

## APPENDIX E

# UNDERGROUND STORAGE TANKS & HAZARDOUS MATERIALS OVERVIEW

KY 107 & I-24 INTERCHANGE  
CHRISTIAN COUNTY, KENTUCKY  
ITEM NO. 2-8702.00

PREPARED FOR



Qk4, INC.  
1046 EAST CHESTNUT STREET  
LOUISVILLE, KENTUCKY 40204

PREPARED BY



HALL-HARMON ENGINEERS, INC.  
1081 DOVE RUN ROAD  
SUITE 203  
LEXINGTON, KENTUCKY 40502  
(859) 269-3150  
(859) 269-3079 FAX

SEPTEMBER 2013

# UNDERGROUND STORAGE TANKS & HAZARDOUS MATERIALS OVERVIEW

## TABLE OF CONTENTS

### TABLE OF CONTENTS

1.0	INTRODUCTION .....	1
2.0	PROJECT LOCATION AND DESCRIPTION .....	1
3.0	SITE DESCRIPTION .....	1
3.1	Topography .....	1
3.2	Soils .....	2
3.3	Surface Drainage .....	3
3.4	Geology and Hydrogeology .....	3
4.0	HISTORIC REVIEW OF PAST SITE AND SURROUNDING LAND USES .....	3
5.0	SITE RECONNAISSANCE .....	4
6.0	UNDERGROUND STORAGE TANKS & HAZARDOUS MATERIALS RECORDS SEARCH .....	6
6.1	EDR DataMap Area Study .....	7
6.2	EPA EnviroMapper for Envirofacts .....	9
6.3	KGS Map Services .....	11
7.0	PAST OR PRESENT WASTE DISPOSAL PRACTICES .....	11
8.0	PAST OR PRESENT POLYCHLORINATED BIPHENYLS (PCB) ELECTRICAL EQUIPMENT USAGE .....	11
9.0	STAINING AND STRESSED VEGETATION .....	12
10.0	WATER SUPPLY .....	12
11.0	WASTEWATER SYSTEMS .....	12
12.0	INTERVIEW OF LOCAL REPRESENTATIVES .....	13
13.0	REGULATORY LISTED FACILITIES .....	13
14.0	CONCLUSIONS AND RECOMMENDATIONS .....	13

## **LIST OF APPENDICES**

Appendix A	Project Area Map
Appendix B	Topographic Map
Appendix C	Soil Resource Report
Appendix D	EDR DataMap Area Study
Appendix E	EDR DataMap Area Study Map
Appendix F	KGS Geologic Map
Appendix G	KGS Sinkholes Map
Appendix H	KGS Springs Map
Appendix I	KGS Water Wells Map

## **LIST OF TABLES**

Table 1	Soil Resource Report Soil Types
Table 2	EDR DataMap Area Study Search Summary
Table 3	EPA EnviroMapper for Envirofacts Search Summary

# **UNDERGROUND STORAGE TANKS & HAZARDOUS MATERIALS OVERVIEW**

## **1.0 INTRODUCTION**

The purpose of this overview is to identify underground storage tank (UST) and hazardous material concerns and document existing environmental information obtained from Federal, State and local database search records for facilities or individuals that generate, transport, treat, store, or disposed of hazardous materials including underground storage tanks within the KY 107 & I-24 Interchange project study area.

This document constitutes a Underground Storage Tanks (UST) & Hazardous Materials (HazMat) Overview, it does not constitute a Phase I Site Assessment, Phase II Site Assessment or Environmental Assessment and is intended to be used by the Kentucky Transportation Cabinet (KYTC) for preliminary assessment of costs associated with the acquisition of new, potentially contaminated right-of-way as required for the project, and the potential future costs and liabilities, which might accrue to the KYTC as owner.

## **2.0 PROJECT LOCATION AND DESCRIPTION**

The study area includes approximately 1,067 acres located in Christian County just southwest of Hopkinsville, Kentucky as shown on the Project Area Map included in Appendix A.

The study area includes the KY 107 overpass at I-24 which is surrounded by agricultural farm land consisting primarily of soy bean and corn crops with residential homes along KY 107 and adjacent side roads.

## **3.0 SITE DESCRIPTION**

### **3.1 Topography**

Christian County is located in the Mississippian Plateaus area of southwestern Kentucky and is bordered on the south by the Kentucky-Tennessee state line.

The southern part of the county is a nearly flat to gently rolling limestone plain with numerous sinkholes, sinkhole ponds, springs, and sinking creeks. Elevations of the karst plain generally range between 530 and 600 feet. Little River is located to the west with two blue line streams within the project area. Fractures in the rock are locally expressed as sinkhole alignments and rectilinear drainage patterns.

The project site is located in the southern area of the Church Hill USGS 7.5-minute topographic quadrangle map. The Topographic Map is included in Appendix B.

Based upon review of the Church Hill topographic map the following features located within the study area are noted:

- A cemetery located on the west side of KY 107 at the juncture with KY 345.
- Numerous sinkholes.
- Numerous ponds.
- Surface drainage north of I-24 flow towards sinkholes and a blue line stream that crosses KY 107 flowing west into the Little River.
- Surface drainage south of I-24 flow towards sinkholes and a blue line stream flowing west into the Little River.
- Elevation varies throughout the project corridor from approximately 550' in the southeastern most vicinity to approximately 480' towards the northwestern most limits of the project limits at I-24 and Little River crossing.

### 3.2 Soils

Included in Appendix C is a Soil Resource Report for the project area prepared by the Web Soil Survey (WSS) that provides soil data and information produced by the National Cooperative Soil Survey operated by the USDA Natural Resources Conservation Service (NRCS).

According to the Soil Resource Report the predominate soil types within the project area are listed in Table 1.

<b>Soil Resource Report Soil Types Table 1</b>			
<b>Map Unit Symbol</b>	<b>Map Unit Name</b>	<b>Acres</b>	<b>Percent</b>
BaD	Baxter cherty silt loam, 12 to 20 percent slopes	10.4	1.0%
CrA	Crider silt loam, 0 to 2 percent slopes	23.3	2.2%
CrB	Crider silt loam, 2 to 6 percent slopes	3.0	0.3%
EIA	Elk silt loam, 0 to 2 percent slopes	22.7	2.1%
EIB	Elk silt loam, 2 to 6 percent slopes	85.8	8.0%

HbC	Hammack-Baxter complex, 6 to 12 percent slopes	29.4	2.8%
Ln	Lindside silt loam	17.0	1.6%
NhB	Nicholson silt loam, 2 to 6 percent slopes	2.7	0.2%
No	Nolin silt loam	111.4	10.4%
PmB	Pembroke silt loam, 2 to 6 percent slopes	598.1	56.1%
PmC	Pembroke silt loam, 6 to 12 percent slopes	112.1	10.5%
VeC	Vertrees silty clay loam, 6 to 12 percent slopes	50.3	4.7%
<b>Total Area</b>		<b>1066.2</b>	<b>100%</b>

### 3.3 Surface Drainage

Based upon the site topography, surface drainage flows to sinkholes and blue line streams that drain to the Little River located at the western most project limits. The Topographic Map of the project area is included in Appendix B.

### 3.4 Geology and Hydrogeology

According to the USGS Geologic Quadrangle for Church Hill the project area geology is primarily Ste. Genevieve limestone with primary lithology consisting of limestone and minor shale. Data from water wells and outcrops along Little River indicate that upper two-thirds of the unit is generally oölitic and noncherty. The principal aquifer in this area of the Little River region is developed in Mississippian-aged limestones of the Pennyroyal Plateau, primarily within a 60 m (200 ft) thickness of the Ste. Genevieve limestone. The Ste. Genevieve limestones consist of the upper section of the Meramecian Series of the Mississippian System that make much of the Little River watershed highly susceptible to karst development. The area is located in the Western Pennyroyal, the largest karst region in Kentucky with terrain that contains numerous sinkholes and springs.

## 4.0 HISTORIC REVIEW OF PAST SITE AND SURROUNDING LAND USES

Past land use for this area was agricultural farmland. Present land use remains agricultural with crops primarily consisting of soy bean and corn with residential dwellings along the major roadways.

## 5.0 SITE RECONNAISSANCE

A limited site reconnaissance based upon visual assessment of the project area from major roadways was conducted on August 29, 2013 to identify underground storage tanks and hazardous materials concerns within the project area.

The following observations were made during the limited site reconnaissance:

- Agricultural operations that may contain pesticides and herbicides or other agricultural chemicals may be present that is typically associated with farming operations which can pose a hazard if improperly disposed of or misapplied. Visual inspections of these features were not verified due to the proximity of the features and the limited access from the major roadways. Silos, barns, out buildings, garages and agricultural equipment including small above ground storage tanks containing fuel were observed. Special wastes such as electrical equipment, air conditioners, automotive tires, asbestos, lead, solvents and paints could also exist within the project area that could not be observed during the limited site reconnaissance.



- A structure located at 7875 Old Palmyra Road has the appearance of an old store that may have had past fueling operations with underground storage tanks even though records searches did not identify this site as a UST location.



