CON: 12-15
Doc # 23460

Paul Property Lead Site
Soil Investigation
Sampling Results

Montgomery, Iowa

September 28, 2001

Iowa Department of Natural Resources

Prepared By

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Environmental Specialist Senior
Contaminated Sites Section

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1. INTRODUCTION

Field Office 4 and the Contaminated Sites Section of the Iowa Department of Natural Resources (Department) conducted a soil investigation at the Paul Property in Montgomery County, Iowa on September 28, 2001. The purpose of this investigation was to collect information concerning conditions at the property to assess the potential threat posed to human health and the environment, and to determine the need for other appropriate action.

2. SITE DESCRIPTION

2.1 Location

The Paul Property is located in Montgomery County, Iowa in Scott Township (NW ¼ of NE ¼ of Section 12 of Township 71 North, Range 37 West)

2.2 Site Description

The property consist of approximately 30 acres which about two thirds is woodlands and the other one third is grasslands with a very small perennial stream (tile drainage?) bisecting the site from the Northwest to the South. The stream drains directly into Viking lake approximately 1,000 feet down stream of the shooting range area. The property is bordered to the East and South by Viking Lake State Park, to the West by private property, to the Northeast by a small housing development, and to the Northwest by the Izaak Walton League's shooting range.

2.3 Local Geology

The site is located on the Southern Iowa Drift Plains consisting of wind blown loess on top of Pre-Illinoian glacial drift deposits on top of inter-till sands and gravel on Pennsylvanian bedrock. The surface elevation is approximately 1,100 feet above sea level at the stream bed to 1240 feet on top of the bluff 350 feet to the south. The Pennsylvanian Bedrock is found at approximately 1060 feet above sea level.

The shooting range is to the north with a small rise in the surface elevation.

2.4 Operational History and Waste Characteristics

The Paul property is rural agricultural land with no previous history of industrial usage. The Izaak Walton League property has been a shooting range for many years and was agricultural land prior to that.

Health Effects Summary
Acute: Lead can cause a variety of adverse health effects in humans. At relatively low levels of exposure, these effects may include interference with red blood cell chemistry, delays in normal physical and mental development in babies and young children, slight deficits in the attention span, hearing, and learning abilities of children, and slight increases in the blood pressure of some adults. It appears that some of these effects, particularly changes in the levels of certain blood enzymes and in aspects of children's neurobehavioral development, may occur at blood lead levels so low as to be essentially without a threshold.

Chronic: Chronic exposure to lead has been linked to cerebrovascular and kidney disease in humans.

Cancer: Lead has the potential to cause cancer from a lifetime exposure at levels above the action level.

Environmental Fate
Lead may enter the environment during its mining, ore processing, smelting, refining use, recycling or disposal. The initial means of entry is via the atmosphere. Lead may also enter the atmosphere from the weathering of soil and volcanoes, but these sources are minor compared with anthropogenic ones. Lead will be retained in the upper 2-5 cm of soil, especially soils with at least 5% organic matter or a pH 5 or above. Leaching is not important under normal conditions. It is expected to slowly undergo speciation to the more insoluble sulfate, sulfide, oxide, and phosphate salts.

3. COLLECTION OF NON-SAMPLING DATA

Non-sampling data was collected from the site and included a interview with Mr. Paul, site walkthrough, collection of maps and other data sources, etc.

4. SAMPLING ACTIVITIES

4.1 Source Sampling

The Izaak Walton League is the source of the majority of the lead on the Paul Property but no samples were collect from their site.

4.2 Groundwater Sampling

Groundwater was not sampled during the site visit.

4.3 Surface Water Sampling

Surface water was not sampled during the site visit.

4.4 Soil Sampling

Six samples were collected from the Paul property to document the lead concentrations at different distances from the shooting range. The first sample was collected 50 feet from the creek channel which was approximately 200 feet from the shotgun range firing line. The next 5 samples were collected in 50 feet intervals in a path leading away from the firing line.

