	0.037	0.027	ND	ND	1.5
Fill-03	0.66B	0.006	0.029	0.017B	0.014	ND	3.6

ND - Not detected at method detection limit.
B - Also found in method blank.
* - Also contained PNA's
Units: mg/kg (ppm)

Analytical Methods:
Volatile Organic Compounds - SW846 EPA Method 8240
Base/Neutral Acid Target Compounds - SW846 EPA Method 8270
Total Arsenic - SW846 Method 7060

APPENDIX G

PENTACHLOROPHENOL WASTE DISPOSAL

NOTIFICATION TO REGULATORY AGENCIES

C611 ILD 095 309 647 USEPA

Morton *International*

November 27, 1991 FILE: USA-BAT-E-SHW-112791

Mr. Charles Zeal, Manager
Illinois Environmental Protection Agency
Division of Land Pollution Control
Permits Section
2200 Churchill Road, P.O. Box 19276
Springfield, IL 62794-9276

RECEIVED
DEC 0 3 1991
IEPA-DLPC

Subject: 0890100007 -- Kane County
Morton International/Batavia
IESDA Incident #912728
Technical Reports

Dear Mr. Zeal:

In response to a telephone conversation with yourself and Mr. Robert Carson on October 25, 1991, Morton International (Morton) hereby submits four (4) copies of a Closure Plan in regard to the referenced project for Agency review and approval. The closure plan, which was prepared by our consultant IT Corporation (IT), covers the planned disposal of a stockpile of soil generated during a recent remedial action at the site. Additional background information on the project can be found in a Morton report to Mr. Carson dated October 2, 1991 and an IEPA response dated October 17, 1991.

Arrangements are currently being made for the disposal of the soil at an appropriate off-site disposal facility. Similar arrangements are being made for a small amount of perched groundwater also removed during the excavation. It is expected that disposal approval for these wastes will be finalized in the next two weeks. As the wastes were generated on October 9, 1991, the 90-day period during which these wastes can be stored on-site expires on January 7, 1992. It is therefore Morton's intention to complete the off-site disposal of the wastes as soon as possible after receipt of approval and before the January 7 deadline. Your office will be contacted prior to any disposal activity.

The Closure Plan will be implemented and documented by IT once plan approval has been received from the Agency. The only activity that might possibly take place before Agency approval is the disposal of waste as outlined above. A closure report will be prepared by IT under the direction of a registered PE and will be submitted to your office upon completion.

Morton International, Inc., Morton International Building
100 North Riverside Plaza, Randolph Street at the River
Chicago, IL 60606-1596 312/807-2000

C6 11

INTERNATIONAL TECHNOLOGY CORPORATION

November 26, 1991

Thomas D. Gentner
Senior Environmental Engineer
Morton Intentional, Inc.
100 North Riverside Plaza
Randolph Street at the River
Chicago, IL 60606-1596

RECEIVED
DEC 0 3 1991
IEPA-DLPC

Re: Soil Pile Closure Plan

Dear Mr. Gentner:

Enclosed is a final copy of the closure plan for the soil pile generated during relocation of the above ground waste solvent storage tank. The closure plan was prepared under my direction, an Illinois Registered Professional Engineer, in accordance with IEPA guidance.

Thank you for the opportunity to assist you in this matter. If you have any further question, please feel free to contact me.

Sincerely,

IT CORPORATION

Raymond Boyd P.E.

RAYMOND R. BOYD, II
062-046655
REGISTERED PROFESSIONAL ENGINEER
STATE OF ILLINOIS

Raymond R. Boyd, P.E.
Project Manager

RRB:mgb
Enclosure

cc: E. Murphy, Morton Batavia

Regional Office
333 Pierce Road • Suite 200 • Itasca, Illinois 60143 • 708-250-7788

IT Corporation is a wholly owned subsidiary of International Technology Corporation

Morton *International*

Specialty Chemicals Group
Industrial Chemicals and Additives

August 2, 1990

United States Environmental Protection Agency
Region 5
230 South Dearborn St.
Chicago, Illinois 60604

Attn: 5HR-12
Mr. Paul Dimock

Re: Morton International, Inc.
USEPA #ILD095787049
F027 Waste Storage

Dear Mr. Dimock:

Morton International's Chicago Facility is pleased to announce that it no longer needs the extension to store F027 Waste at the Chicago plantsite. A storage extension (beyond one year based on LDR Regulations) was granted by USEPA - Region 5 on December 1st, 1989. See attached letter. Beginning in February, 1990, forty-nine drums containing pentachlorophenol contaminated waste (F027) from the Morton facility at 1623-1655 S. Kilbourn Avenue, Chicago, Illinois were shipped to Delaware Container Corporation in Coatesville, Pennsylvania. These were subsequently shipped to Ekokem, Ltd. in Riikimaki, Finland where the material was incinerated. All applicable hazardous waste packaging, manifesting, and transportation regulations were followed.

International Technology Corporation; an independent environmental engineering consultant, was hired by Morton to observe and document activities associated with the transportation and shipment of the waste. Please find enclosed IT's full report. I trust that this will meet with your approval and should close the subject of F027 Waste at the Chicago facility. Of course, the plantsite will continue to comply with all hazardous waste storage regulations. Feel free to call me at (312) 521-7000, if you have any questions.

Sincerely,

Philip R. Camera

Philip R. Camera
Plant Engineer

cc: Morton Group Environmental Affairs Department

PRC/sb

A:F027.LTR

Morton International, Inc., 1645 South Kilbourn Avenue, Chicago, IL 60623 312/521-7000 Fax 312/522-1734

Morton *International*

Specialty Chemicals Group
Industrial Chemicals and Additives

August 2, 1990

Illinois Environmental Protection Agency
Division of Land Pollution Control
Field Operations Section
Maywood Region
1701 First Avenue
Maywood, Illinois 60153

Attn: Ms. Mary Glynn

Re: Morton International, Inc.
USEPA #ILD095787049
F027 Waste Storage

Dear Mary:

Morton International's Chicago Facility is pleased to announce that it no longer needs the extension to store F027 Waste at the Chicago plantsite. A storage extension (beyond one year based on LDR Regulations) was granted by USEPA - Region 5 on December 1st, 1989. See attached letter. Beginning in February, 1990, forty-nine drums containing pentachlorophenol contaminated waste (F027) from the Morton facility at 1623-1655 S. Kilbourn Avenue, Chicago, Illinois were shipped to Delaware Container Corporation in Coatesville, Pennsylvania. These were subsequently shipped to Ekokem, Ltd. in Riikimaki, Finland where the material was incinerated. All applicable hazardous waste packaging, manifesting, and transportation regulations were followed.

International Technology Corporation; an independent environmental engineering consultant, was hired by Morton to observe and document activities associated with the transportation and shipment of the waste. Please find enclosed IT's full report. I trust that this will meet with your approval and should close the subject of F027 Waste at the Chicago facility. Of course, the plantsite will continue to comply with all hazardous waste storage regulations. Feel free to call me at (312) 521-7000, if you have any questions.

Sincerely,

Philip R. Camera

Philip R. Camera
Plant Engineer

cc: Morton Group Environmental Affairs Department

PRC/sb

A:F027.LTR

Morton International, Inc., 1645 South Kilbourn Avenue, Chicago, IL 60623 312/521-7000 Fax 312/522-1734

Morton *International*

Specialty Chemicals Group
Industrial Chemicals and Additives

August 2, 1990

Illinois Environmental Protection Agency
Division of Land Pollution Control
2200 Churchill Road
P.O. Box 19276
Springfield, Illinois 62794

Attn: Mr. Lawrence Eastep

Re: Morton International, Inc.
USEPA #ILD095787049
F027 Waste Storage

Dear Mr. Eastep:

Morton International's Chicago Facility is pleased to announce that it no longer needs the extension to store F027 Waste at the Chicago plantsite. A storage extension (beyond one year based on LDR Regulations) was granted by USEPA - Region 5 on December 1st, 1989. See attached letter. Beginning in February, 1990, forty-nine drums containing pentachlorophenol contaminated waste (F027) from the Morton facility at 1623-1655 S. Kilbourn Avenue, Chicago, Illinois were shipped to Delaware Container Corporation in Coatesville, Pennsylvania. These were subsequently shipped to Ekokem, Ltd. in Riikimaki, Finland where the material was incinerated. All applicable hazardous waste packaging, manifesting, and transportation regulations were followed.

International Technology Corporation; an independent environmental engineering consultant, was hired by Morton to observe and document activities associated with the transportation and shipment of the waste. Please find enclosed IT's full report. I trust that this will meet with your approval and should close the subject of F027 Waste at the Chicago facility. Of course, the plantsite will continue to comply with all hazardous waste storage regulations. Feel free to call me at (312) 521-7000, if you have any questions.

Sincerely,

Philip R. Camera

Philip R. Camera
Plant Engineer

cc: Morton Group Environmental Affairs Department

PRC/sb

A:F027.LTR

Morton International, Inc., 1645 South Kilbourn Avenue, Chicago, IL 60623 312/521-7000 Fax 312/522-1734

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

01 DEC 1989

REPLY TO THE ATTENTION OF:
5HR-12

Mr. James E. Opre
Plant Manager
Morton International, Inc.
1645 South Kilbourn Avenue
Chicago, Illinois 60623

Re: Morton International, Inc.
U.S. EPA ID# ILD 095 787 049

Dear Mr. Opre:

This is in reply to your letter dated November 7, 1989, in which you requested an extension of time for the storage of F027 Waste beyond one year, at the Morton facility.

The Land Disposal Restriction (LDR) Regulations do not prohibit the storage of this waste beyond one year. However, the LDR regulations do impose a burden of proof requiring those treatment, storage, and disposal facilities that exceed one year storage to provide documentation demonstrating that such storage is solely for the purpose of accumulation of such quantities of hazardous waste as are necessary to facilitate proper recovery treatment, or disposal. This requirement is contained in 40 CFR 268.50(c). The U.S. EPA assumes that storage for up to one year is solely for the purpose stated in the LDR regulation identified above, unless there is information to the contrary.

We have reviewed your letter and determined that it fulfills the demonstration requirement specified in the LDR regulations. Therefore, the Morton facility may continue to store F027 waste until such time as a treatment or disposal facility will accept F027 waste.

If you have any further questions or concerns, please contact Mr. Paul Dimock at (312) 886-4445.

Sincerely yours,

William E. Muno, Chief
RCRA Enforcement Branch

RECEIVED
DEC 04 1989
Morton International
CHICAGO FACILITY

C. N. KLUMPP
L. KRISCHKE
P. CAMERA
12/4

INTERNATIONAL
TECHNOLOGY
CORPORATION

PROJECT No. 312253.02
NOVEMBER, 1991

REPORT

CLOSURE PLAN
MORTON INTERNATIONAL

Submitted To:

MORTON INTERNATIONAL
1500 LATHEM
BATAVIA, ILLINOIS 60510

Prepared By:

IT CORPORATION
ITASCA, ILLINOIS

RESPONSIVE TO THE NEEDS OF ENVIRONMENTAL MANAGEMENT

CLOSURE PLAN
MORTON INTERNATIONAL, INCORPORATED
BATAVIA PLANT

PREPARED FOR:

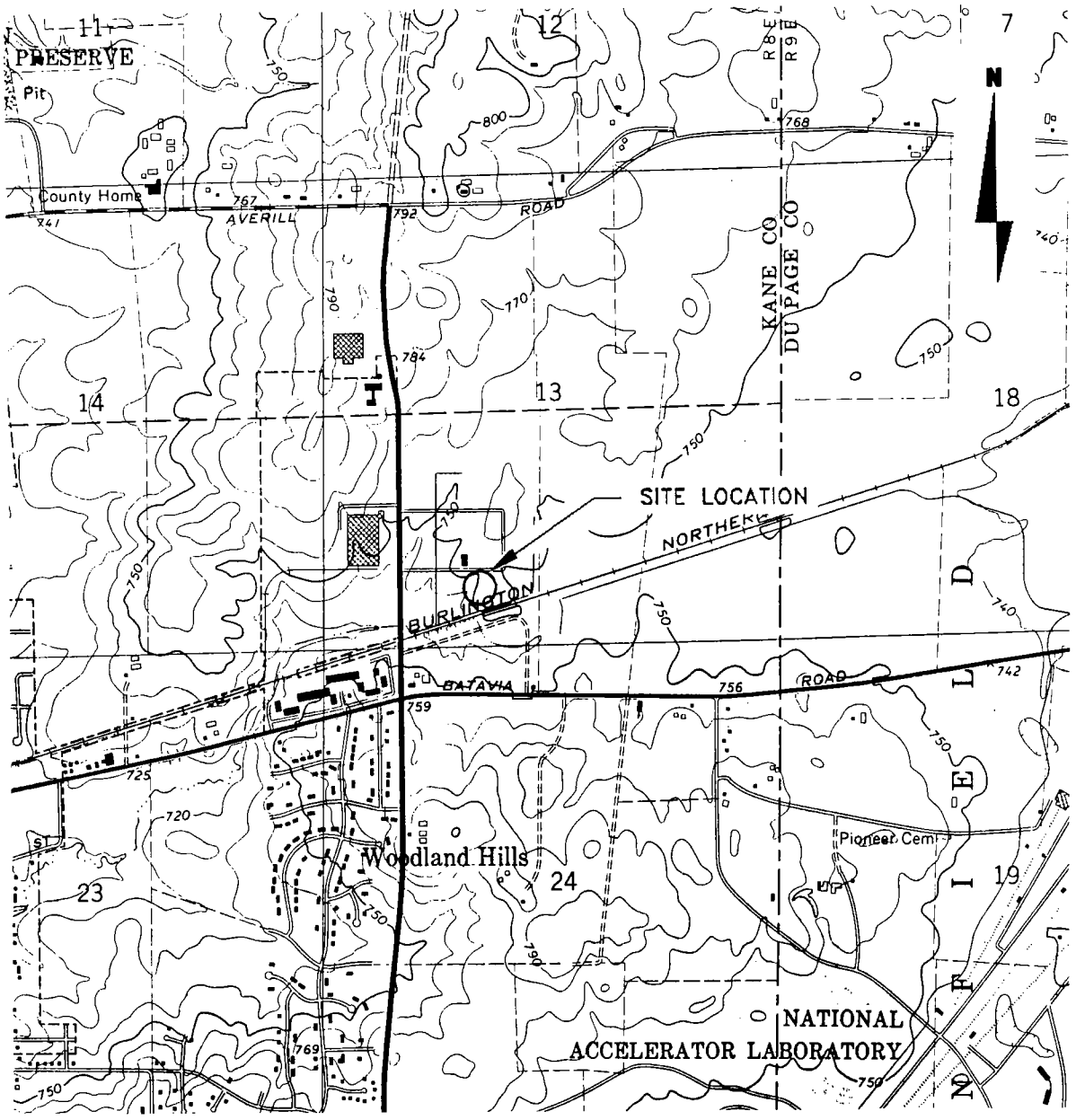
MORTON INTERNATIONAL, INCORPORATED
1500 LATHEM
BATAVIA, ILLINOIS

PREPARED BY:

IT CORPORATION
333 PIERCE ROAD
ITASCA, ILLINOIS

PROJECT NO.: 312253.02
NOVEMBER 1991

DRAWN BY	J JOHNSON 13 NOV 91	CHECKED BY	MJB 11-20-91	DRAWING NUMBER	312253-A9
		APPROVED BY	RPE 11-20-91		



SCALE 1:24 000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

REFERENCE DRAWING

U.S.G.S. 7.5 MINUTE
AURORA NORTH, ILLINOIS
QUADRANGLE MAP

QUADRANGLE LOCATION

FIGURE 1

SITE LOCATION MAP–
MORTON COATINGS, INC.
BATAVIA, ILLINOIS

PREPARED FOR

MORTON INTERNATIONAL, INC.
BATAVIA, ILLINOIS

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		APPROVED BY	SRM	11-20-91		

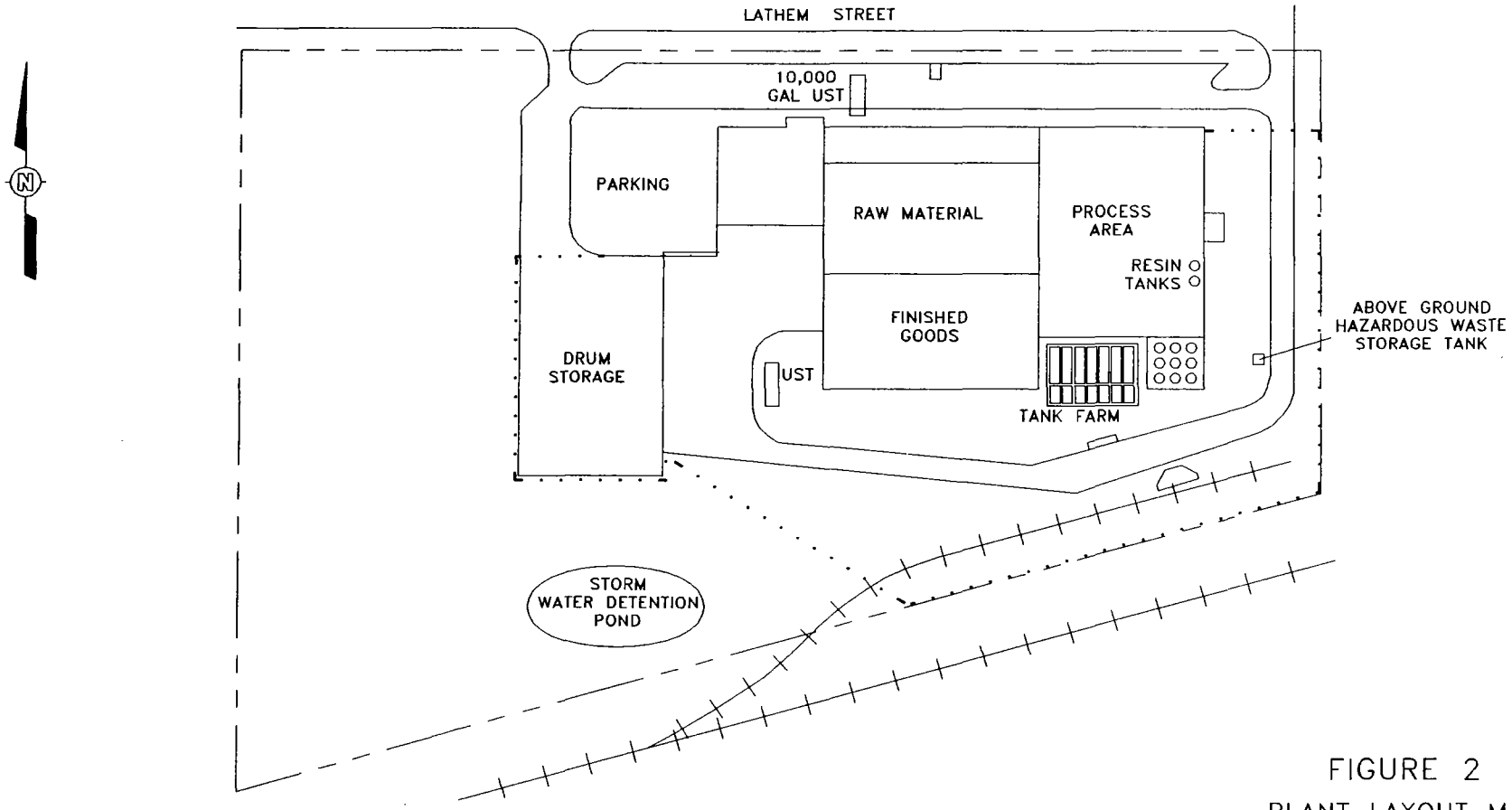

FIGURE 2

PLANT LAYOUT MAP
BATAVIA, ILLINOIS

PREPARED FOR

MORTON INTERNATIONAL, INC.
BATAVIA, ILLINOIS

LEGEND

RAILROAD TRACKS
FENCE
PROPERTY LINE

NOTE: FIGURE NOT TO SCALE

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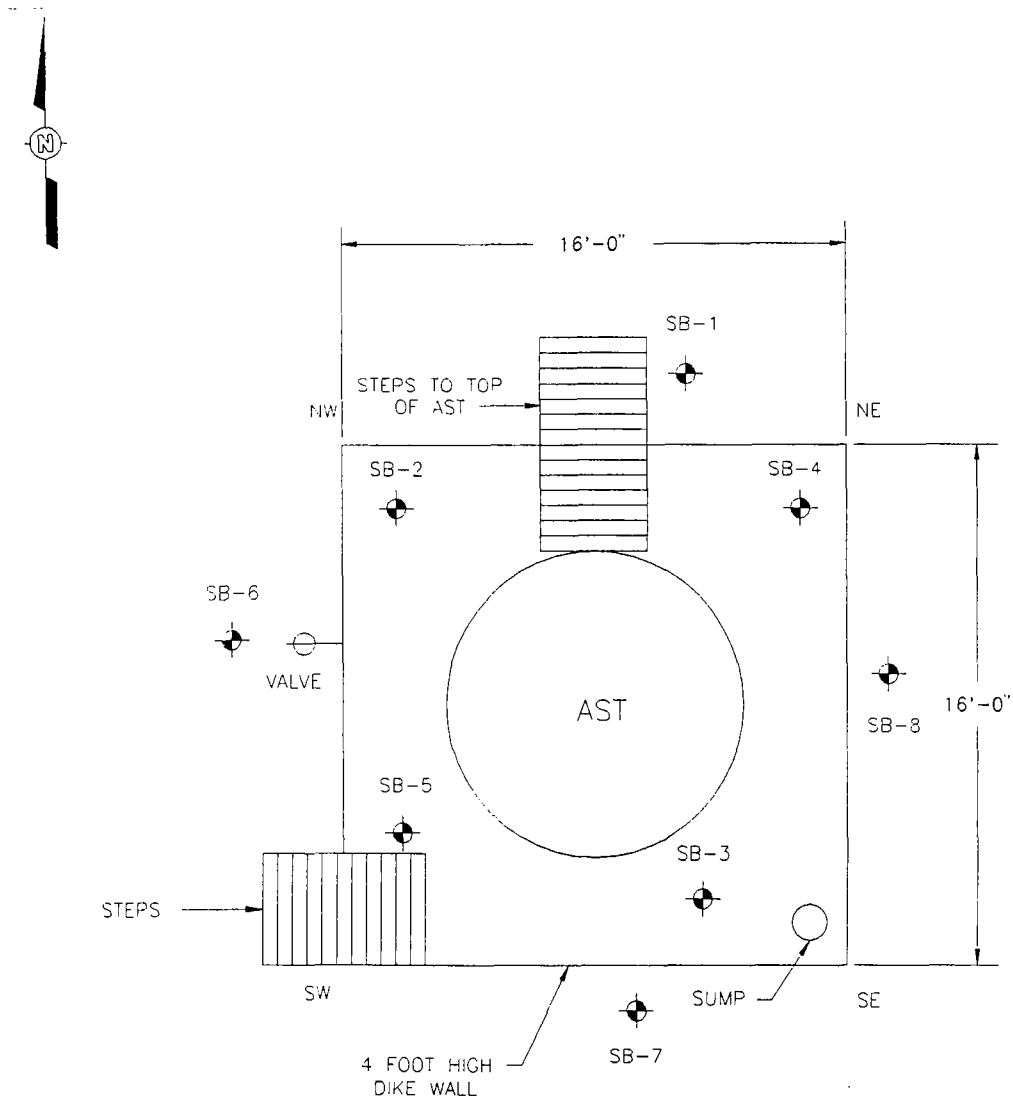
	25 NOV 91	APPROVED BY	KRB		



LEGEND

SB-7 SOIL SAMPLE LOCATION

FIGURE 3

SOIL BORING LOCATIONS-
SEPTEMBER 1991
WASTE ACCUMULATION AST
SAMPLING

PREPARED FOR

MORTON INTERNATIONAL, INC.
BATAVIA, ILLINOIS

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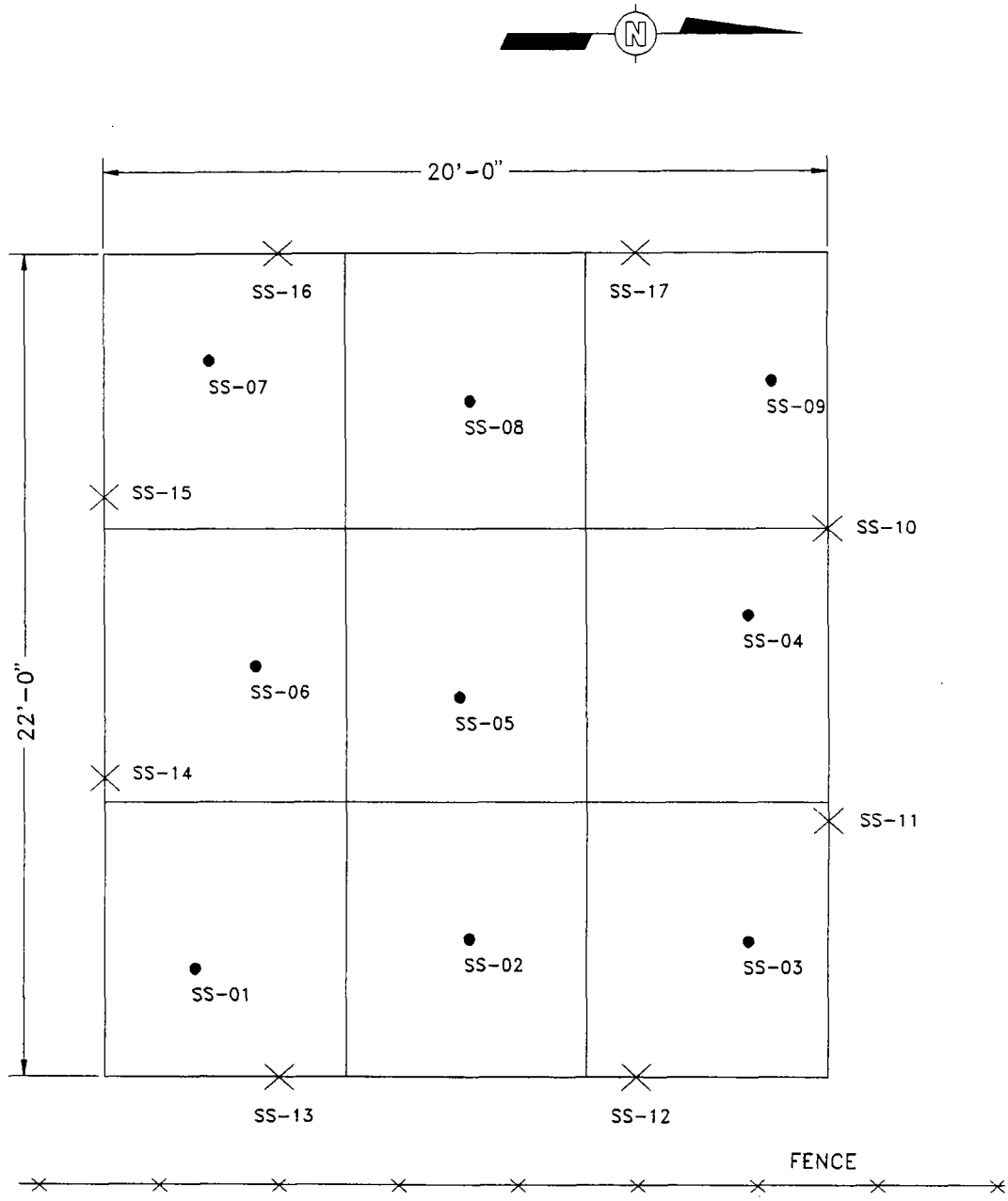
		APPROVED BY	SRM 11-20-91		



LEGEND

- ● SS-01 TO SS-09 – SAMPLES TAKEN FROM BOTTOM
- × SS-10 TO SS-17 – SAMPLES TAKEN FROM SIDEWALL

FIGURE 4

FIRST ROUND SAMPLING LOCATIONS
WASTE ACCUMULATION AST AREA REMEDIATION
BATAVIA, ILLINOIS

PREPARED FOR

MORTON INTERNATIONAL, INC.
BATAVIA, ILLINOIS

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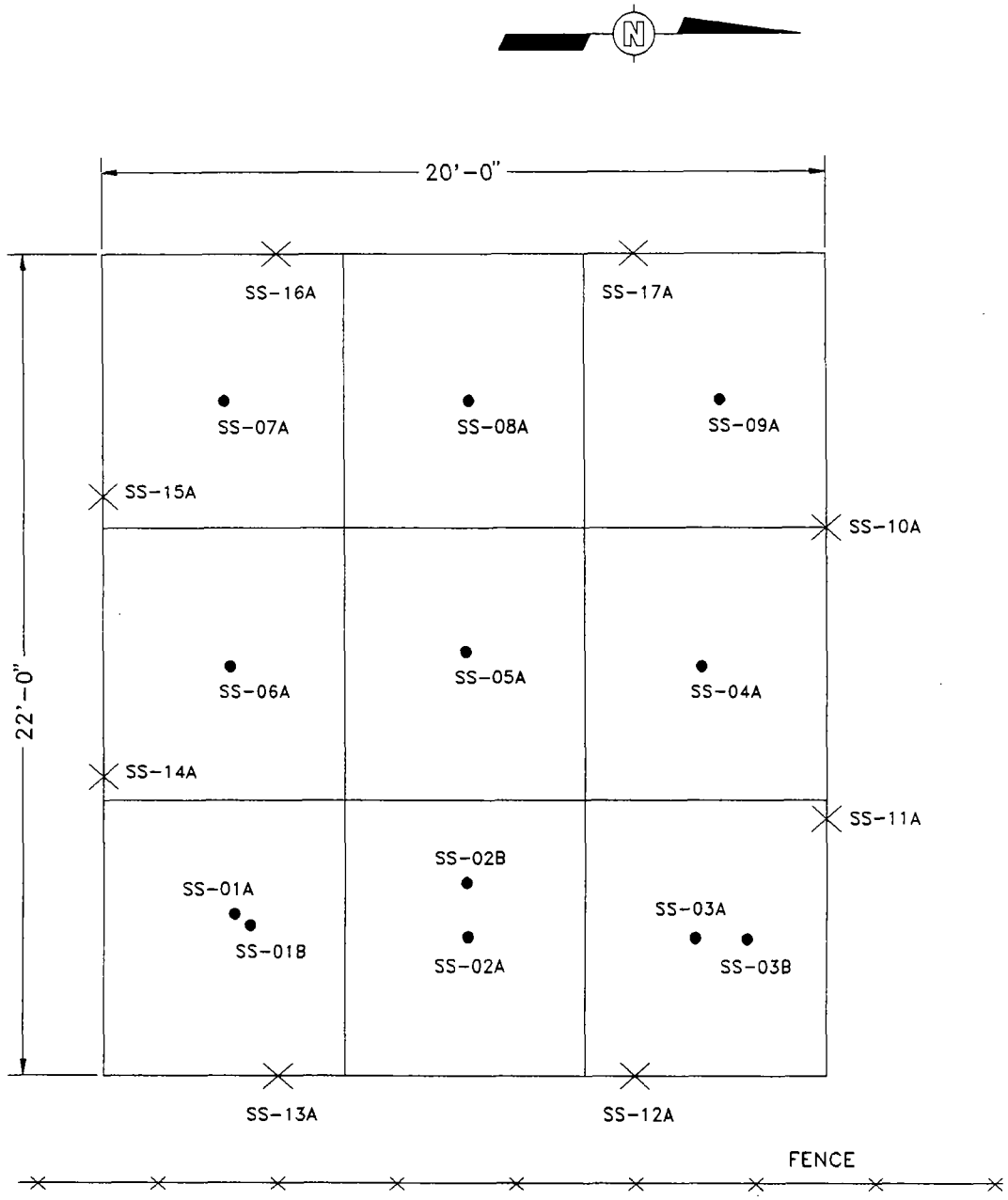

LEGEND

- ● SS-01A TO SS-09A - SAMPLES TAKEN FROM BOTTOM
- × SS-10A TO SS-17A - SAMPLES TAKEN FROM SIDEWALL

FIGURE 5

SECOND ROUND SAMPLING LOCATIONS
WASTE ACCUMULATION AST AREA REMEDIATION
BATAVIA, ILLINOIS

PREPARED FOR

MORTON INTERNATIONAL, INC.
BATAVIA, ILLINOIS

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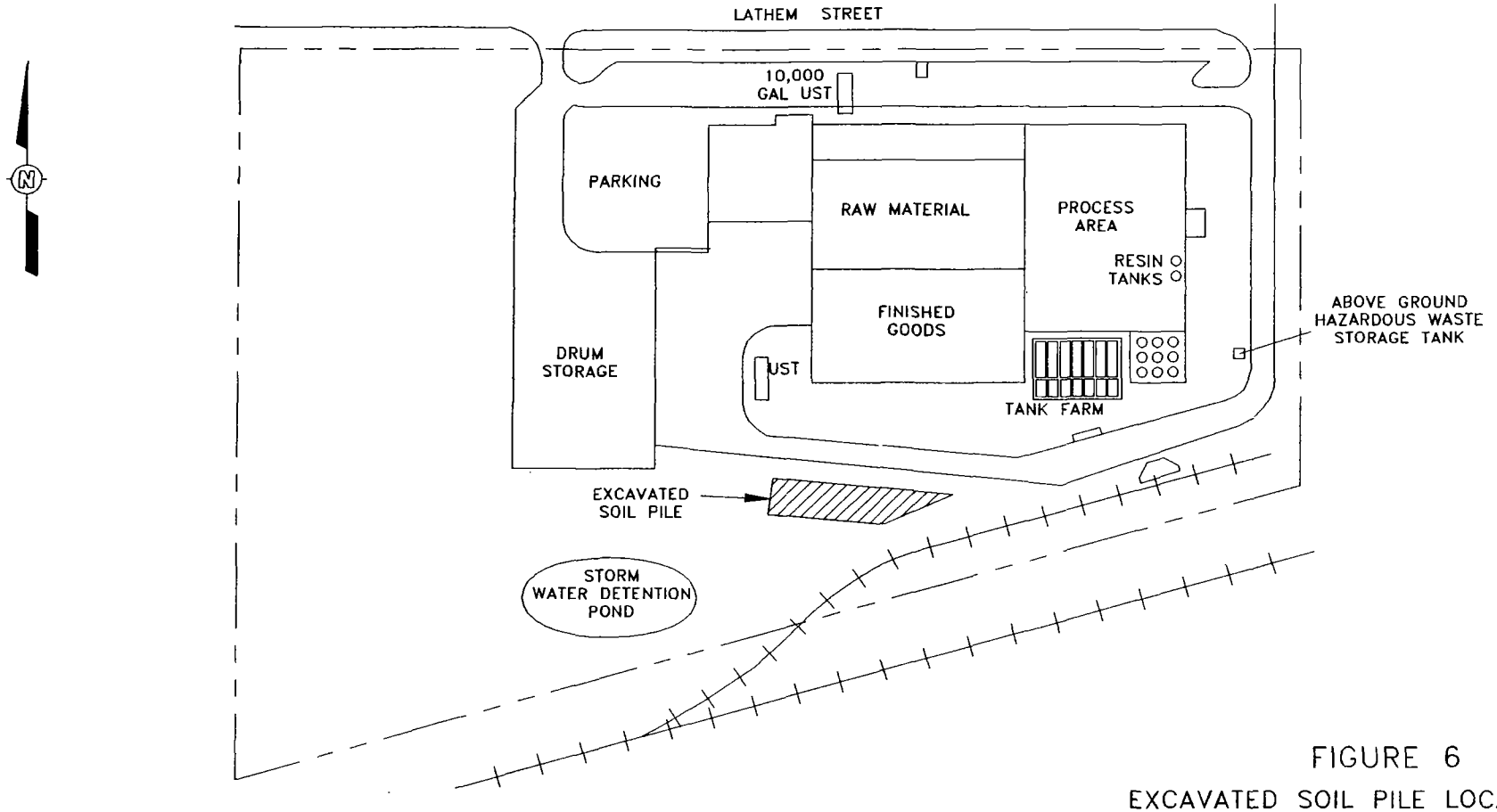