- It could not be determined from the drive-through inspection if buildings or structures located within the project area have asbestos-containing materials, lead-based paint, radon or other such hazardous materials.
- Electrical transformers were observed during the limited site visit that may have the potential for PCB containing materials but could not be verified even though records searches did not identify any PCB containing materials within the project area.



- An old sign indicating Lovelady Welding was observed along KY 107 just south of I-24 crossing. Welding locations have been known to contain hazardous materials even though records searches did not identify this site for hazardous materials. It is also noted that some of the farm barns, garages and out buildings may also contain welding equipment which is typical of farming operations.



- Most residential homes have an above ground liquid propane gas tank for heating purposes.
- Several above ground fuel tanks were observed that most likely contain diesel fuel for equipment.



- What appeared to be a saw mill located on Memory Lane has above ground storage tanks that most likely contain diesel fuel for equipment.



- Roadway flood prone warning signs located at low lying areas.
- Various utility markings for underground fiber optics and electric lines were noted.
- No visual staining or stressed vegetation was observed.

- No odors were noted.
- South Christian No. 2 Wastewater Pump Station located on the southeast quadrant of the KY 107 and I-24 crossing was observed.



- Septic systems and cisterns could not be verified.
- Numerous sinkholes are located throughout the project area that could be used for dumping various types of waste but could not be verified even though records searches did not identify any dump sites for hazardous materials.

- I-24 appeared to be a typical 4 lane interstate facility with depressed median.



## 6.0 UNDERGROUND STORAGE TANKS & HAZARDOUS MATERIALS RECORDS SEARCH

Federal, State and local database record searches were conducted in order to investigate potential locations that may contain underground storage tanks and hazardous materials that might pose substantial costs and liabilities for right-of-way acquisition and cleanup.

## 6.1 EDR DataMap Area Study

Environmental Data Resources Inc. (EDR), a commercial provider of environmental risk information provided database searches of Federal records, State and local records, tribal records and EDR proprietary records.

Refer to Appendix D for the EDR DataMap Area Study and Appendix E for the EDR DataMap Area Study Map. The EDR DataMap Area Study Search Summary is provided in Table 2 which indicates no sites were found or mapped within the project area.

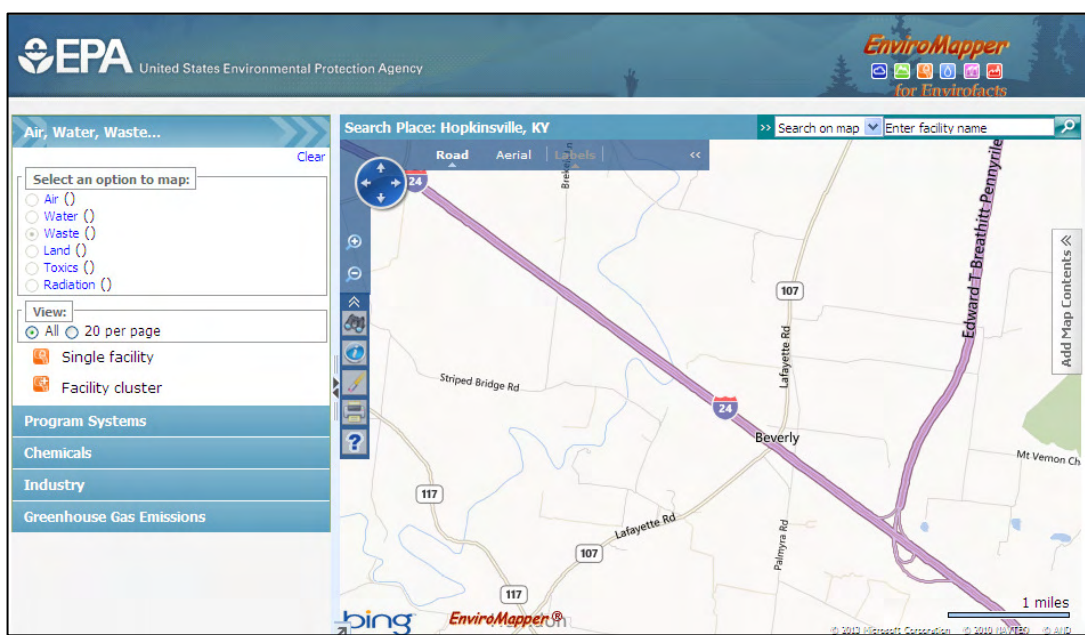
<b>EDR DataMap Area Study Search Summary Table 2</b>		
<b>System Search</b>	<b>System Overview</b>	<b>Sites Mapped</b>
<b>Federal Records Database</b>		
NPL	National Priority List	0
Proposed NPL	Proposed National Priority List Sites	0
Delisted NPL	National Priority List Deletions	0
NPL LIENS	Federal Superfund Liens	0
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System	0
CERC-NFRAP	CERCLIS No Further Remedial Action Planned	0
LIENS 2	CERCLA Lien Information	0
CORRACTS	Corrective Action Report	0
RCRA-TSDF	RCRA - Treatment, Storage and Disposal	0
RCRA-LQG	RCRA - Large Quantity Generators	0
RCRA-SQG	RCRA - Small Quantity Generators	0
RCRA-CESQG	RCRA - Conditionally Exempt Small Quantity Generator	0
RCRA NonGen / NLR	RCRA - Non Generators	0
US ENG CONTROLS	Engineering Controls Sites List	0
US INST CONTROL	Sites with Institutional Controls	0
ERNS	Emergency Response Notification System	0
HMIRS	Hazardous Materials Information Reporting System	0
DOT OPS	Incident and Accident Data	0
US CDL	Clandestine Drug Labs	0
US BROWNFIELDS	A Listing of Brownfields Sites	0
DOD	Department of Defense Sites	0
FUDS	Formerly Used Defense Sites	0
LUCIS	Land Use Control Information System	0
CONSENT	Superfund (CERCLA) Consent Decrees	0
ROD	Records Of Decision	0
UMTRA	Uranium Mill Tailings Sites	0

DEBRIS REGION 9	Torres Martinez Reservation Illegal Dump Site Locations	0
ODI	Open Dump Inventory	0
US MINES	Mines Master Index File	0
TRIS	Toxic Chemical Release Inventory System	0
TSCA	Toxic Substances Control Act	0
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)	0
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing	0
SSTS	Section 7 Tracking Systems	0
ICIS	Integrated Compliance Information System	0
PADS	PCB Activity Database System	0
MLTS	Material Licensing Tracking System	0
RADINFO	Radiation Information Database	0
FINDS	Facility Index System/Facility Registry System	0
RAATS	RCRA Administrative Action Tracking System	0
RMP	Risk Management Plans	0
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List	0
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing	0
US HIST CDL	National Clandestine Laboratory Register	0
PCB TRANSFORMER	PCB Transformer Registration Database	0
FEDERAL FACILITY	Federal Facility Site Information listing	0
US FIN ASSUR	Financial Assurance Information	0
EPA WATCH LIST	EPA WATCH LIST	0
PRP	Potentially Responsible Parties	0
2020 COR ACTION	2020 Corrective Action Program List	0
COAL ASH DOE	Steam-Electric Plant Operation Data	0
FEMA UST	Underground Storage Tank Listing	0
LEAD SMELTERS	Lead Smelter Sites	0
US AIRS	Aerometric Information Retrieval System Facility Subsystem	0
<b>State and Local Records Database</b>		0
SHWS	State Leads List	0
SWF/LF	Solid Waste Facilities List	0
UIC	UIC Information	0
SWRCY	Recycling Facilities	0
HIST LF	Historical Landfills	0
SB193	SB193 Branch Site Inventory List	0
UST	Underground Storage Tank Database	0
SPILLS	State spills	0
ENG CONTROLS	Engineering Controls Site Listing	0
INST CONTROL	State Superfund Database	0
VCP	Voluntary Cleanup Program Sites	0
DRYCLEANERS	Drycleaner Listing	0

BROWNFIELDS	Kentucky Brownfield Inventory	0
CDL	Clandestine Drug Lab Location Listing	0
NPDES	Permitted Facility Listing	0
AIRS	Permitted Airs Facility Listing	0
PSTEAF	Facility Ranking List	0
LEAD	Environmental Lead Program Report Tracking Database	0
COAL ASH	Coal Ash Disposal Sites	0
<b>Tribal Records Database</b>		
INDIAN RESERV	Indian Reservations	0
INDIAN ODI	Report on the Status of Open Dumps on Indian Lands	0
INDIAN LUST	Leaking Underground Storage Tanks on Indian Land	0
INDIAN UST	Underground Storage Tanks on Indian Land	0
INDIAN VCP	Voluntary Cleanup Priority Listing	0
<b>EDR Proprietary Records Database</b>		
EDR MGP	EDR Proprietary Manufactured Gas Plants	0
EDR US Hist Auto Stat	EDR Exclusive Historic Gas Stations	0
EDR US Hist Cleaners	EDR Exclusive Historic Dry Cleaners	0
<b>Total EDR DataMap Area Study Sites Mapped</b>		<b>0</b>

## 6.2 EPA EnviroMapper for Envirofacts

The Environmental Protection Agency (EPA) EnviroMapper for Envirofacts was accessed online to determine if any sites were located within the project area. The EPA EnviroMapper for Envirofacts Search Summary is provided in Table 3 which indicates no sites were found or mapped within the project area.



