

KDHE CERCLA RESPONSE ACTION PRIORITY FORM

Site Name/Location Proposed for EPA Referral: Hoxie Crash Site

CERCLA Response Actions Recommended:

Remedial ___ Removal X Priority: Time-Critical/Emergency

Completed By: Randolph L. Brown, Unit Chief, Site Assessment Unit, KDHE/BER

1. Site Location and Description

The Hoxie Crash site is located at REDACTED in Hoxie, Sheridan County, Kansas. The site area is a residential subdivision. The site is the location of an aerial agricultural pesticide applicator aircraft crash. The crash occurred on July 21, 1998, when an aircraft piloted by REDACTED of Hoxie Flying Service crashed into the Stella Krannawitter residence in Hoxie, Kansas. The aircraft was transporting 120-150 gallons of methyl parathion in a carrier solution for application to agricultural fields. No methyl parathion has been recovered from the crash site. REDACTED was evacuated from the house by the Sheridan County Emergency Preparedness Coordinator. An emergency response contractor for the Hoxie Flying Service applied a chlorine bleach/water treatment to the site after the crash occurred based on the pesticide manufacturer's recommendations. KDHE/BER conducted a Removal Evaluation at the site to verify that a significant release of hazardous substances and exposure threat to nearby residents existed at the site. The KDHE/BER Removal Site Evaluation contains relevant spill documentation and analytical results.

2. Description of Contaminant Extent

Surficial soil sampling indicated levels of methyl parathion in soils as high as 6,200 mg/kg at a depth of 10". Levels in exceeding 1000 mg/kg were detected in the REDACTED residential yard. Research of screening concentrations for residential soils indicated levels of 7.1 mg/kg (Missouri CALM), 9.8 mg/kg (EPA Region IX PRG), 14 mg/kg (older Missouri ASL) and 20 mg/kg (EPA Region III RBC for residential soils). analytical results from the site indicate areas in the REDACTED back yard highly elevated in excess of identified residential screening concentrations. Pesticide residue may be present within the structure of the REDACTED residence and indoor air sampling/surface wipe sampling is necessary. The Tritt and Meyer residences are located directly adjacent to the REDACTED residence and may be affected. Preliminary soil results indicate limited apparent impact to these yards, however the indoor air quality of these residences is also of concern. Another limited area was identified in the front of the REDACTED residence (front yard) above screening levels.

3. Public/Human Health Exposures/Risks

Residential areas are located at and within 1/4 mile from the site. Methyl parathion can be an acutely toxic hazardous waste (P071). Methyl parathion has documented adverse human health affects from exposure. Methyl parathion is considered a highly to acutely toxic member of the organophosphate cholinesterase-inhibiting pesticides. Indoor air quality in the REDACTED and adjacent residences is also a concern and should be properly assessed as part of the removal response at the site. Surface wipe samples, carpet samples, etc. in the affected residences

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should also be conducted. Photoionization device (PID) screening of the Krannawitter yard indicated little or no evidence of a significant petroleum aircraft fuel release at the site. No elevations above zero parts per million (PPM) total organic vapors (TOV) were indicated. The site has been temporarily secured by police tape and plastic security net fence. The degradation product of methyl parathion, methyl paraoxon, has a relative toxicity up to five times greater than methyl parathion.

4. Ecological Risks

The site is located in a residential development, and limited ecological risk above and beyond identified public health exposure risks have been identified.

5. Enforcement Considerations

The Hoxie Flying Service was to complete a Work Plan for the response actions at the site and was required to submit the Work Plan to KDHE by 12:00 p.m. August 25, 1998. The Work Plan was not received by KDHE by the deadline or The Work Plan received by KDHE was not adequate to properly address the response actions at the site.

6. Response Conclusions/Recommendations:

A Fund-lead removal action pursuant to § 106 of CERCLA consistent with §§ 300.410-300.415 of the NCP is recommended at the site in a time-critical or emergency fashion. Soils elevated above appropriate residential levels along with contaminated debris and wastes at the site should be removed, characterized for disposal and properly disposed. Further indoor air and surface sampling should be conducted at the REDACTED and other potentially affected residences.

7. ENFORCEMENT SUMMARY

- a. PRP Information (Identified PRPs) - Hoxie Flying Service
- b. Municipality - Hoxie, Sheridan County, Kansas
- c. PRPs Technically Competent - No (likely)
- d. PRPs Financially Able - No (have defaulted from KDHE-required actions)
- e. PRPs Cooperative - No likely viable PRPs
- f. PRP Contact - REDACTED Hoxie Flying Service, P.O. Box
156, Hoxie, Kansas 67740
(785) 675-3988

8. Other Information

- a. Population Within One Mile - 1000
- b. Sensitive Environments - Residential areas are located within 1/4 mile of the site
- c. Project Manager/Site Contact: Larry Knoche, KDHE/BER, (785) 296-1662

REMOVAL EVALUATION

**HOXIE CRASH SITE
HOXIE, SHERIDAN COUNTY, KS**

**KDHE Identification Number
P609070626**



**Kansas Department of Health and Environment
Bureau of Environmental Remediation
Site Assessment Unit/Remedial Section
Forbes Field, Building 740
Topeka, Kansas 66620
September, 1998**

**REMOVAL EVALUATION
HOXIE CRASH SITE
HOXIE, KANSAS
KDHE/BER PROJECT #P609070626
SEPTEMBER, 1998**



KDHE/BER Project Manager:
Randolph L. Brown, Environmental Geologist

Site Reconnaissance and Field Activities by:
Randolph L. Brown, Environmental Geologist, Site Assessment Unit
Farrell Dallen, Environmental Technician, Site Assessment Unit

**HOXIE CRASH SITE
REMOVAL EVALUATION**

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**HOXIE CRASH SITE
REMOVAL EVALUATION**

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SECTION I: INTRODUCTION

The Kansas Department of Health and Environment (KDHE) has a continuing cooperative agreement with the U.S. Environmental Protection Agency (EPA) to perform investigations of selected sites which are known or suspected to be contaminated with hazardous substances. These investigations are performed under the authority of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986 and consistent with the National Oil and Hazardous Substances Contingency Plan (NCP) 40 CFR § 300.

This Removal Site Evaluation (RE) was performed by the KDHE Bureau of Environmental Remediation (BER) as part of the cooperative agreement for the federal Fiscal Year (FY) 1998. The purpose of this RE was to collect additional information at the Hoxie Crash Site to supplement the Preliminary Removal Evaluation (PRE) form completed by KDHE in 1998 and to evaluate other potential time-critical exposure risks to nearby residents adjacent to the crash site.

The purpose of the RE was also to further assess the threat posed to human health and the environment by the site as well as to determine the need for further action under CERCLA/SARA consistent with the NCP. The RE has gathered additional information to support consideration of removal response actions consistent with § 300.410-300.415 of the NCP. The RE investigation included collection of additional soil samples to further define the area of contamination identified in the PRE.

SECTION II: SITE DESCRIPTION

A. Physical Description

The site is the location of an aerial pesticide applicator aircraft crash in Hoxie, Sheridan County, Kansas. The site is located at **REDACTED** in Hoxie. The legal description for the site is the NW 1/4 of Section 15, Township 8 South, Range 28 West.

The site is located in a residential subdivision in Hoxie north of U.S. Highway 24. The airport from which the aerial applicator was launched is located approximately 1/4 mile due west of the crash site. No access limitations exist at the site, and several residences (**REDACTED**) are located within 100 feet of the crash site.

Land use surrounding the site is primarily residential, commercial (airport), and agricultural. Approximately 1,342 persons live within one mile from the site (Reference

1). Most of the affected areas include the REDACTED house, areas of the front and back yards, and the house itself.

B. Geology/Soils

The site is within the High Plains Physiographic Province and is underlain by aeolian deposits of the Sanborn Formation of Pleistocene age. The Sanborn Formation typically consists of fine-grained silt deposits. The Sanborn Formation is interpreted to be approximately 25 feet thick at the site. The Sanborn Formation is underlain by the Ogallala Formation of Plio-Pleistocene age. The Ogallala Formation consists of stratified sands, silts, gravels, caliche and cemented "mortar beds". The Ogallala is approximately 150-200 feet thick in the site area. Bedrock is present typically at 170-250 feet in the site area (Reference 2). Bedrock at the site consists of the Smoky Hill Chalk Member of the Niobrara Formation. The Niobrara Formation typically acts as a confining layer for the Ogallala Formation in the region (Reference 2). Soils at the site are silts and silty loams of the Keith series, typically formed in Sanborn Formation deposits and are typically greater than 60 inches in depth.

Hoxie's Public Water Supply (PWS) wells are screened in the Ogallala Formation. The water table in the nearby PWS wells is reported to be typically at least 120 feet below ground surface (Reference 3). Most of the PWS wells are 200 feet in total depth (Reference 2).

The Ogallala Formation is also heavily used north of town for center-pivot irrigation. PWS Well #5 is located within 500 feet of the site but is not considered a likely potential exposure target given the nature of the release, depth of the well and physical characteristics of the pesticide constituents.

The mobility of methyl parathion is limited in soils (as is typical of pesticides) and contaminant migration greater than 2 feet in depth from surface is not suspected at the site. Deep ground water sources are therefore not expected to be impacted from the release of hazardous substances at the site.

SECTION III: SITE HISTORY/BACKGROUND

A plane carrying approximately 150 gallons of a water/methyl parathion solution crashed into the REDACTED residence on July 21, 1998. The REDACTED residence is located at REDACTED REDACTED Hoxie, Sheridan County, Kansas. The plane

was piloted by REDACTED and employee of Hoxie Flying Service owned and operated by REDACTED

The plane crashed shortly after take-off from the Hoxie Airport located approximately 1/4 mile from the REDACTED residence. Neither REDACTED, who was home, nor REDACTED was seriously injured. The plane was carrying approximately 30 gallons of concentrated PennCap-M methyl parathion in a water solution of 120 gallons for application to agricultural fields. Hoxie Flying Service is registered with the Kansas Board of Agriculture (KBOA) as a pesticide applicator. A property deed for the REDACTED property is located as Attachment 3 in the PRE.

The house was damaged, especially in the kitchen area where the aircraft penetrated the roof. After impacting the house, the aircraft apparently overturned and came to rest in the back yard near the garage structure. The aircraft was salvaged and removed from the REDACTED property shortly after the crash on July 22, 1998. Photos of the site are included in Appendix B.

Haz-Mat Response, a contractor for the flying service, conducted an initial chemical treatment of the spill site. The treatment consisted of a triple rinse of a chlorine bleach (chlorox)/water wash solution. Several hundred gallons of the chlorox/water solution was applied to the site by the response contractor. The contractor then left the site after the chlorine bleach treatment and did not perform any additional response actions (i.e. soil sampling or indoor air sampling/surface wipe sampling within the house).

KDHE's Northwest District Office (NWDO) and the Sheridan County Emergency Preparedness Coordinator requested further site evaluation from KDHE's Site Assessment Unit because it was unclear whether the owner/operator (Hoxie Flying Service) had the means or was willing to initiate response actions at the site.

No correspondence has been received by KDHE to date indicating the Hoxie Flying Service has agreed or intends to perform additional response actions at the site. The Site Assessment Unit of KDHE completed a Preliminary Removal Evaluation (PRE) based on initial soil sampling and spill information. The PRE form and spill information is included in Appendix A.

REDACTED homeowners insurance carrier has initiated actions for the home structure including retaining contractors for inside air monitoring within the house. Because actions to monitor indoor air quality had been initiated, the PRE/RE focused on wastes and contaminated soils in the yard and in adjacent residential yards.

REDACTED was evacuated by the Sheridan County Emergency Preparedness Coordinator. Additional residents (REDACTED) were not evacuated by the Sheridan County Emergency Preparedness Coordinator.

SECTION IV: HAZARDOUS SUBSTANCE CHARACTERISTICS

The primary hazardous substance of concern is methyl parathion. According to information provided by the manufacturer, ELF-ATOCHEM, methyl paraoxon, a degradation/oxidation product of methyl parathion, is a compound of substantial more toxicity relative to methyl parathion, which is itself an acutely toxic compound (Reference 3). Methyl parathion is designated as an organophosphate cholinesterase-inhibiting pesticide.

Methyl parathion was restricted (RUP) from indoor use as an indoor pesticide in 1978 because of several reported incidents of poisoning of residents and pets in houses at which methyl parathion had been applied. Numerous deaths and sickness have been attributed to acute methyl parathion exposure since the 1950s (Reference 3). Methyl parathion is considered a highly toxic member of the organophosphate pesticide category (Reference 8).

Methyl parathion is a yellowish-brown liquid with a typical sulfur odor similar to rotten eggs. Methyl parathion was originally derived from nerve gas compounds in the early 1950s. The occupational exposure limits established by the Occupational Safety and Health Administration (OSHA) for methyl parathion are low (0.2 mg/m^3).

Methyl parathion is a cholinesterase inhibitor which blocks electrochemical messages from being transmitted between nerve endings and the brain. It has been extensively used as a very strong pesticide for certain types of persistent insects, especially those occurring on cotton, corn, and soybeans. Methyl paraoxon is a similar compound but has a relative toxicity two to five (2-5) times greater than methyl parathion (Reference 3). A Material Safety Data Sheet (MSDS) is included with the PRE in Appendix A. Additional information about methyl parathion is included in Appendix D.

4-nitrophenol is typically the ultimate degradation product in the oxidation process of methyl parathion. 4-nitrophenol is a phenolic compound with much lower toxicity than either methyl parathion or methyl paraoxon. Methyl parathion and all of its degradation/oxidation products exhibit typically low mobility and high persistence in soils (Reference 3)

SECTION V: SUMMARY OF PRELIMINARY REMOVAL EVALUATION RESULTS

KDHE completed a Preliminary Removal Evaluation for the site based on the soil results from location SB-1. This sample indicated a methyl parathion level of 1,400 mg/kg, well over established screening levels currently ranging between 9.8 mg/kg (EPA Region IX) and 20 mg/kg (EPA Region III). A risk level of 7.1 mg/kg was recently established by Missouri as a residential scenario cleanup level (CALM). The PRE and relevant spill information is included in Appendix A. Given the toxicity of methyl parathion and its degradation product, methyl paraoxon, a lower residential screening concentration is probably appropriate.

The sample result from the PRE indicated a substantial acute residential exposure threat was present from wastes and contaminated soils at the site. A more detailed Removal Evaluation was initiated in a time-critical fashion to further evaluate soils and wastes in the yard area. Because the flight path centered on an eastward direction, and the pilot only released the tank contents ("dumped") immediately before impact, the area immediately proximate to the flight path before and after the crash was evaluated.

A substantial exposure threat from a release of hazardous substances was identified from the PRE results. Several residents are located within 100 feet of the crash site and may be exposed to unacceptable risks from air releases and surficial exposure to wastes and contaminated soils/debris. No significant surface water bodies are present at or near the site. Given the high methyl parathion results after a triple chlorine-bleach rinse, the chlorine addition to the wastes and contaminated soils did not appear to effectively oxidize the methyl parathion into 4-nitrophenol as was predicted by the pesticide formulator.

SECTION VI: SITE ACTIVITIES

The KDHE Site Assessment Unit field team of Farrell Dallen and Randy Brown arrived at the site on July 29, 1998 and began sampling the site through July 30, 1998. The site was visually inspected by the KDHE Site Assessment Unit team with Sheridan County Emergency Preparedness Coordinator John Cahoj.

Visible yellow staining was present in much of the backyard area, and along a wooden picket fence separating the REDACTED and REDACTED residences. The area had been initially secured by Mr. Cahoj with yellow police line marking tape and REDACTED had been evacuated.

Sampling was conducted throughout the apparent crash area. Additional sample locations were determined at the ~~REDACTED~~ and ~~REDACTED~~ residences, as well as the front yard area of the ~~REDACTED~~ residence where the initial aerial "dump" of the aircraft pesticide tank occurred. The area was screened by a Photovac 2020 photoionization detector (PID) to determine if significant amounts of aircraft fuel remained at the site. All work was conducted according to KDHE's Quality Management Plan (QMP) following appropriate KDHE Standard Operating Procedures (SOPs). The Photovac 2020 was field calibrated and zeroed each day according to manufacturer's specifications.

Sampling was conducted by advancing acetate liners from the surface to 4-6" with an AMS slambar/soil coring device. After sampling, acetate liner inserts containing the soil samples were removed from the coring device. Samples were handled by immediately labelling and capping acetate liners and placing these on ice in a dedicated sample cooler. Selected deeper samples (4"-10" or 6"-12") were also advanced in some areas. Sample results are reported in Table 1.

Two (2) samples were advanced in the ~~REDACTED~~ yard. This residence was apparently shielded from the spill and release by the ~~REDACTED~~ house and garage. Five (5) samples were advanced in the ~~REDACTED~~ yard along the path of the crash behind the boundary picket fence. Forty-eight (48) locations were advanced in the ~~REDACTED~~ backyard and three (3) in the front yard along the crash path. The fence separating the ~~REDACTED~~ and ~~REDACTED~~ residences was visibly stained with a yellowish-brown streak. The Tritt-Krannawitter fence was not visibly stained.

Selected samples were delivered to Pace Analytical Services in Lenexa, Kansas for analysis via Method 8270. Samples were analyzed for methyl parathion, methyl paraoxon, and 4-nitrophenol. Pace was the only readily available laboratory which could perform the additional methyl paraoxon analysis. A field quality control sample (QC) was obtained by rinsing deionized water through the AMS slambar core tools and thereby obtaining a rinsate sample. All core barrels were rinsed into a composite one liter amber jar and analyzed for methyl parathion, methyl paraoxon and 4-nitrophenol.

Decontamination of field equipment was accomplished by soaking each core tip and barrel in analconox-water solution, using a stiff nylon brush to scrub core tools, and rinsing with deionized water. Core tools were then dried with clean disposable towels and allowed to air dry.

Additional soil, indoor wipe and indoor air sampling was conducted by EPA and its contractor, Ecology and Environment (E&E) under the Superfund Technical

Assessment and Response Team (START) contract on August 27, 1998 after completion of the initial KDHE RE sampling. KDHE was provided with additional sample results and locations from the August 27, 1998. KDHE was only provided with a data table and sketch of the E&E sample results, and did not perform a data validation/evaluation of the E&E data nor can attest to its quality. Sample methodology, techniques, equipment, decontamination, etc. were not included in the data table provided to KDHE with the additional sample results. Additional soil sample locations for the EPA/START sampling event were not indicated other than selected re-sampling of original KDHE soil sample locations.

SECTION VII: ANALYTICAL RESULTS

A. Field Sampling Results

Several samples indicated soil levels in excess of established screening concentrations at this site. Sample results are included in Table 1. Several areas were identified in the front and back yards above the screening concentration. A maximum detection of 4,000 mg/kg was detected in sample K-18 in the 0-4" sampling interval. Sample K-17 deep (4-10") indicated 6200 mg/kg methyl parathion and was the maximum overall detection at the site. Several detections over 1,000 mg/kg were identified in the REDACTED back yard. Generally, samples on the south side of the yard did not indicate elevated levels of methyl parathion.

Figure 2 contains the back yard and crash area as well as a diagram of the adjacent REDACTED and REDACTED residences and yards; Figure 3 includes the front yard area of the REDACTED residence. The primary area of concern appears to be in the back yard of the REDACTED residence near the garage (see Figure 2) and adjacent areas. This area may also extend along the fence an additional length to the north of location K-6 as this extent was not fully defined in the RE. Field screening results from sampling with the Photovac 2020 PID unit did not indicate any levels above zero for fuel (BTEX) compounds; therefore no laboratory samples were obtained for fuel constituents.

A smaller area was defined immediately adjacent to the house in the front yard at sample location KF3. This area appears to be limited to a five (5) foot area from a point 5 feet back from the house to the house. No samples with detections above screening levels were identified in the REDACTED and REDACTED yards. Sample KF3 indicated 2600 mg/kg methyl parathion. Deeper detections in K-34, K-17, K-18, and K-37 indicate that deeper (>6") soil contamination exists in several locations above the screening level. The

heavy application of a chlorox/water solution may actually have saturated soils and forced contamination into deeper soils.

Methyl paraoxon was detected in several samples. The maximum detection of methyl paraoxon was 37 mg/kg in K-3, which had a corresponding methyl parathion detection of 360 mg/kg. Methyl paraoxon was only detected in samples indicating 290 mg/kg and greater concentrations of methyl parathion. No guidelines for soils currently exist for methyl paraoxon in soils. The horizontal and vertical extent of methyl parathion contamination in soils above available screening concentrations at the site was not fully defined by the sampling event.

4-nitrophenol was detected at a maximum concentration of 240 mg/kg in K-17 deep, with a corresponding methyl parathion detection of 6,200 mg/kg. 4-nitrophenol detections were higher relative to methyl parathion detections in several samples, indicating degradation of methyl parathion. Higher 4-nitrophenol results relative to methyl parathion were observed only in samples with less than 1 mg/kg methyl parathion. Degradation appears to be generally inhibited in higher concentrations of methyl parathion. The maximum 4-nitrophenol detection was 240 mg/kg, also in K-17 deep. 4-nitrophenol currently has a risk-based screening level in residential soils of 4800 mg/kg (EPA Region III).

B. QC Sample Results, Data Evaluation

The rinsate QC sample indicated a result of 12 $\mu\text{g/l}$ of methyl parathion. No methyl paraoxon nor 4-nitrophenol were indicated. Given the low concentration of methyl parathion detected relative to the screening concentration (mg/kg range), and multiple non-detections in areas not impacted by the crash and spill, no significant negative data implications have been identified from the rinsate detection. Review of laboratory data indicated all method blanks, matrix spikes, etc. were within an acceptable range. All data collected is therefore determined to be acceptable and valid. A brief data quality evaluation is included with the laboratory data in Appendix C. Data validation was conducted in compliance with KDHE Standard Operating Procedure (SOP) ## BER-11, *Evaluation and Validation of Data*.

C. Additional EPA/START Analytical Data

As previously mentioned, additional soil, indoor wipe and indoor air sampling was conducted by EPA and its contractor, Ecology and Environment (E&E) under the Superfund Technical Assessment and Response Team (START) contract on August 27, 1998, after completion of the initial KDHE RE sampling. The additional EPA/E&E

START sampling data was only provided in the form of a data table, and individual laboratory analytical sheets, chain of custody forms, sample submission forms, lab QC information, and other information necessary to conduct a data quality assessment and validation was not provided by EPA. The additional EPA/START analytical data is included in this site evaluation, but the data has not been validated or its quality assessed. Elevated levels of methyl parathion were verified by the EPA/START sampling in the garage area (maximum detection 1,600 mg/kg) and near the east fence back yard fence, 260 mg/kg). In addition to the soil sample results, wipe sample results from the garage floor, kitchen counter, drywall and basement floor indicated elevated levels of methyl parathion in the REDACTED residence. These are summarized in Table 2. In general, the EPA/START soil results verified the initial KDHE soil results. No detections were indicated in passive indoor air samples.

SECTION VIII: INITIAL CONSIDERATION OF RESPONSE OPTIONS

A. Removal Response Considerations

Methyl parathion is defined by the Resource Conservation and Recovery Act (RCRA) as an acutely toxic waste with a listed waste code of P071. Because an area of acutely toxic waste is present in close proximity to residential areas, physical removal of soils appears to be the most time-efficient and expedient initial option to reduce the exposure threat to residents.

Land application options, conditions, and considerations of pesticide waste and contaminated soils will need to be made through KDHE's Waste Management Program (KDHE/BWM) and the Kansas Board of Agriculture (KBOA). Waste treatment and disposal options for debris will also need to be discussed with KDHE/BWM and obtain KDHE/BWM approval.

The area near sample K-6 indicated levels above the screening concentration of 14 mg/kg. This area has not been fully defined, and some over-excavation to the north of K-6 will be necessary to address the area. This area should also be sampled after removal to verify removal efficiency. Since RE sampling was not inclusive nor intended to definitively delineate areas above the screening level, additional sampling will be required to verify removal efficiency.

Additional removal considerations include contaminated debris such as fencing, garage siding, and roofing which may be saturated or is visibly stained with pesticide waste. Again, BWM should be consulted by any contractor performing work at the site to

determine disposal options. Confirmation sampling approved by KDHE should be conducted for any soil removal at the site.

A precise estimate of volume of soil to be considered for removal is not available, given data gaps in the horizontal and vertical extent of methyl parathion in surficial soils. Initial thumbnail estimates of excavating the north half of the REDACTED and portions of the REDACTED yards to a depth of one foot (1') averaged over the area yields an approximate volume of approximately 185-200 yards of material and an unknown amount of additional demolition debris potentially requiring removal and proper disposal. Additional sampling is required to define the horizontal and vertical extent of soils requiring removal.

B. Remedial Response Considerations

Remedial criteria for release or threat of release consistent with § 300.420 of the NCP should be mitigated by removal of soils impacted above health or risk-based benchmarks in the removal response actions. Removal of these areas of elevated soil concentrations of methyl parathion should also reduce any substantial threat of release to subsurface soils and ground water in the site area. A residual risk evaluation and consideration of remedial criteria should be conducted at the close of the removal response activities by completion of an abbreviated Preliminary Assessment consistent with the NCP by either KDHE or EPA's START contractor. Completion of removal response activities would likely significantly reduce releases or threat of releases of hazardous substances to pathways of concern.

SECTION IX: CONCLUSIONS

A substantial release of methyl parathion has been identified at the Hoxie Crash Site. This RE has preliminarily defined an impacted area within the front and back yards of the REDACTED residence which may pose an imminent or significant exposure threat to residents.

The release of methyl parathion occurred on July 21, 1998, when an aircraft from the Hoxie Flying Service crashed into the REDACTED residence in Hoxie, Kansas, causing a catastrophic release of 120-150 gallons of a methyl parathion solution into the REDACTED house, yard, and adjacent residential yards.

An emergency response contractor for the flying service conducted a limited soil wash/chemical treatment of wastes and impacted soils. The treatment was conducted

by triple washing the area with a chlorine bleach (chlorox)/water solution. The PRE results (further corroborated by the RE) concluded that the chemical treatment was not effective in reducing the concentrations of methyl parathion in wastes and soils at the site below risk-based residential concentrations.

The PRE and RE were conducted to verify the release as well as document conditions eligible for removal response consistent with § 300.410-300.415 of the NCP. The PRE was conducted initially to verify the effectiveness of the emergency response actions, which were determined to not be effective and appropriate. The RE further evaluated the site with additional sampling intended to provide an initial extent to review removal response options.

An area was identified in the front and back yards of the REDACTED residence and potentially adjacent areas which exceeded existing residential soil screening levels for methyl parathion in soils. The most expedient identified removal response option is physical removal and treatment/application of soils as determined by KDHE/BWM and KBOA.

Deeper surficial soils (>6") indicated high levels of methyl parathion in several locations. These areas will require sufficient excavation to remove the source wastes and contaminated soils to alleviate the surficial soil and air exposure threat. The horizontal and vertical extent of methyl parathion contamination in soils above available screening concentrations at the site was not fully defined during the RE sampling event. Additional sampling must be conducted to (1) fully define the extent both horizontally and vertically and (2) confirm the effectiveness of any soil, waste and debris removal completed at the site.

Surface wipe samples in the REDACTED residence indicated elevated levels of methyl parathion in EPA/START sample results. These samples should be evaluated by a competent hygienist/environmental health professional to determine if these areas are suitable for rehabilitation. Indoor air samples did not indicate methyl parathion detections.

If the potentially responsible party (PRP) does not provide response actions at the site under KDHE oversight, the site is a candidate for referral to EPA for additional time-critical removal response consistent with § 300.415 of the NCP. Additional enforcement actions may also be taken by EPA if the site is referred for further time-critical removal response. An abbreviated Preliminary Assessment (PA) or some other confirmatory response is recommended at the site at the close of removal response actions (either PRP, KDHE or EPA-lead) to verify the completion of activities, successful removal of

soils and wastes exceeding appropriate action levels and to complete remedial site evaluation of the site consistent with § 300.420 of the NCP.

The lack of high detections of the ultimate degradation product (4-nitrophenol) relative to methyl parathion detections indicates the prior chemical treatment by the emergency response contractor was not successful or effective in reducing the concentrations and risks present at the site from the methyl parathion release. The primary degradation product of methyl parathion, methyl paraoxon, has a relatively greater toxicity than methyl parathion. Methyl paraoxon detections are limited to areas with detections of methyl parathion over the residential soil screening concentrations.

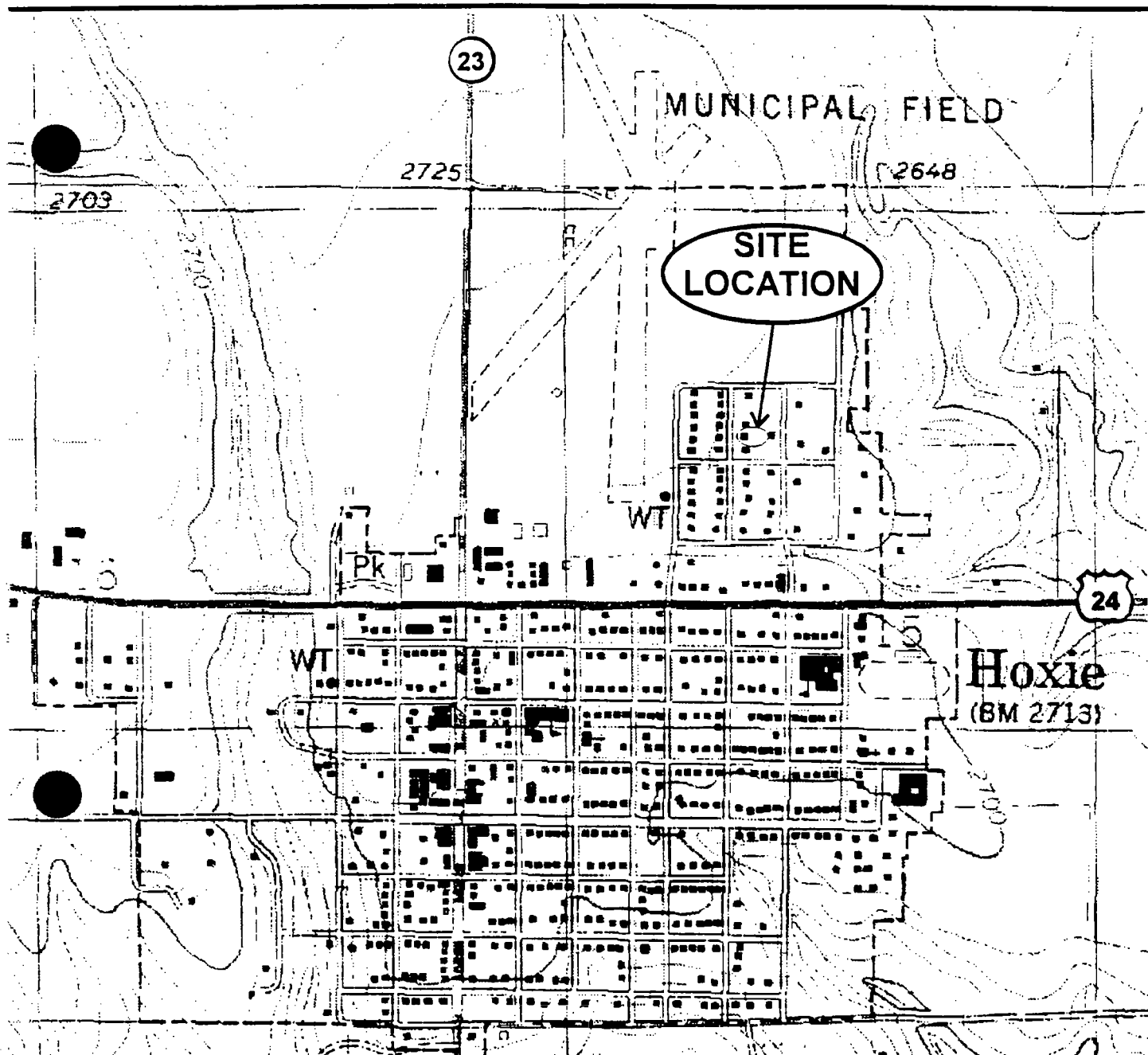
An unacceptable risk from surficial soils/wastes and air exposure to pesticide wastes has been identified at the site. No significant impact to the surface water and ground water pathways is suspected given the nature of the spill and release as well as the characteristics and properties of the hazardous substances involved.

Any additional future EPA/E&E START soil sampling data should be reviewed and integrated into the existing data to provide a more thorough and current site evaluation, as well as aid in determination of exposure threat from surficial soils and indoor exposure. Further removal site evaluation by focused sampling may still be necessary at the site pending future sample results. Follow-up sampling should be conducted to verify the efficiency of any future soil removal or treatment conducted at the site.

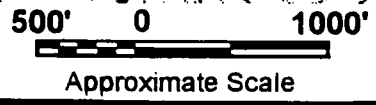
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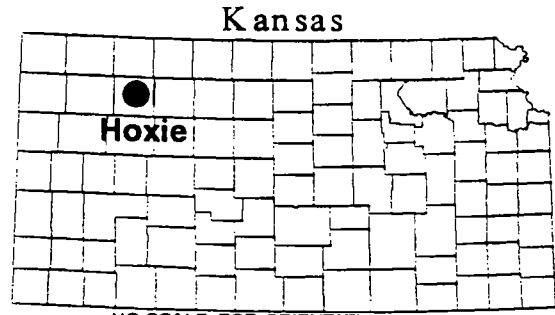
Source: USGS, Hoxie Quadrangle, 1975



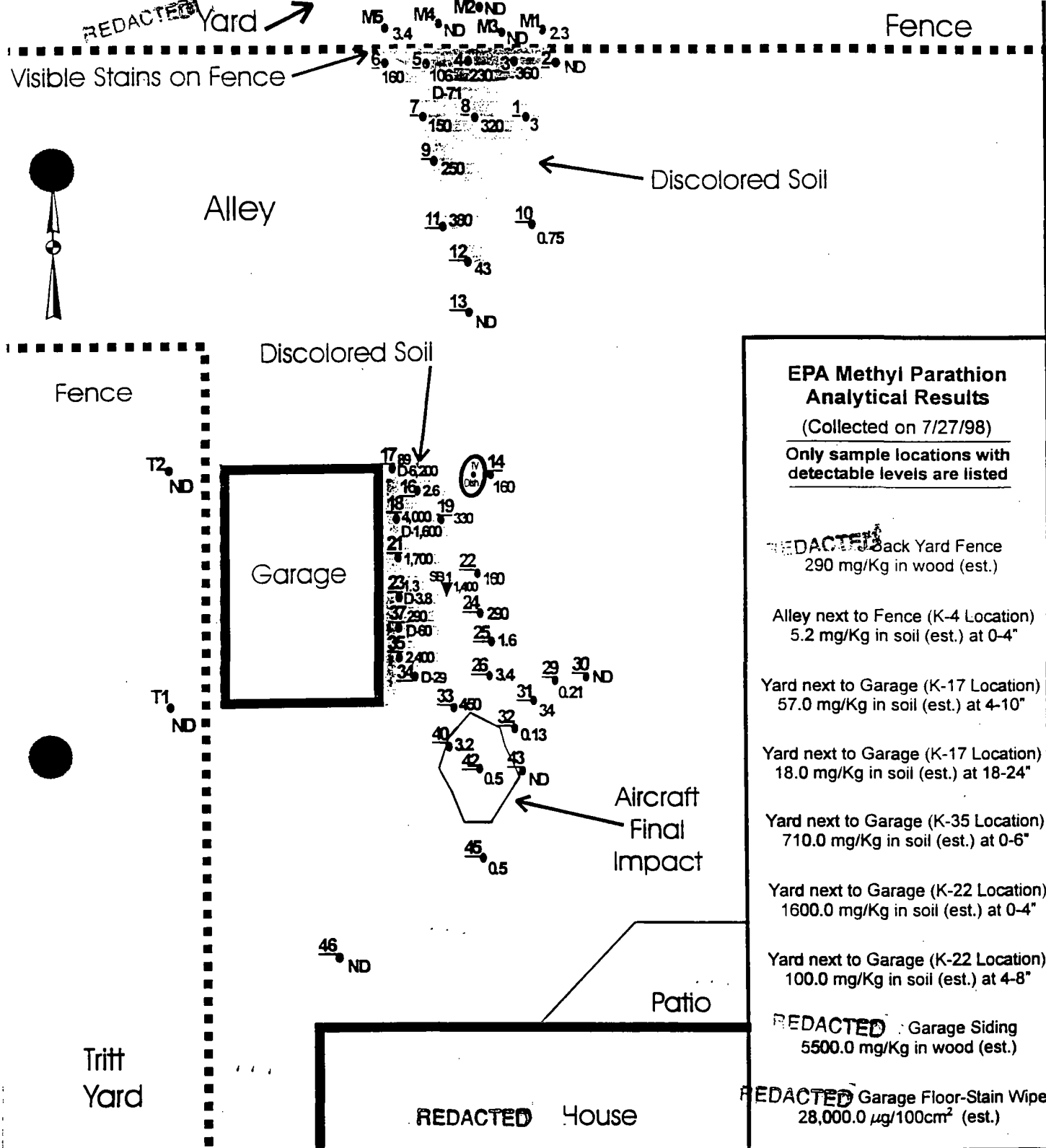
**FIGURE 1
SITE LOCATION**

Hoxie Crash Site
Removal Evaluation
Hoxie, Kansas
August 1998

Prepared by
Kansas Department of Health and Environment
Bureau of Environmental Remediation



NO SCALE: FOR ORIENTATION ONLY



EPA Methyl Parathion Analytical Results

(Collected on 7/27/98)

Only sample locations with detectable levels are listed

Back Yard Fence
290 mg/Kg in wood (est.)

Alley next to Fence (K-4 Location)
5.2 mg/Kg in soil (est.) at 0-4"

Yard next to Garage (K-17 Location)
57.0 mg/Kg in soil (est.) at 4-10"

Yard next to Garage (K-17 Location)
18.0 mg/Kg in soil (est.) at 18-24"

Yard next to Garage (K-35 Location)
710.0 mg/Kg in soil (est.) at 0-6"

Yard next to Garage (K-22 Location)
1600.0 mg/Kg in soil (est.) at 0-4"

Yard next to Garage (K-22 Location)
100.0 mg/Kg in soil (est.) at 4-8"

Garage Siding
5500.0 mg/Kg in wood (est.)

Garage Floor-Stain Wipe
28,000.0 $\mu\text{g}/100\text{cm}^2$ (est.)