FIGURE 6

EXCAVATED SOIL PILE LOCATION MAP
BATAVIA, ILLINOIS

PREPARED FOR

MORTON INTERNATIONAL, INC.
BATAVIA, ILLINOIS

LEGEND

RAILROAD TRACKS

FENCE

PROPERTY LINE

NOTE: FIGURE NOT TO SCALE

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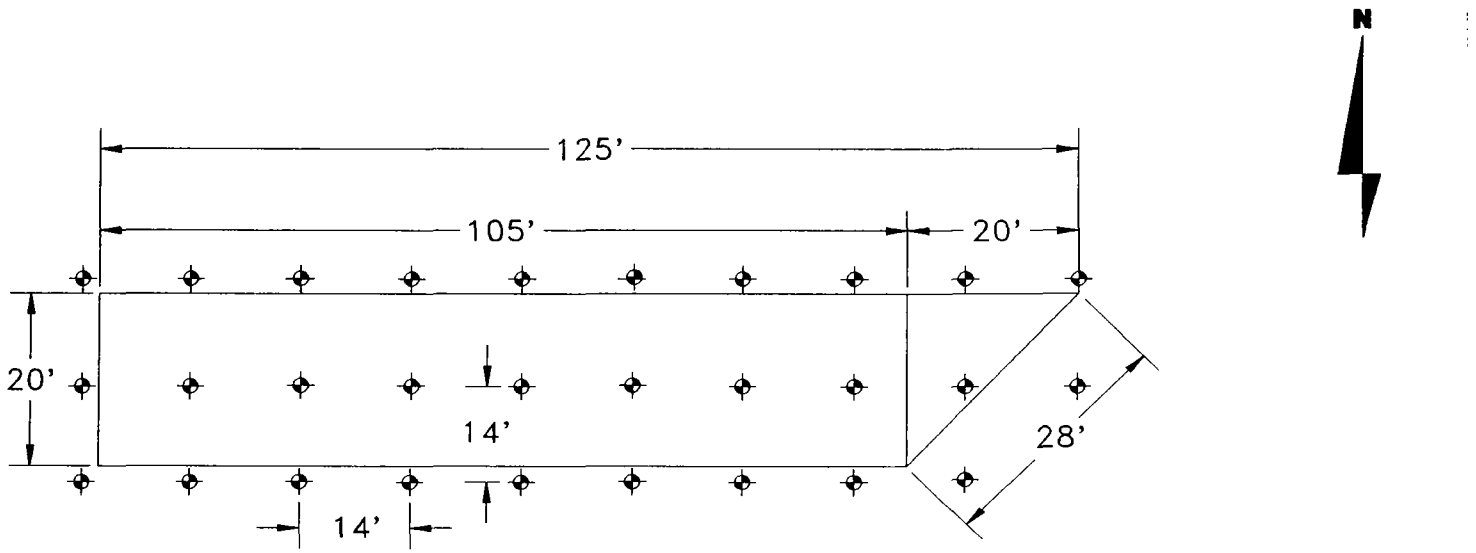
"Do Not Scale This Drawing"

...Creating a Safer Tomorrow

DRAWN BY	J. JOHNSON 20 NOV 91	CHECKED BY	MAB	11-20-91	DRAWING NUMBER	312253-A5
		APPROVED BY	SRM	11-20-91		



LEGEND

⌖ SOIL SAMPLE LOCATION

FIGURE 7

EXCAVATED SOIL PILE
SOIL SAMPLE LOCATION MAP
BATAVIA, ILLINOIS

PREPARED FOR

MORTON INTERNATIONAL, INC.
BATAVIA, ILLINOIS

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TABLE 1
ANALYTICAL DATA SUMMARY
SEPTEMBER 1991
HAZARDOUS WASTE STORAGE TANK
INVESTIGATION SAMPLING
MORTON COATINGS, INC.
BATAVIA, ILLINOIS

	Benzene	Ethyl Benzene	Toluene	Xylene	Dichloroethene	Cis-1,2 Dichloroethene	1,1,1- Trichloroethane	Trichloroethene	Methyl Ethyl Ketone
SB-1									
S1	BDL	BDL	BDL	44	BDL	BDL	BDL	BDL	BDL
S2	BDL	366	BDL	521	BDL	BDL	BDL	BDL	BDL
SB-3									
S1	BDL	148	217	120	BDL	BDL	BDL	314	BDL
SB-4									
S1	BDL	166	BDL	49.9	BDL	BDL	BDL	BDL	BDL
SB-6									
S1	BDL	BDL	36,200		BDL	BDL	BDL	BDL	BDL
S2	BDL	30	103	115	BDL	BDL	BDL	BDL	BDL
SB-7									
S1	BDL	BDL	184	112	BDL	BDL	BDL	BDL	BDL
S3	BDL	BDL		10	BDL	BDL	BDL	6	BDL
SB-8									
S1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
S3	BDL	BDL	76.5	21.1	BDL	BDL	BDL	BDL	BDL
W-5									
H_2O	1.8	379	4740	4110	4.7	43.7	7.9	BDL	107
R-1									
H_2O	BDL	BDL	1.4	BDL	BDL	BDL	BDL	BDL	BDL
Trip Blank									
H_2O	BDL	BDL	1.2	BDL	BDL	BDL	BDL	BDL	BDL

- BDL - Below detection limit
- Soil results on dry weight basis
- Soil concentrations in ug/kg
- Water concentration in ug/l

TABLE 2
ANALYTICAL DATA SUMMARY OF SAMPLES
COLLECTED DURING FIRST ROUND SAMPLING OF WASTE AST AREA
MORTON INTERNATIONAL, INC
BATAVIA, IL.

PARAMETERS	SAMPLE NUMBER									
	SS-01	SS-02	SS-03	SS-04	SS-05	SS-06	SS-07	SS-08	SS-09	SS-10
ACETONE	148	ND	207	ND	ND	76	ND	ND	ND	ND
1,1-DICHLOROETHANE	ND	ND	2	ND	ND	ND	ND	ND	ND	ND
2-BUTANONE	338	1240	690	ND	ND	70	ND	940	ND	ND
CIS-1,2-DICHLOROETHENE	ND	30	10.1	ND	ND	8	ND	ND	ND	18
BENZENE	ND	9.6	5.2	ND	ND	7.3	ND	ND	ND	ND
TRICHLOROETHENE	ND	ND	1.7	ND	ND	2.8	ND	ND	ND	ND
TOLUENE	7600	ND	14900	10800	ND	3330	144	5150	4450	ND
TETRACHLOROETHENE	ND	ND	2.6	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	ND	16.1	ND	517	ND	41.1	ND	455	604	32.6
META & PARA-XYLENE	358	74.7	4950	2850	ND	223	10.1	2050	3940	29.4
ORTHO-XYLENE	73	15	1570	1100	ND	41	ND	680	1310	ND

	SS-11	SS-12	SS-13	SS-14	SS-15	SS-16	SS-17	R-1	R-2	TB
ACETONE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-BUTANONE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,2-DICHLOROETHENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRICHLOROETHENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOLUENE	ND	ND	ND	6400	ND	ND	ND	ND	ND	ND
TETRACHLOROETHENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	ND	27.4	ND	969	20	ND	ND	ND	ND	ND
META & PARA-XYLENE	ND	ND	ND	4530	14	ND	ND	ND	ND	ND
ORTHO-XYLENE	ND	ND	ND	1510	ND	ND	ND	ND	ND	ND

All units shown in ug/kg
ND = NON DETECT
TB = TRIP BLANK, units in ug/L
R-1, R-2 = RINSATE BLANKS, units in ug/L

TABLE 3
ANALYTICAL DATA SUMMARY OF SAMPLES
COLLECTED DURING SECOND ROUND SAMPLING OF WASTE AST AREA
MORTON INTERNATIONAL, INC
BATAVIA, IL.

PARAMETERS	SAMPLE NUMBER										
	SS-01A	SS-02A	SS-03A	SS-04A	SS-05A	SS-06A	SS-07A	SS-08A	SS-09A	SS-10A	SS-11A
BENZENE	ND	ND	ND	ND	ND	44	ND	7.5	ND	ND	ND
2-BUTANONE (MEK)	26	33	ND	ND	ND	ND	ND	ND	ND	ND	54
CHLOROFORM	ND	ND	ND	21	29	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	92	ND
CIS-1,2-DICHLOROETHENE	ND	ND	ND	ND	ND	ND	ND	ND	6.2	ND	ND
ETHYLBENZENE	ND	ND	25	180	ND	440	120	26	29	ND	ND
METHYLENE CHLORIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOLUENE	ND	ND	ND	ND	ND	220	ND	ND	ND	ND	ND
XYLENES	15	ND	27	560	ND	1800	140	ND	ND	ND	ND

	SS-12A	SS-13A	SS-14A	SS-15A	SS-16A	SS-17A	SS-01B	SS-02B	SS-03B	R-1	TB
BENZENE	ND	ND	ND	11	ND	ND	ND	ND	ND	ND	ND
2-BUTANONE (MEK)	44	ND	ND	ND	ND	58	ND	ND	ND	ND	ND
CHLOROFORM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CIS-1,2-DICHLOROETHENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	ND	ND	ND	130	ND	ND	100	100	ND	ND	ND
METHYLENE CHLORIDE	ND	ND	ND	ND	ND	ND	230B	110B	260B	ND	ND
TOLUENE	ND	ND	ND	ND	ND	ND	27	42	ND	ND	ND
XYLENES	ND	ND	ND	ND	ND	ND	470	1100	ND	ND	ND

TABLE 4
CLOSURE COST ESTIMATE
MORTON COATINGS, INC.
BATAVIA, IL

I.	Removal of Soil		
	Loading and removal of soil:	Labor	$ 2,500
		Equipment	500
	Transportation:	$240/load (approximately 9 loads)	2,160
	Disposal:	131 cubic yards ($250/cubic yard)	32,750
	Equipment Decontamination Water (3 drums)		2,070
	Laboratory Analysis (1 water sample)		230
			$40,210
II.	Soil Sampling and Analysis		
	Labor (2 men for 3 days)		$ 2,500
	Sampling equipment		750
	Sample shipment		250
	Laboratory analyses (29 samples, plus 5 QA samples)		7,250
			$10,750
III.	Closure Report and Certification		
	Report		$ 4,300
	Certification		3,000
			$ 7,300
	SUBTOTAL		$58,260
	15% Administration		$ 8,740
	15% Contingency		8,740
	TOTAL		$75,740

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APPENDICES

A September 1991 Waste Accumulation AST Investigation Report
B Sampling and Analysis Plan - Waste Accumulation AST Remediation
C Health and Safety Plan - Waste Accumulation AST Remediation

1.0 CLOSURE PLAN

The following Closure Plan is submitted in accordance with the requirements of 35 IAC 703.183(m), 724.212. The plan will be implemented by an outside contractor, under the supervision of an Illinois registered professional engineer. Prior to implementation of the closure plan, Morton International (Morton) will notify the Illinois Environmental Protection Agency (IEPA) of the outside contractor that will implement the closure plan and the registered professional engineer, who will supervise the closure plan activities. This plan identifies all steps that will be necessary to perform final closure of the excavated soil pile. No waste will remain in the excavated soil pile after performing the closure action. Morton will maintain an on-site copy of the approved Closure Plan, and latest revision to the plan, until the certification of closure completeness has been submitted and accepted by the IEPA.

The projected date for closure of the excavated soil pile is 1992. A closure schedule will be established and submitted once IEPA grants final approval of the closure plan. Upon completion of closure, Morton will submit to IEPA a certification by both the owner/operator, and by an independent Illinois registered professional engineer, that the excavated soil pile has been closed in accordance with the specifications in the approved closure plan.

1.1 DESCRIPTION OF FACILITY

The Batavia Plant of Morton International is located in the far western suburbs of Chicago, approximately 35 miles west of Chicago. The facility address is:

Morton International, Inc.
1500 Lathem
Batavia, IL 60510

The plant contact is:

Eugene Murphy
Vice President - Operations
(708)879-6800

The plant is located in Kane County, T.38N.R.8E.Sec.13, and covers 11.725 acres, and has 68,000 square feet of floor space for manufacturing and warehousing of finished products. Presently, there are 87 people employed at this facility. Figure 1 shows the site location.

The facility manufactures organic coatings from organic solvents and resins. The facility's Standard Industrial Code is 2851. A plant layout is shown in Figure 2.

The facility produces organic coatings using mixing and blending operations from organic solvents and organic resins. The raw materials used in the manufacturing process are stored in an Underground Storage Tank (UST) farm and above ground storage tanks (ASTs). The production process generates approximately 5000 gallons per month of RCRA F003 and F005 hazardous waste (spent solvent) which is shipped off-site for disposal. The ASTs consist of two 6,000 gallon tanks, four 10,000 gallon tanks, one 5,000 gallon tank, and five 5,800 gallon tanks which are used to store organic resins and are equipped with secondary containment. The 5,000 gallon AST is used to store spent solvent. The UST farm contains seven 10,000 gallon tanks and seven 5,000 gallon tanks which are used to store organic solvents and plasticizers. In addition to the UST farm there are two other USTs at the site. One is a 10,000 gallon spill collection tank and the second is an inactive 10,000 gallon heating oil tank.

The facility is presently a generator of hazardous waste and accumulates hazardous wastes for less than 90 days. The facility had an interim status RCRA Part A permit, until the facility withdrew this status. On September 17, 1989 the IEPA formally acknowledged withdrawal of the facility's interim status.

1.1.1 Description of Past Site Assessment and Soil Removal Actions

Due to planned facility upgrade, a site assessment, which included the collection of analytical samples has been conducted at the Batavia facility.

1.1.1.1 September 1991 Hazardous Waste AST Sampling

In anticipation of the AST relocation, a soil sampling program was undertaken in conjunction with facility modification. In September 1991, Morton retained IT to conduct soil sampling for analysis of VOCs beneath and at the outside perimeter of the waste accumulation AST containment dike

to determine if soils immediately surrounding the AST had been impacted by compounds stored in the tank.

A total of eight soil borings were installed. The sampling locations were on each side of the waste accumulation AST. Four boring locations were inside the dike walls and four were outside the dike walls. The locations of the soil borings are shown on Figure 3. The soil borings were drilled using a stainless steel hand auger to a depth of five feet. During the drilling, sampling and screening for VOCs using a photoionization detector (PID) of undisturbed soils was attempted at 0.5 - 1.5 feet, 2.5 - 3.5 feet and 4-5 feet. Soil samples were collected in accordance with IEPA procedures for analysis of VOCs in soil. A report detailing field sampling activities and sampling results is contained in Appendix A.

Soil boring logs are contained in Appendix A. A total of 10 soil samples were collected from six of the eight soil borings. Two soil samples were collected from SB-1 and SB-6 at depths of 0.5 - 1.5 feet and 2.5 - 3.5 feet. Two soil samples were collected from SB-7 and SB-8 at depths of 0.5 - 1.5 feet and 4-5 feet. One soil sample was collected from SB-3 and SB-4, each at a depth of 4 - 5 feet. No soil samples were collected from SB-2 and SB-5. In lieu of a soil sample, PID readings in SB-2 and SB-5 at 4 feet were 155 ppm and 30 ppm, respectively. In addition to the ten soil samples, one groundwater sample, one rinsate blank and one trip blank were collected. The groundwater sample was collected from SB-5. All samples were analyzed for VOCs using EPA SW-846 method 8240. Table 1 summarizes the results of the laboratory analyses.

The results of the soil sample analysis indicated the presence of one or more of F003 (ethyl benzene, xylene) and F005 (toluene, benzene) constituents in all soil samples except SB-8 at 0.5 - 1.5 feet. Ethyl benzene and xylene were present in the 2.5 - 3.5 foot sample from SB-2 at 0.366 ppm and 0.521 ppm, respectively. The sample collected between 0.5 - 1.5 feet from SB-6 contained xylene at 36.200 ppm. In addition to the non-halogenated solvent constituents, low concentrations of chlorinated organic constituents were detected in SB-3 at 0.5 - 1.5 feet and in SB-7 at 2.5 - 3.5 feet. Analytical results are available in Appendix A.

The water sample collected from SB-5 contained both the four non-halogenated and three halogenated constituents. The highest concentrations detected were for toluene (4.74 ug/l) and

xylene (4.11 ug/l).

Due to the presence of F003 and F005 constituents above detection limits in the soils adjacent to the hazardous waste storage tank, remediation of the area soils was implemented.

Upon review of the sample results, Morton notified ESDA on September 25, 1991. The IEPA was also informed by Morton of the above sampling activities and analytical results, with a status letter dated October 2, 1991. A report, detailing the above sampling activities and analytical results was submitted to ESDA on October 4, 1991.

1.1.1.2 Soil Removal and Sampling Activities During Remediation of Waste Accumulation AST Area

In October 1991, remediation activities within the AST area began. Appendix B contains the sampling and analysis plan, and Appendix C contains the Health and Safety Plan for remedial activities near the AST area. The first step in the remediation activities was removing the concrete containment dike beneath the AST which measured 16 feet square and was approximately 9 inches thick. The below grade portion of the containment sidewalls were also removed. The concrete pad was broken and removed. During removal, the pieces of concrete from the pad and sidewalls were cleansed with a steam cleaner and stockpiled in a temporary containment area along the southern portion of the property. The containment area consisted of a 20 mil. polyethylene liner bermed on the perimeter with wooden pallets. Water from steam cleaning was collected and pumped into a temporary storage tank for future disposal. The concrete stockpile was covered with a polyethylene liner to prevent runon from rainwater.

The second step in the AST area remediation was removal of soil. A one to two foot thick layer of gravel located immediately below the concrete pad, 6 inch thick concrete footings, and approximately 90 cubic yards of soil were removed from the former tank area. The excavation created a 20 foot by 22 foot rectangular hole that was from 4.5 to 6.0 feet deep around the perimeter and 2.0 to 2.5 feet in the middle. The excavated material was placed on a separate bermed polyethylene lined containment area adjacent to the concrete stockpile. Water that had accumulated in the excavation was pumped into a temporary storage tank for future disposal. The

water encountered in the excavation is attributable to water accumulated in the sand and gravel fill present beneath the waste AST concrete foundation. The vertical extent of the sand and gravel fill was to the bottom of the containment dike footings, which was approximately 4 feet below grade. The horizontal extent of the sand and gravel fill was to the inside walls of the containment dike footings which is 14.5 feet. No additional water was encountered during the soil removal.

An initial round of soil samples was collected from the floor and sidewalls to evaluate the condition of the remaining soil. Figure 4 shows locations of samples collected during this first round of sampling. A total of seventeen soil samples were collected from both the bottom and side walls of the excavation. All equipment used during sampling activities was decontaminated prior to use. The decontamination procedure consisted of a wash in trisodium phosphate (TSP) solution, a distilled water rinse, a methanol rinse, and a final distilled water rinse. A rinsate sample was collected from a piece of the concrete pad after steam cleaning to assess the pad's condition. A second rinsate sample was collected from a stainless steel trowel used to collect soil from the excavation during this first round of sampling. Soil samples were collected in 4 oz. glass jars and placed in a cooler on ice prior to shipment to the NET Midwest Laboratory in Bartlett, Illinois. Chain of Custody Records and Request for Analysis forms accompanied the samples to the laboratory.

Analytical results from this first round of sampling indicated the presence of several volatile organic compounds above the detection limit in the floor and sidewalls of the excavation. Sample results from this first round of sampling are shown in Table 2. Based on these results, additional soil was removed.

A one to two foot thick layer of additional soil was removed from the bottom and sidewalls of the excavation. This soil was also placed on a bermed polyethylene liner adjacent to the other stockpiles of soil and concrete. Prior to collecting soil samples for chemical analysis, grab samples were collected for screening with a flame ionization detector. A second round of 17 soil samples were collected from both the bottom and sidewalls of the excavation. Figure 5 shows locations of samples collected during this second round of sampling. Samples were collected according to IEPA recommended procedures for soil samples containing volatiles (IEPA's Instructions for Preparation of Closure Plans for Interim Status RCRA Hazardous Waste Facilities, Attachment 7,

Soil Volatile Sampling Procedures).

Prior to collecting the second round of samples, a rinsate sample was collected from one of the stainless steel sampling tubes. The sidewall samples were collected at a depth of approximately 5.5 feet and the bottom samples were collected at a depth of approximately 6 feet. Once the sample was obtained, the ends of the tube were packed tight with moist bentonite clay to eliminate headspace. Each tube was properly labelled and capped at both ends. All samples were packed with ice in a cooler and shipped directly to the NET laboratory in Indianapolis, Indiana. Chain of Custody Records and Request for Analysis forms accompanied the samples to the laboratory. Analytical results for this second round of sampling are shown in Table 3.

An additional 3 to 6 feet of soil was removed from the bottom of the excavation along the east side at a depth of 12 feet. Three additional soil samples were collected from the bottom of the excavation in this area. Two samples were collected at a depth of 12 feet and the third was collected at a depth of 9 feet. Figure 5 shows locations of samples collected during on the east side of the excavation. Analytical results for these samples are also shown in Table 3. The excavated soil was stockpiled on the bermed polyethylene liner with the previously stockpiled soil.

As a result of these soil excavation activities beneath the waste accumulation AST, a stockpile of excavated soil was created. The entire soil pile is approximately 125 feet long, 20 feet wide at one end and a 28 foot wide diagonal on the another end. The location of the soil pile is shown in Figure 6.

1.1.2 Description of Area Geology and Groundwater Use

The geology of northeastern Illinois is characterized by a relatively thick sequence of unconsolidated glacial deposits unconformably overlying sedimentary bedrock (Niagaran dolomite). The glacial material which is present in the area consists of ground and end moraine till deposited during the Wisconsonian Stage, Woodfordian Substage of Pleistocene glaciation. The till is heterogenous and ranges from clay and silt to sand and gravel. Underlying the till are Silurian to Cambrian aged dolomites, shales, and sandstones. Precambrian igneous rocks underlie this thick sedimentary sequence.

In northeastern Illinois, there are four main aquifer systems utilized for industrial, residential and municipal water sources. These aquifer systems are:

- the sand and gravel deposits of the glacial drift,
- the shallow dolomite formations mainly of Silurian age,
- the Cambrian-Ordovician aquifer of which the Ironton-Galesville and Glenwood-St. Peter Sandstones are the most productive formations,
- the Mt. Simon aquifer consisting of the Mt. Simon and lower Eau Claire sandstone formations.

The glacial drift and shallow dolomite aquifer are generally connected hydrologically. These two aquifers are, over most of the region, separated from the Cambrian-Ordovician aquifer by the relatively impermeable Maquoketa Shale Formation of Silurian Age.

The soils in the vicinity of the above ground storage tank area consist of hard clay fill with sand and gravel from ground surface to about 1.5 to 2 feet below grade. Below the clay fill exists native soil which consists of brown and gray clay with traces of silt, sand, and gravel. Groundwater was encountered in the soil borings hand-augered adjacent to the AST, at depths varying from 2 to 2.5 feet below grade to depths greater than 4.5 feet below grade. The generally impermeable nature of the native soils surrounding the AST gravel filled excavation would provide a local collection area for precipitation and surface water runoff. This explanation is consistent with the variability of depth to water seen on the borings.

The potable water source for the city of Batavia are 4 municipal wells, located within the city limits of Batavia. The wells range in depths from 1500 to 2200 feet below ground surface, and service 17,110 people living within the city of Batavia, commercial and industrial establishments. Neighboring area residents, not supplied by the municipal wells utilize private groundwater wells. The Morton-Batavia facility is supplied with municipal well water.

1.1.3 Description of Nearby Surface Waters

The nearest surface water to the Morton-Batavia facility is the Fox River, located approximately 1 3/4 miles west of the facility. The Fox River flows into the Illinois River which eventually

meets the Mississippi River near Alton, Illinois. The Fox River is utilized for a variety of recreational activities.

1.2 DESCRIPTION OF EXCAVATED SOIL PILE

1.2.1 Excavated Soil Pile

The excavated soil pile consists of approximately 131 cubic yards of soil removed from remediation activities conducted in the waste accumulation AST area. The pile consists of removed containment dike concrete, and excavated soil from two stages of soil removal and sampling activities. The soil contains constituents stored in the AST, consisting of F003 and F005 waste. The soil also contains other constituents detected during the various sampling stages. The pile, located on the southern edge of the site, is approximately 125 feet long. It has a width of 20 feet on one end and a width of 28 feet on the other end. The excavated soil pile is lined with a 20 mil thick polyethylene layer, and is bermed on the perimeter with wooden pallets. A 20 mil thick polyethylene layer also covers the excavated soil pile.

1.2.2 Units Being Closed

The unit being closed is an soil pile containing F003 and F005 waste, excavated during remediation of the area beneath an AST containing F003 and F005 waste. A description of the excavated soil pile is contained in the previous section, 1.2.1. Once approval of closure for the unit is received by the IEPA, the facility will no longer utilize this unit as a disposal unit. No management units will remain open after an IEPA approved closure plan is implemented by Morton International and approved by the IEPA.

1.2.3 Units Remaining Open

Only one management unit exists at the facility, the excavated soil pile containing soils contaminated with mainly F003 and F005 waste, which is being closed. No management units will remain open, after approval of closure is granted by the IEPA. The AST will continue to be used to accumulate F003 and F005 wastes for less than 90 days prior to disposal.

1.3 CLOSURE PERFORMANCE STANDARD

This closure plan is designed to ensure that the facility will not require further maintenance and controls after closure, and that threats to human health and the environment will be eliminated.

The closure plan is designed to prevent the escape of hazardous waste, hazardous waste constituents, leachate, contaminated rainfall, or waste decomposition products to the ground and surface waters. Samples will be taken and analyzed for all contaminants stored in the excavated soil pile to determine if contamination is present in the soil. The following sections discuss in detail the efforts that will be made by Morton International, Inc. to satisfy the closure performance standard.

1.4 PARTIAL CLOSURE

Morton International does not plan on performing partial closure of the excavated soil pile. The plan calls for the unit to undergo final closure according to the specifications provided in the following closure plan. If after the closure action commences it is determined that clean closure of the unit is infeasible or impractical, a revised closure plan will be submitted.

1.5 MAXIMUM WASTE INVENTORY

The maximum inventory of hazardous waste in the excavated soil pile is approximately 131 cubic yards of soil containing F003 and F005 waste. It is anticipated that at closure, the unit will contain the maximum waste inventory.

1.6 INVENTORY REMOVAL, DISPOSAL OR DECONTAMINATION OF EQUIPMENT,STRUCTURES AND SOILS

At the time of closure, the unit will be decontaminated. The remaining waste residues will be transported off-site to a permitted TSD facility.

Inventory Removal

The soil in the pile will be shipped off-site to a permitted TSD facility for disposal. The present waste inventory is approximately 131 cubic yards of soil containing F003 and F005 waste. Actions are underway to obtain approval for disposal of the soil at a permitted TSD facility.

Decontamination of Equipment, Structures and Soils

All equipment associated with the excavated soil pile which come in contact with hazardous waste will be decontaminated and residuals from decontamination will be disposed of at a permitted TSD facility when closure of the unit is completed. Structures that come in contact with the excavated

soil pile, such as the berm and liner, will require disposal at a permitted TSD facility.

Steam cleaning of the equipment will be performed in a lined and bermed area with all water collected and sent off-site for disposal. A water sample from the final steam cleaning water will be collected and analyzed to verify decontamination of equipment. It is estimated that less than 1000 gallons of wastewater will be generated during decontamination of the unit. Decontamination will be deemed complete when the level of constituents found in the final steam cleaning water is less than the method detection limit for all constituents in SW 846 EPA Method 8240 VOA.

Soil sampling and analysis will be conducted in the area below and adjacent to the unit to determine if soil contamination has occurred. The samples will be analyzed for all VOCs in SW 846 EPA Method 8240. The locations at which the samples will be collected and parameters for which the samples will be analyzed are discussed in Sections 1.6.1. If contaminated soils are present at the unit based on the sampling results, the soil will be hauled off site for treatment or disposal at a permitted TSD facility. The closure plan outlines proposed handling of contaminated soil in the event this is required, which is discussed in Section 1.6.1.

It is anticipated that outside contractors will supply all equipment necessary to perform closure, including personal protective equipment for the personnel involved in the closure operation.

1.6.1 Closure of the Excavated Soil Pile

The excavated soil pile closure will involve the transportation of approximately 131 cubic yards of soil contaminated with F003 and F005 soil to a permitted TSD facility for disposal; soil sampling and analysis; and if needed, excavation and disposal of additional soils beneath the excavated soil pile. This closure is currently in progress.

1.6.1.1 Closure Soil Sampling Plan

A total of 29 soil samples will be obtained from soils below and around the excavated soil pile. Eight soil samples will be obtained from beneath the soil pile, and 21 soil samples will be obtained from the outside perimeter of the soil pile. Background samples will be collected at a selected location, to establish a consistent base level of constituents in the soil.

The excavated soil pile is 125 long, 20 feet wide on the west end, and 28 feet wide on the east end. The sampling area and the locations of the soil samples are indicated in Figure 7. The sample locations are determined by establishing grid intervals with the following equation:

$$GI = (A/\pi)^{1/2}/2$$
$$A = \text{Area to be Sampled (feet}^2\text{)}$$
$$GI = \text{Grid Interval (feet)}$$

The area to be sampled can be divided into two areas: a rectangular area of 105 feet by 20 feet and triangular area with a length of 28 feet and a height of 14 feet. Each area can be added to obtain a total area as follows:

$$A = A1 + A2 = L1 \times W + 1/2(L2 \times H)$$
$$A = 105' \times 20' + 1/2(28' \times 14')$$
$$A = 2296 \text{ ft}^2$$

Therefore,

$$GI = (A/\pi)^{1/2}/2$$
$$GI = (2296 \text{ ft}^2/\pi)^{1/2}/2$$
$$GI = 13.51 \text{ ft, rounding to the nearest integer, } GI = 14 \text{ feet}$$

The interval between soil samples is 14 feet.

Twenty-nine soil samples will be obtained from the sampling locations indicated in Figure 7. All samples will be discrete grab samples. Samples from beneath the excavated soil pile and at the perimeter of the soil pile will be taken at a depth interval between 6 inches and 18 inches. The reason for a 12-inch increment in the first two feet of sampling is the required sample volume for the various analyses conducted on each discrete sample. If sample results from this depth indicate contamination, samples at a deeper depth will be collected. The deeper depth will be established upon review of the sample results.

All samples collected will require the following IEPA recommended procedure as outlined in IEPA's Attachment 7.

A. The sampler will be prepared and decontaminated according to the following:

1. Wash tubing or sampler with hot water and a nonfoaming detergent.
2. Rinse with hot water.
3. Rinse with a solvent, such as hexane or acetone.
4. Rinse with very hot water to drive off solvent.
5. Rinse with deionized distilled water.
6. Air dry.
7. Store the sampler in aluminum foil until ready for use.

The above decontamination procedure will be used for all sampling equipment used to collect samples for the remaining analyses.

B. The sample collection will be as follows:

1. Using a properly decontaminated sampler (refer to preparation and decontamination instructions), push or drive the sampler to obtain a representative soil sample.
2. DO NOT remove sample from sample tube in the field. The laboratory should remove the sample from the sampling tube.
3. Immediately add clay or other cohesive material (i.e. wetted bentonite) to the ends of the sample to eliminate head space, if necessary.
4. Cover both ends of the sampler with aluminum foil. If possible, cover the aluminum foil with a cap.
5. Put the sample in storage at 4 degrees centigrade immediately.
6. Transport the samples to the laboratory as soon as possible. Most laboratories require delivery within 24 hours of sampling.

Compositing of soil samples will not be conducted. Water from decontaminating equipment will be collected and disposed of off-site.

A rinsate sample will be obtained from the decontaminated sampling equipment and shipped to the laboratory with the samples for analysis.

The proper containers for sample collection will be used during sampling. All samples will be preserved and holding times observed as promulgated in 40 CFR 136.3, Table No. 2, Required Containers, Preservation Techniques, and Holding Times. All sampling methods and equipment will be in accordance with U.S. EPA SW-846, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods".

After each sample is collected, a Sample Collection Log, Chain of Custody record, Laboratory Request for Analysis form, and the sample label will be completed. A unique sample number will be assigned to each sample. Excluding the Sample Collection Log, all forms will accompany the sample to the laboratory.

During all closure activities, a field log will be maintained by the site supervisor. The date, time, personnel involved, activities, sampling events, and weather conditions will be recorded in the field log.

1.6.1.2 Closure Analysis Plan

The soil and water samples will be analyzed for all the constituents in SW 846 EPA Method 8240 VOA.

1.6.1.3 Disposal of Cleaning Waste and Residue

All cleaning wastes and residues will be shipped off-site for treatment and/or disposal at a permitted TSD facility. The soil in the pile will be shipped off-site to a permitted TSD facility for disposal. The present waste inventory is approximately 131 cubic yards of soil containing F003 and F005 waste. Actions are underway to obtain approval for disposal of the soil at a permitted TSD facility.

1.6.2 Closure of Container Storage Area

No container storage areas will be closed at the facility, therefore the closure requirements of 35 IAC 724.278.

1.6.3 Closure of Tank System

No tank systems at the facility will be closed as part of this closure plan, therefore the closure

requirements of 35 IAC 725.297 do not apply.

1.6.4 Closure of Surface Impoundments

No hazardous waste surface impoundments are located at the facility, therefore the closure requirements of 35 IAC 725.328 do not apply.

1.6.5 Closure of Land Treatment Facilities

No land treatment areas exist at the facility, therefore the closure requirements of 35 IAC 725.380(a) through 35 IAC 725.380(e) do not apply.

1.6.6 Closure of Thermal Treatment Units

No thermal treatment units exist at the facility, therefore the closure requirements of 35 IAC 725.481 do not apply.

1.6.7 Closure of Chemical, Physical and Biological Treatment Units

No chemical, physical and biological treatment units exist at the facility, therefore the closure requirements of 35 IAC 725.504 do not apply.

1.7 CLOSURE OF DISPOSAL UNITS

There are and have been no hazardous waste disposal units at this facility, therefore the closure requirements of 35 IAC 725.410 do not apply.

1.8 SCHEDULE OF CLOSURE

The closure of the excavated soil pile is anticipated to occur in the year 1992. The schedule will be submitted upon closure plan approval. Final closure will be supervised and certified by an independent Illinois registered professional engineer.

1.9 EXTENSIONS OF CLOSURE TIME

It is anticipated that Morton International will not require an extension for closure time. If it appears that closure activities will require more than the 180 days allowed, a petition, which provides appropriate justification, will be made to the Illinois EPA at least 30 days prior to the expiration of the original period allowed which requests an extension of closure time. The

justification will include information on why the closure activity will require more than 180 days, or that there is a reasonable likelihood that persons other than the current owner will commence operation of the site, or that closure would be incompatible with continued operation. In addition, a demonstration will be made that all steps have and will be taken to prevent threats to human health and the environment from the non-closed unit.