<b>EPA EnviroMapper for Envirofacts Search Summary</b>		
<b>Table 3</b>		
<b>System Search</b>	<b>System Overview</b>	<b>Sites Mapped</b>
Multisystem	Envirofacts Multisystem Overview	0
AFS	Air Facility System (AFS) Overview	0
BR	Biennial Reporting Overview	0
Brownfields/Cleanups	Brownfields-Cleanups in My Community Overview	0
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Overview	0
Cleanups	Cleanups in My Community Overview	0
ECHO/IDEA	Enforcement & Compliance History Online (ECHO) Overview	0
FRS	Facility Registry System Overview	0
EZ Search		0
Organization Search		0
Greenhouse Gas	Greenhouse Gas Overview	0
Customized Search		0
ICIS	Integrated Compliance Information System (ICIS) Overview	0
IGMS	Integrated Grants Management System (IGMS) Overview	0
ICR	Information Collection Rule (ICR) Overview	0
Locational Information	Locational Information Overview	0
Locational Search		0
PCS	Permit Compliance System (PCS) Overview	0
Customized Search		0
RADInfo	The Radiation Information Database (RADInfo) Overview	0
RadNet	RadNet Overview	0
Customized Search		0
RCRAInfo	Resource Conservation and Recovery Act Information (RCRAInfo) Overview	0
SDWIS	Safe Drinking Water Information System (SDWIS) Overview	0
SRS	Substance Registry Services Overview	0
TRI	Toxics Release Inventory (TRI) Overview	0
TRI Explorer		0
TRI Search		0
Form R Search		0
Form R & A Download		0
EZ Search		0
Customized Search		0
Pollution Prevention	TRI Pollution Prevention Overview	0
TSCA	Toxic Substances Control Act (TSCA) Overview	0
UV Index	Ultraviolet (UV) Index Overview	0
<b>Total EPA EnviroMapper Sites Mapped</b>		<b>0</b>

### 6.3 KGS Map Services

Kentucky Geological Survey (KGS) map-related data was accessed online for the project area. The following information was obtained:

- KY Geologic Map from the Kentucky Geological Survey Digital Mapping. Refer to Appendix F for the KGS Geologic Map indicating geology of the project area.
- KY Coal Exploration Boreholes and Thickness from the KGS borehole database. No coal exploration boreholes were indentified within the project area.
- KY Oil and Gas Well Records stored in the KGS Data Repository. No oil or gas wells were indentified within the project area.
- KY Oil and Gas Fields identified by Kentucky Geological Survey Geologist. No oil or gas fields were identified within the project area.
- KY Sinkholes from USGS 7 minute topographic contours. Refer to Appendix G for the KGS Sinkholes Map indicating sinkholes within the project area.
- KY Springs from the Kentucky Groundwater Data Repository. Refer to Appendix H for the KGS Springs Map indicating springs within the project area.
- KY Water Wells from the Kentucky Groundwater Data Repository. Refer to Appendix I for the KGS Water Wells Map indicating water wells within the project area.

### 7.0 PAST OR PRESENT WASTE DISPOSAL PRACTICES

Based upon information provided in the EDR DataMap Area Study and obtained from EPA EnviroMapper there were no past or present waste disposal practices identified or mapped within the project area.

### 8.0 PAST OR PRESENT POLYCHLORINATED BIPHENYLS (PCB) ELECTRICAL EQUIPMENT USAGE

Based upon information provided in the EDR DataMap Area Study the PCB Transformer Registration Database indicated no PCB sites were identified or mapped within the project area.

## 9.0 STAINING AND STRESSED VEGETATION

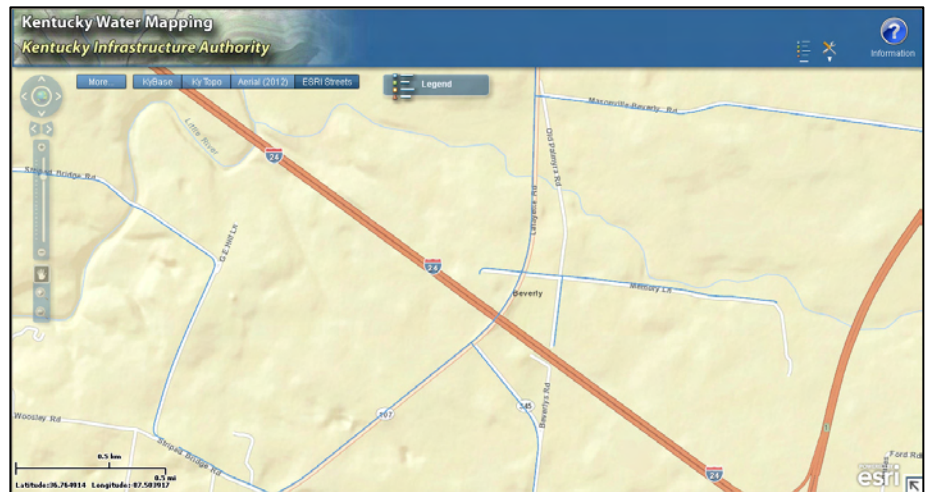
There was no staining or stressed vegetation observed within the project area while performing the limited site survey along major public roadways on August 29, 2013.

## 10.0 WATER SUPPLY

Kentucky Geologic Survey (KGS) Maps indicate three water wells are located within the project limits. See Appendix I for KGS Water Wells Map indicating the locations of the water wells.

Based upon review of the Kentucky Infrastructure Authority's Water Resource Information System (WRIS) for Kentucky Water Mapping the following water systems owned by Christian County Water District were mapped within the project limits:

- 8" PVC distribution water line along KY 107 (Lafayette Road)
- 4" PVC distribution water line along Madison Beverly Road
- 4" PVC distribution water line along Memory Lane and Memory Lane West
- 4" PVC distribution water line along the southern portion of Old Palmyra Road
- 6" PVC distribution water line along KY 345 (Palmyra Road)



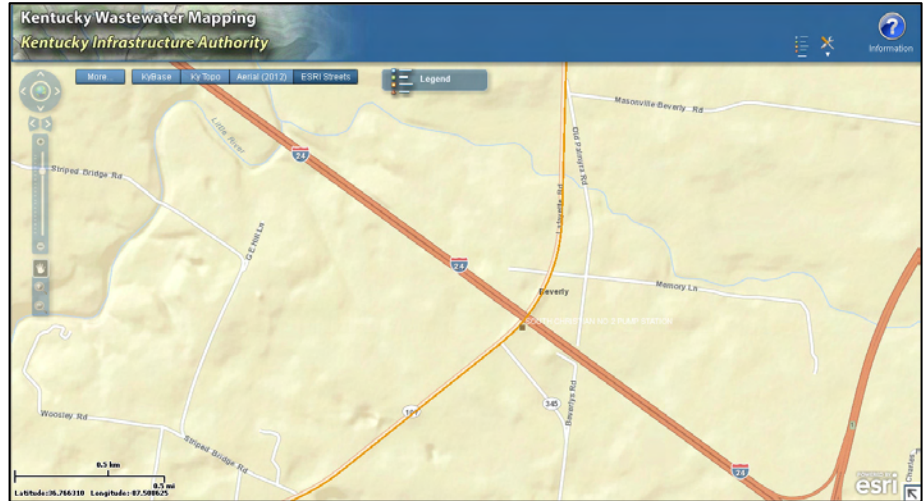
It is noted that some of the residential and farm properties may have cisterns within the project area that could not be verified.

## 11.0 WASTEWATER SYSTEMS

Based upon review of the Kentucky Infrastructure Authority's Water Resource Information System (WRIS) for Kentucky Wastewater Mapping the following wastewater system and pump station owned by Hopkinsville Water Environment Authority was mapped within the project limits:



- 8" PVC force main along KY 107 (Lafayette Road) with South Christian No. 2 Pump Station located at the southeast quadrant of the KY107 and I-24 crossing



It is noted that some of the residential and farm properties may have septic systems within the project area that could not be verified.

## 12.0 INTERVIEW OF LOCAL REPRESENTATIVES

Interviews of local fire and health department representatives to determine if there are any environmental concerns at the site was beyond the scope of this study and is therefore not included in this overview.

## 13.0 REGULATORY LISTED FACILITIES

Based upon results indicated in the EDR DataMap Area Study and from the EPA EnviroMapper there were no listed facilities identified or mapped within the project area.