A shovel was used to place a six inch by six inch by six inch cube of soil in a bucket. The soil sample was then blended by hand to homogenize the sample before filling a sample container supplied by the lab.

4.5 Quality Assurance

No duplicate samples were collected during the sampling event.

4.6. Field Activities

Field personnel traveled to the site on September 28, 2001. The Department staff met Mr. Paul at the site and was accompanied by Mr. Paul during the sample collections.

One Call was not utilized to locate underground utilities due to the isolated nature of the site, Mr. Paul's knowledge of the site, and the samples collected were only surface samples .

Field activities were be performed in Level D. Department staff will exit the site if Level-C personal protection or higher is required.

4.7 Quality Control Procedures

All samples were stored in a cooler on ice until they were relinquished to laboratory personnel at the University of Iowa Hygienic Laboratory in Des Moines, Iowa.

5. Conclusions

Visual inspection of the soils showed significant amounts of lead shot from the surface down to approximately three inches at the first and second soil sample locations. At the third location very little shot was noticed and no shot was seen in the last three samples.

The laboratory analyzed the samples using one method but two different procedures. The first procedure (the normal procedure) filtered the sample which eliminated any shot from the sample prior the analyzing it. These results indicate

the level of lead that has already leached into the soils. The second procedure did not filter the sample prior to testing it so the lead shot was accounted for in the results giving an indication of the potential leaching ability of the soil.

The results were as follows:

Sample Number	Filtered Results	Unfiltered Results
L-50 (50 feet from creek)	9,100 mg/kg	60,000 mg/kg
L-100	7,500 mg/kg	71,000 mg/kg
L-150	440 mg/kg	520 mg/kg
L-200	44 mg/kg	63 mg/kg
L-250	83 mg/kg	90 mg/kg
L-300	110 mg/kg	110 mg/kg

Using the filtered result and the 400 mg/kg lead Statewide Soils Standard in the Land Recycling Program the soils are contaminated above the standards out to the L-150 sample or approximately 350 feet from the firing line.