1.10 AIR EMISSIONS

There are two types of air emissions that may result from closure activities: volatilization of VOCs contained in soil and VOCs driven off by steam cleaning during decontamination of associated equipment. VOC concentrations in the air at the work area will be monitored using a PID as specified in Section 1.11. The analytical results for the soil samples will give an indication of the amount of VOC emissions to expect. Since the VOCs will be given off as fugitive emissions from soil excavation, a high emission rate is not expected. However, if VOC concentrations are high enough to threaten personnel safety or cause an odor problem in surrounding areas, work will be suspended until engineering controls that will prevent the threat to public health can be implemented. Concentrations at which action will be taken are specified in Section 1.11.

1.11 PERSONNEL SAFETY AND FIRE PREVENTION

Measures will be taken to protect the health of neighbors during closure activities and all personnel, including contractors and visitors, involved in closure activities or personnel potentially exposed to hazardous waste by closure activities.

Measures to protect the health of neighbors during closure activities consists of monitoring and controlling expected air emissions that are described in Section 1.10.

All work performed during closure will meet the applicable requirements of OSHA's Hazardous Waste Operations and Emergency Response Standard. Before work commences, a Health and Safety meeting will be held to review with site workers the possible hazards, personal protective equipment to be worn, and procedures for an emergency. A Health and Safety Plan, similar to the one contained in Appendix C will be created for closure activities, and will be used as a guide to safe operation during closure activities. A copy of the Health and Safety Plan will be kept on-site during closure activities. All site workers engaged in activities that expose or potentially

expose them to hazardous substances will have received a minimum of 40 hours of OSHA health and safety training, plus a minimum of three days of field experience under the direct supervision of a trained supervisor, before engaging in any closure activity that could potentially expose them to hazardous substances. Managers and supervisors at the cleanup site will have received at least an additional eight hours of specialized training on managing hazardous waste operations.

Measures to monitor the breathing space of the cleanup site personnel will consist of a PID that measures organic vapors. Air monitoring will be conducted by designated personnel on an hourly basis. Permissible Exposure Limits (PELs) for the VOCs potentially emitted during closure activities will be listed in the Health and Safety Plan.

If PID readings in the work breathing zone indicate VOC readings exceeding PELs listed in the Health & Safety Plan, respiratory equipment will be used by all personnel working in the breathing zone. If PID readings outside the breathing zone, near property boundaries indicate VOC readings of 10 ppm or greater, work will suspended until engineering controls that will protect public health can be implemented.

All personnel potentially in contact with hazardous waste will wear appropriate protective clothing. Decontamination of personnel will occur if contact with hazardous waste is made.

The facility fire prevention program will be adhered to at all times during closure activities by all personnel involved.

APPENDIX A

SEPTEMBER 1991 WASTE ACCUMULATION AST

ASSESSMENT REPORT

RECEIVED
DEC 0 3 1991
IEPA-DLPC

REPORT

HAZARDOUS WASTE STORAGE TANK ASSESSMENT

MORTON INTERNATIONAL, INC.

BATAVIA, ILLINOIS

PREPARED FOR:

MORTON INTERNATIONAL, INC.

SPECIALTY CHEMICAL DIVISION

100 NORTH RIVERSIDE PLAZA

CHICAGO, ILLINOIS

PREPARED BY:

IT CORPORATION

333 PIERCE RD.

ITASCA, ILLINOIS

SEPTEMBER 1991

PROJECT NO. 312253

PROPRIETARY STATEMENT

The proposal submitted herewith contains information that is proprietary to IT CORPORATION. This information is made available to you solely for the purpose of evaluating the proposal. This information shall not be disclosed to any person outside of the staff responsible for the evaluation. No information contained herein shall be duplicated, used, or disclosed in whole or in part other than to evaluate the proposal. There shall be no disclosure of any information (technical and/or financial) to any third party without the prior written consent of IT CORPORATION.

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1.0 INTRODUCTION

IT Corporation performed an assessment at Morton International, Inc.'s (Morton) Batavia Production Facility on September 10 and 11, 1991. The project was performed by Mr. Raymond Boyd, Project Manager, and Mr. Steve Mrkvicka, Geologist. The assessment involved hand augering soil borings and collecting samples to evaluate the subsurface environmental conditions in the vicinity of the hazardous waste accumulation tank.

1.1 OBJECTIVES

The objectives of the assessment were:

- Determine if the soils immediately surrounding the above ground hazardous waste accumulation tank have been impacted by compounds stored in the tank.

- If the soils have been impacted, determined the vertical extent of contamination , and

- Document the results of the project in a report.

1.2 SITE BACKGROUND

Morton presently plans to install a new underground storage tank farm at their facility in Batavia, Illinois. Associated with this project is the relocation of the above ground hazardous waste accumulation tank. Prior to the relocation of the hazardous waste tank, soil samples were collected and analyzed from the existing above ground tank area to document the existing soil conditions.

The waste tank is 5,000 gallons in size and stores F003 and F005 listed waste, primarily derived from spent toluene, xylene and methyl ethyl ketone. The tank is surrounded and underlain by a concrete secondary containment structure which measures approximately 64 feet square in plan dimension.

1.3 SCOPE OF WORK

The Scope of Work for the assessment at the Batavia, Illinois facility involved performing eight soil borings to a depth of five feet; collecting three soil samples in each soil boring, screening of soil samples, laboratory analysis of selected soil samples and field blanks by NET Laboratory for volatile organic compounds using EPA Method 8240, and analyzing the results to prepare a detailed report of the investigation. The specific activities performed in conducting this scope of work are listed below:

- Soil Boring Installation
- Subsurface Soil Sampling
- Analytical Testing
- Data Review
- Report

2.0 FIELD ACTIVITIES

The field activities performed during the assessment consisted of hand augering eight soil borings to collect subsurface soil samples. The sampling locations were placed along each of the four sides of the hazardous waste accumulation tank. Four boring locations were located inside the dike walls and four were located outside the dike walls. The field activity daily logs for the project are included in Appendix A.

The eight soil borings were drilled using a hand auger on September 10 and 11, 1991. Prior to the commencing of drilling at the site and between each boring location, the hand auger and associated sampling equipment was properly decontaminated.

The soil borings were drilled using a stainless steel hand auger to a depth of five feet. During the drilling, sampling of undisturbed soils was attempted at 0.5 - 1.5 feet, 2.5 - 3.5 feet and 4-5 feet. Soil samples were collected in accordance with Illinois EPA procedures. The procedure involved driving a properly decontaminated sampler and associated sampling tube into undisturbed soil to obtain a representative sample. After each soil sample was retrieved, wetted bentonite was added to the ends of the sampling tube to eliminate head space. Both ends of the sample tube were covered with aluminum foil, capped, and taped for shipment to the laboratory.

Upon completion of the drilling operation, the boreholes outside the containment structure were backfilled with soil. The concrete slab within the containment structure was repaired by filling the borehole with Portland cement to maintain the containment integrity.

3.0 RESULTS

The results of the assessment activities are described in the following sections.

3.1 FIELD DATA

The locations of the soil borings are shown on Figure 1. The soil boring logs are contained in Appendix B. Soil borings SB-1, SB-6, SB-7, and SB-8 were installed in accordance with the Work Plan. The lithology of soils indicate brown gravel and clay fill to 1-4 feet below grade overlying stiff brown grey clay. Field screening of samples from these borings with a photoionization detector (PID) produced readings that were less than 20 ppm except for the 4 feet deep samples in SB-7 and SB-8 which were 63 ppm and 46 ppm, respectively.

Soil borings SB-2, SB-3, SB-4 and SB-5 were installed inside the limits of the concrete secondary containment structure. Gravel till was encountered below the concrete slab in each of these borings to a depth of 2.5 feet. This gravel fill prevented the collection of soil samples except at a depth of 4 feet in SB-3 and SB-4. A shallow, perched groundwater sample was obtained from SB-5 in lieu of a soil sample. The PID readings in SB-3 and SB-4 at 4 feet were 155 ppm and 30 ppm, respectively.

3.2 ANALYTICAL RESULTS

A total of ten soil samples, one groundwater sample, one rinsate blank, and one trip blank were analyzed for volatile organic compounds using EPA SW-846 method 8240. Table 1 summarizes the results of the laboratory analyses. Chain-of-custody records are in Appendix C and the complete laboratory package is shown in Appendix D.

The results of the soil sample analysis indicated the presence of one or more of the F003 (ethyl benzene, xylene) and F005 (toluene, benzene) compounds in all the soil samples except SB-8 at 1 foot. The concentrations of the constituents were less than 200 ug/kg except in SB-2 at 3 feet and SB-6 at 1 foot. Ethyl benzene and xylene were present in the 3 foot sample from SB-2 at 366 ug/kg and 521 ug/kg, respectively. The 1 foot sample from SB-6 contained xylene at 36,200 ug/kg.

In addition to the non-halogenated solvent constituents, low concentrations of chlorinated organic constituents were detected in SB-3 at 1 foot and SB-7 at 3 feet.

The water sample from SB-5 contained both the four non-halogenated and three halogenated organic constituents. The highest concentrations detected were for toluene (4,740 ug/l) and xylene (4,110 ug/l).

4.0 CONCLUSIONS

The presence of F003 and F005 constituents above detection limits in the soils adjacent to the hazardous waste accumulation tank necessitate the remediation of the soil as hazardous waste or approval of alternative clean closure levels by IEPA for the area.

The land disposal restrictions are in effect for F003 and F005 listed waste. The treatment standards for constituents of concern are as follows:

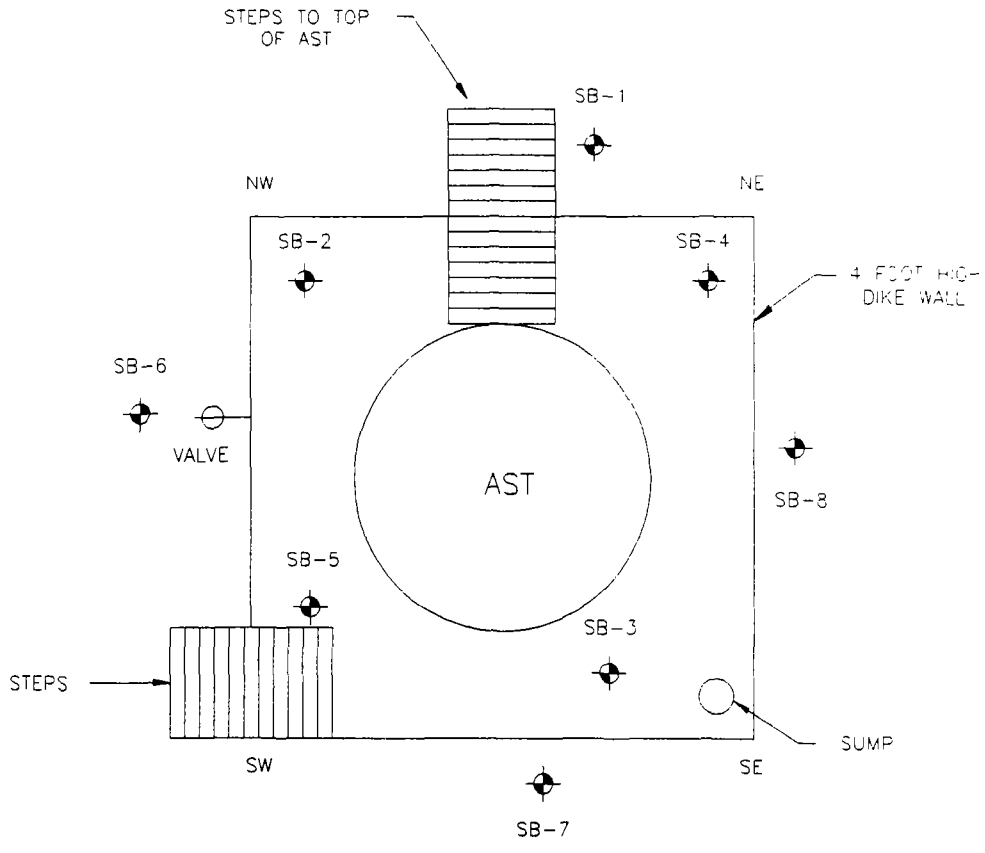
	NON WASTEWATER		WASTEWATER
	Total Composition mg/kg	TCLP mg/l	Total Composition mg/l
Benzene	3.7		0.070
Ethyl Benzene		0.053	0.05
Toluene		0.33	1.12
Xylene		0.15	0.05
MEK		0.75	0.05

TABLE 1
ANALYTICAL DATA SUMMARY
SEPTEMBER 1991
HAZARDOUS WASTE STORAGE TANK
INVESTIGATION SAMPLING
MORTON COATINGS, INC.
BATAVIA, ILLINOIS

	Benzene	Ethyl Benzene	Toluene	Xylene	Dichloroethene	Cis-1,2 Dichloroethene	1,1,1-Trichloroethane	Trichloroethene	Methyl Ethyl Ketone
SB-1									
S1	BDL	BDL	BDL	44	BDL	BDL	BDL	BDL	BDL
S2	BDL	366	BDL	521	BDL	BDL	BDL	BDL	BDL
SB-3									
S1	BDL	148	217	120	BDL	BDL	BDL	314	BDL
SB-4									
S1	BDL	166	BDL	49.9	BDL	BDL	BDL	BDL	BDL
SB-6									
S1	BDL	BDL	36,200		BDL	BDL	BDL	BDL	BDL
S2	BDL	30	103	115	BDL	BDL	BDL	BDL	BDL
SB-7									
S1	BDL	BDL	184	112	BDL	BDL	BDL	BDL	BDL
S3	BDL	BDL		10	BDL	BDL	BDL	6	BDL
SB-8									
S1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
S3	BDL	BDL	76.5	21.1	BDL	BDL	BDL	BDL	BDL
W-5									
H_2O	1.8	379	4740	4110	4.7	43.7	7.9	BDL	107
R-1									
H_2O	BDL	BDL	1.4	BDL	BDL	BDL	BDL	BDL	BDL
Trip Blank									
H_2O	BDL	BDL	1.2	BDL	BDL	BDL	BDL	BDL	BDL

- BDL - Below detection limit
- Soil results on dry weight basis
- Soil concentrations in ug/kg
- Water concentration in ug/l

DRAWN BY	J JOHNSON 23 SEPT 91	CHECKED BY			DRAWING NUMBER 312235-A1
		APPROVED BY			



LEGEND

SB-7 SOIL SAMPLE LOCATION

SOIL SAMPLE LOCATION MAP
HAZARDOUS WASTE STORAGE TANK

PREPARED FOR
MORTON INTERNATIONAL, INC
BATAVIA, ILLINOIS

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IT ...Creating a Safer Tomorrow

"Do Not Scale This Drawing"

INTERNATIONAL TECHNOLOGY CORPORATION

FIELD ACTIVITY DAILY LOG

DAILY LOG			
DATE	9	10	91
NO.	[illegible]	0	1
SHEET	12	OF	13

PROJECT NAME: MORTON - BATAVIA

PROJECT NO.: 5[illegible]235

FIELD ACTIVITY SUBJECT: SOIL SAMPLING

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

[illegible] Arrive @ site

[illegible] Meet Wendell Harkins Morton

Tailgate Safety Meeting

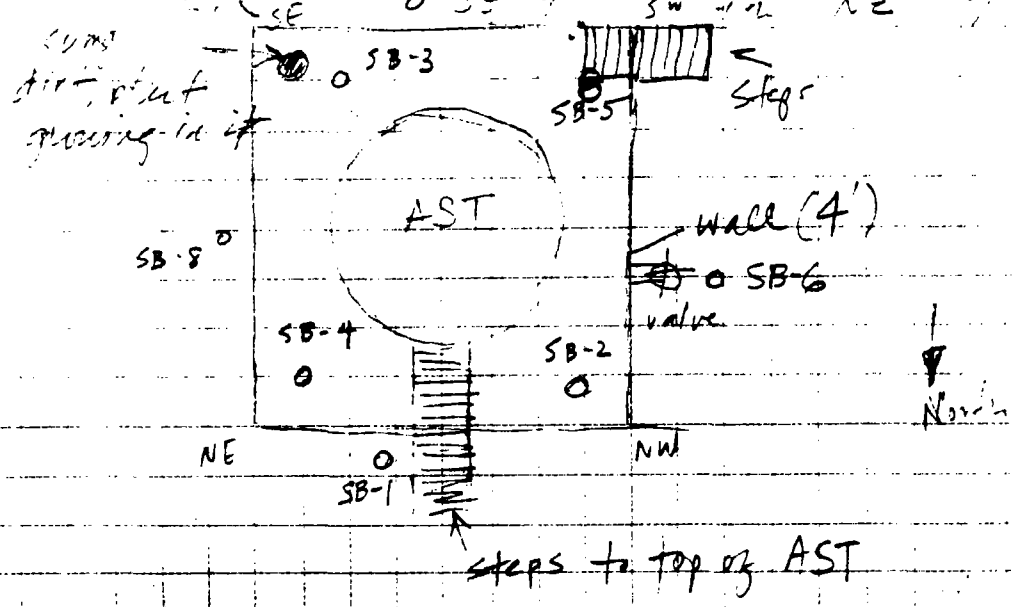
Accurate Boring arrives

[illegible] begin boring at tank containment

[illegible] ~8"

[illegible] ~10"

End [illegible] SE SB-7 SW 0 SE 9" SW [illegible] NE 7"



VISITORS ON SITE: Wendell Morton Harkins

CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS.

WEATHER CONDITIONS: warm Sunny 90°

IMPORTANT TELEPHONE CALLS:

IT PERSONNEL ON SITE: S. MRKVICKA T. DELANEY

SIGNATURE: [signature]

DATE: [illegible]

327A-7-86

INTERNATIONAL TECHNOLOGY CORPORATION

FIELD ACTIVITY DAILY LOG

DAILY LOG			
DATE	9	10	91
NO.	0	0	2
SHEET	2	OF	3

PROJECT NAME MORTON - [illegible]	PROJECT NO. 312235
FIELD ACTIVITY SUBJECT: SOIL SAMPLING	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

[illegible] [illegible] leave site
Paid COD but have to go by [illegible]
for check

1000 Start SB-2 NW inside
auger to 4' - gravel all the way - [illegible]
auger refusal @ 4'
water at 10" below concrete
OVM in hole 4 ppm

1200 Tom Delaney to NET to pick up VOA vials

1300-1335 Tom D back w/ bottles. Lunch.

1345 Move to SB-3 Sample soil below gravel 3½-4½'
SE corner

Move to SB-4 soil sample
Sample 3½-4½' Auger Refusal

1405 Take water sample from groundwater at SB-5
Start augering at SB-5
Auger refusal @ 3½-4'
No sample

VISITORS ON SITE: Wendell Harkins, Morton	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS. Could not sample through gravel fill beneath concrete floor
WEATHER CONDITIONS: warm sunny 90°	IMPORTANT TELEPHONE CALLS: NET - take 40 ml VOA samples from SB-5 hole (groundwater)

IT PERSONNEL ON SITE: T. Delaney

SIGNATURE S Mikrik DATE: 9/10/91

327A-7-86

INTERNATIONAL TECHNOLOGY CORPORATION

FIELD ACTIVITY DAILY LOG

DAILY LOG			
DATE	9	10	91
NO.	0	0	3
SHEET	3	OF	3

PROJECT NAME: MORTON BATAVIA

PROJECT NO. [illegible]

FIELD ACTIVITY SUBJECT: SOIL SAMPLING

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

1505 Plug SB2,3,4,5 with portland cement/ bentonite

1510 Move to SB-6 west wall outside
SB-6-S-1 6"-1½'
S-2 2½-3½ 0 ppm
Backfill SB-6
Move to SB-7 south wall outside

1610 Clean up leave site

VISITORS ON SITE: Wendell Harbins, Morton

CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS.

WEATHER CONDITIONS: warm sunny 90°

IMPORTANT TELEPHONE CALLS:

IT PERSONNEL ON SITE: T. Delaney, S. Mrkvicka

SIGNATURE: S. Mrk

DATE: 9/10/91

327A-7-86

INTERNATIONAL TECHNOLOGY CORPORATION

FIELD ACTIVITY DAILY LOG

DAILY LOG			
DATE	[illegible]		[illegible]
NO.	[illegible]	[illegible]	4
SHEET		OF	1

PROJECT NAME: MORTON BATAVIA

PROJECT NO.: [illegible]

FIELD ACTIVITY SUBJECT: Soil Sampling

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

0650 Arrive at site
Calibrate OVM
Tailgate Safety Mtg.

0[illegible] Start at SB-7 South wall [illegible]

0845 Sample SB-7-S-1 1½'-1½'
S-2 2½'-3½'
S-3 3½'-4½'

0855 Clear debris at SB-5 east wall [illegible]

Take R-1 rinsate

0930 Start at SB-8

1015 Finish last Soil Sample @ SB-8

1045 Cleaning, leave site for office

1130 Arrive at office - screen soil w/ working PID

1215 Arrive at storage + pack samples

VISITORS ON SITE: Wendell Harkins, Morton

CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS.

WEATHER CONDITIONS: cloudy 85°

IMPORTANT TELEPHONE CALLS:

IT PERSONNEL ON SITE: J. Delaney, S. Mihnick

SIGNATURE: Steve G. Mihnick

DATE: 9/11/91

327A-7-86

INTERNATIONAL TECHNOLOGY CORPORATION

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 512251	PROJECT NAME: [illegible]		
BORING NUMBER: SB-1	COORDINATES:		DATE: 9/[illegible]
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: [illegible]
ENGINEER/GEOLOGIST: MR[illegible]	Depth	Date/Time	DATE COMPLETED: [illegible]
DRILLING METHODS: [illegible] AUGER			PAGE 1 OF [illegible]

DEPTH (FT)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6"	RECOVERY (")	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
				brown gravel & clay fill moist	cl			
	S-1	0940						6"-12" = 15 ppm 12"-18" = 15 ppm
2								water @ 2'3"
3	S-2	1015		grey clay wet	cl			2½'-3½' = [illegible]
4				stiff moist grey clay	cl			4-5 = 2 ppm
	S-3	1045						
5								

NOTES:

SUNNY 90°

243A-3-86

INTERNATIONAL TECHNOLOGY CORPORATION

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER:	PROJECT NAME:		
BORING NUMBER: SB-2	COORDINATES:		DATE:
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED:
ENGINEER/GEOLOGIST:	Depth	Date/Time	DATE COMPLETED:
DRILLING METHODS:			PAGE OF

DEPTH (FT)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER ( )	RECOVERY ( )	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
				[illegible]				
1				[illegible]				
				Gravel	GW			OVM = 4 ppm in hole
2								
3								
4				Auger refusal No Sample				
5								

NOTES:

SUNNY 90°

243A-3-86

INTERNATIONAL TECHNOLOGY CORPORATION

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 31223E	PROJECT NAME: MORTON - [illegible]		
BORING NUMBER: SB-F3	COORDINATES:		DATE: [illegible]
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: [illegible]
ENGINEER/GEOLOGIST: [illegible]	Depth	Date/Time	DATE COMPLETED: [illegible]
DRILLING METHODS: [illegible]			PAGE OF

DEPTH (ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER ( )	RECOVERY ( )	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
				concrete				
				gravel fill				
				water @ 2" [illegible]				
				sheen on water after augering.	gw			
2				no sheen prior to augering				
3								
4	S-1	1215		brown wet clay w/ gravel	[illegible]			3½-4½ = 155 ppm
				Auger Refusal				
5								

NOTES:

SUNNY 90°

243A-3-86

INTERNATIONAL TECHNOLOGY CORPORATION

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: [illegible]	PROJECT NAME: [illegible]		
BORING NUMBER: [illegible]	COORDINATES:		DATE: [illegible]
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: [illegible]
ENGINEER/GEOLOGIST: [illegible]	Depth	Date/Time	DATE COMPLETED: [illegible]
DRILLING METHODS: [illegible]			PAGE OF

DEPTH (ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 in.	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
				[illegible]				
				water [illegible]				
				gravel fill	gw			
2				No sheen at start on groundwater. Sheen after augering.				
3								
				brown wet clay w/ gravel	cl			5½ [illegible]
4	S-1	1355						OVM = 33 ppm in hole
				Auger Refusal				

NOTES:

SUNNY 90°

243A-3-86

INTERNATIONAL TECHNOLOGY CORPORATION

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 312235	PROJECT NAME: [illegible]		
BORING NUMBER: SB-5	COORDINATES:		DATE: [illegible]
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: [illegible]
ENGINEER/GEOLOGIST: [illegible]	Depth	Date/Time	DATE COMPLETED: [illegible]
DRILLING METHODS: [illegible]			PAGE OF [illegible]

DEPTH ( )	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER ( )	RECOVERY ( )	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
				concrete ~ 1"				
				gravel fill water @ 12" no product seen on water after augering product floating.	gw			
2								
3								
4	S-1	1440		auger refusal at 3 1/2' No sample				
5								

NOTES:

SUNNY 90°

243A-3-86

INTERNATIONAL TECHNOLOGY CORPORATION

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: [illegible]	PROJECT NAME: [illegible]		
BORING NUMBER: [illegible]	COORDINATES:		DATE: [illegible]
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: [illegible]
ENGINEER/GEOLOGIST: [illegible]	Depth	Date/Time	DATE COMPLETED: [illegible]
DRILLING METHODS: [illegible]			PAGE 1 OF

DEPTH (FT)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER (TIME)	RECOVERY ( )	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
1	S-1	1515		brown moist clay w/ [illegible] fill sand	[illegible]			[illegible]
2								
3	S-2	1545		brown moist clay w/ sand, gravel	cl			3½-3¾ = Depth to water
4								
5								

NOTES:

sunny 90°

243A-3-86

INTERNATIONAL TECHNOLOGY CORPORATION

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 312235	PROJECT NAME: MORTON – BATAVIA		
BORING NUMBER: SB-7	COORDINATES:		DATE: 9/11/91
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: [illegible]
ENGINEER/GEOLOGIST: MRKVICKA	Depth	Date/Time	DATE COMPLETED: 9/11/91
DRILLING METHODS: [illegible]			PAGE 1 OF 1

DEPTH ( ) FT	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER ( ) TIME	RECOVERY ( )	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
				[illegible]				
	[illegible]	[illegible]		[illegible]	CL			[illegible]
	S-2	3310		brown moist clay w/ sand gravel	CL			[illegible] = 1
	S-3	845		water at 3½' brown grey clay wet	CL			3½-4½ = 63
				Auger Refusal				

NOTES:

Cloudy 85°

243A-3-86

INTERNATIONAL TECHNOLOGY CORPORATION

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 312235	PROJECT NAME: MORTON- BATA[illegible]	
BORING NUMBER: [illegible]	COORDINATES:	DATE: 9/11/91
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 9/11/91
ENGINEER/GEOLOGIST: MRKVICKA	Depth Date/Time	DATE COMPLETED: 9/11/91
DRILLING METHODS: HAND AUGER		PAGE 1 OF 1

DEPTH ( ) FT	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER ( ) TIME	RECOVERY ( )	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
				[illegible]				
	[illegible]	[illegible]		[illegible]	cl			[illegible] 0
2								[illegible]
3	[illegible]	0950		brown clay w/ gravel wet, black smell	cl			[illegible] 3
4	[illegible]	[illegible]		brown grey wet clay w/ silt sand wet	cl			3½ · 4½ = 46
5								

NOTES:

cloudy 85°

243A-3-86

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 184742

C/C Control No. 143563

PROJECT NAME/NUMBER Martin-Int. Batavia / 312235

LAB DESTINATION NET

SAMPLE TEAM MEMBERS Steve Makvicka / Tom Delaney

CARRIER/WAYBILL NO. FED EX

Sample Number	Location	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
SB-1-S-1	outside N wall	9/10/91 0940	soil	tube		
SB-1-S-2	outside N wall	9/10/91 1015	soil	tube		
SB-3-S-1	inside SE corner	9/10/91 1215	soil	tube		
SB-4-S-1	inside NE corner	9/10/91 1355	soil	tube		
SM ~~SB-5-S~~	~~inside SW corner~~	~~9/10/91~~	~~soil~~	~~tube~~		
W-5	inside SW corner	9/10/91 1415	water	2 40ml		
SB-6-S-1	outside W wall	9/10/91 1515	soil	tube		
SB-6-S-2	outside W wall	9/10/91 1545	soil	tube		
SB-7-S-1	outside S wall	9/11/91 0745	soil	tube		
SB-7-S-3	outside S wall	9/11/91 0845	soil	tube		

Special Instructions: handle with care

Possible Sample Hazards:

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: S Makvicka IT 9/11/91 1330

Received By:

2. Relinquished By:

Received By:

3. Relinquished By:

Received by:

4. Relinquished By:

Received By:

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 154941

C/C Control No. 143561

PROJECT NAME/NUMBER: MORTON – BATAVIA / 312235

LAB DESTINATION: NET LAB - BARTLETT, IL

SAMPLE TEAM MEMBERS: MRKVICKA / DELANEY

CARRIER/WAYBILL NO. FED EX 0994749081

Sample Number	Location	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
SB-8-S-1	outside [redacted]	9/11/91 0930	soil	tube		
SB-8-S-3	outside [redacted]	9/11/91 1015	soil	tube		
R-1	rinsate [redacted]	9/11/91 0855	water	2-40 ml		
trip blank	trip blank		water	2-40 ml		

Special Instructions: handle with care

Possible Sample Hazards:

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: S. Mk IT Corp. 9/11/91 1330

   Received By:

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 184941
C/C Control No. 143561

PROJECT NAME: MORTON - BATAVIA
PROJECT NUMBER: 512235
PROFIT CENTER NUMBER: 3532
PROJECT MANAGER: R. BOYD
BILL TO:
PURCHASE ORDER NO.:

DATE SAMPLES SHIPPED: 9/11/91
LAB DESTINATION: NET - BARTLETT IL
LABORATORY CONTACT: DIANE BILLINGS
SEND LAB REPORT TO: RAYMOND BOYD - ITCorp
333 Pierce Rd Ste 200
Itasca IL 60143
DATE REPORT REQUIRED: 1 week TAT
PROJECT CONTACT: S. MRKVICKA
PROJECT CONTACT PHONE NO.: 708/250-7788

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
SB-8-5-1	soil	18"x1" tube	4°C	VOAs 8240	
SB-8-5-3	soil	18"x1" tube	4°C	↓	
R-1	SW ~~soil~~ water	2-40 ml	HCl	↓	
triptank	water	2-40 ml	HCl	↓	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Laboratory Project Manager.)
Normal ____ Rush ✓ 1 week TAT (Subject to rush surcharge.)

QC LEVEL: (Levels II and III subject to surcharge; project-specific requirements must be submitted to lab before beginning work.)
I ✓ II ____ III ____ Project Specific ____

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances.)
Non-hazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ✓ Other ____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, archive and disposal.)
Return to Client ____ Disposal by Lab ✓ Archive ____ (Indicate number of months.)

FOR LAB USE ONLY
Received by ____ Date/Time ____

WHITE - Original, to accompany samples
YELLOW - Field copy

126A 10 85

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 184942
C/C Control No. 143563

PROJECT NAME: MORTON - BATAVIA
PROJECT NUMBER: 312235
PROFIT CENTER NUMBER: 3332
PROJECT MANAGER: R. BOYD
BILL TO: [redacted]
PURCHASE ORDER NO.: [redacted]

DATE SAMPLES SHIPPED: 9/11/91
LAB DESTINATION: NFT labs - Bartlett, IL
LABORATORY CONTACT: Diane Billings
SEND LAB REPORT TO: Raymond Boyd - IT
333 Pierce Rd Ste 200
Itasca, IL 60143
DATE REPORT REQUIRED: 1 week TAT
PROJECT CONTACT: S. MRKVICKA
PROJECT CONTACT PHONE NO.: 708/250-7788

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
SB-1-S-	soil	18"x1" tube	4°C	VOAs 8240	
SB-1-S	soil	18"x1" tube	4°C		
SB-3-S-1	soil	18"x1" tube	4°C		
SB-4-S-1	soil	18"x1" tube	4°C		
SM ~~SB-5-S~~	~~soil~~	~~18"x1" tube~~	~~4°C~~		
W-5	water	2-40ml	HCl		
SB-6-S-1	soil	18"x1" tube	4°C	VOAs 8240	
SB-6-S-2	soil	18"x1" tube	4°C		
SB-7-S-1	soil	18"x1" tube	4°C		
SB7-S-3	soil	18"x1" tube	4°C		

TURNAROUND TIME REQUIRED: (Rush must be approved by the Laboratory Project Manager.)
Normal ____ Rush ✓ 1 WEEK TAT (Subject to rush surcharge.)

QC LEVEL: (Levels II and III subject to surcharge; project-specific requirements must be submitted to lab before beginning work.)
I ✓ II ____ III ____ Project Specific ____

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances.)
Non-hazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ✓ Other ____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, archive and disposal.)
Return to Client ____ Disposal by Lab ✓ Archive ____ (Indicate number of months.)