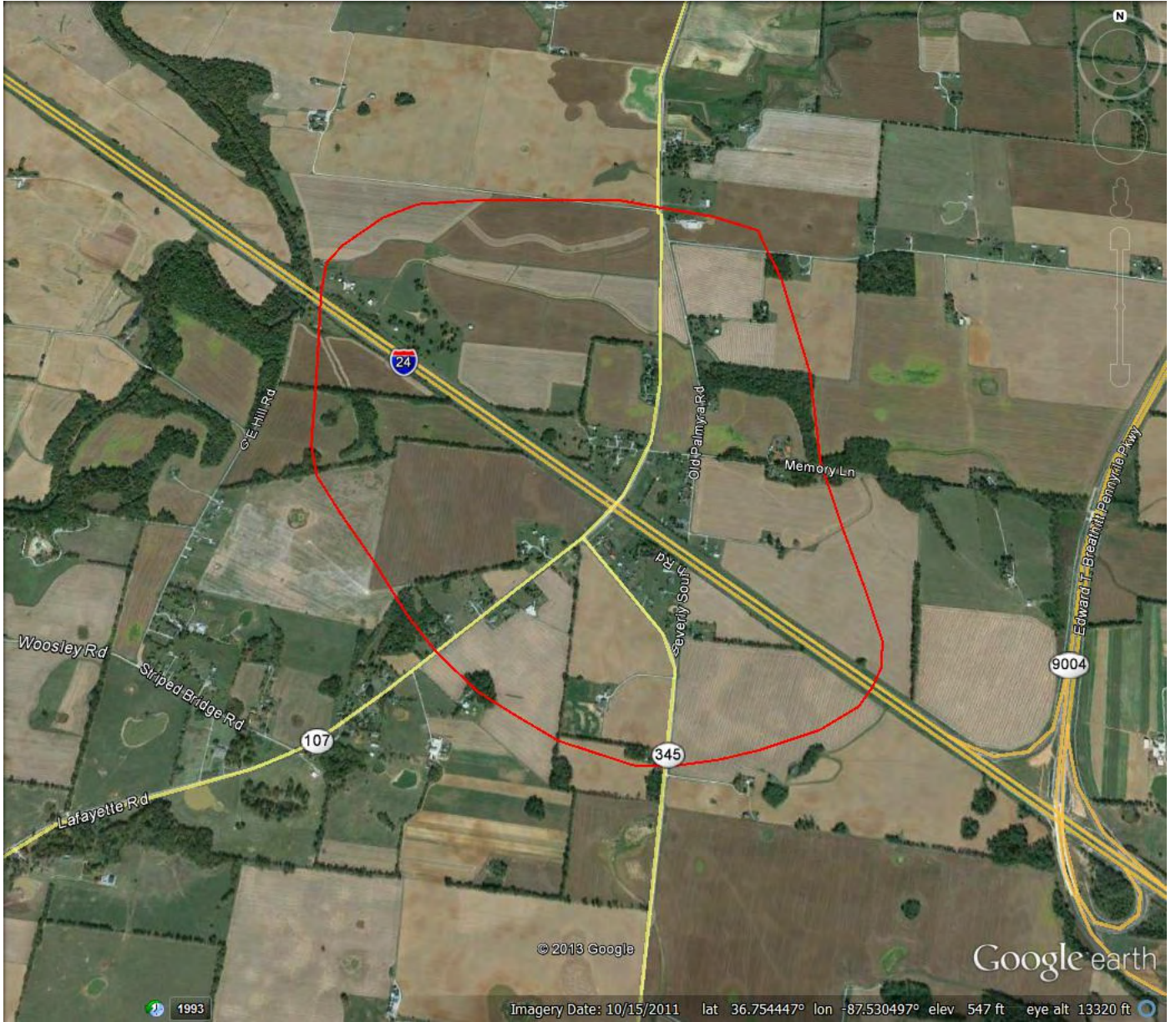
## 14.0 CONCLUSIONS AND RECOMMENDATIONS

Based upon information provided from the records searches supplemented with the limited site reconnaissance there were no hazardous material sites or underground storage tanks identified or mapped within the project area.

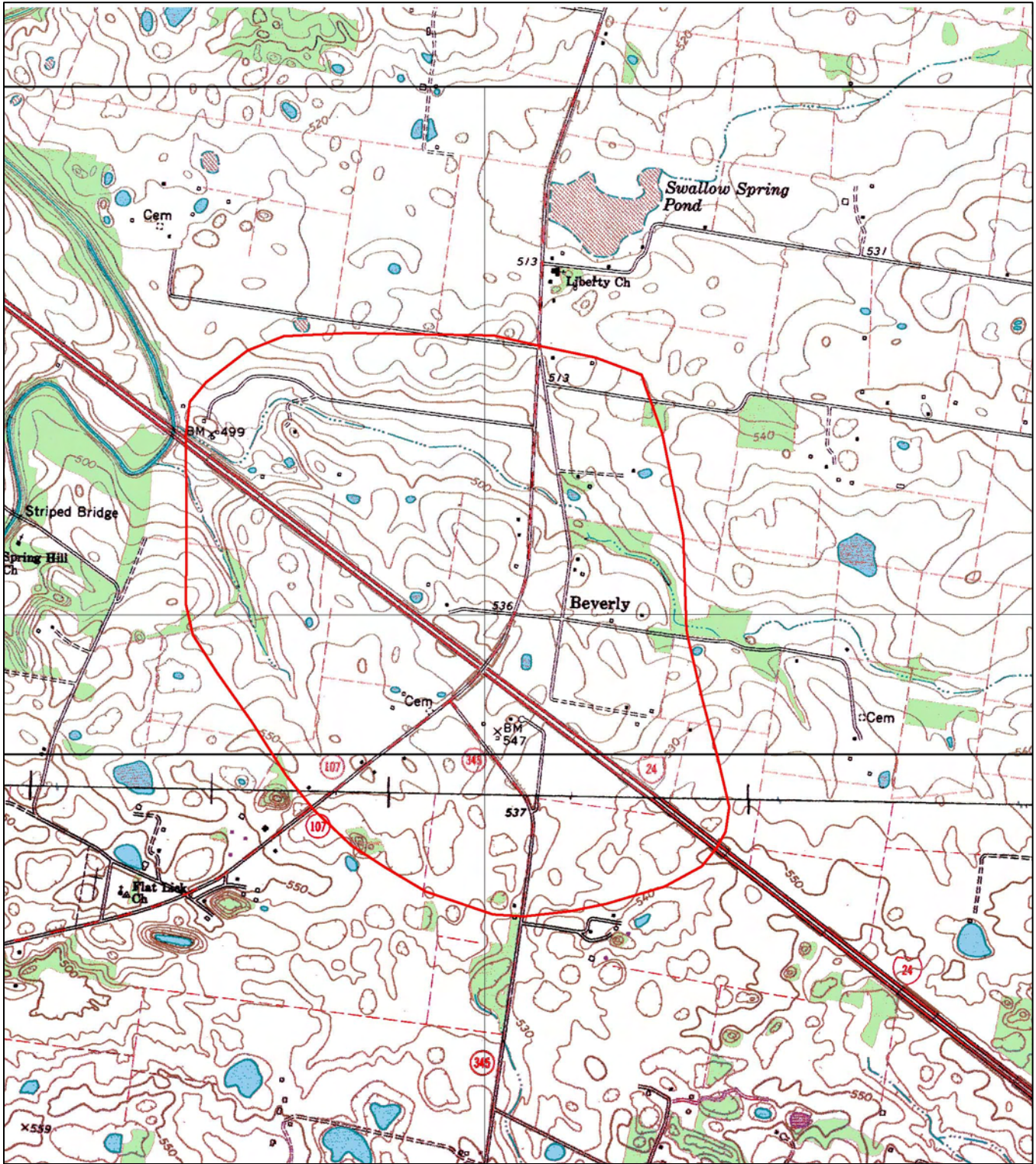
This overview should not be construed as verifying the present property owner or operator's compliance with Federal, State, and local regulations. No detailed site inspections, interviews, sampling or testing or in depth document research has been provided which is beyond the scope of this overview.

In the development of transportation projects it is recommended to consider to the maximum practicable extent potential impacts of hazardous materials and underground storage tanks, to exercise due care with respect to hazardous substances, to take reasonable precautions by appropriate inquiry prior to the acquisition of potentially contaminated rights-of-way, and to avoid whenever possible all potential aspects of hazardous materials and contaminated sites.

# Appendix A Project Area Map



# Appendix B Topographic Map





Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

# Custom Soil Resource Report for Christian County, Kentucky

## KY 107 & I-24 Interchange



# Preface

---

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://soils.usda.gov/sqi/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<http://offices.sc.egov.usda.gov/locator/app?agency=nracs>) or your NRCS State Soil Scientist ([http://soils.usda.gov/contact/state\\_offices/](http://soils.usda.gov/contact/state_offices/)).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means

for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

# Contents

---

<b>Preface</b> .....	2
<b>How Soil Surveys Are Made</b> .....	5
<b>Soil Map</b> .....	7
Soil Map.....	8
Legend.....	9
Map Unit Legend.....	10
Map Unit Descriptions.....	10
Christian County, Kentucky.....	13
BaD—Baxter cherty silt loam, 12 to 20 percent slopes.....	13
CrA—Crider silt loam, 0 to 2 percent slopes.....	14
CrB—Crider silt loam, 2 to 6 percent slopes.....	15
EIA—Elk silt loam, 0 to 2 percent slopes.....	16
EIB—Elk silt loam, 2 to 6 percent slopes.....	17
HbC—Hammack-Baxter complex, 6 to 12 percent slopes.....	18
Ln—Lindside silt loam.....	20
NhB—Nicholson silt loam, 2 to 6 percent slopes.....	21
No—Nolin silt loam.....	22
PmB—Pembroke silt loam, 2 to 6 percent slopes.....	23
PmC—Pembroke silt loam, 6 to 12 percent slopes.....	24
VeC—Vertrees silty clay loam, 6 to 12 percent slopes.....	25
<b>References</b> .....	27
<b>Glossary</b> .....	29