HIGHWAY AND TRANSPORTATION MAP

MONTGOMERY COUNTY

IOWA

Prepared by

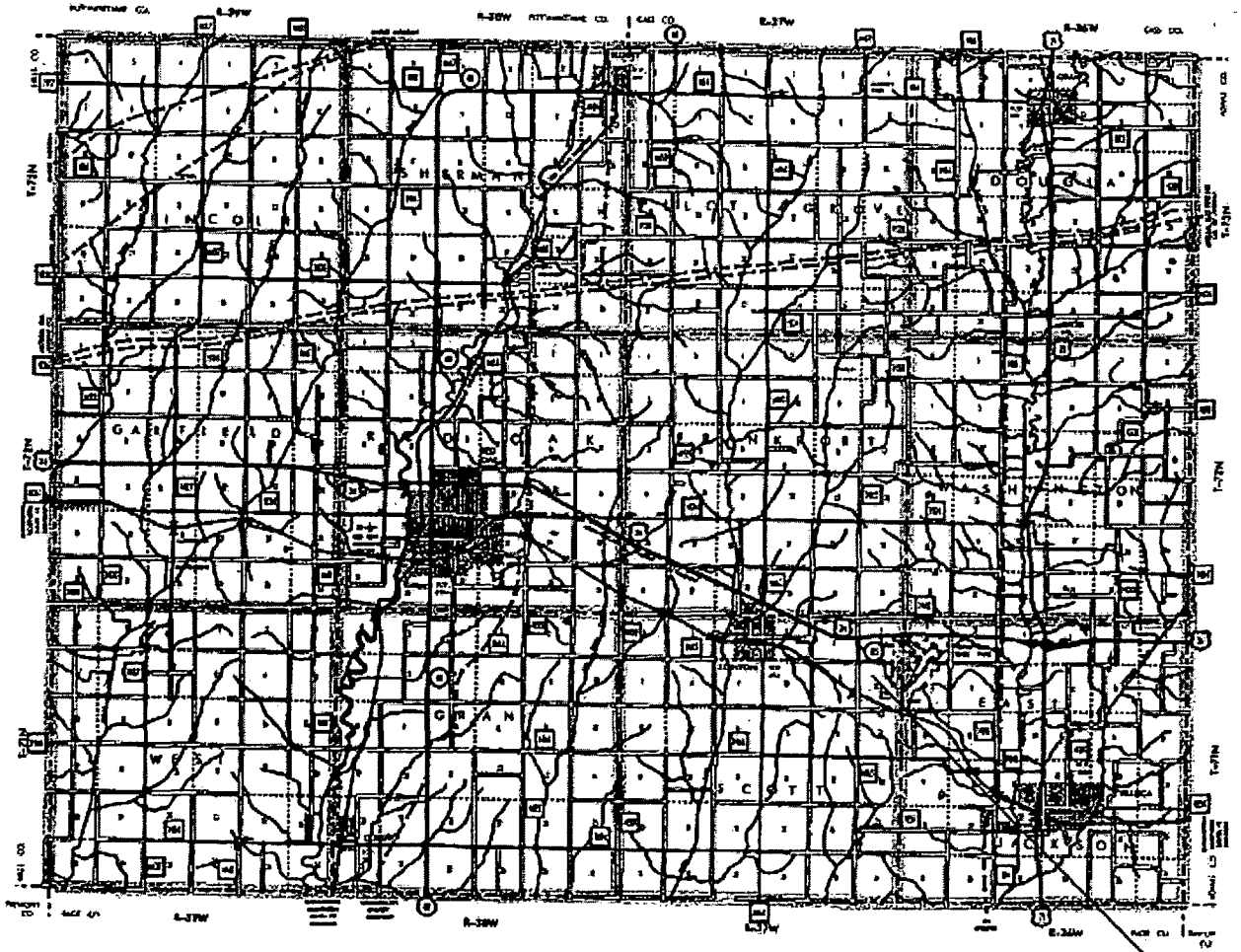
Iowa Department of Transportation

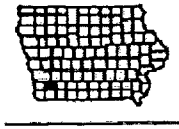
[illegible]

