

LAND PROFILE SERVICES

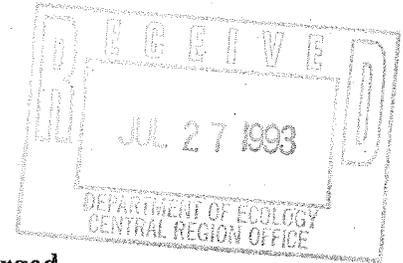
DATE: July 25, 1993
SUBJECT: Site Audit - Petroleum Contaminated Soil

Niels J. Brown, Personal Representative
Art Leyendekker Estate
c/o Hart and Winfree
P. O. Box 210
Sunnyside, WA 98944

REPORT NO.: 93-097
STUDY DATE: May 11, 1993

PROJECT: KELLOGGS KORNER

SUMMARY:



Water potentially contaminated with gasoline was discharged at three (3) locations. Soil samples were taken and analyzed. Contamination was not detected.

PURPOSE:

The estate of Art Leyendekker owns property, Kelloggs Korner, which required underground storage tank removal. During removal, potential contamination of soil off site occurred at three locations known to Darrell Downing. Washington Department of Ecology requires a site assessment for petroleum contaminated soil related to activities at Kelloggs Korner. This report serves to meet this requirement.

METHODS:

Site Identification. Sites were visited on May 11, 1993 by Philip Small, Jeff Wertenberger, Darrell Downing and John Wietfield. Figure 1 depicts relative locations on an area map. Points of discharge were identified to the sampling team by Darrell Downing and in the presence of John Wietfield, Washington Department of Ecology. Site specific sampling approach was discussed at each site.

Sampling. Sampling was performed by Philip Small assisted by Jeff Wertenberger, Land Profile Services. Sampling equipment was decontaminated immediately prior to sampling using laboratory cleanser and rinsed with distilled water. Soils within six (6) inches of the surface were discarded prior to removing samples. Soil samples were removed using a 0.75 inch (I.D.) stainless steel soil probe. Sample depth was 18 inches at the open ground site and varied at the lagoon bank site.

Sample Handling. Samples were placed in glass containers provided by Lauck's Testing Labs. Containers were filled to capacity (4 fluid ounces), sealed with aluminum foil, capped and placed on gel ice in a Styrofoam container. Samples were refrigerated overnight and delivered into the custody of TR Applied Science, Yakima, for subsequent analysis by Lauck's Testing Labs.