# **How Soil Surveys Are Made**

---

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the



## Custom Soil Resource Report

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

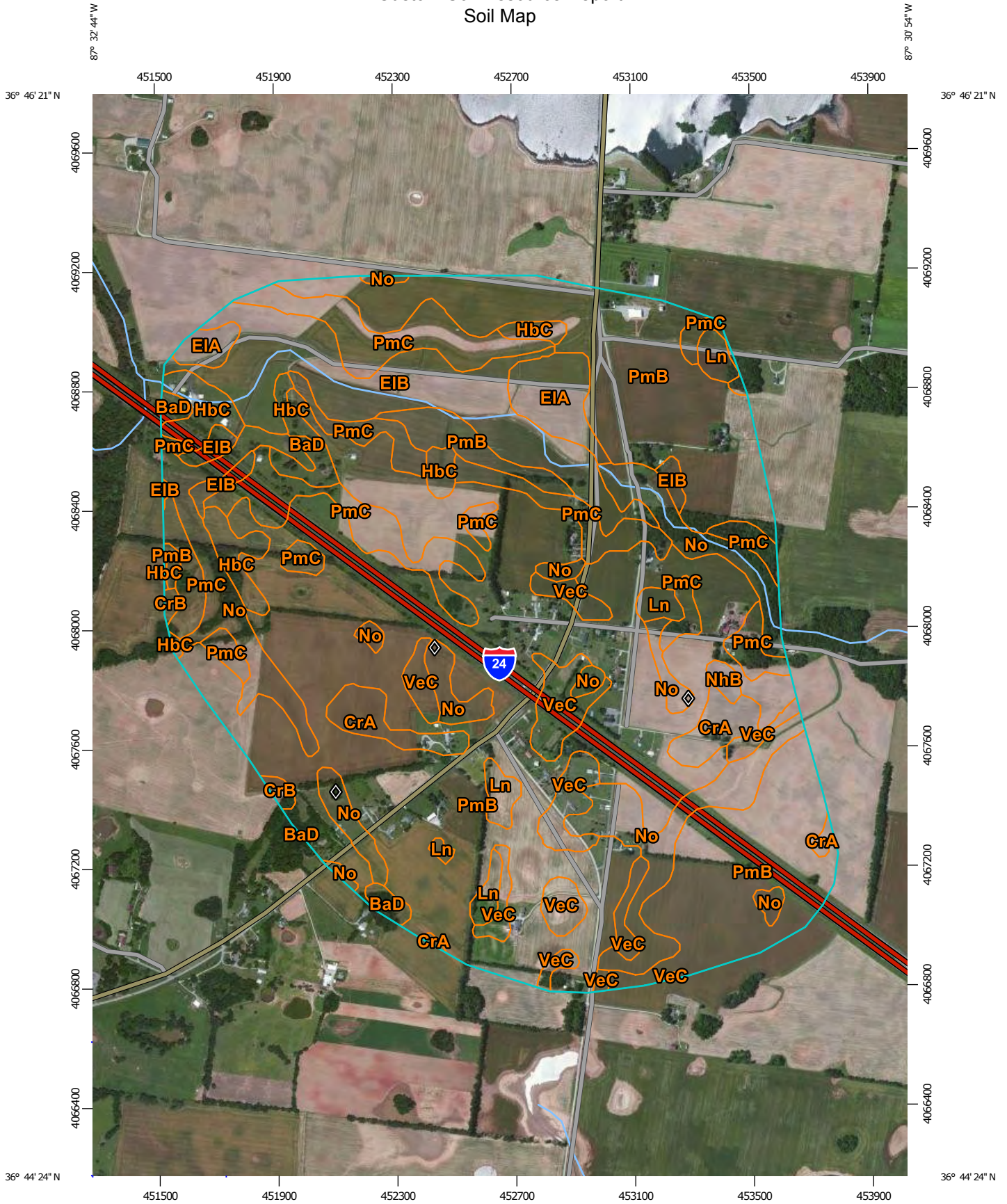
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

# Soil Map

---

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

# Custom Soil Resource Report Soil Map




Map Scale: 1:17,700 if printed on A portrait (8.5" x 11") sheet.




Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84


### MAP LEGEND


**Area of Interest (AOI)**

 Area of Interest (AOI)




















**Soils**







 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

**Special Point Features**






-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features


**Water Features**

 Streams and Canals

**Transportation**

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

**Background**

 Aerial Photography

### MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>  
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Christian County, Kentucky  
 Survey Area Data: Version 9, Sep 13, 2012

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 17, 2011—May 30, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Map Unit Legend

Christian County, Kentucky (KY047)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BaD	Baxter cherty silt loam, 12 to 20 percent slopes	10.4	1.0%
CrA	Crider silt loam, 0 to 2 percent slopes	23.3	2.2%
CrB	Crider silt loam, 2 to 6 percent slopes	3.0	0.3%
EIA	Elk silt loam, 0 to 2 percent slopes	22.7	2.1%
EIB	Elk silt loam, 2 to 6 percent slopes	85.8	8.0%
HbC	Hammack-Baxter complex, 6 to 12 percent slopes	29.4	2.8%
Ln	Lindside silt loam	17.0	1.6%
NhB	Nicholson silt loam, 2 to 6 percent slopes	2.7	0.2%
No	Nolin silt loam	111.4	10.4%
PmB	Pembroke silt loam, 2 to 6 percent slopes	598.1	56.1%
PmC	Pembroke silt loam, 6 to 12 percent slopes	112.1	10.5%
VeC	Vertrees silty clay loam, 6 to 12 percent slopes	50.3	4.7%
<b>Totals for Area of Interest</b>		<b>1,066.2</b>	<b>100.0%</b>

## Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

## Custom Soil Resource Report

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be

## Custom Soil Resource Report

made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

## Christian County, Kentucky

### BaD—Baxter cherty silt loam, 12 to 20 percent slopes

#### Map Unit Setting

*Elevation:* 410 to 630 feet

*Mean annual precipitation:* 43 to 58 inches

*Mean annual air temperature:* 45 to 68 degrees F

*Frost-free period:* 164 to 194 days

#### Map Unit Composition

*Baxter and similar soils:* 80 percent

*Minor components:* 20 percent

#### Description of Baxter

##### Setting

*Landform:* Hills

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Concave

*Across-slope shape:* Linear

*Parent material:* Clayey residuum weathered from cherty limestone

##### Properties and qualities

*Slope:* 12 to 20 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Well drained

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high  
(0.60 to 2.00 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water capacity:* Moderate (about 7.9 inches)

##### Interpretive groups

*Farmland classification:* Not prime farmland

*Land capability (nonirrigated):* 4e

*Hydrologic Soil Group:* B

##### Typical profile

*0 to 5 inches:* Gravelly silt loam

*5 to 17 inches:* Gravelly silt loam

*17 to 75 inches:* Gravelly silty clay

*75 to 96 inches:* Clay

#### Minor Components

##### Vertrees

*Percent of map unit:* 10 percent

##### Other soils

*Percent of map unit:* 10 percent



## CrA—Crider silt loam, 0 to 2 percent slopes

### Map Unit Setting

*Elevation:* 470 to 640 feet

*Mean annual precipitation:* 43 to 58 inches

*Mean annual air temperature:* 45 to 68 degrees F

*Frost-free period:* 164 to 194 days

### Map Unit Composition

*Crider and similar soils:* 85 percent

*Minor components:* 15 percent

### Description of Crider

#### Setting

*Landform:* Ridges

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluve

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Thin fine-silty noncalcareous loess over clayey residuum weathered from limestone

#### Properties and qualities

*Slope:* 0 to 2 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Well drained

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high  
(0.60 to 2.00 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water capacity:* High (about 11.0 inches)

#### Interpretive groups

*Farmland classification:* All areas are prime farmland

*Land capability (nonirrigated):* 1

*Hydrologic Soil Group:* B

#### Typical profile

*0 to 9 inches:* Silt loam

*9 to 33 inches:* Silty clay loam

*33 to 99 inches:* Clay

### Minor Components

#### Nolin

*Percent of map unit:* 4 percent

*Landform:* Flood plains

## Custom Soil Resource Report

### **Pembroke**

*Percent of map unit: 4 percent*

### **Nicholson**

*Percent of map unit: 4 percent*

### **Other soils**

*Percent of map unit: 3 percent*

## **CrB—Crider silt loam, 2 to 6 percent slopes**

### **Map Unit Setting**

*Elevation: 430 to 800 feet*

*Mean annual precipitation: 43 to 58 inches*

*Mean annual air temperature: 45 to 68 degrees F*

*Frost-free period: 164 to 194 days*

### **Map Unit Composition**

*Crider and similar soils: 80 percent*

*Minor components: 20 percent*

### **Description of Crider**

#### **Setting**

*Landform: Ridges*

*Landform position (two-dimensional): Summit*

*Landform position (three-dimensional): Interfluve*

*Down-slope shape: Linear*

*Across-slope shape: Linear*

*Parent material: Thin fine-silty noncalcareous loess over clayey residuum weathered from limestone*