United States Department of Transportation

JANUARY 1, 2000

LEGEND





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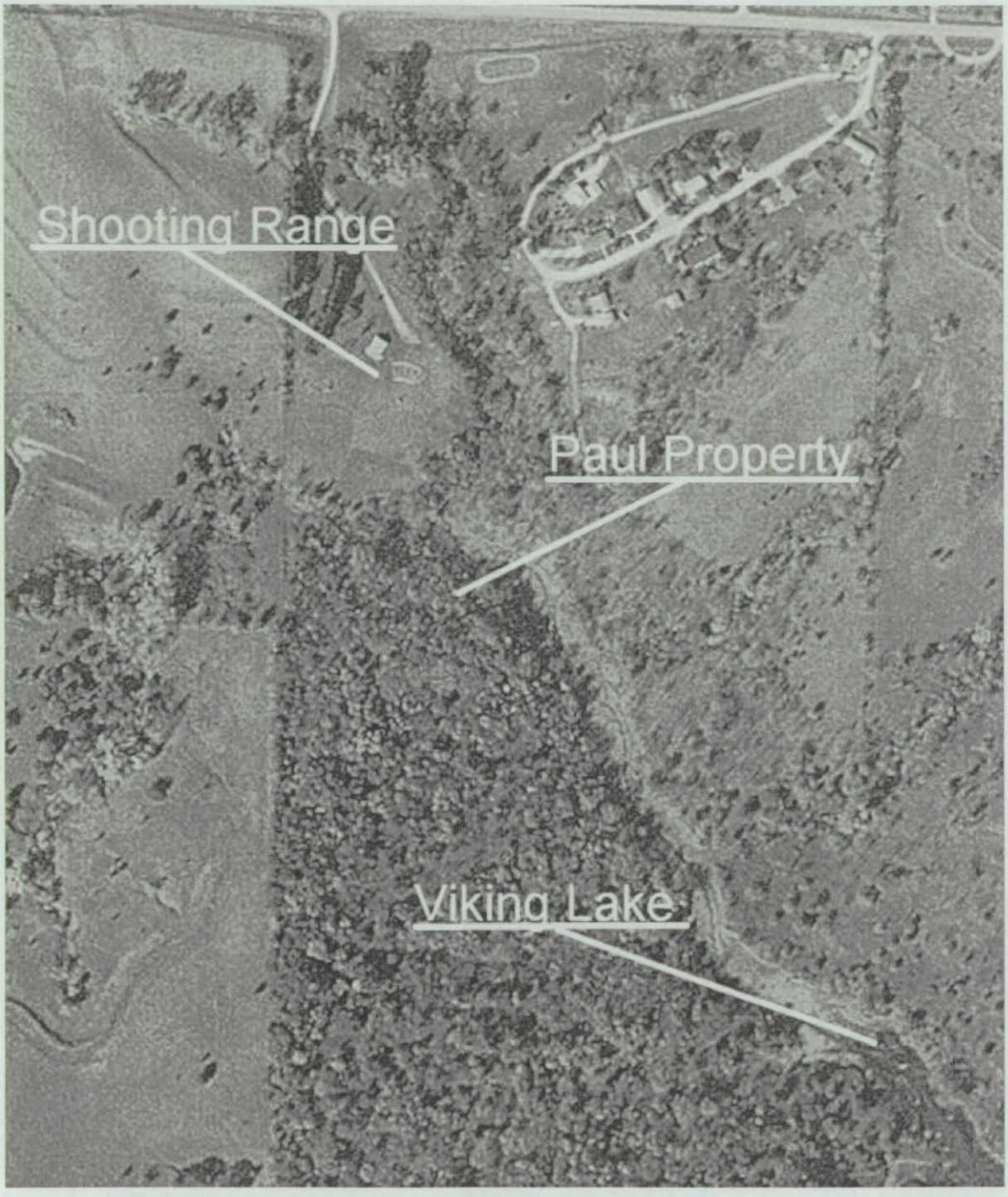
Sandstone


Shooting Range
Paul Property
Viking Lake

Hygienic Laboratory

The University of Iowa

Date of report: 10-17-2001

IDNR CONTAMINATED SITES
WALLACE STATE OFFICE BLDG
900 EAST GRAND AVENUE
DES MOINES IA 50319-0034

Sample Number	**200162005**
Date Received	10-02-2001
Project	WMSF
Date Collected	09-28-2001 09:50
Collection Site	paul property, 1-50
Collection Town	Stanton
Description	soil
Reference	PAUL PROPERTY
Collector	COOK DAN
Phone	(515) 281-4171
Purchase Order	

Comments: *Upon receipt at the UHL sample meets standard acceptance criteria. sample contains lead shot*

Results of Analyses

Inorganic Chemistry

Analyte	Concentration	Method	Analyst/ Verifier	Date Analyzed
Total Lead	60000 mg/kg by dry wt	EPA 7420	ML/DC	10-12-2001
Comments	*SAMPLES WITH LEAD SHOT*			

Inorganic Chemistry

Analyte	Concentration	Method	Analyst/ Verifier	Date Analyzed
Total Lead	9100 mg/kg by dry wt	EPA 7420	ML/DC	10-15-2001
Comments	*LEAD SHOT REMOVED*			

Description of units used within this report

mg/kg by dry wt - Milligrams per Kilogram by Dry Weight

Iowa Laboratory Certification No. 027. AIHA, ICR, NVLAP, USEPA and other credentials available upon request.

If you have any questions please call Sherri Marine at 800/421-IOWA (4692) or 319/335-4500. Thank you.