**FIGURE 2
SAMPLE LOCATIONS**

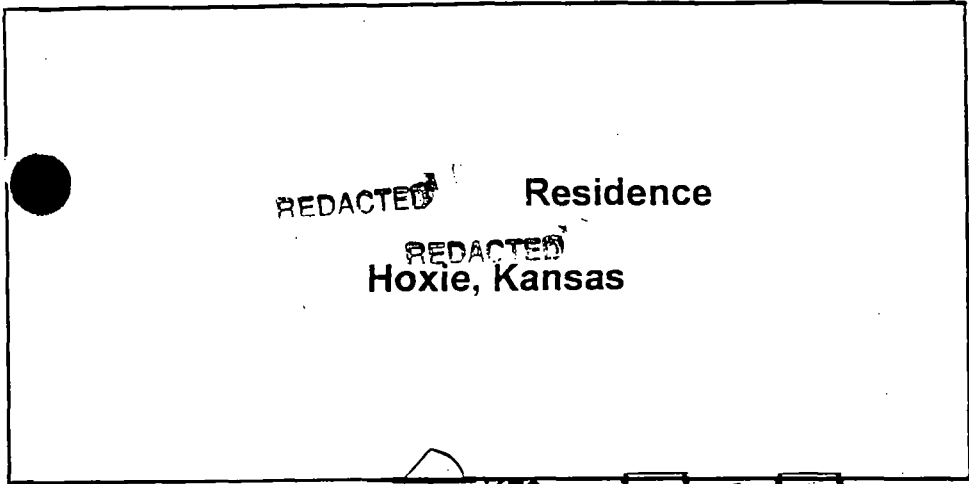
Back Yard and Yards)
Hoxie Crash Site
Removal Evaluation
Hoxie, Kansas
August 1998

Prepared by
Kansas Department of Health and Environment
Bureau of Environmental Remediation

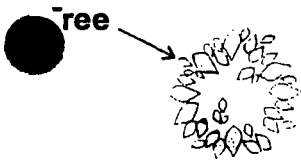
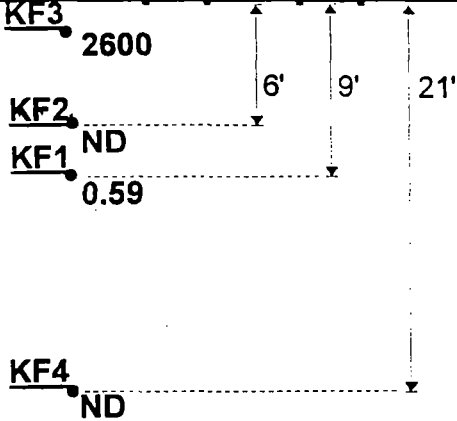
Legend

- ▼ SB 1 Soil Sample obtained 7/23/98
- (1,T1,M1) Soil Samples obtained 7/29-30/98
- 1,400 Concentration of methyl parathion in mg/Kg
- D Deep (74") Sample
- ND Methyl parathion not detected in sample

Approximate Scale: 1" = 15'



REDACTED Residence
 REDACTED
 Hoxie, Kansas



EPA Methyl Parathion Analytical Results

(Collected on 7/27/98)

Only sample locations with detectable levels are listed

- REDACTED
 Kitchen Counter-Stain Wipe
 33.0 $\mu\text{g}/100\text{cm}^2$ (est.)
- REDACTED
 Basement Floor-Stain Wipe
 1600.0 $\mu\text{g}/100\text{cm}^2$ (est.)
- REDACTED
 Basement Drywall-Stain Wipe
 42.0 $\mu\text{g}/100\text{cm}^2$ (est.)
- REDACTED
 Drywall underlying wipe sample
 14.0 mg/Kg in drywall
- REDACTED
 Kitchen Ceiling-ceiling material
 400.0 mg/Kg (est.)
- REDACTED
 Attic above attached garage 3.7 mg/Kg in wood, drywall and insulation
- Front Yard next to house (KF3 Location)
 190.0 mg/Kg in soil (est.) at 0-6"
- Front Yard next to house (KF3 Location)
 4.3 mg/Kg in soil (est.) at 6-12"
- South Yard next to drain (KF5 Location)
 340.0 mg/Kg in soil (est.) at 0-4"
- South Yard next to drain (KF5 Location)
 1.2 mg/Kg in soil (est.) at 4-8"

**FIGURE 3
 SAMPLE LOCATIONS
 REDACTED FRONT YARD and HOUSE**

Hoxie Crash Site
 Removal Evaluation
 Hoxie, Kansas
 August 1998

Prepared by
 Kansas Department of Health and Environment
 Bureau of Environmental Remediation

Legend

- KF1** Soil Samples obtained 7/29-30/98
- 2600** Concentration of methyl parathion in mg/Kg
- ND** Methyl parathion not detected in sample

Approximate Scale: 1" = 10'

Table 1
Laboratory Results
Hoxie Crash Site Removal Evaluation
Hoxie, Kansas

results expressed as milligrams per kilogram (mg/kg)

Sample #	Date Sample	Time Collected	Depth (inches)	Methyl Parathion	*Methyl Paraoxone	4-Nitrophenol
T1	7/29/98	1705	0 - 4	ND(0.33)	ND(0.33)	ND(1.6)
T2	7/29/98	1710	0 - 4	ND(0.33)	ND(0.33)	ND(1.6)
M1	7/29/98	1630	0 - 4	2.3	ND(0.33)	ND(1.6)
M2	7/29/98	1635	0 - 4	ND(0.33)	ND(0.33)	ND(1.6)
M3	7/29/98	1650	0 - 4	ND(0.33)	ND(0.33)	ND(1.6)
M4	7/29/98	1655	0 - 4	ND(0.33)	ND(0.33)	ND(1.6)
M5	7/29/98	1725	0 - 4	3.4	ND(0.33)	ND(1.6)
KF1	7/30/98	1230	0 - 6	0.59	ND(0.33)	ND(1.6)
KF2	7/30/98	1236	0 - 6	ND(0.33)	ND(0.33)	ND(1.6)
KF3	7/30/98	1241	0 - 6	2,600	15	87
KF4	7/30/98	1247	0 - 6	ND(0.33)	ND(0.33)	ND(1.6)
K1	7/29/98	1740	0 - 4	3	ND(0.33)	ND(1.6)
K2	7/29/98	1745	0 - 4	ND(0.33)	ND(0.33)	ND(1.6)
K3	7/29/98	1915	0 - 4	360	37	30
K4	7/29/98	1920	0 - 4	230	0.92	4.8
K5	7/29/98	1930	0 - 4	1.6	ND(0.33)	ND(1.6)
K5 Deep	7/29/98	1935	4 - 8	71	ND(0.33)	1.2
K6	7/29/98	1940	0 - 4	160	ND(0.33)	26
K7	7/29/98	1944	0 - 4	150	ND(0.33)	2
K8	7/29/98	1948	0 - 4	320	2	9.9
K9	7/29/98	1953	0 - 4	250	1.1	25
K10	7/29/98	1956	0 - 4	0.75	ND(0.33)	ND(1.6)
K11	7/29/98	2000	0 - 4	380	ND(0.33)	19
K12	7/29/98	2003	0 - 4	43	0.58	2.7
K13	7/30/98	1215	0 - 6	ND(0.33)	ND(0.33)	ND(1.6)
K14	7/30/98	0905	0 - 4	160	ND(0.33)	2
K16	7/30/98	0955	0 - 4	2.6	ND(0.33)	ND(1.6)
K17	7/30/98	1045	0 - 4	89	ND(0.33)	2.8
K17 Deep	7/30/98	1145	4 - 10	6,200	7.6	240

Source: Pace Analytical Services, Inc., Lenexa, Kansas

Comments ND() = Not Detected with reporting limit in parenthesis

* Methyl paraoxone values are considered qualitative and/ or semi-quantitative

"T" samples were collected from the ~~REDACTED~~ back yard

"M" samples were collected from the ~~REDACTED~~ back yard

"K" samples were collected from the ~~REDACTED~~ back yard

"KF" samples were collected from the ~~REDACTED~~ front yard

Results of a Rinsate sample collected by rinsing the sampler with deionized water:

Methyl Parathion = 12 micrograms per liter

Methyl Paraoxone = ND(10) micrograms per liter

4-Nitrophenol = ND(50) micrograms per liter

Laboratory data sheets reported results in ug/kg; results converted to mg/kg for Table 1

Table 1 (continued)
Laboratory Results
Hoxie Crash Site Removal Evaluation
Hoxie, Kansas

results expressed as milligrams per kilogram (mg/kg)

Sample #	Date Sample	Time Collected	Depth (inches)	Methyl Parathion	*Methyl Paraoxone	4-Nitrophenol
K18	7/30/98	1050	0 - 4	4,000	ND(3.3)	58
K18 Deep	7/30/98	1144	4 - 10	1,600	7.3	24
K19	7/30/98	0915	0 - 4	330	ND(0.33)	13
K21	7/30/98	1055	0 - 6	1,700	ND(3.3)	78
K21 Deep	7/30/98	1135	6 - 12	1.5	ND(0.33)	ND(1.6)
K22	7/30/98	0925	0 - 4	160	ND(0.33)	12
K23	7/30/98	1102	0 - 6	1.3	ND(0.33)	1.1
K23 Deep	7/30/98	1200	6 - 12	3.8	ND(0.33)	ND(1.6)
K24	7/30/98	0930	0 - 4	290	0.13	9.2
K25	7/30/98	0935	0 - 4	1.6	ND(0.33)	ND(1.6)
K26	7/30/98	1030	3 - 7	3.4	ND(0.33)	ND(1.6)
K29	7/29/98	2026	0 - 4	0.21	ND(0.33)	ND(1.6)
K30	7/29/98	2022	0 - 4	ND(0.33)	ND(0.33)	ND(1.6)
K31	7/29/98	2031	0 - 4	34	ND(3.3)	ND(16)
K32	7/30/98	0940	0 - 4	0.13	ND(0.33)	ND(1.6)
K33	7/30/98	0950	0 - 4	450	ND(3.3)	9.6
K34 Deep	7/30/98	1220	6 - 12	29	ND(0.33)	1.2
K35	7/30/98	1114	0 - 6	2,400	ND(3.3)	59
K37	7/30/98	1107	0 - 6	290	0.18	9.9
K37 Deep	7/30/98	1208	6 - 12	60	ND(0.33)	ND(1.6)
K39	7/30/98	0858	0 - 4	0.56	ND(0.33)	3.1
K40	7/30/98	0945	0 - 4	3.2	ND(0.33)	ND(1.6)
K42	7/30/98	1035	6 - 10	0.5	ND(0.33)	0.85
K43	7/30/98	0845	0 - 4	ND(0.33)	ND(0.33)	ND(1.6)
K44	7/29/98	2045	0 - 4	0.12	ND(0.33)	2.4
K45	7/29/98	2040	0 - 4	0.5	ND(0.33)	ND(1.6)
K46	7/29/98	2015	0 - 4	ND(0.33)	ND(0.33)	ND(1.6)
SB1	7/23/98	2000	0 - 6	1,400	0.33	35

Source: Pace Analytical Services, Inc., Lenexa, Kansas

Comments ND() = Not Detected with reporting limit in parenthesis

* Methyl paraoxone values are considered qualitative and/or semi-quantitative

"K" samples were collected from the ~~REDACTED~~ back yard

Laboratory data sheets reported results in ug/kg; results converted to mg/kg for Table 1

Table 2

Summary of EPA/START Air and Wipe Analytical Results

Hoxie Crash Site

August 27, 1998 Sampling Event

EPA Sample # :	Matrix:	Location:	Methyl Parathion:
001	air	REDACTED upstairs bedroom	<1.2 ug/m ³
002	air	REDACTED 1 st floor bedroom	<1.2 ug/m ³
003	air	REDACTED basement bedroom	<1.2 ug/m ³
004	air	REDACTED kitchen	<1.2 ug/m ³
005	air	REDACTED front entry/foyer	<1.2 ug/m ³
006	air	REDACTED basement	<1.2 ug/m ³
007	air	REDACTED living room	<1.2 ug/m ³
008	air	REDACTED kitchen	<1.2 ug/m ³
100	wipe	REDACTED front entry/foyer	not detected (ND)
101	wipe	REDACTED kitchen counter	ND
102	wipe	REDACTED kitchen floor	ND
103	wipe	REDACTED north kitchen floor wallpaper	ND
104	wipe	REDACTED kitchen counter	33 ug/100cm²
105	wipe	REDACTED kitchen floor	ND
106	wipe	REDACTED living room	ND
107	wipe	REDACTED bathroom floor	ND
108	wipe	REDACTED wing set	ND
109	wipe	REDACTED trampoline	ND
110	wipe	Field Blank	ND
111	wipe	REDACTED basement drywall - stain	42 ug/100cm²
112	wipe	REDACTED basement drywall - no stain	No results included
113	wipe	REDACTED basement floor - stain	1,600 ug/100cm²*
114	wipe	REDACTED garage floor - stain	28,000 ug/100cm²*

Table 2 (continued)

Summary of EPA/START Soil Analytical Results

Hoxie Crash Site

August 27, 1998 Sampling Event

EPA Sample # :	Matrix:	Location:	Methyl Parathion:
200	soil	REDACTED back yard	ND
201	soil	REDACTED back yard	ND
202	soil	REDACTED back yard	ND
203	soil	REDACTED back yard	ND
204	soil	REDACTED yard	ND
205	soil	REDACTED KDHE KF3 Location (0-6")	190 mg/kg*
206	soil	REDACTED KDHE KF3 Location (6-12")	4.3 mg/kg*
207	soil	REDACTED KDHE KF5 Location (0-4")	340 mg/kg*
208	soil	REDACTED KDHE KF5 Location (4-8")	1.2 mg/kg
209	soil	REDACTED KDHE K17 Location (4-10")	57 mg/kg*
210	soil	REDACTED KDHE K17 Location (18-24")	18 mg/kg*
211	soil	REDACTED KDHE K35 Location (0-6")	710 mg/kg*
212	soil	REDACTED KDHE K35 Location (6-12")	ND
213	soil	REDACTED KDHE K22 Location (0-4")	1,600 mg/kg*
214	soil	REDACTED KDHE K22 Location (4-8")	100 mg/kg*
215	soil	REDACTED KDHE K4 Location (0-4")	5.2 mg/kg*
216	soil	REDACTED KDHE K4 Location (4-8")	ND
217	soil	REDACTED KDHE M6 Location (0-4")	ND
218	soil	REDACTED KDHE M6 Location (4-8")	ND
219	soil	REDACTED KDHE M3 Location (0-4")	ND
220	soil	REDACTED KDHE M3 Location (0-4")	ND

Table 2 (continued)

Summary of EPA/START Structural (Wood/Dust/Drywall, etc.) Analytical Results

Hoxie Crash Site

August 27, 1998 Sampling Event

EPA Sample # :	Matrix:	Location:	Methyl Parathion:
400	wood	REDACTED back yard fence	290 mg/kg*
401	wood	REDACTED swing set	ND
402	ceiling material	REDACTED kitchen	400 mg/kg*
403	dust	REDACTED vacuum bag	ND
404	wood, drywall, insulation	REDACTED attic	3.7 mg/kg
405	drywall	REDACTED drywall below sample #111	14 mg/kg
406	wood siding	REDACTED composite of detached garage	5,500 mg/kg*

Table Notes:

Bold - Methyl Parathion Detection

* - Methyl Parathion Value Estimated by Laboratory

Source of analytical data, method, data/lab sheets, chain of custody, QC information, etc. not provided by EPA.

KDHE locations refer to original July, 1998 KDHE sample locations.

ND - not detected by laboratory.

REDACTED REDACTED resident's name for sample identification.

APPENDIX A

**PRELIMINARY REMOVAL EVALUATION FORM
AND SPILL DOCUMENTATION**

**HOXIE CRASH SITE
REMOVAL EVALUATION**

HOXIE CRASH SITE
PRELIMINARY REMOVAL SITE EVALUATION

Table of Contents

Preliminary Removal Site Evaluation Summary

Preliminary Removal Site Evaluation Form

- | | |
|----------------------|---|
| Attachment 1: | Spill Notification Documentation |
| Attachment 2: | Material Safety Data Sheets |
| Attachment 3: | Property Ownership Records |
| Attachment 4: | Laboratory Analytical Results |

PRELIMINARY REMOVAL SITE EVALUATION SUMMARY

The Hoxie Crash site is located at REDACTED in Hoxie, Sheridan County, Kansas. The site is the location of an agricultural aerial applicator aircraft crash in a residential subdivision REDACTED, of Hoxie Flying Service of Hoxie, Kansas, crashed shortly after take-off from the Hoxie Airport. The plane crashed into the REDACTED residence at the above address. The plane was reportedly transporting 120-150 gallons of a methyl parathion solution (commercial variety PennCap-M) for application to agricultural fields. Hoxie Flying Service is registered by the Kansas Board of Agriculture as a pesticide applicator. The Sheridan County Emergency Preparedness Coordinator evacuated the resident, REDACTED REDACTED from the house. KDHE's Northwest District Office (NWDO) was notified of the crash by the Federal Aviation Administration (FAA) on July 21, 1998. The identified responsible party (PRP), Hoxie Flying Service, retained an emergency response contractor, Haz-Mat Response, to provide initial response actions at the site. The emergency response contractor conducted a triple-rinse chlorine bleach (chlorox)/water wash treatment of the spill areas. The aircraft was salvaged on July 22, 1998, from the site.

KDHE initiated the Preliminary Removal Evaluation (PRE) in September, 1997, to evaluate the site as a candidate for a removal action and/or further removal site evaluation consistent with § 300.410-300.415 of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). Sampling conducted on July 23, 1998 by KDHE personnel indicated a highly elevated detection of methyl parathion after chemical treatment by the emergency response contractor for the Hoxie Flying Service (the identified PRP). Sample SB-1 indicated 1,400 mg/kg after completion of the treatment by the emergency response contractor, indicating the initial chemical treatment was not successful. Analytical documentation is included in Attachment 4. Risk-based residential soil concentrations range between 7.1 mg/kg (Missouri CALM), to 9.8 mg/kg (EPA Region IX PRG) and to 20 mg/kg (EPA Region III RBC). The Missouri CALM residential screening concentration for methyl parathion in soils is recommended for consideration given its conservative nature and the relative toxicity of the constituents at the site.

The initial sample results indicate a substantial release of methyl parathion remains at the site. A more detailed Removal Site Evaluation (RSE or RE) is recommended at the site. The RSE/RE should provide a more thorough evaluation of exposure hazards at the site due to surficial soils, wastes, and debris in the REDACTED and adjacent residential yards. Unacceptable residential exposure threat to surficial soils, wastes and debris as well as from air releases may be present at the site. Indoor air sampling and surface sampling of living areas is also recommended by an experienced contractor. Indoor air and sampling is outside of the scope of this PRE or the RSE/RE because of potential limitations on response as defined by the NCP. The indoor air information should be reviewed with recommendations made by an experienced industrial hygienist/environmental health professional.

Wastes at the site may be listed Resource Conservation and Recovery Act (RCRA) listed acutely toxic wastes (P071) as defined by § 261.33 of RCRA. Methyl parathion and its degradation products methyl paraoxon and 4-nitrophenol are hazardous substances as defined by § 302.4 of the NCP. Methyl paraoxon is two (2) to five (5) times greater in relative toxicity than methyl parathion. The ultimate degradation product, 4-nitrophenol, has substantially lower relative toxicity than methyl parathion. No methyl paraoxon was detected in SB-1, and the low detection of 4-nitrophenol (35 mg/kg) relative to the high methyl parathion detection (1,400 mg/kg) indicates that degradation is not rapidly occurring and verifies that the initial chemical treatment was not effective. Any soil, wastes, or debris removed from the site should be handled, transported and disposed appropriately with KDHE approval in accordance with RCRA.

**KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT
BUREAU OF ENVIRONMENTAL REMEDIATION
PRELIMINARY REMOVAL SITE EVALUATION**

I. SITE NAME AND LOCATION:

NAME: Hoxie Crash Site

ADDRESS OR OTHER LOCATION IDENTIFIER: Northwest 1/4 of Section 15, Township 8 South, Range 28 West, Sheridan County, Kansas, (Located on Hoxie USGS 7.5' topographic quadrangle map)

CITY: Hoxie	COUNTY: Sheridan	STATE: Kansas	ZIP: 67740
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TELEPHONE:	FAX:
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DIRECTIONS TO SITE: The site is located in a residential area at **REDACTED** in the northern portion of Hoxie, approximately 1/4 mile east of the Hoxie Airport, Hoxie, Sheridan County, Kansas.
MAP ATTACHED Yes

II. SITE REFERRAL INFORMATION:

REQUESTED BY: Bill Heimann	DATE OF REQUEST: 09/11/96
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AGENCY/OFFICE: KDHE/Northwest District Office

MAILING ADDRESS: 2301 East 13th Street

CITY: Hays	STATE: Kansas	ZIP: 67601
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TELEPHONE: (913) 625-5663	FAX: (913) 625-4005
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SITE CONTACT: John Cahoj

AGENCY/OFFICE: Sheridan County Emergency Preparedness

MAILING ADDRESS: P.O. Box 899, 940 8th Street

CITY: Hoxie	STATE: Kansas	ZIP: 67740
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TELEPHONE: (785) 675-3624	FAX:
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KDHE/BER PRELIMINARY REMOVAL SITE EVALUATION

DEFINITION OF TERMS

CERCLA is the Comprehensive Environmental Response Compensation and Liabilities Act, 42 USC §9601 et seq. (as amended).

A **FACILITY** is defined as any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly-owned treatment works (POTW), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, or aircraft or any site or area, where a hazardous substance has been deposited, stored, disposed of, or placed, or otherwise come to be located; but does not include any consumer product in consumer use or any vessel.

A **HAZARDOUS SUBSTANCE** means any substance, element, compound, mixture, solution, hazardous waste, toxic pollutant, hazardous air pollutant, or imminently hazardous chemical substance or mixture designated pursuant to the Clean Water Act (CWA), CERCLA, Safe Drinking Water Act (SDWA), Clean Air Act (CAA) or Toxic Substances Control Act (TSCA). The term does not include petroleum products, natural gas, natural gas liquids, liquefied natural gas, synthetic gas or mixtures of natural and synthetic gas.

The **LIMITATIONS ON RESPONSE** provisions of the NCP [40 CFR 300.400(b)] states that removals shall not be undertaken in response to a release: of a naturally occurring substance in its unaltered or natural form from products that are a part of the structure of, and result in exposure within, residential buildings or business or community structures; or into public or private drinking water supplies due to deterioration of the system through ordinary use.

NCP is the National Oil and Hazardous Substances Pollution Contingency Plan 40 CFR §300-302.

POLLUTANT or **CONTAMINANT** includes, but is not limited to, any element, substance, compound, or mixture, including disease-causing agents, which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions or physical deformations, in such organisms or their offspring. The term does not include petroleum products, natural gas, natural gas liquids, liquefied natural gas, synthetic gas or mixtures of natural and synthetic gas.). [40 CFR 300.5]

RCRA is the Resource Conservation and Recovery Act, 42 USC §3007 and § 7003 et seq. (as amended), as regulated in 40 CFR §§ 260-299.

A **RELEASE** is defined as any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment of barrels, containers, and other closed receptacles containing any hazardous substances or pollutant or contaminant), but excludes: workplace exposures; engine exhaust emissions; nuclear releases otherwise regulated; and the normal application of fertilizer. For purposes of the NCP, release also means threat of release. [40 CFR 300.5]

KDHE/BER PRELIMINARY REMOVAL SITE EVALUATION

III. REMOVAL SITE EVALUATION CRITERIA (40 CFR 300.410[E])

A. IS THERE A RELEASE OR THREAT OF RELEASE AS DEFINED BY THE NCP? YES or NO
UNKNOWN

EXPLAIN: The site is the location of an aerial sprayer airplane crash. The plane was enroute to apply an agricultural pesticide.

B. IS THE SOURCE A FACILITY OR VESSEL AS DEFINED BY THE NCP? YES or NO
UNKNOWN

EXPLAIN: The site is the location of a downed aircraft carrying approximately 150 gallons of agricultural pesticide formulation. Aircraft are included in the definition of a facility in § 300.5 of the NCP.

C. DOES THE RELEASE OR THREAT OF RELEASE INVOLVE A HAZARDOUS SUBSTANCE, OR POLLUTANT CONTAMINANT AS DEFINED BY THE NCP? YES or NO
UNKNOWN

EXPLAIN: Methyl parathion and its degradations compound 4-nitrophenol and methyl paraoxon are hazardous substances as defined by § 302.4 of the NCP. Methyl parathion is also defined as a listed acutely toxic waste (P071) in § 261.33 of RCRA. Material Safety Data Sheets (MSDS) are included as Attachment 2 to the PRE.

D. IS THE RELEASE SUBJECT TO THE LIMITATIONS ON RESPONSE? YES or NO
UNKNOWN

EXPLAIN: No limitations on response exist at the site.

E. DOES THE QUANTITY OR CONCENTRATION WARRANT RESPONSE: YES or NO

EXPLAIN: Sampling of the crash site indicated methyl parathion at 1,400 mg/kg, well above current residential risk screening levels of 9.8 mg/kg (EPA Region IX PRG), 7.1 mg/kg (Missouri CALM) and 20 mg/kg (EPA Region III RBC). Further expedited removal site evaluation is recommended to initially identify areas above screening concentrations. The Missouri residential concentration (CALM) of 7.1 mg/kg for methyl parathion is the most conservative and given the relative toxicity of methyl parathion and methyl paraoxon should be considered. The SB-1 sample location is included in Figure 2, and analytical results are included in Attachment 4. Methyl paraoxon was not detected, and 4-nitrophenol was detected at 35 mg/kg, well below its risk-based screening concentration in residential soils of 4,800 mg/kg.

F. HAS A PRP BEEN IDENTIFIED? YES or NO

CURRENT OWNER: Hoxie Flying Service, P.O. Box 156, Hoxie, KS 67740

CURRENT OPERATOR: REDACTED Hoxie Flying Service, P.O. Box 156, Hoxie, KS 67740
(785) 675-3988

ACTED HOMEOWNER: REDACTED REDACTED Hoxie, Kansas 67740 (Note: deed is
included as Attachment 3).

KDHE/BER PRELIMINARY REMOVAL SITE EVALUATION

3. **WHAT IS THE CURRENT LAND USE AROUND THE FACILITY?**

RESIDENTIAL COMMERCIAL RECREATIONAL INDUSTRIAL
AGRICULTURAL

WHAT IS THE FUTURE ZONING OF THE AREA AROUND THE FACILITY?

RESIDENTIAL COMMERCIAL RECREATIONAL INDUSTRIAL
AGRICULTURAL

DESCRIBE ECONOMIC CONDITIONS SURROUNDING THE SITE:

The site is located in a residential subdivision.

4. **REGULATORY/OPERATIONAL HISTORY OF THE SITE:**

The aerial spraying aircraft operated by REDACTED of Hoxie Flying Service crashed on July 21, 1998, at the site. REDACTED was apparently carrying 120-150 gallons of PennCap-A variety methyl parathion for routine aerial application to nearby agricultural land.

REDACTED was evacuated from her home. Neither her or the pilot were seriously injured in the crash. Visible stains of pesticide waste were evident on soils, on the garage, and the fence bordering the adjacent REDACTED residence to the east. Hoxie Spraying Service is a registered herbicide applicator with the Kansas Board of Agriculture (KBOA).

Spill documentation is included as Attachment 1. Material Safety Data Sheets (MSDS) for the pesticide compound is included as Attachment 2 to the PRE.

Methyl parathion is an organo-phosphate pesticide originally formulated in the early 1950s from nerve gas experimentation and constituents. Methyl parahion has two (2) primary degradation products, methyl paraoxon and 4-nitrophenol. Methyl pesticide is considered a highly toxic member of the organophosphate cholinesterase-inhibiting pesticides.

KDHE/BER PRELIMINARY REMOVAL SITE EVALUATION

CONDITIONS TO WARRANT REMOVAL (40 CFR 300.415[b][2]):

A. IS THERE AN ACTUAL OR POTENTIAL EXPOSURE TO HAZARDOUS SUBSTANCES, OR POLLUTANTS, OR CONTAMINANTS? YES NO

DEFINE THE MEDIA, PATHWAY AND RECEPTOR:

GROUND WATER YES NO UNKNOWN RECEPTOR: _____

EXPLAIN:

The Hoxie Public Water Supply (PWS) Well #5 is located approximately 500 feet from the site. The Hoxie PWS Well #5 is indicated as screened in the Ogallala Formation and has a total depth of approximately 200 feet (KDHE WW-5 Database). Soils in the site area are underlain by silts of the Pleistocene Sanborn Formation to about 25 feet. The Sanborn Formation is underlain by stratified clays, silts, sands, and gravels of the Plio-Pleistocene Ogallala Formation. Cemented layers (caliche and "mortar beds") are present intermittently in the Ogallala Formation. The Cretaceous Niobrara Chalk Formation underlies the Ogallala Formation at a depth of 200-250 feet in the site area and probably acts as a leaky lower confining layer. Given the relatively low mobility of methyl parathion in the subsurface, recent nature of the release and the relatively deep screening interval of PWS wells, no release of pesticides to ground water is likely at the site.

SURFACE WATER YES NO UNKNOWN RECEPTOR: _____

EXPLAIN:

No surface water intakes are located within 15 miles downstream of the site. The site is located in a relatively arid upland area. No surface water releases are suspected because of the site location in an arid upland area and relatively low mobility of methyl parathion after contact with soils.

SOIL YES NO UNKNOWN RECEPTOR: nearby residents

EXPLAIN:

Methyl parathion was detected in very elevated levels in a surface soil sample at the site. Approximately 1,342 residents are present within one mile of the site. Access to the site is unlimited. Soils at the site consist of silt and silty loams of the Keith series (CL-ML), with moderate permeability.

WASTE YES NO UNKNOWN RECEPTOR: Disposal fate unknown

EXPLAIN:

Areas of parathion waste are interpreted to be present at the site given the highly elevated levels detected after a chemical chlorox/water wash treatment. The treatment does not appear to have effectively reduced the methyl parathion concentrations in soils and wastes at the site. Contaminated debris, soils and wastes are likely present at the site given the initial analytical results. Methyl parathion and its degradation products methyl paraoxon and 4-nitrophenol are hazardous substances as defined in § 302.4 of the NCP. Pesticide wastes present at the site may be listed acutely toxic hazardous waste (P071) as defined by § 261.33 of RCRA. KDHE/BWM should be notified before any disposal of wastes from the site occurs.

AIR YES NO UNKNOWN RECEPTOR: Residents

EXPLAIN:

Although no formal air monitoring was conducted, the site appears to pose a significant risk from airborne emission from pesticide wastes and contaminated soils, debris, and living space given the apparent quantities and detected levels. Access to the site is not limited with the exception of a security mesh/police placed around the Krannawitter residence.

KDHE/BER PRELIMINARY REMOVAL SITE EVALUATION

B. **IS THERE ACTUAL OR A POTENTIAL FOR CONTAMINATION? ACTUAL: YES NO UNKNOWN**
OF DRINKING WATER SUPPLIES? POTENTIAL: YES or NO
RELATIVE POTENTIAL: LOW MODERATE HIGH

EXPLAIN:
No ground water contamination is suspected given the recent nature of the release as well as the relatively low mobility of methyl parathion in soils. The Hoxie PWS wells are typically 200 feet in depth. Hoxie PWS Well #5 is within 500 of the site further reinforcing the need for some removal response to eliminate a source area for future subsurface releases.

C. **ARE THERE HAZARDOUS SUBSTANCES, POLLUTANTS, OR CONTAMINANTS IN DRUMS, BARRELS, BULK STORAGE CONTAINERS, OR TANKS:** YES or NO
UNKNOWN

EXPLAIN:
The damaged airplane including the aerial applicator tank was removed from the site by the operator. Most of the tank contents were released at the site.

D. **ARE THERE HIGH LEVELS OF HAZARDOUS SUBSTANCES, POLLUTANTS, OR CONTAMINANTS IN NEAR-SURFACE SOILS?** YES or NO

IS THERE SURFACE SOIL CONTAMINATION? YES NO UNKNOWN
SURFICIAL WASTES PRESENT? YES NO UNKNOWN

Highly elevated levels of methyl parathion were identified at the site after a triple rinse of a chlorine bleach (chlorox)/water solution were to have quickly oxidized the parathion into 4-nitrophenol (according to the manufacturer). Soil sample SB-1 indicated 1,400 mg/kg methyl parathion well after the triple chlorine bleach (chlorox) was completed, indicating little oxidation has actually occurred. At these elevated levels, the presence of methyl parathion wastes at the site is apparent.

SITE ACCESSIBILITY: SECURE ACCESS LIMITED READILY ACCESSIBLE

The site is located in a residential area with no access limitations. Police tape and a safety mesh have been placed around the Krannawitter back yard to isolate the site.

E. **ARE THERE CONDITIONS ON SITE WHICH MAY BE SUSCEPTIBLE TO YES or NO IMPACT FROM ADVERSE WEATHER CONDITIONS? UNKNOWN/UNCERTAIN**

EXPLAIN:
Given the persistence and high levels indicated in the preliminary sample, no additional adverse impacts from weather conditions are likely.

F. **IS THERE A THREAT OF FIRE OR EXPLOSION? YES or NO**
UNKNOWN/UNCERTAIN **EXPLAIN:**

No apparent fire or explosion threat was identified during the PRE.

KDHE/BER PRELIMINARY REMOVAL SITE EVALUATION

IS THERE A POTENTIAL FOR OTHER FEDERAL OR STATE RESPONSE MECHANISMS? IF SO, IDENTIFY THE APPROPRIATE PROGRAM: YES ___ or NO X

RCRA ___ NRC ___ FIFRA/TSCA ___ UST ___ OTHER FEDERAL (_____)

STATE DEFERRAL _____

EXPLAIN: A substantial residential exposure threat from methyl parathion releases appears to exist at the site. The identified PRP has conducted no further response actions since a limited unsuccessful chemical treatment of the spill residue. The site warrants further high priority removal site evaluation to further identify the exposure risks posed by contaminated soils and wastes at the site. The site is a candidate for further removal site evaluation consistent with § 300.410 of the NCP, and at the conclusion of the removal site evaluation the site will most likely be a candidate for a time-critical removal action consistent with § 300.415 of the NCP if the identified PRP is unwilling or unable to conduct additional appropriate response actions under KDHE oversight.

H. ARE THERE ENDANGERED SPECIES HABITATS, WETLANDS, OR OTHER SENSITIVE ENVIRONMENTS NEARBY WHICH MAY BE ADVERSELY IMPACTED BY THE SITE? YES X or NO ___ UNKNOWN ___

EXPLAIN: Residences with children and/or elderly persons are located within one mile of the site.

I. ARE THERE OTHER SITUATIONS OR FACTORS WHICH POSE A THREAT? YES ___ or NO ___ UNKNOWN X

EXPLAIN: Initial analytical data from the site indicates a significant air and surficial soil exposure threat to residents from methyl parathion releases at the site. Initial results indicate levels at 1,400 mg/kg in surficial soils, well over a 7.1 mg/kg screening level. Methyl parathion is considered both a hazardous substance by the NCP and as well as an acutely toxic waste (P071) by RCRA. Additional residential threat is present inside the house because parathion spill residue may be present in walls, rafters, counter tops, floor surfaces, carpets, etc. in the Krannawitter residence.

KDHE/BER PRELIMINARY REMOVAL SITE EVALUATION

POTENTIAL REMOVAL ACTIONS 940 CFR 300.415 [D]):

The following identifies potential removal actions which may be determined to be appropriate pending further review and study. The proposed actions should be considered preliminary proposals and are subject to change.

SITE SECURITY: YES or NO

EXPLAIN: The site has been initially secured with police tape and security mesh fencing. The resident in the affected home (REDACTED) has been evacuated. Until the area has been properly evaluated (including indoor and outdoor areas) habitation may not be appropriate.

DRAINAGE CONTROL: YES or NO

EXPLAIN: No drainage control will be necessary given the relatively flat terrain and the solid nature of the soils/wastes and debris. Excavation should be conducted in a manner to prevent unnecessary runoff.

STABILIZATION OR REMOVAL OF SURFACE IMPOUNDMENTS: YES or NO

EXPLAIN: No surface impoundments are present at the site.

CAPPING OF CONTAMINATED SOIL: YES or NO

EXPLAIN: Identified areas of contaminated soils would probably be better addressed by physical removal than capping.

USE OF CHEMICALS TO CONTROL/RETARD SPREAD OF CONTAMINATION: YES or NO

EXPLAIN: A chlorine bleach (chlorox)/water spray was used in an attempt to oxidize the methyl parathion wastes at the site. Very elevated levels indicate the chemical treatment was not successful and additional attempts are not recommended. The additional fluid load of chlorox/water may actually have driven wastes deeper into soils.

CONTAMINATED SOIL EXCAVATION: YES or NO

EXPLAIN: Based on the results of a more detailed removal site evaluation, soil removal may be the most direct and efficient method of eliminating the unacceptable risk indicated by initial soil sample results. Contaminated debris and wastes will most likely require removal and proper disposal.

REMOVAL OF DRUMS, TANKS, OR BULK STORAGE CONTAINERS: YES or NO

EXPLAIN: No bulk containers, tanks, or drums remain at the site. The airplane containing the pesticide aerial applicator equipment has been salvaged from the site.

CONTAINMENT, TREATMENT, OR DISPOSAL OF HAZARDOUS SUBSTANCES, POLLUTANTS, OR CONTAMINANTS: YES or NO

EXPLAIN: KDHE/BWM will be referred the site information to investigate disposal options for wastes, debris and soils. Wastes removed at the site may be P071 listed hazardous wastes as defined by § 261.33 of RCRA.

PROVIDE ALTERNATIVE WATER SUPPLIES: YES or NO

EXPLAIN: No ground water contamination is likely given the relatively recent nature of the release and the depth (200 feet) of nearby PWS wells. The proximity of Hoxie PWS Well #5 indicates that actions should be taken in a time-critical fashion.

KDHE/BER PRELIMINARY REMOVAL SITE EVALUATION

REMOVAL SITE EVALUATION DETERMINATION AND REMOVAL PRELIMINARY ASSESSMENT FINDINGS AND RECOMMENDATIONS:

REMOVAL IS WARRANTED DEPENDING ON REMOVAL SITE EVALUATION/PRP RESPONSE

REMOVAL NOT WARRANTED - REMOVAL SITE EVALUATION TERMINATED.

REMOVAL ACTION:

REMOVAL RECOMMENDED BASED ON REMOVAL EVALUATION

PRIORITY: EMERGENCY TIME-CRITICAL NON-TIME CRITICAL

REMOVAL ASSESSMENT RECOMMENDED? YES NO (See Section VII below)

PRIORITY: HIGH PRIORITY LOW PRIORITY

(Cite one or more conditions or factors as a basis for recommending that a removal action be conducted.)

<input checked="" type="checkbox"/>	EXPOSURE TO HAZARDOUS SUBSTANCES OR POLLUTANTS OR CONTAMINANTS		CONTAMINATED DRINKING WATER
	DRUMS, BARRELS, OR CONTAINERS	<input checked="" type="checkbox"/>	DIRECT CONTACT WITH CONTAMINATED SOIL OR UNCONTROLLED WASTES PRESENT IN SOILS
	ADVERSE WEATHER IMPACTS		FIRE/EXPLOSION THREAT
<input checked="" type="checkbox"/>	NO OTHER RESPONSE MECHANISM	<input checked="" type="checkbox"/>	SENSITIVE ENVIRONMENTS
<input checked="" type="checkbox"/>	OTHER FACTORS (STATE): ACCESSIBILITY, AIR RELEASES		

(Identify one or more types of response actions which are recommended.)

<input checked="" type="checkbox"/>	SITE SECURITY - ACCESSIBILITY		DRAINAGE CONTROL
	IMPOUNDMENT STABILIZATION		SOIL CAPPING
	CHEMICAL CONTROLS	<input checked="" type="checkbox"/>	SOIL EXCAVATION
	REMOVAL OF DRUMS, BARRELS, ETC.	<input checked="" type="checkbox"/>	CONTAIN IMMEDIATE THREAT/DISPOSE OF WASTES
	ALT. DRINKING WATER SUPPLIES		OTHER OPTIONS (SPECIFY):

KDHE/BER PRELIMINARY REMOVAL SITE EVALUATION

COMMENT:

A higher priority removal site evaluation consistent with §300.410 of the NCP is recommended at the site. The response actions to date of the PRP appear inadequate to address releases of hazardous substances identified at the site. The removal site evaluation should focus on additional sampling of soils and wastes in yards at the REDACTED and adjacent REDACTED residences. Indoor air sampling should be conducted inside the REDACTED and adjacent residences but is within the limitations on response as defined in CERCLA. A competent and experienced contractor should be retained to conduct indoor air sampling and wipe/residue analysis of indoor surfaces to determine if the residences may be occupied. A qualified industrial hygienist/environmental health professional should be retained to advise based on exposure levels detected within the house.

VII. SAMPLING AND FIELD METHODS


On July 23, 1998, KDHE personnel collected a soil sample from 0-6" in a visibly contaminated area at the Hoxie Crash site. The sample was submitted for analysis via EPA Method 8270 for methyl parathion and 4-nitrophenol. An amended method was also used to analyze for methyl paraoxon. The sample was obtained with a hand augers and sample was placed in a 4-ounce glass laboratory jar and shipped via courier to Pace Analytical Services for analysis via EPA Method 8270 (methyl parathion and 4-nitrophenol) and Amended EPA Method 8270 (methyl paraoxon).

VIII. FINAL REMARKS AND RECOMMENDATIONS

The Hoxie Crash site appears to pose an unacceptable threat and exposure hazard from an uncontrolled release of methyl parathion. A surficial soil sample obtained after chemical treatment indicated methyl parathion levels at 1,400 mg/kg, well over risk-based residential soil concentrations (9.8-20 mg/kg). The release occurred when an aerial pesticide applicator aircraft from Hoxie Flying Service crashed into the REDACTED residence on July 21, 1998. The aircraft was salvaged from the site and REDACTED (the only current resident) was evacuated by Sheridan County Emergency Preparedness personnel. A contractor for the Hoxie Flying Service conducted a chemical wash (chlorox/water) treatment of the site shortly after the crash, but the high levels indicated in the post-treatment sample SB-1 indicates treatment was not successful. Hoxie Flying Service is reportedly uninsured, and no other response actions have taken place by the owner/operator after completion of chemical treatment.

A high priority Removal Evaluation is recommended to further sample soils and wastes at the site. Adjacent residential yards (REDACTED residences) should also be sampled to determine if methyl parathion spill residue has impacted these residences. The contaminated soil and debris may be a RCRA listed hazardous waste (P071). Indoor air sampling and surface/wipe sampling should be conducted within the affected homes by an experienced professional with the data reviewed and recommendations made by an experienced hygienist/environmental health professional. Soils should also be field screened by a photoionization device (PID) to determine if significant releases of aircraft fuel (AVGAS) constituents are present.

IX. EVALUATOR

SIGNATURE:  DATE: July 28, 1998
Randolph L. Brown

POSITION/TITLE: Environmental Geologist/Unit Chief, Pre-Remedial Unit

OFFICE/AGENCY: KDHE/Bureau of Environmental Remediation/Remedial Section

INTERVIEWED BY:  DATE: 8/25/98
Larry Knoche, Bureau Manager, Bureau of Environmental Remediation

ATTACHMENT 1

HOXIE CRASH SITE

PRELIMINARY REMOVAL SITE EVALUATION

SPILL NOTIFICATION DOCUMENTATION

KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT
SPILL NOTIFICATION
CONTACT #(913)296-1679

ALL RECEIVED BY SADIB KHAN DATE 7/21/98 TIME 12:29 pm
REFERRED TO NWDO, BEFS, EMPRI DATE 7/21/98 TIME 12:41 pm
PERSON REPORTING SPILL Jessica Eshleman
REPRESENTING: EIJ Atochem (Manufacturer) PHONE # (215) 419-5054
COMPLAINT BY _____ PHONE # _____

ADDRESS _____ CITY/STATE _____ ZIP _____
CARRIER Hoxic Flying Service PHONE # (785) 675-3988
ADDRESS unknown CITY/STATE Hoxic KS ZIP _____

CENTRAL OFFICE USE ONLY

TIME AND DATE OCCURRED 9:30 AM 7/21/98 98 - -
MATERIAL SPILLED Penn cap AMOUNT SPILLED 30 gallons
MATERIAL SPILLED _____ AMOUNT SPILLED _____

LOCATION OF SPILL REDACTED REDACTED, Hoxic KS
COUNTY Sheridan WATERWAY INVOLVED X NO YES
CAUSE Plane crash. No deaths.

OTHER INFORMATION Fire dept or EIJ Atochem will hire
a private contractor to clean up the spill

NATIONAL RESPONSE CENTER - STATE*FAX

GOVERNMENT USE ONLY ** GOVERNMENT USE ONLY ** GOVERNMENT USE ONLY **
DO NOT RELEASE this information to the public without permission
from the National Response Center (G-OPF), U. S. Coast Guard
Headquarters, Washington DC 20593-0001 (202)267-2675.