#### **Properties and qualities**

*Slope: 2 to 6 percent*

*Depth to restrictive feature: More than 80 inches*

*Drainage class: Well drained*

*Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)*

*Depth to water table: More than 80 inches*

*Frequency of flooding: None*

*Frequency of ponding: None*

*Available water capacity: High (about 11.0 inches)*

#### **Interpretive groups**

*Farmland classification: All areas are prime farmland*

*Land capability (nonirrigated): 2e*

*Hydrologic Soil Group: B*

#### **Typical profile**

*0 to 9 inches: Silt loam*

*9 to 33 inches: Silty clay loam*

## Custom Soil Resource Report

33 to 99 inches: Clay

### Minor Components

#### Nolin

*Percent of map unit: 5 percent*

*Landform: Flood plains*

#### Pembroke

*Percent of map unit: 5 percent*

#### Nicholson

*Percent of map unit: 5 percent*

#### Other soils

*Percent of map unit: 5 percent*

## EIA—Elk silt loam, 0 to 2 percent slopes

### Map Unit Setting

*Elevation: 470 to 580 feet*

*Mean annual precipitation: 43 to 58 inches*

*Mean annual air temperature: 45 to 68 degrees F*

*Frost-free period: 164 to 194 days*

### Map Unit Composition

*Elk, rarely flooded, and similar soils: 85 percent*

*Minor components: 15 percent*

### Description of Elk, Rarely Flooded

#### Setting

*Landform: Stream terraces*

*Landform position (three-dimensional): Tread*

*Down-slope shape: Linear*

*Across-slope shape: Linear*

*Parent material: Mixed fine-silty alluvium*

#### Properties and qualities

*Slope: 0 to 2 percent*

*Depth to restrictive feature: More than 80 inches*

*Drainage class: Well drained*

*Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high  
(0.60 to 2.00 in/hr)*

*Depth to water table: More than 80 inches*

*Frequency of flooding: NoneRare*

*Frequency of ponding: None*

*Available water capacity: High (about 11.8 inches)*

#### Interpretive groups

*Farmland classification: All areas are prime farmland*

*Land capability (nonirrigated): 1*

## Custom Soil Resource Report

*Hydrologic Soil Group: B*

### **Typical profile**

*0 to 9 inches: Silt loam*

*9 to 50 inches: Silty clay loam*

*50 to 68 inches: Silty clay loam*

### **Minor Components**

#### **Nolin**

*Percent of map unit: 4 percent*

*Landform: Flood plains*

#### **Crider**

*Percent of map unit: 4 percent*

#### **Nicholson**

*Percent of map unit: 4 percent*

#### **Other soils**

*Percent of map unit: 3 percent*

## **EIB—Elk silt loam, 2 to 6 percent slopes**

### **Map Unit Setting**

*Elevation: 400 to 650 feet*

*Mean annual precipitation: 43 to 58 inches*

*Mean annual air temperature: 45 to 68 degrees F*

*Frost-free period: 164 to 194 days*

### **Map Unit Composition**

*Elk, rarely flooded, and similar soils: 85 percent*

*Minor components: 15 percent*

### **Description of Elk, Rarely Flooded**

#### **Setting**

*Landform: Stream terraces*

*Landform position (three-dimensional): Tread*

*Down-slope shape: Linear*

*Across-slope shape: Linear*

*Parent material: Mixed fine-silty alluvium*

#### **Properties and qualities**

*Slope: 2 to 6 percent*

*Depth to restrictive feature: More than 80 inches*

*Drainage class: Well drained*

*Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high  
(0.60 to 2.00 in/hr)*

*Depth to water table: More than 80 inches*

*Frequency of flooding: RareNone*

*Frequency of ponding: None*

## Custom Soil Resource Report

*Available water capacity:* High (about 11.8 inches)

### **Interpretive groups**

*Farmland classification:* All areas are prime farmland

*Land capability (nonirrigated):* 2e

*Hydrologic Soil Group:* B

### **Typical profile**

*0 to 9 inches:* Silt loam

*9 to 50 inches:* Silty clay loam

*50 to 68 inches:* Silty clay loam

### **Minor Components**

#### **Crider**

*Percent of map unit:* 5 percent

#### **Nicholson**

*Percent of map unit:* 5 percent

#### **Other soils**

*Percent of map unit:* 5 percent

## **HbC—Hammack-Baxter complex, 6 to 12 percent slopes**

### **Map Unit Setting**

*Elevation:* 400 to 650 feet

*Mean annual precipitation:* 43 to 58 inches

*Mean annual air temperature:* 45 to 68 degrees F

*Frost-free period:* 164 to 194 days

### **Map Unit Composition**

*Hammack and similar soils:* 45 percent

*Baxter and similar soils:* 42 percent

*Minor components:* 13 percent

### **Description of Hammack**

#### **Setting**

*Landform:* Ridges

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Concave

*Across-slope shape:* Linear

*Parent material:* Thin fine-silty noncalcareous loess over clayey residuum weathered from cherty limestone

#### **Properties and qualities**

*Slope:* 6 to 12 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Well drained

## Custom Soil Resource Report

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high  
(0.60 to 2.00 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water capacity:* Moderate (about 8.8 inches)

### Interpretive groups

*Farmland classification:* Farmland of statewide importance

*Land capability (nonirrigated):* 3e

*Hydrologic Soil Group:* B

### Typical profile

*0 to 8 inches:* Silt loam

*8 to 28 inches:* Silty clay loam

*28 to 42 inches:* Very gravelly silty clay loam

*42 to 99 inches:* Gravelly clay

## Description of Baxter

### Setting

*Landform:* Ridges

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Concave

*Across-slope shape:* Linear

*Parent material:* Clayey residuum weathered from cherty limestone

### Properties and qualities

*Slope:* 6 to 12 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Well drained

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high  
(0.60 to 2.00 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water capacity:* Moderate (about 7.9 inches)

### Interpretive groups

*Farmland classification:* Farmland of statewide importance

*Land capability (nonirrigated):* 3e

*Hydrologic Soil Group:* B

### Typical profile

*0 to 5 inches:* Gravelly silt loam

*5 to 17 inches:* Gravelly silt loam

*17 to 75 inches:* Gravelly silty clay

*75 to 96 inches:* Clay

## Minor Components

### Nolin

*Percent of map unit:* 5 percent

*Landform:* Flood plains

### Vertrees

*Percent of map unit:* 5 percent

## Custom Soil Resource Report

### Other soils

*Percent of map unit: 3 percent*

## Ln—Lindside silt loam

### Map Unit Setting

*Elevation: 390 to 680 feet*

*Mean annual precipitation: 43 to 58 inches*

*Mean annual air temperature: 45 to 68 degrees F*

*Frost-free period: 164 to 194 days*

### Map Unit Composition

*Lindside, occasionally flooded, and similar soils: 90 percent*

*Minor components: 10 percent*

### Description of Lindside, Occasionally Flooded

#### Setting

*Landform: Flood plains, closed depressions*

*Down-slope shape: Concave*

*Across-slope shape: Linear*

*Parent material: Mixed fine-silty alluvium*

#### Properties and qualities

*Slope: 0 to 2 percent*

*Depth to restrictive feature: More than 80 inches*

*Drainage class: Moderately well drained*

*Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high  
(0.20 to 2.00 in/hr)*

*Depth to water table: About 18 to 36 inches*

*Frequency of flooding: OccasionalNone*

*Frequency of ponding: None*

*Available water capacity: Very high (about 12.2 inches)*

#### Interpretive groups

*Farmland classification: All areas are prime farmland*

*Land capability (nonirrigated): 2w*

*Hydrologic Soil Group: B/D*

#### Typical profile

*0 to 8 inches: Silt loam*

*8 to 60 inches: Silty clay loam*

### Minor Components

#### Other soils

*Percent of map unit: 4 percent*

#### Nolin

*Percent of map unit: 3 percent*

## Custom Soil Resource Report

*Landform:* Flood plains

### **Newark**

*Percent of map unit:* 3 percent

*Landform:* Flood plains

## **NhB—Nicholson silt loam, 2 to 6 percent slopes**

### **Map Unit Setting**

*Elevation:* 410 to 790 feet

*Mean annual precipitation:* 43 to 58 inches

*Mean annual air temperature:* 45 to 68 degrees F

*Frost-free period:* 164 to 194 days

### **Map Unit Composition**

*Nicholson and similar soils:* 85 percent

*Minor components:* 15 percent

### **Description of Nicholson**

#### **Setting**

*Landform:* Ridges

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Interfluve

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Thin fine-silty noncalcareous loess over clayey residuum weathered from limestone

#### **Properties and qualities**

*Slope:* 2 to 6 percent

*Depth to restrictive feature:* 16 to 30 inches to fragipan

*Drainage class:* Moderately well drained

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)

*Depth to water table:* About 18 to 30 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water capacity:* Low (about 4.6 inches)