FOR LAB USE ONLY
Received by ____ Date/Time ____

WHITE - Original, to accompany samples
YELLOW - Field copy

126A 10 85

INTERNATIONAL TECHNOLOGY CORPORATION

DATE	0	9	1	0	9	1
TIME	0	9	4	0		
PAGE 1 OF 1						
PAGE	0	0	0	0	1	
PROJECT NO. 312235						

SAMPLE COLLECTION LOG

PROJECT NAME: Morton - Batavia

SAMPLE NO.: SB - 1 - S - 1

SAMPLE LOCATION: Outside N wall

SAMPLE TYPE: Soil

COMPOSITE: ___ YES ✓ NO

COMPOSITE TYPE: N/A

DEPTH OF SAMPLE: 6" - 18"

WEATHER: Sunny 90°

CONTAINERS USED	AMOUNT COLLECTED
18" x 1" tube	

COMMENTS:

VOAS

PREPARED BY: [signature]

INTERNATIONAL TECHNOLOGY CORPORATION

DATE	09/09/1
TIME	1015
PAGE 1 OF 1	
PAGE	00002
PROJECT NO.	312235

SAMPLE COLLECTION LOG

PROJECT NAME: MORTON - BATAVIA

SAMPLE NO.: SB-1-S-2

SAMPLE LOCATION: outside N wall

SAMPLE TYPE: Soil

COMPOSITE: ___ YES ✓ NO

COMPOSITE TYPE: N/A

DEPTH OF SAMPLE: 2½-3½'

WEATHER: Sunny 90°

CONTAINERS USED	AMOUNT COLLECTED
18" x 1" tube	

COMMENTS:

VOAs

PREPARED BY: [signature]

INTERNATIONAL TECHNOLOGY CORPORATION

DATE	0	9	1	0	9	1
TIME	1	2	1	5		
PAGE 1 OF 1						
PAGE	0	0	0	0	3	
PROJECT NO. 312235						

SAMPLE COLLECTION LOG

PROJECT NAME Morton-Batavia

SAMPLE NO. SB-3-S-1

SAMPLE LOCATION inside SE corner

SAMPLE TYPE Soil

COMPOSITE ____ YES ✓ NO

COMPOSITE TYPE N/A

DEPTH OF SAMPLE 3½ 4½'

WEATHER Sunny 90°

CONTAINERS USED	AMOUNT COLLECTED
18" x 1" tube	

COMMENTS:

VOAs

PREPARED BY: [signature]

INTERNATIONAL TECHNOLOGY CORPORATION

DATE	091091
TIME	1355
PAGE 1 OF 1	
PAGE	00004
PROJECT NO.	312235

SAMPLE COLLECTION LOG

PROJECT NAME Morton - Batavia

SAMPLE NO. SB-4-S-1

SAMPLE LOCATION inside NE corner

SAMPLE TYPE Soil

COMPOSITE ____ YES ✓ NO

COMPOSITE TYPE N/A

DEPTH OF SAMPLE 3½' - 4½'

WEATHER Sunny 90°

CONTAINERS USED	AMOUNT COLLECTED
18" x 1" tube	

COMMENTS:

VOAs

PREPARED BY: [signature]

INTERNATIONAL TECHNOLOGY CORPORATION

DATE	0	9	/	0	9	/			
TIME	1	4	/	5					
PAGE 1 OF 1									
PAGE	0	0	0	0	5				
PROJECT NO. 312235									

SAMPLE COLLECTION LOG

PROJECT NAME Martin - Pantana

SAMPLE NO. W-5

SAMPLE LOCATION Opposite of SB-5

SAMPLE TYPE water

COMPOSITE ____ YES ✓ NO

COMPOSITE TYPE N/A

DEPTH OF SAMPLE N/A

WEATHER Sunny 90°

CONTAINERS USED	AMOUNT COLLECTED
2 - 40ml glass VOAs	

COMMENTS:

VOAs

PREPARED BY: [signature]

INTERNATIONAL TECHNOLOGY CORPORATION

DATE	0	9	1	0	9	1
TIME	1	5	1	5		
PAGE 1 OF 1						
PAGE	0	0	0	0	6	
PROJECT NO. 312235						

SAMPLE COLLECTION LOG

PROJECT NAME Martin - Batavia

SAMPLE NO. SB-6-S-1

SAMPLE LOCATION outside A wall

SAMPLE TYPE Soil

COMPOSITE ____ YES ✓ NO

COMPOSITE TYPE N/A

DEPTH OF SAMPLE 6"-18"

WEATHER Sunny 90°

CONTAINERS USED	AMOUNT COLLECTED
18" x 1" tube	

COMMENTS:

VOAs

PREPARED BY: SMR

INTERNATIONAL TECHNOLOGY CORPORATION

DATE	0	9	1	0	9	1
TIME	1	5	4	5		
PAGE 1 OF 1						
PAGE	0	0	0	0	7	
PROJECT NO. 3:22 55						

SAMPLE COLLECTION LOG

PROJECT NAME Morton - Batavia

SAMPLE NO. SB-6-S-2

SAMPLE LOCATION outside W. wall

SAMPLE TYPE soil

COMPOSITE ____ YES ✓ NO

COMPOSITE TYPE N/A

DEPTH OF SAMPLE 2 1/2 - 3 1/2

WEATHER sunny 90°

CONTAINERS USED	AMOUNT COLLECTED
18" x 1" tube	

COMMENTS:

VOAs

PREPARED BY: [signature]

INTERNATIONAL TECHNOLOGY CORPORATION

DATE	0	9	1	1	9	1	
TIME	0	7	4	5			
PAGE 1 OF 1							
PAGE	0	0	0	0	8		
PROJECT NO. 312235							

SAMPLE COLLECTION LOG

PROJECT NAME: MORTON – Batavia

SAMPLE NO.: SB-7-S-1

SAMPLE LOCATION: outside of water

SAMPLE TYPE: soil

COMPOSITE: ___ YES ✓ NO

COMPOSITE TYPE: N/A

DEPTH OF SAMPLE: 6" - 18"

WEATHER: ~~sunny~~ 90° SM cloudy 85

CONTAINERS USED	AMOUNT COLLECTED
18" x 1" tube	

COMMENTS: VOAs

PREPARED BY: SMK

INTERNATIONAL TECHNOLOGY CORPORATION

DATE	0	9	1	1	9	1
TIME	0	8	4	5		
PAGE 1 OF 1						
PAGE	0	0	0	0	9	
PROJECT NO. 51.2235						

SAMPLE COLLECTION LOG

PROJECT NAME: Morton - Batavia

SAMPLE NO.: SB-9-5-3

SAMPLE LOCATION: outside S wall

SAMPLE TYPE: Soil

COMPOSITE: ___ YES ✓ NO

COMPOSITE TYPE: N/A

DEPTH OF SAMPLE: 3½ - 4½

WEATHER: ~~Sunny 60°~~ SM Cloudy 85°

CONTAINERS USED	AMOUNT COLLECTED
18" x 1" tube	

COMMENTS:

VCAS

PREPARED BY: [signature]

INTERNATIONAL TECHNOLOGY CORPORATION

DATE	0	9	1	1	9	1
TIME	0	9	3	0		
PAGE 1 OF 1						
PAGE	0	0	0	1	K	
PROJECT NO. 31231						

SAMPLE COLLECTION LOG

PROJECT NAME Milton - Batavia

SAMPLE NO. SB-8-S-1

SAMPLE LOCATION outside E wall

SAMPLE TYPE soil

COMPOSITE ____ YES ✓ NO

COMPOSITE TYPE N/A

DEPTH OF SAMPLE 6"-15"

WEATHER cloudy 85°

CONTAINERS USED	AMOUNT COLLECTED
18" x 1" tube	

COMMENTS:

VOAs

PREPARED BY: [signature]

INTERNATIONAL TECHNOLOGY CORPORATION

DATE	0 9 1 1 9 1
TIME	0 1 0 1 5
PAGE 1 OF 1	
PAGE	0 0 0 1 1
PROJECT NO. 312235	

SAMPLE COLLECTION LOG

PROJECT NAME Morton - Botanica

SAMPLE NO. SB-8-5-3

SAMPLE LOCATION outside E wall

SAMPLE TYPE soil

COMPOSITE ____ YES ✓ NO

COMPOSITE TYPE N/A

DEPTH OF SAMPLE 3½-4½'

WEATHER cloudy 85°

CONTAINERS USED	AMOUNT COLLECTED
18" x 1" tube	

COMMENTS:

VOAs

PREPARED BY: [signature]

INTERNATIONAL TECHNOLOGY CORPORATION

DATE	09/11/91
TIME	0855
PAGE 1 OF 1	
PAGE	00012
PROJECT NO.	312235

SAMPLE COLLECTION LOG

PROJECT NAME: Morton - Batavia

SAMPLE NO.: R-1

SAMPLE LOCATION: rinsate

SAMPLE TYPE: water

COMPOSITE: ___ YES ✓ NO

COMPOSITE TYPE: N/A

DEPTH OF SAMPLE: N/A

WEATHER: cloudy 85°

CONTAINERS USED	AMOUNT COLLECTED
2 - 40 ml vials	

COMMENTS:

VOAs

PREPARED BY: [signature]

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Bartlett Division
850 West Bartlett Road
Bartlett, IL 60103

Tel: (708) 289-3100
Fax: (708) 289-5445

ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148642

Job No.: 91.3442

Sample Description: SB-1-S-1
312235 Morton-Batavia

Date Taken: 09/10/1991
Time Taken: 09:40
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

Solids, Total	31.64	mg/L

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Bartlett Division
850 West Bartlett Road
Bartlett, IL 60103

Tel: (708) 289-3100
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ANALYTICAL REPORT

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IT CORPORATION
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09/20/1991

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312235 Morton-Batavia

Date Taken: 09/10/1991
Time Taken: 09:40
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

VOLATILES - 8240 NONAQUEOUS

Acrolein	<100.	ug/Kg
Acrylonitrile	<100.	ug/Kg
Benzene	<10.	ug/Kg
Bromodichloromethane	<10.	ug/Kg
Bromoform	<10.	ug/Kg
Bromomethane	<100.	ug/Kg
Carbon tetrachloride	<10.	ug/Kg
Chlorobenzene	<10.	ug/Kg
Chloroethane	<100.	ug/Kg
2-Chloroethylvinyl ether	<10.	ug/Kg
Chloroform	<10.	ug/Kg
Chloromethane	<100.	ug/Kg
Dibromochloromethane	<10.	ug/Kg
1,2-Dichlorobenzene	<10.	ug/Kg
1,3-Dichlorobenzene	<10.	ug/Kg
1,4-Dichlorobenzene	<10.	ug/Kg
1,1-Dichloroethane	<10.	ug/Kg
1,2-Dichloroethane	<10.	ug/Kg
1,1-Dichloroethene	<10.	ug/Kg
trans-1,2-Dichloroethene	<10.	ug/Kg
cis-1,2-Dichloroethene	<10.	ug/Kg
1,2-Dichloropropane	<10.	ug/Kg
cis-1,3-Dichloropropene	<10.	ug/Kg
trans-1,3-Dichloropropene	<10.	ug/Kg
Ethyl benzene	<10.	ug/Kg
Methylene chloride	<50.	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NET
NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Bartlett Division
850 West Bartlett Road
Bartlett, IL 60103

Tel: (708) 289-3100
Fax: (708) 289-5445

ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148642

Job No.: 91.3442

Sample Description: SB-1-S-1
312235 Morton-Batavia

Date Taken: 09/10/1991
Time Taken: 09:40
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

VOLATILES - 8240 NONAQUEOUS

1,1,2,2-Tetrachloroethane	<10.	ug/Kg
Tetrachloroethene	<10.	ug/Kg
Toluene	<10.	ug/Kg
1,1,1-Trichloroethane	<10.	ug/Kg
1,1,2-Trichloroethane	<10.	ug/Kg
Trichloroethene	<10.	ug/Kg
Trichlorofluoromethane	<10.	ug/Kg
Vinyl chloride	<100.	ug/Kg
Xylenes, Total	44.	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NET Midwest, Inc.
Bartlett Division
850 West Bartlett Road
Bartlett, IL 60103

Tel: (708) 289-3100
Fax: (708) 289-5445

NATIONAL ENVIRONMENTAL TESTING, INC.

ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148643

Job No.: 91.3442

Sample Description: SB-1-S-2
312235 Morton-Batavia

Date Taken: 09/10/1991
Time Taken: 10:15
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

Solids, Total	32.25	mg/L

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Bartlett Division
850 West Bartlett Road
Bartlett, IL 60103

Tel: (708) 289-3100
Fax: (708) 289-5445

ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148643

Job No.: 91.3442

Sample Description: SB-1-S-2
312235 Morton-Batavia

Date Taken: 09/10/1991
Time Taken: 10:15
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

VOLATILES - 8240 NONAQUEOUS

Acrolein	<100.	ug/Kg
Acrylonitrile	<100.	ug/Kg
Benzene	<10.	ug/Kg
Bromodichloromethane	<10.	ug/Kg
Bromoform	<10.	ug/Kg
Bromomethane	<100.	ug/Kg
Carbon tetrachloride	<10.	ug/Kg
Chlorobenzene	<10.	ug/Kg
Chloroethane	<100.	ug/Kg
2-Chloroethylvinyl ether	<10.	ug/Kg
Chloroform	<10.	ug/Kg
Chloromethane	<100.	ug/Kg
Dibromochloromethane	<10.	ug/Kg
1,2-Dichlorobenzene	<10.	ug/Kg
1,3-Dichlorobenzene	<10.	ug/Kg
1,4-Dichlorobenzene	<10.	ug/Kg
1,1-Dichloroethane	<10.	ug/Kg
1,2-Dichloroethane	<10.	ug/Kg
1,1-Dichloroethene	<10.	ug/Kg
trans-1,2-Dichloroethene	<10.	ug/Kg
cis-1,2-Dichloroethene	<10.	ug/Kg
1,2-Dichloropropane	<10.	ug/Kg
cis-1,3-Dichloropropene	<10.	ug/Kg
trans-1,3-Dichloropropene	<10.	ug/Kg
Ethyl benzene	366.	ug/Kg
Methylene chloride	<50.	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Bartlett Division
850 West Bartlett Road
Bartlett, IL 60103

Tel: (708) 289-3100
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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148643

Job No.: 91.3442

Sample Description: SB-1-S-2
312235 Morton-Batavia

Date Taken: 09/10/1991
Time Taken: 10:15
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

VOLATILES - 8240 NONAQUEOUS

1,1,2,2-Tetrachloroethane	<10.	ug/Kg
Tetrachloroethene	<10.	ug/Kg
Toluene	<10.	ug/Kg
1,1,1-Trichloroethane	<10.	ug/Kg
1,1,2-Trichloroethane	<10.	ug/Kg
Trichloroethene	<10.	ug/Kg
Trichlorofluoromethane	<10.	ug/Kg
Vinyl chloride	<100.	ug/Kg
Xylenes, Total	521.	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

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NET Midwest, Inc.
Bartlett Division
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Bartlett, IL 60103

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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148644

Job No.: 91.3442

Sample Description: SB-3-S-1
312235 Morton-Batavia

Date Taken: 09/10/1991
Time Taken: 12:15
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

Solids, Total	66.79	mg/L

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148644

Job No.: 91.3442

Sample Description: SB-3-S-1
312235 Morton-Batavia

Date Taken: 09/10/1991
Time Taken: 12:15
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

VOLATILES - 8240 NONAQUEOUS

Acrolein	<100.	ug/Kg
Acrylonitrile	<100.	ug/Kg
Benzene	<10.	ug/Kg
Bromodichloromethane	<10.	ug/Kg
Bromoform	<10.	ug/Kg
Bromomethane	<100.	ug/Kg
Carbon tetrachloride	<10.	ug/Kg
Chlorobenzene	<10.	ug/Kg
Chloroethane	<100.	ug/Kg
2-Chloroethylvinyl ether	<10.	ug/Kg
Chloroform	<10.	ug/Kg
Chloromethane	<100.	ug/Kg
Dibromochloromethane	<10.	ug/Kg
1,2-Dichlorobenzene	<10.	ug/Kg
1,3-Dichlorobenzene	<10.	ug/Kg
1,4-Dichlorobenzene	<10.	ug/Kg
1,1-Dichloroethane	<10.	ug/Kg
1,2-Dichloroethane	<10.	ug/Kg
1,1-Dichloroethene	<10.	ug/Kg
trans-1,2-Dichloroethene	<10.	ug/Kg
cis-1,2-Dichloroethene	<10.	ug/Kg
1,2-Dichloropropane	<10.	ug/Kg
cis-1,3-Dichloropropene	<10.	ug/Kg
trans-1,3-Dichloropropene	<10.	ug/Kg
Ethyl benzene	148.	ug/Kg
Methylene chloride	<50.	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148644

Job No.: 91.3442

Sample Description: SB-3-S-1
312235 Morton-Batavia

Date Taken: 09/10/1991
Time Taken: 12:15
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

VOLATILES - 8240 NONAQUEOUS

1,1,2,2-Tetrachloroethane	<10.	ug/Kg
Tetrachloroethene	314.	ug/Kg
Toluene	217.	ug/Kg
1,1,1-Trichloroethane	<10.	ug/Kg
1,1,2-Trichloroethane	<10.	ug/Kg
Trichloroethene	<10.	ug/Kg
Trichlorofluoromethane	<10.	ug/Kg
Vinyl chloride	<100.	ug/Kg
Xylenes, Total	120.	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

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NET Midwest, Inc.
Bartlett Division
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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148645

Job No.: 91.3442

Sample Description: SB-4-S-1
312235 Morton-Batavia

Date Taken: 09/10/1991
Time Taken: 13:55
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

Solids, Total	60.09	mg/L

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148645

Job No.: 91.3442

Sample Description: SB-4-S-1
312235 Morton-Batavia

Date Taken: 09/10/1991
Time Taken: 13:55
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

VOLATILES - 8240 NONAQUEOUS

Acrolein	<50.	ug/Kg
Acrylonitrile	<50.	ug/Kg
Benzene	<5.0	ug/Kg
Bromodichloromethane	<5.0	ug/Kg
Bromoform	<5.0	ug/Kg
Bromomethane	<50.	ug/Kg
Carbon tetrachloride	<5.0	ug/Kg
Chlorobenzene	<5.0	ug/Kg
Chloroethane	<50.	ug/Kg
2-Chloroethylvinyl ether	<5.0	ug/Kg
Chloroform	<5.0	ug/Kg
Chloromethane	<50.	ug/Kg
Dibromochloromethane	<5.0	ug/Kg
1,2-Dichlorobenzene	<5.0	ug/Kg
1,3-Dichlorobenzene	<5.0	ug/Kg
1,4-Dichlorobenzene	<5.0	ug/Kg
1,1-Dichloroethane	<5.0	ug/Kg
1,2-Dichloroethane	<5.0	ug/Kg
1,1-Dichloroethene	<5.0	ug/Kg
trans-1,2-Dichloroethene	<5.0	ug/Kg
cis-1,2-Dichloroethene	<5.0	ug/Kg
1,2-Dichloropropane	<5.0	ug/Kg
cis-1,3-Dichloropropene	<5.0	ug/Kg
trans-1,3-Dichloropropene	<5.0	ug/Kg
Ethyl benzene	166.	ug/Kg
Methylene chloride	<25.	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148645

Job No.: 91.3442

Sample Description: SB-4-S-1
312235 Morton-Batavia

Date Taken: 09/10/1991
Time Taken: 13:55
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

VOLATILES - 8240 NONAQUEOUS

1,1,2,2-Tetrachloroethane	<5.0	ug/Kg
Tetrachloroethene	<5.0	ug/Kg
Toluene	<5.0	ug/Kg
1,1,1-Trichloroethane	<5.0	ug/Kg
1,1,2-Trichloroethane	<5.0	ug/Kg
Trichloroethene	<5.0	ug/Kg
Trichlorofluoromethane	<5.0	ug/Kg
Vinyl chloride	<50.	ug/Kg
Xylenes, Total	49.9	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148646

Job No.: 91.3442

Sample Description: SB-6-S-1
312235 Morton-Batavia

Date Taken: 09/10/1991
Time Taken: 15:15
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

Solids, Total	67.33	mg/L

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

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Bartlett Division
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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148646

Job No.: 91.3442

Sample Description: SB-6-S-1
312235 Morton-Batavia

Date Taken: 09/10/1991
Time Taken: 15:15
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

VOLATILES - 8240 NONAQUEOUS

Acrolein	<5000.	ug/Kg
Acrylonitrile	<5000.	ug/Kg
Benzene	<500.	ug/Kg
Bromodichloromethane	<500.	ug/Kg
Bromoform	<500.	ug/Kg
Bromomethane	<5000.	ug/Kg
Carbon tetrachloride	<500.	ug/Kg
Chlorobenzene	<500.	ug/Kg
Chloroethane	<5000.	ug/Kg
2-Chloroethylvinyl ether	<500.	ug/Kg
Chloroform	<500.	ug/Kg
Chloromethane	<5000.	ug/Kg
Dibromochloromethane	<500.	ug/Kg
1,2-Dichlorobenzene	<500.	ug/Kg
1,3-Dichlorobenzene	<500.	ug/Kg
1,4-Dichlorobenzene	<500.	ug/Kg
1,1-Dichloroethane	<500.	ug/Kg
1,2-Dichloroethane	<500.	ug/Kg
1,1-Dichloroethene	<500.	ug/Kg
trans-1,2-Dichloroethene	<500.	ug/Kg
cis-1,2-Dichloroethene	<500.	ug/Kg
1,2-Dichloropropane	<500.	ug/Kg
cis-1,3-Dichloropropene	<500.	ug/Kg
trans-1,3-Dichloropropene	<500.	ug/Kg
Ethyl benzene	<500.	ug/Kg
Methylene chloride	<2500.	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

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NET Midwest, Inc.
Bartlett Division
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Bartlett, IL 60103

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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148646

Job No.: 91.3442

Sample Description: SB-6-S-1
312235 Morton-Batavia

Date Taken: 09/10/1991
Time Taken: 15:15
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

VOLATILES - 8240 NONAQUEOUS

1,1,2,2-Tetrachloroethane	<500.	ug/Kg
Tetrachloroethene	<500.	ug/Kg
Toluene	<500.	ug/Kg
1,1,1-Trichloroethane	<500.	ug/Kg
1,1,2-Trichloroethane	<500.	ug/Kg
Trichloroethene	<500.	ug/Kg
Trichlorofluoromethane	<500.	ug/Kg
Vinyl chloride	<5000.	ug/Kg
Xylenes, Total	36,200.	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

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Bartlett Division
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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148647

Job No.: 91.3442

Sample Description: SB-6-S-2
312235 Morton-Batavia

Date Taken: 09/10/1991
Time Taken: 15:45
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

Solids, Total	27.03	mg/L

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Bartlett Division
850 West Bartlett Road
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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148647

Job No.: 91.3442

Sample Description: SB-6-S-2
312235 Morton-Batavia

Date Taken: 09/10/1991
Time Taken: 15:45
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

VOLATILES - 8240 NONAQUEOUS

Acrolein	<100.	ug/Kg
Acrylonitrile	<100.	ug/Kg
Benzene	<10.	ug/Kg
Bromodichloromethane	<10.	ug/Kg
Bromoform	<10.	ug/Kg
Bromomethane	<100.	ug/Kg
Carbon tetrachloride	<10.	ug/Kg
Chlorobenzene	<10.	ug/Kg
Chloroethane	<100.	ug/Kg
2-Chloroethylvinyl ether	<10.	ug/Kg
Chloroform	<10.	ug/Kg
Chloromethane	<100.	ug/Kg
Dibromochloromethane	<10.	ug/Kg
1,2-Dichlorobenzene	<10.	ug/Kg
1,3-Dichlorobenzene	<10.	ug/Kg
1,4-Dichlorobenzene	<10.	ug/Kg
1,1-Dichloroethane	<10.	ug/Kg
1,2-Dichloroethane	<10.	ug/Kg
1,1-Dichloroethene	<10.	ug/Kg
trans-1,2-Dichloroethene	<10.	ug/Kg
cis-1,2-Dichloroethene	<10.	ug/Kg
1,2-Dichloropropane	<10.	ug/Kg
cis-1,3-Dichloropropene	<10.	ug/Kg
trans-1,3-Dichloropropene	<10.	ug/Kg
Ethyl benzene	30.	ug/Kg
Methylene chloride	<50.	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NET
NATIONAL ENVIRONMENTAL TESTING, INC.

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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148647

Job No.: 91.3442

Sample Description: SB-6-S-2
312235 Morton-Batavia

Date Taken: 09/10/1991
Time Taken: 15:45
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

VOLATILES - 8240 NONAQUEOUS

1,1,2,2-Tetrachloroethane	<10.	ug/Kg
Tetrachloroethene	<10.	ug/Kg
Toluene	103.	ug/Kg
1,1,1-Trichloroethane	<10.	ug/Kg
1,1,2-Trichloroethane	<10.	ug/Kg
Trichloroethene	<10.	ug/Kg
Trichlorofluoromethane	<10.	ug/Kg
Vinyl chloride	<100.	ug/Kg
Xylenes, Total	115.	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

Bartlett Division
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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148648

Job No.: 91.3442

Sample Description: SB-7-S-1
312235 Morton-Batavia

Date Taken: 09/11/1991
Time Taken: 07:45
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

Solids, Total	27.71	mg/L

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Bartlett Division
850 West Bartlett Road
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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148648

Job No.: 91.3442

Sample Description: SB-7-S-1
312235 Morton-Batavia

Date Taken: 09/11/1991
Time Taken: 07:45
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

VOLATILES - 8240 NONAQUEOUS

Acrolein	<100.	ug/Kg
Acrylonitrile	<100.	ug/Kg
Benzene	<10.	ug/Kg
Bromodichloromethane	<10.	ug/Kg
Bromoform	<10.	ug/Kg
Bromomethane	<100.	ug/Kg
Carbon tetrachloride	<10.	ug/Kg
Chlorobenzene	<10.	ug/Kg
Chloroethane	<100.	ug/Kg
2-Chloroethylvinyl ether	<10.	ug/Kg
Chloroform	<10.	ug/Kg
Chloromethane	<100.	ug/Kg
Dibromochloromethane	<10.	ug/Kg
1,2-Dichlorobenzene	<10.	ug/Kg
1,3-Dichlorobenzene	<10.	ug/Kg
1,4-Dichlorobenzene	<10.	ug/Kg
1,1-Dichloroethane	<10.	ug/Kg
1,2-Dichloroethane	<10.	ug/Kg
1,1-Dichloroethene	<10.	ug/Kg
trans-1,2-Dichloroethene	<10.	ug/Kg
cis-1,2-Dichloroethene	<10.	ug/Kg
1,2-Dichloropropane	<10.	ug/Kg
cis-1,3-Dichloropropene	<10.	ug/Kg
trans-1,3-Dichloropropene	<10.	ug/Kg
Ethyl benzene	<10.	ug/Kg
Methylene chloride	<50.	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NET NATIONAL ENVIRONMENTAL TESTING, INC.

Bartlett Division
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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148648

Job No.: 91.3442

Sample Description: SB-7-S-1
312235 Morton-Batavia

Date Taken: 09/11/1991
Time Taken: 07:45
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

VOLATILES - 8240 NONAQUEOUS

1,1,2,2-Tetrachloroethane	<10.	ug/Kg
Tetrachloroethene	<10.	ug/Kg
Toluene	184.	ug/Kg
1,1,1-Trichloroethane	<10.	ug/Kg
1,1,2-Trichloroethane	<10.	ug/Kg
Trichloroethene	<10.	ug/Kg
Trichlorofluoromethane	<10.	ug/Kg
Vinyl chloride	<100.	ug/Kg
Xylenes, Total	112.	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Bartlett Division
850 West Bartlett Road
Bartlett, IL 60103

Tel: (708) 289-3100
Fax: (708) 289-5445

ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148649

Job No.: 91.3442

Sample Description: SB-7-S-3
312235 Morton-Batavia

Date Taken: 09/11/1991
Time Taken: 08:45
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

Solids, Total	76.77	mg/L

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Bartlett Division
850 West Bartlett Road
Bartlett, IL 60103

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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148649

Job No.: 91.3442

Sample Description: SB-7-S-3
312235 Morton-Batavia

Date Taken: 09/11/1991
Time Taken: 08:45
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

VOLATILES - 8240 NONAQUEOUS

Acrolein	<50.	ug/Kg
Acrylonitrile	<50.	ug/Kg
Benzene	<5.0	ug/Kg
Bromodichloromethane	<5.0	ug/Kg
Bromoform	<5.0	ug/Kg
Bromomethane	<50.	ug/Kg
Carbon tetrachloride	<5.0	ug/Kg
Chlorobenzene	<5.0	ug/Kg
Chloroethane	<50.	ug/Kg
2-Chloroethylvinyl ether	<5.0	ug/Kg
Chloroform	<5.0	ug/Kg
Chloromethane	<50.	ug/Kg
Dibromochloromethane	<5.0	ug/Kg
1,2-Dichlorobenzene	<5.0	ug/Kg
1,3-Dichlorobenzene	<5.0	ug/Kg
1,4-Dichlorobenzene	<5.0	ug/Kg
1,1-Dichloroethane	<5.0	ug/Kg
1,2-Dichloroethane	<5.0	ug/Kg
1,1-Dichloroethene	<5.0	ug/Kg
trans-1,2-Dichloroethene	<5.0	ug/Kg
cis-1,2-Dichloroethene	<5.0	ug/Kg
1,2-Dichloropropane	<5.0	ug/Kg
cis-1,3-Dichloropropene	<5.0	ug/Kg
trans-1,3-Dichloropropene	<5.0	ug/Kg
Ethyl benzene	<5.0	ug/Kg
Methylene chloride	<25.	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Bartlett Division
850 West Bartlett Road
Bartlett, IL 60103

Tel: (708) 289-3100
Fax: (708) 289-5445

ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148649

Job No.: 91.3442

Sample Description: SB-7-S-3
312235 Morton-Batavia

Date Taken: 09/11/1991
Time Taken: 08:45
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

VOLATILES - 8240 NONAQUEOUS

1,1,2,2-Tetrachloroethane	<5.0	ug/Kg
Tetrachloroethene	<5.0	ug/Kg
Toluene	<5.0	ug/Kg
1,1,1-Trichloroethane	<5.0	ug/Kg
1,1,2-Trichloroethane	<5.0	ug/Kg
Trichloroethene	6.0	ug/Kg
Trichlorofluoromethane	<5.0	ug/Kg
Vinyl chloride	<50.	ug/Kg
Xylenes, Total	10.0	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148650

Job No.: 91.3442

Sample Description: SB-8-S-1
312235 Morton-Batavia

Date Taken: 09/11/1991
Time Taken: 09:30
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

Solids, Total	88.74	mg/L

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

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850 West Bartlett Road
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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148650

Job No.: 91.3442

Sample Description: SB-8-S-1
312235 Morton-Batavia

Date Taken: 09/11/1991
Time Taken: 09:30
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

VOLATILES - 8240 NONAQUEOUS

Acrolein	<50.	ug/Kg
Acrylonitrile	<50.	ug/Kg
Benzene	<5.0	ug/Kg
Bromodichloromethane	<5.0	ug/Kg
Bromoform	<5.0	ug/Kg
Bromomethane	<50.	ug/Kg
Carbon tetrachloride	<5.0	ug/Kg
Chlorobenzene	<5.0	ug/Kg
Chloroethane	<50.	ug/Kg
2-Chloroethylvinyl ether	<5.0	ug/Kg
Chloroform	<5.0	ug/Kg
Chloromethane	<50.	ug/Kg
Dibromochloromethane	<5.0	ug/Kg
1,2-Dichlorobenzene	<5.0	ug/Kg
1,3-Dichlorobenzene	<5.0	ug/Kg
1,4-Dichlorobenzene	<5.0	ug/Kg
1,1-Dichloroethane	<5.0	ug/Kg
1,2-Dichloroethane	<5.0	ug/Kg
1,1-Dichloroethene	<5.0	ug/Kg
trans-1,2-Dichloroethene	<5.0	ug/Kg
cis-1,2-Dichloroethene	<5.0	ug/Kg
1,2-Dichloropropane	<5.0	ug/Kg
cis-1,3-Dichloropropene	<5.0	ug/Kg
trans-1,3-Dichloropropene	<5.0	ug/Kg
Ethyl benzene	<5.0	ug/Kg
Methylene chloride	<25.	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148650

Job No.: 91.3442

Sample Description: SB-8-S-1
312235 Morton-Batavia

Date Taken: 09/11/1991
Time Taken: 09:30
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

VOLATILES - 8240 NONAQUEOUS

1,1,2,2-Tetrachloroethane	<5.0	ug/Kg
Tetrachloroethene	<5.0	ug/Kg
Toluene	<5.0	ug/Kg
1,1,1-Trichloroethane	<5.0	ug/Kg
1,1,2-Trichloroethane	<5.0	ug/Kg
Trichloroethene	<5.0	ug/Kg
Trichlorofluoromethane	<5.0	ug/Kg
Vinyl chloride	<50.	ug/Kg
Xylenes, Total	<5.0	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148651

Job No.: 91.3442

Sample Description: SB-8-S-3
312235 Morton-Batavia

Date Taken: 09/11/1991
Time Taken: 10:15
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

Solids, Total	61.43	mg/L

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Bartlett Division
850 West Bartlett Road
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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148651

Job No.: 91.3442

Sample Description: SB-8-S-3
312235 Morton-Batavia

Date Taken: 09/11/1991
Time Taken: 10:15
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

VOLATILES - 8240 NONAQUEOUS

Acrolein	<50.	ug/Kg
Acrylonitrile	<50.	ug/Kg
Benzene	<5.0	ug/Kg
Bromodichloromethane	<5.0	ug/Kg
Bromoform	<5.0	ug/Kg
Bromomethane	<50.	ug/Kg
Carbon tetrachloride	<5.0	ug/Kg
Chlorobenzene	<5.0	ug/Kg
Chloroethane	<50.	ug/Kg
2-Chloroethylvinyl ether	<5.0	ug/Kg
Chloroform	<5.0	ug/Kg
Chloromethane	<50.	ug/Kg
Dibromochloromethane	<5.0	ug/Kg
1,2-Dichlorobenzene	<5.0	ug/Kg
1,3-Dichlorobenzene	<5.0	ug/Kg
1,4-Dichlorobenzene	<5.0	ug/Kg
1,1-Dichloroethane	<5.0	ug/Kg
1,2-Dichloroethane	<5.0	ug/Kg
1,1-Dichloroethene	<5.0	ug/Kg
trans-1,2-Dichloroethene	<5.0	ug/Kg
cis-1,2-Dichloroethene	<5.0	ug/Kg
1,2-Dichloropropane	<5.0	ug/Kg
cis-1,3-Dichloropropene	<5.0	ug/Kg
trans-1,3-Dichloropropene	<5.0	ug/Kg
Ethyl benzene	<5.0	ug/Kg
Methylene chloride	<25.	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NET NATIONAL ENVIRONMENTAL TESTING, INC.

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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148651

Job No.: 91.3442

Sample Description: SB-8-S-3
312235 Morton-Batavia

Date Taken: 09/11/1991
Time Taken: 10:15
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

VOLATILES - 8240 NONAQUEOUS

1,1,2,2-Tetrachloroethane	<5.0	ug/Kg
Tetrachloroethene	<5.0	ug/Kg
Toluene	76.5	ug/Kg
1,1,1-Trichloroethane	<5.0	ug/Kg
1,1,2-Trichloroethane	<5.0	ug/Kg
Trichloroethene	<5.0	ug/Kg
Trichlorofluoromethane	<5.0	ug/Kg
Vinyl chloride	<50.	ug/Kg
Xylenes, Total	21.2	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NET NATIONAL ENVIRONMENTAL TESTING, INC.