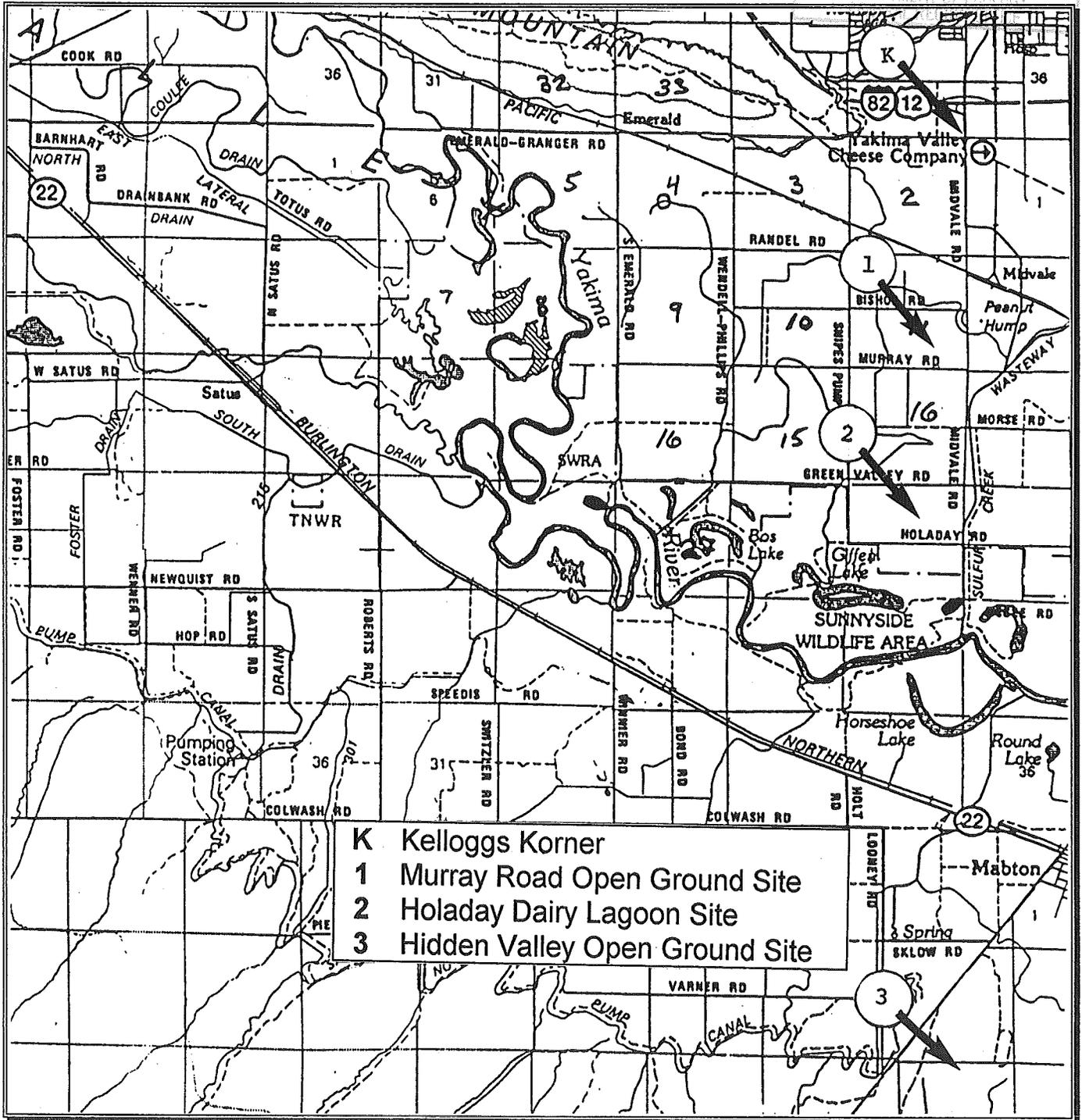
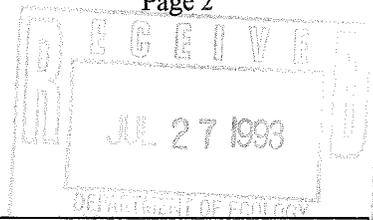
Laboratory Analysis. WTPH-G / BTEX analysis was requested. Analysis was performed by Lauck's Testing Laboratories, Inc., Seattle, WA.

Kelloggs Korner Project

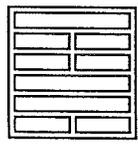
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Page 2

Figure 1: Sample Site Locations
Study conducted May 11, 1993



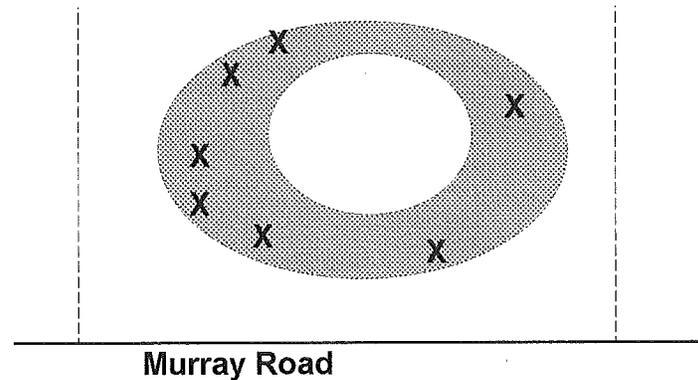
- K Kelloggs Korner
- 1 Murray Road Open Ground Site
- 2 Holaday Dairy Lagoon Site
- 3 Hidden Valley Open Ground Site