From: National Response Center
USCG HQ Washington, D. C.
1-800-424-8802

To: DEPT NAT RES ATTN: LARRY KNOCHE
Incident Report # 446867

INCIDENT DESCRIPTION

Report taken by CIV ROBERTSON at 13:14 on 21-JUL-98
Incident Type: AIR
Incident Cause: TRANSPORT ACCIDENT
Affected Area: INSIDE OF A HOUSE AND ATMOSPHERE
The incident occurred on 21-JUL-98 at 09:30 local time.
Affected Medium: UNKNOWN OR OTHER

SUSPECTED RESPONSIBLE PARTY

Name: REDACTED
Organization: HOXIE FLYING SERVICE
Address: HOXIE, KS
Telephone: (785)6753988
Type of Organization: PRIVATE ENTERPRISE

INCIDENT LOCATION

Address: REDACTED
County: SHERIDAN
City: HOXIE, KS

RELEASED MATERIAL(S)

HR Code: NCC Official Material Name: NO CHRIS CODE
Also Known As: PENNCAP-M INSECTICIDE
Quantity Released: 30 GAL(S) Qty in Water: 0 NON(S)

SOURCE/CAUSE OF INCIDENT

PROP DUSTING PLANE / THE PLANE FLEW TOO LOW AND STRUCK A PRIVATE
RESIDENCE WHICH PUNCTURED A TANK

DAMAGE

Injuries: Fatalities: Evacuations: Damages: Air Close: Road Close:
1 0 N N

REMEDIAL ACTIONS

THE MATERIAL MAINLY AFFECTED THE UPSTAIRS OF THE PRIVATE RESIDENCE /
WILL DEPLOY A CONTRACTOR / FIRE DEPT CONTAINED MATERIAL

NOTIFICATIONS BY CALLER

NOTIFICATIONS BY NRC

AGENCY TOXIC SUBST & DISEASE REGISTRY (404)6396360
HEALTH SAFETY HAZ MAT INVEST BOARD (202)7377270
EPA OFFICE OF EMERG RESPONSE(OERR) (703)6030256
U. S. EPA VII MR RAPPLEAN (913)2810991
FEDERAL EMERGENCY MANAGEMENT AGENCY (202)8986100
NATIONAL RESPONSE CENTER HQ (206)5266344
NATIONAL RESPONSE CENTER HQ (202)2672100
DEPT NAT RES ATTN: LARRY KNOCHE (913)2961662
DOI/OEPC DENVER (303)4452500

ADDITIONAL INFORMATION

EVACUATIONS WERE TO 1 BLOCK RESIDENTIAL AREA AND ALSO DOWN WIND / INJURY
WAS TO THE PILOT DUE TO EXPOSURE / WILL NOTIFY: KOHE, ERC, LEPC

*** END INCIDENT REPORT # 446867 ***

PLEASE VISIT OUR WEB SITE

<http://www.nrc.uscg.mil>

*** MULTI TX/RX REPORT ***

TX/RX NO 0863
INCOMPLETE TX/RX
ACTION OK [02]13266
[04]92741426
[07]1#87856254005
ERROR

BODO
EM PREP
NWDO

KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT
SPILL NOTIFICATION
CONTACT #(913)296-1679

ALL RECEIVED BY SADIR KHAN DATE 7/21/98 TIME 12:29 pm

ALL REFERRED TO NWDO, BEFS, EMPPR DATE 7/21/98 TIME 12:41 pm

PERSON REPORTING SPILL Jessica Eshleman

REPRESENTING EJH Atochem (Manufacture) PHONE # (215) 419-5054

COMPLAINT BY _____ PHONE # _____

REPRESENTING _____

ADDRESS _____ CITY/STATE _____ ZIP _____

SPILLER Hoxic Flying Service PHONE # (785) 675-3988

BY _____

ADDRESS unknown CITY/STATE Hoxic KS ZIP _____

CENTRAL OFFICE USE ONLY

TIME AND DATE OCCURRED 9:30 AM 7/21/98 98 - -

MATERIAL SPILLED Penn cap AMOUNT SPILLED 30 Gallons

MATERIAL SPILLED _____ AMOUNT SPILLED _____

LOCATION OF SPILL REDACTED REDACTED Hoxic KS

COUNTY Sheridan WATERWAY INVOLVED X NO YES

REASON Plane crash No deaths

SPILL NOTIFICATION
CONTACT # (913) 896-1679

ALL RECEIVED BY Mary Kelly DATE 7/21/98 TIME 0940

REFERRED TO AWO DATE 7/21/98 TIME 1102

PERSON REPORTING SPILL John Cahoj

REPRESENTING Sheridan Co Emerg Mgmt PHONE # 785 675-2288

COMPLAINT BY _____ PHONE # 3481

REPRESENTING _____

ADDRESS _____ CITY/STATE _____ ZIP _____

SPILLER Hoxie Crop Dusting PHONE # 785 675-3988

BY _____

ADDRESS Home Address REDACTED CITY/STATE KS ZIP 67240

CENTRAL OFFICE USE ONLY

TIME AND DATE OCCURRED 8:39 am 7-21-98 98

MATERIAL SPILLED 50 gal Aviation Fuel
AMOUNT SPILLED _____

MATERIAL SPILLED _____ AMOUNT SPILLED _____

LOCATION OF SPILL Hoxie

COUNTY Sheridan WATERWAY INVOLVED NO YES _____

CAUSE REDACTED 2-Pilot

OTHER INFORMATION Gene McFall - 316-723-3060 - Bd of Ag
Bd of Ag Don Teagle - spoke to him he will follow up
Crop dusting plane / Spilled on
Pen-Cap (Methal Perathion) House
Washed pilot off with water
ran down street

Called Jerry Wilson - Bd of Ag. Field Inv. left msg. 785-434-7592 on voicemail

SPILL REPORT FORM

DATE REPORTED:

No. 07/21/98 6BH1 1033
 mo day year initials time reported
 (2400hr)

Initial Report
 Update
 (check one)

INITIAL REPORT BY: (if other than spiller)

Name Jim Budhorte Telephone (316)-941-1200
 Address FAA Federal Aviation Administration

ALVIN CLARK
 FAA inspector
 (316)

- (check one)
- | | | |
|--------------------|--------------------|---------------|
| 2. NRC | 9. EPA | 15. anonymous |
| 7. KDHE | 13. Kansas agency | 16. other |
| 8. private citizen | 14. federal agency | 17. DEP |

EPA Spill No. _____ KDHE Spill No. _____

SPILLER: Did spiller report incident? yes no

Contact REDACTED - LATE (plot) Telephone 785-675-3988
 Company Hoxie Flying Service Street P.O. Box 156
 City Hoxie State KS Zip 67740

SPILL DESCRIPTION:

KDHE District 06 (NW)

Date 07/21/98 Time 0853 Discovery: Date 07/21/98 Time 0853
 mo da yr 2400hr mo da yr 2400hr

Address 1524 15th St 15th Locust City Hoxie
 (OR)
 Legal NW 1/4 15-8-28W County Sheridan State KS

Material Spilled	Material Code	Amount Spilled	Amount Recovered	Unit Code	CAS ID NO.
<u>PARAFFIN (PENKAR M)</u>	<u>14</u>	<u>30/150</u>	<u>0</u>	<u>1</u>	
<u>Aviation gas</u>	<u>4</u>	<u>25</u>	<u>0</u>		

- Material Codes: 22 active ingredient revised to 120 gal
 1. PCB - 30 gallon product
 2. crude oil - 120 gal water
 3. gasoline
 4. diesel fuel
 5. other fuel
 6. asphalt
 7. animal/veg. oil
 8. waste oil
 9. other oil
 10. agric. chemicals
 11. herbicides
 12. insecticides
 13. fertilizer
 14. metals
 15. acids
 16. organic solvents
 17. caustics
 18. alcohol
 19. other
 20. unknown
 21. brine
 Unit Codes:
 1. gallons
 2. pounds
 3. barrels
 4. tons
 5. sheen
 6. unknown
 7. ppm
 8. pints
 9. quarts

TYPE: (Circle ALL that pertain)

- | | | |
|------------------|-------------------|-----------------|
| 1. motor vehicle | 6. tank | 11. fire |
| 2. rail | 7. U.G. tank | 12. oil lease |
| 3. marine | 8. discharge | 13. transformer |
| 4. pipeline | 9. fixed facility | 14. explosion |
| 5. aircraft | 10. other | 15. evacuation |

Media affected media.

1. air 2. ground water 3. surface water 4. soil 5. None

Waterways affected waterways. None

- | | | |
|----------------|-------------------|-----------------|
| 1. river | 5. sanitary sewer | 9. ground water |
| 2. stream | 6. lake | 10. reservoir |
| 3. creek | 7. pond | 11. canal |
| 4. storm sewer | 8. ditch | 12. wetland |

dent Description: CROP sprayer plane clipped a house on take-off
plane crashed, tail-first in house yard. Ag-chemical and aviation gas.
HUMAN AG-CAT aircraft; bi-plane. 120 gallons of total spray solution
aviation fuel (gasoline) was spilled; tank less than full (let out fuel).
solution was splashed on house (roof mainly) back yard & back yard
ledge, and on fence & tree east side of alley. No solution was (residual) contained

INVESTIGATION AND CLEAN-UP:

Investigation by: (Circle ALL that pertain)

- 2. EPA/TAT
- 14 KDHE
- 15. USCG
- 18. local health
- 19 local fire
- 20 local police
- 21. county
- 22. fire marshal
- 23. none
- 25. other
- 26. KCC
- 27. DEP

Troy Dewey - County
 Superintendent
 - Landfill Operator
 Lic # 181
 Sheridan
 office 675-3621
 cell 4 905

NOT KDHE/KCC:

Name _____ Telephone _____

KCC Staff Time:

Staff Computer Initials	Hours Worked	Signature
60DH1	10 (7/21/98)	Bill Heiman
60BH1	9 (7/22/98)	Bill Heiman
60BA1	20 7/23,24,27/98	Bill Heiman

CLEAN-UP METHODS: (Circle ALL that pertain)

- 1 physical removal
- 2 neutralization
- 3. stabilized
- burning
- 5. dilution
- 6 biodegradation
- 7. recycled
- 8. no clean-up
- 9. other
- 10. unknown

Describe the clean-up: Local emergency personnel on-site almost immediately.

1st victim injured and was able to get free and was immediately hospitalized
responders (spray had burned pilot). During gate ^{had been} opened over 15th St
Some of the spray load hit lawn, house, back yard and back yard shed
alley plus fence and evergreen tree on E. side of alley. Av. gas fill
dripping at time of KDOT's inspection but tank during appeared in-tact.
ted with Horic Flying Service, owner, REDACTED for details. His son reported
bits of the crash, which REDACTED relayed to me. He is hospitalized in Horic, stable being
for observation. His eyes are burned from contact with the chemical. REDACTED
Quoted to me that he has no insurance for the incident.

US Dept of Agr, Gene McFall, is in route from Hutchinson. Haz-Mat Response, Inc,
which is in-route also to the site for clean-up. [Weather: clear, Wind 10-20, 102°F.
The area affected with the spray solution was dried out by 1630 hrs and is clearly
site by virtue of its yellowish-gold hue; the affected area is clearly delineated.
Gene McFall, Dept of Agr, arrived and he surveyed the area after reviewing the MSDS
PENNCAP-m. He used a cautious approach until further expertise was available. Mr.

How required? YES NO Date closed 7/21/98

local emergency
 personnel used maint.
 ing security of the
 Contained
 next page
 Revised

Report prepared by: Bill Heiman Date 7/21/98

SPILL REPORT FORM
Additional Notes

(2)

Follow up date: 7/21/98 Details/Notes: PENNCAP-m. air plane crash spill in Hoxie
NW 1/4 15-8-28 W - Sheridan Co. (Hoxie Flying Service).

1900: Haz-mat Response, Inc. arrived. Kenny Simmons, team leader was briefed
and a cleanup plan discussed with local and state representatives. It was
determined that the spill area would be washed down with a mild
solution of Chlorox/bleach water. the roof hole covered w/ plastic sheeting
and preparations be made for plane extraction in the morning. There
was an evaluation made of the REDACTED residence, for exposure of
the chemical (REDACTED and REDACTED were exposed when they assisted
REDACTED from her house this morning and washed the chemical
off the pilot). Their exposed clothing, still in the house, was bagged. There was

Follow up date: 1/1 Details/Notes: no odor evident by either REDACTED

Kenny Simmons or me in the REDACTED residence, and we saw no reason to
stop their return following final approval from Energy Preparedness
officer John Cahaj. In fact, downwind residence would likely be
permitted to return to their homes by nightfall. The chemical was
dry by this point, all moisture having been evaporated by the high temperature.

2035 hrs. - B. Heiman left site. Clean-up and containment continued
done jointly by Volunteer F.D.; Sheriff staff and Haz-mat Response.

B. Heiman 7/21/98

7/21/98 - Phoned Richard Brorrough, BWM, to report and discuss waste
disposal options. FAKED MSDS to him. B. Heiman returned to site

Follow up date: -1-1- Details/Notes: 1100 hrs. Visited with Gene McFall then with

Haz-mat Response personnel K. Simmons and Brad Becker. Aircraft had been
removed by 1000 hrs, and additional assessment made at spill area made by
Haz-Mat. Haz-Mat Response invited me to participate in a telephone
conference call at Hoxie Flying Service that would involve input from
Elf-Ato-Chem Product Safety Officer, Robert Rosenwasser, in Philadelphia.
Representatives of all involved parties were present. Mr. Ken Smith and Mr.
Richard Brorrough, BWM/KDITE/Topoka were also conferenced in and
asked questions, as did the parties in Hoxie. Mr. Rosenwasser elabor-
ated on characteristics of Beacup-m and the oxidation of the product
(reportedly) by application of a water/bleach solution. (continued).

3

SPILL REPORT FORM

Additional Notes

Follow up date: 7/22/78 ^(continued) Details/Notes: HOXIE PENNAC-M spill NW 1/4 15-8-28W, Sheridan Co

● R. Rosenwasser agreed to send literature (technical) on the oxidation of
Pennac-M, plus his recommended laboratory analytical method for the product.
Following the conference, Haz-Mat Response agreed to return to REDACTED
home to fully assess structural contamination, remove affected materials from
the attic (mainly cellulose insulation) and interior of the house, and spray additional
bleach solution on surfaces where the product was visible (fence, swingset at
REDACTED
yard, roof, trees, gutters, lawn, garage, etc.

1750, B. Heiman visited with American Family Insurance agent, Jeff Barum,
representing REDACTED, to address his concerns. He was made aware of
the meticulous process needed and the uncertain, though lengthy, time frame required.

Follow up date: - 1 - 1 - Details/Notes: Visited with John Cahaj, Emergency Mgmt, and
communicated the subject at hand. Left site 1900 hrs.

7/23/78 Bill Heiman and Ron Adams flew O/KDHE to site 1630 hrs. Talked with
FAA Inspector Calvin B. Clark, at Hoxie Flying Service to investigate. Adams
● Heiman then observed the aircraft during engine removal and talked
with REDACTED pilot, then proceeded to crash site to communicate
with Kenny Simmons, Haz-Mat Response. He was finishing up his response
activities and preparing to exit. Fourteen boxes of contaminated waste and
protective clothing were seen staged/labelled in the attached garage of REDACTED
REDACTED. Mr. Simmons had not yet received the expected technical info. from

Follow up date: - 1 - 1 - Details/Notes: EIF-Atto-chem. We proceeded to REDACTED
office and called Robert Rosenwasser. He was unaware the Hoxie parties had
not received the promised information, via FAX, at the REDACTED office. He
suggested he contact another EIF Attochem representative, Dr. Mike Wright, to
address the issue. Within 10 minutes Dr Wright returned the phone call
and we discussed the situation. Dr. Wright, (600) 375-6473, is group
leader of the Corporate Residue Research Team. Notes from that
conversation are attached. If particular interest to us, during our
conversation, was Dr. Wright's description of the degradation process:

METHYL PARATHION → PARATHOXON (intermediate degradation product) → Para-Nitrophenol.
● and most significantly, the acutely toxic PARATHOXON. We need to be cautious
about the P-oxon.
(continued, p. 5)

SPILL REPORT FORM
Additional Notes

(Continued)

Follow up date: 7/23/98 Details/Notes: Toxic - Kenicaps-M spill

Kearny Simmons, B. Heiman and R. Adams determined it was important to collect soil samples from the spill site using Level C/Level D PPE. Mr. Simmons donned Level C PPE, Mr. Heiman Level D PPE. Mr. Simmons entered the hot zone, collecting soil samples from the area where the plane came to rest and appeared substantially affected. One boring was made with a sharp-shooter spade, soils being collected from intervals 0-6" and 6-12" depth, both in boring SB-1 (Toxic Kenicaps-M Spill). Mr. Simmons had two sample jars, KDHE NIDDO split with two sample jars. As Mike Wright had suggested, the samples should be analyzed for Methyl Parathion.

Follow up date: -1 + - Details/Notes: Methyl Parathion and Para-nitrophenol.
2000 hrs B. Heiman and Ron Adams left site. Mr. Simmons left later that same evening.

7/24/98 Phoned ^{KDHE} BEFS Bureau Chief Terese Hodges, Topeka, to apprise. Left message.

930 - Phoned Leo Henning, BER/KDHE, Topeka to apprise and discuss samples analysis. He would check with KHEZ Lab to see if it can perform.

1000 - Phoned CAS Lab, Salina to see if that lab can run samples. Will check.

1030 - Call from REDACTED REDACTED REDACTED to inquire about having contractor enter house to assess structure. I strongly recommended the house not be entered until evaluated for ambient concentrations.

Follow up date: -1 -1 - Details/Notes: of the pesticide(s). He also indicated that the neighbors to the NE (across alley) found plane sprayer attachment in their back yard. REDACTED agreed to get the part (or have Toxic Spraying/Flying Service get it) and place with the other crash debris. I suggested he open doors/windows on the house for aeration. He agreed.

1100 hrs. Spoke with Ed Conard, FD, requesting plastic snow fence be placed around the spill/crash point where the pesticide is concentrated. This may prevent curious individuals from entering the area where contact with pesticide is expected. Mr. Conard agreed to arrange.

1200 hrs - Phoned PACE Analytical to inquire about samples analysis.

Later in the day, arrangements made w/ Pace to pick up samples and debris to Pace - Lenexa, KS (see attached C-O-C record).

SPILL REPORT FORM

CONTINUED From Additional Notes

875

Follow up date: 7/24/98 Details/Notes: Hoxic Flying Service - Spill/Crash.

1200 hrs. Spoke w/ Ros Smith, BWM, who indicated Randy Brown, BER, planning to do site sampling the week of 7/27/98

1600 Spoke w/ Dan Tugler, KS Dept of Agric., who indicated he is actively working on this issue and would have input. We will keep up lines of communication.

1610 Discussion w/ Ken Simmons, Haz-MAT Response, about lab. analysis of soil samples. He has been unsuccessful in locating a lab to perform complete analysis.

1620 hrs. Phone convers. w/ Teresa Hodges, BEFS, to discuss and give description of site problems.

Follow up date: 7/27/98 Details/Notes:

Phone conversation with John Cahoy, Hoxic. All appears stable at site

Phone convers. w/ Randy Brown, BER, who is scheduled for site survey and sampling 7/29 + 30/98. I gave him a briefing.

Follow up date: 7/28/98 Details/Notes: 1137 Am - FAX from PACE Analytical with results of soil sample, SB-1 (0-6"). See attached report

(785) 675-3217

7/28/98 Phone conversation w/ Mr. Ken Eland, City of Hoxic atty. He is apprised of current status and understands the process will take considerable time to resolve. He requested documentation.

Wright - EIT / Ato Chem
↳ (610) 792-9647 (H), (610) 878-6473

Corporate
EIT Ato Chem
1000

Paranitrophenol - daughter product of Methyl Parathion
↳ result of oxidation

31 Analytical Method - Simple Pesticide Screening method
Organophosphate pesticides

Paranitrophenol
Methyl paraoxone - v. acute toxin (oxidation process)

* Specify to lab the need for values for:
① methyl parathion
② methyl paraoxone
③ paranitrophenol

- Wright is not aware of any regulatory restriction on Paranitrophenol

B9 4

08 792-9647... (610) 878-6473

Wright
Ato Chem



KANSAS
DEPARTMENT OF HEALTH & ENVIRONMENT
BILL GRAVES, GOVERNOR
Gary R. Mitchell, Secretary

NORTHWEST DISTRICT OFFICE
2301 E. 13TH ST.
HAYS, KANSAS 67601

Phone # (785) 625-5663
Fax # (785) 625-4005

Date: 7-22-98 To: Richard Bronaugh ^{(785) 296-1120} ^{For Smith} ²⁹⁶⁻¹⁶⁰ ~~KDHE~~

of Pages: 7 From: Bill Heumann

Cellular # 785-623-3616

Comments: Mike Wright

(800) 438-6071 - Div. Off
(215) 736-3303 (H)

12/98 Conference call with:
- Robert Rosenwasser - Elf Atochem reg Philadelphia (215) 419-5054, prod safety
- Ron Smith & Richard Bronaugh - Dir of Waste mgmt, KDHE Zepke

Issues: 1st a briefing
2nd - ?'s from Haz-Mat Response

- ① Waste in air from Chlorox washing Response - field application is safe due to biodegradation
- ② Dept of Ag, Gene McFall, indicated the concentration is ± 10,000 times normal Appl
- ③ Haz-Mat has given three applications of Chlorox so far. EPA used this method of decontam in Miss. Assessment is needed
- ④ Robert R. will get into to Home Pkg Service on monitoring for Penncep-M.
- ⑤ Is the waste generated Hazardous, Special waste; can the soil be land-applied?

?s from R. Smith - persistence of product in the soil? Ans: it is not stable in the environment. It oxidizes naturally & is enhanced w/ Chlorox. Robert will get data to Dan Tuggle on soil c/cr guidelines

?s - REDACTED (smiley face) HAVE A GREAT DAY!
w/obj, furniture etc, other personal effects
Ans: from Robert R - if no odor or visual, no reason to dispose.

(smiley face) Ans: Robert R. is of opinion that the affected soil will be bio & graded & reusable.
[Penncep must be dry to release the chemical]

?s from Gene McFall - ambient conditions - respiratory protection
Ans: Robert R. recommended resp. protection

7/21/98

Kansas

● Region

Pilot suffers minor injuries after crop duster crashes

HOXIE — A Hoxie man walked away with minor injuries after the crop duster he was flying crashed into a house Tuesday morning.

REDACTED was flying a bi-wing agricultural plane for Hoxie Flying Service when the plane lost power shortly before 9 a.m., according to Sheridan County Sheriff James Johnson.

The plane hit the roof of a house on the north side of Hoxie near the Sheridan County Airport and flipped on its top, spilling 52 gallons of fuel and approximately 32 gallons of methyl parathion.

"Fire and rescue units have contained the spill and the EPA has been notified," Johnson said of the Environmental Protection Agency.

Johnson said a one-block area around the crash site has been evacuated. He did not know how long people would be required to stay away.

"We may have to evacuate further," Johnson said. "But it is contained."

REDACTED was decontaminated at the scene and transported to the Sheridan County Health Complex, Hoxie, in stable condition.

Iowa woman dies in one-vehicle accident

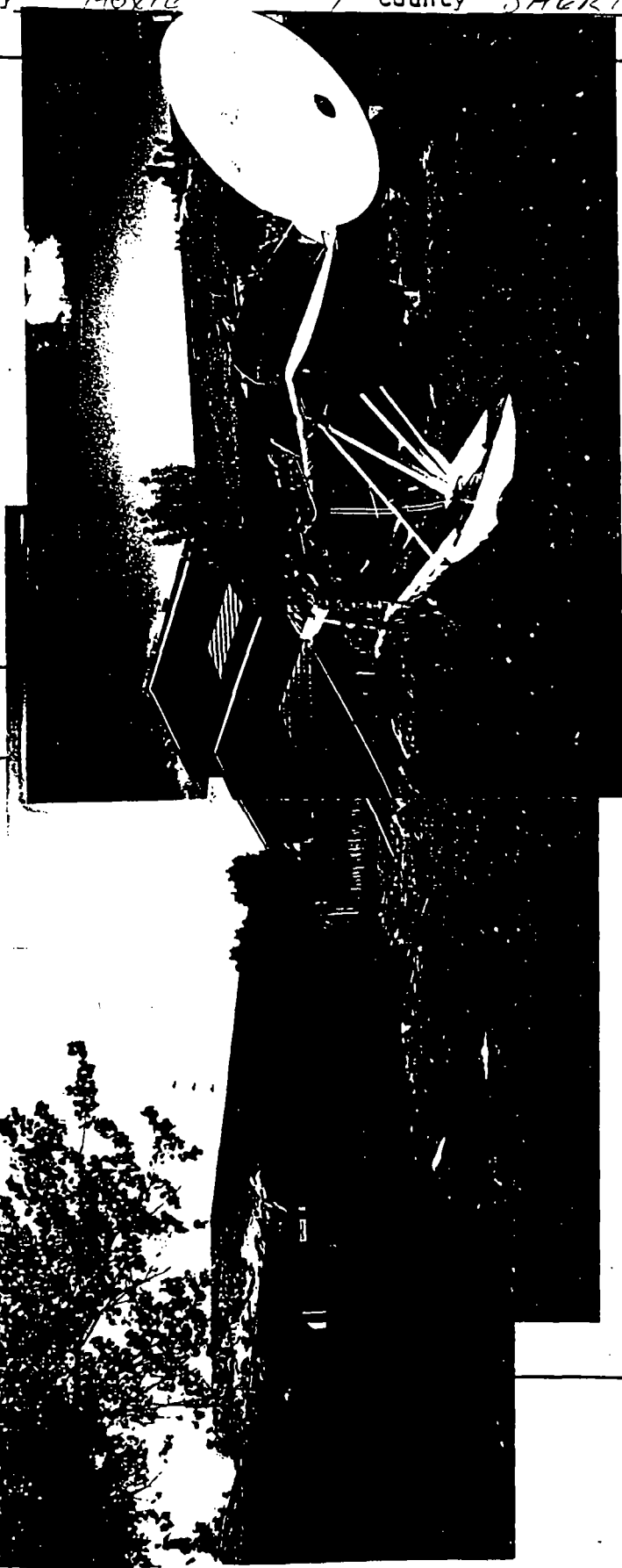
GOODLAND — An Iowa woman died Monday due to injuries suffered in a one-vehicle accident near Goodland.



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PHOTO MOUNTING SHEET

Site: HOXIE FLYING SERVICE / CRASH + Spill EPA ID # 072198 4 B11 I
City: HOXIE County SHERIDAN Legal NW 1/4 15-85-286



3

Picture No. 3
Date: 7-21-98
Time: PM
General Direction Faced: N
Weather Conditions: PC, 105°F, S. breeze
Type of Camera: Canon
35 mm
Comments: Plane at crash
site Note chemical
(methyl parathion) in grass, garage
and satellite dish

4

Picture No. 4
Date: 7-21-98
Time: PM
General Direction Faced: _____
Weather Conditions: _____
P.C 105°F, S. breeze
Type of Camera: Canon
35 mm
Comments: Damaged house from
Plane wreck

PHOTO MOUNTING SHEET

Site: Hoxic Flying Service / CRASH + Spill EPA ID # 072198 48111
City: Hoxic County: Sheridan Legal: N1/4 15-85-286



3

Picture No. 3
Date: 7-21-98
Time: 8M
General Direction Faced: N
Weather Conditions: PC 105°F S. breeze
Type of Camera: Canon
35mm
Comments: Plant at crash
site Note chemical
(mercury) in grass garage
and satellite dish



4

Picture No. 4
Date: 7-21-98
Time: 8M
General Direction Faced: _____
Weather Conditions: PC 105°F, S. breeze
Type of Camera: Canon
35mm
Comments: Damaged house from
Plane wreck

PHOTO MOUNTING SHEET

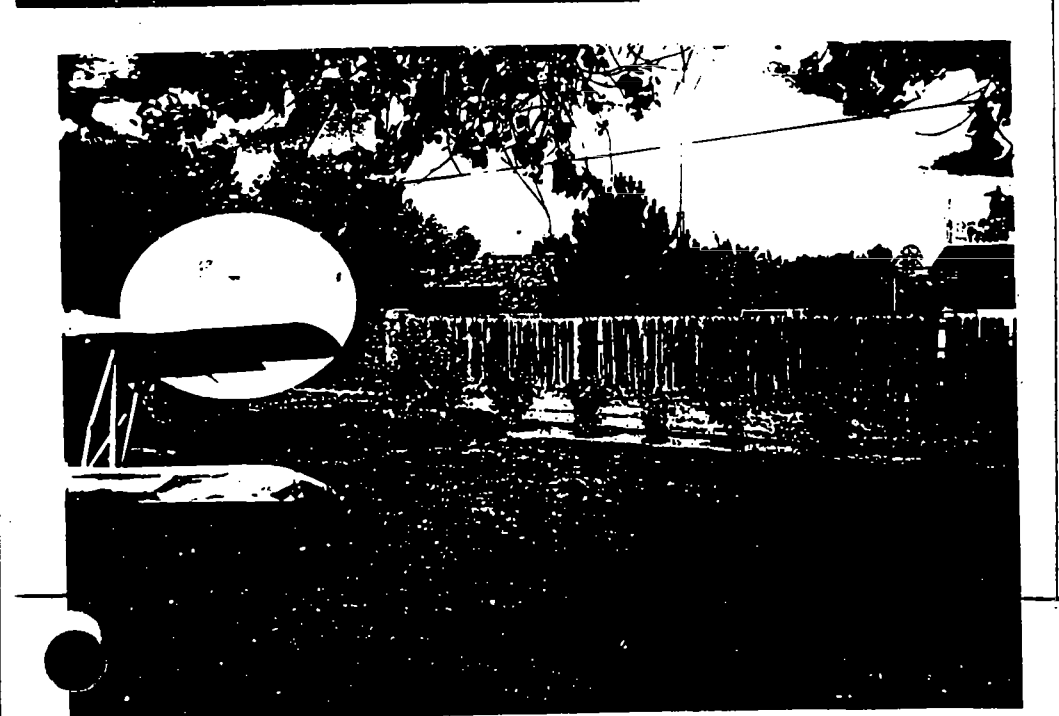
Site: Hoxie Flying Service / CRASH + Spill EPA ID # 072198 GRH1
City Hoxie County Sheridan Legal NW 1/4 15-85-28



Picture No. 1
Date: 7-21-98
Time: PM
General Direction Faced: E

Weather Conditions: PC, 105°F, S. breeze
Type of Camera: Canon
35 mm

Comments: Front of REDACTED
REDACTED - house,
REDACTED when
Hoxie Flying Service plane
hit, dinged methyl parathion
load (120 gal). Note chert
stain in front of house
on roof



Picture No. 2
Date: 7-21-98
Time: PM
General Direction Faced: E

Weather Conditions: P.C. 105°F, S. breeze
Type of Camera: Canon
35 mm

Comments: Rear of
REDACTED - house; after
to East, and fence the
was splashed with chemical
during crash.

PHOTO MOUNTING SHEET

Site: Hoxie Flying Service / CRASH + Spill EPA ID # 072198 GRH1
City Hoxie County SHERIDAN Legal NW 1/4 15-85-28W



Picture No. 1
Date: 7-21-98
Time: PM
General Direction Faced: E

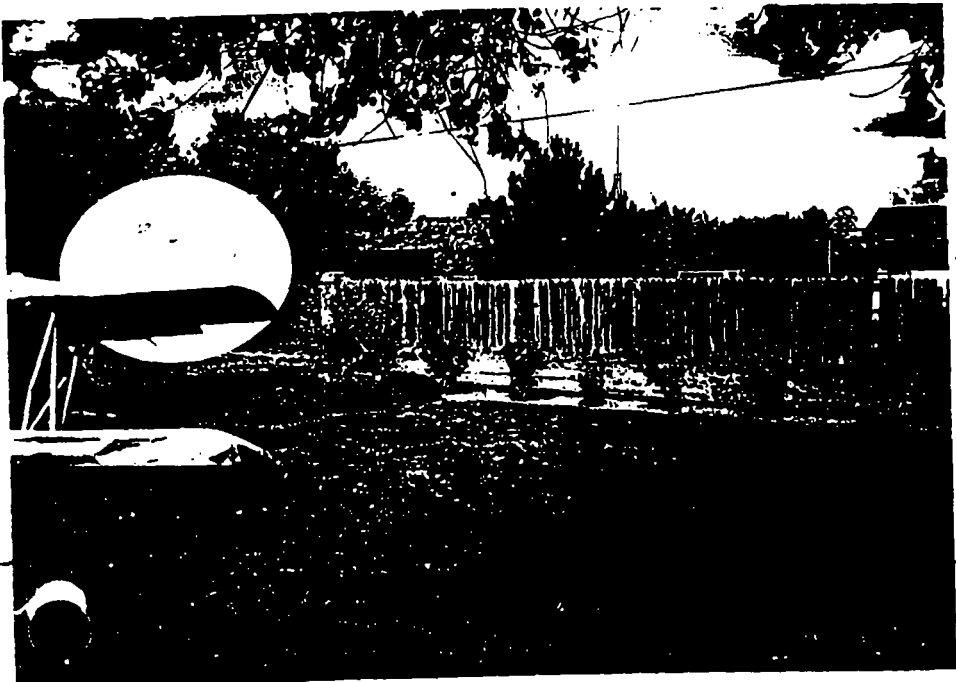
Weather Conditions: P.C. 105°F, S. breeze
Type of Camera: Canon
35 mm

Comments: Front of REDACTED
REDACTED - house,
REDACTED REDACTED where
Hoxie Flying Service plane
hit, dinged methyl parathion
load (120 gal). Note chem
stain on front of house
on roof

Picture No. 2
Date: 7-21-98
Time: PM
General Direction Faced: E

Weather Conditions: P.C. 105°F, S. breeze
Type of Camera: Canon
35 mm

Comments: Rear of
REDACTED house; alley
to East, and fence that
was splashed with chemical
during crash.



KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT

SPILL NOTIFICATION

CONTACT #(913)296-1679

LI RECEIVED BY SADIB KHAN DATE 7/21/98 TIME 12:29 pm

LI REFERRED TO NWIDO, BEFS, EMPRP DATE 7/21/98 TIME 12:41 pm

PERSON REPORTING SPILL Jessica Eshleman

PRESENTING: Eij Atochem (Manufacturer) PHONE # (215) 419-5054

COMPLAINT BY H... PHONE # ...

REPRESENTING _____

ADDRESS _____ CITY/STATE _____ ZIP _____

FILLER Hoxic Flying Service PHONE # (785) 675-3988

BY _____

ADDRESS unknown CITY/STATE Hoxic KS ZIP _____

CENTRAL OFFICE USE ONLY

TIME AND DATE OCCURRED 9:30 AM 7/21/98 98

MATERIAL SPILLED Penn cap AMOUNT SPILLED 30 gallons

MATERIAL SPILLED _____ AMOUNT SPILLED _____

LOCATION OF SPILL REDACTED REDACTED Hoxic KS

COUNTY Sheridan WATERWAY INVOLVED NO YES

CAUSE Plane crash No deaths

OTHER INFORMATION Fire dept or Eij Atochem will hire private contractor to clean up the spill

NATIONAL RESPONSE CENTER - STATE FAX
GOVERNMENT USE ONLY ** GOVERNMENT USE ONLY ** GOVERNMENT USE ONLY **
DO NOT RELEASE this information to the public without permission
from the National Response Center (G-OPF), U. S. Coast Guard
Headquarters, Washington DC 20593-0001 (202)267-2675.

From: National Response Center
USCG HQ Washington, D. C.
1-800-424-8802

To: DEPT NAT RES ATTN: LARRY KNOCHE
Incident Report # 446867

INCIDENT DESCRIPTION

Report taken by CIV ROBERTSON at 13:14 on 21-JUL-98
Incident Type: AIR
Incident Cause: TRANSPORT ACCIDENT
Affected Area: INSIDE OF A HOUSE AND ATMOSPHERE
The incident occurred on 21-JUL-98 at 09:30 local time.
Affected Medium: UNKNOWN OR OTHER

SUSPECTED RESPONSIBLE PARTY

Name: REDACTED
Organization: HOXIE FLYING SERVICE
HOXIE, KS
Day Phone: (785)6753988
Type of Organization: PRIVATE ENTERPRISE

INCIDENT LOCATION

1524 15TH STREET County: SHERIDAN
HOXIE, KS.

RELEASED MATERIAL(S)

CHRIS Code: NCC Official Material Name: NO CHRIS CODE
Also Known As: PENNCAP-M INSECTICIDE
Qty Released: 30 GAL(S) Qty in Water: 0 NON(S)

SOURCE/CAUSE OF INCIDENT

CROP DUSTING PLANE / THE PLANE FLEW TOO LOW AND STRUCK A PRIVATE
RESIDENCE WHICH PUNCTURED A TANK.

DAMAGE

Injuries: Fatalities: Evacuations: Damages: Air Close: Road Close:
1 0 N N

REMEDIAL ACTIONS

THE MATERIAL MAINLY AFFECTED THE UPSTAIRS OF THE PRIVATE RESIDENCE /
WILL DEPLOY A CONTRACTOR / FIRE DEPT CONTAINED MATERIAL

NOTIFICATIONS BY CALLER

NOTIFICATIONS BY NRC

AGCY TOXIC SUBST & DISEASE REGISTRY	(404)6398360
CHEM SAFETY HAZ MAT INVEST BOARD	(202)7377270
EPA OFFICE OF EMERG RESPONSE(OERR)	(703)8030256
S. EPA VII	(913)2810991
FEDERAL EMERGENCY MANAGEMENT AGENCY	(202)8988100
NOAA 1ST CLASS BB RPTS FOR KS	(206)5288344
NATIONAL RESPONSE CENTER HQ	(202)2872100
DEPT NAT RES ATTN: LARRY KNOCHE	(913)2861662
DOI/OEPC DENVER	(303)4452500

NATIONAL RESPONSE CENTER - STATE*FAX

** GOVERNMENT USE ONLY ** GOVERNMENT USE ONLY ** GOVERNMENT USE ONLY **

ADDITIONAL INFORMATION

EVACUATIONS WERE TO 1 BLOCK RESIDENTIAL AREA AND ALSO DOWN WIND / INJURY
TO THE PILOT DUE TO EXPOSURE / WILL NOTIFY: KOHE, ERC, LEPC
*** END INCIDENT REPORT # 446867 ***

PLEASE VISIT OUR WEB SITE
<http://www.nrc.uscg.mil>

MADDO

SPILL NOTIFICATION
CONTACT #(913)896-1679

ALL RECEIVED BY Mary Kelly DATE 7/21/98 TIME 0940

ALL REFERRED TO KW Co DATE 7/21/98 TIME 1102

PERSON REPORTING SPILL John Cahoj

REPRESENTING Sheridan Co Emerg Mgmt PHONE # 785 675-2288

COMPLAINT BY _____ PHONE # 348

REPRESENTING _____

ADDRESS _____ CITY/STATE _____ ZIP _____

PILLER Hoxie Crop Dusting PHONE # 785 675-3988

ADDRESS Home Address REDACTED REDACTED CITY/STATE KS ZIP 67740

CENTRAL OFFICE USE ONLY

TIME AND DATE OCCURRED 8:39 am 7-21-98 98

MATERIAL SPILLED 50 gal AMOUNT SPILLED Aviation Fuel

MATERIAL SPILLED _____ AMOUNT SPILLED _____

LOCATION OF SPILL Hoxie

COUNTY Sheridan WATERWAY INVOLVED NO YES

USE REDACTED REDACTED - Pilot

Gene McFall - 316-723-3060 - Bd of Ag

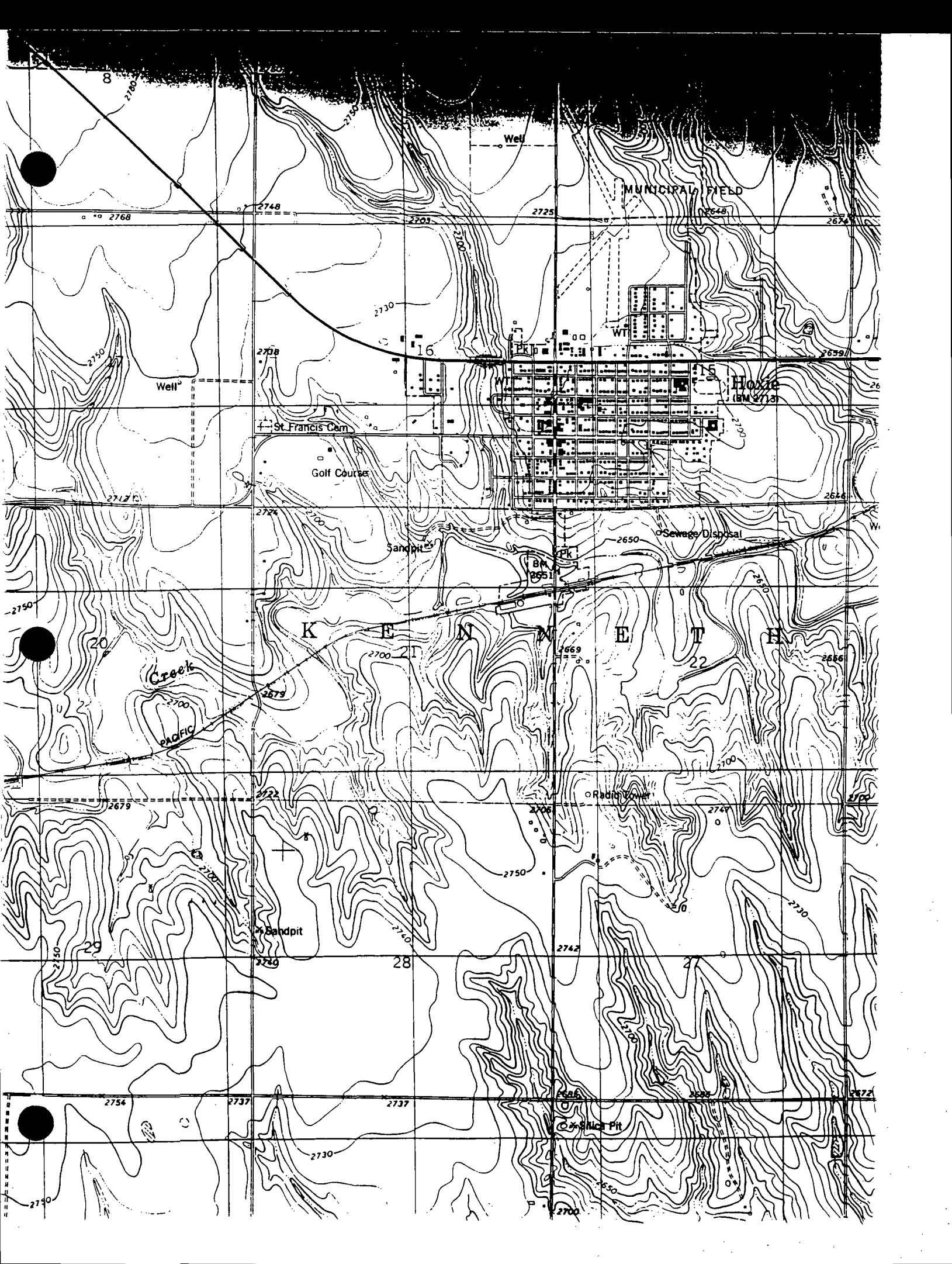
Bd of Ag Don Trigg - spoke to him he will follow up

OTHER INFORMATION Crop dusting plane / Spilled on

Pen-Cap (Methal Perathion) House

washed pilot off with water
ran down street

7 SPILL FRM Call 0 Bureau (1) Division - K-100 Field Inv. left msg



8

MUNICIPAL FIELD

Well

2738

St. Francis Cam

Golf Course

2730

16

WT

15
Hoxie
(M 273)

2717

2724

Sandpit

BM
2651

Sewage Disposal

-2750

20

Creek

PACIFIC

K E N N E B E C

2700

2669

2656

2679

2722

Radio Tower

2749

2722

2750

29

Sandpit

2746

28

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2686

2682

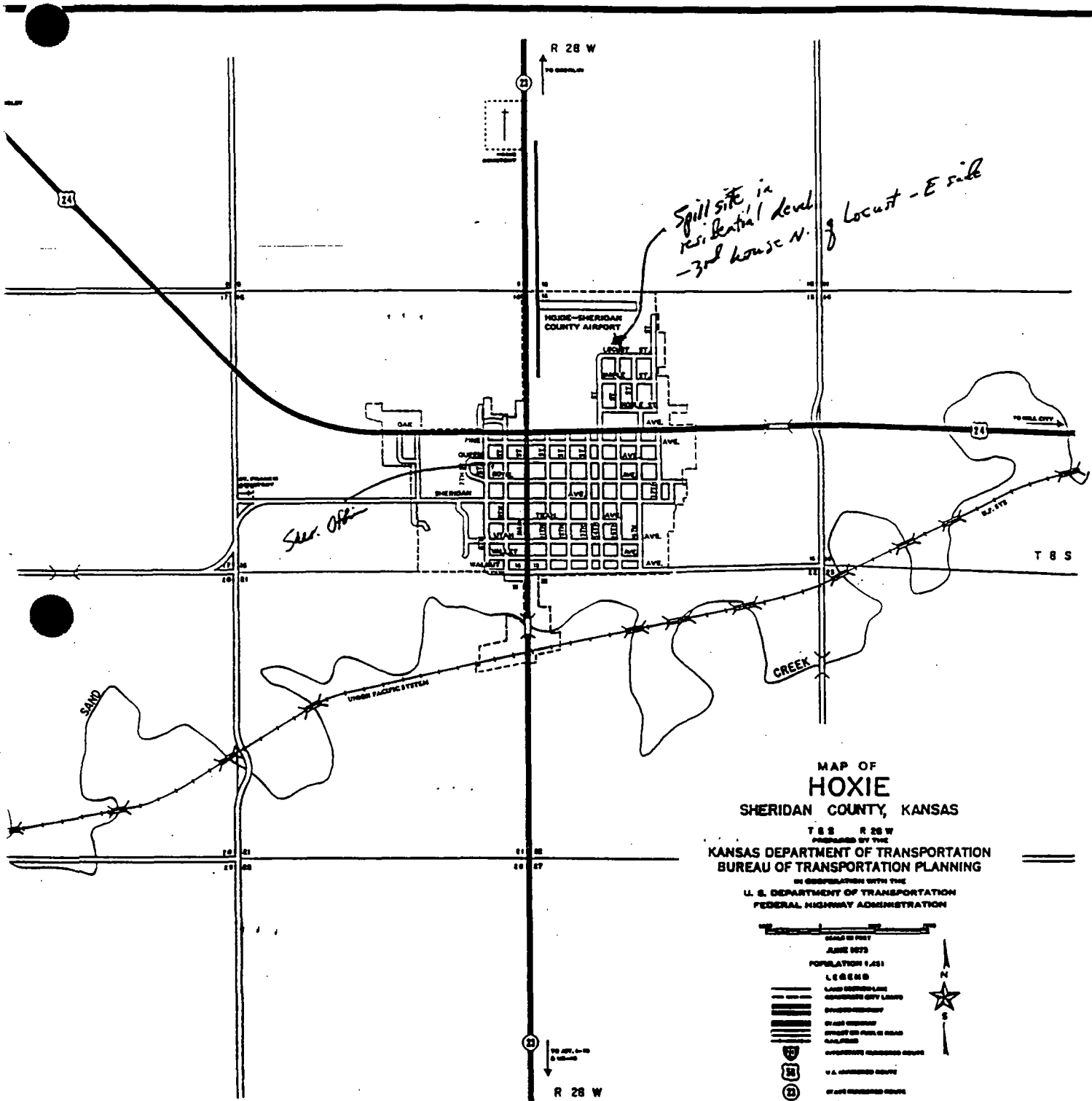
2672

2750

2730

2700

Co-Since Pit



MAP OF
HOXIE
 SHERIDAN COUNTY, KANSAS

T 8 S R 28 W
 PREPARED BY THE
KANSAS DEPARTMENT OF TRANSPORTATION
BUREAU OF TRANSPORTATION PLANNING
 IN COOPERATION WITH THE
U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

SCALE 1" = 1 MILE
 JUNE 1973
 POPULATION 1,451

LEGEND

- LAND SURVEY LINE
- SHERIDAN CITY LIMITS
- STREETS
- U.S. HIGHWAY
- STREET OR ROAD OR RAIL
- RAILROAD
- UNOFFICIAL RAILROAD ROUTE
- U.S. HIGHWAY ROUTE
- U.S. HIGHWAY ROUTE

REVISED MAP OF HOXIE

ATTACHMENT 2

HOXIE CRASH SITE

PRELIMINARY REMOVAL SITE EVALUATION

MATERIAL SAFETY DATA SHEETS

PENNCAP-M

INSECTICIDE

**EMERGENCY
TELEPHONE NUMBERS:**
(409) 779-0060 (PRIMARY)
(800) 424-9300 (CHEMTREC)

ADDRESS:
PENNWALT CORPORATION
AGCHEM DIVISION
THREE PARKWAY
PHILADELPHIA, PA 19102

AGCHEM
PENNWALT

FORM 4627
REV 6/89

MATERIAL SAFETY DATA SHEET

PRODUCT IDENTIFICATION

**PRODUCT
NAME**
PENNCAP-M® INSECTICIDE

EPA REG. NO.
4581-292

**PENNWALT
CODE NUMBER**
8056

**CHEMICAL NAME AND
FORMULA**
O,O-DIMETHYL O-P-NITROPHENYL
PHOSPHOROTHIOATE
C₈H₁₀NO₃PS

SYNONYMS
METHYL PARATHION

CAS NUMBER
298-00-0

CHEMICAL FAMILY
ORGANOPHOSPHATE

HAZARDOUS INGREDIENTS

**MATERIALS
OR COMPONENTS** %WW

Methyl parathion,
including related
isomers and xylene
base aromatic solvent 259

Contained in polymeric microcapsules
dispersed and suspended in water

Contains no substances listed as toxic
by SARA 313. Contains no substances
known to be carcinogens.