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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148652

Job No.: 91.3442

Sample Description: W-5
312235 Morton-Batavia

Date Taken: 09/11/1991
Time Taken: 14:15
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

VOLATILES - 8240 AQUEOUS

Acrolein	<10.0	ug/L
Acrylonitrile	<10.0	ug/L
Benzene	1.8	ug/L
Bromodichloromethane	<1.0	ug/L
Bromoform	<1.0	ug/L
Bromomethane	<10.0	ug/L
Carbon tetrachloride	<1.0	ug/L
Chlorobenzene	<1.0	ug/L
Chloroethane	<10.0	ug/L
2-Chloroethylvinyl ether	<5.0	ug/L
Chloroform	<1.0	ug/L
Chloromethane	<10.0	ug/L
Dibromochloromethane	<1.0	ug/L
1,2-Dichlorobenzene	<1.0	ug/L
1,3-Dichlorobenzene	<1.0	ug/L
1,4-Dichlorobenzene	<1.0	ug/L
1,1-Dichloroethane	4.7	ug/L
1,2-Dichloroethane	<1.0	ug/L
1,1-Dichloroethene	<1.0	ug/L
cis-1,2-Dichloroethene	43.7	ug/L
trans-1,2-Dichloroethene	<1.0	ug/L
1,2-Dichloropropane	<1.0	ug/L
cis-1,3-Dichloropropene	<1.0	ug/L
trans-1,3-Dichloropropene	<1.0	ug/L
Ethyl benzene	379.	ug/L
Methylene chloride	<5.0	ug/L

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148652

Job No.: 91.3442

Sample Description: W-5
312235 Morton-Batavia

Date Taken: 09/11/1991
Time Taken: 14:15
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

VOLATILES - 8240 AQUEOUS

1,1,2,2-Tetrachloroethane	<1.0	ug/L
Tetrachloroethene	<1.0	ug/L
Toluene	4740.	ug/L
1,1,1-Trichloroethane	7.9	ug/L
1,1,2-Trichloroethane	<1.0	ug/L
Trichloroethene	<1.0	ug/L
Trichlorofluoromethane	<1.0	ug/L
Vinyl chloride	<10.0	ug/L
Xylenes, total	4110.	ug/L

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Bartlett Division
850 West Bartlett Road
Bartlett, IL 60103

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Fax: (708) 289-5445

ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148653

Job No.: 91.3442

Sample Description: R-1
312235 Morton-Batavia

Date Taken: 09/11/1991
Time Taken: 08:55
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

VOLATILES - 8240 AQUEOUS

Acrolein	<10.0	ug/L
Acrylonitrile	<10.0	ug/L
Benzene	<1.0	ug/L
Bromodichloromethane	2.8	ug/L
Bromoform	<1.0	ug/L
Bromomethane	<10.0	ug/L
Carbon tetrachloride	<1.0	ug/L
Chlorobenzene	<1.0	ug/L
Chloroethane	<10.0	ug/L
2-Chloroethylvinyl ether	<5.0	ug/L
Chloroform	<1.0	ug/L
Chloromethane	<10.0	ug/L
Dibromochloromethane	<1.0	ug/L
1,2-Dichlorobenzene	<1.0	ug/L
1,3-Dichlorobenzene	<1.0	ug/L
1,4-Dichlorobenzene	<1.0	ug/L
1,1-Dichloroethane	<1.0	ug/L
1,2-Dichloroethane	<1.0	ug/L
1,1-Dichloroethene	<1.0	ug/L
cis-1,2-Dichloroethene	<1.0	ug/L
trans-1,2-Dichloroethene	<1.0	ug/L
1,2-Dichloropropane	<1.0	ug/L
cis-1,3-Dichloropropene	<1.0	ug/L
trans-1,3-Dichloropropene	<1.0	ug/L
Ethyl benzene	<1.0	ug/L
Methylene chloride	<5.0	ug/L

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc
Bartlett Division
850 West Bartlett Road
Bartlett, IL 60103

Tel: (708) 289-3100
Fax: (708) 289-5445

ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148653

Job No.: 91.3442

Sample Description: R-1
312235 Morton-Batavia

Date Taken: 09/11/1991
Time Taken: 08:55
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

VOLATILES - 8240 AQUEOUS

1,1,2,2-Tetrachloroethane	<1.0	ug/L
Tetrachloroethene	<1.0	ug/L
Toluene	1.4	ug/L
1,1,1-Trichloroethane	<1.0	ug/L
1,1,2-Trichloroethane	<1.0	ug/L
Trichloroethene	<1.0	ug/L
Trichlorofluoromethane	<1.0	ug/L
Vinyl chloride	<10.0	ug/L
Xylenes, total	<1.0	ug/L

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc
Bartlett Division
850 West Bartlett Road
Bartlett, IL 60103

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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148654

Job No.: 91.3442

Sample Description: Trip Blank
312235 Morton-Batavia

Date Taken:
Time Taken:
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

VOLATILES - 8240 AQUEOUS

Acrolein	<10.0	ug/L
Acrylonitrile	<10.0	ug/L
Benzene	<1.0	ug/L
Bromodichloromethane	<1.0	ug/L
Bromoform	<1.0	ug/L
Bromomethane	<10.0	ug/L
Carbon tetrachloride	<1.0	ug/L
Chlorobenzene	<1.0	ug/L
Chloroethane	<10.0	ug/L
2-Chloroethylvinyl ether	<5.0	ug/L
Chloroform	<1.0	ug/L
Chloromethane	<10.0	ug/L
Dibromochloromethane	<1.0	ug/L
1,2-Dichlorobenzene	<1.0	ug/L
1,3-Dichlorobenzene	<1.0	ug/L
1,4-Dichlorobenzene	<1.0	ug/L
1,1-Dichloroethane	<1.0	ug/L
1,2-Dichloroethane	<1.0	ug/L
1,1-Dichloroethene	<1.0	ug/L
cis-1,2-Dichloroethene	<1.0	ug/L
trans-1,2-Dichloroethene	<1.0	ug/L
1,2-Dichloropropane	<1.0	ug/L
cis-1,3-Dichloropropene	<1.0	ug/L
trans-1,3-Dichloropropene	<1.0	ug/L
Ethyl benzene	<1.0	ug/L
Methylene chloride	<5.0	ug/L

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Bartlett Division
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Bartlett, IL 60103

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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/20/1991

Sample No.: 148654

Job No.: 91.3442

Sample Description: Trip Blank
312235 Morton-Batavia

Date Taken:
Time Taken:
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

VOLATILES - 8240 AQUEOUS

1,1,2,2-Tetrachloroethane	<1.0	ug/L
Tetrachloroethene	<1.0	ug/L
Toluene	1.2	ug/L
1,1,1-Trichloroethane	<1.0	ug/L
1,1,2-Trichloroethane	<1.0	ug/L
Trichloroethene	<1.0	ug/L
Trichlorofluoromethane	<1.0	ug/L
Vinyl chloride	<10.0	ug/L
Xylenes, total	<1.0	ug/L

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Bartlett Division
850 West Bartlett Road
Bartlett, IL 60103

Tel: (708) 289-3100
Fax: (708) 289-5445

ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/27/1991

Sample No.: 148642

Job No.: 91.3442

Sample Description: SB-1-S-1
312235 Morton-Batavia

Date Taken: 09/10/1991
Time Taken: 09:40
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

Solids, Total	31.64	%
Methyl Ethyl Ketone (MEK)	<25.	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Bartlett Division
850 West Bartlett Road
Bartlett, IL 60103

Tel: (708) 289-3100
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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/27/1991

Sample No.: 148643

Job No.: 91.3442

Sample Description: SB-1-S-2
312235 Morton-Batavia

Date Taken: 09/10/1991
Time Taken: 10:15
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

Solids, Total	32.25	%
Methyl Ethyl Ketone (MEK)	<25.	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

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Bartlett Division
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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/27/1991

Sample No.: 148644

Job No.: 91.3442

Sample Description: SB-3-S-1
312235 Morton-Batavia

Date Taken: 09/10/1991
Time Taken: 12:15
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

Solids, Total	66.79	%
Methyl Ethyl Ketone (MEK)	<40.	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Bartlett Division
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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/27/1991

Sample No.: 148645

Job No.: 91.3442

Sample Description: SB-4-S-1
312235 Morton-Batavia

Date Taken: 09/10/1991
Time Taken: 13:55
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

Solids, Total	60.09	%
Methyl Ethyl Ketone (MEK)	<25.	ug/Kg

Results on a dry weight basis.

Neal E Cleghorn

Neal E. Cleghorn
Project Manager

NET NATIONAL ENVIRONMENTAL TESTING, INC.

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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/27/1991

Sample No.: 148646

Job No.: 91.3442

Sample Description: SB-6-S-1
312235 Morton-Batavia

Date Taken: 09/10/1991
Time Taken: 15:15
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

Solids, Total	67.33	%
Methyl Ethyl Ketone (MEK)	<2500.	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Bartlett Division
850 West Bartlett Road
Bartlett, IL 60103

Tel: (708) 289-3100
Fax: (708) 289-5445

ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/27/1991

Sample No.: 148647

Job No.: 91.3442

Sample Description: SB-6-S-2
312235 Morton-Batavia

Date Taken: 09/10/1991
Time Taken: 15:45
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

Solids, Total	27.03	%
Methyl Ethyl Ketone (MEK)	<25.	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
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850 West Bartlett Road
Bartlett, IL 60103

Tel: (708) 289-3100
Fax: (708) 289-5445

ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/27/1991

Sample No.: 148648

Job No.: 91.3442

Sample Description: SB-7-S-1
312235 Morton-Batavia

Date Taken: 09/11/1991
Time Taken: 07:45
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

Solids, Total	27.71	%
Methyl Ethyl Ketone (MEK)	<25.	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/27/1991

Sample No.: 148649

Job No.: 91.3442

Sample Description: SB-7-S-3
312235 Morton-Batavia

Date Taken: 09/11/1991
Time Taken: 08:45
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

Solids, Total	76.77	%
Methyl Ethyl Ketone (MEK)	<25.	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NET NATIONAL ENVIRONMENTAL TESTING, INC.

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Bartlett Division
850 West Bartlett Road
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Fax: (708) 289-5445

ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/27/1991

Sample No.: 148650

Job No.: 91.3442

Sample Description: SB-8-S-1
312235 Morton-Batavia

Date Taken: 09/11/1991
Time Taken: 09:30
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

Solids, Total	88.74	%
Methyl Ethyl Ketone (MEK)	<25.	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Bartlett Division
850 West Bartlett Road
Bartlett, IL 60103

Tel: (708) 289-3100
Fax: (708) 289-5445

ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/27/1991

Sample No.: 148651

Job No.: 91.3442

Sample Description: SB-8-S-3
312235 Morton-Batavia

Date Taken: 09/11/1991
Time Taken: 10:15
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

Solids, Total	61.43	%
Methyl Ethyl Ketone (MEK)	<25.	ug/Kg

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Bartlett Division
850 West Bartlett Road
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ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/27/1991

Sample No.: 148652

Job No.: 91.3442

Sample Description: W-5
312235 Morton-Batavia

Date Taken: 09/11/1991
Time Taken: 14:15
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

Methyl Ethyl Ketone (MEK)	107.	ug/L

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Bartlett Division
850 West Bartlett Road
Bartlett, IL 60103

Tel: (708) 289-3100
Fax: (708) 289-5445

ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/27/1991

Sample No.: 148653

Job No.: 91.3442

Sample Description: R-1
312235 Morton-Batavia

Date Taken: 09/11/1991
Time Taken: 08:55
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

Methyl Ethyl Ketone (MEK)	<10.	ug/L

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Bartlett Division
850 West Bartlett Road
Bartlett, IL 60103

Tel: (708) 289-3100
Fax: (708) 289-5445

ANALYTICAL REPORT

Mr. Raymond Boyd
IT CORPORATION
333 Pierce Rd. Ste. 200
Itasca, IL 60143

09/27/1991

Sample No.: 148654

Job No.: 91.3442

Sample Description: Trip Blank
312235 Morton-Batavia

Date Taken:
Time Taken:
IEPA Cert. No. 100221

Date Received: 09/12/1991
Time Received: 10:00
WDNR Cert. No. 999447130

Methyl Ethyl Ketone (MEK)	<10.	ug/L

Results on a dry weight basis.

Neal E. Cleghorn
Project Manager

APPENDIX B

SAMPLING AND ANALYSIS PLAN

WASTE ACCUMULATION AST AREA REMEDIATION

INTERNATIONAL
TECHNOLOGY
CORPORATION

PROJECT No. 312253
OCTOBER, 1991

SAMPLING & ANALYSIS PLAN

SOIL REMEDIATION
MORTON INTERNATIONAL
SPECIALTY CHEMICAL GROUP

Submitted To:

MORTON INTERNATIONAL
BATAVIA, ILLINOIS 60510

Prepared By:

IT CORPORATION
ITASCA, ILLINOIS

RESPONSIVE TO THE NEEDS OF ENVIRONMENTAL MANAGEMENT

LIST OF FIGURES

Figure No.	Title
1	SITE MAP WITH SAMPLING LOCATIONS

LIST OF APPENDICES

APPENDIX A	IEPA's ATTACHMENT 7
APPENDIX B	EXAMPLES OF SAMPLE DOCUMENTATION FORMS

1.0 INTRODUCTION

This sampling and analysis plan has been prepared by IT Corporation (IT) to provide for proper implementation of the soil remediation effort at the Morton International, Inc. (Morton) Batavia, Illinois facility. The purpose of the plan is to provide guidance during field activities to confirm that all soils impacted by the hazardous waste tank have been removed for off site disposal. The sampling and analysis plan describes sample location, procedures, equipment, analytical targets and methods, and field/lab QA/QC procedures.

This sampling and analysis plan is organized as follows:

- Site Description (Section 2.0)
- Field Sampling Plan (Section 3.0)
- Quality Assurance Project Plan (Section 4.0)
- Data Management Plan (Section 5.0)

2.0 SITE DESCRIPTION

Morton presently plans to install a new storage tank at their facility in Batavia, Illinois. Associated with this project is the relocation of the above ground hazardous waste accumulation tank. Prior to the relocation of the hazardous waste tank, soil samples were collected and analyzed from the existing tank area to document the conditions at the area. Among the chemicals detected in the soils was toluene which was found in concentration as high as 36,200 ppb.

The waste tank is 5,000 gallons in size and stores F003 listed waste, primarily derived from spent toluene, xylene and methyl ethyl ketone. The tank is surrounded and underlain by a concrete secondary containment structure which measures approximately 16 square feet in plan dimension.

3.0 FIELD SAMPLING PLAN

This sampling plan describes the rationale for the sampling which will be done, the numbering system used for the samples, the procedures and equipment to be used in sampling, and the handling and analysis of the samples.

3.1 SAMPLING OBJECTIVES

The scope of work for the site assessment at the Batavia, Illinois facility is to preform the remediation, the engineering oversight and the project documentation. The sampling and analysis plan will provide guidance for soil sampling needed to verify all contaminated soils have been removed from the site.

3.2 SAMPLE LOCATIONS AND FREQUENCY

This section details the sample locations and the number of samples to be taken for analysis from each excavation

Locations of samples have been chosen to confirm the vertical and horizontal extent of the excavations have encompassed all contaminated soils. A grid system, referenced to the Illinois EPA Division of Land Pollution Control "Instructions for the Preparation of Closure Plans for Interim Status RCRA Hazardous Waste Facilities", specifies a sampling grid interval for each area of excavation. The sample locations are shown in Figure 1.

If a larger area is excavated the grid will have to be recalculated and the number of samples changed accordingly.

3.3 SAMPLE DESIGNATION

A unique sample number will identify each sample collected and sent to the laboratory for analysis. Samples will be numbered using the following system (e.g., SS-01):

SS - Soil sample
01 - Sample number
ER - Equipment rinsate
TB - Trip blank

3.4 SAMPLING EQUIPMENT AND PROCEDURES

This section details the procedures and equipment to be used in soil sampling.

Soil samples will be collected at each sampling location at a minimum of 6" below the native soil surface within each excavation to assure a non-volatilized, representative sample. A decontaminated stainless steel sampler will be used to secure the sample. All sampling will be done in accordance with attachment 7 of the IEPA's instruction for the preparation of closure plans for interim status RCRA hazardous waste facilities. See Appendix H for attachment 7. All sampling equipment will be decontaminated between sampling locations using a trisodium phosphate wash, a distilled water rinse, a methanol rinse, and a final distilled water rinse. Soil samples will be placed into appropriate sample containers for volatile organic analysis. A sample collection log will be completed for each sample to be sent to the laboratory. The samples will be placed in a cooler on ice and sent via overnight courier to an IEPA-approved analytical laboratory for analysis. Completed chain-of-custody and request for analysis forms will accompany each sample.

3.5 SAMPLE HANDLING AND ANALYSIS

While awaiting packaging, samples will be stored on ice in coolers. All samples will be preserved on the same day that they were collected. If samples cannot be shipped on the same day that they are collected, packing will be delayed until the following morning

so that the samples can be shipped with a full load of ice. These samples will be stored on ice in coolers and kept in a secure area.

Samples which will be shipped to the laboratory for analysis will be prepared for shipment using the following procedures:

- Tighten sample bottle lids "hand" tight
- Place about 3 inches of packing material (zonolite, vermiculite, etc.) in bottom of waterproof metal or equivalent strength plastic cooler
- Place containers in clear plastic bags in the cooler in such a way that they do not touch
- Put VOC vials in Ziploc bag and place them in the center of the cooler
- Put ice in plastic bags and place in cooler on and around bottles; especially on VOC vials. (Approximately three bags of ice are necessary per cooler)
- Fill cooler with packing material
- Put paperwork in plastic bags and top with masking tape or duct tape to inside lid of cooler
- Tape drain shut
- Close cooler and secure lid by taping cooler completely around the strapping tape at two locations
- Place lab address on top of cooler
- Put "This Side Up" labels and "Fragile" labels on the cooler. (CAUTION: Do not cover labels with strapping tape.)
- Affix custody seals on front right and back left of cooler. Cover seals with wide, clear tape.

After the samples are packaged for shipping, custody will be transferred to a team member who will ship the coolers via overnight courier. Upon shipment, the laboratory will be notified that a sample shipment is scheduled to arrive.

4.0 QUALITY ASSURANCE PROJECT PLAN

This section describes QA procedures to be implemented in the field.

4.1 PROJECT ORGANIZATION AND RESPONSIBILITIES

IT Corporation, Chicago office, will be performing this investigation. Project Manager for this project is Mr. Raymond Boyd. The site supervisor is Mr. Mike Doran. The laboratory used will be NET Midwest Inc.'s laboratory in Bartlett, Illinois.

4.2 QA OBJECTIVES

To obtain data which meets quality requirements is essential in a determination of the presence or absence of contaminants on a site. Project objectives are:

- to generate quality data that will withstand scientific and legal scrutiny.
- to gather and develop data in accordance with procedures appropriate for the intended use of the data.
- to generate data which are precise, accurate, representative, complete and comparable.

4.3 SAMPLING PROCEDURES

Sampling procedures are detailed in the preceding Field Sampling Plan Section 3.0.

4.4 SAMPLE CUSTODY AND TRANSPORT

4.4.1 Field Custody Procedures

The sample containers and preservatives that will be needed for this investigation will be provided by the laboratory. As each sample is collected, it will be placed in a labeled bottle and

stored in an iced cooler. Samples will be identified with labels directly affixed to the sample container and completed using indelible ink. Sample labels will include a unique sample number, the project number, sampling date and time, and any preservatives used. Each sample will be identified by a sample label including:

- Date and time of sample collection
- The sample location, including depth, if appropriate
- The sample number
- The name of the person collecting the sample
- Preservation methods
- Requested analysis.

While awaiting packaging, samples will be stored on ice in coolers. All samples will be preserved on the same day that they were collected. If samples cannot be shipped on the same day that they are collected, packing will be delayed until the following morning so that the samples can be shipped with a full load of ice. These samples will be stored on ice in coolers and kept in a secure area.

After the samples are packaged for shipping, custody will be transferred to a team member who will ship the coolers via overnight courier. Upon shipment, the laboratory will be notified that a sample shipment is scheduled to arrive.

A trip blank will accompany each day's collection of samples. The trip blank consists of two 40 ml vials, filled in the laboratory with organic-free deionized water, transported to the site, handled like a sample, and analyzed to determine that volatile organic contamination is not present due to container preparation, the activities of the sampling team, or shipping procedures.

Chain-of-Custody and Request For Analysis forms will be prepared for each sample shipped to the laboratory. Examples of these forms are in Appendix B.

The Chain-of-Custody form will be used to document sample possession from the time of collection to disposal. Each time custody of a sample changes, the new custodian will sign the form and document the time and date. A sample will be considered in custody if it is:

- In one's actual possession
- In view, after being in physical possession
- Locked so that no one can tamper with it, after being in physical possession
- In a secured area, restricted to authorized personnel.

4.4.2 Laboratory Custody Procedures

Procedures for the receipt and logging of samples by the laboratory are addressed below.

Initial processing of the samples received is handled by members of the Field Services Group. Their work in turn is reviewed by the QA/QC Coordinator and the Laboratory Manager. Duties of the Field Services Group include:

- Examine all samples and determine if proper temperature was maintained during shipment. If samples were damaged during shipment, the remaining samples will be carefully examined to determine whether they were affected. Any samples affected will be considered damaged. It will be noted on the Chain-of-Custody form and reported to laboratory management that specific samples were damaged and that the samples were removed from the sampling program.

- Verify that sample holding times were not exceeded.

- Sign and date the Chain-of-Custody and Request for Analysis forms and attach the waybill to the Chain-of-

Custody.

- Place samples in adequate laboratory storage.

- Enter the following information in the laboratory sample log-in book:
  - Project name and number
  - Number and types of samples
  - Project contact
  - Date received in laboratory
  - Analytical groups involved and required testing
  - Person that accepted custody
  - Storage location

- Notify the Laboratory Managers or Group Leaders of the arrival of the samples.

- Place the completed Chain-of-Custody forms in the project file.

4.5 CALIBRATION PROCEDURES

Field measuring and testing equipment will be calibrated in accordance with the requirements of IT's Engineering Services field equipment calibration procedures. Measuring equipment, test equipment and reference standards will be calibrated at prescribed intervals and/or before use. Calibration frequency will be based on the type of equipment, inherent stability, manufacturer's recommendations, values given in national standards, intended use, and experience.

In some cases, particularly for field equipment, scheduled periodic calibration will not be performed because the equipment is not continuously in use. Such equipment will be calibrated on an "as needed" basis prior to use, and then at the required frequencies

for as long as its use continues.

Calibrated equipment will be uniquely identified by using the IT equipment number affixed to the equipment or if that is unavailable, the manufacturer's serial number. Each calibration activity will be recorded on the IT Equipment Calibration Record or on the Field Activity Daily Log. It is the responsibility of each individual equipment user to verify the calibration status prior to using the equipment.

If equipment malfunction is suspected and calibration failure occurs, the equipment will be removed from service and substitute equipment obtained.

4.6 ANALYTICAL PROCEDURE

NET Midwest Inc.'s Bartlett, Illinois laboratory is a participant in the IEPA's contract Lab Program. The laboratory analytical methods to be used will be the EPA approved SW-846 methods for volatile organics (method 8240).

4.7 DATA REDUCTION, VALIDATION AND REPORTING

See Data Management Plan (section 5.0) for data control procedures.

4.8 INTERNAL QUALITY CONTROL

To check the quality of data from field sampling efforts, equipment rinsate blanks will be collected for analysis. The rinsate blanks will be treated as separate samples with unique sample numbers for identification, logging and shipping. Analytical results on the blanks will be reported along with the appropriate field sample data.

As part of this sampling program, VOC samples will be collected for analysis. Thus, trip blanks will be used as part of the Quality Assurance/Quality Control procedures. A trip blank is organic free

deionized water that is provided by the laboratory and is sent into the field accompanying the sample bottles. The trip blanks are then returned to the laboratory with the shipments containing samples which are to be analyzed for VOCs and are analyzed for VOCs along with the samples. A trip blank will accompany all soil samples for each day of sample collection during this investigation.

Rinsates are field blanks used to determine if decontamination procedures are effective in cleaning the sampling equipment. The technique for collection of the rinsate sample is as follows: after the sampling equipment has been decontaminated and before the next sample is collected, deionized water is poured over the sampling equipment and collected into the appropriate sampling containers, preserved and shipped to the laboratory. A rinsate will be collected from the soil sampling equipment for each day of sample collection. The rinsate blanks will be analyzed for volatile organic compounds, semi-volatile organic compounds, and total arsenic and the results reported along with the field sample data.

4.9 PERFORMANCE AND SYSTEMS AUDITS

Field performance will be monitored by the project manager. All Quality Assurance/Quality Control in the field will be performed by the IT site supervisor.

4.10 PREVENTATIVE MAINTENANCE

Field equipment is calibrated (section 4.5) and checked prior to each use and also, as necessary, on a periodic basis. If equipment develops inconsistences or does not calibrate, the equipment is removed from use and sent for maintenance. Equipment which is infrequently used is checked for problems before being taken into the field.

4.11 DATA ASSESSMENT PROCEDURES

Data assessment procedures are addressed in the Data Management Plan (section 5.0).

4.12 CORRECTIVE ACTIONS

Corrective actions required by inconsistencies or incompleteness of field operations, field data and the management of field data will be instituted as required by the project manager and reported to him.

4.13 QUALITY ASSURANCE REPORTING

Quality assurance procedures and data will be evaluated and reported as part of the final evaluation and report of this investigation.

5.0 DATA MANAGEMENT PLAN

The primary purpose of this investigation is the collection and analysis of data to characterize existing site conditions. Critical to this process is the integrity and quality of the data generated during the course of the investigation.

This plan outlines procedures that will be followed to determine that data generated during this investigation are scientifically valid and defensible. Topics which will be addressed include: types of data which will be generated, technical data handling and processing, tracking data handling and processing and document control.

5.1 DATA TYPES

Two primary types of data are associated with an investigation. These are technical data and project tracking data. Technical data are data required for or generated by the investigation. Examples of such data are field data or data resulting form laboratory or engineering analysis. Project tracking data are used to monitor, manage, and document the project schedule and financial performance. Project tracking data include information such as projected vs. actual expenditures and task completion dates. Guidelines and procedures for managing these data are discussed below.

5.2 TECHNICAL DATA

Data required for or generated during the course of an investigation must be documented as to its origin and validity and verified for accuracy. This is essential to provide that reliable information is generated by the investigation. To generate valid and accurate data collection and transmittal, all data, data reduction, and results of field investigations and sampling must be completely documented.

5.2.1. Literature Documentation

Data obtained from outside literature sources such as:

- Government and private regulation, standards, guidelines, journals, periodicals, and data compilations
- Textbooks and maps
- Reports and manuals previously issued by IT, the client, or other organizations
- Procurement documents issued by the client,

will be documented to indicate its source. Documentation will, as appropriate, also include author or individual contacted; title; identification of periodical or journal; standard, guideline, or report number; identification of publisher or originating organization; page location; and date. Documentation will be sufficient to allow other individuals to easily obtain or verify the information.

Whenever possible, complete copies of articles, data compilations, maps, reports, and photographs will be included in the project files. If this is not feasible, copies of title pages and pertinent sections will be included with complete source documentation. Regulations, standards, guidelines, and textbooks, which are generally not project specific, may be obtained and kept in the office library if they are of a unique nature or will be used on several projects.

5.2.2 Field Activity Documentation

Field information will be recorded on standardized forms. Documentation will include a daily log of project activities and appropriate field data as listed. The daily log will include the following as appropriate:

- Project identification
- Field activity subject
- General work activity
- Unusual events
- Changes to plans and specifications
- Visitors on site
- Subcontractor progress or problems
- Communications with the client or others
- Weather conditions
- IT personnel on site

Copies of daily logs will be sent to the Project Manager or designee for review and approval and forwarded to other personnel or file as appropriate.

All field measurements and observations will be recorded in sample collection logs. Field measurements include field screening instrument readings. All data will be recorded directly and legibly on forms with all entries signed and dated. If entries must be changed, the change will not obscure the original entry. The change will be initialed and dated or identified at the time the change is made.

Sample collection logs will be completed for each sample collected in the field. Information to be provided on these forms will include project name and number, sample number, sampling location, sampling date and time individual performing the sampling, preservation method employed, sample type, sampling method description, and results of any field tests.

Field calibration records will be maintained for any equipment used to perform field measurements (PID, etc.). Calibration records will include, at a minimum:

- Type of equipment to be calibrated
- Data and time of calibration
- Reference equipment and standards used
- Calibration method and sequential actions
- Identification numbers of the instrument, if appropriate.

5.2.3 Sample Identification and Chain of Custody

Each sample will be identified by a sample label including:

- Date and time of sample collection
- The sample location, including depth, if appropriate
- The sample number
- The name of the person collecting the sample
- Preservation methods
- Requested analysis.

Chain-of-Custody records will be maintained to demonstrate that the samples were obtained from the locations stated and reached the laboratory without alteration. Evidence of possession from sample collection, shipment, laboratory receipt and laboratory custody until disposal will be documented. A sample is considered in possession if it is:

- In a person's actual possession
- In view, after being in physical possession
- Locked so that no one can tamper with it, after being in physical custody
- In a secured area, restricted to authorized personnel.

When samples are being shipped to the laboratory by commercial carrier, the Chain-of-Custody record will be sealed in a watertight container, placed in the shipping container, and the shipping container sealed prior to giving it to the carrier. If no Chain-of-Custody record is with the samples when they are received by the laboratory, the samples will not be analyzed. Copies of Chain-of-

Custody forms will be maintained in the project files.

5.2.4 Meeting Documentation

Personal communications such as meetings, correspondence, or telephone conversations will be completely documented in the form of trip reports, meeting notes, memorandums, and telephone records and the resulting documentation included in the project files. The documentation will include, as appropriate, the name, organization, date, address, phone number, and credentials of all individuals contacted. A request will be made for formal written confirmation of critical data obtained by telephone to serve as final documentation.

5.2.5 Data Reduction and Validation

Data reduction is an integral part of any remedial investigation. This process often includes applications of methods, calculations, and computer programs. Documentation of all methods, calculations and data must be sufficient to allow a technically qualified person to review and understand the calculations and data and verify the results.

Copies of all raw data will be maintained in the central records file after completion of the phase for which the data are doing gathered. All data, calculations and methods used will be checked by a person other than the originator for:

- Correctness of numerical input including transcription
- Appropriateness of equations used
- Correctness of calculations
- For computer data, all input entry will be verified.

All reduction, validation and reporting of data will be performed consistently with IT procedures.

5.2.6 Verification of Engineering Data

Calculations, including cost estimates, computer programs, computer input, logs, drawings, tables, an analysis of data (i.e., computations of hydraulic conductivity and gradients) will be formally verified (checked) using the standard processes by qualified personnel. If it becomes necessary to use or present unchecked work, the unchecked material will be marked "preliminary".

For calculations, the standard checking process is outlined as follows:

- The originator supplies the designated checker with a machine copy of the calculations. Originals should not leave the originator's possession until they are ready for final checker signing.
- The checker marks the calculation copy with a yellow marker for all items he approves. It is emphasized that a numerical check is not sufficient. The checker is responsible for every item on every sheet--including the completion of the title block and page numbers. The importance of a complete and thorough review cannot be overemphasized.
- If the checker disagrees, for any reason, the checker crosses through the item with a red marker and writes the recommended correction or comment above it.
- The checker signs and dates all pages of the check-prints.
- The checker returns the checkprints to the originator who, in turn, reviews all recommended changes. Agreed-to corrections may be marked with a check of a third color. If a disagreement still exists, the originator adds comments to the checkprints using the third color, initials and dates the checkprints, and then confers with the checker until all differences are resolved.
- The originator corrects, or "scrubs," the calculation originals so they agree with the checkprints. A one-to-one correspondence between the originals and checkprints must exist.
- The originator gives the originals and checkprints to the checker who compares them to verify all agreed-to

corrections have been made.

- When the checker is satisfied, the checker signs and dates the originals.

Checkprints will be maintained as a part of the project file, of equal importance as the originals.

Under no circumstances will calculations be altered after final signature by the checker. If it becomes necessary for calculations to be revised, the new pages will be formally checked as described above.

5.2.7 Laboratory Data Validation

Data validation begins with the processing of data and continues through review of the data and the reporting of analytical results. Data processing can be performed either by the technical personnel who obtained the data or another analyst. Review of the data is done by analysts independent of the data acquisition and processing or by the Group Leader. Final review of the data is by the Operations Manager.

5.3 TRACKING DATA HANDLING AND PROCESSING

Cost and schedule control will be accomplished through the use of the IT Project Management System (PMS), an integrated project planning, tracking, and control system. The software package used is the Job Tracking System (JTS) on the IBM System 38. This software package is described below.

5.3.1 The Job Tracking System

The Job Tracking System will be used by the IT Project Manager to track and maintain information on actual project costs. Daily and weekly input forms will be used to capture IT employee job charges. Outside service charges will be captured via an automated interface from the Accounts Payable/Purchase Order system. On a nightly basis, these job charges will then be valued against job terms and

system tables, and the extended transactions posted to the job file for management reporting.

Typical uses of JTS are to:

- Compile labor and expense charges from IT offices throughout the country
- Provide budgeting/project control tools
- Provide commitments/purchase order tracking
- Match costs and revenue
- Provide data for micro analysis
- Perform intercompany accounting
- Generate invoices
- Simplify the revenue accrual process.

5.4 DATA STORAGE

The safe, organized and easily accessible storage of data is essential not only for timely and accurate completion of a project but also for long term records. This project will require the management of data in on-site, laboratory, and central project record files. Records management will be done in accordance with applicable IT Engineering Services Quality Assurance practices and IT Analytical Services Quality Assurance practices. Record control will include receipt from external sources, transmittal, transfer to storage and indication of record status. Retention will include receipt at storage areas, indexing and filing, storage and maintenance and retrieval.

5.4.1 Central Project Files

Central Project files are maintained and updated as necessary by the Project Manager or designee. Files are managed as outlined below.

5.4.2 Record Control

The central control of records provides for documentation of

internal and external flow of information. All field records, laboratory data, test data, calculations, correspondence, reports and other data transmittals and checkprints will be transferred to the project central file. Copies of purchase orders and contracts will also be filed to document financial activities. Records submitted to the project central file will have a completed Record Maintenance Form attached to provide the necessary information for correct filing.

5.4.3 Record Status

All records which are not in final form (have not been checked or verified for accuracy) will be marked "preliminary" if they are to be included in the central project file or used for external distribution. Outdated records will either be marked "void" or destroyed at the discretion of the Project Manager. If "void" copies are maintained in the files, the date and reason for voiding will be included.

5.4.4 Laboratory Files

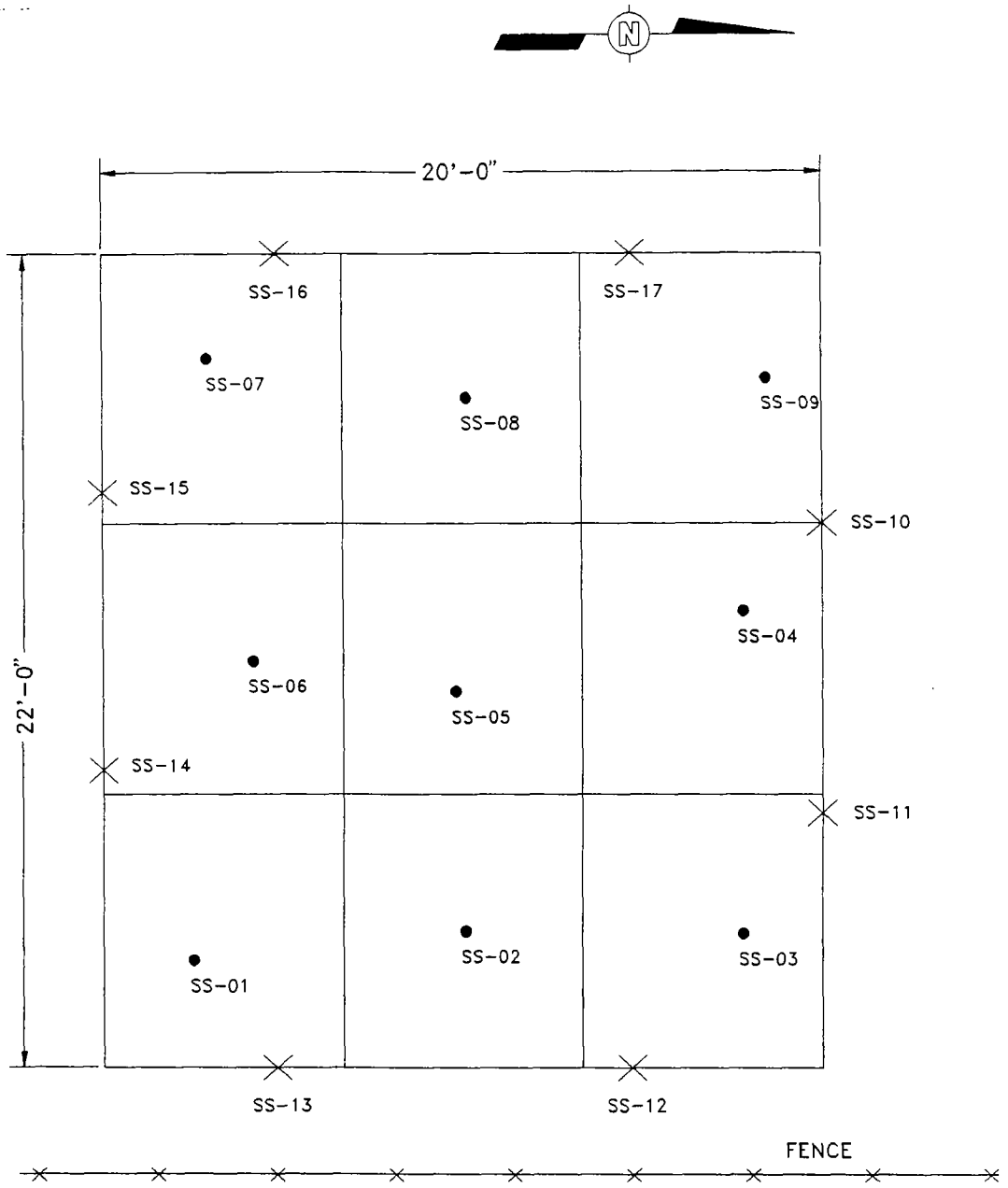
The laboratory will maintain records pertinent to analytical performance. These records will be stored in a manner similar to the central project file records described in Section 6.4.1. These records will include:

- Sample specific records (i.e., chain of custody, request for analysis, analysis results, etc.).