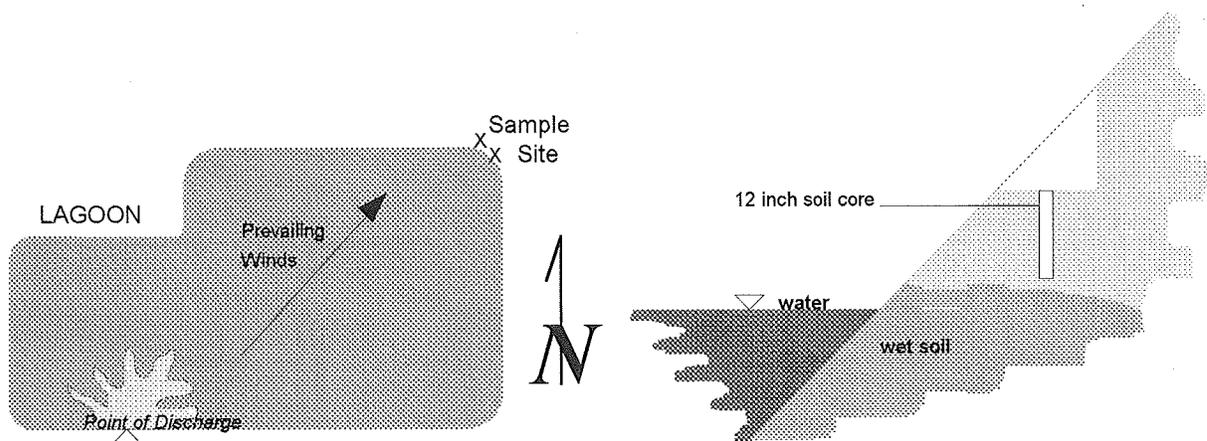
LAND PROFILE SERVICES

SITE CONDITIONS:

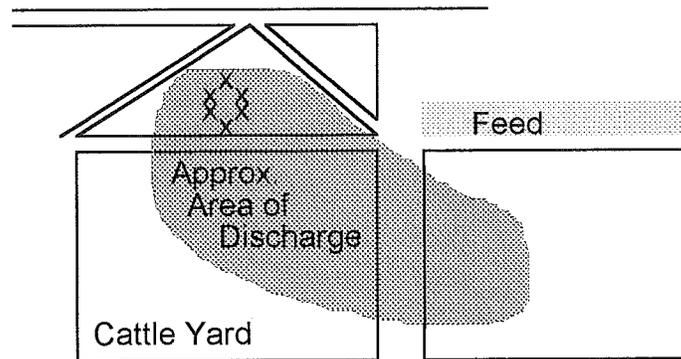
Site 1: Murray Road. The Murray Road site is closest (2¼ miles) to Kelloggs Korner. Current use is fallow open cropland and appears to have remained so for at least 10 years. Darrell Downing represented it as receiving the largest volume of water, estimating that twelve to fifteen of the total sixteen to nineteen loads were delivered to this field. Water was discharged while the truck travelled in an oval path between the east and west boundaries of the field. Murray road bounds the field on the south. Within the south portion of the field most likely to have received discharge, areas of surface disturbance consistent with a past discharge of water were observed. Sampling was biased towards these areas. A total of seven cores were taken. Soil was dry and sandy.



Site 2: Holaday Road Site. The Holaday Road site is a dairy lagoon located at 1741 Holaday Road. Only one load was delivered to this location. It was introduced into the lagoon just east of the southwest corner. Soil samples were taken from the northeast corner of the lagoon where prevailing winds would most likely have concentrated gasoline contamination. Two core samples were taken. Cores were taken about two feet back from the water's edge. This allowed for removal of the top six inches and extracting a twelve inch core of unsaturated soil. Soil was very moist and silty. Sampling location and core configuration are shown below.



Site 3: Hidden Valley. The Hidden Valley site is the most distant (8 miles) and has been altered since the discharges were made. Darrell Downing could identify the bounds of the discharge in only general terms, but it appeared that almost all of it is now covered by cattle yard. One small area north of the west cattle yard was believed to have received some discharge and was subsequently selected for sampling. It is a grassy area. Unlike the Murray Road site, there is no evidence of water discharges. Soils were taken from a depth of six to eighteen inches. Six core samples were taken.



DATA (see attached):

CONCLUSION:

Evidence of gasoline contamination was not apparent. No further testing or action is recommended at these sites.

LIMITATIONS:

This report has been prepared based upon limited knowledge of conditions at the sites studied and their adjacent areas. Conditions reported are representative of conditions at the specified site and on the specific dates on which they were observed. Land use, site conditions or other factors may change over time. Should conditions change or new information become available, Land Profile Services reserves the right to amend judgments presented in this report.