#### **Interpretive groups**

*Farmland classification:* All areas are prime farmland

*Land capability (nonirrigated):* 2e

*Hydrologic Soil Group:* D

#### **Typical profile**

*0 to 8 inches:* Silt loam

*8 to 23 inches:* Silty clay loam

*23 to 42 inches:* Silty clay loam

*42 to 70 inches:* Silty clay



**Minor Components**

**Crider**

*Percent of map unit: 5 percent*

**Lawrence**

*Percent of map unit: 5 percent*

*Landform: Stream terraces*

**Other soils**

*Percent of map unit: 5 percent*

**No—Nolin silt loam**

**Map Unit Setting**

*Elevation: 400 to 780 feet*

*Mean annual precipitation: 43 to 58 inches*

*Mean annual air temperature: 45 to 68 degrees F*

*Frost-free period: 164 to 194 days*

**Map Unit Composition**

*Nolin, occasionally flooded, and similar soils: 90 percent*

*Minor components: 10 percent*

**Description of Nolin, Occasionally Flooded**

**Setting**

*Landform: Flood plains, closed depressions*

*Down-slope shape: Concave*

*Across-slope shape: Linear*

*Parent material: Mixed fine-silty alluvium*

**Properties and qualities**

*Slope: 0 to 3 percent*

*Depth to restrictive feature: More than 80 inches*

*Drainage class: Well drained*

*Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high  
(0.60 to 2.00 in/hr)*

*Depth to water table: About 36 to 63 inches*

*Frequency of flooding: OccasionalNone*

*Frequency of ponding: None*

*Available water capacity: Very high (about 12.6 inches)*

**Interpretive groups**

*Farmland classification: All areas are prime farmland*

*Land capability (nonirrigated): 2w*

*Hydrologic Soil Group: C*

**Typical profile**

*0 to 9 inches: Silt loam*

*9 to 63 inches: Silt loam*

**Minor Components**

**Lindside**

*Percent of map unit: 5 percent*  
*Landform: Flood plains*

**Other soils**

*Percent of map unit: 5 percent*

**PmB—Pembroke silt loam, 2 to 6 percent slopes**

**Map Unit Setting**

*Elevation: 410 to 710 feet*  
*Mean annual precipitation: 43 to 58 inches*  
*Mean annual air temperature: 45 to 68 degrees F*  
*Frost-free period: 164 to 194 days*

**Map Unit Composition**

*Pembroke and similar soils: 85 percent*  
*Minor components: 15 percent*

**Description of Pembroke**

**Setting**

*Landform: Ridges*  
*Landform position (two-dimensional): Summit*  
*Landform position (three-dimensional): Interfluve*  
*Down-slope shape: Linear*  
*Across-slope shape: Linear*  
*Parent material: Thin fine-silty noncalcareous loess over clayey residuum weathered from limestone*

**Properties and qualities**

*Slope: 2 to 6 percent*  
*Depth to restrictive feature: More than 80 inches*  
*Drainage class: Well drained*  
*Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)*  
*Depth to water table: More than 80 inches*  
*Frequency of flooding: None*  
*Frequency of ponding: None*  
*Available water capacity: High (about 10.9 inches)*

**Interpretive groups**

*Farmland classification: All areas are prime farmland*  
*Land capability (nonirrigated): 2e*  
*Hydrologic Soil Group: B*

**Typical profile**

*0 to 8 inches: Silt loam*  
*8 to 31 inches: Silty clay loam*

## Custom Soil Resource Report

31 to 93 inches: Silty clay

### Minor Components

#### Nolin

*Percent of map unit:* 5 percent

*Landform:* Depressions, flood plains

#### Crider

*Percent of map unit:* 5 percent

#### Fredonia

*Percent of map unit:* 5 percent

## PmC—Pembroke silt loam, 6 to 12 percent slopes

### Map Unit Setting

*Elevation:* 400 to 710 feet

*Mean annual precipitation:* 43 to 58 inches

*Mean annual air temperature:* 45 to 68 degrees F

*Frost-free period:* 164 to 194 days

### Map Unit Composition

*Pembroke and similar soils:* 85 percent

*Minor components:* 15 percent

### Description of Pembroke

#### Setting

*Landform:* Ridges

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Convex

*Across-slope shape:* Linear

*Parent material:* Thin fine-silty noncalcareous loess over clayey residuum weathered from limestone

#### Properties and qualities

*Slope:* 6 to 12 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Well drained

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.60 to 2.00 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water capacity:* High (about 10.9 inches)

#### Interpretive groups

*Farmland classification:* Farmland of statewide importance

*Land capability (nonirrigated):* 3e

*Hydrologic Soil Group:* B

**Typical profile**

*0 to 8 inches: Silt loam  
8 to 31 inches: Silty clay loam  
31 to 93 inches: Silty clay*

**Minor Components**

**Vertrees**

*Percent of map unit: 5 percent*

**Baxter**

*Percent of map unit: 5 percent*

**Fredonia**

*Percent of map unit: 5 percent*

**VeC—Vertrees silty clay loam, 6 to 12 percent slopes**

**Map Unit Setting**

*Elevation: 420 to 720 feet  
Mean annual precipitation: 43 to 58 inches  
Mean annual air temperature: 45 to 68 degrees F  
Frost-free period: 164 to 194 days*

**Map Unit Composition**

*Vertrees and similar soils: 85 percent  
Minor components: 15 percent*

**Description of Vertrees**

**Setting**

*Landform: Ridges  
Landform position (two-dimensional): Backslope  
Landform position (three-dimensional): Side slope  
Down-slope shape: Convex  
Across-slope shape: Linear  
Parent material: Clayey residuum weathered from limestone*

**Properties and qualities**

*Slope: 6 to 12 percent  
Depth to restrictive feature: More than 80 inches  
Drainage class: Well drained  
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)  
Depth to water table: More than 80 inches  
Frequency of flooding: None  
Frequency of ponding: None  
Available water capacity: High (about 9.7 inches)*

**Interpretive groups**

*Farmland classification: Farmland of statewide importance*

## Custom Soil Resource Report

*Land capability (nonirrigated): 3e*  
*Hydrologic Soil Group: C*

### **Typical profile**

*0 to 8 inches: Silty clay loam*  
*8 to 72 inches: Clay*

### **Minor Components**

#### **Baxter**

*Percent of map unit: 5 percent*

#### **Pembroke**

*Percent of map unit: 5 percent*

#### **Other soils**

*Percent of map unit: 5 percent*

# References

---

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. <http://soils.usda.gov/>

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. <http://soils.usda.gov/>

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. <http://soils.usda.gov/>

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. <http://soils.usda.gov/>

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.glti.nrcs.usda.gov/>

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. <http://soils.usda.gov/>

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. <http://soils.usda.gov/>

## Custom Soil Resource Report

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210.

# Glossary

---

Many of the terms relating to landforms, geology, and geomorphology are defined in more detail in the "[National Soil Survey Handbook](#)."

## **ABC soil**

A soil having an A, a B, and a C horizon.

## **Ablation till**

Loose, relatively permeable earthy material deposited during the downwasting of nearly static glacial ice, either contained within or accumulated on the surface of the glacier.

## **AC soil**

A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

## **Aeration, soil**

The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

## **Aggregate, soil**

Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

## **Alkali (sodic) soil**

A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

## **Alluvial cone**

A semiconical type of alluvial fan having very steep slopes. It is higher, narrower, and steeper than a fan and is composed of coarser and thicker layers of material deposited by a combination of alluvial episodes and (to a much lesser degree) landslides (debris flow). The coarsest materials tend to be concentrated at the apex of the cone.



**Alluvial fan**

A low, outspread mass of loose materials and/or rock material, commonly with gentle slopes. It is shaped like an open fan or a segment of a cone. The material was deposited by a stream at the place where it issues from a narrow mountain valley or upland valley or where a tributary stream is near or at its junction with the main stream. The fan is steepest near its apex, which points upstream, and slopes gently and convexly outward (downstream) with a gradual decrease in gradient.

**Alluvium**

Unconsolidated material, such as gravel, sand, silt, clay, and various mixtures of these, deposited on land by running water.

**Alpha,alpha-dipyridyl**

A compound that when dissolved in ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction implies reducing conditions and the likely presence of redoximorphic features.

**Animal unit month (AUM)**

The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

**Aquic conditions**

Current soil wetness characterized by saturation, reduction, and redoximorphic features.

**Argillic horizon**

A subsoil horizon characterized by an accumulation of illuvial clay.

**Arroyo**

The flat-floored channel of an ephemeral stream, commonly with very steep to vertical banks cut in unconsolidated material. It is usually dry but can be transformed into a temporary watercourse or short-lived torrent after heavy rain within the watershed.

**Aspect**

The direction toward which a slope faces. Also called slope aspect.

**Association, soil**

A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

**Available water capacity (available moisture capacity)**

The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

## Custom Soil Resource Report

*Very low:* 0 to 3

*Low:* 3 to 6

*Moderate:* 6 to 9

*High:* 9 to 12

*Very high:* More than 12

### **Backslope**

The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

### **Backswamp**

A flood-plain landform. Extensive, marshy or swampy, depressed areas of flood plains between natural levees and valley sides or terraces.