Mary J. R. Gilchrist, Ph.D.
Director

102 Oakdale Campus, #101 OH
Iowa City, Iowa 52242-5002
319/335-4500 Fax: 319/335-4555

http://www.uhl.uiowa.edu

H.A. Wallace Building
East Grand, Des Moines, Iowa 50319-0034
515/281-5371 Fax: 515/243-1349

Hygienic Laboratory

The University of Iowa

Date of report: 10-17-2001

IDNR CONTAMINATED SITES
WALLACE STATE OFFICE BLDG
900 EAST GRAND AVENUE
DES MOINES IA 50319-0034

Sample Number	**200162006**
Date Received	10-02-2001
Project	WMSF
Date Collected	09-28-2001 09:58
Collection Site	paul property, I-100
Collection Town	Stanton
Description	soil
Reference	PAUL PROPERTY
Collector	COOK DAN
Phone	(515) 281-4171
Purchase Order	

Comments: *Upon receipt at the UHL sample meets standard acceptance criteria. sample contains lead shot*

Results of Analyses

Inorganic Chemistry

Analyte	Concentration	Method	Analyst/ Verifier	Date Analyzed
Total Lead	71000 mg/kg by dry wt	EPA 7420	ML/DC	10-12-2001
Comments	*SAMPLES WITH LEAD SHOT*			

Inorganic Chemistry

Analyte	Concentration	Method	Analyst/ Verifier	Date Analyzed
Total Lead	7500 mg/kg by dry wt	EPA 7420	ML/DC	10-15-2001
Comments	*LEAD SHOT REMOVED*			

Description of units used within this report

mg/kg by dry wt - Milligrams per Kilogram by Dry Weight

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IDNR CONTAMINATED SITES
WALLACE STATE OFFICE BLDG
900 EAST GRAND AVENUE
DES MOINES IA 50319-0034

Sample Number	**200162007**
Date Received	10-02-2001
Project	WMSF
Date Collected	09-28-2001 10:07
Collection Site	paul property, 1-150
Collection Town	Stanton
Description	soil
Reference	PAUL PROPERTY
Collector	COOK DAN
Phone	(515) 281-4171
Purchase Order	

Comments: *Upon receipt at the UHL sample meets standard acceptance criteria. sample contains lead shot*

Results of Analyses

Inorganic Chemistry

Analyte	Concentration	Method	Analyst/ Verifier	Date Analyzed
Total Lead	520 mg/kg by dry wt	EPA 7420	ML/DC	10-16-2001
Comments	*SAMPLES WITH LEAD SHOT*			

Inorganic Chemistry

Analyte	Concentration	Method	Analyst/ Verifier	Date Analyzed
Total Lead	440 mg/kg by dry wt	EPA 7420	ML/DC	10-15-2001
Comments	*LEAD SHOT REMOVED*			

Description of units used within this report

mg/kg by dry wt - Milligrams per Kilogram by Dry Weight

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The University of Iowa

Date of report: 10-17-2001

IDNR CONTAMINATED SITES
WALLACE STATE OFFICE BLDG
900 EAST GRAND AVENUE
DES MOINES IA 50319-0034

Sample Number	200162008
Date Received	10-02-2001
Project	WMSF
Date Collected	09-28-2001 10:07
Collection Site	paul property, 1-200
Collection Town	Stanton
Description	soil
Reference	PAUL PROPERTY
Collector	COOK DAN
Phone	(515) 281-4171
Purchase Order	

Comments: *Upon receipt at the UHL sample meets standard acceptance criteria.*

Results of Analyses

Inorganic Chemistry

Analyte	Concentration	Method	Analyst/ Verifier	Date Analyzed
Total Lead	63 mg/kg by dry wt	EPA 7420	ML/DC	10-12-2001

Comments: *SAMPLES WITH LEAD SHOT*

Inorganic Chemistry

Analyte	Concentration	Method	Analyst/ Verifier	Date Analyzed
Total Lead	44 mg/kg by dry wt	EPA 7420	ML/DC	10-15-2001