SARA TITLE III RATINGS

This formulated product has a positive
rating for Acute Hazard.

SHIPPING INFORMATION

DOT I.D. NO.
NA-9188
TANK TRUCK ONLY

DOT CLASS
ORM-E
TANK TRUCK ONLY

SHIPPING NAME
PO HAZARDOUS SUBSTANCE, LIQUID
NOS (METHYL PARATHION)
(TANK TRUCK ONLY)

PHYSICAL PROPERTIES

PHYSICAL STATE

BOILING POINT/RANGE
ca 100 °C
ca 212 °F

MELTING POINT
NA - LIQUID

FREEZING POINT
< 0°C < 32°F

**MOLECULAR WEIGHT
(CALCULATED)**
NA

SPECIFIC GRAVITY (H₂O=1)
1.081 @ 20/20 °C

VAPOR PRESSURE (mm Hg)
NE

VAPOR DENSITY (AIR = 1)
NA

SOLUBILITY IN H₂O
DISPERSES

% VOLATILES BY VOLUME
NA

EVAPORATION RATE

ETHER = 1
 WATER = 1
 BUTYLACETATE = 1

APPEARANCE AND ODOR
BEIGE LIQUID -
ORGANOPHOSPHATE ODOR

FIRE AND EXPLOSION DATA

FLASH POINT (TEST METHOD)
> 96°C > 205°F (TCC)

FLAMMABLE LIMITS
NA

**AUTOIGNITION TEMPERATURE/
FIRE POINT**
NA

EXTINGUISHING MEDIA
 WATER SPRAY DRY CHEMICAL
 WATER FOG ALCOHOL
FOAM
 WATER STREAM FOAM
 CO₂ EARTH OR
SAND

**SPECIAL FIRE FIGHTING
PROCEDURES**

DO NOT ENTER BUILDING
 ALLOW FIRE TO BURN
 WATER MAY CAUSE FROTHING
 DO NOT USE WATER
 OTHER
WEAR SELF CONTAINED
BREATHING APPARATUS AND
PROTECTIVE CLOTHING

**UNUSUAL FIRE AND
EXPLOSION HAZARDS**

DUST EXPLOSION HAZARD
 SENSITIVE TO SHOCK
 CONTAMINATION
 TEMPERATURE
 OTHER
TOXIC FUMES

REACTIVITY DATA

STABILITY

STABLE UNSTABLE

**CONDITIONS CONTRIBUTING
TO INSTABILITY**

THERMAL DECOMPOSITION
 PHOTO DEGRADATION
 POLYMERIZATION
 CONTAMINATION

**INCOMPATIBILITY—AVOID
CONTACT WITH**

STRONG ACIDS
 STRONG ALKALIS
 STRONG OXIDIZERS
 OTHER
MATERIALS THAT REACT
WITH WATER

REACTIVITY DATA, CONTINUED

**HAZARDOUS DECOMPOSITION
PRODUCTS, THERMAL AND
OTHER:**

MIXED TOXIC SUBSTANCES FROM
THERMAL DEGRADATION

CONDITIONS TO AVOID

HEAT
 OPEN FLAMES
 SPARKS
 IGNITION SOURCES

SPILL OR LEAK

**STEPS TO BE TAKEN IF
MATERIAL IS RELEASED
OR SPILLED**

① FLUSH WITH WATER
① ABSORB WITH SAND OR
INERT MATERIAL
③ NEUTRALIZE
② SWEEP OR SCOOP UP AND
REMOVE
 KEEP UPWIND. EVACUATE
ENCLOSED SPACES
 PREVENT SPREAD OR SPILL
 DISPOSE OF IMMEDIATELY

WASTE DISPOSAL METHOD:

If wastes cannot be disposed of by use
according to label instructions, contact
your State Pesticide or Environmental
Control Agency or the hazardous waste
representative at the nearest EPA
Regional Office for guidance.

*- Pesticide Hazardous
- dangerous product
to the general
public / Chlorine
- degradation via
oxidation by
chlorine (bleach)*

NA = NOT APPLICABLE
NE = NOT ESTABLISHED

CONTINUED ON OTHER SIDE

MATERIAL
SAFETY
DATA SHEET

PENNWALT
PRODUCT NAME:
PENNCAP-M[®] INSECTICIDE
CODE NUMBER:
8056

USE PRODUCT, READ AND FOLLOW DIRECTIONS AND PRECAUTIONS ON PRODUCT LABEL AND BULLETINS.

CITY

(ACUTE)

LD₅₀ - 600 mg/kg

(ACUTE)

LD₅₀ (BIT) > 5,450 mg/kg

(CHRONIC) (ACUTE)

LD₅₀ (NON-TOXIC AT 2.920 ppm
OR 1 HOUR

SUBCHRONIC, ETC.

Ingredient, methyl parathion, is a cholinesterase inhibitor to which exposure may produce effects similar to those of acute organophosphate insecticides. Symptoms include headache, dizziness, incoordination, muscle tremor, nausea, abdominal cramps, and sweating.

HEALTH HAZARD INFORMATION

STATEMENT OF EXPOSURE CONCENTRATION

LD₅₀ (ACUTE) (ORAL) (RAT) 1000 mg/kg

LD₅₀ (ACUTE) (DERMAL) (RAT) 1000 mg/kg

LD₅₀ (ACUTE) (INHALATION) (RAT) 1000 mg/kg

(ACUTE)

(CHRONIC)

(ACUTE)

(CHRONIC)

HEALTH HAZARD INFORMATION CONTINUED

INHALATION EFFECTS

NA

LUNG EFFECTS

NA

EMERGENCY FIRST AID

INGESTION

GET MEDICAL ATTENTION

INDUCE VOMITING

DO NOT INDUCE VOMITING

GIVE PLENTY OF WATER

OTHER:

ATROPINE IS ANTIDOTAL. 2-PAM IS ALSO ANTIDOTAL AND MAY BE ADMINISTERED IN CONJUNCTION WITH ATROPINE. MORPHINE IS CONTRAINDICATED.

DERMAL

GET MEDICAL ATTENTION

FLUSH WITH SOAP AND WATER

CONTAMINATED CLOTHING—REMOVE AND LAUNDRY

CONTAMINATED SHOES—DESTROY

EYE CONTACT

GET MEDICAL ATTENTION

FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES

INHALATION

GET MEDICAL ATTENTION

REMOVE TO FRESH AIR

IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION

GIVE OXYGEN

SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS—

ALWAYS MAINTAIN EXPOSURE BELOW PERMISSIBLE EXPOSURE LIMITS

CONSULT AN INDUSTRIAL HYGIENIST OR ENVIRONMENTAL HEALTH SPECIALIST

LOCAL EXHAUST

USE WITH ADEQUATE VENTILATION

CHECK FOR AIR CONTAMINANT AND OXYGEN DEFICIENCY

EYE

GOGGLES

FACE SHIELD

HAND (GLOVE TYPE)

BUTYL RUBBER

POLYVINYL ALCOHOL

POLYVINYL CHLORIDE

NEOPRENE

NATURAL RUBBER

POLYETHYLENE

ANY

RESPIRATOR TYPE—

WEAR A PESTICIDE RESPIRATOR APPROVED BY NIOSH/MESA

OTHER PROTECTIVE EQUIPMENT

RUBBER BOOTS

APRON

OTHER:

PROTECTIVE CLOTHING WHICH PREVENTS SKIN CONTACT INCLUDING CHEMICAL RESISTANT SHOES, AND HOOD OR WIDE-BRIMMED HAT WHEN HANDLING CONCENTRATE

SPECIAL PRECAUTIONS

PRECAUTIONARY LABELING

WASH THOROUGHLY AFTER HANDLING

DO NOT GET IN EYES, ON SKIN OR CLOTHING

DO NOT BREATHE DUST, VAPOR, MIST, GAS

KEEP CONTAINER CLOSED

KEEP AWAY FROM HEAT, SPARKS AND OPEN FLAMES

STORE IN TIGHTLY CLOSED CONTAINERS

DO NOT STORE NEAR COMBUSTIBLES

KEEP FROM CONTACT WITH CLOTHING AND OTHER COMBUSTIBLE MATERIALS

EMPTY CONTAINER MAY CONTAIN HAZARDOUS RESIDUES

USE EXPLOSION-PROOF EQUIPMENT

OTHER HANDLING AND STORAGE CONDITIONS

Store in the original container, preferably in a locked storage area. Do not store in manner where cross-contamination with other pesticides, fertilizers, food or feed could occur.

PLEASE NOTE

The above information is accurate to the best of our knowledge. However, since data, safety standards, and government regulations are subject to change and the conditions of handling and use of this product are beyond our control, Pennwalt makes no warranty, either express or implied, with respect to the completeness or continuing accuracy of the information contained herein and disclaims all liability for reliance thereon. User should consult the label of current data sheets for the particular use.

PREPARED BY: R. A. CLEMMER

DATE: 6/89

ADDRESS:
PENNWALT CORPORATION
AGCHEM DIVISION ROOM 619
THREE PARKWAY
PHILADELPHIA, PA 19102

PHONE:
(215) 587-7667

Insecticide

Manufacturer

1 NORTH AMERICA, INC.
DIVISION
PARKWAY
ELPHIA, PA 19102

5/89

TELEPHONE NUMBERS:
779-0060 (PRIMARY)
424-9300 (CHEMTREC)

NOT APPLICABLE
NOT ESTABLISHED

IDENTIFICATION

PRODUCT NAME: PENNCAP-M(R) INSECTICIDE

REG. NO.: 4581-292

FORM CODE NUMBER: 8056

GENERIC NAME AND FORMULA: O,O-DIMETHYL O-p- NITROPHENYL PHOSPHOROTHIOATE
NOS PS

ACTIVE INGREDIENTS: METHYL PARATHION

REG. NO.: 298-00-0

GENERIC FAMILY: ORGANOPHOSPHATE

ACTIVE INGREDIENTS

ACTIVE INGREDIENTS OR COMPONENTS

94W

Methyl parathion, including related isomers and xylene base
aromatic solvent

26.0

Formulated in polymeric microcapsules dispersed and suspended in water.
Contains no substances listed as toxic by GARA 113. Contains no substances
to be carcinogens.

ENVIRONMENTAL RATINGS

formulated product has a positive rating for Acute Hazard.

IDENTIFICATION

I.D. NO.: NA-9188 TANK TRUCK ONLY

CLASS: ORM-E TANK TRUCK ONLY

PLING NAME: RQ HAZARDOUS SUBSTANCE, LIQUID NOS (METHYL PARATHION) (TANK TRUCK ONLY)

PHYSICAL PROPERTIES

PHYSICAL STATE

MELTING POINT/RANGE:

00 C
32 F

FREEZING POINT: NA - LIQUID

BOILING POINT: <0C <32F

MOLECULAR WEIGHT (CALCULATED): NA

RELATIVE GRAVITY (H₂O = 1): 1.081 @ 20/20 C

VAPOR PRESSURE (mm Hg): NE

RELATIVE DENSITY (AIR = 1): NA

SOLUBILITY IN H₂O: DISPERSES

STABILITY BY VOLUME: NA

DECOMPOSITION RATE:

ETHERAL: 1

WATER: 1

ETHYL ACETATE: 1

APPEARANCE AND ODOR: BEIGE LIQUID - ORGANOPHOSPHATE ODOR

FLAMMABLE EXPLOSION DATA

FLASH POINT (TEST METHOD): >96C >205F (TCC)

UPPER FLAMMABLE LIMITS: NA

IGNITION TEMPERATURE/FIRE POINT: NA

EXTINGUISHING MEDIA:

WATER SPRAY

WATER FOG

-) WATER STREAM
-) CO2
-) DRY CHEMICAL
-) FOAM
-) M
-) EARTH OR SAND

SPECIAL FIRE FIGHTING PROCEDURES:

-) DO NOT ENTER BUILDING
-) ALLOW FIRE TO BURN
-) WATER MAY CAUSE FROTHING
-) DO NOT USE WATER
-) OTHER: WEAR SELF CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

-) DUST EXPLOSION HAZARD
-) SENSITIVE TO SHOCK
-) CONTAMINATION
-) TEMPERATURE
-) OTHER: TOXIC FUMES.

REACTIVITY DATA

STABILITY:

-) STABLE
-) UNSTABLE

CONDITIONS CONTRIBUTING TO INSTABILITY:

-) THERMAL DECOMPOSITION
-) PHOTO DEGRADATION
-) POLYMERIZATION
-) CONTAMINATION

COMPATIBILITY-AVOID CONTACT WITH:

-) STRONG ACIDS
-) STRONG ALKALIS
-) STRONG OXIDIZERS
-) OTHER: MATERIALS THAT REACT WITH WATER.

HAZARDOUS DECOMPOSITION PRODUCTS, THERMAL AND OTHER: MIXED TOXIC SUBSTANCES FROM THERMAL DEGRADATION

CONDITIONS TO AVOID:

-) HEAT
-) OPEN FLAMES
-) SPARKS
-) IGNITION SOURCES

SPILL OR LEAK

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

-) WASH WITH WATER
-) COVER WITH SAND OR INERT MATERIAL
-) NEUTRALIZE
-) SWEEP OR SCOOP UP AND REMOVE

-) KEEP UPWIND. EVACUATE ENCLOSED SPACES
-) PREVENT SPREAD OR SPILL
-) DISPOSE OF IMMEDIATELY

ASBESTOS DISPOSAL METHOD: If wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency or the hazardous waste representative at the nearest EPA Regional Office for guidance.

TOXICITY

ORAL (ACUTE): LD50 (RAT) 400 mg/kg

DERMAL (ACUTE): LD50 (RABBIT) 5,450 mg/kg

INHALATION (ACUTE): RAT-NON TOXIC AT 2,000 ppm 500 1 HOUR

CHRONIC, SUBCHRONIC, ETC.: The active ingredient, methyl parathion, is a cholinesterase inhibitor to which repeated exposure may produce effects without symptoms.

Symptoms of acute organophosphate poisoning include headache, dizziness, weakness, incoordination, muscle twitching, tremor, nausea, abdominal cramps, diarrhea, and sweating.

ENVIRONMENTAL HAZARD INFORMATION

PERCENTAGE OF EXPOSURE TO CONCENTRATE

PERMISSIBLE EXPOSURE LIMIT (TLV/TWA OR CEILING ppm)

CGIH 1988-89: TLV/TWA 0.2 mg/m³ (skin)

SHA 1989: TWA 0.2 mg/m³

IRRITATION: NA

CORROSIVITY: NA

SENSITIZATION: NOT A SENSITIZER

INHALATION EFFECTS: NA

EYE EFFECTS: NA

EMERGENCY FIRST AID

INGESTION:

- x) GET MEDICAL ATTENTION
- x) INDUCE VOMITING
-) DO NOT INDUCE VOMITING
-) GIVE PLENTY OF WATER

NOTE: OTHER: ATROPINE IS ANTIDOTAL. D-PAM IS ALSO ANTIDOTAL AND MAY BE ADMINISTERED IN CONJUNCTION WITH ATROPINE. MORPHINE IS CONTRAINDICATED.

SKIN:

- x) GET MEDICAL ATTENTION
- x) FLUSH WITH SOAP AND WATER

CONTAMINATED CLOTHING-REMOVE AND LAUNDRER
CONTAMINATED SHOES-DESTROY

CONTACT:
GET MEDICAL ATTENTION
FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES

LATION:
GET MEDICAL ATTENTION
REMOVE TO FRESH AIR
IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION
GIVE OXYGEN

IAL PROTECTION INFORMATION

ILATION REQUIREMENTS: ALWAYS MAINTAIN EXPOSURE BELOW PERMISSIBLE EXPOSURE
TS
CONSULT AN INDUSTRIAL HYGIENIST OR ENVIRONMENTAL HEALTH SPECIALIST
LOCAL EXHAUST
USE WITH ADEQUATE VENTILATION
CHECK FOR AIR CONTAMINANT AND OXYGEN DEFICIENCY

GOGGLES
FACE SHIELD

(GLOVE TYPE):
B RUBBER
P VINYL ALCOHOL
POLYVINYL CHLORIDE
NEOPRENE
NATURAL RUBBER
POLYETHELENE
ANY

IRATOR TYPE: WEAR A PESTICIDE RESPIRATOR APPROVED BY NIOSH/MESA.

ER PROTECTIVE EQUIPMENT:

RUBBER BOOTS
APRON

OTHER: PROTECTIVE CLOTHING WHICH PREVENTS SKIN CONTACT, INCLUDING
ICAL RESISTANT SHOES, AND HOOD OR WIDE-BRIMMED HAT WHEN HANDLING
CENTRATE

IAL PRECAUTIONS

CAUTIONARY LABELING:

WASH THOROUGHLY AFTER HANDLING
DO NOT GET IN EYES, ON SKIN OR CLOTHING
DO NOT BREATH DUST, VAPOR MIST, GAS
KEEP CONTAINER CLOSED
KE AWAY FROM HEAT SPARKS AND OPEN FLAMES
S IN TIGHTLY CLOSED CONTAINERS
DO NOT STORE NEAR COMBUSTIBLES
KEEP FROM CONTACT WITH CLOTHING AND OTHER COMBUSTIBLE MATERIALS.

) EMPTY CONTAINER MAY CONTAIN HAZARDOUS RESIDUES
) USE EXPLOSION-PROOF EQUIPMENT

HANDLING AND STORAGE CONDITIONS:

Store in the original container, preferably in a locked storage area. Do not store in a manner where cross-contamination with other pesticides, fertilizers, food or feed could occur.

BEFORE USING PRODUCT, READ AND FOLLOW DIRECTIONS AND PRECAUTIONS ON PRODUCT LABEL AND BULLETINS.

PLEASE NOTE

The above information is accurate to the best of our knowledge. However, scientific data, safety standards, and government regulations are subject to change and the conditions of handling and use, or misuse, are beyond our control. Atochem MAKES NO WARRANTY, EITHER EXPRESS OR IMPLIED, WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN AND DISCLAIMS ALL LIABILITY FOR RELIANCE THEREON. User should satisfy himself that he has all current data relevant to his particular use.

PREPARED BY: R. A. CLEMMER

DATE: 6/89

ADDRESS:

Atochem NORTH AMERICA, INC.
OPERATIONS DIVISION, ROOM 619
RESEARCH PARKWAY
PHILADELPHIA, PA 19102

PHONE: (215) 587-7667



KANSAS

DEPARTMENT OF HEALTH & ENVIRONMENT

BILL GRAVES, GOVERNOR

Gary R. Mitchell, Secretary

HAYS DISTRICT OFFICE

2301 E. 13TH STREET

HAYS, KS 67601

785-625-5663

785-625-4005 - FAX

PLEASE DELIVER THE FOLLOWING PAGES TO:

DATE: 7/24/98

NAME: Scott Barnum

FROM: Bill Heimann

TOTAL NUMBER OF PAGES INCLUDING COVER SHEET: 9



KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT
BUREAU OF WASTE MANAGEMENT
BUILDING 740, FORBES FIELD
TOPEKA, KANSAS 66620-0001
VOICE PHONE (785) 296-1591
FAX (785) 296-8642

TO: Bill Heinann

FAX NUMBER: _____

FROM: R. Smith

DATE: 7/24/98

COVER SHEET + _____ PAGES

COMMENTS: _____

TO: Dan Tuggle FAX # 913-296-0673
FROM: Don O'Shaughnessy
RE: Methyl parathion soil dissipation

As per discussion, following is the summarized information on soil dissipation and mobility of methyl parathion, and including nitrophenol degradation product. Clearly, these data do not take into account a massive exposure to a small area, but rather aim to evaluate the dissipation under conditions of agricultural application. Never-the-less, you will see that methyl parathion degrades rapidly in soil, to dissipate primarily as carbon dioxide into the air. Nitrophenol also disappears rapidly, and ought not be substantial issue.

The data also do not take into account the effects of encapsulation. Elf Atochem will be in a better position to comment on that.

Whether active remediation or dissipation over time is best cannot be judged without knowing the concentration over the area of soil affected. I again feel confident that Elf Atochem will be able to advise.

Post-It Fax Note	7671	Date	7/	# of pages	11
To	Ron Smith	From	Don Tuggle		
Co./Dept	Remediation	Co.	KDA		
Phone #	6-1604	Phone #	6-5395		
Fax #	6-8642	Fax #	6-0673		

Ron,
I don't have
a fax No. for
Bill Heinnann,
Please fax this
on to him also.

Thanks
Dan



Chemimova AG/AS
P. O. Box 8
DK-7820 Lemvig
Denmark

Phone (+45) 97 83 41 00
Fax (+45) 97 83 45 55
Telex 66314 CHEMIV DK
VIA reg. no. 177.122

Data Manual
Methyl Parathion Technical - Product No. 270
November 1995

The soils were fortified with the test compound at concentrations of 2, 10, 15 or 20 µg/ml. Soil suspensions in 0.01 M calcium chloride solution were shaken in the dark at 25±1°C for 24 h. They were then centrifuged and the supernatants decanted. Fresh calcium chloride solution was added to the soil pellets and the process repeated. The supernatant samples were assayed radiochemically by LSC; the residual soil samples were combusted and the trapped radioactivity measured by LSC.

The adsorption and desorption constants K_d were obtained by the Freundlich isotherm and the constant K_{oc} determined, based upon organic carbon content for each soil. The values obtained were as follows:

Soil	OC (%)	Adsorption		Desorption	
		K_d	K_{oc}	K_d	K_{oc}
Silt loam	1.2	7.09	591	11.1	923
Clay loam	1.3	8.71	670	12.3	947
Sandy loam	0.4	1.82	456	2.71	677
Sand	0.25	0.57	230	0.89	357

The K_{oc} values indicate that Parathion-Methyl has low mobility in silt and clay loams, a low-medium mobility in sandy loam and medium mobility in sand.

The ^{14}C - mass balance for the tests on the 4 soils was 101-102%.

The adsorption/desorption properties of Parathion-Methyl in soils and sediments have also been reported in published studies (73). Samples of 11 soils and 8 sediments of widely varying pH, CEC, organic matter and sand/silt/clay distributions were equilibrated with ^{14}C -methyl parathion for periods of 2 or 24 h. After equilibration and centrifugation, aliquots of the supernatants were removed for radiochemical assay by LSC. The decrease in the Parathion-Methyl concentration in the liquid phase was attributed to adsorption by soil. Soil-water distribution (K) and partition coefficients adjusted for organic carbon content (K_{oc}) were calculated.

The 24 h K_{oc} values for Parathion-Methyl ranged from 554 to 2831. Soils and sediments that absorbed Parathion-Methyl relatively strongly were generally those with the highest organic matter content and those which adsorbed more weakly generally had lower OMs. Adsorption coefficients were, mostly, similar at 2 and 24 h.

b) Field Dissipation

The movement of Parathion-Methyl in soil has been assessed in two field studies conforming to EPA-RIFRA guideline N164-1.

In the first, (10) Parathion-Methyl was applied as an emulsifiable concentrate to replicate plots of cotton and to a separate untreated plot. Six applications were made at weekly intervals with a boom sprayer, each at a rate of 1.1 kg Parathion-Methyl per ha. The test location was in Madera County, California, USA and the soil was a



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 P. O. Box 8
 Dc 7820 Larnaq
 Denmark
 Data Manual
 Methyl Parathion Technical - Product No. 270
 November 1985

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 Telex 88614 CHEMV DK
 A/S reg. no. 177122

sandy loam with organic matter 0.2%, pH 6.2, sand 77%, silt 17%, clay 6% and CEC 3.1 meq/100g in the 0-10 cm top layer.

Soil cores, 120 cm x 4.5 cm, were taken pre-application, immediately after each subsequent application and then on days 1, 7, 14, 21, 28, 56, 91, 119, 182, 273, 364, 448 and 546 following the last application. Soil cores were divided as follows for analysis. 0-10, 10-20, 20-30, 30-45, 45-60, 60-90 and 90-120 cm segments. The soil segments were analysed for Parathion-Methyl and methyl paraoxon after extraction with aqueous methanol and partitioning with methylane chloride. The extracts were submitted to column chromatography, the eluates evaporated to dryness, dissolved in toluene and submitted for GLC analysis with a TS detector. The method was validated with soil fortification levels of 0.05, 0.5 and 5 ppm of the two compounds. Recoveries of 79-101% were attained for methyl paraoxon and 80-104% for Parathion-Methyl. A detection limit of 0.05 ppm was established for both compounds.

The mean Parathion-Methyl soil residues at 0.-10 cm depth immediately after each application were -

Application	1	2	3	4	5	6
Parathion-Methyl (ppm)	0.37	0.32	0.25	0.16	0.16	0.085

By Day 1 following the 6th application the average soil Parathion-Methyl concentration was 0.033 ppm and by Day 7 the compound could not be detected (<0.05 ppm,) in any samples at 0-10 cm.

✓ No Parathion-Methyl residues were detected (<0.05 ppm) in soil samples below the 10 cm level and no methyl paraoxon residues (0.05 ppm) were detected in soil samples at any depth.

A dissipation half-life in the 0-10 cm layer could not be determined because the residues dissipated so rapidly. The absence of detectable residues in the lower levels indicate that Parathion-Methyl does not leach.

The second study was carried out on a cotton crop to the same design as that described above (74). The location was Pemiscot County, Missouri, USA and the soil was a loam with organic matter 0.7%, pH 5.4, sand 30%, silt 46%, clay 24%, CEC 11.4 meq/100 g in the 0-30 cm top layer. - The application procedures and rate, the soil sampling and analytical methods were as described previously. The analytical method was validated with soil fortification levels of 0.05, 0.5 and 5 ppm of the two compounds and recoveries of 70-96% were attained. A detection limit of 0.05 ppm was established.



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Denmark

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A/S reg. no. 177.122

Date Manual:
Methyl Parathion Technical - Product No. 270
November 1985

The mean Parathion-Methyl soil residues at 0-10 cm depth immediately after each application were -

Application	1	2	3	4	5	6
Parathion-Methyl (ppm)	0.039	0.030	0.059	0.087	0.022	0.052

Parathion-Methyl residues could not be detected (<0.05 ppm) one day after the final application, nor could they be detected in soil at a depth below 10 cm at any time. No methyl paraoxon residues were detected in soil at any time or any depth (<0.05 ppm)

A dissipation half-life for Parathion-Methyl could not be determined in the 0-10 cm soil layer because the residues dissipated so rapidly. The absence of detectable residues in the lower layers indicate that the compound does not leach.

20.2 Aerobic soil metabolism and degradation

The metabolism of ^{14}C -ring labelled Parathion-Methyl (radiochemical purity 97.2%) was studied in a sandy loam soil (OM 1.6%, sand 56%, silt 26%, clay 18%, pH 6.8, CEC 11.6 meq/100g). The study followed EPA-FIFRA guideline N162-1 (75).

The soil was fortified with 10.96 ppm ^{14}C -Parathion-Methyl and kept sealed in the dark at 75% field capacity at $25 \pm 1^\circ\text{C}$. ^{14}C -volatiles and soil were sampled at intervals up to 6 months. Soil samples were extracted and the post-extracted soil combusted for determination of bound residues. Soil extracts, soil combustion products and volatility traps were assayed radiochemically by LSC. Soil extracts were also submitted to HPLC and TLC analysis for metabolite identification.

Parathion-Methyl declined quickly for the first few days with a half-life ($t_{1/2}$) of 4.7 days. It then declined less quickly but only 1.6% remained by day 28. Cumulative volatiles amounted to 64% of the initial dose at 6 months, mostly as $^{14}\text{CO}_2$. Bound residues increased to 38.7% of the dose at 1 month, then declined to 26.7% by 6 months. A major proportion was bound to humin. *p*-Nitrophenol was the most abundant soil metabolite, equivalent to 7.7% of the dose at day 1, declining to $<0.2\%$ by day 7. A small amount of *O,O*-bis(4-nitrophenyl)-*O*-methyl phosphorothioate was also present. Thus, Parathion-Methyl degrades rapidly in soil with a large proportion of the molecule mineralised to CO_2 .

Similar results were obtained from an investigation of the metabolism of ^{14}C -ring labelled Parathion-Methyl in two soils treated at a rate equivalent to 50 ppm (76). The soils were maintained at $22 \pm 2^\circ\text{C}$ and 40% of maximum water capacity. The concentration of Parathion-Methyl declined progressively in both soils over 52 days to 16.4% and 30.1% of the initial values. The main degradation products were CO_2 and *p*-nitrophenol.

The breakdown and fate of Parathion-Methyl in soil has also been reported in a published study (77). In a laboratory evaluation, a loam soil was fortified at 200 ppm



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 SK-7620 Lerum
 Sweden
 Data Manual
 Methyl Parathion Technical - Product No. 270
 November 1995

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 A/S Reg. no. 177.122

with Parathion-Methyl and incubated at 30°C and pH 6.2 - 6.5 for 12 days. Samples were taken at intervals and analysed for Parathion-Methyl by GLC. Parathion-Methyl declined rapidly, 26% remaining at 3 days and only 5% by 12 days. The compound, as an emulsifiable formulation, was also applied at 5.6 kg/ha to a silt loam soil under field conditions and its disappearance followed over a 5 month period. A residue level of approximately 0.1 ppm, equivalent to 3% of the applied dose, was reached within 30 days.

20.3 Photodegradation on Soil

The photolytic breakdown of ¹⁴C- ring labelled Parathion-Methyl (radiochemical purity >99%) on soil was evaluated in a study following EPA-FIFRA guideline N161-3 (78).

The test substance was incorporated into a 1 mm layer of a sandy loam soil at a level of 0.3 mg/cm². It was exposed to a xenon lamp light source with a light intensity similar to midday sun at 40° latitude. A control preparation was incubated in the dark. A study was also undertaken in daylight, under mostly cloudy conditions. Soil samples were taken at regular intervals and extracted with methanol and submitted to column chromatographic clean up. The soil extracts and trapped volatiles were assayed radiochemically by LSC. Soil extracts were also analysed by HPLC.

The photolysis study had to be repeated because, in the 1st study, additional moisture was absorbed from the air. In the 2nd, the air was dried. In both studies the degradation of Parathion-Methyl followed a 2-step reaction.

	Rate constant (day ⁻¹)	Half-life (day)
Study 1. phase 1	0.1538	4.5
phase 2	0.0567	12.2
Study 2. phase 1	0.1412	4.9
phase 2	0.0161	43.0

The sunlight experiment showed a much longer 1st phase (61 days) due to the cloudy conditions.

The formation of ¹⁴CO₂ increased steadily in the two photolysis studies from 5.7% at day 4 to 13.9% at day 10 (Study 1) and 1.3% at day 4 to 6.8% at day 11 (Study 2). 4-Nitrophenol was identified as a degradate (6-7% of initial dose) but was also a significant breakdown product in the dark control. The overall material balance for the 2 studies was 92.5-104% ¹⁴C.

Therefore Parathion-Methyl is photolysed on soil by a 2-stage process, the first with a half-life of about 4.7 days and the second varying between 12 and 43 days according to soil moisture content.



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20.4 Volatility from Soil

The extent of volatilisation from soil of ^{14}C -ring labelled Parathion-Methyl (radiochemical purity $\geq 98\%$) was assessed in a study conforming to EPA-FIFRA guideline N163-2 (79).

A sandy clay loam (OM 2%, pH 7.0, sand 55.8%, clay 21.4%, silt 22.8%, FMC 17.75%) was fortified with a formulation containing labelled material to give a total Parathion-Methyl level of $33.66 \mu\text{g}/\text{cm}^2$ (52.9 ppm). The prepared soil was maintained in the test system at 50% or 75% of its FMC and with air flows of 100 or 300 ml/min. The outlet air was passed through traps to collect volatiles. The whole system was maintained in the dark at $25 \pm 1^\circ\text{C}$.

The volatility of Parathion-Methyl was calculated from the average μg recovered per day divided by the soil surface area and its concentration in air was based on average μg recovered per day divided by total air volume through the system. The results were as follows:

Test system Air flow (ml/min)	FMC %	Parathion-Methyl		
		Max. air concn. ($\mu\text{g}/\text{m}^3$)	Max volatility ($\mu\text{g}/\text{cm}^2 \text{h}$)	% Initial dose
100	50	34.3	2.6×10^{-3}	0.13
300	50	15.2	3.5×10^{-3}	0.17
100	75	3.1	2.4×10^{-4}	0.03
300	75	55.9	1.3×10^{-2}	0.25

The $^{14}\text{CO}_2$ generated from the systems, as per cent initial dose, was 10.3% (100/50), 0.2% (100/75), 6.4% (300/50) and 55.4% (300/75). The ^{14}C -mass balance for the 4 studies ranged from 98.3%-115.2%

✱ The volatility of Parathion-Methyl from soil is therefore very low.

✱ Severn & Hong (1989) reviewed two studies on the volatility of Parathion-Methyl from sandy loam or silt loam soils and also concluded that the proportion of the compound volatilising from soil was very small (80).

20.5 Hydrolysis

^{14}C - Parathion-Methyl (radiochemical purity $> 90\%$) was dissolved in water at a concentration of 4 ppm and maintained for 30 days at 25°C at pHs of 5, 7 or 9 in the dark. The study was conducted according to EPA-FIFRA guideline N 161-1 (5). The compound slowly but progressively degraded over the time period with half-lives



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of 68, 40 and 33 days at pH 5, 7 and 9 respectively. The overall ^{14}C - activity accountability was 100%.

Maximum degradation was at pH 9 with about 46% decline in 30 days. The major metabolite at pH 5 was desmethyl Parathion-Methyl (20% of original dose), at pH 9 p-nitrophenol was the major metabolite (30%) and at pH 7 approximately equal amounts (20%) of the 2 metabolites were produced after 30 days.

20.6 Aerobic aquatic metabolism

The breakdown of ^{14}C - ring labelled Parathion-Methyl (radiochemical purity 99%) was evaluated in a water sediment system under aerobic conditions. The study design conformed to EPA-FIFRA guideline N162-4 (81).

Samples of a sandy loam soil were brought to 86% of field capacity and then dosed with ^{14}C - Parathion-Methyl treated water to a level of 12.42 ppm. The system was incubated in the dark at $25 \pm 1^\circ\text{C}$ for 30 days. Soil, water and volatiles were collected for analysis at days 0, 1, 2, 5, 7, 9, 14 and 30. Water samples, soil extracts, soil combustion products and trapped volatiles were assayed radiochemically by LSC. Water samples and soil extracts were also analysed by TLC and HPLC.

The Parathion-Methyl content declined rapidly to 0.4% of the initial dose by day 30 with a half-life of 4.1 days. The principle metabolite was p-nitrophenol which was present in approximately equal proportions in the soil extracts and water layer. It increased from a total of 19.9% of the initial dose at day 1 to a maximum of 29.3% at day 5 and declined to 6.7% by day 30. A significant proportion (61%) of the original ^{14}C - dose remained as unextractable residue in the soil at 30 days. Cumulative volatiles, mainly CO_2 , accounted for 2.6% of the initial dose. The overall accountability of applied ^{14}C was 96% for the study.

The breakdown of Parathion-Methyl in natural aqueous systems has been described in the published literature (82, 83, 84).

Parathion-Methyl was added to raw river water at 10 $\mu\text{g/l}$ and incubated at room temperature for up to 8 weeks in daylight or artificial fluorescent light. Samples were taken at intervals and extracted with 20% benzene in hexane and aliquots of the extract submitted to GLC analysis. The Parathion-Methyl content declined rapidly to 25% of the initial concentration after 1 week and could not be detected after 4 weeks (84).

Parathion-Methyl, at 200 $\mu\text{g/l}$, was also incubated in estuarine water, from 3 sites of a river estuary in 3 test systems containing either filtered (3μ) water, or water and sediment or intact sediment-water core. The preparations were maintained at 18°C in the dark. Samples, taken at intervals, were extracted with hexane and the extract analysed by GLC. Parathion-Methyl degraded most rapidly in the intact sediment-water cores ($t_{1/2} = 77-157$ h), followed by water and sediment ($t_{1/2} = 214-533$ h) and



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least rapidly in water with $t_{1/2}$ of 1414 and 1925 h at 2 sites and 251 h at the third site (83).

In the third published study, Parathion-Methyl at 200 $\mu\text{g/l}$ was incubated with sea water or sea water + 0.5% settled sewage at 25°C. Samples were taken for analysis weekly and were replaced by the same volume of sea water containing 200 $\mu\text{g/l}$ Parathion-Methyl. Parathion-Methyl degradation rates increased as the bacterial population adapted to its utilisation. The $t_{1/2}$ in sea water, after the first addition of Parathion-Methyl, was 113.6 days and after the 3rd addition it was 34.6 days. Degradation followed a similar pattern in sea water + sewage with a $t_{1/2}$ of 91.2 days (1st addition) and 26.6 days (3rd addition). Degradation of the compound in sea water appeared to be due mainly to microbiological action (82).

20.7 Anaerobic Aquatic Metabolism

The breakdown of ^{14}C -ring labelled Parathion-Methyl (radiochemical purity 99.3%) was evaluated in a water-sediment system under anaerobic conditions. The study design conformed to EPA-FIFRA guideline N162-3 (85).

Samples of a sandy loam soil were mixed with a blended water and incubated in sealed vials for 58 days during which time glucose was added to induce anaerobic conditions. ^{14}C -Parathion-Methyl was then added to initiate the anaerobic metabolism study at a fortification level of 11.3 ppm. Incubation continued in the dark at 25±1°C. Soil, water and volatiles were collected at intervals for up to 12 months. Water samples, soil extracts, soil combustion products and trapped volatiles were assayed radiochemically by LSC. Water samples and soil extracts were also submitted to HPLC and TLC analysis.

The Parathion-Methyl concentration declined very rapidly to 0.9% of the initial dose after 3 days, with a half-life of 1.1 day. The major metabolite was p-nitrophenol, equivalent to 18.8% of the initial dose at 24 h, declining to 0.7% by 1 month and remaining at about this level for the remainder of the study. Small amounts of other metabolites identified in the first 7 days included methyl paraoxon, amino-Parathion-Methyl, S-Parathion-Methyl and S-phenylParathion-Methyl. Non-extractable residues in the soil increased from 14.5% at day 1 to 79% of the initial dose by 6 months and declined slightly to 75% by 12 months. Cumulative volatiles amounted to 2.8%, mainly as CO_2 , by 12 months. Overall ^{14}C -mass accountability for the study was 96.3%.

The stability of Parathion-Methyl under anaerobic conditions was also reported in a published study (86). An alluvial soil (OM 1.6%) was flooded for 10 days at 28±4°C and then a methyl parathion formulation was added to give a concentration of 25 ppm a.i. in the soil. Incubation continued for a further 12 days during which time samples were taken and extracted for analysis by GLC. Parathion-Methyl degraded rapidly in the system, 45% remaining after 2 days and only 12% after 12 days. The metabolite, p-nitrophenol, appeared within 1 day and then also declined rapidly and was undetectable after 12 days.