- Documentation of laboratory performance and operation (i.e., QA/QC logs, etc.).

The sample specific records will be assigned a project specific number for efficient maintenance and access. The records for documentation of analytical performance will be kept in a separate file because they are not project specific.

DRAWN BY	J. JOHNSON 21 NOV 91	CHECKED BY / APPROVED BY			DRAWING NUMBER 312253-A10



LEGEND

- ● SS-01 TO SS-09 – SAMPLES TAKEN FROM BOTTOM
- × SS-10 TO SS-17 – SAMPLES TAKEN FROM SIDEWALL

FIGURE 1

SAMPLING LOCATIONS
WASTE ACCUMULATION AST AREA REMEDIATION
BATAVIA, ILLINOIS

PREPARED FOR

MORTON INTERNATIONAL, INC.
BATAVIA, ILLINOIS

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...Creating a Safer Tomorrow

"Do Not Scale This Drawing"

Illinois Environmental Protection Agency · P.O. Box 19276, Springfield, IL 62794-9276

ATTACHMENT 7

Soil Volatile Sampling Procedures

Procedure:

A. PREPARATION AND DECONTAMINATION OF SOIL SAMPLER (i.e. STAINLESS STEEL, BRASS, BRONZE, COPPER, etc.). An example of these samplers would be a shelby tube, split-barrel sampler with metal tube inserts or california sampler. These are only examples there maybe more types available. Also, the sample tube must be at least six inches long.

*1. Wash tubing or sampler with hot water and a nonfoaming detergent.
2. Rinse with hot water.
*3. Rinse with a solvent, such as hexane or acetone.
4. Rinse with very hot water to drive off solvent.
5. Rinse with deionized distilled water.
6. Air Dry
7. Store the sampler in aluminum foil until ready for use.
*Consult the laboratory for specific recommendations.

B. SOIL SAMPLING FOR VOLATILE ORGANICS

1. Using a properly decontaminated sampler (refer to preparation and decontamination instructions), push or drive the sampler to obtain a representative soil sample.

2. DO NOT remove sample from sample tube in the field. The laboratory should remove the sample from the sampling tuba.

3. Immediately add clay or other cohesive material (i.e. wetted bentonite) to the ends of the sample to eliminate head space, if necessary.

4. Cover both ends of the sampler with aluminum foil. If possible, cover the aluminum foil with a cap.

5. Put the sample in storage at 4 degrees centigrade immediately.

6. Transport the samples to the laboratory as soon as possible. Most laboratories require delivery within 24 hours of sampling.

NOTE:

Soil samples which will be tested for volatile organic constituents <u>cannot</u> be composited because of the volatilization which would result from any compositing method.

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. _____

C/C Control No. 244078

PROJECT NAME/NUMBER _____ LAB DESTINATION _____

SAMPLE TEAM MEMBERS _____ CARRIER/WAYBILL NO. _____

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.

Special Instructions: _____

Possible Sample Hazards: _____

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: _____

   Received By: _____

2. Relinquished By: _____

   Received By: _____

3. Relinquished By: _____

   Received by: _____

4. Relinquished By: _____

   Received By: _____

WHITE - To accompany samples
YELLOW - Field copy

127A 10-85

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 0[illegible]052
C/C Control No. _____

PROJECT NAME _____
PROJECT NUMBER _____
PROJECT MANAGER _____
BILL TO _____

PURCHASE ORDER NO. _____

DATE SAMPLES SHIPPED _____
LAB DESTINATION _____
LABORATORY CONTACT _____
SEND LAB REPORT TO _____

DATE REPORT REQUIRED _____
PROJECT CONTACT _____
PROJECT CONTACT PHONE NO. _____

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal _____ **Rush** _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ **Flammable** _____ **Skin Irritant** _____ **Highly Toxic** _____ **Other** _____ **(Please Specify)**

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ **Disposal by Lab** _____

FOR LAB USE ONLY

Received By _____ **Date/Time** _____

WHITE - Original, to accompany samples
YELLOW - Field copy

APPENDIX C

HEALTH AND SAFETY PLAN

WASTE ACCUMULATION AST AREA REMEDIATION

INTERNATIONAL
TECHNOLOGY
CORPORATION

PROJECT NO. 312235
OCTOBER 1991

HEALTH & SAFETY PLAN

SOIL REMEDIATION
MORTON INTERNATIONAL
SPECIALTY CHEMICAL GROUP

Submitted To:

MORTON INTERNATIONAL
BATAVIA, ILLINOIS 60510

Prepared By:

IT CORPORATION
ITASCA, ILLINOIS

RESPONSIVE TO THE NEEDS OF ENVIRONMENTAL MANAGEMENT

SOIL REMEDIATION

HEALTH AND SAFETY PLAN

PREPARED FOR:

MORTON INTERNATIONAL
BATAVIA, ILLINOIS 60510

PREPARED BY:

IT CORPORATION
333 PIERCE ROAD
ITASCA, ILLINOIS 60143

OCTOBER 1991

PROJECT NO. 312235

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REVIEW AND APPROVAL

PROJECT MANAGER
IT CORPORATION

_____ _____

Raymond R. Boyd Date

SITE SUPERVISOR
IT CORPORATION

_____ _____

Mike Doran Date

HEALTH AND SAFETY MANAGER
IT CORPORATION

_____ _____

Clifton Gregory, JR. Date

SITE HEALTH AND SAFETY PLAN

ACKNOWLEDGMENT

I have read, understand, and agree to abide by the provisions as detailed in this Site Specific Health and Safety Plan prepared by IT Corporation. Failure to comply with these provisions may lead to disciplinary action and/or my dismissal from the work site.

Printed Name	Employee Number	Signature	Date

KEY PERSONNEL

IT CORPORATION PROJECT MANAGER

Raymond R. Boyd	(708) 250-7788

IT CORPORATION SITE SUPERVISOR

Mike Doran	(708) 250-7788

IT CORPORATION HEALTH AND SAFETY OFFICER

Clifton Gregory, Jr	(708) 250-7788

2.0 INTRODUCTION

2.1 OBJECTIVE

Soil Remediation at Morton International will include the following tasks:

- Provide all personnel, materials, and equipment necessary to remove and steam clean the concrete and move the concrete to an on site stockpile area
- Evacuate and transport soils and gravel to the stockpile area and place facility water into a temporary storage
- Sample (in accordance with IEPA methods) the remaining soils to determine the extent of impact
- Backfill excavated areas with clean fill to grade.

2.2 HAZARD RATING FROM ANALYTICAL RESULTS

The hazards associated with this project come from potential exposure to F003 listed waste, primarily derived from spent toluene, xylene and methylethyl ketone, and excavation of the remediation zone.

Volatile organic compounds (VOCs) detected in the soils included trichloroethene, toluene, xylene, ethyl benzene and methyl ethyl ketone.

2.3 SITE AND FACILITY DESCRIPTION

This facility located in Batavia, Illinois, was constructed in 1979. The property encompasses 5.89 acres with 60,000 square feet under roof. Morton presently produces organic coatings from organic solvents and resins.

2.4 POLICY STATEMENT

It is the policy of IT Corporation (IT) to provide a safe and healthful work environment for all its employees. IT considers no phase of operations or administration to be of greater importance than injury and illness prevention. Safety takes precedence over expediency or shortcuts. At IT Corporation we believe every

accident and every injury is avoidable. We will take every reasonable step to reduce the possibility of injury, illness, or accident.

This Health and Safety Plan prescribes the procedures that must be followed by all site personnel while on the project site. Operational changes which could affect the health or safety of personnel, the community, or the environment will not be made without prior approval of Morton International, the IT Project Manager and the IT Health and Safety Department.
The provisions of this plan are mandatory to all IT Corporation personnel and subcontractors assigned to the project. IT Corporation requires all visitors to any of the work sites to abide by these procedures. Work conditions can change as operations progress. The Health and Safety Manager will provide written addenda to this Health and Safety Plan when changes warrant. No changes to the plans will be implemented without prior approval of the Health and Safety Manager or his authorized representative.

2.5 REFERENCES

This Health and Safety Plan complies with applicable Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) regulations. This plan follows the guidelines established in the following documents:

(a) Standard Operating Safety Guides (USEPA November 1984);

(b) Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (NIOSH 85-115);

(c) Title 29 of the Code of Federal Regulations, Part 1910.120 (29 CFR 1910.120); (USDOL/OSHA)

Contents of this plan are consistent with the following IT Corporation Health and Safety Policies and Procedures:

HS001	Safety Policy
ITC 9001	Respiratory Protection Devices - Wearer Fit Policy
HS020	Accident Prevention Program: Investigation and Review
HS021	Accident Prevention Program: Safety Inspections
HS022	Accident Prevention Program: Review of New Proposals, Projects, Operations, and Construction
HS023	Accident Prevention Program: Performance Recognition Program
ITC 9030.1A	Employee and Contractor Training Requirements
ITC 9220	Reporting/Recording Occupational Injuries/ Illnesses
ITC 9410.1D	Pre-employment Medical Examinations
ITC 9410.2B	Periodic/Update Medical Examinations
ITC 9420.1B	Access to Employee Exposure and Medical Records
ITC 9420.2	Maintenance of Employee Monitoring and Medical Records
ITC 9462A	Work Related Illnesses and Injuries
ITC 9520	Hazard Assessment, Personal and Environmental Monitoring
ITC 9531.1B	Confined Spaces, Industrial
ITC 9531.3A	Confined Spaces, Leaded Product
ITC 9532.5B	Emergency Response Operations
HS307	Excavation and Trenching
ITC 9532.7A	Underground Storage Tank Removal and Closure
ITC 9532.10B	Hazardous Waste Operations at Controlled Waste Sites
ITC 9533.1	Working in Hot Environments
ITC 9533.2	Cold Stress
ITC 9540.1C	Tailgate Safety Meetings
ITC 9550.1B	Employee Notification of Industrial Hygiene Monitoring Results

ITC	9552.A	Hazard Communication Program
ITC	9560.D	Personal Protective Equipment
ITC	9561.E	Respiratory Protective Devices
ITC	9571	Fire Safety
ITC	9572	Electrical Safety
ITC	9591.1	Health and Safety Rules For Contractors
ITC	9650	Hearing Conservation Program

These policies and their implementation are central to IT's accident prevention program.

3.0 RESPONSIBILITIES

3.1 ALL PERSONNEL

All personnel are responsible for continuous adherence to these health and safety procedures during the performance of their work. No person may work in a manner that conflicts with the intent of, or the inherent safety and environmental precautions expressed in these procedures. After due warnings, IT Corporation will dismiss from the site any person who violates safety procedures. IT Corporation employees are subject to progressive discipline and may be terminated for continued violations. All on site personnel will be trained in accordance with 29 CFR 1910.120, and this document.

3.2 HEALTH AND SAFETY OFFICER AND ON-SITE HEALTH AND SAFETY COORDINATOR

The project Health and Safety Officer is responsible for developing and coordinating the site-specific Health and Safety Plan and addenda as required. This plan complies with 29 CFR 1910.120 in all respects and includes medical surveillance and training requirements, hazard assessment, personal protective equipment specifications, field implementation procedures, and audits. The Health and Safety Officer will issue addenda to the Health and Safety Plan if warranted by changed conditions. The Health and Safety Officer and his designee report to the Project Manager for operational matters. The Health and Safety Officer is the contact for regulatory agencies on matters of safety and health. Other Health and Safety Officer and Onsite Health and Safety Coordinator responsibilities include:

- General Health and Safety program administration
- Determining the level of personnel protection required
- Updating equipment or procedures based on information obtained during site operations
- Establishing air monitoring parameters based on expected contaminants
- Establishing employee exposure monitoring notification

programs
- Investigating significant accidents and illnesses and implementing corrective action plans
- Performing regular site inspections
- Developing site-specific employee/community emergency response plans as required based on expected hazards

3.3 PROJECT MANAGER

The Project Manager is ultimately responsible for ensuring that all project activities are completed in accordance with requirements set forth in this plan.

3.4 SITE SUPERVISOR

The IT Corporation Site Supervisor supervises all IT Corporation activities at the site and is responsible for field implementation of the Health and Safety Plan. This includes communicating site requirements to all personnel, ensuring field supervisors and subcontractors enforce all provisions of the plan, and consulting with the Health and Safety Coordinator regarding changes to the Health and Safety Plan. Other responsibilities include:

- Reading and becoming familiar with this health and safety plan and IT Corporation Policies and Procedures
- Enforcing the Health and Safety Plan and other safety regulations
- Stopping work as required to ensure personal and environmental health and safety
- Determining evacuation routes, establishing and posting local emergency telephone numbers, and arranging emergency transportation
- Ensuring that all site personnel and visitors have received the proper training and medical clearance prior to entering the site (See Section 7 of this plan.)
- Establishing exclusion, decontamination and clean zones (See Section 8 of this plan.)

- Presenting tailgate safety meetings and maintaining attendance logs and records
- Assuring that the respiratory protection program is implemented (See Section 6 of this plan.)
- Assuring that decontamination procedures meet established criteria
- Assuring that there is a qualified first aider onsite
- Discussing potential health and safety hazards with the Health and Safety Coordinator and the Project Manager
- Implementing changes as directed by the Health and Safety Officer and Project Manager

3.5 SUBCONTRACTORS

Onsite subcontractors and their personnel are responsible for understanding and complying with all site requirements. Subcontractors are required to follow the guidelines established in IT Corporation's Safety Rules for Contractors and this Health and Safety Plan.

3.6 ONSITE PERSONNEL AND VISITORS

All onsite personnel and visitors are required to comply with the provisions of this Health and Safety Plan and all applicable Federal, State and local regulations. Each person is responsible for their own health and safety, for completing tasks in a safe manner and for reporting any unsafe acts or conditions to his supervisor or the IT Corporation representative. Personnel will monitor themselves and their fellow employees for signs and symptoms of heat/cold stress and chemical exposure.

4.0 JOB HAZARD ANALYSIS

4.1 SCOPE OF WORK

IT Corporation will excavate and move contaminated soils to an on site stock pile and obtain soil samples for laboratory analysis.

4.2 JOB SAFETY ANALYSIS

The Job Safety Analysis identifies potential safety, health, and environmental hazards and provides for the protection of personnel, the community and the environment. Because of the complexity and constant change of remediation projects, supervisors must continually inspect the work site to identify hazards which may harm site personnel, the community, or the environment. The Project Manager, Site Supervisor, Contractor Supervisor, and Onsite Safety Coordinator must be aware of these changing conditions and discuss them with the Health and Safety Officer. The Health and Safety Manager will write addenda to change Job Safety Analysis and associated hazard controls as necessary.

4.2.1 Excavation of Soil

The volatile organic contamination of the soil make it a potential eye, nasal, and upper respiratory tract irritant. Respiratory protection will be used while the backhoe is operating.

4.3 HAZARDOUS AND TOXIC MATERIALS

The Material Safety Data Sheets (Attachment A) describes the hazards associated with materials that have been found on the site. The Health and Safety Officer will update these sheets as information developed during this project warrants.

4.4 HEAT AND COLD STRESS

Wearing personal protective equipment (PPE) puts a hazardous waste site worker at considerable risk of heat stress. Heat stress effects range from transient heat fatigue to serious illness and

death. Heat stress is caused by several interacting factors, including environmental conditions, clothing, work load, and the individual characteristics of the worker. Because heat stress is the most common and potentially serious illness at hazardous waste sites, preventive measures and alertness to the signs and symptoms are vital.

Heat stress monitoring should begin when personnel are wearing PPE, including Tyvek coveralls, and the ambient temperature exceeds 21°C (70°F). If impermeable garments are not worn, heat stress monitoring should begin at 29°C (85°F). When ambient temperatures exceed 32°C (90°F) and impermeable garments are worn, QuesTemp° heat stress monitors should be used.

The potential for heat or cold stress is minimal.

4.5 CONFINED SPACE ENTRY

Pits and trenches are confined spaces until the atmosphere has been demonstrated safe. Confined space entries are anticipated with this project. IT and Morton procedures will be used to make these confined space entries.

4.6 DUST CONTROL AND SPILL CONTROL

Due to the very low potential for contaminated dust on this project, dust control and suppression will not be necessary for the protection of personnel, the community, and the environment.

4.7 HEARING CONSERVATION

All personnel on site will wear hearing protection while heavy equipment is in operation. Baseline measurements of the noise levels indicates levels of 86 to 94 dBA in the vicinity of this equipment when it is operating. IT Procedure 9650 requires hearing protection when sound pressure levels exceed 85 dBA.

5.0 SAFETY PROGRAM

The following procedures are mandatory for all IT Corporation and subcontractors personnel. All site visitors entering exclusion zones must follow these procedures. Personnel not following procedures will be warned. If they refuse to follow these procedures, they will be escorted from the site.

5.1 GENERAL PRACTICES

- At least one copy of this plan shall be available at the job work site.
- At least one person trained in a minimum of basic first aid and CPR will be on site whenever remediation activities occur. As an alternative, this requirement is satisfied when a 911 emergency responder can respond within five (5) minutes to the site.
- No food, beverages, tobacco products shall be present, consumed or used in contaminated areas or potentially contaminated areas. Taking medication, smoking or applying cosmetics are also prohibited. These activities are allowed only in the established clean room and clean areas.
- Before eating, drinking, or smoking employees shall wash their hands and remove outer protective garments.
- At the end of each work shift, before leaving the site, personnel who worked in contaminated zones shall thoroughly shower to remove any contaminants.
- Containers shall be moved only with the proper equipment and shall be secured to prevent dropping or loss of control during transport.
- Emergency equipment shall be located in readily accessible uncontaminated locations. The eyewash must be capable of washing both eyes at once, delivering at least 0.4 gallons per minute for at least 15 minutes. At least one eyewash will be maintained in the contamination reduction zone (CRZ).
- All personnel entering the site shall be thoroughly briefed on

the hazards, equipment requirements, safety practices, emergency procedures, and communication methods.

- Employee entrance and exit routes shall be planned and emergency escape routes designated. A map showing evacuation routes shall be posted at the site.
- Unfamiliar operations shall be discussed with affected employees before beginning work.
- Operations will be stopped whenever visible dust emissions are generated. Site wetting practices shall be used to control dust emissions.
- Work areas shall be illuminated to a minimum of 20 foot candles. Supplementary lighting may be necessary inside buildings, tanks, at night, or in other poorly lit areas.
- IT Corporation employees will use the sanitary facilities of the offices of Morton International. No portable sanitary facilities will be provided.
- No smoking will be permitted on the project except in designated areas.
- Fire extinguishers will be mounted on equipment as required. When there is a fire potential, fire extinguishers will be located in the adjacent area.

5.2 FALL PROTECTION

The walking and working surfaces will become wet, muddy and slippery during rain. Use extra caution when working on muddy ground.

5.3 BUDDY SYSTEM

All onsite personnel shall use the buddy system. Buddies shall maintain visual contact with each other. Personnel must observe each other for signs of heat stress or toxic exposure such as:

1. Changes in complexion and skin discoloration
2. Changes in coordination or demeanor
3. Excessive salivation and pupillary response
4. Changes in speech pattern

Personnel shall inform their supervisor of nonvisual effects of toxic exposure such as:

1. Headaches, dizziness, blurred vision
2. Nausea, cramps
3. Irritation of eyes, skin or respiratory tract

5.4 HEAT AND COLD STRESS

Heat stress, due to protective clothing decreasing body ventilation, is an important factor. Heat stress of employees on site will be monitored by the American Red Cross method of monitoring heart rates as personnel come out for rest and cooling off.

One or more of the following control measures can be used to help control heat stress and are mandatory if heat stress is detected by elevated heart rate above 110 beats per minute.

1. Employees should drink plenty of water throughout the day and should increase their salt intake slightly by salting their food a little heavier.
2. On site drinking water will be kept cool, 10-15°C (50-60°F), to encourage personnel to drink often.
3. A work regimen that will provide adequate rest periods for cooling down will be established as required.
4. All personnel will be advised of the dangers and symptoms of heat stroke and exhaustion.
5. Cooling devices such as vortex tubes or cooling vests can be worn beneath protective garments.
6. Employees shall be admonished to monitor themselves and their co-workers for the effects of heat disorders and to take additional breaks as needed.
7. All breaks are taken in a shaded rest area.
8. Employees shall not do other tasks during rest periods.

9. Employees shall remove impermeable garments during rest periods.
10. All employees shall be informed of the importance of adequate rest, acclimatization, and proper diet in the prevention of heat stress.

5.4.1 Signs And Symptoms Of Heat Stress

Heat Cramps:

Heat cramps are caused by heavy sweating and inadequate electrolyte replacement. Signs and symptoms include muscle spasms and pain in the hands, feet and abdomen.

Heat Exhaustion:

Heat exhaustion occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include:

- Pale, cool, moist skin
- Heavy sweating
- Dizziness, Nausea
- Fainting

Heat Stroke:

Heat stroke is the most serious form of heat stress. Temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury or death occur. Competent medical help must be obtained immediately. This is a true medical emergency. Signs and symptoms are:

- Red, hot, usually dry skin
- Lack of or reduced perspiration
- Nausea
- Dizziness and confusion
- Strong, rapid pulse initially
- Coma

5.4.2 Cold Stress

Most cold-related worker fatalities have resulted from failure to escape low environmental air temperatures, or from immersion in low temperature water. The single most important aspect of life-threatening hypothermia is a fall in the deep core temperature of the body.

Employees should be protected from exposure to cold so that the deep core temperature does not fall below 36°C (98.6°F.) Lower body temperature will very likely result in reduced mental alertness, reduction in rational decision making, or loss of consciousness with the threat of fatal consequences.

- Workers shall be provided with warm clothing, such as mittens, heavy socks, when the air temperature is below 4-7°C (40-45°F.) Protective clothing may be used to protect the employee.
- When the air temperature is below 0-7°C (32-40°F) (depending on employee comfort), clothing for warmth, in addition to protective clothing shall be provided. This will include:

1. Insulated suits, such as whole-body thermal underwear;
2. Wool socks or polypropylene socks to keep moisture off the feet if there is a potential of work activity which would cause sweating;
3. Insulated gloves;
4. Boots;
5. Insulated head cover, such as knit caps.

- At air temperature below 2°C (35°F) the following work practices must be followed:

1. If the clothing of an employee might become wet on the job site, the outer layer of the clothing must be impermeable to water.
2. If an employee's underclothing (socks, mittens, etc.) becomes wet in any way, the employee must change into dry clothing

immediately. If the clothing becomes wet from sweating, the employee may finish the task which caused the sweating before changing into dry clothing.

3. Employees must be provided a warm area, 18°C (65°)F or above, to change from work clothing into street clothing.
4. Employees must be provided a warm break area, 15°C (60°F) or above.
5. Hot liquids, such as soups, warm, sweet drinks, shall be provided in the break area. The intake of coffee shall be limited because of the attendant diuretic and circulatory effects.
6. The buddy system shall be practiced at all times. Any employee observed with severe shivering shall leave the cold area immediately.
7. Employees should layer their clothing. Thinner, lighter clothing should be worn next to the body with heavier clothing layered outside the inner clothing.
8. Avoid overdressing when going into warm areas or when performing activities which are strenuous. This could lead to heat stress problems.
9. Employees handling volatile liquids (such as gasoline, hexane, alcohol) shall take special precautions to avoid spilling liquids on clothing or gloves because of the added danger of cold injury by evaporative cooling.

5.5 HEARING CONSERVATION

All on site personnel shall wear hearing protection (E.A.R. foam inserts or equivalent) when operating earthmoving equipment or whenever noise levels exceed 85 dBA, according to IT Procedure 9650. All personnel required to wear hearing protection shall receive baseline and annual audiograms and training on the causes and prevention of hearing loss.

The Health and Safety Officer will evaluate noise hazards with appropriate instrumentation, including an ANSI Type 2 or Type 1 sound level meter and noise dosimeters.

6.0 PERSONAL PROTECTIVE EQUIPMENT

The personal protective equipment (PPE) outlined below have been selected according to the site characterization and analysis, job tasks, site hazards, intended use and duration of potential employee exposures. Maintenance and storage of PPE, decontamination, donning and doffing procedures, inspection and monitoring of effectiveness, and limitation are outlined in this section.

6.1 RESPIRATORY PROTECTION

- Only employees who have been trained to wear and maintain respirators properly shall be allowed to use respiratory protection.
- Only properly cleaned, maintained, National Institute of Occupational Safety and Health (NIOSH) approved respirators shall be used on site.
- Selection of respirators, as well as any decisions regarding upgrading or downgrading of respiratory protection, will be made by the Health and Safety Manager or his designee.
- Used air-purifying cartridges shall be replaced at the end of each shift. PAPR cartridges will be changed when flow falls below 4 cfm through the cartridge.
- Positive and negative pressure tests shall be performed each time the respirator is donned.
- Only employees who have been fit tested within the last 12 months will be allowed to work in atmospheres where respirators are required. Subcontractors shall provide certificates of respirator fit test completed within the last 12 months for each employee onsite.
- Respirator users shall be instructed in the proper use and limitations of respirators.
- If an employee has difficulty in breathing during the fit test or during use, he shall be evaluated medically to determine if

he can wear a respirator safely while performing assigned tasks.

- No employee shall be assigned to tasks requiring the use of respirators if, based upon the most recent examination, a physician determines that the health or safety of the employee will be impaired by respirator use.
- Contact lenses shall not be worn while using any type of respiratory protection.
- Air-supplied respirators shall be assembled according to manufacturer's specifications. Hose length, couplings, valves, regulators, manifolds and all accessories shall meet ANSI and the manufacturer's requirements.
- Respirators shall be cleaned and sanitized daily after use.
- Respirators shall be stored in a convenient, clean and sanitary location on site.
- Respirators shall be inspected during cleaning. Worn or deteriorated parts shall be replaced.
- Facial hair that might interfere with a good face piece seal or proper operation of the respirator is prohibited.
- The IT Site Supervisor shall review the respiratory protection program daily to ensure employees are properly wearing and maintaining their respirators and that the respiratory protection is adequately protecting the employees.
- The Health and Safety Manager and the Project Manager shall evaluate the respiratory protection program monthly to ensure the continuing effectiveness.
- Respirators used for emergency response shall be inspected weekly by the Health and Safety Coordinator.

6.2 LEVELS OF PROTECTION

The level of protection used in the exclusion zone is based on site specific information. The levels of protection are outlined as follows. Specific levels of protection will be changed whenever site conditions change. They can either be increased to the next higher level or decreased to the next lower level. The decision to

change levels of protection will be made by the IT Corporation Site Supervisor with input from the Project Officer and the IT Corporation Health and Safety Officer. If the need arises to protect health and safety, the Site Supervisor can upgrade protection levels without input from the Health and Safety Officer or Project manager. He will then discuss the decision with the Health and Safety Officer, Health and Safety Coordinator, and the Project Manager when they are available. Levels of protection will not be downgraded without prior approval from the Health and Safety Officer.

6.2.1 Level A Protection

Level A Protection is not required.

6.2.2 Level B Protection

Level B Protection is not required. Level B Protection will be required if airborne concentrations of toxic contaminants exceed twice the permissible exposure level as determined by personnel monitoring. The Health and Safety Manager will be notified when the decision is made to upgrade to Level B.

6.2.3 Level C Protection

Level C Protection is required. Level C will be required if concentration of toxic airborne contaminants exceed one-half the OSHA permissible exposure limit (PEL).

The following equipment will be used for Level C Protection:

- Half mask or full-face air-purifying respirators with combination organic vapor/HEPA filter (color-coded black and magenta or black and purple.)
- Hooded one piece suit (double-layered), tyvek or equal, taped at gloves and boot covers. Tyvek underwear
- Gloves: neoprene, nitrile or other impermeable material (If leather or canvas outer gloves are used, they will be disposed at the end of each shift.)

- Steel toed boots, PVC with or without booties (Disposable boot covers when working in or near contaminated soil, debris or dust make decontamination easier.)
- Hardhat
- Safety glasses are required with half mask respirators

6.2.4 Level D Protection

Level D Protection will be used if concentration of toxic airborne contaminants does not exceed one-half the PEL. Site personnel will ensure there is no potential for exposure to toxic vapors or dusts.

The following equipment will be used for Level D Protection:

- Coveralls or work clothes
- Safety glasses
- Hardhat
- Steel toed boots/shoes
- Gloves as necessary

6.3 DONNING AND DOFFING

All persons entering the Exclusion Zone shall put on the required personal protective equipment according to established procedures in this plan to minimize exposure potential. When leaving the Exclusion Zone, personal protective equipment shall be removed according to these established procedures to minimize the spread of contamination.

6.3.1 Donning Procedures

- Remove street clothes and store in a clean location.
- Put on coveralls or work clothes.
- Put on boots.
- Put on gloves.
- Put on remaining protective equipment, such as hard hat, safety glasses, etc.

6.3.2 Doffing Procedures

Whenever a person leaves the work site, the following proper decontamination sequence will be followed:

- Upon entering the Contamination Reduction Zone, rinse contaminated mud and debris from boots or remove boot covers.
- Clean reusable protective equipment.
- Wash hands and face thoroughly.
- Clean respirator and prepare for next use.

All disposable equipment, garments, and personal protective equipment shall be bagged in two 6 mil plastic bags, properly labeled and disposed.

6.4 SANITATION

IT Corporation employees will use the sanitary facilities of the offices of Morton International. No portable sanitary facilities will be provided.

IT Corporation employees will keep the work and support areas neat and orderly and collect and remove the trash generated by their activities.

7.0 SITE CONTROL

Site control requires establishing specific measures to prevent unauthorized entry onto the site and to protect all personnel entering the site from recognized safety and health hazards. The following measures are mandatory:

7.1 AUTHORIZATION TO ENTER

The Project Manager and the Site Supervisor may grant authorization to enter the site. Access to contaminated work areas is regulated and limited to authorized personnel. Only those who have completed the required training and medical requirements will be allowed to enter. Representatives from regulatory agencies personnel will be permitted to enter the site at any time during business hours or at other reasonable times by appointment to conduct official business. Representatives of the news media and other visitors must receive authorization from the client and the IT Corporation General Manager, Mr. William K. Graham, before entry.

7.2 HAZARD BRIEFING

The Site Supervisor shall brief this Health and Safety Plan to all personnel entering the site to inform them of potential site health and safety hazards and procedures specific to this site. All personnel shall acknowledge this briefing by signing the Health and Safety Plan. This briefing shall be further documented in the site daily log.

7.3 DOCUMENTATION OF CERTIFICATES

Personnel entering the site to work shall have satisfied the medical and training requirements of 29 CFR 1910.120. The project file shall contain copies of certificates documenting status for all onsite personnel. Personnel not entering the exclusion zones need not meet the above requirements. The Site Supervisor shall accommodate requests from representatives from regulatory agencies to review documentation. All visitors must present documentation

of current training and medical status before being granted authorization to enter the exclusion zone.

7.4 ENTRY LOG

The Site Supervisor keeps a daily roster of all onsite personnel. The Site Supervisor records the time of entry into and exit from the exclusion zone for each person.

7.5 ENTRY REQUIREMENTS

All personnel entering work or exclusion zones will use the proper personal protective equipment. All personnel entering exclusion zones will enter and exit through the decontamination units and observe the mandatory decontamination procedures.

7.6 EMERGENCY ENTRY AND EXIT

During emergencies, decontamination will be conducted to the extent that is possible without endangering personnel. All persons responding, both onsite and off-site, will be informed of site safety and health hazards and health hazards associated with contaminated personnel.

8.0 DECONTAMINATION

8.1 CONTAMINATION CONTROL ZONES

The Project Manager shall establish contamination control zones for the project based on the location of contamination, remediation activities, accessibility, and site control. These zones must be clearly marked and defended against unauthorized entry.

8.1.1 Exclusion Zone

An exclusion zone is the area where contamination does or could occur. This zone has the highest potential for exposure to the contaminants by contact or inhalation.

8.1.2 Contamination Reduction Zone

The Contamination Reduction Zone (CRZ) is established at the entry and exit to the exclusion zone. Decontamination activities take place in the CRZ.

8.1.3 Support Zone

Support zones are established in uncontaminated areas and are used for the storage of supplies and general administrative functions.

8.2 POSTING

The perimeter fence is posted with keep out signs. Warning tape will be posted to delineate the exclusion zone and excavations.

8.3 DECONTAMINATION GENERAL RULES

- An area outside of the exclusion zone shall be designated as the break area. Employees shall proceed through personal decontamination before eating, drinking or smoking. No eating, drinking or smoking shall take place in the exclusion zone.
- The Site Supervisor shall monitor the effectiveness of the decontamination procedures and if ineffective shall take

appropriate steps to correct any deficiencies or modify the plan as needed.

8.4 EQUIPMENT DECONTAMINATION

The purpose of the Contamination Reduction Zone is to limit the spread of contamination by contaminated personnel, tools, equipment and materials from the Exclusion Zone. Any person, tool, equipment or material from inside the Exclusion Zone will be considered contaminated and must be cleaned before leaving the work site.

8.5 Personal Protective Equipment Decontamination

Whenever a person leaves the work site, the following proper decontamination sequence will be followed:

- Rinse contaminated mud, etc. from boots or remove boot covers.
- Remove protective garments and equipment and respirator. All disposable clothing should placed in plastic bags and labeled as contaminated waste.
- Reusable protective equipment must either be cleaned onsite or bagged and returned to Stockroom with appropriate warning labels.
- Remove respirator after contaminated outer wear has been removed.
- Thoroughly wash hands and face.
- Clean respirator and prepare for next use.

All disposable equipment, garments, and personal protective equipment shall be bagged in two 6 mil plastic bags, properly labeled and disposed.

All contaminated reusable equipment, garments, and personal protective equipment which is not cleaned onsite shall be bagged in two 6 mil plastic bags, properly labeled and returned to the Stockroom.

9.0 SITE MONITORING

9.1 AIR MONITORING

Air in the breathing zone will be monitored whenever odor indicates the presence of airborne contaminants. When H-Nu or Century OVA indicates 5 ppm above background, level of protection will be upgraded from Level D to Level C and the Health and Safety Officer notified.

9.2 HAZARDOUS CONDITIONS

The Site Supervisor shall take affirmative action to limit exposures. If unknown chemicals or contamination are encountered, operations will cease until the situation is evaluated. The Site Supervisor shall contact the Health and Safety Officer to evaluate any potentially hazardous situations, or any situation with elevated contamination levels. Operations will only be resumed if they can be accomplished in a safe manner.

9.3 NOISE MONITORING

Noise monitoring will be conducted as required. Hearing protection is mandatory for all employees in noise hazardous areas around or operating heavy equipment.