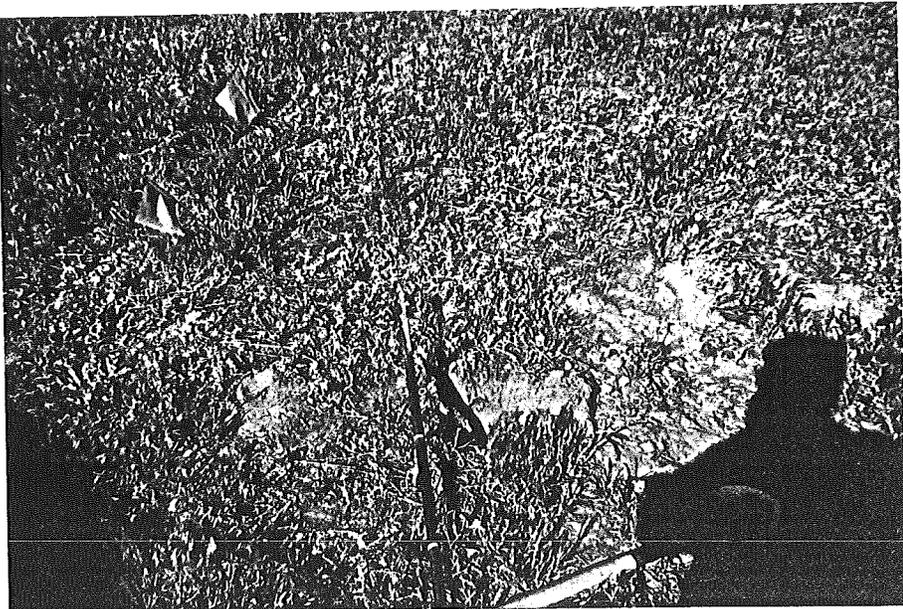
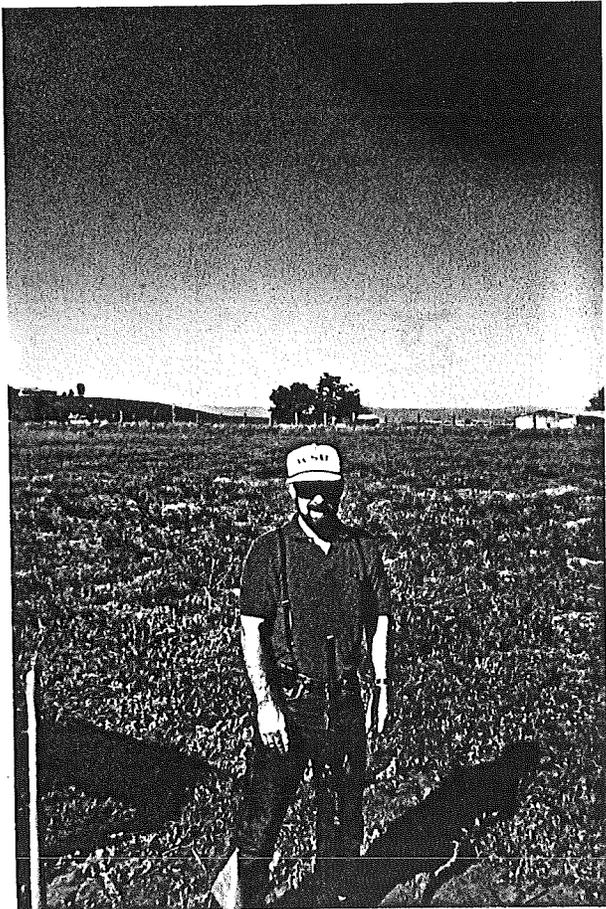
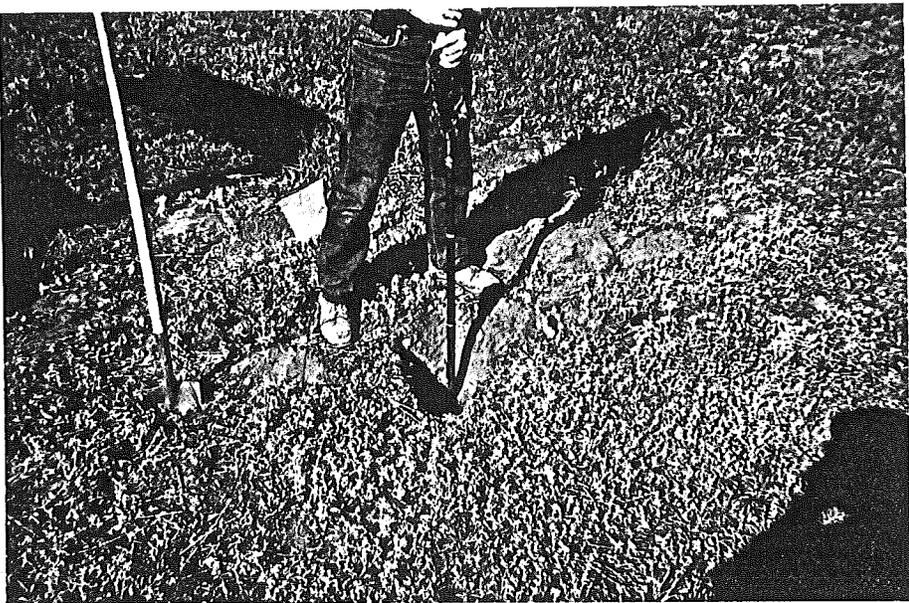
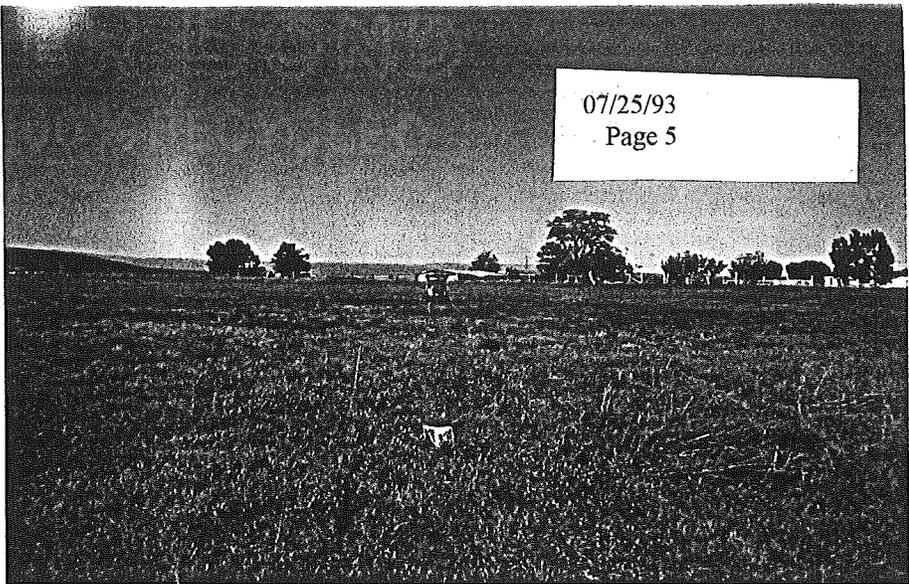
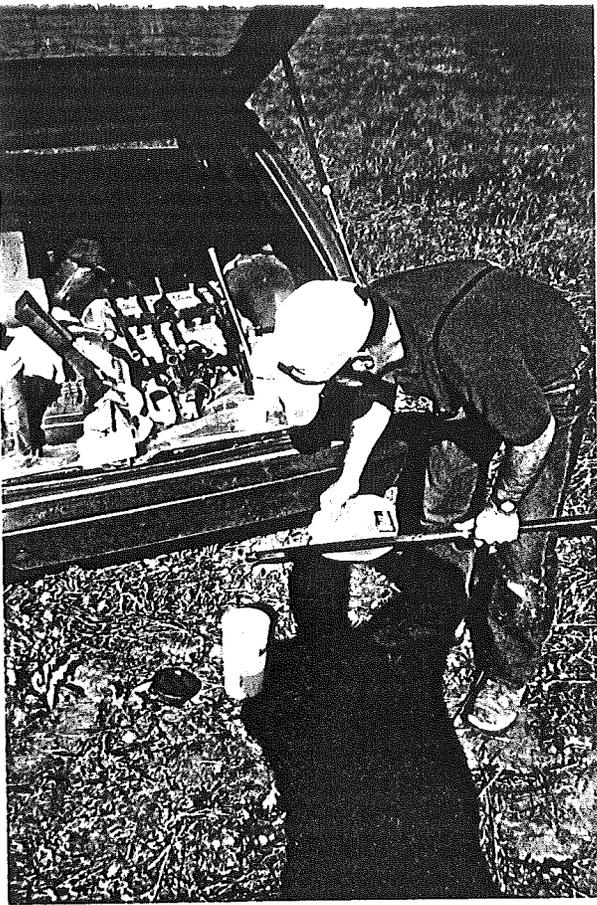
This report is presented without warranty, express or implied, except that the services associated with this report are rendered by Land Profile Services in good faith and according to the standards generally practiced by professional soil scientists.