Comments: *LEAD SHOT REMOVED*

Description of units used within this report

mg/kg by dry wt - Milligrams per Kilogram by Dry Weight

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Date of report: 10-17-2001

IDNR CONTAMINATED SITES
WALLACE STATE OFFICE BLDG
900 EAST GRAND AVENUE
DES MOINES IA 50319-0034

Sample Number	200162009
Date Received	10-02-2001
Project	WMSF
Date Collected	09-28-2001 10:25
Collection Site	paul property, 1-250
Collection Town	Stanton
Description	soil
Reference	PAUL PROPERTY
Collector	COOK DAN
Phone	(515) 281-4171
Purchase Order	

Comments: *Upon receipt at the UHL sample meets standard acceptance criteria.*

Results of Analyses

Inorganic Chemistry

Analyte	Concentration	Method	Analyst/ Verifier	Date Analyzed
Total Lead	90 mg/kg by dry wt	EPA 7420	ML/DC	10-12-2001

Comments: *SAMPLES WITH LEAD SHOT*

Inorganic Chemistry

Analyte	Concentration	Method	Analyst/ Verifier	Date Analyzed
Total Lead	83 mg/kg by dry wt	EPA 7420	ML/DC	10-15-2001

Comments: *LEAD SHOT REMOVED*

Description of units used within this report

mg/kg by dry wt - Milligrams per Kilogram by Dry Weight

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The University of Iowa

Date of report: 10-17-2001

IDNR CONTAMINATED SITES
WALLACE STATE OFFICE BLDG
900 EAST GRAND AVENUE
DES MOINES IA 50319-0034

Sample Number	200162010
Date Received	10-02-2001
Project	WMSF
Date Collected	09-28-2001 10:32
Collection Site	paul property, I-300
Collection Town	Stanton
Description	soil
Reference	PAUL PROPERTY
Collector	COOK DAN
Phone	(515) 281-4171
Purchase Order	

Comments: *Upon receipt at the UHL sample meets standard acceptance criteria.*

Results of Analyses

Inorganic Chemistry

Analyte	Concentration	Method	Analyst/ Verifier	Date Analyzed
Total Lead	110 mg/kg by dry wt	EPA 7420	ML/DC	10-12-2001
Comments:	*SAMPLES WITH LEAD SHOT*			

Inorganic Chemistry

Analyte	Concentration	Method	Analyst/ Verifier	Date Analyzed
Total Lead	110 mg/kg by dry wt	EPA 7420	ML/DC	10-15-2001
Comments:	*LEAD SHOT REMOVED*			

Description of units used within this report

mg/kg by dry wt - Milligrams per Kilogram by Dry Weight

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Hygienic Laboratory

The University of Iowa

CHAIN-OF-CUSTODY

Contact Name	Phone	Purchase Order #
Dan Cook	515-281-4171	
Company	**Fax**	**Report Name and/or Number**
Iowa DNR	515-281-8895	Paul Property
Address		**Collector's Phone**
Wallace State Office Bldg		515-281-4171
City	**State** **Zip**	**Print Collector's Name**
Des Moines	Ia 50319	Dan Cook
		Collector's Signature
		D Cook

Sample ID/Description	Date	Time	Sample Matrix: W	S	Other	Lead (Aroma Procedure)	Lead (unsisted analysis)	Comments/Special Instructions
1. L-50 9-743	9-28-01	9:50		X		X	X	Contains Lead shot 162005
2. L-100 9-291	9-28-01	9:58		X		X	X	Contains Lead shot 16200
3. L-150 9-729	9-28-01	10:07		X		X	X	Contains Lead shot 16200
4. L-200 9-303	9-28-01	10:15		X		X	X	162008
5. L-250 9-338	9-28-01	10:25		X		X	X	162009
6. L-300 9-300	9-28-01	10:32		X		X	X	162010
7.								
8.								
9.								
10.								

Relinquished by	Date	Time	Comments
D Cook	10-2-01	9:53 am	
Received at Laboratory by	**Date**	**Time**	**Sample Receipt Comments**
K Eckar	"	"	

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Yellow - UHL copy,
Blue - Client copy