Onsite personnel must wear monitoring equipment as instructed by the health and safety representative. Refusal to wear monitoring equipment or intentional tampering with sampling apparatus will lead to immediate dismissal from the job site.

9.4 MONITORING RECORDKEEPING

The Health and Safety Officer or his designee will be responsible for establishing and maintaining records of all required monitoring as described below;

- Employee name, social security number, payroll number;
- The date, time, pertinent task information, exposure information;

- Description of the analytical methods, equipment used, calibration data;
- Type of personal protective equipment worn;
- Engineering controls used to reduce exposure.

10.0 EMPLOYEE TRAINING

10.1 GENERAL

IT Corporation trains all field personnel according to 29 CFR 1910.120 before their initial assignment to any project. All field employees receive a minimum of 40 hours of training off site and a minimum of 3 days of actual field experience under the direct supervision of a trained, experienced supervisor. Subcontractor personnel must meet the above training requirements. Personnel, including subcontractors, whose activities are limited to nonhazardous activities must complete 24 hours of training off site and 8 hours of onsite training. Asbestos workers receive 40 hours of classroom training for asbestos work.

Onsite management and supervision receive a minimum of 8 hours of additional training on program supervision. Each hazardous waste operations employee receives 8 hours annually of refresher training on the topics listed in the course content.

IT Corporation provides each employee who completes the required 40 hours of classroom training and 3 days of field experience with a certificate signed by the instructor. A copy of the certificate is maintained with the project files and in the IT Corporation Health and Safety Office. Subcontractors must provide certificates of training for the project file for all employee assigned to the project.

10.2 HAZWOPER SITE WORKERS COURSE CONTENT

Following is a general list of topics covered in the 40-hour course:

- General site safety
- Physical hazards (fall protection, noise, heat stress, cold stress)
- Names and titles of key personnel responsible for site health and safety

- Safety, health and other hazards present at the site
- Use of personal protective equipment
- Work practices by which employees can minimize risks from hazards
- Safe use of engineering controls and equipment on site
- Medical surveillance requirements including recognition of symptoms and signs which might indicate over exposure to hazards
- Worker Right-to-Know
- Routes of exposure to on site contaminants
- Engineering controls and safe work practices
- Components of the site health and safety program
- Decontamination practices for personnel and equipment
- Confined space entry procedures
- Emergency response plan

10.3 SUPERVISORS COURSE CONTENT

Management and supervisors receive an additional 8 hours of training which includes

- General safety and health program
- Personal protective equipment program
- Spill containment program
- Air monitoring techniques

10.4 ASBESTOS WORKERS COURSE CONTENT

Following is a general list of topics covered in the 40-hour course:

- Methods of recognizing asbestos and asbestos-containing materials
- Health effects associated with asbestos, the relationship between asbestos exposure and lung cancer
- Operations which may lead to asbestos exposure
- Exposure mitigation practices and procedures

- Engineering and work practice controls for minimizing exposures
- Respiratory protection
- Housekeeping procedures
- Hygiene facilities and procedures
- Protective clothing
- Decontamination procedures
- Emergency procedures
- Waste disposal procedures
- Medical surveillance program
- OSHA asbestos standard

10.5 INSTRUCTORS

The IT Corporation Training Division, headquartered in Irvine, California, teaches the 40-hour classes using certified instructors. When training needs exceed the capacity of the Training Division, IT Corporation uses outside institutions. IT Corporation Training Division is recognized by USEPA and listed in the Federal Register (53 FR 3982). Only similarly recognized outside training institutions are used.

10.6 PRE-ENTRY BRIEFINGS

The following training sessions and informational materials are provided at each project site:

10.6.1 Tailgate Safety Meetings

The site supervisor conducts a tailgate safety meeting the beginning of each shift or whenever new employees arrive at the job site once the job commences. The topics discussed at the tailgate safety meeting include health and safety considerations for the day's activities, necessary protective equipment, problems encountered, and new operations. Attendance records and meeting notes are maintained with the project files.

10.6.2 Material Safety Data Sheets

The site specific health and safety plan includes material safety data sheets and occupational health guidelines for chemical substances. See Attachment C. The health and safety plan is maintained on site and accessible to the employees. Each employee reviews the health and safety plan and signs the acknowledgment before starting work on the site.

10.6.3 Health and Safety Plans

The IT Corporation safety department prepares a site specific health and safety plan for each project falling within the scope and application of 29 CFR 1910.120. Injury and illness prevention programs are written for all other projects. The site supervisor presents the health and safety plan and discusses it with everybody assigned to the project. All workers and visitors must read and sign the health and safety plan acknowledging acceptance of site rules and understanding of site hazards before entering.

11.0 MEDICAL SURVEILLANCE

11.1 PHYSICAL EXAMINATION

As required by IT Corporation Policy and Procedure 9410.2B all personnel on site will have successfully completed a preplacement or periodic/update physical examination. This examination has been designed to meet the requirements of 29 CFR 1910.120 requirements for hazardous waste site operations and 29 CFR 1926.58 requirements for asbestos operations.

The IT Corporation medical surveillance program examination consists of:

- Medical and occupational history questionnaire
- Physical examination
- Complete blood count with differential
- SMAC 24
- Urinalysis
- Chest x-ray
- Pulmonary function test
- Audiogram
- Drug and alcohol screening
- Visual acuity

The following information is provided to the examining physician:

- Description of employee's duties
- Anticipated chemical and asbestos exposure and levels
- Description of the personal protective equipment to be used
- Information from previous medical exams

A copy of the medical examination is provided at the employee's request. The employee shall be informed of any medical conditions that would result in work restriction or that would prevent them from working at hazardous waste sites.

Contractors will certify that all their employees have successfully completed a physical examination by a qualified physician on the Certification Form (Appendix B). The physical

examinations shall meet the requirements of 29 CFR1910.120, and 29 CFR 1910.134.

Contractors will supply copies of the medical examination certificate for each onsite employee.

11.2 MEDICAL RECORDS

Medical and personal exposure monitoring records will be maintained according to the requirements of 29 CFR1910.20 and shall be kept for a minimum of 30 years. Employee confidentiality shall be maintained.

12.0 EMERGENCY PROCEDURES

The Health and Safety Plan has been developed to allow remediation activities and operations to be conducted without adverse impacts on the health and safety of the worker, environment and community. Supplementary emergency response procedures are included to cover extraordinary conditions that might occur at various sites.

12.1 GENERAL

The Site Supervisor and Health and Safety Coordinator will establish evacuation routes and assembly areas for each site. All personnel entering the site will be informed of these routes and assembly areas. If the site is large and the evacuation routes are not clear, a site plan will be made marking the evacuation routes and will be posted at conspicuous locations.

Each site will be evaluated for the potential for fire, explosion, chemical release or other catastrophic events. Based on site characterization and remediation activities, chemical releases and explosions are not likely to occur. Unusual events, activities, chemicals and conditions will be reported to the Site Supervisor.

12.2 EMERGENCY RESPONSE

All incidents will be dealt with in a manner to minimize adverse health risks to site workers, the environment and the local community. If an incident occurs the following procedure will be followed:

The Site Supervisor will be the site emergency coordinator and will evaluate each incident to determine the extent of the incident and the need for outside assistance. Outside assistance will be requested as needed. The emergency coordinator will act as liaison between responding agencies and site personnel. The emergency coordinator will notify the Project Manager and Health and Safety

Officer of any incident, maintain appropriate records and report incidents according to IT Procedures.

The emergency coordinator has the authority to commit resources as needed to contain and control released material and to prevent its spread to off site areas.

12.3 SAFETY SIGNALS

Vehicle, tractor, or portable horns will be used for safety signals as follows:

1 Long Blast:	Emergency evacuation
2 Short Blasts:	Clear working area around powered or moving equipment

12.4 MEDICAL EMERGENCY

Paramedics will be summoned without delay in the event of a medical emergency. The emergency coordinator will stay on the line with the 911 operator until the operator hangs up.

12.5 REPORTING INJURIES AND ILLNESSES

Employees will report all injuries to their supervisor immediately and illnesses as soon as the employee knows he is sick. Supervisors will submit completed "Supervisor's Report of Injury" to IT Corporation Health and Safety within 24 hours of the occurrence. If there is any indication that the illness is work-related, the supervisor will submit a completed "Supervisor's Report of Injury" to Health and Safety within 24 hours after being notified by the employee.

Material Safety Data Sheet

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GENIUM PUBLISHING CORP.

No. 303
METHYL ETHYL KETONE
(Revision C)

Issued: September 1979
Revised: March 1986

SECTION 1. MATERIAL IDENTIFICATION 20

MATERIAL NAME: METHYL ETHYL KETONE

OTHER DESIGNATIONS: MEK, Butanone, 2-Butanone, Ethyl Methyl Ketone, $CH_3COCH_2CH_3$, ASTM D740, CAS #0078-93-3

MANUFACTURER/SUPPLIER: Available from many suppliers, including:
Ashland Chemical Company, Industrial Chemicals & Solvents Div., PO Box 2219, Columbus, OH 43216;
Telephone: (614) 889-3844

HMIS
H: 1
F: 3
R: 1
PPE*
*See sect. 8

SECTION 2. INGREDIENTS AND HAZARDS

	%	HAZARD DATA
Methyl Ethyl Ketone; (C_4H_8O)	ca 100	8-hr TWA 200 ppm* or 590 mg/m^3
		Human, Inhalation TCLo: 100 ppm/5 min.
* Current OSHA PEL and ACGIH (1985-86) TLV. NIOSH (1978) proposed a 10-hr TWA of 200 ppm.		Rat, Oral, LD_{50}: 2.7 g/kg
		Rabbit, Skin, LD_{50}: 13 g/kg

SECTION 3. PHYSICAL DATA

Boiling Point, 1 atm ... 176°F (80°C)
Vapor Pressure @ 20°C ... 72
Vapor Density (Air = 1) ... 2.5
Viscosity @ 25°C, cp ... 0.40
Solubility in Water @ 20°C, wt. % ... 27.1

Specific Gravity (20/4°C) ... 0.805
Volatiles, vol. % ... ca 100
Evaporation Rate (BuAc = 1) ... 5.7
Freezing Point ... -122.8°F (-86°C)
Molecular Weight ... 72.12

Appearance and odor: Colorless liquid with a moderately sharp, fragrant, mintlike odor. Unfatigued, odor recognition threshold (100% of test panel) is 6-10 ppm.

SECTION 4. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp.	Flammability Limits In Air	LOWER	UPPER
20°F (-6.7°C) CC	960°F (516°C)	% by Vol.	1.8	10.0

EXTINGUISHING MEDIA: Dry chemical, carbon dioxide, alcohol foam, water spray. Use water spray to disperse vapors and to flush spills away from exposures. A stream of water can scatter flames. Water may be ineffective in extinguishing fire but should be used to help control fire and keep fire-exposed containers cool. Methyl ethyl ketone is a dangerous fire hazard and a moderate explosion hazard when exposed to heat or flame. Vapors can flow along surfaces to a distant ignition source and flash back.

Fire fighters should wear self-contained breathing apparatus in enclosed areas.

SECTION 5. REACTIVITY DATA

Methyl ethyl ketone is a stable material in closed containers at room temperature under normal storage and handling conditions. It does not polymerize.

This material is an OSHA Class IB Flammable Liquid. It is incompatible with oxidizing agents that can cause spontaneous ignition and violent reaction. Ignition is caused by reaction with potassium t-butoxide.

Thermal-oxidative degradation products can include carbon monoxide, carbon dioxide, and various hydrocarbons.

MEK can attack many plastics, resins, and rubber.

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No. 303 3/86 METHYL ETHYL KETONE

SECTION 6. HEALTH HAZARD INFORMATION | TLV

Methyl ethyl ketone is not listed as a carcinogen by the NTP, IARC, or OSHA. Inhalation of methyl ethyl ketone vapors can irritate the eyes, nose, and respiratory tract. Exposure to high concentrations will produce headache; dizziness; and, in extreme cases, unconsciousness. It can have a narcotic effect; however, its irritancy will often preclude exposure to narcotic concentrations. Prolonged or repeated skin contact may cause drying, cracking, irritation, and dermatitis. Eye contact may cause irritation and burning sensations. Ingestion can irritate the digestive tract; ingestion of several ounces can cause narcosis and acidosis.**

FIRST AID: SKIN CONTACT: Wash area of contact with soap and water. Remove contaminated clothing immediately. EYE CONTACT: Immediately wash with plenty of water, including under the eyelids. If irritation persists, get medical attention. INHALATION: Remove victim to fresh air. If required, restore breathing. Keep warm and at rest. Get immediate medical attention! INGESTION: If victim is conscious and medical help is not readily available, give him 3 glasses of water or milk to drink to induce vomiting. Get medical help as soon as possible* with special attention to acidosis.**

* GET MEDICAL ASSISTANCE = In plant, paramedic, community. Get medical help for further treatment, observation, and support after first aid, if indicated.

** P.G. Kopelman, "Severe Metabolic Acidosis After Ingestion of Butanone," *Brit. Med. J.* 286 (1986):21

SECTION 7. SPILL, LEAK, AND DISPOSAL PROCEDURES

Notify safety personnel and implement containment procedures. Remove all sources of heat or ignition. Provide optimum (explosion-proof) ventilation.

Cleanup personnel should use protection against inhalation of vapors and contact with liquid. Use foam to control vapors. Contain spills using absorbent material (dry sand or vermiculite). Use nonsparking tools. Mix well and place in appropriate container for disposal. Flush trace residues with much water. Do not flush to sewers or open waterways.

DISPOSAL: Waste may be burned in an approved incinerator or disposed of by a licensed disposal firm. Follow Federal, state, and local regulations.

EPA Hazardous Waste No. U159 (40 CFR 261); the primary hazardous properties of MEK are ignitability and toxicity (40 CFR 261.33).

SECTION 8. SPECIAL PROTECTION INFORMATION

Provide general and local exhaust fume ventilation to met TLV requirements. Exhaust hoods should have a minimum velocity of 100 lfm (linear feet per minute). Exhaust fans and other electrical services must be of explosion-proof construction.

For emergency and nonroutine work above the TLV an approved, full-facepiece, organic-vapor, canister gas mask is recommended; but for unknown concentrations or those above or about 3000 ppm, self-contained or air-supplied respirators (positive pressure) are needed.

Use chemical safety goggles where liquid contact with the eyes is possible. Do not use contact lenses when working with solvents; soft lenses may absorb irritants and all lenses concentrate them. Use impervious gloves. Where splashing may occur, use a face shield, apron, and other protective clothing as needed to prevent skin contact. An eyewash station must be available near the workplace. A safety shower is desirable when large amounts of this material are used. Methyl n-butyl ketone has caused neurotoxic effects, and studies have shown that MEK may trigger these effects. (K. Saida, et al., *J. Neuropathology and Exp. Neurology* 35 [May 1976]: 207).

SECTION 9. SPECIAL PRECAUTIONS AND COMMENTS

Store in a clean, cool, well-ventilated area away from heat, ignition, and oxidizing agents. Containers should be electrically interconnected and grounded for liquid transfers to prevent static sparks. Storage and use areas should be No Smoking areas. Use nonsparking tools. Small amounts should be handled in approved safety cans with proper labeling. Emptied containers may retain hazardous product residues (vapor or liquid). Electrical services must meet code requirements.

Avoid skin and eye contact. Avoid breathing vapors. Do not ingest. Avoid contact with copper or copper-bearing materials. Wash thoroughly after handling.

DOT Classification: Flammable Liquid ID No.: UN1193 Label: Flammable Liquid

Data Source(s) Code: 1-9, 12, 14, 19-21, 23, 26, 27, 34, 38, 47, 82, 84. CK

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Approvals Joseph O. Rizzuto, 11/86.

Indust. Hygiene/Safety 10-86

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NO. 316

MATERIAL SAFETY DATA SHEET

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GENIUM PUBLISHING CORP.

BENZENE

Revision C

Date November 1978

SECTION I. MATERIAL IDENTIFICATION

MATERIAL NAME: BENZENE

OTHER DESIGNATIONS: Benzol, Phenylhydride, Phene, C_6H_6, GE Material D5353, ASTM D835, D836, D2359, CAS #000 071 432

MANUFACTURER: Available from many sources.

SECTION II. INGREDIENTS AND HAZARDS

SECTION II. INGREDIENTS AND HAZARDS	%	HAZARD DATA
Benzene	ca 100	8-hr TWA 10 ppm (skin)* with 25 ppm ceiling level and 50 ppm 10 minute peak

*Current OSHA and ACGIH (1978) permissible exposure level. Note that the OSHA standard on benzene which would reduce the TLV to 1 ppm with a 5 ppm ceiling, forbid contact with liquid with over 0.5% benzene, and legally classify benzene as a human carcinogen has been struck down by U.S. Court of Appeals.

ACGIH (1978) lists benzene as a suspected carcinogen for humans.

SECTION III. PHYSICAL DATA

Boiling point, 1 atm, deg F (C)	176 (80)	Specific gravity, 20/4 C	0.879
Vapor pressure at 20 C, mm Hg	74.6	Volatiles, %	ca 100
Vapor density (Air=1)	2.77	Evaporation rate (CCl_4=1)	1.0
Solubility in water, wt. %	0.06	Molecular weight	78.12
		Melting point, deg F (C)	42 (5.5)

Appearance & Odor: Clear, colorless liquid having a characteristic aromatic odor. The odor recognition threshold (100% of panel) is 4.68 ppm (unfatigued) in air. Odor is is not an adequate warning of hazard.

SECTION IV. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp.	Flammability Limits In Air Volume %	LOWER	UPPER
12°F (-11C) (TCC)	1044°F (562°C)		1.3	7.1

Extinguishing Media: Water fog, CO_2, dry chemical or foam. Use a blanketing effect to smother fire. A water stream will scatter the fire. A water spray can be used to cool fire exposed containers.

Firefighters should wear approved self-contained breathing apparatus.

This material can form explosive and flammable mixtures with air at room temperature. It is a severe explosion hazard and toxic hazard in a fire situation. Vapors can flow along surfaces to distant ignition sources and flash back.

SECTION V. REACTIVITY DATA

Benzene is a stable compound under normal storage and use conditions; it does not polymerize.

Benzene will react vigorously with strong oxidizers such as ozone, permanganate, sulfuric or nitric acids, potassium peroxide, sodium peroxide, et al. It is a flammable liquid. OSHA Class IB. Heating greatly increases the fire and explosion hazards.

Oxidation in air will produce oxides of carbon and nitrogen.

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No. 316

SECTION VI. HEALTH HAZARD INFORMATION

TLV 10 ppm or 30 mg/m^3 (skin)

Excessive inhalation or prolonged skin exposure may cause headache, weariness, loss of appetite and lassitude with incipient blood effects including decreased cell counts, mild lymphotosis and eosinopenia. The most significant toxic effect of benzene is insidious and often irreversible injury to the blood forming tissue from chronic low level exposures. Development of leukemia may occur from chronic excessive exposure! Eye contact yields irritation from liquid or high vapor concentrations. Skin contact will also yield a defatting effect. Inhalation may result in collapse, bronchitis and pneumonia.

FIRST AID:

Eye contact: Wash eyes well with water for 15 minutes. Contact physician.

Skin contact: Wash skin well with water. Contaminated clothing should be removed at once.

Inhalation: Remove victim to fresh air. Restore breathing if required and administer oxygen for labored breathing. Contact physician.

Ingestion: Give edible fats or oils to swallow. Do not induce vomiting (aspiration hazard). Contact a physician immediately.

SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES

If a significant spill occurs, notify safety personnel and evacuate the area. Remove all ignition sources. Provide maximum, explosion-proof ventilation. Clean-up personnel must use approved self-contained breathing apparatus and other protective equipment to avoid contact with benzene.

Remove free liquid. Pick up residue with an inert absorbant, such as vermiculite, and placed in a closed metal container for disposal, using non-sparking tools. When necessary, benzene may be flushed away from a critical area with water, but flush to open area only, not to sewer or to surface waters.

DISPOSAL: Incinerate waste benzene or dispose of via a licensed solvent disposal company. Do not send (or allow run off) to the sewer!

SECTION VIII. SPECIAL PROTECTION INFORMATION

Provide general ventilation and local exhaust ventilation where benzene is used, handled, or stored to meet TLV requirements. Self-contained breathing apparatus should be available for emergencies and non-routine situations. Approved cartridge or canister type respirators can be used for benzene concentrations up to 50 ppm for short periods. A full facepiece is required above 10 ppm

To prevent skin contact, gloves, aprons, boots, etc of neoprene or other benzene-resistant materials should be used. Chemical goggles or face shields should be used if splashing is possible. Eyewash station should be available where splashing is probable.

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

Whenever possible, less toxic solvents should be substituted for benzene. Consult health and safety services before benzene is used in plant operations. Do not breathe vapors. Prevent contact with liquid. It is a suspected cancer causing agent!

Keep away from heat, sources of ignition, and oxidizing agents. No smoking in areas of use. Store and handle as OSHA Class IB liquid.

Pre-placement detailed medical examination is needed. Workers who show heart, lung, kidney, liver, nervous disease, or any blood abnormality should not be assigned. Periodic physical examinations and area monitoring is required.

DATA SOURCE(S) CODE: 2-9, 12, 21

APPROVALS: MIS, CRD

Industrial Hygiene and Safety

Corporate Medical Staff

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GENIUM PUBLISHING CORP.

No. 385

ETHYL BENZENE
(Revision A)
Issued: August 1978
Revised: November 1988

SECTION 1. MATERIAL IDENTIFICATION 27

Material Name: ETHYL BENZENE

Description (Origin/Uses): Used as a solvent and as an intermediate in the production of styrene monomer.

Other Designations: Phenylethane; Ethylbenzol; $C_2H_5C_6H_5$; CAS No. 0100-41-4

Manufacturer: Contact your supplier or distributor. Consult the latest edition of the *Chemicalweek Buyers' Guide* (Genium ref. 73) for a list of suppliers.

NFPA: 3 / 2 / 0 / -

HMIS	
H 2	R 1
F 3	I 3
R 0	S 2
PPG*	K 4
*See sect. 8	

SECTION 2. INGREDIENTS AND HAZARDS

Ingredients	%	Exposure Limits
Ethyl Benzene, CAS No. 0100-41-4	Ca 100	**OSHA PELs** 8-Hr TWA: 100 ppm, 435 mg/m³ 15-Min STEL: 125 ppm, 545 mg/m³ **ACGIH TLVs, 1988-89** TLV-TWA: 100 ppm, 435 mg/m³ TLV-STEL: 125 ppm, 545 mg/m³ **Toxicity Data*** Human, Inhalation, TC_{Lo}: 100 ppm (8 Hrs) Rat, Oral, LD_{50}: 3500 mg/kg

*See NIOSH, *RTECS* (DA0700000), for additional data with references to reproductive, irritative, and mutagenic effects.

SECTION 3. PHYSICAL DATA

Boiling Point: 277°F (136°C)
Melting Point: -139°F (-95°C)
Vapor Pressure: 7.1 Torrs at 68°F (20°C)
Vapor Density (Air = 1): 3.7
% Volatile by Volume: Ca 100
Molecular Weight: 106 Grams/Mole
Solubility in Water (%): Slight
Specific Gravity (H_2O = 1): 0.86258 at 77°F (25°C)

Appearance and Odor: A clear, colorless, flammable liquid; characteristic aromatic hydrocarbon odor.

SECTION 4. FIRE AND EXPLOSION DATA

Flash Point and Method: 64°F (18°C) CC	Autoignition Temperature: 810°F (432.22°C)	LEL: 1% v/v	UEL: 6.7% v/v

Extinguishing Media: Use foam, dry chemical, or carbon dioxide to put out ethyl benzene fires. A water spray may be ineffective in extinguishing the fire, because it can scatter and spread the burning liquid. Use water spray to cool fire-exposed containers of ethyl benzene, to disperse ethyl benzene vapor, and to protect personnel attempting to stop an ethyl benzene leak. **Unusual Fire or Explosion Hazards:** This liquid can readily form explosive vapor-air mixtures, especially when heated. Ethyl benzene vapor is heavier than air and may travel a considerable distance to a low-lying source of ignition and flash back to its origin. **Special Fire-fighting Procedures:** Wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in the pressure-demand or positive-pressure mode.

SECTION 5. REACTIVITY DATA

Stability/Polymerization: Ethyl benzene is stable in closed containers during routine operations. Hazardous polymerization cannot occur. **Chemical Incompatibilities:** Hazardous chemical reactions can occur between ethyl benzene and strong oxidizing agents, acids, ammonia, and bases. **Conditions to Avoid:** Avoid any exposure to sources of ignition such as heat, sparks, open flame, and lighted tobacco products, etc., and to incompatible chemicals. Use caution when entering confined spaces, particularly low-lying areas where explosive concentrations of ethyl benzene vapor may be present. Provide good ventilation to such areas to prevent the concentration of this vapor. **Hazardous Products of Decomposition:** Thermal-oxidative degradation can include toxic gases such as carbon monoxide and/or aromatic hydrocarbon gases.

SECTION 6. HEALTH HAZARD INFORMATION

Carcinogenicity: Ethyl benzene is not listed as a carcinogen by the NTP, IARC, or OSHA.
Summary of Risks: Ethyl benzene vapor is severely irritating to the eyes and to the mucous membranes of the respiratory system. Sustained inhalation of excessive levels can cause depression of the central nervous system (CNS) characterized by dizziness, headache, narcosis, and coma. Skin contact with liquid ethyl benzene causes irritation; dermatitis and defatting can also develop. The acute oral toxicity of ethyl benzene is low; however, ingestion of it presents a serious aspiration hazard. Aspirating even a small amount into the lungs can result in extensive edema (lungs filled with fluid) and hemorrhaging of the lung tissue. No systemic effects are expected at the levels that produce pronounced, unignorable, disagreeable skin and eye irritation. The TLVs cited in section 2 are set to prevent this intolerable irritation. **Medical Conditions Aggravated by Long-Term Exposure:** None reported. **Target Organs:** Skin, eyes, respiratory system, and CNS. **Primary Entry:** Inhalation, skin contact **Acute Effects:** Irritation of the skin, eyes, and respiratory system. Also, cardiac-rhythm disturbance due to sensitization; acute bronchitis, bronchospasm, pulmonary and laryngeal edema; euphoria; headache; giddiness; dizziness; and incoordination, as well as possible depression; confusion; and coma. **Chronic Effects:** None reported. **First Aid:** Eyes. Immediately

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SECTION 6. HEALTH HAZARD INFORMATION, cont.

flush eyes, including under the eyelids, gently but thoroughly with flooding amounts of running water for at least 15 minutes. **Skin.** Rinse the affected area with plenty of water, then wash it with soap and water. **Inhalation.** Remove the exposed person to fresh air; restore and/or support his or her breathing as needed. Have qualified medical personnel administer oxygen as required. **Ingestion.** Unlikely. Should this type of exposure occur, the aspiration hazard must be considered. Do not induce vomiting unless directed to do so by a physician. To prevent aspiration by spontaneous vomiting, keep the victim's head low (between his or her knees). Get medical help (in plant, paramedic, community) *for all exposures. Seek prompt medical assistance for further treatment, observation, and support after first aid. Note* **to Physician:** Professional judgment is required as to whether or not to induce vomiting because of the possibility of aspiration. A gastric lavage may be administered, followed by saline catharsis, if this procedure is appropriate to the specific incident. Monitor cardiac and pulmonary functions.

SECTION 7. SPILL, LEAK, AND DISPOSAL PROCEDURES

Spill/Leak: Notify safety personnel, evacuate unnecessary personnel, eliminate all sources of ignition immediately, and provide adequate explosion-proof ventilation. Cleanup personnel need protection against skin or eye contact with this liquid as well as inhalation of its vapor (see sect. 8). Contain large spills and collect waste or absorb it with an inert material such as sand, earth, or vermiculite. Use nonsparking tools to place waste liquid or absorbent into closable containers for disposal. Keep waste out of sewers, watersheds, and waterways. **Waste Disposal:** Contact your supplier or a licensed contractor for detailed recommendations. Follow Federal, state, and local regulations.

OSHA Designations

Listed as an Air Contaminant (29 CFR 1910.1000 Subpart Z).

EPA Designations (40 CFR 302.4)

CERCLA Hazardous Substance, Reportable Quantity: 1000 lbs (454 kg), per the Clean Water Act (CWA), §§ 311 (b) (4) and 307 (a).

SECTION 8. SPECIAL PROTECTION INFORMATION

Goggles: Always wear protective eyeglasses or chemical safety goggles. Where splashing is possible, wear a full face shield. Follow OSHA eye- and face-protection regulations (29 CFR 1910.133). **Respirator:** Wear a NIOSH-approved respirator per Genium reference 88 *for the maximum-use concentrations and/or the exposure limits cited in section 2.* Follow OSHA respirator regulations (29 CFR 1910.134). For emergency or nonroutine operations (spills or cleaning reactor vessels and storage tanks), wear an SCBA. **Warning:** *Air-purifying* respirators will *not* protect workers in oxygen-deficient atmospheres. **Other:** Wear impervious gloves, boots, aprons, and gauntlets, etc., to prevent prolonged or repeated skin contact with this material. **Ventilation:** Install and operate general and local maximum, explosion-proof ventilation systems powerful enough to maintain airborne levels of this material below the OSHA PEL standard cited in section 2. Local exhaust ventilation is preferred because it prevents dispersion of the contaminant into the general work area by eliminating it at its source. Consult the latest edition of Genium reference 103 for detailed recommendations. **Safety Stations:** Make emergency eyewash stations, *safety/quick-drench showers, and washing facilities available in work areas. Contaminated Equipment: Contact lenses pose a special* hazard; soft lenses may absorb irritants, and all lenses concentrate them. Do *not* wear contact lenses in any work area. Remove contaminated clothing and launder it before wearing it again; clean this material from shoes and equipment. **Comments:** Practice good personal hygiene; always wash thoroughly after using this material and before eating, drinking, smoking, using the toilet, or applying cosmetics. Keep it off your clothing and equipment. Avoid transferring it from your hands to your mouth while eating, drinking, or smoking. Do *not* eat, drink, or smoke in any work area. Do not inhale ethyl benzene vapor.

SECTION 9. SPECIAL PRECAUTIONS AND COMMENTS

Storage/Segregation: Store ethyl benzene in closed containers in a cool, dry, well-ventilated area away from sources of ignition and strong oxidizers. Protect containers from physical damage. **Special Handling/Storage:** Outside, isolated, detached, or remote storage is recommended for large quantities of ethyl benzene. Isolate bulk storage areas from acute fire hazards. **Engineering Controls:** Make sure *all engineering systems (production, transportation) are of maximum explosion-proof design.* To prevent static sparks, electrically ground and bond all containers, pipelines, etc., used in shipping, transferring, reacting, production, and sampling operations. **Other:** Use safety cans for transferring small amounts of ethyl benzene.

Transportation Data (49 CFR 172.101-2)

DOT Shipping Name: Ethyl Benzene
DOT Hazard Class: Flammable Liquid
ID No. UN1175
DOT Label: Flammable Liquid
DOT Packaging Exceptions: 49 CFR 173.118
DOT Packaging Requirements: 49 CFR 173.119

IMO Shipping Name: Ethylbenzene
IMO Hazard Class: 3.2
IMO Label: Flammable Liquid
IMDG Packaging Group: *II*

References: 1, 26, 38, 84-94, 100, 116, 117, 120, 122.

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Material Safety Data Sheet

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GENIUM PUBLISHING CORP.

No. 317
TOLUENE
(Revision D)

Issued: August 1979
Revised: April 1986

SECTION 1. MATERIAL IDENTIFICATION

20

MATERIAL NAME: TOLUENE

OTHER DESIGNATIONS: Methyl Benzene, Methyl Benzol, Phenylmethane, Toluol, C_7H_8, CAS #0108-88-3

MANUFACTURER/SUPPLIER: Available from many suppliers, including:
Allied Corp., PO Box 2064R, Morristown, NJ 07960; Telephone: (201) 455-4400
Ashland Chemical Co., Industrial Chemicals & Solvents Div., PO Box 2219, Columbus, OH; Telephone: (614) 889-3844

HMIS
H: 2
F: 3
R: 0
PPE*
*See sect. 8

R 1
I 3
S 2
K 4

SECTION 2. INGREDIENTS AND HAZARDS

	%	HAZARD DATA
Toluene	ca 100	8-hr TLV: 100 ppm, or 375 mg/m³* (Skin)** Man, Inhalation, TCLo: 100 ppm: Psychotropic*** Rat, Oral, LD_{50}: 5000 mg/kg Rat, Inhalation, LCLo: 4000 ppm/4 hrs. Rabbit, Skin, LD_{50}: 14 gm/kg Human, Eye: 300 ppm

* Current (1985-86) ACGIH TLV. The OSHA PEL is 200 ppm with an acceptable ceiling concentration of 300 ppm and an acceptable maximum peak of 500 ppm/10 minutes.
** Skin designation indicates that toluene can be absorbed through intact skin and contribute to overall exposure.
*** Affects the mind.

SECTION 3. PHYSICAL DATA

Boiling Point ... 231°F (111°C)
Vapor Pressure @ 20°C, mm Hg ... 22
Water Solubility @ 20°C, wt. % ... 0.05
Vapor Density (Air = 1) ... 3.14
Evaporation Rate (BuAc = 1) ... 2.24
Specific Gravity (H_2O = 1) ... 0.866
Melting Point ... -139°F (-95°C)
Percent Volatile by Volume ... ca 100
Molecular Weight ... 92.15

Appearance and odor: Clear, colorless liquid with a characteristic aromatic odor. The odor is detectable to most individuals in the range of 10 to 15 ppm. Because olfactory fatigue occurs rapidly upon exposure to toluene, odor is not a good warning property.

SECTION 4. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp.	Flammability Limits In Air	LOWER	UPPER
40°F (4°C) CC	896°F (480°C)	% by Volume	1.27	7.1

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical, alcohol foam. Do not use a solid stream of water because the stream will scatter and spread the fire. Use water spray to cool tanks/containers that are exposed to fire and to disperse vapors.
UNUSUAL FIRE/EXPLOSION HAZARDS: This OSHA class IB flammable liquid is a dangerous fire hazard. It is a moderate fire hazard when exposed to oxidizers, heat, sparks, or open flame. Vapors are heavier than air and may travel a considerable distance to an ignition source and flash back.
SPECIAL FIRE-FIGHTING PROCEDURES: Fire fighters should wear self-contained breathing apparatus with full facepiece operated in a positive-pressure mode when fighting fires involving toluene.

SECTION 5. REACTIVITY DATA

CHEMICAL INCOMPATIBILITIES: Toluene is stable in closed containers at room temperature under normal storage and handling conditions. It does not undergo hazardous polymerization. This material is incompatible with strong oxidizing agents, dinitrogen tetraoxide, silver perchlorate, tetranitromethane, and uranium hexafluoride. Contact with these materials may cause fire or explosion. Nitric acid and toluene, especially in the presence of sulfuric acid, will produce nitrated compounds that are dangerously explosive.

CONDITIONS TO AVOID: Avoid exposure to sparks, open flame, hot surfaces, and all sources of heat and ignition. Toluene will attack some forms of plastics, rubber, and coatings. Thermal decomposition or burning produces carbon dioxide and/or carbon monoxide.