Respectfully submitted,

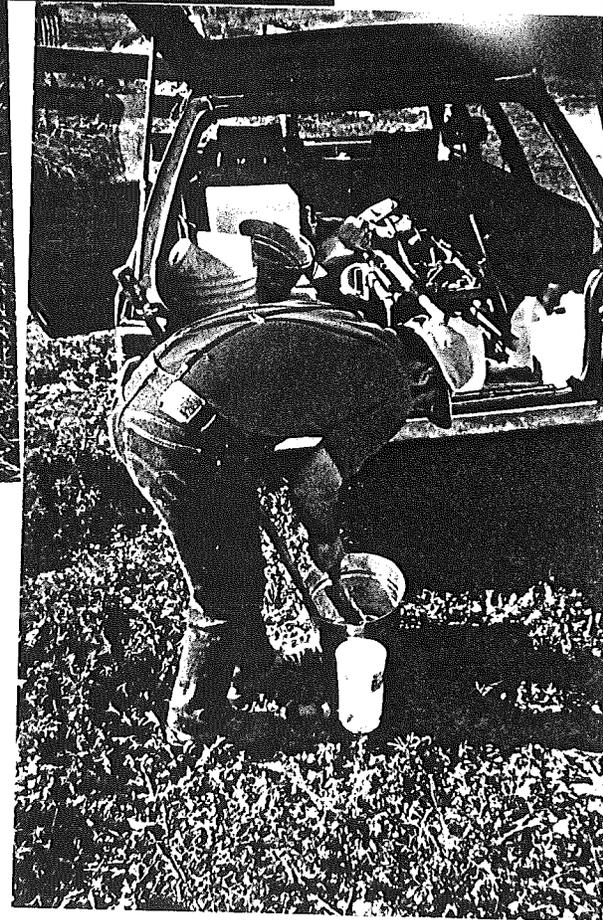
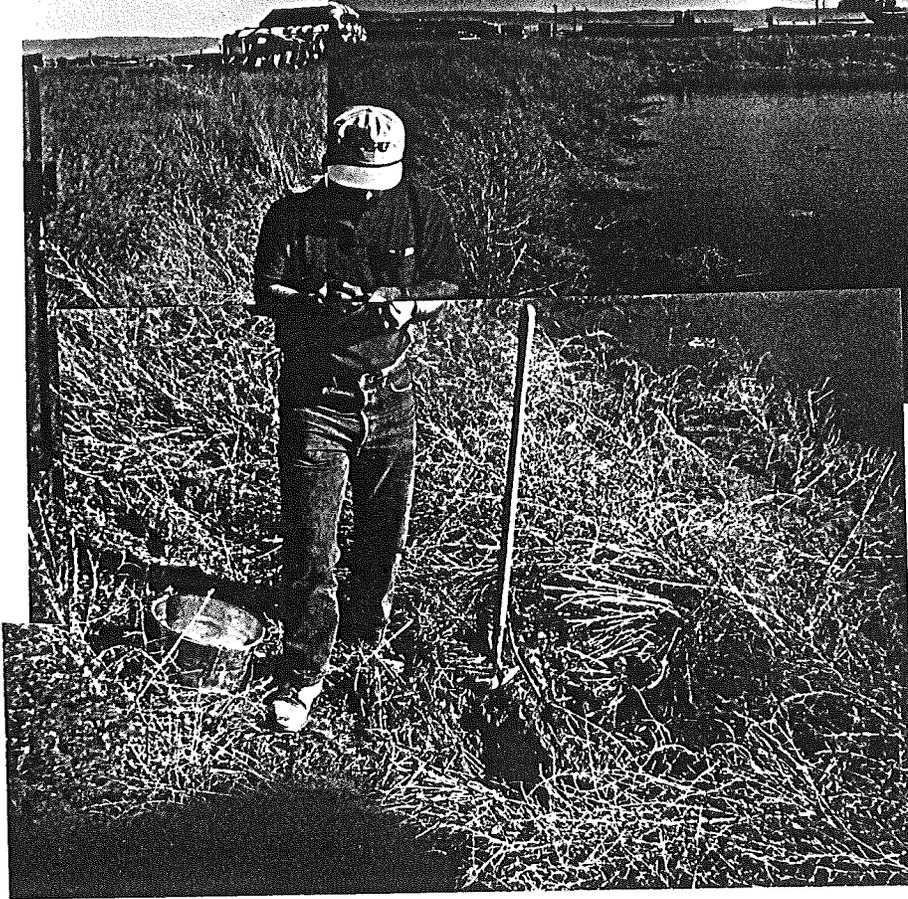


Philip Small, R.P.S.S.
Principal Soil Scientist
Washington State (UST Program) Registered Site Assessor