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20.8 Photodegradation in Water

The photolytic decomposition of ^{14}C -ring labelled Parathion-Methyl (radiochemical purity >99%) was evaluated in a study following EPA-FIFRA guideline N161-2 (7a, b).

The test compound was dissolved in a buffered aqueous solution at pH 5 at a level of 4.7 ppm. It was exposed to a Xenon lamp light source with an intensity similar to midday sun at 40° latitude. A control preparation was incubated in the dark. A study was also undertaken in daylight under mostly cloudy conditions. At regular intervals, volatiles were trapped and water samples taken. Water samples and trapped volatiles were assayed radiochemically by LSC and water was also analysed by HPLC.

The rate constant and half-life for Parathion-Methyl under the test conditions were determined to be 0.0141 h^{-1} and 49.2 h respectively. The daylight experiment produced a half-life of about 18 days due to the mainly cloudy conditions.

The controlled aqueous photolysis of ^{14}C -Parathion-Methyl resulted in a steady production of $^{14}\text{CO}_2$ equivalent to 15% of the initial dose after 121.5 h and >40% at 13 days. The main metabolite identified in water was p-nitrophenol which reached a steady state of about 10% of initial dose within 1 day. The overall ^{14}C -material balance for the study was 90-100%. Parathion-Methyl is degraded rapidly by photolysis in water and is ultimately mineralised to CO_2 .

In a further study investigating the quantum yield of direct photodegradation of Parathion-Methyl in water the mean environmental half-lives, as calculated by the Frank & Klopffer computer program, were in the range of 22-98 days (87).

20.9 Aquatic Field Dissipation

The dissipation of Parathion-Methyl in water and possible accumulation in irrigated crops was studied on rice paddy plots at two locations in the USA. The study designs followed EPA-FIFRA guidelines N164-2 and N165-3.

In the first study (88) in Madera County, California, the site consisted of 2 rice paddy plots (one control, one treated) having adjacent irrigated crop plots of lettuce, carrots, wheat, sorghum and tomatoes. The soil was a sandy loam (OM 0.2%, sand 77%, silt 17%, clay 6%). Parathion-Methyl was applied as an emulsifiable concentrate at weekly intervals (6 applications) by tractor mounted power sprayer at a rate of 0.82 kg Parathion-Methyl per ha. Soil core samples (60 cm x 2.5 cm) were taken from the treated rice plot immediately before and after the initial application, immediately after each subsequent application and then at intervals up to 1 year after the final application. Soil core samples were also taken from the treated irrigated plots on the day prior to the initial application and then within 1 day after the irrigation which followed each application and then at intervals thereafter. Samples of water were taken from the treated rice plot and from the irrigation system at appropriate times.



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Soil core segments (0-10, 10-20, 20-30, 30-45 and 45-60 cm) were analysed for Parathion-Methyl and methyl paraoxon. After extraction with aqueous methanol and partitioning with methylene chloride, the extracts were submitted to column chromatography, the eluates evaporated to dryness, dissolved in toluene and submitted for GLC analysis. Plant samples were analysed by a similar procedure. Water was also analysed for Parathion-Methyl and methyl paraoxon by GLC after extraction with methylene chloride. Additionally, water samples were analysed for p-nitrophenol by HPLC. All methods were validated by fortification of control samples with the appropriate compound at 0.05-5 ppm for Parathion-Methyl and methyl paraoxon in soil and crops and at 0.01-1 ppm for these compounds and p-nitrophenol in water. Detection limits of 0.01 ppm in water and 0.05 ppm in soil and crops were established for the compounds concerned.

Parathion-Methyl was detected in the rice paddy water after each application as follows:

Application	1	2	3	4	5	6
Parathion-Methyl (ppm)	0.21	0.17	0.30	0.28	0.30	0.13

Seven days after each of the first 5 applications, Parathion-Methyl could not be detected in paddy water (<0.01 ppm). One day after the sixth application the concentration was 0.07 ppm, and 7 days later the compound could not be detected (<0.01 ppm). Because of this rapid dissipation the half-life of Parathion-Methyl could not be established.

Parathion-Methyl, at an average of 0.011 ppm appeared in irrigated crop plot water samples during the third irrigation. It was not detected in all other water samples from this plot.

Neither methyl paraoxon nor p-nitrophenol was detected in any water sample (<0.01 ppm).

Neither Parathion-Methyl nor methyl paraoxon was detected (<0.05 ppm) in soil from the rice or the irrigated plots or in the irrigated crops.

The second study (89) in Pemiscot County, Missouri, was undertaken to the same design as described above for the first study. The site consisted of two rice paddy plots (one control, one treated) having adjacent irrigated crop plots of Swiss chard, sweet potatoes, sorghum, corn and soyabean. The soil was a loam (OM 0.7%, sand 30%, silt 46%, clay 24%).

Parathion-Methyl was detected in the rice paddy water immediately after each application except the 6th, as follows:

Application	1	2	3	4	5	6
Parathion-Methyl (ppm)	0.28	0.17	0.22	0.23	0.23	<0.05



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Seven days after each of the first 5 applications, Parathion-Methyl could not be detected in paddy water (<0.01 ppm). One day after the 6th application a mean concentration of 0.031 ppm was found, but 7 days later the compound could not be detected. Because of this rapid dissipation the half-life of Parathion-Methyl could not be established.

Parathion-Methyl appeared at concentrations of 0.071, 0.033, 0.032, 0.066 and 0.036 ppm in water samples taken from the 1st, 2nd, 3rd, 5th and 6th irrigations. Neither Parathion-Methyl nor methyl paraoxon were detected (<0.01 ppm) in any other water sample from the irrigation system.

Except for a trace detected in one replicate of the irrigation water samples taken at the 1st and 6th irrigations, p-nitrophenol was not detected (<0.01 ppm) in any water sample from the rice paddy plots or irrigation system.

Neither Parathion-Methyl nor methyl paraoxon was detected (<0.05 ppm) in soil from the rice or irrigated plots or in the irrigated crops.

These two studies show that Parathion-Methyl dissipates very rapidly from rice paddy water after treatment. Neither the compound nor its possible metabolite, methyl paraoxon, were detected in soil or in crops irrigated by the rice paddy water.

20.10 Photodegradation in Air

The photochemical degradability of Parathion-Methyl was examined in a study with specifications similar to EPA-FIFRA guideline N161-4 (90).

Parathion-Methyl (99% pure) was converted into gaseous form in a gas-phase mass analyser linked to a quadrupole mass spectrometer for direct analysis of the gaseous phase. The concentrations of Parathion-Methyl in air were 100 or 150 ppm and they were irradiated by a Xenon lamp (XB 0150) at 25°C. Control concentrations were exposed in the dark. The system was calibrated directly with known air concentrations of Parathion-Methyl (1-150 ppm).

The rate constant for the breakdown of Parathion-Methyl was $3.5 - 3.72 \times 10^{-4} \text{ sec}^{-1}$ and its half-life was 31-33 min. Major metabolites identified after 2 h irradiation were p-nitrophenol (31%) and dimethylthiophosphoric acid (12.3%). Thus, Parathion-Methyl is very quickly degraded by photolysis in air.

A computer based calculation gave a half-life of 12.8 h for Parathion-Methyl, due to OH-radical-induced oxidation in the troposphere. This degradation process was considered to be of greater significance than direct photolysis (91)

20.11 Bioaccumulation

Parathion-Methyl accumulates in bluegill sunfish with a BCF of 71. Residues depurate rapidly with a half-life of about 6.7 h (see details in Section 19.6).

ATTACHMENT 3

HOXIE CRASH SITE

PRELIMINARY REMOVAL SITE EVALUATION

PROPERTY OWNERSHIP RECORDS

This 19th day of May, 1989

REDACTED husband and wife
CONVEY AND WARRANT TO

REDACTED and **REDACTED**, husband and wife

as JOINT TENANTS and not as tenants in common, with full rights of survivorship, the whole estate to vest in the survivor in the event of the death of either, all the following described REAL ESTATE in the County of SHERIDAN and the State of Kansas, to-wit:

North Fifty Feet (N50') of Lot Three (3) and South Fifty Feet (S50') of Lot Four (4), Block Eleven (11), Wheatridge Addition to the City of Hoxie, Sheridan County, Kansas

Entered in Transfer Record in my office this
1977 day of April, A. D., 1987
Paula Siskin
Deputy
County Clerk.



for the sum of Ten Dollars (\$10.00) and o.v.c.

EXCEPT AND SUBJECT TO: Easements, restrictions and right-of-ways of record.

Dated May 19, 1989

STATE OF KANSAS, SHERIDAN COUNTY, ss

BE IT REMEMBERED, That on this 19th day of May

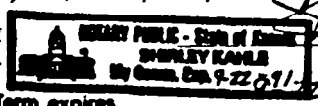
A. D. 1989, before me, the undersigned, a Notary Public

in and for the County and State aforesaid, came

Frank Gallagher & Joyce Gallagher,
husband and wife

who are personally known to me to be the same person(s) who executed the within instrument of writing and such person(s) duly acknowledged the execution of the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal, the day and year last above written.



Shirley Kagle
Notary Public.

Term expires 1991

REDACTED
REDACTED
REDACTED

STATE OF Kansas ss.
Sheridan County,

This instrument was filed for record on the 19th day of June, A. D., 1989, at 3:45 o'clock P.M., and duly recorded in book 220 of Records at page 817.

Kari Weiss
Register of Deeds.

Fees, \$6.00 Deputy.

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ATTACHMENT 4

**HOXIE CRASH SITE
PRELIMINARY REMOVAL SITE EVALUATION
LABORATORY ANALYTICAL RESULTS**

July 28, 1998

Mr. BILL HEIMANN
KDHE
2301 E 13TH
HAYS, KS 67601

RE: Pace Project Number: 6023119
Client Project ID: HOXIE PENNCAP SPILL

Dear Mr. HEIMANN:

Enclosed are the results of analyses for sample(s) received on July 25, 1998. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Rebecca Wenner
Project Manager

Enclosures

REPORT OF LABORATORY ANALYSIS

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DATE: 07/28/98
 PAGE: 1

E 13TH
 , KS 67601

Pace Project Number: 6023119
 Client Project ID: MOXIE PENNCAP SPILL

Attn: Mr. BILL HEIMANN
 Phone: (785)625-5663

All results are reported on a wet weight basis.

Sample No: 601996135 Date Collected: 07/23/98 Matrix: Soil
 Parent Sample ID: SOIL SB-1 0 IN TO 6 IN Date Received: 07/25/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

MS -- Semi-VOA

Method: EPA 8270	Prep Method: EPA 3550 Sonication
Semivolatile Organics	
Methyl Parathion 1400000 ug/kg 33000	07/27/98 MSR 95-50-1 1
Methyl Paraoxonate 330 ug/kg 330	07/27/98 MSR 120-82-1 2,3
4-Nitrophenol 35000 ug/kg 16000	07/27/98 MSR 100-02-7 4
1,2-Dichlorobenzene-d5 (S) 92 %	07/27/98 MSR 4165-60-0
2-Fluorobiphenyl (S) 102 %	07/27/98 MSR 321-60-8
Terphenyl-d14 (S) 68 %	07/27/98 MSR 1718-51-0
Phenol-d6 (S) 108 %	07/27/98 MSR 13127-88-3
2-Fluorophenol (S) 140 %	07/27/98 MSR 367-12-4
2,4,6-Tribromophenol (S) 77 %	07/27/98 MSR 118-79-6
Date Extracted	07/27/98

→ An estimated value -
 Methyl Paraoxonate is present in the sample but cannot be quantified. It could be > 330 ug/kg but probably is not. Rebecca (Pace) will attempt to find out if a standard is ~~now~~ exists for Methyl Paraoxonate.

* The 4-Nitrophenol is about 2.5% of the total methyl phenol concentration.

Soil holding time is 7 days extraction.

Pat 2/29/98

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QUALITY CONTROL DATA

DATE: 07/28/98
PAGE: 3

Pace Project Number: 6023119
Client Project ID: HOXIE PENNCAP SPILL

13TH
XS 67601

Mr. BILL HEIMANN
(785)625-5663

Lab ID: 48289
Analysis Method: EPA 8270
Associated Pace Samples:

QC Batch Method: EPA 3550 Sonication
Analysis Description: Semivolatile Organics

601996135

Method Blank: 601996366
Associated Pace Samples:

601996135

Parameter	Units	Method Blank Result	PRL	Footnotes
1,1-Dichloroethane	ug/kg	ND	330	
1,1-Dichloroethene	ug/kg	ND	330	
1,1,1-Trichloroethane	ug/kg	ND	1600	
1,2-Dichlorobenzene-d5 (S)	%	74		
1,2-Dichlorobiphenyl (S)	%	82		
1,2-Dichlorobenzene-d14 (S)	%	74		
1,2-Dichloroethane	%	88		
1,2-Dichloroethene	%	96		
1,2,4-Trichlorobenzene (S)	%	93		

REPORT OF LABORATORY ANALYSIS

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DATE: 07/28/98
PAGE: 4

Pace Project Number: 6023119
Client Project ID: HOKIE PENNCAP SPILL

QUALITY CONTROL DATA PARAMETER FOOTNOTES

Consistent with EPA guidelines unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

- Not Detected
- Not Calculable
- Pace Reporting Limit
- Relative Percent Difference
- Surrogate

REPORT OF LABORATORY ANALYSIS

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Client: **K D HE**
 Address: **2301 E 13TH**
HAYS KS 67601
 Phone: **785-625-5663**

Report To: **BILL HEIMANN**
 Bill To: **KATHY LEWIS / BOB JERGEWS**
 P.O. # / Billing Reference:
 Project Name / No: **HOXIE PENNACAP SPILL**

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

Pace Client No.
 Pace Project Manager: **JOHN WILLIAMS**
 Pace Project No: **6023119**
 Requested Due Date: **7/28/98**

Prepared By (PRINT): **Bill Heimann**
 Phone: **785-625-4005**
 Analyst Signature: *Bill Heimann*
 Date Sampled: **7/23/98**

NO.	SAMPLE DESCRIPTION	TIME	MATRIX	PAGE NO.	NO. OF CONTAINERS	PRESERVATIVES						ANALYSES REQUEST	REMARKS
						UNPRESERVED	H ₂ SO ₄	HNO ₃	VOA (HCL)	NaOH	Na ₂ S ₂ O ₃		
1	SOIL SB-1 (0"-6")	20:00	SOIL	60179135	1	ice						X	METHYL PARATHION, METHYL PARATHION, PARA-NITROPHENOL
2	SOIL SB-1 (6"-12")	20:00	SOIL		1	ice						X	HOLD UNTIL NOTIFIED
3													
4													
5													
6													
7													
8													

COOLER NOS.	BAILERS	SHIPMENT METHOD	
		OUT/DATE	RETURNED/DATE
		7/24/98	

ITEM NUMBER	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
1	Kathy Lewis for Bill Heimann / K016	7/23/98	1605	Fred... / K016	7/24/98	4:00 PM
	USE 2			...	7/24/98	...

Additional Comments

SAMPLE CONDITION				
Temp: _____ °C	Received on Ice: <input checked="" type="checkbox"/> Y/N	Sealed Cooler: <input type="checkbox"/> Y/N	Samples Intact: <input type="checkbox"/> Y/N	pH _____

APPENDIX B

PHOTOGRAPHIC DOCUMENTATION

**HOXIE CRASH SITE
REMOVAL EVALUATION**

PHOTO #1

Date: July 29-30, 1998
Location: Hoxie Crash Site, Hoxie, Kansas
Direction: Viewing west
Photographer: Randolph L. Brown, KDHE/BER



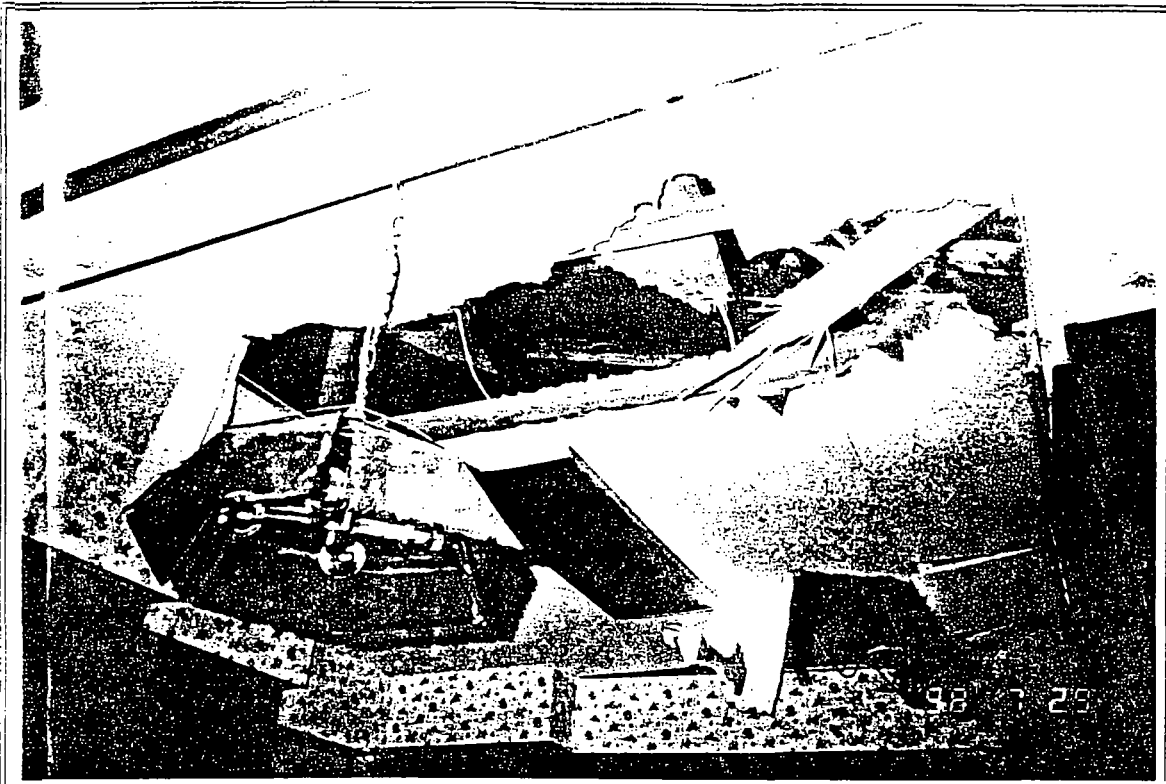
Comments: View of ~~REDACTED~~ residence (photo taken from back yard towards porch) with location of aircraft impact on roof. The aircraft overturned after this impact.

PHOTO #2

Date: July 29-30, 1998
Location: Hoxie Crash Site, Hoxie, Kansas
Direction: Viewing east
Photographer: Randolph L. Brown, KDHE/BER



Comments: Front of ~~REDACTED~~ residence. Blue tarp covers the initial impact location on house.



PHOTOS # 3 & 4

Date: July 29-30, 1998
Location: Hoxie Crash Site; Hoxie, Kansas
Direction: Inside ~~REDACTED~~ Residence
Photographer: Randolph L. Brown, KDHE/BER
Comments: Alternate views of aircraft impact in ceiling of ~~REDACTED~~ kitchen.

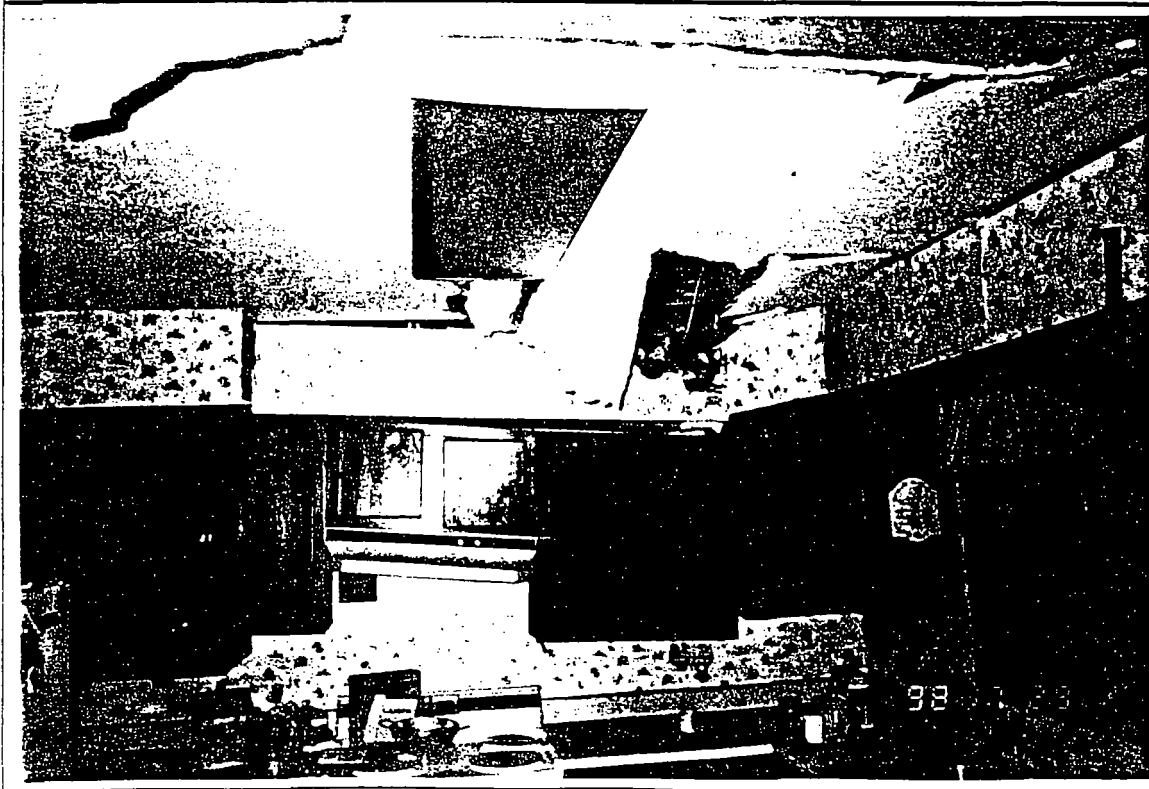
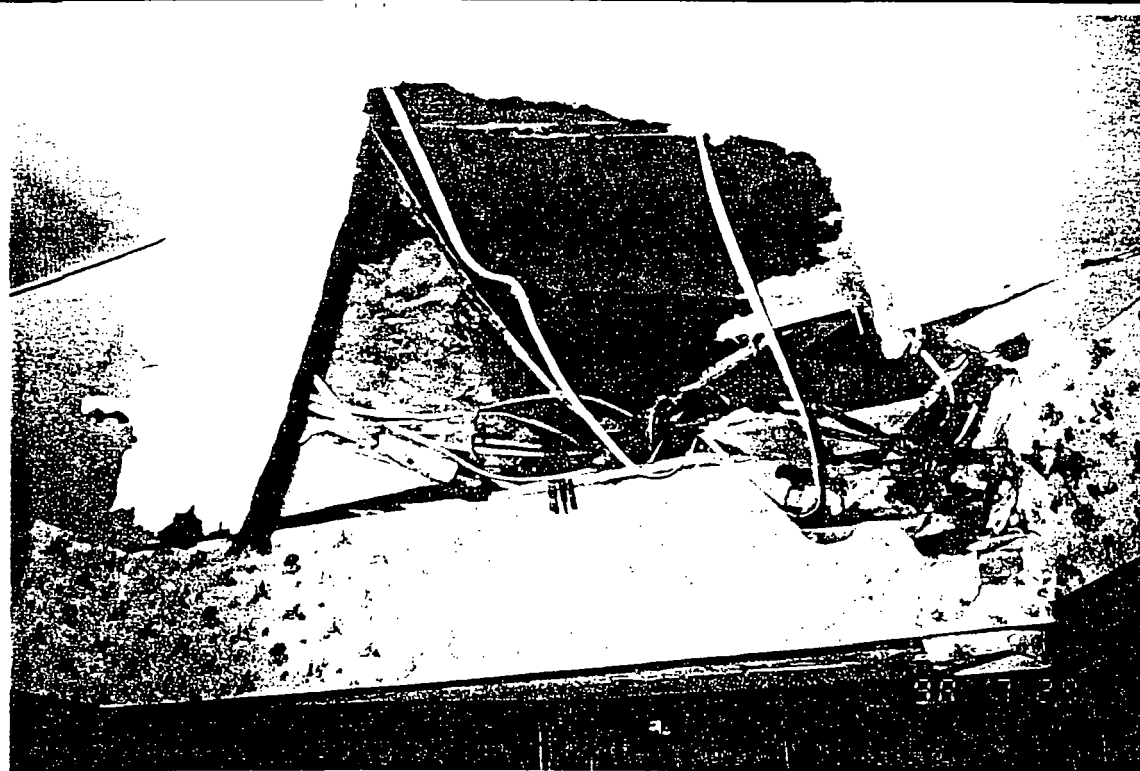


PHOTO # 5

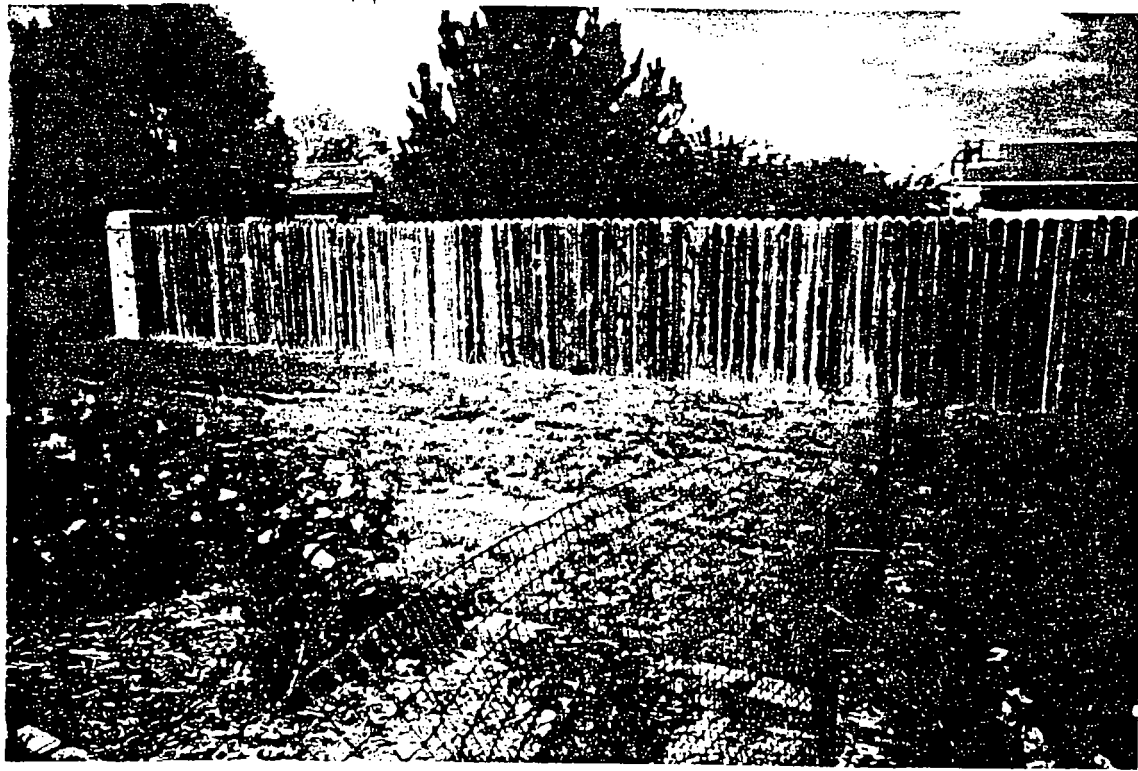
Date: July 29-30, 1998
Location: Hoxie Crash Site, Hoxie, Kansas
Direction: Inside ~~REDACTED~~ Residence
Photographer: Randolph L. Brown, KDHE/BER



Comments: Alternate view of aircraft impact in ceiling of ~~REDACTED~~ kitchen.

PHOTO # 6

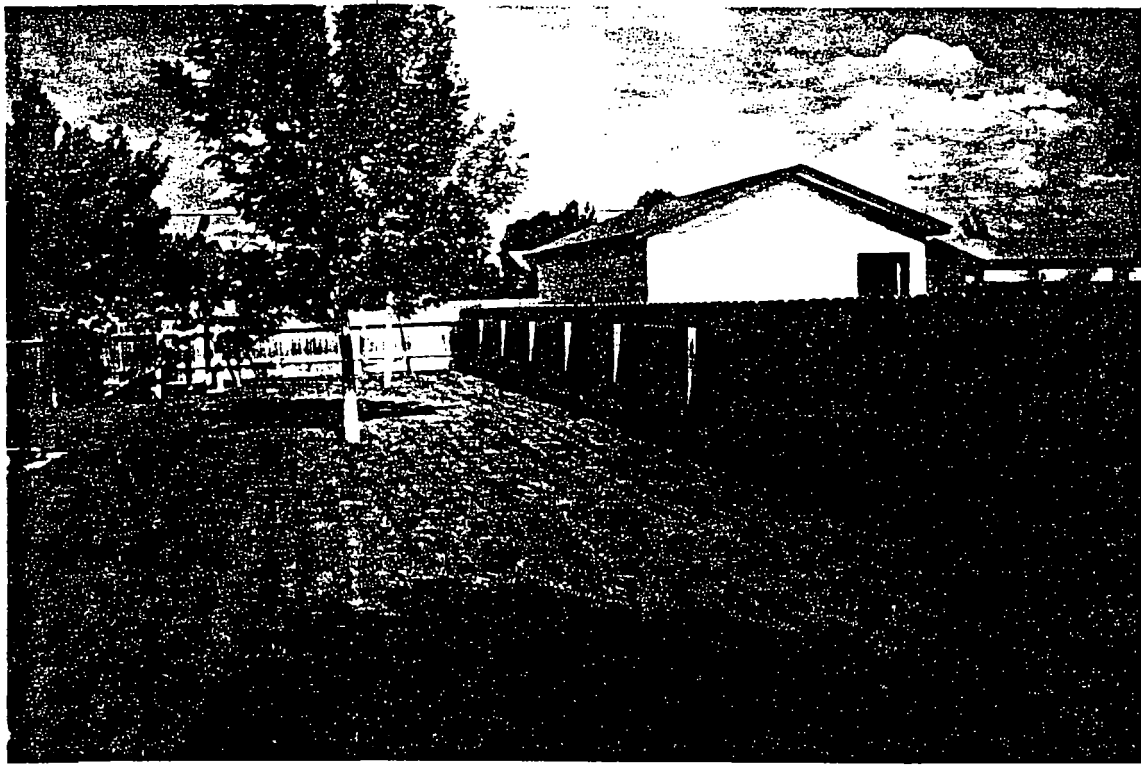
Date: July 29-30, 1998
Location: Hoxie Crash Site, Hoxie, Kansas
Direction: Viewing east
Photographer: Randolph L. Brown, KDHE/BER



Comments: Location of visible yellow methyl parathion stain along fence separating ~~REDACTED~~ and ~~REDACTED~~ residences, and stain on surficial soils in ~~REDACTED~~ yard. Photo taken from ~~REDACTED~~ back yard.

PHOTO # 7

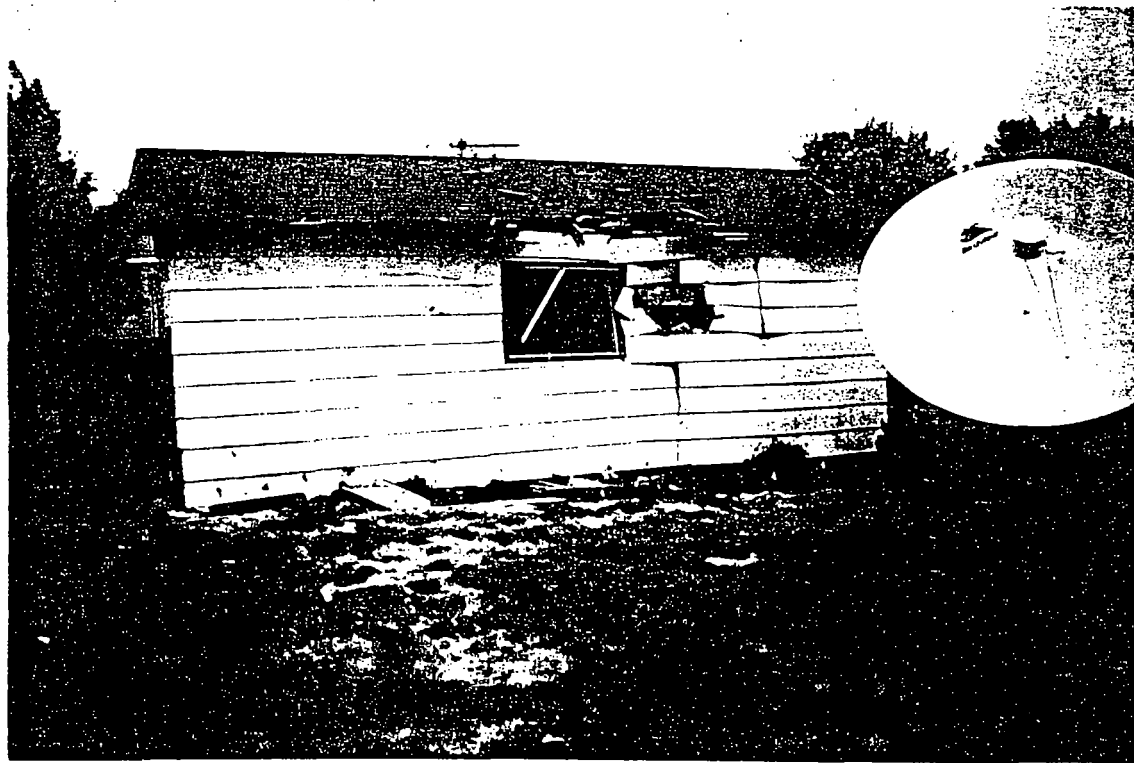
Date: July 29-30, 1998
Location: Hoxie Crash Site, Hoxie, Kansas
Direction: Viewing east
Photographer: Randolph L. Brown, KDHE/BER



Comments: ~~REDACTED~~ yard with soil sample locations (flagged) ~~REDACTED~~
garage is visible directly behind fence in center of photo.

PHOTO # 8

Date: July 29-30, 1998
Location: Hoxie Crash Site, Hoxie, Kansas
Direction: Viewing northeast
Photographer: Randolph L. Brown, KDHE/BER



Comments: ~~REDACTED~~ garage after aircraft impact.

PHOTO # 9

Date: July 29-30, 1998
Location: Hoxie Crash Site, Hoxie, Kansas
Direction: Viewing northeast
Photographer: Randolph L. Brown, KDHE/BER



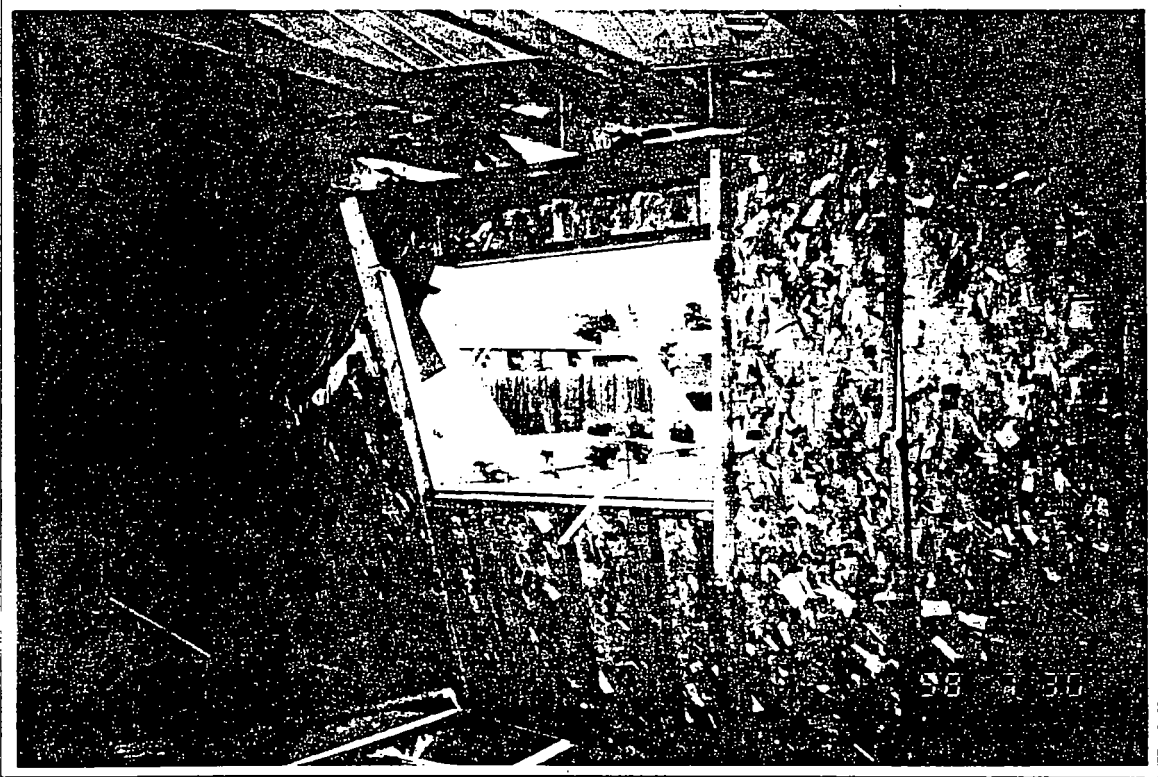
Comments: KDHE personnel sampling site with ~~REDACTED~~ garage in background. KDHE Environmental Technician Farrell Dallen is standing near a depression (at bottom of sampling tool) where aircraft finally came to rest after impact.

PHOTO # 10

Date: July 29-30, 1998
Location: Hoxie Crash Site, Hoxie, Kansas
Direction: Viewing northwest
Photographer: Randolph L. Brown, KDHE/BER



Comments: Alternate view of Photo # 9.



PHOTOS # 11 & 12

Date: July 29-30, 1998
Location: Hoxie Crash Site, Hoxie, Kansas
Direction: Inside Krannawitter Garage
Photographer: Randolph L. Brown, KDHE/BER
Comments: Interior of ~~REDACTED~~ garage.

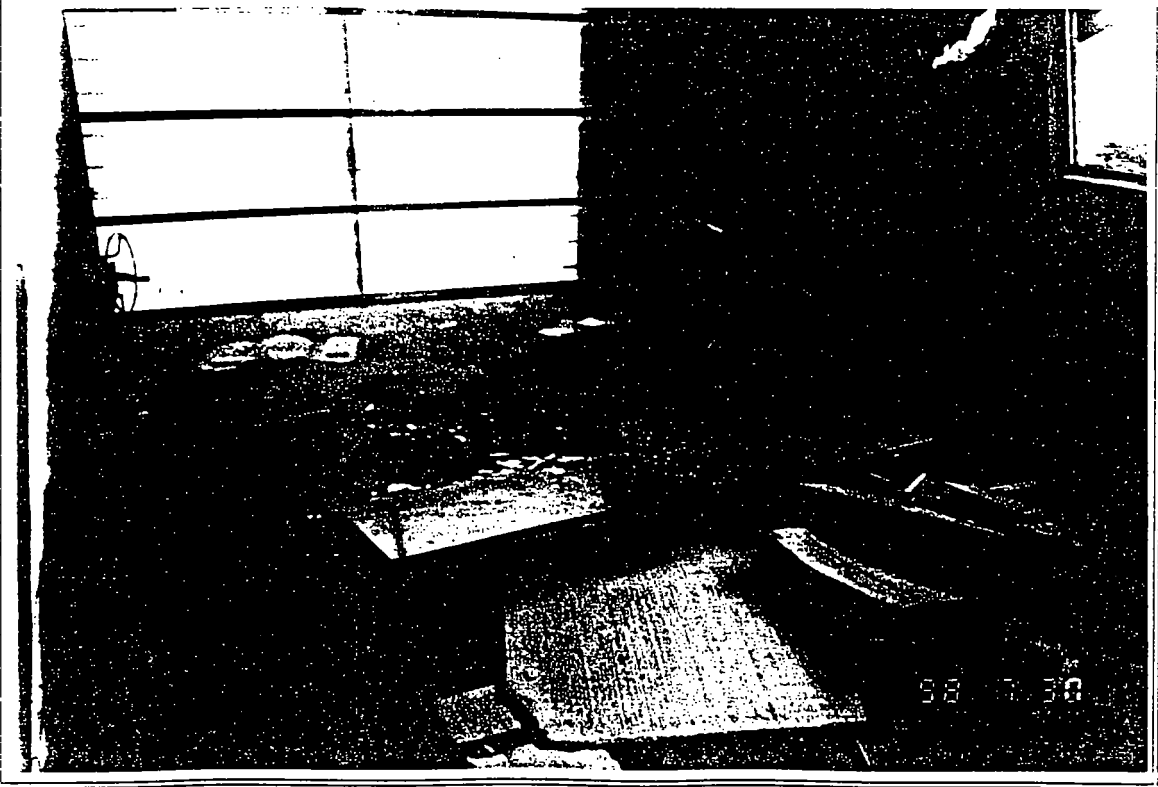


PHOTO # 13

Date: July 29-30, 1998
Location: Hoxie Crash Site, Hoxie, Kansas
Direction: Viewing to west
Photographer: Randolph L. Brown, KDHE/BER



Comments: Overview of REDACTED back yard from stained area
(see Photo 6).