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SECTION 6. HEALTH HAZARD INFORMATION | TLV

Toluene is not considered a carcinogen by the NTP, IARC, or OSHA. SUMMARY OF RISKS: Vapors of toluene may cause irritation of the eyes, nose, upper respiratory tract, and skin. Exposure to 200 ppm for 8 hours causes mild fatigue, weakness, confusion, lacrimation (tearing) and paresthesia (a sensation of prickling, tingling, or creeping on the skin that has no objective cause). Exposure to higher concentrations may cause headache, nausea, dizziness, dilated pupils, and euphoria, and, in severe cases, may cause unconsciousness and death. The liquid is irritating to the eyes and skin. Contact with the eyes may cause transient corneal damage, conjunctival irritation, and burns if not promptly removed. Repeated and/or prolonged contact with the skin may cause drying and cracking. It may be absorbed through the skin in toxic amounts. Ingestion causes irritation of the gastrointestinal tract and may cause effects resembling those from inhalation of the vapor. Chronic overexposure to toluene may cause reversible kidney and liver injury. FIRST AID: EYE CONTACT: Immediately flush eyes, including under eyelids, with running water for at least 15 minutes. Get medical attention if irritation persists.* SKIN CONTACT: Immediately flush skin (for at least 15 minutes) while removing contaminated shoes and clothing. Wash exposed area with soap and water. Get medical attention if irritation persists or if a large area has been exposed.* INHALATION: Remove victim to fresh air. Restore and/or support breathing as required. Keep victim warm and quiet. Get medical help.* INGESTION: Give victim 1 to 2 glasses of water or milk. Contact a poison control center. Do not induce vomiting unless directed to do so. Transport victim to a medical facility. Never give anything by mouth to a person who is unconscious or convulsing. * GET MEDICAL ASSISTANCE = In plant, paramedic, community. Get medical help for further treatment, observation, and support after first aid, if indicated.

SECTION 7. SPILL, LEAK, AND DISPOSAL PROCEDURES

SPILL/LEAK: Notify safety personnel of large spills or leaks. Remove all sources of heat and ignition. Provide maximum explosion-proof ventilation. Limit access to spill area to necessary personnel only. Remove leaking containers to safe place if feasible. Cleanup personnel need protection against contact with liquid and inhalation of vapor (see sect. 8).
WASTE DISPOSAL: Absorb small spills with paper towel or vermiculite. Contain large spills and collect if feasible, or absorb with vermiculite or sand. Place waste solvent or absorbent into closed containers for disposal using nonsparking tools. Liquid can be flushed with water to an open holding area for handling. Do not flush to sewer, watershed, or waterway.
COMMENTS: Place in suitable container for disposal by a licensed contractor or burn in an approved incinerator. Consider reclaiming by distillation. Contaminated absorbent can be buried in a sanitary landfill. Follow all Federal, state, and local regulations. TLm 96: 100-10 ppm. Toluene is designated as a hazardous waste by the EPA. The EPA (RCRA) HW No. is U220 (40 CFR 261). The reportable quantity (RQ) is 1000 lbs/454 kg (40 CFR 117).

SECTION 8. SPECIAL PROTECTION INFORMATION

Provide general and local exhaust ventilation to meet TLV requirements. Ventilation fans and other electrical service must be nonsparking and have an explosion-proof design. Exhaust hoods should have a face velocity of at least 100 lfm (linear feet per minute) and be designed to capture heavy vapor. For emergency or nonroutine exposures where the TLV may be exceeded, use an organic chemical cartridge respirator if concentration is less than 200 ppm and an approved canister gas mask or self-contained breathing apparatus with full facepiece if concentration is greater than 200 ppm.
Safety glasses or splash goggles should be worn in all work areas. Neoprene gloves, apron, face shield, boots, and other appropriate protective clothing and equipment should be available and worn as necessary to prevent skin and eye contact. Remove contaminated clothing immediately and do not wear it until it has been properly laundered.

Eyewash stations and safety showers should be readily available in use and handling areas.

Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them.

SECTION 9. SPECIAL PRECAUTIONS AND COMMENTS

STORAGE SEGREGATION: Store in a cool, dry, well-ventilated area away from oxidizing agents, heat, sparks, or open flame. Storage areas must meet OSHA requirements for class IB flammable liquids. Use metal safety cans for handling small amounts. Protect containers from physical damage. Use only with adequate ventilation. Avoid contact with eyes, skin, or clothing. Do not inhale or ingest. Use caution when handling this compound because it can be absorbed through intact skin in toxic amounts. SPECIAL HANDLING/STORAGE: Ground and bond metal containers and equipment to prevent static sparks when making transfers. Do not smoke in use or storage areas. Use nonsparking tools. ENGINEERING CONTROLS: Preplacement and periodic medical exams emphasizing the liver, kidneys, nervous system, lungs, heart, and blood should be provided. Workers exposed to concentrations greater than the action level (50 ppm) should be examined at least once a year. Use of alcohol can aggravate the toxic effects of toluene.
COMMENTS: Emptied containers contain product residues. Handle accordingly!
Toluene is designated as a hazardous substance by the EPA (40 CFR 116). DOT Classification: Flammable liquid. UN1294.
Data Source(s) Code: 1-9, 12, 16, 20, 21, 24, 26, 34, 81, 82, CR

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Approvals J.O. Rechacek, 11/86.
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GENIUM PUBLISHING CORP.

No. 516

XYLENE (Mixed Isomers)
(Revision D)
Issued: November 1980
Revised: August 1988

SECTION 1. MATERIAL IDENTIFICATION

26

Material Name: XYLENE (Mixed Isomers)
Description (Origin/Uses): Used as a raw material for the production of benzoic acid, phthalic anhydride, isophthalic and terephthalic acids and their dimethyl esters in the manufacture of polyester fibers; in sterilizing catgut; with Canadian balsam as oil-immersion in microscopy; and as a cleaning agent in microscopic techniques.
Other Designations: Dimethylbenzene; Xylol; C_8H_{10}; CAS No. 1330-20-7
Manufacturer: Contact your supplier or distributor. Consult the latest edition of the *Chemicalweek Buyers' Guide* (Genium ref. 73) for a list of suppliers.
Comments: Although there are three different isomers of xylene (*ortho*, *meta*, and *para*), the health and physical hazards of all three isomers are very similar. This MSDS is written for a xylene mixture of all three isomers, which is usually commercial xylene.

NFPA: 3 / 2 / 0 / -

HMIS			
H	2	R	1
F	3	I	3
R	0	S	2
PPG*		K	3

*See sect. 8

SECTION 2. INGREDIENTS AND HAZARDS / % / EXPOSURE LIMITS

INGREDIENTS AND HAZARDS	%	EXPOSURE LIMITS
Xylene (Mixed Isomers), CAS No. 1330-20-7*	**	IDLH*** Level: 1000 ppm
*o-Xylene, CAS No. 0095-47-6 *m-Xylene*, CAS No. 0108-38-3 *p-Xylene*, CAS No. 0106-42-3 **Check with your supplier to determine if there are additions, contaminants, or impurities (such as benzene) that are present in reportable quantities per 29 CFR 1910. ***Immediately dangerous to life and health. **** See NIOSH, *RTECS* (No. ZE2100000), for additional data with references to reproductive, irritative, and mutagenic effects.		**OSHA PEL** 8-Hr TWA: 100 ppm, 435 mg/m³ **ACGIH TLVs, 1987-88** TLV-TWA: 100 ppm, 435 mg/m³ TLV-STEL: 150 ppm, 655 mg/m³ **Toxicity Data**** Human, Inhalation, TC_{Lo}: 200 ppm Man, Inhalation, LC_{Lo}: 10000 ppm/6 Hrs Rat, Oral, LD_{50}: 4300 mg/kg

SECTION 3. PHYSICAL DATA

Boiling Point: 275°F to 293°F (135°C to 145°C)*
Melting Point: -13°F (-25°C)
Evaporation Rate: 0.6 Relative to BuAc = 1
Specific Gravity (H_2O = 1): 0.86
Water Solubility (%): Insoluble
Molecular Weight: 106 Grams/Mole
% Volatile by Volume: Ca 100
Vapor Pressure: 7 to 9 Torrs at 68°F (20°C)
Vapor Density (Air = 1): 3.7

Appearance and Odor: A clear liquid; aromatic hydrocarbon odor.

*Materials with wider and narrower boiling ranges are commercially available.

SECTION 4. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temperature	Flammability Limits in Air	LOWER	UPPER
81°F to 90°F (27°C to 32°C)	867°F (464°C)	% by Volume	1%	7%

Extinguishing Media: Use foam, dry chemical, or carbon dioxide. Use water sprays to reduce the rate of burning and to cool containers.

Unusual Fire or Explosion Hazards: Xylene vapor is heavier than air and may travel a considerable distance to a low-lying source of ignition and flash back.

Special Fire-fighting Procedures: Wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in the pressure-demand or positive-pressure mode.

SECTION 5. REACTIVITY DATA

Xylene is stable in closed containers during routine operations. It does not undergo hazardous polymerization.

Chemical Incompatibilities: This material may react dangerously with strong oxidizers.

Conditions to Avoid: Avoid any exposure to sources of ignition and to strong oxidizers.

Hazardous Products of Decomposition: Carbon monoxide (CO) may be evolved during xylene fires.

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SECTION 6. HEALTH HAZARD INFORMATION

Xylene is not listed as a carcinogen by the IARC, NTP, or OSHA.

Summary of Risks: Liquid xylene is a skin irritant and causes erythema, dryness, and defatting; prolonged contact may cause blistering. Inhaling xylene can depress the central nervous system (CNS), and ingesting it can result in gastrointestinal disturbance; and possibly hematemesis (vomiting blood). Effects on the eyes, kidneys, liver, lungs, and the CNS are also reported. **Medical Conditions Aggravated by Long-Term Exposure:** Problems with eyes, skin, central nervous system, kidneys, and liver may be worsened by exposure to xylene. **Target Organs:** CNS, eyes, gastrointestinal tract, blood, liver, kidneys, skin. **Primary Entry:** Inhalation, skin contact/absorption. **Acute Effects:** Dizziness; excitement; drowsiness; incoordination; staggering gait; irritation of eyes, nose, and throat; corneal vacuolization; anorexia; nausea; vomiting; abdominal pain; and dermatitis. **Chronic Effects:** Reversible eye damage, headache, loss of appetite, nervousness, pale skin, and skin rash.

FIRST AID: Eyes. Immediately flush eyes, including under the eyelids, gently but thoroughly with plenty of running water for at least 15 minutes. **Skin.** Immediately wash the affected area with soap and water. **Inhalation.** Remove the exposed person to fresh air; restore and/or support his or her breathing as needed. Have a trained person administer oxygen. **Ingestion.** Never give anything by mouth to someone who is unconscious or convulsing. Vomiting may occur spontaneously, but do not induce it. If vomiting should occur, keep exposed person's head below his or her hips to prevent aspiration (breathing the liquid xylene into the lungs). Severe hemorrhagic pneumonitis with grave, possibly fatal, pulmonary injury can occur from aspiring very small quantities of xylene.

GET MEDICAL HELP (IN PLANT, PARAMEDIC, COMMUNITY) FOR ALL EXPOSURES. Seek prompt medical assistance for further treatment, observation, and support after first aid. If exposure is severe, hospitilization for at least 72 hours with careful monitoring for delayed onset of pulmonary edema is recommended.

SECTION 7. SPILL, LEAK, AND DISPOSAL PROCEDURES

Spill/Leak: Notify safety personnel, provide ventilation, and eliminate all sources of ignition immediately. Cleanup personnel need protection against contact with and inhalation of xylene vapor (see sect. 8). Contain large spills and collect waste or absorb it with an inert material such as sand, earth, or vermiculite. Use nonsparking tools to place waste liquid or absorbent into closable containers for disposal. Keep waste out of sewers, watersheds, and waterways.

Waste Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow Federal, state, and local regulations.

OSHA Designations

Air Contaminant (29 CFR 1910.1000 Subpart Z)

EPA Designations (40 CFR 302.4)

RCRA Hazardous Waste, No. U239

CERCLA Hazardous Substance, Reportable Quantity: 1000 lbs (454 kg), per the Clean Water Act (CWA), section 311 (b) (9)

SECTION 8. SPECIAL PROTECTION INFORMATION

Goggles: Always wear protective eyeglasses or chemical safety goggles. Where splashing is possible, wear a full face shield as a supplementary protective measure. Follow OSHA eye- and face-protection regulations (29 CFR 1910.133). **Respirator:** Use a NIOSH-approved respirator per the *NIOSH Pocket Guide to Chemical Hazards* for the maximum-use concentrations and/or the exposure limits cited in section 2. Follow OSHA respirator regulations (29 CFR 1910.134). For emergency or nonroutine use (leaks or cleaning reactor vessels and storage tanks), wear an SCBA with a full facepiece operated in the pressure-demand or positive-pressure mode. **Warning:** Air-purifying respirators will *not* protect workers in oxygen-deficient atmospheres. **Other:** Wear impervious gloves, boots, aprons, gauntlets, etc., as required by the specifics of the work operation to prevent prolonged or repeated skin contact with xylene. **Ventilation:** Install and operate general and local maximum, explosion-proof ventilation systems powerful enough to maintain airborne levels of xylene below the OSHA PEL standard cited in section 2. Local exhaust ventilation is preferred because it prevents dispersion of xylene into general work areas by eliminating it at its source. Consult the latest edition of Genium reference 103 for detailed recommendations. **Safety Stations:** Make eyewash stations, safety/quick-drench showers, and washing facilities available in areas of use and handling. **Contaminated Equipment:** Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them. Do *not* wear contact lenses in any work area. Remove contaminated clothing and launder it before wearing it again; clean xylene from shoes and equipment. **Comments:** Practice good personal hygiene; always wash thoroughly after using this material. Keep it off of your clothing and equipment. Avoid transferring it from your hands to your mouth while eating, drinking, or smoking. Do *not* eat, drink, or smoke in any work area. Do not inhale xylene vapor.

SECTION 9. SPECIAL PRECAUTIONS AND COMMENTS

Storage/Segregation: Store xylene in a cool, dry, well-ventilated area away from sources of ignition and strong oxidizers. Protect containers from physical damage.

Special Handling/Storage: Make sure all engineering systems (production, transportation) are of maximum explosion-proof design. Ground and bond all containers, pipelines, etc., used in shipping, transferring, reacting, producing, and sampling operations.

Transportation Data (49 CFR 172.101-2)

DOT Shipping Name: Xylene	**DOT Label:** Flammable Liquid	**IMO Label:** Flammable Liquid
DOT ID No. UN1307	**DOT Hazard Class:** Flammable Liquid	**IMO Class:** 3.2 or 3.3

References: 1, 2, 12, 73, 84-94, 100, 103.

Judgments as to the suitability of information herein for purchaser's purposes are necessarily purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of such information, Genium Publishing Corp. extends no warranties, makes no representations and assumes no responsibility as to the accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use.

Prepared by PJ Igoe, BS

Industrial Hygiene Review: DJ Wilson, CIH

Medical Review: MJ Hardies, MD

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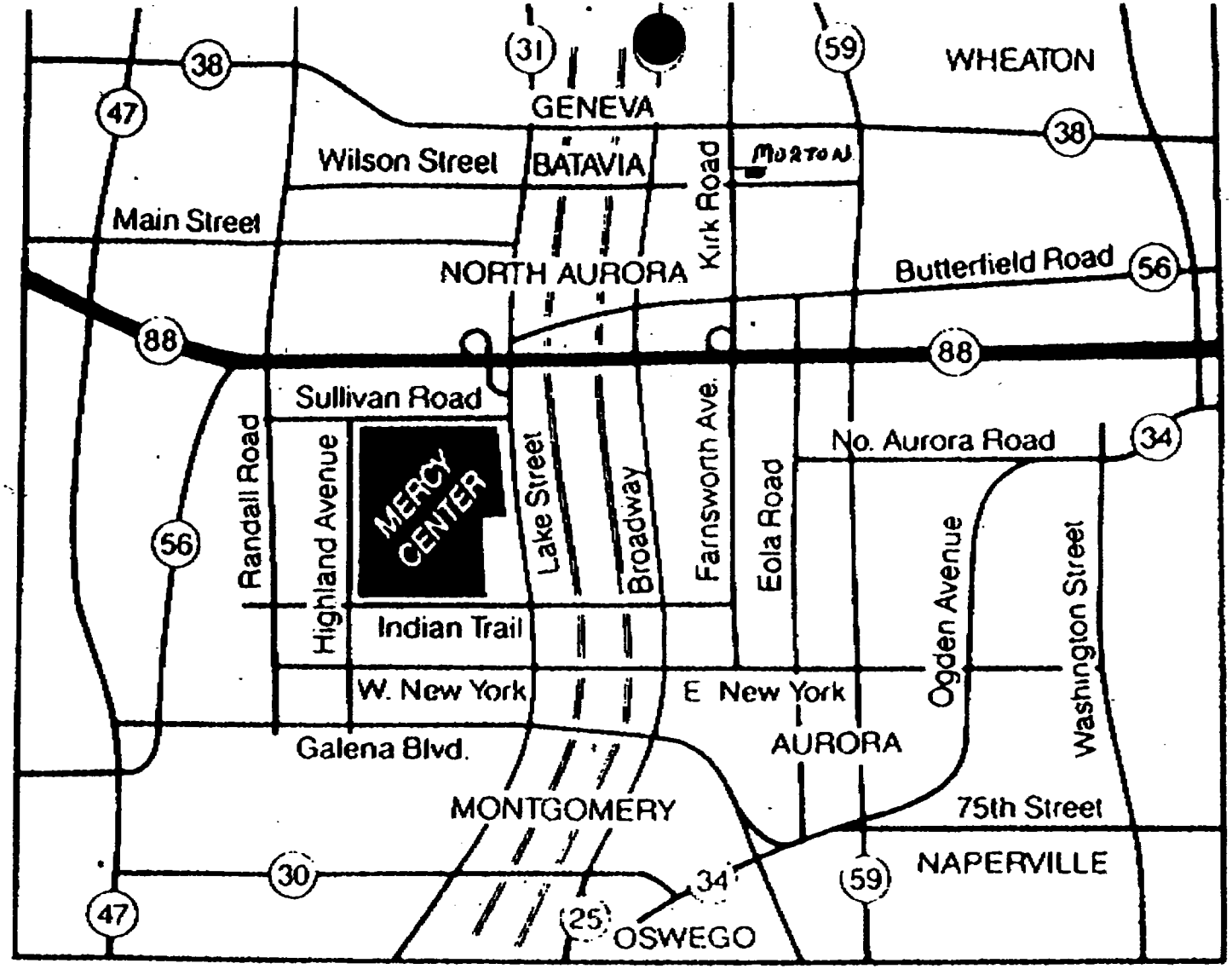


Mercy Center for Health Care Services

1325 N. Highland Avenue
Aurora, Illinois 60506
(312) 859-2222

CONTRACTOR CERTIFICATION

I, _____

as an agent of _____, do hereby certify that the following employees have successfully completed a 40 hour training course which complies with the provisions of 29 CFR 1910.120, and respiratory protection training which complies with 8 CFR 5144. Each employee has successfully completed a medical examination which complies with the above regulations.

Individual copies of certification of successful completion of the required training and medical examination are attached for each employee.

_____ Signature

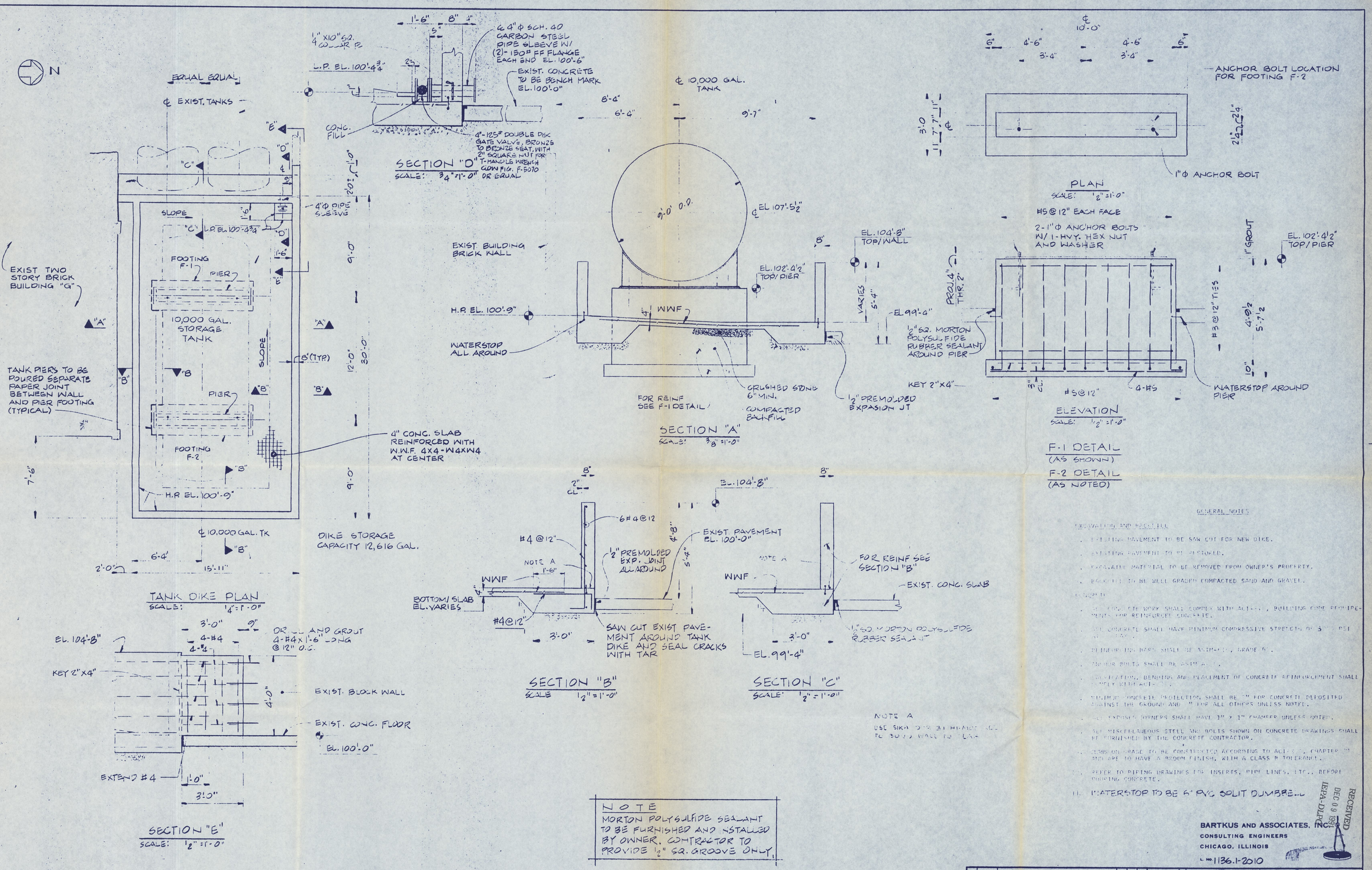
_____ Date

ANALYTICAL RESULTS
MORTON - BATAVIA
HAZARDOUS WASTE STORAGE TANK

	Benzene	Ethyl Benzene	Toluene	Xylene	Dichloroethane	Cis-1,2 Dichloroethene	1,1,1-Trichloroethane	Trichloroethene
SB-1								
S1	BDL	BDL	BDL	44	BDL	BDL	BDL	BDL
S2	BDL	366	BDL	521	BDL	BDL	BDL	BDL
SB-3								
S1	BDL	148	217	120	BDL	BDL	BDL	314
SB-4								
S1	BDL	166	BDL	49.9	BDL	BDL	BDL	BDL
SB-6								
S1	BDL	BDL	36,200		BDL	BDL	BDL	BDL
S2	BDL	30	103	115	BDL	BDL	BDL	BDL
SB-7								
S1	BDL	BDL	184	112	BDL	BDL	BDL	BDL
S3	BDL	BDL		10	BDL	BDL	BDL	6
SB-8								
S1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
S3	BDL	BDL	76.5	21.1	BDL	BDL	BDL	BDL
SB-5								
H_2O	1.8	379	4740	4110	4.7	43.7	7.9	BDL

Soil results on dry weight basis

Soil concentrations in ug/kg
Water concentration in ug/l



NOTE A
USE SIKA [illegible] TO BOND WALL TO SLAB

NOTE
MORTON POLYSULFIDE SEALANT TO BE FURNISHED AND INSTALLED BY OWNER. CONTRACTOR TO PROVIDE ½" SQ. GROOVE ONLY

GENERAL NOTES

EXCAVATION AND BACKFILL

1. EXISTING PAVEMENT TO BE SAW CUT FOR NEW DIKE.
2. EXISTING PAVEMENT TO BE RESTORED.
3. EXCAVATED MATERIAL TO BE REMOVED FROM OWNER'S PROPERTY.
4. BACKFILL TO BE WELL GRADED COMPACTED SAND AND GRAVEL.

CONCRETE

5. ALL CONCRETE WORK SHALL COMPLY WITH ACI-318, BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE.
6. ALL CONCRETE SHALL HAVE MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
7. REINFORCING BARS SHALL BE ASTM-615, GRADE 60.
8. ANCHOR BOLTS SHALL BE ASTM A-307.
9. FABRICATION, BENDING AND PLACEMENT OF CONCRETE REINFORCEMENT SHALL COMPLY WITH ACI-318.
10. MINIMUM CONCRETE PROTECTION SHALL BE 3" FOR CONCRETE DEPOSITED AGAINST THE GROUND AND 2" FOR ALL OTHERS UNLESS NOTED.
11. ALL EXPOSED CORNERS SHALL HAVE 1" x 1" CHAMFER UNLESS NOTED.
12. ALL MISCELLANEOUS STEEL AND BOLTS SHOWN ON CONCRETE DRAWINGS SHALL BE FURNISHED BY THE CONCRETE CONTRACTOR.
13. FLOOR ON GRADE TO BE CONSTRUCTED ACCORDING TO ACI-302, CHAPTER 13 AND ARE TO HAVE A BROOM FINISH, WITH A CLASS B TOLERANCE.
14. REFER TO PIPING DRAWINGS FOR INSERTS, PIPE LINES, ETC., BEFORE POURING CONCRETE.
15. WATERSTOP TO BE 6" PVC SPLIT DUMBBELL

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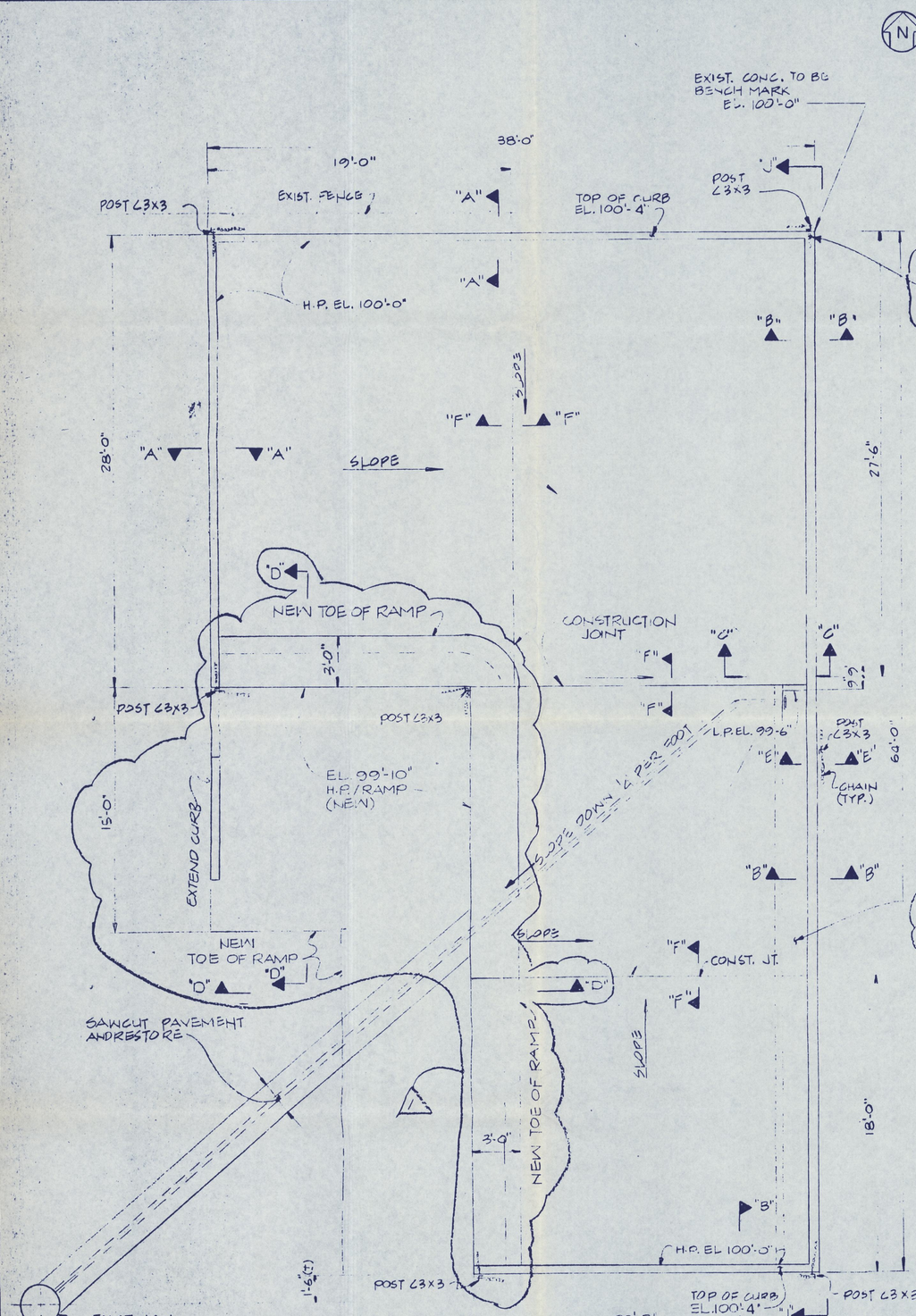
BARTKUS AND ASSOCIATES, INC.
CONSULTING ENGINEERS
CHICAGO, ILLINOIS
L. NO. 1136.1-2010

REV.	DATE	DESCRIPTION	DR.	CH.	AP.

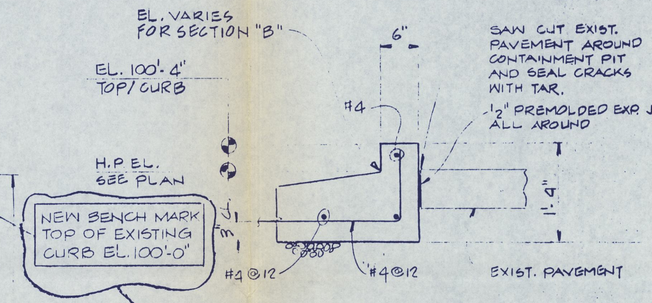
MORTON THIOKOL, INC.
Morton Chemical Division

VENTRON DIVISION - CHICAGO PLANT
TANK DIKE
PLAN AND SECTIONS

DRN. S.R.	LOCATION CHGO	DATE 9-23-88	DATE
CHK. F.A.	PROJ. NO.	DRAWING NO.	REVISION
APP.	SCALE AS NOTED	D-1038 05-01	0



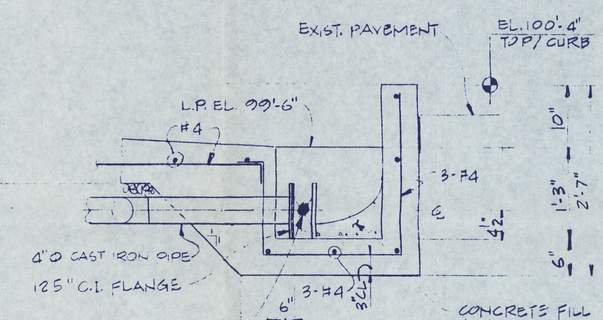
PLAN
SCALE: 1/4" = 1'-0"



SECTION "A"
AS SHOWN

SECTION "B"
AS NOTED

SCALE: 1" = 1'-0"



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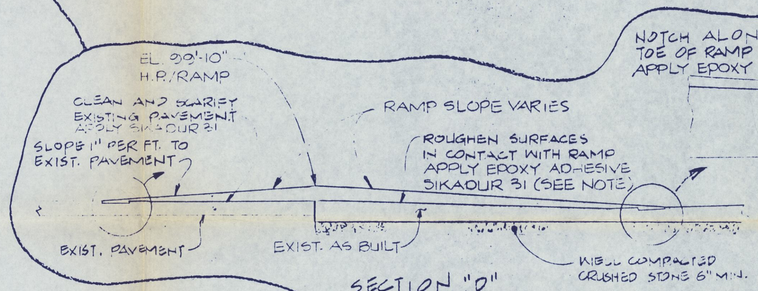

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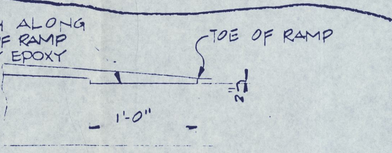
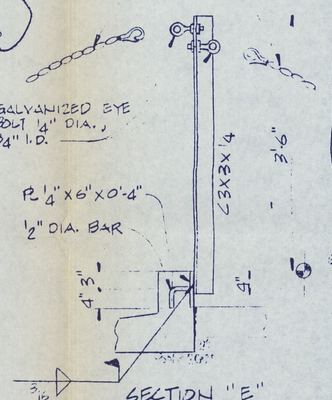
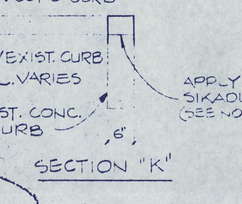


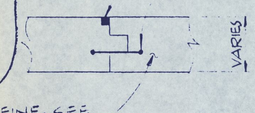
NOTE: USE SIKADUR 31, HI-MOD GEL EPOXY ADHESIVE FOR BONDING NEW AND EXISTING CONCRETE. TO BE USED NEAT PER MANUFACTURER'S SPECIFICATION OF SIKA CORP.



SECTION "E"
(7-POST REQUIRED)
SCALE: 1" = 1'-0"



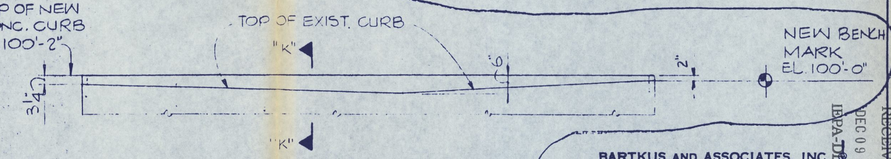
SECTION "K"



FOR REINF. SEE SECTION "A"

SECTION "F"
(TYP. WATERTIGHT CONSTRUCTION JOINT)

NOTE:
FOR GENERAL NOTES SEE DWG. D-1038-05-01



SECTION "J"

NOTE: TOP OF CURB EL. 100'-4" SHOWN ON THIS DWG. NOT "AS BUILT."

BARTKUS AND ASSOCIATES, INC.
CONSULTING ENGINEERS
CHICAGO, ILLINOIS
L. No. 1136.1-2030

REV.	DATE	DESCRIPTION	DR.	CH.	AP.
1	3-30-89	MOD. PER C.A.T. ORD.			
0	[illegible]	[illegible]			

MORTON THIOKOL, INC.
Morton Chemical Division

VENTRON DIVISION - CHICAGO PLANT
DRUMMED WASTE STORAGE DIKE
PLAN AND SECTIONS

DRN. S.R.	LOCATION CHGO.	DATE 9-23-88	DATE
CHK. F.A.	PROJ. NO.	DRAWING NO. D-1038-05-02	REVISION 1
APP.	SCALE AS NOTED		

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