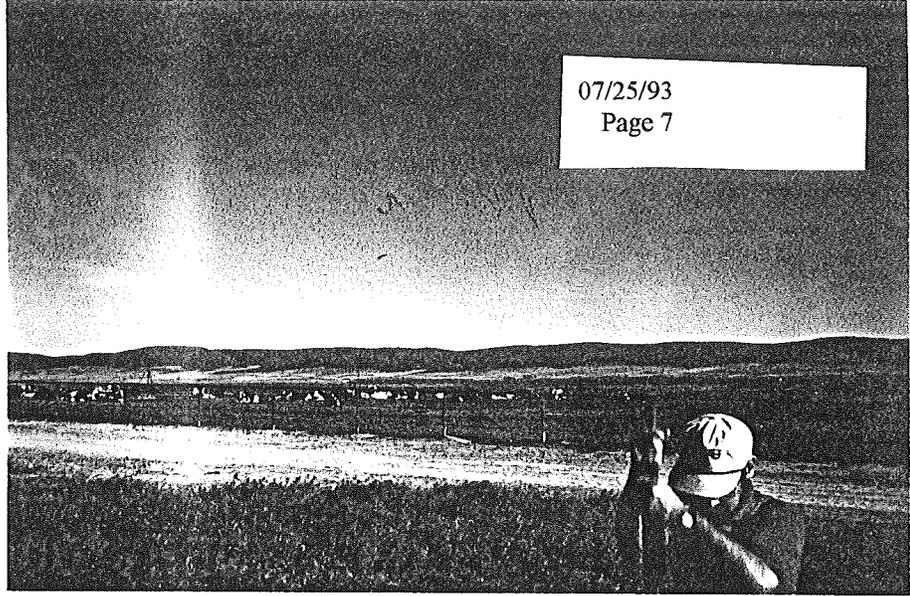
cc. John Wietfeld, WDOE



Photographs: Murray Road Site (May 11, 1993)



Photographs: Holaday Road (Lagoon) Site (May 11, 1993)



Photographs: Hidden Valley Site (May 11, 1993)

Laucks ⁸⁵ years

Testing Laboratories, Inc.

940 South Harney St., Seattle, WA 98108 (206) 767-5060 FAX 767-5063

Chemistry, Microbiology, and Technical Services

CLIENT: T.R. Applied Science, Inc.
1106 Ledwich
Yakima, WA 98902

Certificate of Analysis

Work Order# : 93-05-584
DATE RECEIVED : 05/14/93
DATE OF REPORT: 05/27/93

ATTN : Tamis Root

Work ID : Kellogs Korner/T305066
Taken By : Client
Transported by: Laucks
Type : Soil

SAMPLE IDENTIFICATION:

	Sample Description	Collection Date
01	#1 Murry Rd.	05/11/93 04:50
02	#2 Holiday Rd.	05/11/93 05:45
03	#3 Hidden Valley	05/11/93 06:30

FLAGGING:

The flag "U" indicates the analyte of interest was not detected, to the limit of detection indicated.

ATTACHMENTS:

Following presentation of sample results, the following appendices are attached to this report:

Appendix A: Method Blank and Surrogate Recoveries Report
Appendix B: MS/Dup and Duplicate Report
Appendix C: Chain-of-Custody



This report is submitted for the exclusive use of the person, partnership, or corporation to whom it is addressed. Subsequent use of the name of this company or any member of its staff in connection with the advertising or sale of any product or process will be granted only on contract. This company accepts no responsibility except for the due performance of inspection and/or analysis in good faith and according to the rules of the trade and of science.

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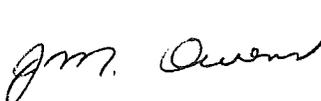
CLIENT : T.R. Applied Science, Inc.

Certificate of Analysis

Work Order# : 93-05-584

Unless otherwise instructed all samples will be discarded on 07/12/93

Respectfully submitted,
Laucks Testing Laboratories, Inc.


J. M. Owens



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CLIENT : T.R. Applied Science, Inc.

Certificate of Analysis

Work Order # 93-05-584

TESTS PERFORMED AND RESULTS:

Analyte	Units	<u>01</u>	<u>02</u>	<u>03</u>
Total Solids	%	93.9	78.9	96.0



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Chemistry, Microbiology, and Technical Services

Lab Sample ID : 9305584-01
Client Sample ID: #1 Murry Rd.

Date Collected: 05/11/93
Date Received : 05/14/93

----- WTPH-G -----

Preparation Date: 05/19/93
Analysis Date : 05/19/93

GC Method: Purge and trap GC

	Result	SDL
Gasoline Range.....	5.3 U	5.3 mg/kg DB
Benzene.....	0.11 U	0.11 mg/kg DB
Toluene.....	0.11 U	0.11 mg/kg DB
Total Xylenes.....	0.16 U	0.16 mg/kg DB
Ethyl Benzene.....	0.11 U	0.11 mg/kg DB

Surrogate recoveries	% Rec	LCL	UCL
Trifluorotoluene	51.8	50	150
Bromofluorobenzene	58.8	50	150



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Chemistry, Microbiology, and Technical Services

Lab Sample ID : 9305584-02
Client Sample ID: #2 Holiday Rd.