APPENDIX C

**LABORATORY SHEETS FOR ANALYTICAL RESULTS
WITH DATA QUALITY EVALUATION MEMO**

**HOXIE CRASH SITE
REMOVAL EVALUATION**

August 06, 1998

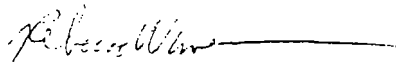
Mr. RANDY BROWN
KDHE
BUILDING 740, FORBES FIELD
TOPEKA, KS 66620

RE: Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Dear Mr. BROWN:

Enclosed are the results of analyses for sample(s) received on July 31, 1998. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Rebecca Wenner
Project Manager

Enclosures

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DATE: 08/06/98
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KDHE
BUILDING 740, FORBES FIELD
TOPEKA, KS 66620

Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Attn: Mr. RANDY BROWN
Phone: (785)296-8065

Solid results are reported on a wet weight basis

Pace Sample No: 602006850 Date Collected: 07/30/98 Matrix: Soil
Client Sample ID: K23 Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatile Organics							
							Method: EPA 8270
							Prep Method: EPA 3550 Sonication
Methyl Parathion	1300	ug/kg	330	08/04/98	MSR	95-50-1	
Methyl Paraoxone	ND	ug/kg	330	08/04/98	MSR	120-82-1	
4-Nitrophenol	1100	ug/kg	1600	08/04/98	MSR	100-02-7	
Terphenyl-d14 (S)	70	%		08/04/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	138	%		08/04/98	MSR	118-79-6	
Date Extracted				08/04/98			

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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Sample No: 602006959 Date Collected: 07/30/98 Matrix: Soil
Sample ID: K35 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes	
S -- Semi-VOA								
Semi-volatile Organics				Method: EPA 8270				Prep Method: EPA 3550 Sonication
Methyl Parathion	2400000	ug/kg	3300	08/04/98	MSR	95-50-1	2,3	
Methyl Paraoxon	ND	ug/kg	3300	08/04/98	MSR	120-82-1		
4-Nitrophenol	59000	ug/kg	16000	08/04/98	MSR	100-02-7	4	
Terphenyl-d14 (S)	23	%		08/04/98	MSR	1718-51-0		
2,4,6-Tribromophenol (S)	23	%		08/04/98	MSR	118-79-6		
Date Extracted				08/04/98				

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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602006967
Client Sample ID: K23 DEEP

Date Collected: 07/30/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatile Organics		Method: EPA 8270			Prep Method: EPA 3550 Sonication		
Methyl Parathion	3800	ug/kg	3300	08/05/98	MSR	95-50-1	5
Methyl Paraoxone	ND	ug/kg	330	08/05/98	MSR	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/05/98	MSR	100-02-7	
Terphenyl-d14 (S)	75	%		08/05/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	132	%		08/05/98	MSR	118-79-6	
Date Extracted				08/04/98			

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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Sample No: 602006975 Date Collected: 07/30/98 Matrix: Soil
Site Sample ID: K-42 Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-VOA							
Volatile Organics							
		Method: EPA 8270				Prep Method: EPA 3550 Sonication	
Methyl Parathion	500	ug/kg	330	08/04/98	MSR	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/04/98	MSR	120-82-1	
p-Nitrophenol	850	ug/kg	1600	08/04/98	MSR	100-02-7	1
Terphenyl-d14 (S)	74	%		08/04/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	127	%		08/04/98	MSR	118-79-6	
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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007031 Date Collected: 07/30/98 Matrix: Soil
Client Sample ID: K-18 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatile Organics							
		Method: EPA 8270				Prep Method: EPA 3550 Sonication	
Methyl Parathion	4000000	ug/kg	3300	08/05/98	MSR	95-50-1	2
Methyl Paraoxon	ND	ug/kg	3300	08/05/98	MSR	120-82-1	
4-Nitrophenol	58000	ug/kg	16000	08/05/98	MSR	100-02-7	2
Terphenyl-d14 (S)	103	%		08/05/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	119	%		08/05/98	MSR	118-79-6	
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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Sample No: 602007056 Date Collected: 07/30/98 Matrix: Soil
Sample ID: M-1 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
-- Semi-VOA							
Volatile Organics				Method: EPA 8270			
				Prep Method: EPA 3550 Sonication			
ethyl Parathion	2300	ug/kg	330	08/05/98	MSR	95-50-1	
ethyl Paraoxon	ND	ug/kg	330	08/05/98	MSR	120-82-1	
-Nitrophenol	ND	ug/kg	1600	08/05/98	MSR	100-02-7	
erphenyl-d14 (S)	69	%		08/05/98	MSR	1718-51-0	
,4,6-Tribromophenol (S)	124	%		08/05/98	MSR	118-79-6	
ate Extracted				08/04/98			

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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007064 Date Collected: 07/24/98 Matrix: Soil
Client Sample ID: M-3 Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatiles Organics							
		Method: EPA 8270			Prep Method: EPA 3550	Sonication	
Methyl Parathion	ND	ug/kg	330	08/04/98	MSR	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/04/98	MSR	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/04/98	MSR	100-02-7	
Terphenyl-d14 (S)	77	%		08/04/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	137	%		08/04/98	MSR	118-79-6	
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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Sample No: 602007072 Date Collected: 07/24/98 Matrix: Soil
Sample ID: M-4 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-VOA							
Method: EPA 8270				Prep Method: EPA 3550 Sonication			
Diethyl Parathion	ND	ug/kg	330	08/04/98	MSR	95-50-1	
Diethyl Paraoxone	ND	ug/kg	330	08/04/98	MSR	120-82-1	
2,4-Dinitrophenol	ND	ug/kg	1600	08/04/98	MSR	100-02-7	
Terphenyl-d14 (S)	82	%		08/04/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	161	%		08/04/98	MSR	118-79-6	
Date Extracted				08/03/98			

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Pace Project Number: 6023247

Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007080
Client Sample ID: M-5

Date Collected: 07/24/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatile Organics							
			Method: EPA 8270			Prep Method: EPA 3550 Sonication	
Methyl Parathion	3400	ug/kg	3300	08/04/98	MSR	95-50-1	5
Methyl Paraoxon	ND	ug/kg	330	08/04/98	MSR	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/04/98	MSR	100-02-7	
Terphenyl-d14 (S)	81	%		08/04/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	143	%		08/04/98	MSR	118-79-6	
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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Sample No: 602007122 Date Collected: 07/24/98 Matrix: Soil
Int Sample ID: T-1 Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

S -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	ND	ug/kg	330	08/06/98	MSR	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/06/98	MSR	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/06/98	MSR	100-02-7	
Terphenyl-d14 (S)	41	%		08/06/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	53	%		08/06/98	MSR	118-79-6	
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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007130 Date Collected: 07/24/98 Matrix: Soil
Client Sample ID: T-2 Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatile Organics							
Methyl Parathion	ND	ug/kg	330	08/04/98	MSR	95-50-1	
Methyl Paraoxone	ND	ug/kg	330	08/04/98	MSR	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/04/98	MSR	100-02-7	
Terphenyl-d14 (S)	77	%		08/04/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	152	%		08/04/98	MSR	118-79-6	
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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Sample No: 602007148 Date Collected: 07/24/98 Matrix: Soil
Site Sample ID: K-1 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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Semi-VOA

Parameter	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	3000	ug/kg	330	08/04/98	MSR	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/04/98	MSR	120-82-1	
p-Nitrophenol	ND	ug/kg	1600	08/04/98	MSR	100-02-7	
Terphenyl-d14 (S)	85	%		08/04/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	140	%		08/04/98	MSR	118-79-6	
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Pace Project Number: 6023247

Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007155
Client Sample ID: K-2

Date Collected: 07/24/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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GC/MS -- Semi-VOA

Semivolatiles Organics

Method: EPA 8270

Prep Method: EPA 3550 Sonication

Methyl Parathion	ND	ug/kg	330	08/05/98	MSR	95-50-1	
Methyl Paraoxone	ND	ug/kg	330	08/05/98	MSR	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/05/98	MSR	100-02-7	
Terphenyl-d14 (S)	73	%		08/05/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	141	%		08/05/98	MSR	118-79-6	
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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Sample No: 602007163 Date Collected: 07/24/98 Matrix: Soil
Plant Sample ID: K-11 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

3 -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	380000	ug/kg	330	08/05/98	MSR	95-50-1	2
Methyl Paraoxon	ND	ug/kg	330	08/05/98	MSR	120-82-1	
1-Nitrophenol	19000	ug/kg	16000	08/05/98	MSR	100-02-7	5
Terphenyl-d14 (S)	67	%		08/05/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	139	%		08/05/98	MSR	118-79-6	
Date Extracted				08/04/98			

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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Sample No: 602007189 Date Collected: 07/29/98 Matrix: Soil
Sample ID: K-3 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

S -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	360000	ug/kg	330	08/05/98	MSR	95-50-1	2
Methyl Paraoxon	3700	ug/kg	330	08/05/98	MSR	120-82-1	6
1-Nitrophenol	30000	ug/kg	16000	08/05/98	MSR	100-02-7	5
Terphenyl-d14 (S)	73	%		08/05/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	143	%		08/05/98	MSR	118-79-6	
Date Extracted				08/04/98			

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Pace Project Number: 6023247

Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007205
Client Sample ID: K-4

Date Collected: 07/29/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatile Organics							
	Method: EPA 8270				Prep Method: EPA 3550 Sonication		
Methyl Parathion	230000	ug/kg	330	08/05/98	MSR	95-50-1	2
Methyl Paraoxon	920	ug/kg	330	08/05/98	MSR	120-82-1	6
4-Nitrophenol	4800	ug/kg	16000	08/05/98	MSR	100-02-7	1,5
Terphenyl-d14 (S)	68	%		08/05/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	133	%		08/05/98	MSR	118-79-6	
Date Extracted				08/04/98			

REPORT OF LABORATORY ANALYSIS

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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Sample No: 602007213 Date Collected: 07/29/98 Matrix: Soil
Sample ID: K-5 Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	71000	ug/kg	330	08/04/98	MSR	95-50-1	2
Methyl Paraoxon	ND	ug/kg	330	08/04/98	MSR	120-82-1	
4-Nitrophenol	1200	ug/kg	1600	08/04/98	MSR	100-02-7	1
Terphenyl-d14 (S)	69	%		08/04/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	140	%		08/04/98	MSR	118-79-6	
Date Extracted				08/04/98			

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Pace Project Number: 6023247

Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007221
Client Sample ID: K-6Date Collected: 07/29/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatiles Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	160000	ug/kg	330	08/05/98	MSR	95-50-1	2
Methyl Paraoxon	ND	ug/kg	330	08/05/98	MSR	120-82-1	
4-Nitrophenol	2600	ug/kg	16000	08/05/98	MSR	100-02-7	1,5
Terphenyl-d14 (S)	72	%		08/05/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	140	%		08/05/98	MSR	118-79-6	
Date Extracted				08/04/98			

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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Sample No: 602007239 Date Collected: 07/29/98 Matrix: Soil
Sample ID: K-7 Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

S -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	150000	ug/kg	330	08/05/98	MSR	95-50-1	2
Methyl Paraoxon	ND	ug/kg	330	08/05/98	MSR	120-82-1	
4-Nitrophenol	2000	ug/kg	16000	08/05/98	MSR	100-02-7	1,5
Terphenyl-d14 (S)	73	%		08/05/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	142	%		08/05/98	MSR	18-79-6	
Date Extracted				08/04/98			

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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Sample No: 602007254 Date Collected: 07/29/98 Matrix: Soil
Lot Sample ID: K-9 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
S -- Semi-VOA							
Semi-volatile Organics				Method: EPA 8270			
				Prep Method: EPA 3550 Sonication			
Methyl Parathion	250000	ug/kg	330	08/05/98	MSR	95-50-1	2
Methyl Paraoxon	1100	ug/kg	330	08/05/98	MSR	120-82-1	6
o-Nitrophenol	25000	ug/kg	1600	08/05/98	MSR	100-02-7	2
Perphenyl-d14 (S)	67	%		08/05/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	123	%		08/05/98	MSR	118-79-6	
Date Extracted				08/04/98			

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Pace Project Number: 6023247

Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007262
Client Sample ID: K-10

Date Collected: 07/29/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatiles Organics							
Methyl Parathion	750	ug/kg	330	08/05/98	MSR	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/05/98	MSR	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/05/98	MSR	100-02-7	
Terphenyl-d14 (S)	73	%		08/05/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	127	%		08/05/98	MSR	118-79-6	
Date Extracted				08/04/98			

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Pace Project Number: 5023247
Client Project ID: HOXIE CRASH SITE

METER FOOTNOTES

Not Detected
Not Calculable
Pace Reporting Limit
Surrogate

Detected but below the PRL; therefore, result is an estimated concentration (CLP J-Flag).
The qualitative amount exceeds 14 ppm.
Sample was biphasic. Lower layer analyzed.
The qualitative result exceeds 14 ppm.
The value for this analyte was determined from a secondary dilution of 1:10.
This is a qualitative result for methyl paraoxone.

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QUALITY CONTROL DATA

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KDHE
BUILDING 740, FORBES FIELD
TOPEKA, KS 66620

Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Attn: Mr. RANDY BROWN
Phone: (785)296-8065

QC Batch ID: 48647
Analysis Method: EPA 8270
Associated Pace Samples: 602007064 602007072 602007080 602007122 602007130 602007148

QC Batch Method: EPA 3550 Sonication
Analysis Description: Semivolatile Organics

METHOD BLANK: 602008096
Associated Pace Samples:

Parameter	Units	602007064	602007072 Method Blank Result	602007080 PRL	602007122	602007130	602007148	Footnotes
Methyl Parathion	ug/kg		ND	330				
Methyl Paraoxone	ug/kg		ND	330				
4-Nitrophenol	ug/kg		ND	1600				
Terphenyl-d14 (S)	%		84					
2,4,6-Tribromophenol (S)	%		145					

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 602008104 602008112

Parameter	Units	602006041	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footr
Methyl Paraoxone	ug/kg	0	3298	1396	42.3	1319	39.8	6	
4-Nitrophenol	ug/kg	0	4947	2378	48.1	2133	42.9	11	
Terphenyl-d14 (S)					82		82		
2,4,6-Tribromophenol (S)					90		100		

LABORATORY CONTROL SAMPLE: 602008120

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
4-Nitrophenol	ug/kg	5000	3380	67.6	
Terphenyl-d14 (S)				80	
2,4,6-Tribromophenol (S)				147	

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QUALITY CONTROL DATA

DATE: 08/06/98
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Pace Project Number: 6023247
 Client Project ID: HOXIE CRASH SITE

ADDRESS: 740, FORBES FIELD
 LENEXA, KS 66620

CONTACT: Mr. RANDY BROWN
 PHONE: (785)296-8065

Batch ID: 48679
 Analysis Method: EPA 8270
 Associated Pace Samples:

QC Batch Method: EPA 3550 Sonication
 Analysis Description: Semivolatile Organics

602006850	602006959	602006967	602006975	602007031
602007056	602007155	602007163	602007171	602007189
602007205	602007213	602007221	602007239	602007247
602007254	602007262			

MOD BLANK: 602010068
 Associated Pace Samples:

602006850	602006959	602006967	602006975	602007031	602007056	602007155
602007163	602007171	602007189	602007205	602007213	602007221	602007239
602007247	602007254	602007262				

Sample Name	Units	Method Blank Result	PRL	Footnotes
Diethyl Parathion	ug/kg	ND	330	
Diethyl Paraoxone	ug/kg	ND	330	
4-Nitrophenol	ug/kg	ND	1600	
1,2,4-Trichlorobenzene-d14 (S)	%	81		
1,2,4-Trichlorobenzene (S)	%	133		

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 602010076	602010084	Matrix Spike Conc.	Matrix Spike Result	Matrix Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
4-Nitrophenol	ug/kg	0	5000	3723	3723	74.5	3647	72.9	2	
1,2,4-Trichlorobenzene-d14 (S)						74		76		
1,2,4-Trichlorobenzene (S)						143		137		

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QUALITY CONTROL DATA

DATE: 08/06/98
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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

LABORATORY CONTROL SAMPLE: 602010092

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
4-Nitrophenol	ug/kg	5000	3513	70.3	
Terphenyl-d14 (S)				73	
2,4,6-Tribromophenol (S)				133	

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August 10, 1998

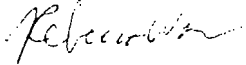
Mr. RANDY BROWN
KDHE
BUILDING 740, FORBES FIELD
TOPEKA, KS 66620

RE: Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Dear Mr. BROWN:

Enclosed are the results of analyses for sample(s) received on July 31, 1998. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Rebecca Wenner
Project Manager

Enclosures

REPORT OF LABORATORY ANALYSIS

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KDHE
BUILDING 740, FORBES FIELD
TOPEKA, KS 66620

Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Attn: Mr. RANDY BROWN
Phone: (785)296-8065

***ALL QC IS NOT COMPLETE FOR QC SAMPLE(S):
ESN 602015976 BATCH 48995

PREPARED BY

12/19/98

ANALYST

REPORT OF LABORATORY ANALYSIS

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DATE: 08/10/98
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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

BOXING 740, FORBES FIELD
LENEXA, KS 66620

Client: Mr. RANDY BROWN
Phone: (785)296-8065

Analysis results are reported on a wet weight basis

Sample No: 602007270 Date Collected: 07/30/98 Matrix: Soil
Parent Sample ID: K-37 DEEP Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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S -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	60000	ug/kg	330	08/06/98	DJE	95-50-1	1
Methyl Paraoxon	ND	ug/kg	330	08/06/98	DJE	120-82-1	
2,4-Dichlorophenol	ND	ug/kg	1600	08/06/98	DJE	100-02-7	
2,4-Dichlorophenyl-d14 (S)	72	%		08/06/98	DJE	1718-51-0	
2,4,6-Trichlorophenol (S)	96	%		08/06/98	DJE	118-79-6	
Date Extracted				08/05/98			

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DATE: 08/10/98

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Pace Project Number: 6023248

Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007288
Client Sample ID: K-13

Date Collected: 07/30/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

GC/MS -- Semi-VOA

Semivolatile Organics

Method: EPA 8270

Prep Method: EPA 3550 Sonication

Methyl Parathion	ND	ug/kg	330	08/06/98	DJE	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/06/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/06/98	DJE	100-02-7	
Terphenyl-d14 (S)	138	%		08/06/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	127	%		08/06/98	DJE	118-79-6	
Date Extracted				08/05/98			

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007296 Date Collected: 07/30/98 Matrix: Soil
Sample ID: KF1 Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

IS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	590	ug/kg	330	08/06/98	DJE	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/06/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/06/98	DJE	100-02-7	
Terphenyl-d14 (S)	154	%		08/06/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	128	%		08/06/98	DJE	118-79-6	
Date Extracted				08/05/98			

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DATE: 08/10/98
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Pace Project Number: 6023248
Client Project ID: HQXIE CRASH SITE

Pace Sample No: 602007312 Date Collected: 07/30/98 Matrix: Soil
Client Sample ID: KF2 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatile Organics							
		Method: EPA 8270				Prep Method: EPA 3550 Sonication	
Methyl Parathion	ND	ug/kg	330	08/06/98	DJE	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/06/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/06/98	DJE	100-02-7	
Terphenyl-d14 (S)	183	%		08/06/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	126	%		08/06/98	DJE	118-79-6	
Date Extracted				08/05/98			

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007320
Site Sample ID: KF3

Date Collected: 07/30/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	2600000	ug/kg	3300	08/06/98	DJE	95-50-1	2
Methyl Paraoxon	15000	ug/kg	3300	08/06/98	DJE	120-82-1	3
p-Nitrophenol	87000	ug/kg	16000	08/06/98	DJE	100-02-7	2
Terphenyl-d14 (S)	117	%		08/06/98	DJE	1718-51-0	
1,4,6-Tribromophenol (S)	127	%		08/06/98	DJE	118-79-6	
Rate Extracted				08/05/98			

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DATE: 08/10/98
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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007338
Client Sample ID: KF4

Date Collected: 07/30/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

GC/MS -- Semi-VOA

Semivolatile Organics

Method: EPA 8270

Prep Method: EPA 3550 Sonication

Methyl Parathion	ND	ug/kg	330	08/08/98	DJE	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/08/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/08/98	DJE	100-02-7	
Terphenyl-d14 (S)	171	%		08/08/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	127	%		08/08/98	DJE	118-79-6	
Date Extracted				08/05/98			

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007346 Date Collected: 07/30/98 Matrix: Soil
Sample ID: K34DEEP Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Method: EPA 8270							
Prep Method: EPA 3550 Sonication							
Diethyl Parathion	29000	ug/kg	330	08/08/98	DJE	95-50-1	2
Diethyl Paraoxon	ND	ug/kg	330	08/08/98	DJE	120-82-1	
2,4-Dinitrophenol	1200	ug/kg	1600	08/08/98	DJE	100-02-7	4
Chlorophenyl-d14 (S)	66	%		08/08/98	DJE	1718-51-0	
1,4,6-Tribromophenol (S)	90	%		08/08/98	DJE	118-79-6	
Date Extracted				08/05/98			

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007353
Client Sample ID: K37

Date Collected: 07/30/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatile Organics							
							Method: EPA 8270
							Prep Method: EPA 3550 Sonication
Methyl Parathion	290000	ug/kg	330	08/06/98	DJE	95-50-1	2
Methyl Paraoxon	180	ug/kg	330	08/06/98	DJE	120-82-1	4,5
4-Nitrophenol	9900	ug/kg	1600	08/06/98	DJE	100-02-7	6
Terphenyl-d14 (S)	147	%		08/06/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	128	%		08/06/98	DJE	118-79-6	
Date Extracted				08/05/98			

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DATE: 08/10/98
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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007361 Date Collected: 07/30/98 Matrix: Soil
Sample ID: K21 DEEP Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

S -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	1500	ug/kg	330	08/10/98	DJE	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/10/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/10/98	DJE	100-02-7	
Terphenyl-d14 (S)	121	%		08/10/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	114	%		08/10/98	DJE	118-79-6	
Date Extracted				08/05/98			

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007379
Client Sample ID: K18 DEEP

Date Collected: 07/30/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatile Organics							
			Method: EPA 8270			Prep Method: EPA 3550 Sonication	
Methyl Parathion	1600000	ug/kg	3300	08/06/98	DJE	95-50-1	2
Methyl Paraoxon	7300	ug/kg	3300	08/06/98	DJE	120-82-1	5
4-Nitrophenol	24000	ug/kg	16000	08/06/98	DJE	100-02-7	2
Terphenyl-d14 (S)	124	%		08/06/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	121	%		08/06/98	DJE	118-79-6	
Date Extracted				08/05/98			

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007387
Sample ID: K17 DEEP

Date Collected: 07/30/98
Date Received: 07/31/98

Matrix: Soil

meters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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S -- Semi-VOA

	Method: EPA 8270				Prep Method: EPA 3550 Sonication		
Non-volatile Organics							
Methyl Parathion	6200000	ug/kg	3300	08/06/98	DJE	95-50-1	2
Methyl Paraoxon	7600	ug/kg	3300	08/06/98	DJE	120-82-1	7
4-Nitrophenol	240000	ug/kg	16000	08/06/98	DJE	100-02-7	2
Terphenyl-d14 (S)	139	%		08/06/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	176	%		08/06/98	DJE	118-79-6	
Date Extracted				08/05/98			

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007395 Date Collected: 07/30/98 Matrix: Soil
Client Sample ID: K-40 Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatile Organics							
		Method: EPA 8270				Prep Method: EPA 3550 Sonication	
Methyl Parathion	3200	ug/kg	330	08/10/98	DJE	95-50-1	6
Methyl Paraoxon	ND	ug/kg	330	08/10/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/10/98	DJE	100-02-7	
Terphenyl-d14 (S)	108	%		08/10/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	102	%		08/10/98	DJE	118-79-6	
Date Extracted				08/05/98			

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007403 Date Collected: 07/30/98 Matrix: Soil
Sample ID: K-33 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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IS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	450000	ug/kg	3300	08/06/98	DJE	95-50-1	2
Methyl Paraoxon	ND	ug/kg	3300	08/06/98	DJE	120-82-1	
4-Nitrophenol	9600	ug/kg	16000	08/06/98	DJE	100-02-7	4
Terphenyl-d14 (S)	1640	%		08/06/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	1260	%		08/06/98	DJE	118-79-6	
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Pace Project Number: 6023248

Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007411
Client Sample ID: K-16

Date Collected: 07/30/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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GC/MS -- Semi-VOA

Semivolatile Organics	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Methyl Parathion	2600	ug/kg	3300	08/06/98	DJE	95-50-1	4
Methyl Paraoxon	ND	ug/kg	330	08/06/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/06/98	DJE	100-02-7	
Terphenyl-d14 (S)	129	%		08/06/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	125	%		08/06/98	DJE	118-79-6	
Date Extracted				08/05/98			

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007429 Date Collected: 07/30/98 Matrix: Soil
Sample ID: K-26 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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S -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Nonvolatile Organics							
Methyl Parathion	3400	ug/kg	330	08/06/98	DJE	95-50-1	6
Methyl Paraoxon	ND	ug/kg	330	08/06/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/06/98	DJE	100-02-7	
Terphenyl-d14 (S)	192	%		08/06/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	121	%		08/06/98	DJE	118-79-6	
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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007437
Client Sample ID: K-17

Date Collected: 07/30/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatile Organics							
							Method: EPA 8270
							Prep Method: EPA 3550 Sonication
Methyl Parathion	89000	ug/kg	330	08/07/98	DJE	95-50-1	2
Methyl Paraoxon	ND	ug/kg	330	08/07/98	DJE	120-82-1	
4-Nitrophenol	2800	ug/kg	1600	08/07/98	DJE	100-02-7	
Terphenyl-d14 (S)	35	%		08/07/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	44	%		08/07/98	DJE	118-79-6	
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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007445 Date Collected: 07/30/98 Matrix: Soil
nt Sample ID: K-21 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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S -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	1700000	ug/kg	3300	08/08/98	DJE	95-50-1	2
Methyl Paraoxon	ND	ug/kg	3300	08/08/98	DJE	120-82-1	
1-Nitrophenol	78000	ug/kg	16000	08/08/98	DJE	100-02-7	8
Terphenyl-d14 (S)	103	%		08/08/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	103	%		08/08/98	DJE	118-79-6	
Date Extracted				08/06/98			

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007452 Date Collected: 07/30/98 Matrix: Soil
Client Sample ID: K-43 Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatile Organics							
		Method: EPA 8270				Prep Method: EPA 3550 Sonication	
Methyl Parathion	ND	ug/kg	330	08/07/98	DJE	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/07/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/07/98	DJE	100-02-7	
Terphenyl-d14 (S)	149	%		08/07/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	128	%		08/07/98	DJE	118-79-6	
Date Extracted				08/06/98			

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007460
Sample ID: K-39

Date Collected: 07/30/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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S -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	560	ug/kg	330	08/07/98	DJE	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/07/98	DJE	120-82-1	
4-Nitrophenol	3100	ug/kg	1600	08/07/98	DJE	100-02-7	
Terphenyl(-d14 (S)	136	%		08/07/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	124	%		08/07/98	DJE	118-79-6	
Date Extracted:				08/06/98			

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007486 Date Collected: 07/30/98 Matrix: Soil
Lot Sample ID: K-19 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
S -- Semi-VOA							
Method: EPA 8270 Prep Method: EPA 3550 Sonication							
Nonvolatile Organics	330000	ug/kg	330	08/07/98	DJE	95-50-1	2
Methyl Parathion	ND	ug/kg	330	08/07/98	DJE	120-82-1	
Methyl Paraoxon	13000	ug/kg	16000	08/07/98	DJE	100-02-7	4
o-Nitrophenol	26	%		08/07/98	DJE	1718-51-0	
p-Terphenyl-d14 (S)	39	%		08/07/98	DJE	118-79-6	
2,4,6-Tribromophenol (S)				08/06/98			
Date Extracted							

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Pace Project Number: 6023248

Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007494
Client Sample ID: K-22

Date Collected: 07/30/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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GC/MS -- Semi-VOA

Semivolatiles Organics

Method: EPA 8270

Prep Method: EPA 3550 Sonication

Methyl Parathion	160000	ug/kg	330	08/07/98	DJE	95-50-1	2
Methyl Paraoxon	ND	ug/kg	330	08/07/98	DJE	120-82-1	
4-Nitrophenol	12000	ug/kg	1600	08/07/98	DJE	100-02-7	
Terphenyl-d14 (S)	23	%		08/07/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	29	%		08/07/98	DJE	118-79-6	
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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007502 Date Collected: 07/30/98 Matrix: Soil
Sample ID: K-24 Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	290000	ug/kg	330	08/07/98	DJE	95-50-1	2
Methyl Paraoxon	130	ug/kg	330	08/07/98	DJE	120-82-1	4,5
4-Nitrophenol	9200	ug/kg	1600	08/07/98	DJE	100-02-7	
Terphenyl-d14 (S)	106	%		08/07/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	111	%		08/07/98	DJE	118-79-6	
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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007510 Date Collected: 07/30/98 Matrix: Soil
Client Sample ID: K-25 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatiles Organics							
							Method: EPA 8270
							Prep Method: EPA 3550 Sonication
Methyl Parathion	1600	ug/kg	330	08/07/98	DJE	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/07/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/07/98	DJE	100-02-7	
Terphenyl-d14 (S)	135	%		08/07/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	125	%		08/07/98	DJE	118-79-6	
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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007528 Date Collected: 07/30/98 Matrix: Soil
Parent Sample ID: K-31 Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

IS -- Semi-VOA

Parameter	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics							
Method: EPA 8270							
Prep Method: EPA 3550 Sonication							
Methyl Parathion	130	ug/kg	330	08/07/98	DJE	95-50-1	4
Methyl Paraoxon	ND	ug/kg	330	08/07/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/07/98	DJE	100-02-7	
Terphenyl-d14 (S)	129	%		08/07/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	121	%		08/07/98	DJE	118-79-6	
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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007536
Client Sample ID: K-46

Date Collected: 07/29/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatile Organics							
			Method: EPA 8270				Prep Method: EPA 3550 Sonication
Methyl Parathion	ND	ug/kg	330	08/07/98	DJE	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/07/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/07/98	DJE	100-02-7	
Terphenyl-d14 (S)	165	%		08/07/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	126	%		08/07/98	DJE	118-79-6	
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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007544 Date Collected: 07/29/98 Matrix: Soil
Lot Sample ID: K-30 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
S -- Semi-VOA							
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Diethyl Parathion	ND	ug/kg	330	08/07/98	DJE	95-50-1	
Diethyl Paraoxon	ND	ug/kg	330	08/07/98	DJE	120-82-1	
o-Nitrophenol	ND	ug/kg	1600	08/07/98	DJE	100-02-7	
Terphenyl-d14 (S)	171	%		08/07/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	127	%		08/07/98	DJE	118-79-6	
Date Extracted				08/04/98			

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007551 Date Collected: 07/29/98 Matrix: Soil
Client Sample ID: K-29 Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatile Organics							
			Method: EPA 8270			Prep Method: EPA 3550 Sonication	
Methyl Parathion	210	ug/kg	330	08/07/98	DJE	95-50-1	4
Methyl Paraoxon	ND	ug/kg	330	08/07/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/07/98	DJE	100-02-7	
Terphenyl-d14 (S)	196	%		08/07/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	112	%		08/07/98	DJE	118-79-6	
Date Extracted				08/04/98			

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007569 Date Collected: 07/29/98 Matrix: Soil
Parent Sample ID: K-31 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-VOA							
Semi-volatile Organics							
	Method: EPA 8270			Prep Method: EPA 3550 Sonication			
Methyl Parathion	34000	ug/kg	3300	08/07/98	DJE	95-50-1	2
Methyl Paraoxon	ND	ug/kg	3300	08/07/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	16000	08/07/98	DJE	100-02-7	
Terphenyl-d14 (S)	112	%		08/07/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	133	%		08/07/98	DJE	118-79-6	
Date Extracted				08/05/98			

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007577 Date Collected: 07/29/98 Matrix: Soil
Client Sample ID: K-45 Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatiles Organics							
Methyl Parathion	500	ug/kg	330	08/07/98	DJE	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/07/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/07/98	DJE	100-02-7	
Terphenyl-d14 (S)	189	%		08/07/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	124	%		08/07/98	DJE	118-79-6	
Date Extracted				08/05/98			

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007585 Date Collected: 07/29/98 Matrix: Soil
Int Sample ID: K-44 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
S -- Semi-VOA							
Semivolatile Organics Method: EPA 8270 Prep Method: EPA 3550 Sonication							
Methyl Parathion	120	ug/kg	330	08/07/98	DJE	95-50-1	4
Methyl Paraoxon	ND	ug/kg	330	08/07/98	DJE	120-82-1	
4-Nitrophenol	2400	ug/kg	1600	08/07/98	DJE	100-02-7	
Perphenyl-d14 (S)	194	%		08/07/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	114	%		08/07/98	DJE	118-79-6	
Date Extracted				08/05/98			

REPORT OF LABORATORY ANALYSIS

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DATE: 08/10/98
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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

PARAMETER FOOTNOTES

ND Not Detected
NC Not Calculable
PRL Pace Reporting Limit
(S) Surrogate
[1] The qualitative result exceeds 14 ppm.
[2] The qualitative amount exceeds 14 ppm.
[3] The qualitative result for methyl paraoxon exceeds 14 ppm.
[4] Detected but below the PRL; therefore, result is an estimated concentration (CLP J-Flag).
[5] This is a qualitative result for methyl paraoxon.
[6] Compound concentration exceeds the calibration range of the instrument (CLP E-Flag).
[7] The result is qualitative for methyl paraoxon.
[8] The qualitative amount exceeds 14 ppm.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

DATE: 08/10/98
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ADDRESS: 740, FORBES FIELD
 LENEXA, KS 66620

Pace Project Number: 6023248
 Client Project ID: HOXIE CRASH SITE

CONTACT: Mr. RANDY BROWN
 PHONE: (785)296-8065

Batch ID: 48679
 Analysis Method: EPA 8270
 Associated Pace Samples: 602007536 602007544 602007551
 QC Batch Method: EPA 3550 Sonication
 Analysis Description: Semivolatile Organics

FIELD BLANK: 602010068
 Associated Pace Samples:

Parameter	Units	602007536	602007544	602007551	Method Blank Result	PRL	Footnotes
Diethyl Parathion	ug/kg				ND	330	
Chlorpyrifos	ug/kg				ND	330	
Endosulfan	ug/kg				ND	1600	
Endosulfan-d14 (S)	%				81		
1,6-Tribromophenol (S)	%				133		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 602010076 602010084

Parameter	Units	602007155	Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Endosulfan	ug/kg	0	5000	3723	74.5	3647	72.9	2	
Endosulfan-d14 (S)					74		76		
1,6-Tribromophenol (S)					143		137		

LABORATORY CONTROL SAMPLE: 602010092

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
Endosulfan	ug/kg	5000	3513	70.3	
Endosulfan-d14 (S)				73	
1,6-Tribromophenol (S)				133	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

DATE: 08/10/98
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KDHE
 BUILDING 740, FORBES FIELD
 TOPEKA, KS 66620

Pace Project Number: 6023248
 Client Project ID: HOXIE CRASH SITE

Attn: Mr. RANDY BROWN
 Phone: (785)296-8065

QC Batch ID: 48736
 Analysis Method: EPA 8270
 Associated Pace Samples: 602007270 602007288 602007296 602007312 602007320
 602007338 602007346 602007353 602007361 602007379
 602007387 602007395 602007403 602007411 602007429
 602007569 602007577 602007585

QC Batch Method: EPA 3550 Sonication
 Analysis Description: Semivolatile Organics

METHOD BLANK: 602012650
 Associated Pace Samples:

602007270 602007288 602007296 602007312 602007320 602007338 602007353 602007361 602007379 602007387 602007395 602007403 602007429 602007569 602007577 602007585

Parameter	Units	Method Blank Result	PRL	Footnotes
Methyl Parathion	ug/kg	ND	330	
Methyl Paraoxone	ug/kg	ND	330	
Terphenyl-d14 (S)	%	78		
2,4,6-Tribromophenol (S)	%	93		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 602012668 602012676

Parameter	Units	602011348	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Foot
Methyl Paraoxone	ug/kg	0	3332	0	0	0	0	0	
4-Nitrophenol	ug/kg	0	4998	0	0	0	0	0	
Terphenyl-d14 (S)					0		0		
2,4,6-Tribromophenol (S)					0		0		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

DATE: 08/10/98
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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

LABORATORY CONTROL SAMPLE: 602012684

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
nitrophenol	ug/kg	5000	3333	66.7	
phenyl-d14 (S)				133	
2,6-Tribromophenol (S)				116	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

DATE: 08/10/98
PAGE: 36

KDHE
BUILDING 740, FORBES FIELD
TOPEKA, KS 66620

Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Attn: Mr. RANDY BROWN
Phone: (785)296-8065

QC Batch ID: 48801
Analysis Method: EPA 8270
Associated Pace Samples: 602007437 602007486
QC Batch Method: EPA 3550 Sonication
Analysis Description: Semivolatile Organics
602007445 602007452 602007460 602007478
602007494 602007502 602007510 602007528

METHOD BLANK: 602015943
Associated Pace Samples:

Parameter	Units	602007437 602007502	602007445 602007510	602007452 602007528	602007460	602007478	602007486	602007
			Method Blank Result	PRL				Footnotes
Methyl Parathion	ug/kg		ND	330				
Methyl Paraoxon	ug/kg		ND	330				
4-Nitrophenol	ug/kg		ND	1600				
Terphenyl-d14 (S)	%		108					
2,4,6-Tribromophenol (S)	%		101					

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 602015950 602015968

Parameter	Units	602007437	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Foot
4-Nitrophenol	ug/kg	2822	4993	17880	302	12650	197	42	1,1
Terphenyl-d14 (S)					199		92		
2,4,6-Tribromophenol (S)					53		73		

REPORT OF LABORATORY ANALYSIS

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DATE: 08/10/98
PAGE: 37

Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

QUALITY CONTROL DATA PARAMETER FOOTNOTES

Consistent with EPA guidelines unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

Not Detected

Not Calculable

Pace Reporting Limit

Relative Percent Difference

Surrogate

Due to high analyte concentration the matrix spike and/or matrix spike duplicate do not provide reliable recovery data.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

DATE: 08/10/98
 PAGE: 34

KDHE
 BUILDING 740, FORBES FIELD
 TOPEKA, KS 66620

Pace Project Number: 6023248
 Client Project ID: HOXIE CRASH SITE

Attn: Mr. RANDY BROWN
 Phone: (785)296-8065

QC Batch ID: 48736
 Analysis Method: EPA 8270
 Associated Pace Samples:

QC Batch Method: EPA 3550 Sonication
 Analysis Description: Semivolatile Organics

602007270	602007288	602007296	602007312	602007320
602007338	602007346	602007353	602007361	602007379
602007387	602007395	602007403	602007411	602007429
602007569	602007577	602007585		

METHOD BLANK: 602012650
 Associated Pace Samples:

602007270	602007288	602007296	602007312	602007320	602007338	602007346
602007353	602007361	602007379	602007387	602007395	602007403	602007429
602007429	602007569	602007577	602007585			

Parameter	Units	Method Blank Result	PRL	Footnotes
Methyl Parathion	ug/kg	ND	330	
Methyl Paraoxone	ug/kg	ND	330	
Terphenyl-d14 (S)	%	78		
2,4,6-Tribromophenol (S)	%	93		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 602012668 602012676

Parameter	Units	602011348	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnote
Methyl Paraoxone	ug/kg	0	3332	0	0	0	0	0	
4-Nitrophenol	ug/kg	0	4998	0	0	0	0	0	
Terphenyl-d14 (S)					0		0		
2,4,6-Tribromophenol (S)					0		0		

REPORT OF LABORATORY ANALYSIS

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Pace Analytical

Pace Analytical Services
 9608 Lorret
 Lenexa, KS 6
 Tel: 913-599-
 Fax: 913-599-

QUALITY CONTROL DATA

DATE: 08/10/98
 PAGE: 36

KDHE
 BUILDING 740, FORBES FIELD
 TOPEKA, KS 66620

Pace Project Number: 6023248
 Client Project ID: HOXIE CRASH SITE

Attn: Mr. RANDY BROWN
 Phone: (785)296-8065

QC Batch ID: 48801
 Analysis Method: EPA 8270
 Associated Pace Samples: 602007437 602007445 602007452 602007460 602007478
 602007486 602007494 602007502 602007510 602007528

QC Batch Method: EPA 3550 Sonication
 Analysis Description: Semivolatile Organics

METHOD BLANK: 602015943
 Associated Pace Samples:

Parameter	Units	Method Blank Result	PRL	Footnotes
Methyl Parathion	ug/kg	ND	330	
Methyl Paraoxon	ug/kg	ND	330	
4-Nitrophenol	ug/kg	ND	1600	
Terphenyl-d14 (S)	%	108		
2,4,6-Tribromophenol (S)	%	101		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 602015950 602015968

Parameter	Units	602007437 Conc.	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footr
4-Nitrophenol	ug/kg	2822	4993	17880	302	12650	197	42	1,1
Terphenyl-d14 (S)					199		92		
2,4,6-Tribromophenol (S)					53		73		

REPORT OF LABORATORY ANALYSIS

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DATE: 08/10/98
PAGE: 37

Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

QUALITY CONTROL DATA PARAMETER FOOTNOTES

Consistent with EPA guidelines unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

ND Not Detected
NC Not Calculable
PRL Pace Reporting Limit
RPD Relative Percent Difference
(S) Surrogate
[1] Due to high analyte concentration the matrix spike and/or matrix spike duplicate do not provide reliable recovery data.

HOXIE CRASH SITE

Aug 12 1998

REPORT OF LABORATORY ANALYSIS

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Client: KOHLBER	Report To: Randy Brown	Turn around Time <input type="checkbox"/> 24 Hours <input type="checkbox"/> 48 Hours <input checked="" type="checkbox"/> 3-5 Days <input checked="" type="checkbox"/> 1 Week 2 Weeks <input type="checkbox"/> Normal 14 Days	Pace Client No.
Address: Bullseye 744000 Field	Bill To:		Pace Project Manager: RW
Phone: 785-246-8015	P.O. # / Billing Reference		Pace Project No. 602007353
Sampled By (PRINT): Randolph W. Brown		Project Name / No.: Aspic Cracks Site	*Requested Due Date: 6-2-98

Sampler Signature: _____ Date Sampled: **5/30/98**

ITEM NO.	SAMPLE DESCRIPTION	TIME	MATRIX	PACE NO.	NO. OF CONTAINERS	PRESERVATIVES					ANALYSES REQUEST		REMARKS	
						UNPRESERVED	H ₂ SO ₄	HNO ₃	VOA (HCL)	NaOH	Metal P	Paracetamol		
1	A K 23	1102	50.1	602006850	1	1								Disposable liners
2	K 37	1107		602007353	1									Substrate composite
3	K 35	1114		602006959	1									
4	K 36	1120			1									
5	K 21 Deep	1135		602007361	1									
6	K 18 Deep	1144		602007379	1									
7	K 17 Deep	1155		602007387	1									
8	K 23 Deep	1200	✓	602006967	1									

SHIPMENT METHOD	AIR BILL NO.	SHIPPING DATE	NUMBER OF COOLERS	ITEM NUMBER	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
					R Brown / KOHE	7/31/98	1100	K. White	7/31/98	1100
					Kat. White	7/31/98	1314		7/31/98	1314

Additional Comments: **A - Priority sample**

SAMPLE CONDITION

Temp: _____ °C Received on Ice: Y / N Sealed Cooler: Y / N Samples Intact: Y / N

Pace Analytical

394478

CHAIN-OF-CUSTODY RECORD Analytical Request

Client: <u>LD</u>	Report To: <u>Rodney Brown</u>	Turn around Time <input type="checkbox"/> 24 Hours <input type="checkbox"/> 48 Hours <input checked="" type="checkbox"/> 3-5 Days <input checked="" type="checkbox"/> 1 Week 2 Weeks <input type="checkbox"/> Normal 14 Days	Pace Client No.
Address: <u>Brown's Dairy Farm</u>	Bill To:		Pace Project Manager
Phone: <u>785-296-7065</u>	P.O. # / Billing Reference		Pace Project No.
Project Name / No. <u>William Creek, Mo</u>			*Requested Due Date:

Sampled By (PRINT): <u>Rodney Brown</u>	NO. OF CONTAINERS	PRESERVATIVES UNPRESERVED H ₂ SO ₄ HNO ₃ VOA (HCL) NaOH	ANALYSES REQUEST	REMARKS
Sampler Signature: <u>[Signature]</u>				

ITEM NO.	SAMPLE DESCRIPTION	TIME	MATRIX	PACE NO.	NO. OF CONTAINERS	UNPRESERVED	H ₂ SO ₄	HNO ₃	VOA (HCL)	NaOH	ANALYSES REQUEST	REMARKS
1	* M-1	11:30	S	602007056	1						X X X	A 400000 lines
2	* M-3	11:50	S	602007064	1						X X X	Subsample compare
3	A M-4	12:55	S	602007072	1						X X X	
4	* M-5	12:25	S	602007080	1						X X X	
5	A T-1	1:05	S	602007122	1						X X X	
6	* T-2	1:10	S	602007130	1						X X X	
7	* 2-1	1:40	S	602007148	1						X X X	
8	A 12-2	1:45	S	602007155	1						X X X	

SHIPMENT METHOD	AIR BILL NO.	SHIPPING DATE	NUMBER OF COOLERS	ITEM NUMBER	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
					<u>[Signature]</u>	7/30/14	11:00	<u>[Signature]</u>	7/30/14	11:00
					<u>[Signature]</u>	7/30/14	1:14	<u>[Signature]</u>	7/30/14	1:14

Additional Comments
 A - 400000 lines sample

SAMPLE CONDITION			
Temp: _____ °C	Received on Ice: Y / N	Sealed Cooler: Y / N	Samples Intact: Y / N

SEE REVERSE SIDE FOR INSTRUCTIONS

Client: KONE	Report To: Randy Brown / DUE	Turn around Time <input type="checkbox"/> 24 Hours <input type="checkbox"/> 48 Hours <input checked="" type="checkbox"/> 3-5 Days <input checked="" type="checkbox"/> 1 Week 2 Weeks <input type="checkbox"/> Normal 14 Days	Pace Client No.
Address: Building 740 Forbes Field	Bill To:		Pace Project Manager: RW
Phone: 785-296-8065	P.O. # / Billing Reference		Pace Project No.: 6023247 8-5-98
Project Name / No.: Hoxic Cus h Site		*Requested Due Date: 6023247 8-7-98	

Sampled By (PRINT): **Randy Brown**
 Sampler Signature: *[Signature]* Date Sampled: **7/29/98**

ITEM NO.	SAMPLE DESCRIPTION	TIME	MATRIX	PACE NO.	NO. OF CONTAINERS	PRESERVATIVES					ANALYSES REQUEST		REMARKS	
						UNPRESERVED	H ₂ SO ₄	HNO ₃	VOA (HCL)	NaOH	1	2		
1	* K-11	2000	Soil	602007163	1						X	X	X	Dissolvable Metals Subsample composite
2	* K-12	2003		602007171	1						X	X	X	
3	K-46	2005		602007536	1						X	X	X	
4	K-48	2008			1						X	X	X	
5	K-30	2022		602007544	1						X	X	X	
6	K-29	2026		602007551	1						X	X	X	
7	K-30	2031		602007569	1						X	X	X	
8	K-45	2040		602007577	1						X	X	X	

SHIPMENT METHOD	AIR BILL NO.	SHIPPING DATE	NUMBER OF COOLERS	ITEM NUMBER	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
					<i>[Signature]</i>	7/31/98	1100	<i>[Signature]</i>	7/31/98	1100
					<i>[Signature]</i>	7-31-98	1313	<i>[Signature]</i>	7/31/98	1313

Additional Comments
 1 - primary sample

SAMPLE CONDITION

Temp: _____ °C Received on Ice: Y / N Sealed Cooler: Y / N Samples Intact: Y / N

Pace Analytical

394462

CHAIN-OF-CUSTODY RECORD Analytical Request

Client: <u>KOH</u>	Report To: <u>Randy Brown</u>	Turn around Time <input type="checkbox"/> 24 Hours <input type="checkbox"/> 48 Hours <input checked="" type="checkbox"/> 3-5 Days <input checked="" type="checkbox"/> 1 Week 2 Weeks <input type="checkbox"/> Normal 14 Days	Pace Client No.
Address: <u>Building 744 Forbes Field</u>	Bill To:		Pace Project Manager: <u>RW</u>
Phone: <u>785-291-5015</u>	P.O. # / Billing Reference		Pace Project No.: <u>602007189</u> <u>8-5-98</u>
Project Name / No.: <u>Hept. Wash. Site</u>		*Requested Due Date:	

Sampled By (PRINT): Randolph L Brown
 Sampler Signature: [Signature] Date Sampled: 7/24/98

NO. OF CONTAINERS	PRESERVATIVES					ANALYSES REQUEST										REMARKS
	UNPRESERVED	H ₂ SO ₄	HNO ₃	VOA (HCL)	NaOH	1	2	3	4	5	6	7	8	9	10	

*Methyl Parathion
Diazinon L Gval
4-Misophenol*

ITEM NO.	SAMPLE DESCRIPTION	TIME	MATRIX	PACE NO.	NO. OF CONTAINERS	UNPRESERVED	H ₂ SO ₄	HNO ₃	VOA (HCL)	NaOH	1	2	3	4	5	6	7	8	9	10	11	12	REMARKS
1	* K-3	1915	soil	602007189	1	1					X	X	A										Disposable liners
2	* K-4	1920		602007205	1						X	X	X										Subsample composite
3	* K-5	1935		602007213	1						X	X	X										
4	* K-6	1940		602007221	1						X	X	X										
5	* K-7	1944		602007239	1						X	X	X										
6	A K-8	1948		602007247	1						X	X	X										
7	* K-9	1953		602007254	1						X	X	X										
8	A K-10	1956		602007262	1						X	X	X										

SHIPMENT METHOD	AIR BILL NO.	SHIPPING DATE	NUMBER OF COOLERS

ITEM NUMBER	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	<u>R. Brown / KOH</u>	<u>7/24/98</u>	<u>1100</u>	<u>[Signature]</u>	<u>7/24/98</u>	<u>1100</u>
	<u>[Signature]</u>	<u>7/24/98</u>	<u>1312</u>	<u>[Signature]</u>	<u>7/24/98</u>	<u>1312</u>

Additional Comments:
 * priority sample

SAMPLE CONDITION

Temp: _____ °C Received on Ice: Y/N Sealed Cooler: Y/N Samples Intact: Y/N

SEE REVERSE SIDE FOR INSTRUCTIONS

CHAIN-OF-CUSTODY RECORD
Analytical Request

Client: KDNE	Report To: Randy Brown / KDNE	Turn around Time <input type="checkbox"/> 24 Hours <input type="checkbox"/> 48 Hours <input checked="" type="checkbox"/> 3-5 Days <input checked="" type="checkbox"/> 1 Week 2 Weeks <input type="checkbox"/> Normal 14 Days	Pace Client No.
Address: Building 740, Forbes Field	Bill To:		Pace Project Manager: RJ
Phone: 785-296-8065	P.O. # / Billing Reference		Pace Project No.: 6023248
Sampled By (PRINT): Randy L. Brown		Project Name / No.: 12 yr. Crush Site	
Sampler Signature: <i>[Signature]</i>		Date Sampled: 7/24/98	
Requested Due Date: 8-7-98			

ITEM NO.	SAMPLE DESCRIPTION	TIME	MATRIX	PACE NO.	NO. OF CONTAINERS	PRESERVATIVES					ANALYSES REQUEST	REMARKS
						UNPRESERVED	H ₂ SO ₄	HNO ₃	VOA (HCL)	NaOH		
1	K-44	2045	Soil	602007595	1	1						Disposable liners subsample composite
2												
3												
4												
5												
6												
7												
8												

SHIPMENT METHOD	AIR BILL NO.	SHIPPING DATE	NUMBER OF COOLERS	ITEM NUMBER	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
					R. Brown / KDNE	7/31/98	1100	Kent Johnson / KDNE	7/31/98	1100
					Kent Johnson / KDNE	8/4/98	1314	[Signature]	8/4/98	1314

Additional Comments

SAMPLE CONDITION

Temp: _____ °C Received on Ice: Y / N Sealed Cooler: Y / N Samples Intact: Y / N

Pace Analytical

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
Tel: 913-599-5665
Fax: 913-599-1759

RECEIVED

August 06, 1998

AUG 12 1998

Mr. RANDY BROWN
KDHE
BUILDING 740, FORBES FIELD
TOPEKA, KS 66620

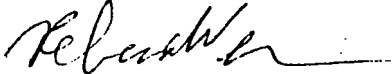
BUREAU OF
ENVIRONMENTAL
REMEDATION

RE: Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Dear Mr. BROWN:

Enclosed are the results of analyses for sample(s) received on July 31, 1998. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Rebecca Wenner
Project Manager

Enclosures

REPORT OF LABORATORY ANALYSIS

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Pace Analytical

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
Tel: 913-599-5665
Fax: 913-599-1759

DATE: 08/06/98
PAGE: 1

KDHE
BUILDING 740, FORBES FIELD
TOPEKA, KS 66620

Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Attn: Mr. RANDY BROWN
Phone: (785)296-8065

Solid results are reported on a wet weight basis

Pace Sample No: 602006850 Date Collected: 07/30/98 Matrix: Soil
Client Sample ID: K23 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatile Organics							
Methyl Parathion	1300	ug/kg	330	08/04/98	MSR	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/04/98	MSR	120-82-1	
4-Nitrophenol	1100	ug/kg	1600	08/04/98	MSR	100-02-7	1
Terphenyl-d14 (S)	70	%		08/04/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	138	%		08/04/98	MSR	118-79-6	
Date Extracted				08/04/98			

Method: EPA 8270
Prep Method: EPA 3550 Sonication

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AUG 12 1998

BUREAU OF
ENVIRONMENTAL
REMEDATION

REPORT OF LABORATORY ANALYSIS

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DATE: 08/06/98
PAGE: 2

Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602006959
Client Sample ID: K35

Date Collected: 07/30/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatile Organics							
	Method: EPA 8270				Prep Method: EPA 3550 Sonication		
Methyl Parathion	2400000	ug/kg	3300	08/04/98	MSR	95-50-1	2,3
Methyl Paraoxon	ND	ug/kg	3300	08/04/98	MSR	120-82-1	
4-Nitrophenol	59000	ug/kg	16000	08/04/98	MSR	100-02-7	4
Terphenyl-d14 (S)	23	%		08/04/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	23	%		08/04/98	MSR	118-79-6	
Date Extracted				08/04/98			

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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602006967
Client Sample ID: K23 DEEP

Date Collected: 07/30/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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GC/MS --- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatile Organics							
Methyl Parathion	3800	ug/kg	3300	08/05/98	MSR	95-50-1	5
Methyl Paraoxon	ND	ug/kg	330	08/05/98	MSR	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/05/98	MSR	100-02-7	
Terphenyl-d14 (S)	75	%		08/05/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	132	%		08/05/98	MSR	118-79-6	
Date Extracted				08/04/98			

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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602006975
Client Sample ID: K-42

Date Collected: 07/30/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatile Organics							
Methyl Parathion	500	ug/kg	330	08/04/98	MSR	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/04/98	MSR	120-82-1	
4-Nitrophenol	850	ug/kg	1600	08/04/98	MSR	100-02-7	1
Terphenyl-d14 (S)	74	%		08/04/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	127	%		08/04/98	MSR	118-79-6	
Date Extracted				08/04/98			

Method: EPA 8270

Prep Method: EPA 3550 Sonication

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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE.

Pace Sample No: 602007031
Client Sample ID: K-18

Date Collected: 07/30/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	4000000	ug/kg	3300	08/05/98	MSR	95-50-1	2
Methyl Paraoxone	ND	ug/kg	3300	08/05/98	MSR	120-82-1	
4-Nitrophenol	58000	ug/kg	16000	08/05/98	MSR	100-02-7	2
Terphenyl-d14 (S)	103	%		08/05/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	119	%		08/05/98	MSR	118-79-6	
Date Extracted				08/04/98			

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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007056
Client Sample ID: M-19 M1

Date Collected: 07/30/98
Date Received: 07/31/98

Matrix: Soil

Parameters *FD* Results Units PRL Analyzed Analyst CAS# Footnotes

GC/MS -- Semi-VOA

Semivolatile Organics

Method: EPA 8270

Prep Method: EPA 3550 Sonication

Methyl Parathion	2300	ug/kg	330	08/05/98	MSR	95-50-1
Methyl Paraoxon	ND	ug/kg	330	08/05/98	MSR	120-82-1
4-Nitrophenol	ND	ug/kg	1600	08/05/98	MSR	100-02-7
Terphenyl-d14 (S)	69	%		08/05/98	MSR	1718-51-0
2,4,6-Tribromophenol (S)	124	%		08/05/98	MSR	118-79-6
Date Extracted				08/04/98		

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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007064 Date Collected: 07/24/98 Matrix: Soil
Client Sample ID: M-3 Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatile Organics							
		Method: EPA 8270				Prep Method: EPA 3550 Sonication	
Methyl Parathion	ND	ug/kg	330	08/04/98	MSR	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/04/98	MSR	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/04/98	MSR	100-02-7	
Terphenyl-d14 (S)	77	%		08/04/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	137	%		08/04/98	MSR	118-79-6	
Date Extracted				08/03/98			

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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Sample No: 602007072 Date Collected: 07/24/98 Matrix: Soil
Sample ID: M-4 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes	
S -- Semi-VOA								
Semivolatile Organics				Method: EPA 8270				Prep Method: EPA 3550 Sonication
Methyl Parathion	ND	ug/kg	330	08/04/98	MSR	95-50-1		
Methyl Paraoxon	ND	ug/kg	330	08/04/98	MSR	120-82-1		
4-Nitrophenol	ND	ug/kg	1600	08/04/98	MSR	100-02-7		
Terphenyl-d14 (S)	82	%		08/04/98	MSR	1718-51-0		
2,4,6-Tribromophenol (S)	161	%		08/04/98	MSR	118-79-6		
Date Extracted				08/03/98				

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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Sample No: 602007122 Date Collected: 07/24/98 Matrix: Soil
Sample ID: T-1 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
S -- Semi-VOA							
Semi-volatile Organics Method: EPA 8270 Prep Method: EPA 3550 Sonication							
Methyl Parathion	ND	ug/kg	330	08/06/98	MSR	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/06/98	MSR	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/06/98	MSR	100-02-7	
Terphenyl-d14 (S)	41	%		08/06/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	53	%		08/06/98	MSR	118-79-6	
Date Extracted				08/03/98			

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Pace Project Number: 6023247

Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007130
Client Sample ID: T-2

Date Collected: 07/24/98
Date Received: 07/31/98

Matrix: Soil

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

GC/MS -- Semi-VOA

Semivolatile Organics

Method: EPA 8270

Prep Method: EPA 3550 Sonication

Methyl Parathion	ND	ug/kg	330	08/04/98	MSR	95-50-1	
Methyl Paraoxone	ND	ug/kg	330	08/04/98	MSR	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/04/98	MSR	100-02-7	
Terphenyl-d14 (S)	77	%		08/04/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	152	%		08/04/98	MSR	118-79-6	
Date Extracted				08/03/98			

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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Sample No: 602007148 Date Collected: 07/24/98 Matrix: Soil
Sample ID: K-1 Date Received: 07/31/98

meters Results Units PRL Analyzed Analyst CAS# Footnotes

S -- Semi-VOA

Method:	EPA 8270	Prep Method:	EPA 3550 Sonication
Non-volatile Organics			
Methyl Parathion	3000 ug/kg	330	08/04/98 MSR 95-50-1
Methyl Paraoxon	ND ug/kg	330	08/04/98 MSR 120-82-1
4-Nitrophenol	ND ug/kg	1600	08/04/98 MSR 100-02-7
Terphenyl-d14 (S)	85 %		08/04/98 MSR 1718-51-0
2,4,6-Tribromophenol (S)	140 %		08/04/98 MSR 118-79-6
Date Extracted			08/03/98

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Pace Project Number: 6023247

Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007155
Client Sample ID: K-2

Date Collected: 07/24/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

GC/MS -- Semi-VOA

Semivolatiles Organics

Method: EPA 8270

Prep Method: EPA 3550 Sonication

Methyl Parathion	ND	ug/kg	330	08/05/98	MSR	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/05/98	MSR	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/05/98	MSR	100-02-7	
Terphenyl-d14 (S)	73	%		08/05/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	141	%		08/05/98	MSR	118-79-6	
Date Extracted				08/04/98			

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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Sample No: 602007163 Date Collected: 07/24/98 Matrix: Soil
Sample ID: K-11 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
S -- Semi-VOA							
Method: EPA 8270				Prep Method: EPA 3550 Sonication			
Non-volatile Organics	380000	ug/kg	330	08/05/98	MSR	95-50-1	2
Methyl Parathion	ND	ug/kg	330	08/05/98	MSR	120-82-1	
Methyl Paraoxon	19000	ug/kg	16000	08/05/98	MSR	100-02-7	5
4-Nitrophenol	67	%		08/05/98	MSR	1718-51-0	
Terphenyl-d14 (S)	139	%		08/05/98	MSR	118-79-6	
2,4,6-Tribromophenol (S)				08/04/98			
Date Extracted							

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Pace Project Number: 6023247

Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007171
Client Sample ID: K-12

Date Collected: 07/24/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

GC/MS -- Semi-VOA

Semivolatiles Organics

Method: EPA 8270

Prep Method: EPA 3550 Sonication

Methyl Parathion	43000	ug/kg	330	08/05/98	MSR	95-50-1	2
Methyl Paraoxon	580	ug/kg	330	08/05/98	MSR	120-82-1	6
4-Nitrophenol	2700	ug/kg	16000	08/05/98	MSR	100-02-7	1,5
Terphenyl-d14 (S)	76	%		08/05/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	147	%		08/05/98	MSR	118-79-6	
Date Extracted				08/04/98			

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Pace Project Number: 6023247
 Client Project ID: HOXIE CRASH SITE

Sample No: 602007189 Date Collected: 07/29/98 Matrix: Soil
 Sample ID: K-3 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

IS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	360000	ug/kg	330	08/05/98	MSR	95-50-1	2
Methyl Paraoxon	3700	ug/kg	330	08/05/98	MSR	120-82-1	6
4-Nitrophenol	30000	ug/kg	16000	08/05/98	MSR	100-02-7	5
Terphenyl-d14 (S)	73	%		08/05/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	143	%		08/05/98	MSR	118-79-6	
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Pace Project Number: 6023247
 Client Project ID: HOXIE CRASH SITE

Sample No: 602007213 *Rec'd* Date Collected: 07/29/98 Matrix: Soil
 Sample ID: K-5 Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

IS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics							
	Method: EPA 8270			Prep Method: EPA 3550 Sonication			
Methyl Parathion	71000	ug/kg	330	08/04/98	MSR	95-50-1	2
Methyl Paraoxon	ND	ug/kg	330	08/04/98	MSR	120-82-1	
4-Nitrophenol	1200	ug/kg	1600	08/04/98	MSR	100-02-7	1
Terphenyl-d14 (S)	69	%		08/04/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	140	%		08/04/98	MSR	118-79-6	
Date Extracted				08/04/98			

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Pace Project Number: 6023247

Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007221
Client Sample ID: K-6

Date Collected: 07/29/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

GC/MS -- Semi-VOA

Semivolatiles Organics

Method: EPA 8270

Prep Method: EPA 3550 Sonication

Methyl Parathion	160000	ug/kg	330	08/05/98	MSR	95-50-1	2
Methyl Paraoxon	ND	ug/kg	330	08/05/98	MSR	120-82-1	
4-Nitrophenol	2600	ug/kg	16000	08/05/98	MSR	100-02-7	1,5
Terphenyl-d14 (S)	72	%		08/05/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	140	%		08/05/98	MSR	118-79-6	
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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Sample No: 602007239 Date Collected: 07/29/98 Matrix: Soil
Parent Sample ID: K-7 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
MS -- Semi-VOA							
Semivolatile Organics							
Method: EPA 8270				Prep Method: EPA 3550 Sonication			
Methyl Parathion	150000	ug/kg	330	08/05/98	MSR	95-50-1	2
Methyl Paraoxon	ND	ug/kg	330	08/05/98	MSR	120-82-1	
4-Nitrophenol	2000	ug/kg	16000	08/05/98	MSR	100-02-7	1,5
Terphenyl-d14 (S)	73	%		08/05/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	142	%		08/05/98	MSR	118-79-6	
Date Extracted				08/04/98			

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Pace Project Number: 6023247

Client Project ID: HOXIE CRASH SITE

Sample No: 602007254
Sample ID: K-9

Date Collected: 07/29/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

S -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	250000	ug/kg	330	08/05/98	MSR	95-50-1	2
Methyl Paraoxon	1100	ug/kg	330	08/05/98	MSR	120-82-1	6
4-Nitrophenol	25000	ug/kg	1600	08/05/98	MSR	100-02-7	2
Terphenyl-d14 (S)	67	%		08/05/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	123	%		08/05/98	MSR	118-79-6	
Date Extracted				08/04/98			

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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007262
Client Sample ID: K-10

Date Collected: 07/29/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

GC/MS -- Semi-VOA

Semivolatile Organics	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Methyl Parathion	750	ug/kg	330	08/05/98	MSR	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/05/98	MSR	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/05/98	MSR	100-02-7	
Terphenyl-d14 (S)	73	%		08/05/98	MSR	1718-51-0	
2,4,6-Tribromophenol (S)	127	%		08/05/98	MSR	118-79-6	
Date Extracted				08/04/98			

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Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

METER FOOTNOTES

Not Detected

Not Calculable

Pace Reporting Limit

Surrogate

Detected but below the PRL; therefore, result is an estimated concentration (CLP J-Flag).

The qualitative amount exceeds 14 ppm.

Sample was biphasic. Lower layer analyzed.

The qualitative result exceeds 14 ppm.

The value for this analyte was determined from a secondary dilution of 1:10.

This is a qualitative result for methyl paraoxone.

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REPORT OF LABORATORY ANALYSIS

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9608 Loiret
Lenexa, KS 6

Tel: 913-599
Fax: 913-599

QUALITY CONTROL DATA

DATE: 08/06/98
PAGE: 25

KDHE
BUILDING 740, FORBES FIELD
TOPEKA, KS 66620

Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

Attn: Mr. RANDY BROWN
Phone: (785)296-8065

QC Batch ID: 48647
Analysis Method: EPA 8270
Associated Pace Samples: 602007064 602007072 602007080 602007122 602007130 602007148

QC Batch Method: EPA 3550 Sonication
Analysis Description: Semivolatile Organics

METHOD BLANK: 602008096
Associated Pace Samples:

Parameter	Units	602007064		602007072		602007080		602007122		602007130		602007148	
		Method Blank Result	PRL	Method Blank Result	PRL	Method Blank Result	PRL	Method Blank Result	PRL	Method Blank Result	PRL	Method Blank Result	PRL
Methyl Parathion	ug/kg	ND	330	ND	330	ND	330	ND	330	ND	330	ND	330
Methyl Paraoxone	ug/kg	ND	330	ND	330	ND	330	ND	330	ND	330	ND	330
4-Nitrophenol	ug/kg	ND	1600	ND	1600	ND	1600	ND	1600	ND	1600	ND	1600
Terphenyl-d14 (S)	%	84		84		84		84		84		84	
2,4,6-Tribromophenol (S)	%	145		145		145		145		145		145	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 602008104 602008112

Parameter	Units	602006041		602008104		602008112		Spike Dup % Rec	RPD	Footr
		Conc.	Spike Conc.	Matrix Spike Result	Matrix Spike % Rec	Matrix Sp. Dup. Result	Matrix Sp. Dup. % Rec			
Methyl Paraoxone	ug/kg	0	3298	1396	42.3	1319	39.8	6		
4-Nitrophenol	ug/kg	0	4947	2378	48.1	2133	42.9	11		
Terphenyl-d14 (S)					82		82			
2,4,6-Tribromophenol (S)					90		100			

LABORATORY CONTROL SAMPLE: 602008120

Parameter	Units	Spike Conc.		LCS Result		Spike % Rec	Footnotes
		Conc.	Spike Conc.	Result	Spike % Rec		
4-Nitrophenol	ug/kg	5000	3380	67.6			
Terphenyl-d14 (S)				80			
2,4,6-Tribromophenol (S)				147			

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QUALITY CONTROL DATA

DATE: 08/06/98
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Pace Project Number: 6023247
 Client Project ID: HOXIE CRASH SITE

ADDRESS: 740, FORBES FIELD
 LENEXA, KS 66620

CONTACT: Mr. RANDY BROWN
 PHONE: (785)296-8065

Batch ID: 48679
 Analysis Method: EPA 8270
 Associated Pace Samples: 602006850 602006959 602006967 602006975 602007031
 602007056 602007155 602007163 602007171 602007189
 602007205 602007213 602007221 602007239 602007247
 602007254 602007262

Method Blank: 602010068
 Associated Pace Samples:

602006850 602006959 602006967 602006975 602007031 602007056 602007155
 602007163 602007171 602007189 602007205 602007213 602007221 602007239
 602007247 602007254 602007262

Parameter	Units	Method Blank Result	PRL	Footnotes
Diethyl Parathion	ug/kg	ND	330	
Diethyl Paraoxone	ug/kg	ND	330	
o-Cresol	ug/kg	ND	1600	
o-Cresol-d14 (S)	%	81		
2,4,6-Tribromophenol (S)	%	133		

Parameter	Units	Matrix Spike Conc.	Matrix Spike Result	Matrix Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
o-Cresol	ug/kg	0	5000	3723	74.5	3647	72.9	2
o-Cresol-d14 (S)					74		76	
2,4,6-Tribromophenol (S)					143		137	

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QUALITY CONTROL DATA

DATE: 08/06/98
PAGE: 27

Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

LABORATORY CONTROL SAMPLE: 602010092

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
4-Nitrophenol	ug/kg	5000	3513	70.3	
Terphenyl-d14 (S)				73	
2,4,6-Tribromophenol (S)				133	

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DATE: 08/06/98
PAGE: 28

Pace Project Number: 6023247
Client Project ID: HOXIE CRASH SITE

QUALITY CONTROL DATA PARAMETER FOOTNOTES

Consistent with EPA guidelines unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

Not Detected

Not Calculable

Pace Reporting Limit

Relative Percent Difference

Surrogate

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2000
2000
2000

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CHAIN-OF-CUSTODY RECORD Analytical Request

Client: <u>ZD</u>	Report To: <u>Rudolph B...</u>	Turn around Time <input type="checkbox"/> 24 Hours <input type="checkbox"/> 48 Hours <input checked="" type="checkbox"/> 3-5 Days <input checked="" type="checkbox"/> 1 Week 2 Weeks <input type="checkbox"/> Normal 14 Days	Pace Client No.
Address: <u>...</u>	Bill To:		Pace Project Manager
Phone: <u>719-241-1115</u>	P.O. # / Billing Reference		Pace Project No.
	Project Name / No. <u>...</u>		*Requested Due Date:

Sampled By (PRINT): <u>Rudolph B...</u>	NO. OF CONTAINERS	PRESERVATIVES	ANALYSES REQUEST	REMARKS	
Sampler Signature: <u>Rudolph B...</u>					UNPRESERVED
Date Sampled: <u>7/21/11</u>					

ITEM NO.	SAMPLE DESCRIPTION	TIME	MATRIX	PACE NO.	NO. OF CONTAINERS	UNPRESERVED	H ₂ SO ₄	HNO ₃	VOA (HCL)	NaOH	ANALYSES REQUEST	REMARKS
1	Y 91-1	1725			1							disposable lines
2	+ M-3	1750			1							Subsample complete
3	+ M-4	1755			1							
4	+ M-5	1755			1							
5	+ T-1	1755			1							
6	+ T-2	1710			1							
7	+ 2-1	1750			1							
8	A 2	1755			1							

SHIPMENT METHOD	AIR BILL NO.	SHIPPING DATE	NUMBER OF COOLERS	ITEM NUMBER	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
					<u>Rudolph B...</u>	7/21/11	1115	<u>...</u>	7/21/11	1115
					<u>...</u>	7/21/11	1115	<u>...</u>	7/21/11	1115

Additional Comments

August 10, 1998


Mr. RANDY BROWN
KDHE
BUILDING 740, FORBES FIELD
TOPEKA, KS 66620

RE: Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Dear Mr. BROWN:

Enclosed are the results of analyses for sample(s) received on July 31, 1998. If you have any questions concerning this report, please feel free to contact me.

Sincerely,


Rebecca Wenner
Project Manager

Enclosures

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DATE: 08/10/98
PAGE: 0

KDHE
BUILDING 740, FORBES FIELD
TOPEKA, KS 66620

Pace Project Number: 6023248
Client Project ID: HOKIE CRASH SITE

Attn: Mr. RANDY BROWN
Phone: (785)296-8065

***ALL QC IS NOT COMPLETE FOR QC SAMPLE(S):
ESN 602015976 BATCH 48995

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DATE: 08/10/98
PAGE: 1

Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

EDING 740, FORBES FIELD
EKA, KS 66620

Mr. RANDY BROWN
Phone: (785)296-8065

and results are reported on a wet weight basis

Sample No: 602007270 Date Collected: 07/30/98 Matrix: Soil
Sample ID: K-37 DEEP Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

1S -- Semi-VOA

Parameter	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	60000	ug/kg	330	08/06/98	DJE	95-50-1	1
o,p'-DDT	ND	ug/kg	330	08/06/98	DJE	120-82-1	
o,p'-DDE	ND	ug/kg	1600	08/06/98	DJE	100-02-7	
o,p'-DDD	72	%		08/06/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	96	%		08/06/98	DJE	118-79-6	
Date Extracted				08/05/98			

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DATE: 08/10/98

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Pace Project Number: 6023248

Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007288
Client Sample ID: K-13

Date Collected: 07/30/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

GC/MS -- Semi-VOA

Semivolatile Organics

Method: EPA 8270

Prep Method: EPA 3550 Sonication

Methyl Parathion	ND	ug/kg	330	08/06/98	DJE	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/06/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/06/98	DJE	100-02-7	
Terphenyl-d14 (S)	138	%		08/06/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	127	%		08/06/98	DJE	118-79-6	
Date Extracted				08/05/98			

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DATE: 08/10/98
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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007296 Date Collected: 07/30/98 Matrix: Soil
Sample ID: KF1 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
MS -- Semi-VOA							
Semivolatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	590	ug/kg	330	08/06/98	DJE	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/06/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/06/98	DJE	100-02-7	
Terphenyl-d14 (S)	154	%		08/06/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	128	%		08/06/98	DJE	118-79-6	
Date Extracted				08/05/98			

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DATE: 08/10/98

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Pace Project Number: 6023248

Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007312
Client Sample ID: KF2

Date Collected: 07/30/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

GC/MS -- Semi-VOA

Semivolatile Organics

Method: EPA 8270

Prep Method: EPA 3550 Sonication

Methyl Parathion	ND	ug/kg	330	08/06/98	DJE	95-50-1	
Methyl Paraoxone	ND	ug/kg	330	08/06/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/06/98	DJE	100-02-7	
Terphenyl-d14 (S)	183	%		08/06/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	126	%		08/06/98	DJE	118-79-6	
Date Extracted				08/05/98			

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007320 Date Collected: 07/30/98 Matrix: Soil
Sample ID: KF3 Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

IS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	2600000	ug/kg	3300	08/06/98	DJE	95-50-1	2
Methyl Paraoxon	15000	ug/kg	3300	08/06/98	DJE	120-82-1	3
4-Nitrophenol	87000	ug/kg	16000	08/06/98	DJE	100-02-7	2
Terphenyl-d14 (S)	117	%		08/06/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	127	%		08/06/98	DJE	118-79-6	
Date Extracted				08/05/98			

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DATE: 08/10/98
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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007338
Client Sample ID: KF4

Date Collected: 07/30/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

GC/MS -- Semi-VOA

Semivolatile Organics

Method: EPA 8270

Prep Method: EPA 3550 Sonication

Methyl Parathion	ND	ug/kg	330	08/08/98	DJE	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/08/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/08/98	DJE	100-02-7	
Terphenyl-d14 (S)	171	%		08/08/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	127	%		08/08/98	DJE	118-79-6	
Date Extracted				08/05/98			

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DATE: 08/10/98
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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007346 Date Collected: 07/30/98 Matrix: Soil
Sample ID: K34DEEP Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
S -- Semi-VOA							
Method: EPA 8270				Prep Method: EPA 3550 Sonication			
Non-volatile Organics	29000	ug/kg	330	08/08/98	DJE	95-50-1	2
Methyl Parathion	ND	ug/kg	330	08/08/98	DJE	120-82-1	
Methyl Paraoxone	1200	ug/kg	1600	08/08/98	DJE	100-02-7	4
4-Nitrophenol	66	%		08/08/98	DJE	1718-51-0	
Terphenyl-d14 (S)	90	%		08/08/98	DJE	118-79-6	
2,4,6-Tribromophenol (S)				08/05/98			
Date Extracted							

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007361 Date Collected: 07/30/98 Matrix: Soil
Sample ID: K21 DEEP Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

IS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	1500	ug/kg	330	08/10/98	DJE	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/10/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/10/98	DJE	100-02-7	
Terphenyl-d14 (S)	121	%		08/10/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	114	%		08/10/98	DJE	118-79-6	
Date Extracted				08/05/98			

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007387 Date Collected: 07/30/98 Matrix: Soil
Sample ID: K17 DEEP Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

IS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	6200000	ug/kg	3300	08/06/98	DJE	95-50-1	2
Methyl Paraoxon	7600	ug/kg	3300	08/06/98	DJE	120-82-1	7
4-Nitrophenol	240000	ug/kg	16000	08/06/98	DJE	100-02-7	2
Terphenyl-d14 (S)	139	%		08/06/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	176	%		08/06/98	DJE	118-79-6	
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DATE: 08/10/98
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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007395 Date Collected: 07/30/98 Matrix: Soil
Client Sample ID: K-40 Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatiles Organics							
		Method: EPA 8270				Prep Method: EPA 3550 Sonication	
Methyl Parathion	3200	ug/kg	330	08/10/98	DJE	95-50-1	6
Methyl Paraoxon	ND	ug/kg	330	08/10/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/10/98	DJE	100-02-7	
Terphenyl-d14 (S)	108	%		08/10/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	102	%		08/10/98	DJE	118-79-6	
Date Extracted				08/05/98			

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ANALYST
DJE

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DATE: 08/10/98
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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007403 Date Collected: 07/30/98 Matrix: Soil
Sample ID: K-33 Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

S -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	450000	ug/kg	3300	08/06/98	DJE	95-50-1	2
Methyl Paraoxone	ND	ug/kg	3300	08/06/98	DJE	120-82-1	
4-Nitrophenol	9600	ug/kg	16000	08/06/98	DJE	100-02-7	4
Terphenyl-d14 (S)	1640	%		08/06/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	1260	%		08/06/98	DJE	118-79-6	
Date Extracted				08/05/98			

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Lenexa, KS 66151

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Fax: 913-599-1101

DATE: 08/10/98
PAGE: 14

Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007411 Date Collected: 07/30/98 Matrix: Soil
Client Sample ID: K-16 Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatiles Organics							
Methyl Parathion	2600	ug/kg	3300	08/06/98	DJE	95-50-1	4
Methyl Paraoxon	ND	ug/kg	330	08/06/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/06/98	DJE	100-02-7	
Terphenyl-d14 (S)	129	%		08/06/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	125	%		08/06/98	DJE	118-79-6	
Date Extracted				08/05/98			

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DATE: 08/10/98
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Pace Project Number: 6023248
 Client Project ID: HOXIE CRASH SITE

Sample No: 602007429 Date Collected: 07/30/98 Matrix: Soil
 Sample ID: K-26 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

IS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	3400	ug/kg	330	08/06/98	DJE	95-50-1	6
Methyl Paraoxon	ND	ug/kg	330	08/06/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/06/98	DJE	100-02-7	
Terphenyl-d14 (S)	192	%		08/06/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	121	%		08/06/98	DJE	118-79-6	
Date Extracted				08/05/98			

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DATE: 08/10/98

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Pace Project Number: 6023248

Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007437
Client Sample ID: K-17

Date Collected: 07/30/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatile Organics							
Methyl Parathion	89000	ug/kg	330	08/07/98	DJE	95-50-1	2
Methyl Paraoxone	ND	ug/kg	330	08/07/98	DJE	120-82-1	
4-Nitrophenol	2800	ug/kg	1600	08/07/98	DJE	100-02-7	
Terphenyl-d14 (S)	35	%		08/07/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	44	%		08/07/98	DJE	118-79-6	
Date Extracted				08/06/98			

Method: EPA 8270

Prep Method: EPA 3550 Sonication

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007445 Date Collected: 07/30/98 Matrix: Soil
Sample ID: K-21 Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	1700000	ug/kg	3300	08/08/98	DJE	95-50-1	2
Methyl Paraoxon	ND	ug/kg	3300	08/08/98	DJE	120-82-1	
4-Nitrophenol	78000	ug/kg	16000	08/08/98	DJE	100-02-7	8
Terphenyl-d14 (S)	103	%		08/08/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	103	%		08/08/98	DJE	118-79-6	
Date Extracted				08/06/98			

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007452
Client Sample ID: K-43

Date Collected: 07/30/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatiles Organics							
Methyl Parathion	ND	ug/kg	330	08/07/98	DJE	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/07/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/07/98	DJE	100-02-7	
Terphenyl-d14 (S)	149	%		08/07/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	128	%		08/07/98	DJE	118-79-6	
Date Extracted				08/06/98			

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Fax: 913-599-1759

DATE: 08/10/98
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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007460 Date Collected: 07/30/98 Matrix: Soil
Sample ID: K-39 Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

S -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	560	ug/kg	330	08/07/98	DJE	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/07/98	DJE	120-82-1	
4-Nitrophenol	3100	ug/kg	1600	08/07/98	DJE	100-02-7	
Terphenyl-d14 (S)	136	%		08/07/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	124	%		08/07/98	DJE	118-79-6	
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DEPARTMENT OF REVENUE
LABORATORY

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DATE: 08/10/98
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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007486 Date Collected: 07/30/98 Matrix: Soil
Sample ID: K-19 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
S -- Semi-VOA							
Semivolatile Organics Method: EPA 8270 Prep Method: EPA 3550 Sonication							
Methyl Parathion	330000	ug/kg	330	08/07/98	DJE	95-50-1	2
Methyl Paraoxon	ND	ug/kg	330	08/07/98	DJE	120-82-1	
4-Nitrophenol	13000	ug/kg	16000	08/07/98	DJE	100-02-7	4
Terphenyl-d14 (S)	26	%		08/07/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	39	%		08/07/98	DJE	118-79-6	
Date Extracted				08/06/98			

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007502 Date Collected: 07/30/98 Matrix: Soil
Sample ID: K-24 Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

S -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	290000	ug/kg	330	08/07/98	DJE	95-50-1	2
Methyl Paraoxone	130	ug/kg	330	08/07/98	DJE	120-82-1	4,5
4-Nitrophenol	9200	ug/kg	1600	08/07/98	DJE	100-02-7	
Terphenyl-d14 (S)	106	%		08/07/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	111	%		08/07/98	DJE	118-79-6	
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Pace Project Number: 6023248

Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007510
Client Sample ID: K-25

Date Collected: 07/30/98
Date Received: 07/31/98

Matrix: Soil

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

GC/MS -- Semi-VOA

Semivolatile Organics

Method: EPA 8270

Prep Method: EPA 3550 Sonication

Methyl Parathion	1600	ug/kg	330	08/07/98	DJE	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/07/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/07/98	DJE	100-02-7	
Terphenyl-d14 (S)	135	%		08/07/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	125	%		08/07/98	DJE	118-79-6	
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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007528 Date Collected: 07/30/98 Matrix: Soil
Sample ID: K-32 Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

IS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	130	ug/kg	330	08/07/98	DJE	95-50-1	4
Methyl Paraoxon	ND	ug/kg	330	08/07/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/07/98	DJE	100-02-7	
Terphenyl-d14 (S)	129	%		08/07/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	121	%		08/07/98	DJE	118-79-6	
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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007536 Date Collected: 07/29/98 Matrix: Soil
Client Sample ID: K-46 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatiles Organics							
Methyl Parathion	ND	ug/kg	330	08/07/98	DJE	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/07/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/07/98	DJE	100-02-7	
Terphenyl-d14 (S)	165	%		08/07/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	126	%		08/07/98	DJE	118-79-6	
Date Extracted				08/04/98			

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007544 Date Collected: 07/29/98 Matrix: Soil
Sample ID: K-30 Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

S -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	ND	ug/kg	330	08/07/98	DJE	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/07/98	DJE	120-82-1	
1-Nitrophenol	ND	ug/kg	1600	08/07/98	DJE	100-02-7	
1erphenyl-d14 (S)	171	%		08/07/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	127	%		08/07/98	DJE	118-79-6	
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DJE

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007551 Date Collected: 07/29/98 Matrix: Soil
Client Sample ID: K-29 Date Received: 07/31/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

GC/MS -- Semi-VOA

Semivolatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	210	ug/kg	330	08/07/98	DJE	95-50-1	4
Methyl Paraoxon	ND	ug/kg	330	08/07/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/07/98	DJE	100-02-7	
Terphenyl-d14 (S)	196	%		08/07/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	112	%		08/07/98	DJE	118-79-6	
Date Extracted				08/04/98			

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007569
Sample ID: K-31

Date Collected: 07/29/98
Date Received: 07/31/98

Matrix: Soil

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

3 -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Diethyl Parathion	34000	ug/kg	3300	08/07/98	DJE	95-50-1	2
Diethyl Paraoxon	ND	ug/kg	3300	08/07/98	DJE	120-82-1	
1-Nitrophenol	ND	ug/kg	16000	08/07/98	DJE	100-02-7	
Terphenyl-d14 (S)	112	%		08/07/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	133	%		08/07/98	DJE	118-79-6	
Date Extracted				08/05/98			

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Pace Sample No: 602007577
Client Sample ID: K-45

Date Collected: 07/29/98
Date Received: 07/31/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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GC/MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatile Organics							
Methyl Parathion	500	ug/kg	330	08/07/98	DJE	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/07/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/07/98	DJE	100-02-7	
Terphenyl-d14 (S)	189	%		08/07/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	124	%		08/07/98	DJE	118-79-6	
Date Extracted				08/05/98			

Method: EPA 8270

Prep Method: EPA 3550 Sonication

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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Sample No: 602007585 Date Collected: 07/29/98 Matrix: Soil
Sample ID: K-44 Date Received: 07/31/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

IS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semi-volatile Organics		Method: EPA 8270		Prep Method: EPA 3550 Sonication			
Methyl Parathion	120	ug/kg	330	08/07/98	DJE	95-50-1	4
Methyl Paraoxon	ND	ug/kg	330	08/07/98	DJE	120-82-1	
4-Nitrophenol	2400	ug/kg	1600	08/07/98	DJE	100-02-7	
Terphenyl-d14 (S)	194	%		08/07/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	114	%		08/07/98	DJE	118-79-6	
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DATE: 08/10/98

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Pace Project Number: 6023248

Client Project ID: HOXIE CRASH SITE

PARAMETER FOOTNOTES

ND Not Detected
NC Not Calculable
PRL Pace Reporting Limit
(S) Surrogate
[1] The qualitative result exceeds 14 ppm.
[2] The qualitative amount exceeds 14 ppm.
[3] The qualitative result for methyl paraoxon exceeds 14 ppm.
[4] Detected but below the PRL; therefore, result is an estimated concentration (CLP J-Flag).
[5] This is a qualitative result for methyl paraoxon.
[6] Compound concentration exceeds the calibration range of the instrument (CLP E-Flag).
[7] The result is qualitative for methyl paraoxon.
[8] The qualitative amount exceeds 14 ppm.