Date Collected: 05/11/93
Date Received : 05/14/93

----- WTPH-G -----

Preparation Date: 05/19/93
Analysis Date : 05/19/93

GC Method: Purge and trap GC

	Result	SDL
Gasoline Range.....	6.2 U	6.2 mg/kg DB
Benzene.....	0.12 U	0.12 mg/kg DB
Toluene.....	0.12 U	0.12 mg/kg DB
Total Xylenes.....	0.19 U	0.19 mg/kg DB
Ethyl Benzene.....	0.12 U	0.12 mg/kg DB

Surrogate recoveries	% Rec	LCL	UCL
Trifluorotoluene	79.0	50	150
Bromofluorobenzene	82.5	50	150



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Laucks ⁸⁵ years

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Chemistry, Microbiology, and Technical Services

Lab Sample ID : 9305584-03
Client Sample ID: #3 Hidden Valley

Date Collected: 05/11/93
Date Received : 05/14/93

----- WTPH-G -----

Preparation Date: 05/19/93
Analysis Date : 05/19/93

GC Method: Purge and trap GC

	Result	SDL
Gasoline Range.....	5.3 U	5.3 mg/kg DB
Benzene.....	0.11 U	0.11 mg/kg DB
Toluene.....	0.11 U	0.11 mg/kg DB
Total Xylenes.....	0.16 U	0.16 mg/kg DB
Ethyl Benzene.....	0.11 U	0.11 mg/kg DB

Surrogate recoveries	% Rec	LCL	UCL
Trifluorotoluene	103	50	150
Bromofluorobenzene	107	50	150



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Laucks ⁸⁴_{years}

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APPENDIX A

Method Blank and Method Blank Surrogate Recoveries Report



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Quality Control Report Method Blanks for Work Order 9305584

<u>Blank Name</u>	<u>Samples Verified</u>	<u>Test Description</u>	<u>Result</u>	<u>Units</u>	<u>Control Limit</u>
B051993_GVO_ST2	1-3	Gasoline range, as gasoline	5.0 U	mg/kg	5.0
		Benzene	0.10 U		0.10
		Toluene	0.10 U		0.10
		Total xylenes	0.15 U		0.15
		Ethylbenzene	0.10 U		0.10

A method blank can validate more than one analyte on more than one work order. The method blanks in this report may validate analytes not determined on this work order, but nonetheless determined in the associated blank.

Because they validate more than one work order, method blank results are not always reported in the same concentration units used for sample results.

* = blank exceeds control limit



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Chemistry, Microbiology, and Technical Services

Quality Control Report
Multi-Component Method Blanks
Surrogate Recoveries for Work Order 9305584

<u>Blank Name</u>	<u>Test Description</u>	<u>Surrogate Compound</u>	<u>Recov</u>	<u>LCL</u>	<u>UCL</u>
B051993_GVO_ST2	WTPH gas in soil	Trifluorotoluene	117	50	150
		Bromofluorobenzene	120	50	150

* = Recovery exceeds control limit

Recov = Percent recovery of surrogate compound

LCL = Lower Control Limit

UCL = Upper Control Limit



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APPENDIX B

MS/Dup and Duplicate Report



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Chemistry, Microbiology, and Technical Services

Quality Control Report
Matrix Spike/Duplicate Report for Work Order 9305584

MS/Dupe Name	Sample Fractions Verified	Sample	Analyte	RPD	MS	Cont. Limits		
					Recov	RPD	LCL	LCL
M051993_GVOST2	1-3	9305413-01	Gasoline range, as gasoline	0.7	L 106	25	20	160

* = Value Exceeds Control Limit
 RPD = Relative Percent Difference
 LCL = Lower Control Limit
 UCL = Upper Control Limit
 L = RPD control limit for this analyte is 5x the detection limit. The value appearing in the RPD column is the absolute difference of the duplicates.
 -1 for recovery value indicates that recovery could not be calculated

An MS/Duplicate pair can validate the results for more than one work order. For this reason, results for analytes not requested on this work order may appear in this MS/Duplicate report.



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Quality Control Report Duplicate Report for Work Order 9305584

<u>Duplicate Name</u>	<u>Sample Fractions Verified</u>	<u>Sample</u>	<u>Analyte</u>	<u>RPD</u>	<u>Limit</u>
D052493_TSS01	1-3	9305584-03	Total Solids	0.21	30

* = Value Exceeds Control Limit

RPD = Relative Percent Difference

L = RPD control limit for this analyte is 5x the detection limit. The value appearing in the RPD column is the absolute difference of the duplicates.

-1 for recovery value indicates that recovery could not be calculated

A duplicate pair can validate the results for more than one work order. For this reason, results for analytes not requested on this work order may appear in this duplicate report.



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APPENDIX C

Chain-of-Custody



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