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QUALITY CONTROL DATA

DATE: 08/10/98
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Pace Project Number: 6023248
 Client Project ID: HOXIE CRASH SITE

ADDRESS: 740, FORBES FIELD
 LENEXA, KS 66620

CONTACT: Mr. RANDY BROWN
 PHONE: (785)296-8065

BATCH ID: 48679
 ANALYSIS METHOD: EPA 8270
 ASSOCIATED PACE SAMPLES: 602007536 602007544 602007551
 QC BATCH METHOD: EPA 3550 Sonication
 ANALYSIS DESCRIPTION: Semivolatile Organics

METHOD BLANK: 602010068
 ASSOCIATED PACE SAMPLES:

Parameter	Units	Method Blank Result	PRL	Footnotes
Chl Parathion	ug/kg	ND	330	
Chl Proxone	ug/kg	ND	330	
Chl Phenol	ug/kg	ND	1600	
Chl phenyl-d14 (S)	%	81		
Chl 4,6-Tribromophenol (S)	%	133		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 602010076 602010084

Parameter	Units	602007155 Conc.	602010084 Spike Conc.	Matrix Spike Result	Matrix Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Nitrophenol	ug/kg	0	5000	3723	74.5	3647	72.9	2	
phenyl-d14 (S)					74		76		
4,6-Tribromophenol (S)					143		137		

LABORATORY CONTROL SAMPLE: 602010092

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
Nitrophenol	ug/kg	5000	3513	70.3	
phenyl-d14 (S)				73	
4,6-Tribromophenol (S)				133	

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QUALITY CONTROL DATA

DATE: 08/10/98

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KDHE
BUILDING 740, FORBES FIELD
TOPEKA, KS 66620

Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Attn: Mr. RANDY BROWN
Phone: (785)296-8065

QC Batch ID: 48736
Analysis Method: EPA 8270
Associated Pace Samples: 602007270 602007288 602007296 602007312 602007320
602007338 602007346 602007353 602007361 602007379
602007387 602007395 602007403 602007411 602007429
602007569 602007577 602007585

QC Batch Method: EPA 3550 Sonication
Analysis Description: Semivolatile Organics

METHOD BLANK: 602012650
Associated Pace Samples:

602007270 602007288 602007296 602007312 602007320 602007338 602007346
602007353 602007361 602007379 602007387 602007395 602007403 602007411
602007429 602007569 602007577 602007585

Parameter	Units	Method Blank Result	PRL	Footnotes
Methyl Parathion	ug/kg	ND	330	
Methyl Paraoxon	ug/kg	ND	330	
Terphenyl-d14 (S)	%	78		
2,4,6-Tribromophenol (S)	%	93		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 602012668 602012676

Parameter	Units	602011348	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footr
Methyl Paraoxon	ug/kg	0	3332	0	0	0	0	0	
4-Nitrophenol	ug/kg	0	4998	0	0	0	0	0	
Terphenyl-d14 (S)					0		0		
2,4,6-Tribromophenol (S)					0		0		

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QUALITY CONTROL DATA

DATE: 08/10/98
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Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

LABORATORY CONTROL SAMPLE: 602012684

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
nitrophenol	ug/kg	5000	3333	66.7	
phenyl-d14 (S)				133	
2,6-Tribromophenol (S)				116	

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DATE: 08/10/98
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BUILDING 740, FORBES FIELD
TOPEKA, KS 66620

Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

Attn: Mr. RANDY BROWN
Phone: (785)296-8065

QC Batch ID: 48801
Analysis Method: EPA 8270
Associated Pace Samples: 602007437 602007445 602007452 602007460 602007478
602007486 602007494 602007502 602007510 602007528

QC Batch Method: EPA 3550 Sonication
Analysis Description: Semivolatile Organics

METHOD BLANK: 602015943
Associated Pace Samples:

Parameter	Units	602007437 602007502	602007445 602007510	602007452 602007528	602007460	602007478	602007486	602007
		Method Blank Result		PRL	Footnotes			
Methyl Parathion	ug/kg		ND		330			
Methyl Paraoxone	ug/kg		ND		330			
4-Nitrophenol	ug/kg		ND		1600			
Terphenyl-d14 (S)	%		108					
2,4,6-Tribromophenol (S)	%		101					

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 602015950 602015968

Parameter	Units	602007437	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Foot
4-Nitrophenol	ug/kg	2822	4993	17880	302	12650	197	42	1,1
Terphenyl-d14 (S)					199		92		
2,4,6-Tribromophenol (S)					53		73		

REPORT OF LABORATORY ANALYSIS

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DATE: 08/10/98
PAGE: 37

Pace Project Number: 6023248
Client Project ID: HOXIE CRASH SITE

QUALITY CONTROL DATA PARAMETER FOOTNOTES

Consistent with EPA guidelines unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

Not Detected

Not Calculable

Pace Reporting Limit

Relative Percent Difference

Surrogate

Due to high analyte concentration the matrix spike and/or matrix spike duplicate do not provide reliable recovery data.

RECEIVED

AUG 16 1998

REPORT OF LABORATORY ANALYSIS

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DATE: 08/06/98

PAGE: 28

Pace Project Number: 6023247

Client Project ID: HOXIE CRASH SITE

QUALITY CONTROL DATA PARAMETER FOOTNOTES

Consistent with EPA guidelines unrounded concentrations are displayed and have been used to calculate % Rec and RPI

ND	Not Detected
NC	Not Calculable
PRL	Pace Reporting Limit
RPD	Relative Percent Difference
(S)	Surrogate

REPORT OF LABORATORY ANALYSIS

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August 14, 1998

Mr. RANDY BROWN
KDHE
BUILDING 740, FORBES FIELD
TOPEKA, KS 66620

RE: Pace Project Number: 6023319
Client Project ID: HOXIE CRASH

Dear Mr. BROWN:

Enclosed are the results of analyses for sample(s) received on August 4, 1998. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Rebecca Wenner
Project Manager

Enclosures

RECEIVED

AUG 17 1998

BUREAU OF
ENVIRONMENTAL
REMEDATION

REPORT OF LABORATORY ANALYSIS

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DATE: 08/14/98

PAGE: 1

KDHE
BUILDING 740, FORBES FIELD
TOPEKA, KS 66620

Pace Project Number: 6023319
Client Project ID: HOXIE CRASH

Attn: Mr. RANDY BROWN
Phone: (785)296-8065

Solid results are reported on a wet weight basis

Pace Sample No: 602014888 Date Collected: 07/30/98 Matrix: Water
Client Sample ID: RINSATE Date Received: 08/04/98

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

GC/MS -- Semi-VOA

Semivolatiles	Method	Prep Method
Semivolatiles by 8270	EPA 8270	EPA 3520
Methyl Parathion	12 ug/L	10 08/12/98 DJE 95-50-1
Methyl Paraoxon	ND ug/L	10 08/12/98 DJE 120-82-1
4-Nitrophenol	ND ug/L	50 08/12/98 DJE 100-02-7
Terphenyl-d14 (S)	107 %	08/12/98 DJE 1718-51-0
2,4,6-Tribromophenol (S)	108 %	08/12/98 DJE 118-79-6
Date Extracted		08/06/98

REPORT OF LABORATORY ANALYSIS

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DATE: 08/14/98
PAGE: 2

Pace Project Number: 6023319
Client Project ID: HOXIE CRASH

Sample No: 602014896 Date Collected: 07/29/98 Matrix: Soil
Parent Sample ID: K-5 Date Received: 08/04/98

Parameters Results Units PRL Analyzed Analyst CAS# Footnotes

MS -- Semi-VOA

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Semivolatile Organics							
							Method: EPA 8270 Prep Method: EPA 3550 Sonication
Methyl Parathion	1600	ug/kg	330	08/12/98	DJE	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/12/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/12/98	DJE	100-02-7	
Terphenyl-d14 (S)	112	%		08/12/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	107	%		08/12/98	DJE	118-79-6	
Date Extracted				08/07/98			

REPORT OF LABORATORY ANALYSIS

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DATE: 08/14/98

PAGE: 3

Pace Project Number: 6023319

Client Project ID: HOXIE CRASH

Pace Sample No: 602014904
Client Sample ID: M-2Date Collected: 07/29/98
Date Received: 08/04/98

Matrix: Soil

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

GC/MS -- Semi-VOA

Semivolatile Organics

Method: EPA 8270

Prep Method: EPA 3550 Sonication

Methyl Parathion	ND	ug/kg	330	08/12/98	DJE	95-50-1	
Methyl Paraoxon	ND	ug/kg	330	08/12/98	DJE	120-82-1	
4-Nitrophenol	ND	ug/kg	1600	08/12/98	DJE	100-02-7	
Terphenyl-d14 (S)	109	%		08/12/98	DJE	1718-51-0	
2,4,6-Tribromophenol (S)	107	%		08/12/98	DJE	118-79-6	
Date Extracted				08/07/98			

REPORT OF LABORATORY ANALYSIS

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DATE: 08/14/98
PAGE: 4

Pace Project Number: 6023319
Client Project ID: HOXIE CRASH

AMETER FOOTNOTES

Not Detected
Not Calculable
Pace Reporting Limit
Surrogate

REPORT OF LABORATORY ANALYSIS

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Pace Analytical

Pace Analytical Services
9608 Loiret
Lenexa, KS 6

Tel: 913-599-
Fax: 913-599-

QUALITY CONTROL DATA

DATE: 08/14/98
PAGE: 5

KDHE
BUILDING 740, FORBES FIELD
TOPEKA, KS 66620

Pace Project Number: 6023319
Client Project ID: HOXIE CRASH

Attn: Mr. RANDY BROWN
Phone: (785)296-8065

QC Batch ID: 48744
Analysis Method: EPA 8270
Associated Pace Samples:

QC Batch Method: EPA 3520
Analysis Description: Semivolatile Organics by 8270
602014888

METHOD BLANK: 602018186
Associated Pace Samples:

602014888

Parameter	Units	Method Blank Result	PRL	Footnotes
Methyl Paration	ug/L	ND	10	
Methyl Paraoxone	ug/L	ND	10	
4-Nitrophenol	ug/L	ND	50	
2,4,6-Tribromophenol (S)	%	96		
Terphenyl-d14 (S)	%	86		

LABORATORY CONTROL SAMPLE & LCSD: 602013203 602013211

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Methyl Parthion	ug/L	1000	234.3	23.4	329.3	32.9	34	
4-Nitrophenol	ug/L	1500	438.4	29.2	562.7	37.5	25	
2,4,6-Tribromophenol (S)				81		114		
Terphenyl-d14 (S)				65		89		

REPORT OF LABORATORY ANALYSIS

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DATE: 08/14/98
PAGE: 6

Pace Project Number: 6023319
Client Project ID: HOXIE CRASH

QUALITY CONTROL DATA PARAMETER FOOTNOTES

Consistent with EPA guidelines unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

- Not Detected
- Not Calculable
- Pace Reporting Limit
- Relative Percent Difference
- Surrogate

REPORT OF LABORATORY ANALYSIS

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Client: KDHE	Report To: Hardy Brown	Turn around Time	Pace Client No.
Address: Building 744, Forbes Field	Bill To:	<input type="checkbox"/> 24 Hours	Pace Project Manager: RW
Phone: 785-291-5665	P.O. # / Billing Reference:	<input type="checkbox"/> 48 Hours	Pace Project No.: 1022001 8-5-99
Sampled By (PRINT): Hardy Brown	Project Name / No.: Acid Wash Site	<input checked="" type="checkbox"/> 3-5 Days	Requested Due Date:
Sampler Signature: [Signature]	Date Sampled: 7/22/99	<input checked="" type="checkbox"/> 1 Week 2 Weeks	
		<input type="checkbox"/> Normal 14 Days	

SAMPLE DESCRIPTION	TIME	MATRIX	FACE NO.	NO. OF CONTAINERS	PRESERVATIVES				ANALYSES REQUEST			REMARKS	
					UNPRESERVED	H ₂ SO ₄	HNO ₃	VOA (HCL)	NaOH	Asst 1	Asst 2		Asst 3
* K-3	1915	soil	602007189	1	1					X	Y	Y	Possible Lead
* K-4	1920		602007205	1						X	Y	Y	Substrate Composite
* K-5 ¹⁰⁻⁴⁸	1935		602007213	1						Y	Y	Y	
* K-6	1940		602007221	1						Y	Y	Y	
* K-7	1944		602007239	1						Y	Y	Y	
* K-8	1948		602007247	1						Y	Y	Y	
* K-9	1953		602007254	1						Y	Y	Y	
* K-10	1956		602007262	1						Y	Y	Y	

SHIPMENT METHOD	AIR BILL NO.	SHIPPING DATE	NUMBER OF COOLERS	ITEM NUMBER	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
					R. Brown KDHE	7/22/99	11:00	Ken [Signature]	7/22/99	11:00
					Ken [Signature]	7/22/99	13:12	[Signature]	7/22/99	13:12

Additional Comments: * - priority sample

SAMPLE CONDITION

Temp: _____ °C Received on Ice: Y/N Sealed Cooler: Y/N Samples Intact: Y/N

HUG-06-98 1700 04:21 PM
 TRACE ANALYTICAL
 FAX NO. 9134383449
 P. 35

Pace Analytical

394464

CHAIN-OF-CUSTODY RECORD Analytical Request

Client: <u>V.DHE</u>	Report To: <u>Randy Brown (P.O.)</u>	Turn around Time <input type="checkbox"/> 24 Hours <input type="checkbox"/> 48 Hours <input checked="" type="checkbox"/> 3-5 Days <input checked="" type="checkbox"/> 1 Week <input type="checkbox"/> 2 Weeks <input type="checkbox"/> Normal 14 Days	Pace Client No.
Address: <u>Building 740 Forbes Field</u>	Bill To:		Pace Project Manager: <u>RW</u>
Phone: <u>785-296-8015</u>	P.O. # / Billing Reference		Pace Project No.: <u>602007117</u> <u>8-5-98</u>
Sampled By (PRINT): <u>Randy L. Brown</u>	Project Name / No.: <u>Haric Cash Site</u>		Requested Due Date: <u>602007</u> <u>9-7-98</u>

Sampler Signature: [Signature] Date Sampled: 7/29/98

SAMPLE DESCRIPTION	TIME	MATRIX	PACE NO.	NO. OF CONTAINERS	UNPRESERVED	PRESERVATIVES				ANALYSES REQUEST		REMARKS
						H ₂ SO ₄	HNO ₃	VOA (HCL)	NaOH	Metals	Trace	
L 11	2000	Soil	602007113	1	1					X	X	Digestible lining Substrate
* 12	2003		602007117	1	1					X	X	
12-46	2005		602007536	1	1					X	X	
12-48	2008			1	1					X	X	
1-30	2022		602007544	1	1					X	X	
1-29	2026		602007551	1	1					X	X	
1-30	2031		602007569	1	1					X	X	
1-45	2040		602007577	1	1					X	X	

SHIPMENT METHOD	AIR BILL NO.	SHIPPING DATE	NUMBER OF COOLERS	ITEM NUMBER	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
					<u>[Signature]</u>	7/31/98	1100	<u>[Signature]</u>	7/31/98	1100
					<u>[Signature]</u>	7-31-98	1313	<u>[Signature]</u>	7/31/98	1313

Additional Comments:

AUG-06-98 THU 04:27 PM PAGE ANALYTICAL FAX NO. 9134383449 P

Client: LDNE	Report To: Randy Brown / LDNE	Turn around Time	Pace Client No.
Address: Building 700, Fort Collins, CO	Bill To:	<input type="checkbox"/> 24 Hours	Pace Project Manager: FW
Phone: 785-206-7065	P.O. # / Billing Reference	<input type="checkbox"/> 48 Hours	Pace Project No. 0-7 78
Sampled By (PRINT): Randolph L Brown	Project Name / No. Hattie Creek Site	<input checked="" type="checkbox"/> 3-5 Days	Requested Due Date:
Sampler Signature: <i>[Signature]</i>	Date Sampled: 7/24/98	<input checked="" type="checkbox"/> 1 Week 2 Weeks	
		<input type="checkbox"/> Normal 14 Days	

SAMPLE DESCRIPTION	TIME	MATRIX	PACE NO.	NO. OF CONTAINERS	UNPRESERVED	PRESERVATIVES				ANALYSES REQUEST			REMARKS
						H ₂ SO ₄	HNO ₃	VOA (HCL)	NaOH	Metal	Trace	Y-N	
* M-1	1630	Soil	602007056	1						X	X		3-pcs soil bags
* M-3	1650		602007064	1						X	X		3-bags composite
* M-4	1655		602007072	1						X	X		
* M-5	725		602007080	1						X	X		
* T-1	1705		602007122	1						X	X		
* T-2	1710		602007130	1						X	X		
* K-1	1740		602007148	1						X	X		
* K-2	745		602007145	1						X	X		

SHIPMENT METHOD	AIR BILL NO.	SHIPPING DATE	NUMBER OF COOLERS	ITEM NUMBER	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
					<i>[Signature]</i>	7/24/98	1150	<i>[Signature]</i>	7/24/98	1150
					<i>[Signature]</i>	7/24/98	1314	<i>[Signature]</i>	7/24/98	1314

Additional Comments

* - Priority Sample

Temp: _____ °C Received on Ice: Y/N Sealed Cooler: Y/N Samples Intact: Y/N

AUG-06-98 THU 04:26 PM
 PACE ANALYTICAL
 FAX NO. 9134383449
 P. 33

Pace Analytical

412679

CHAIN-OF-CUSTODY RECORD Analytical Request

Client: WDAE BFR	Report To: <i>Randolph Brown</i>	Turn around Time	Client No.:
Address: <i>Building 740 Forbes Field</i>	Bill To:	<input type="checkbox"/> 24 Hours	Project Manager: <i>PH</i>
Phone: <i>785-291-2015</i>	P.O. # / Billing Reference:	<input type="checkbox"/> 48 Hours	Project No.:
Sampled By (PRINT): <i>Randolph L. Brown</i>	Project Name / No. <i>North Cough Site</i>	<input checked="" type="checkbox"/> 3-5 Days	Requested Due Date: <i>9-1-98</i>
Sampler Signature: <i>[Signature]</i>	Date Sampled: <i>7/31/98</i>	<input checked="" type="checkbox"/> 1 Week - 2 Weeks	
		<input type="checkbox"/> Normal 14 Days	

SAMPLE DESCRIPTION	TIME	MATRIX	PACE NO.	NO. OF CONTAINERS	UNPRESERVED	PRESERVATIVES				ANALYSES REQUEST				REMARKS	
						H ₂ SO ₄	HNO ₃	VOA (HCL)	NaOH	Asbestos	PAHs	W. White	BTEX		
K-40	0445	Soil	602007395	1	1					X	X				Disposable line
K-33	0450		602007403	1	1					X	X				Sub sample temp - C
K-16	0455		602007411	1	1					X	X				
K-26	0530		602007429	1	1					X	X				
* K-42	1035		602007475	1	1					X	X	X			
K-17	1045		602007437	1	1					X	X				
* K-18	1050		602007491	1	1					X	X				
K-21	1055		602007445	1	1					X	X				

SHIPMENT METHOD	AIR BILL NO.	SHIPPING DATE	NUMBER OF COOLERS	ITEM NUMBER	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
					<i>[Signature]</i>	7/31/98	1100	<i>[Signature]</i>	7/31/98	1200
					<i>[Signature]</i>	7/31/98	1314	<i>[Signature]</i>	7/31/98	12:14

Additional Comment:

AUG-06-98 THU 04:26 PM PACE ANALYTICAL FAX NO. 9134383449

Kansas Department of Health and Environment
Bureau of Environmental Remediation

MEMORANDUM

To: Hoxie Crash Site File

From: ^{FD}Farrell Dallen, Environmental Technician

Date: August 25, 1998

Subject: Sample data for the removal evaluation

I have reviewed the data from the soil samples that were collected for the removal evaluation at the plane crash site in Hoxie, Kansas. Methyl parathion was detected at 12 micrograms per liter ($\mu\text{g/l}$) in the rinsate sample, which is just slightly higher than the laboratory reporting limit of 10 $\mu\text{g/l}$. This value is not high enough to indicate that any problem existed with the decontamination procedure for the soil sampler. Results from several of the samples were not detected, which also indicates that cross contamination did not occur.

**SIGNS OF METHYL PARATHION
CONTAMINATION**

Agency for Toxic Substances and Disease
Registry - Emergency Response Hotline (24
hrs.) 404-639-0615

National Animal Poison Control
1-800-548-2423

NTPN 1-800-858-7378

EPA Regions ([See above](#))

(Rhonda J. Ferree, Extension Specialist)

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[Training Schedule](#) | [Fact Sheets](#) | [Other Resources](#)

Have an Illinois-related pesticide question?
Contact your local University of Illinois [Extension Office](#)

College of Agricultural, Consumer
and Environmental Sciences

EXTOXNET

Extension Toxicology Network

A Pesticide Information Project of Cooperative Extension Offices of Cornell University, Michigan State University, Oregon State University, and University of California at Davis. Major support and funding was provided by the USDA/Extension Service/National Agricultural Pesticide Impact Assessment Program.

Pesticide
Information
Profile

Methyl Parathion

TRADE OR OTHER NAMES

Alternate common names are parathion-methyl and and metafos (3). Trade names include Bladan M, Cekumethion, Dalf, Dimethyl Parathion, Devithion, E 601, Folidol-M, Fosferno M50, Gearphos, Kilex Parathion, Metacide, Metaphos, Metron, Nitrox 80, Partron M, Penncap-M, Tekwaisa.

REGULATORY STATUS

Some or all applications of methyl parathion may be classified as Restricted Use Pesticides (RUP) by EPA (3). RUPs may be purchased and used only by certified applicators. Products containing methyl parathion must bear the signal word "Danger" (3). No worker may enter a field treated with methyl parathion within 48 hours of treatment (EPA 1980).

INTRODUCTION

Methyl parathion is an insecticide and acaricide used to control boll weevils and many biting or sucking insect pests of agricultural crops (3). It kills insects by contact, stomach and respiratory action. Methyl parathion is available in dust, emulsifiable concentrate, ULV liquid, microencapsules and wettable powder formulations (3).

Methyl parathion is one of a class of insecticides referred to as organophosphates. These chemicals act by interfering with the activities of cholinesterase, an enzyme that is essential for the proper working of the nervous systems of humans, animals and insects. Please refer to the Toxicology Information Brief on cholinesterase-inhibition for a more detailed description of this topic.

TOXICOLOGICAL EFFECTS

ACUTE TOXICITY

Methyl parathion is highly toxic by inhalation and ingestion, and moderately toxic by dermal adsorption (9). As with all organophosphates, methyl parathion is readily absorbed through the skin. Skin which has come in contact with this material should be washed immediately with soap and water and all contaminated clothing should be removed. Accidental skin and inhalation exposure to methyl parathion have caused human fatalities. Methyl parathion may cause contact burns to the skin or eyes (13).

Because methyl parathion has a short half-life (1 hour on cotton) when applied to crops, the risk of exposure to agricultural workers is low. Factory workers who handle quantities of concentrated methyl parathion are at a higher risk (2). Exposure may occur during mixing, spraying or application of methyl parathion, during cleaning and repair of equipment or during early re-entry into fields (20). Persons with

respiratory ailments. recent exposure to cholinesterase inhibitors. cholinesterase impairment. or liver malfunction are at increased risk from exposure to methyl parathion. High environmental temperatures or exposure of the chemical to visible or UV light may increase its toxicity (9).

Organophosphate insecticides are cholinesterase inhibitors. They are highly toxic by all routes of exposure. When inhaled, the first effects are usually respiratory and may include bloody or runny nose, coughing, chest discomfort, difficult or short breath, and wheezing due to constriction or excess fluid in the bronchial tubes. Skin contact with organophosphates may cause localized sweating and involuntary muscle contractions. Eye contact will cause pain, bleeding, tears, pupil constriction, and blurred vision. Following exposure by any route, other systemic effects may begin within a few minutes or be delayed for up to 12 hours. These may include pallor, nausea, vomiting, diarrhea, abdominal cramps, headache, dizziness, eye pain, blurred vision, constriction or dilation of the eye pupils, tears, salivation, sweating, and confusion. Severe poisoning will affect the central nervous system, producing incoordination, slurred speech, loss of reflexes, weakness, fatigue, involuntary muscle contractions, twitching, tremors of the tongue or eyelids, and eventually paralysis of the body extremities and the respiratory muscles. In severe cases there may also be involuntary defecation or urination, psychosis, irregular heart beats, unconsciousness, convulsions and coma. Death may be caused by respiratory failure or cardiac arrest (9).

Some organophosphates may cause delayed symptoms beginning 1 to 4 weeks after an acute exposure which may or may not have produced immediate symptoms. In such cases, numbness, tingling, weakness and cramping may appear in the lower limbs and progress to incoordination and paralysis. Improvement may occur over months or years, but some residual impairment will remain (9).

The amount of a chemical that is lethal to one-half (50%) of experimental animals fed the material is referred to as its acute oral lethal dose fifty, or LD50. The oral LD50 for methyl parathion in rats is 18 to 50 mg/kg, in mice is 14.5 to 19.5 mg/kg, in rabbits is 420 mg/kg, in guinea pigs is 1270 mg/kg, and in dogs is 90 mg/kg (2, 3, 9). The dermal LD50 in rats is 63 to 491 mg/kg, in mice is 1200 mg/kg, and in rabbits is 300 mg/kg (3, 9).

Lethal concentration fifty, or LC50, is that concentration of a chemical in air or water that kills half of the experimental animals exposed to it for a set time period. The 4-hour inhalation LC50 for methyl parathion in rats is 34 mg/m³, and in mice is 120 mg/m³ (9).

CHRONIC TOXICITY

Repeated or prolonged exposure to organophosphates may result in the same effects as acute exposure including the delayed symptoms. Other effects reported in workers repeatedly exposed include impaired memory and concentration, disorientation, severe depressions, irritability, confusion, headache, speech difficulties, delayed reaction times, nightmares, sleepwalking and drowsiness or insomnia. An influenza-like condition with headache, nausea, weakness, loss of appetite, and malaise has also been reported (9).

Studies with human volunteers have found that 1 to 22 mg/person/day have no effect on cholinesterase activity. In a 4-week study of volunteers given 22, 24, 26, 28 or 30 mg/person/day, mild cholinesterase inhibition appeared in some individuals in the 24, 26 and 28 mg dosage groups. In the 30 mg/person/day (about 0.43 mg/kg/day) group, red blood cholinesterase activity was depressed by 37%. When methyl parathion was fed to dogs for 12 weeks, a dietary level of 1.25 mg/kg soon caused a significant depression of red blood cell and plasma cholinesterase. A dietary level of 0.125 mg/kg produced no effects (2).

The EPA has established a Lifetime Health Advisory (LHA) level of 60 micrograms per liter (ug/l) for 4-nitrophenol, a breakdown product of methyl parathion, in drinking water. This means that EPA believes that water containing 4-nitrophenol at or below this level is acceptable for drinking every day for the course of one's lifetime, and does not pose any health concerns. However, consumption of 4-nitrophenol at high levels well above the LHA level over a long period of time has been shown to cause adverse health effects, including damage to the liver, respiratory stress, and inflammation of the

stomach in animal studies (11).

Reproductive Effects

3-generation study with rats fed dietary levels of 0, 0.5, or 1.5 mg/kg/day, there was reduced weanling survival, reduced weanling weights, and an increase in the number of stillbirths at the 1.5 mg/kg. Some of these effects also occurred at the 0.5 mg/kg dosage level. In rats and mice, a single injection of LD50 rates during pregnancy caused suppression of fetal growth and bone formation in the offspring that survived. These injections also caused high fetal mortality. The rats had been injected with 25 mg/kg on day 12 of pregnancy, and the mice were injected with 60 mg/kg on day 10. In another study, there were no adverse effects observed in the offspring of rats given oral doses of 4 or 6 mg/kg on day 9 or 15 of pregnancy (2). Once in the bloodstream, methyl parathion may cross the placenta (9). Large doses of methyl parathion injected into pregnant rats and mice reduced litter size and survival of offspring (6).

Teratogenic Effects

Methyl parathion is a possible human teratogen (14).

Mutagenic Effects

No signs of mutagenicity were seen in mice given dosages of 5 to 100 mg/kg, nor in mice fed methyl parathion for 7 weeks (2). No mutagenic changes were seen when cell cultures were grown from factory workers who had been exposed to low levels of methyl parathion for very long periods of time (15, Mut. Res. 103 (1):71-76, 1982). Other research has shown mutations to occur in cells exposed to methyl parathion (Mut. Res. 102 (1):89-102, 1982).

Carcinogenic Effects

Methyl parathion is not a suspected carcinogen (20, 21).

Organ Toxicity

Methyl parathion primarily affects the nervous system through inhibition of cholinesterase, an enzyme required for proper nerve functioning (9).

Consumption of 4-nitrophenol, a breakdown product of methyl parathion, at high levels well above the Lifetime Health Advisory level of 60 ug/l over a long period of time has been shown to cause adverse health effects, including damage to the liver, respiratory stress, and inflammation of the stomach in animal studies (11).

Fate in Humans and Animals

Methyl parathion is rapidly absorbed into the bloodstream through all normal routes of exposure. Following administration of a single oral dose, the highest concentration of methyl parathion in body tissues occurred within 1 to 2 hours (2). Metabolism occurs in the liver, eventually to phenols which can be detected in the urine (14). Methyl parathion does not accumulate in the body. It is almost completely excreted through the kidneys (urine) within 24 hours (8).

ECOLOGICAL EFFECTS

Effects on Birds

Number of studies indicate that birds are highly tolerant of the effects of methyl parathion (NRC Drinking Water and Health 1977).

Effects on Aquatic Organisms

Methyl parathion is toxic to fish and to animals which eat fish (8). Other studies, however, indicate that fish kills may be caused by the following series of events. Methyl parathion kills insects and crustaceans (e.g., crayfish) which feed on algae. When these organisms are killed, algal populations rapidly "bloom," consuming all available oxygen in the pond water. It may be the lack of oxygen which kills fish (Ecotoxicol. Environ. Safety 8 (5):482-495, 1984).

Effects on Other Animals (Nontarget species)

Methyl parathion is moderately toxic to mammals such as rats, dogs and rabbits (8).

ENVIRONMENTAL FATE

Methyl parathion is rapidly metabolized by both plants and animals and it is not expected to persist or bioconcentrate (7).

Breakdown of Chemical in Soil and Groundwater

In most situations, methyl parathion adsorbs to soil particles and degrades rapidly. It is therefore unlikely to contaminate groundwater (3, 4, 7) and has rarely been detected in groundwater outside of areas where it is used on farms. It has been detected in the groundwater of Mississippi at 8 ppb (12). When it is applied as an insecticide, methyl parathion breaks down within several months, primarily by photolysis and biodegradation. The rate of degradation increases with temperature and with exposure to sunlight. Its biodegradation half-life in soil is 10 days to 2 months. Degradation was faster in flooded soils than in non-flooded soils. Mineralization may occur, especially in moist soils. Some volatilization of applied methyl parathion may occur. When large concentrations of methyl parathion reach the soil, as in an accidental spill, degradation will occur only after many years, with photolysis being the dominant process (7). It is unlikely that methyl parathion will run-off into surface waters (J. Environ. Qual. 9:665-672, 1980). 4-Nitrophenol is an insecticide and a break down product of methyl parathion. It may have been detected at very low levels by EPA during a national survey of drinking water wells. EPA is uncertain and cannot quantify the amount or frequency of 4-nitrophenol in drinking water wells, because the tests used to detect the presence of 4-nitrophenol are not reliable for measuring concentrations of this material in water. However, 4-nitrophenol does not adsorb to soil particles and may contaminate groundwater (11).

Breakdown of Chemical in Water

Methyl parathion degrades rapidly in seawater, lake, and river waters, with 100% degradation occurring within 2 weeks to 1 month or more. Degradation is faster in the presence of sediments, and is faster in fresh water than in salt water. Mineralization occurs at a rate of 5 to 11% in 4 days in rivers, and more slowly in marine waters. In water, methyl parathion is subject to photolysis, with a half-life of 8 days during the summer and 38 days in winter (7).

Breakdown of Chemical in Vegetation

Uptake and metabolism of methyl parathion in plants is fairly rapid. Four days after applying methyl parathion to the leaves of corn, it was almost completely metabolized (7).

PHYSICAL PROPERTIES AND GUIDELINES

Pure methyl parathion is a white crystalline solid with a characteristic odor of rotten eggs or garlic. The technical product is light to dark tan with about 80% purity (2). Methyl parathion is hydrolyzed by, and is therefore not compatible with, alkaline materials. It may react with strong oxidizers. Methyl parathion should not be heated above 55 degrees C. It decomposes rapidly above 100 degrees C, creating an explosion hazard. Thermal decomposition may release toxic fumes of dimethyl sulfide, sulfur dioxide.

explosion hazard. Thermal decomposition may release toxic fumes of dimethyl sulfide, sulfur dioxide, carbon monoxide, carbon dioxide, phosphorus pentoxide, and nitrogen oxides (3, 9).

The National Fire Protection Agency ratings for methyl parathion include:

A. health: 4 = a few whiffs of the fumes could prove fatal; normal fire fighting gear is inadequate to protect against any exposure to the skin.

B. flammability: 1 = solids which must be preheated to burn; 3 = liquids which when burning can not be extinguished with water (in fact water may be dangerous to use). Dusts may create flash fires.

C. reactivity: 2 = normally unstable materials which will react violently (with water). Are potentially explosive when mixed with water (18).

Methyl parathion will react violently with oxidizing agents (16). It may explode upon heating. The temperature around containers of methyl parathion should not exceed 25-30 degrees C (75-85 degrees F) (1).

Contaminated clothing is best thrown away. It takes many washings to bring the level of methyl parathion down to non-hazardous levels (Bull. Envir. Contam. Tox. 27:518-523; 29:461-468. 1982).

Exposure Guidelines:

0.2 mg/m³ OSHA TWA (skin) (9)

0.2 mg/m³ ACGIH TWA (skin) (9)

0.2 mg/m³ NIOSH Recommended TWA (skin) (9)

Physical Properties:

CAS #: 298-00-0

Specific gravity: 1.20 - 1.36 at 20 degrees C (2, 3)

H₂O solubility: 55 - 60 mg/l at 20 degrees C (3)

Solubility in other solvents: Soluble in dichloromethane, 2-propanol, toluene, and most organic solvents.

Slightly soluble in aliphatic hydrocarbons, and in light petroleum and mineral oils. Nearly insoluble in n-hexane (2, 3, 9).

Melting point: 35 - 36 degrees C (97 degrees F) (3, 9)

Boiling point: 143 degrees C (7); 228 degrees F (109 degrees C) at 0.05 mm Hg (9)

Decomposition temperature: 100 degrees C (9)

Flashpoint: 42 degrees C (3)

Vapor pressure: 0.97 x 10 to the minus 5 mm Hg at 20 degrees C (2)

Koc: 5100 g/ml (4)

Chemical Class/Use: Organophosphate insecticide

BASIC MANUFACTURER

Chemnova Agro A/S

Box 9

7620 Lemvig Denmark

Telephone: 45-9-783-4100

Review by Basic Manufacturer:

Comments solicited: October, 1992

Comments received: January, 1994

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EPA Region 4 Press Releases for the Week of May 19, 1997

- [New Guidelines For Responding to Methyl Parathion Contamination to be Used for Relocation Decisions](#)

NEW GUIDELINES FOR RESPONDING TO METHYL PARATHION CONTAMINATION TO BE USED FOR RELOCATION DECISIONS

The U.S. Environmental Protection Agency (EPA) announced today that a new protocol will be used to determine whether to temporarily relocate people whose homes have been illegally sprayed with the pesticide methyl parathion.

Since EPA's initial response to the misapplication of methyl parathion in Lorain County, Ohio, the environmental criteria developed by EPA Region 5 (Chicago) has been used for relocation and cleanup to ensure protection of public health. However, after a very thorough reevaluation of the Lorain Protocol, the Methyl Parathion Health Sciences Steering Committee, including toxicologists, medical doctors, and other health professionals from EPA, the Agency for Toxic Substances and Disease Registry, and the State Health Departments of Illinois, Louisiana, Mississippi, and Tennessee, has developed a protocol that more accurately determines exposure to methyl parathion.

The scientific relationship between environmental levels of the pesticide and urine levels as found in Lorain, Ohio were not found to exist in other geographic locations due to site specific differences. The differences included spray technique, house construction, and climate factor. The Steering Committee concluded that in the absence of such site specific correlations, urine levels will become the prime determinant for temporary relocation.

The new protocol is effective immediately and will be the basis for decisions regarding Superfund-financed temporary relocation of persons from contaminated homes and businesses. The new protocol will not apply to families who have already been relocated. But residents whose homes were sprayed and were not relocated will be reevaluated using the new protocol. Some residents may not be moved out of their homes but may be asked to submit periodic urine samples to monitor exposure.

In addition to urine testing by the Mississippi Department of Health (MSDH), EPA will continue to use environmental (wipe) sampling to identify people most acutely affected by methyl parathion poisoning.

Residents interested in obtaining additional information are encouraged to contact the Community Coordination Center in Jackson County at 601/762-1202 or in Hattiesburg at 601/554-0600.

-0- May 20, 1997

CONTACT:

Carl Terry, EPA Press Office. 404-562-8325
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For additional information contact EPA Region 4, Public Affairs at 404-562-8327

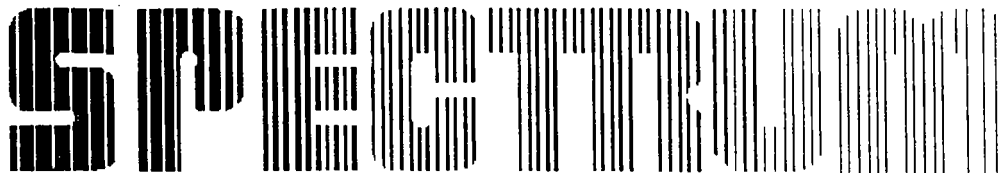
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Revised May 21, 1997

URL:<http://www.epa.gov/region4/pr97139.html>



Chemical Fact Sheet

Chemical Abstract Number (CAS #)	298000
Synonyms	Methyl parathion Parathion-methyl Metaphos Phosphorothioic acid, O,O-dimethyl O-(4-nitrophenyl) ester O,O-dimethyl O-p-nitrophenyl phosphorothioate Nitrox-80
Analytical Method	EPA Method 8141A
Molecular Formula	C ₈ H ₁₀ NO ₅ PS
Use	INSECTICIDE USED ON OVER 50 CROPS (PRIMARILY COTTON) & ON SEVERAL ORNAMENTALS IT CONTROLS APHIDS, BOLL WEEVILS, & MITES ESP WELL, ALTHOUGH ITS SPECTRUM FOR CONTROL OF INSECTS IS NEARLY AS BROAD AS PARATHION. RECOMMENDED AS BROAD SPECTRUM INSECTICIDE FOR RICE, FRUIT, & VEGETABLES. EMULSIONS OR DUSTS FOR CONTROLLING PLANT LICE, THRIPS, & BUGS
Consumption Patterns	83% FOR COTTON; 8% FOR SOYBEANS; 2% FOR WHEAT; 5% FOR OTHER GRAIN CROPS INCLUDING CORN; 2% FOR ORNAMENTALS AND MISC AGRICULTURAL COMMODITIES INCLUDING TOBACCO, PEANUTS, ALFALFA, ASSORTED VEGETABLES, AND CITRUS FRUITS (1971) Applied to alfalfa, 15.6%; Artichokes, 7.5%; Cotton, 7.8%; Lettuce, 7.9%; Onions, 3%; Rice, 32%; Sugarbeets, 7.4%; Tomatoes, 8.1%; Most of remainder applied to vegetable crops (1984); /California use, calculated from table (1984) 1.04X10 ⁶ g Used in California
Apparent Color	WHITE CRYSTALLINE SOLID OR POWDER ; CRYSTALS FROM COLD METHANOL
Melting Point	37-38 DEG C
Molecular Weight	263.23
Density	1.358 AT 20 DEG C/4 DEG C
Odor Threshold Concentration	0.1328 mg/cu m odor low and high. 1.23X10 ⁻² ppm (detection in water; purity not specified)
Sensitivity Data	Since methyl parathion does not irritate or burn the skin, no warning of skin exposure is likely to occur.
Environmental Impact	Methyl parathion is likely to enter the atmosphere from production of the pesticide, or its application as an insecticide. It should degrade in soil and water over the course of several months primarily by photolysis and biodegradation. The major exception is for spills, where degradation will occur only after many years. Methyl parathion metabolizes rapidly in plants and animals and is not expected to bioconcentrate in food products. Human exposure is primarily occupational, or from contact with spills; however some intake may result from fruits and vegetables as well as air and water in agricultural areas where methyl parathion is used during the growing season.

Methyl parathion is an important insecticide for agricultural crops, and when used according to its registration -- only in open fields (outdoors)-- methyl parathion breaks down and dissipates quickly. As is the case with many other pesticides, EPA is continuing to review methyl parathion as part of its ongoing reregistration program for older pesticides. The goal of reregistration is to bring the data supporting pesticide registrations first granted before November 1984 up to date with current science and ensure that all pesticide uses meet today's stringent safety standards. EPA may impose additional risk reductions on methyl parathion in the future, if warranted. At this time, the Agency does not believe that the registered uses of the pesticide pose unreasonable risks because it degrades and dissipates when properly applied outdoors to agricultural crops. There are no legal indoor uses of methyl parathion.

8. How can I protect myself from illegal pesticide use?

If you are considering hiring someone to treat your home for a pest problem, see the box on page 2 of this Fact Sheet. If you buy over-the-counter pesticide products to apply yourself, be sure the product is unopened, it is labeled, and it contains an EPA Registration number. Never purchase pesticide products from other than established retail businesses (stores). Use the product according to label directions; always store pesticide products in locked cabinets out of the reach of children and pets; and dispose of pesticide products according to label directions.

9. Where can I go to get more information?

Before using or allowing pesticides to be used in or around your home, if there are ANY questions or concerns regarding the pesticide products being proposed for use, you should contact the County Cooperative Extension Service listed in your telephone book) or a local pesticide dealer.

If you believe that you have experienced adverse health effects from exposure to methyl parathion contact your personal physician promptly, as well as your local Poison Control Center and local and/or State Department of Health.

Additional information can also be obtained from the National Pesticide Telecommunications Network (NPTN). NPTN is a toll-free telephone service that provides pesticide information to anyone called in the United States, Puerto Rico, or the Virgin Islands. This service provides objective, science-based information about a wide variety of pesticide-related subjects including pesticide products, recognition and management of pesticide poisoning, toxicology and environmental chemistry. NPTN is staffed by highly qualified and trained pesticide specialists who have the toxicology and environmental chemistry education and training needed to provide knowledgeable answers to pesticide questions. NPTN operates 7 days a week from 6:30 a.m. to 4:30 p.m. p.s.t/p.d.t. 1-800-858-7378