### **Badland**

A landscape that is intricately dissected and characterized by a very fine drainage network with high drainage densities and short, steep slopes and narrow interfluves. Badlands develop on surfaces that have little or no vegetative cover overlying unconsolidated or poorly cemented materials (clays, silts, or sandstones) with, in some cases, soluble minerals, such as gypsum or halite.

### **Bajada**

A broad, gently inclined alluvial piedmont slope extending from the base of a mountain range out into a basin and formed by the lateral coalescence of a series of alluvial fans. Typically, it has a broadly undulating transverse profile, parallel to the mountain front, resulting from the convexities of component fans. The term is generally restricted to constructional slopes of intermontane basins.

### **Basal area**

The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

### **Base saturation**

The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

### **Base slope (geomorphology)**

A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

### **Bedding plane**

A planar or nearly planar bedding surface that visibly separates each successive layer of stratified sediment or rock (of the same or different lithology) from the preceding or following layer; a plane of deposition. It commonly marks a change

in the circumstances of deposition and may show a parting, a color difference, a change in particle size, or various combinations of these. The term is commonly applied to any bedding surface, even one that is conspicuously bent or deformed by folding.

**Bedding system**

A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

**Bedrock**

The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

**Bedrock-controlled topography**

A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

**Bench terrace**

A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

**Bisequum**

Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

**Blowout (map symbol)**

A saucer-, cup-, or trough-shaped depression formed by wind erosion on a preexisting dune or other sand deposit, especially in an area of shifting sand or loose soil or where protective vegetation is disturbed or destroyed. The adjoining accumulation of sand derived from the depression, where recognizable, is commonly included. Blowouts are commonly small.

**Borrow pit (map symbol)**

An open excavation from which soil and underlying material have been removed, usually for construction purposes.

**Bottom land**

An informal term loosely applied to various portions of a flood plain.

**Boulders**

Rock fragments larger than 2 feet (60 centimeters) in diameter.

**Breaks**

A landscape or tract of steep, rough or broken land dissected by ravines and gullies and marking a sudden change in topography.

**Breast height**

An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

**Brush management**

Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

**Butte**

An isolated, generally flat-topped hill or mountain with relatively steep slopes and talus or precipitous cliffs and characterized by summit width that is less than the height of bounding escarpments; commonly topped by a caprock of resistant material and representing an erosion remnant carved from flat-lying rocks.

**Cable yarding**

A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

**Calcareous soil**

A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

**Caliche**

A general term for a prominent zone of secondary carbonate accumulation in surficial materials in warm, subhumid to arid areas. Caliche is formed by both geologic and pedologic processes. Finely crystalline calcium carbonate forms a nearly continuous surface-coating and void-filling medium in geologic (parent) materials. Cementation ranges from weak in nonindurated forms to very strong in indurated forms. Other minerals (e.g., carbonates, silicate, and sulfate) may occur as accessory cements. Most petrocalcic horizons and some calcic horizons are caliche.

**California bearing ratio (CBR)**

The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

**Canopy**

The leafy crown of trees or shrubs. (See Crown.)

**Canyon**

A long, deep, narrow valley with high, precipitous walls in an area of high local relief.

**Capillary water**

Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

**Catena**

A sequence, or “chain,” of soils on a landscape that formed in similar kinds of parent material and under similar climatic conditions but that have different characteristics as a result of differences in relief and drainage.

**Cation**

An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

**Cation-exchange capacity**

The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

**Catsteps**

See Terracettes.

**Cement rock**

Shaly limestone used in the manufacture of cement.

**Channery soil material**

Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

**Chemical treatment**

Control of unwanted vegetation through the use of chemicals.

**Chiseling**

Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

**Cirque**

A steep-walled, semicircular or crescent-shaped, half-bowl-like recess or hollow, commonly situated at the head of a glaciated mountain valley or high on the side of a mountain. It was produced by the erosive activity of a mountain glacier. It commonly contains a small round lake (tarn).

**Clay**

As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

**Clay depletions**

See Redoximorphic features.

**Clay film**

A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

**Clay spot (map symbol)**

A spot where the surface texture is silty clay or clay in areas where the surface layer of the soils in the surrounding map unit is sandy loam, loam, silt loam, or coarser.

**Claypan**

A dense, compact subsoil layer that contains much more clay than the overlying materials, from which it is separated by a sharply defined boundary. The layer restricts the downward movement of water through the soil. A claypan is commonly hard when dry and plastic and sticky when wet.

**Climax plant community**

The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

**Coarse textured soil**

Sand or loamy sand.

**Cobble (or cobblestone)**

A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

**Cobbly soil material**

Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

**COLE (coefficient of linear extensibility)**

See Linear extensibility.

**Colluvium**

Unconsolidated, unsorted earth material being transported or deposited on side slopes and/or at the base of slopes by mass movement (e.g., direct gravitational action) and by local, unconcentrated runoff.

**Complex slope**

Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

**Complex, soil**

A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

**Concretions**

See Redoximorphic features.

**Conglomerate**

A coarse grained, clastic sedimentary rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

**Conservation cropping system**

Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

**Conservation tillage**

A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

**Consistence, soil**

Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

**Contour stripcropping**

Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

**Control section**

The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

**Coprogenous earth (sedimentary peat)**

A type of limnic layer composed predominantly of fecal material derived from aquatic animals.

**Corrosion (geomorphology)**

A process of erosion whereby rocks and soil are removed or worn away by natural chemical processes, especially by the solvent action of running water, but also by other reactions, such as hydrolysis, hydration, carbonation, and oxidation.

**Corrosion (soil survey interpretations)**

Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

**Cover crop**

A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

**Crop residue management**

Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

**Cropping system**

Growing crops according to a planned system of rotation and management practices.

**Cross-slope farming**

Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

**Crown**

The upper part of a tree or shrub, including the living branches and their foliage.

**Cryoturbate**

A mass of soil or other unconsolidated earthy material moved or disturbed by frost action. It is typically coarser than the underlying material.

**Cuesta**

An asymmetric ridge capped by resistant rock layers of slight or moderate dip (commonly less than 15 percent slopes); a type of homocline produced by differential erosion of interbedded resistant and weak rocks. A cuesta has a long, gentle slope on one side (dip slope) that roughly parallels the inclined beds; on the other side, it has a relatively short and steep or clifflike slope (scarp) that cuts through the tilted rocks.

**Culmination of the mean annual increment (CMAI)**

The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age,



the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

**Cutbanks cave**

The walls of excavations tend to cave in or slough.

**Decreasers**

The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

**Deferred grazing**

Postponing grazing or resting grazing land for a prescribed period.

**Delta**

A body of alluvium having a surface that is fan shaped and nearly flat; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

**Dense layer**

A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

**Depression, closed (map symbol)**

A shallow, saucer-shaped area that is slightly lower on the landscape than the surrounding area and that does not have a natural outlet for surface drainage.

**Depth, soil**

Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

**Desert pavement**

A natural, residual concentration or layer of wind-polished, closely packed gravel, boulders, and other rock fragments mantling a desert surface. It forms where wind action and sheetwash have removed all smaller particles or where rock fragments have migrated upward through sediments to the surface. It typically protects the finer grained underlying material from further erosion.

**Diatomaceous earth**

A geologic deposit of fine, grayish siliceous material composed chiefly or entirely of the remains of diatoms.

**Dip slope**

A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

**Diversion (or diversion terrace)**

A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

**Divided-slope farming**

A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

**Drainage class (natural)**

Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained*. These classes are defined in the “Soil Survey Manual.”

**Drainage, surface**

Runoff, or surface flow of water, from an area.

**Drainageway**

A general term for a course or channel along which water moves in draining an area. A term restricted to relatively small, linear depressions that at some time move concentrated water and either do not have a defined channel or have only a small defined channel.

**Draw**

A small stream valley that generally is shallower and more open than a ravine or gulch and that has a broader bottom. The present stream channel may appear inadequate to have cut the drainageway that it occupies.

**Drift**

A general term applied to all mineral material (clay, silt, sand, gravel, and boulders) transported by a glacier and deposited directly by or from the ice or transported by running water emanating from a glacier. Drift includes unstratified material (till) that forms moraines and stratified deposits that form outwash plains, eskers, kames, varves, and glaciofluvial sediments. The term is generally applied to Pleistocene glacial deposits in areas that no longer contain glaciers.

**Drumlin**

A low, smooth, elongated oval hill, mound, or ridge of compact till that has a core of bedrock or drift. It commonly has a blunt nose facing the direction from which the ice approached and a gentler slope tapering in the other direction. The longer axis is parallel to the general direction of glacier flow. Drumlins are products of

## Custom Soil Resource Report

streamline (laminar) flow of glaciers, which molded the subglacial floor through a combination of erosion and deposition.

### **Duff**

A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

### **Dune**

A low mound, ridge, bank, or hill of loose, windblown granular material (generally sand), either barren and capable of movement from place to place or covered and stabilized with vegetation but retaining its characteristic shape.

### **Earthy fill**

See Mine spoil.

### **Ecological site**

An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

### **Eluviation**

The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

### **Endosaturation**

A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

### **Eolian deposit**

Sand-, silt-, or clay-sized clastic material transported and deposited primarily by wind, commonly in the form of a dune or a sheet of sand or loess.

### **Ephemeral stream**

A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

### **Episaturation**

A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

### **Erosion**

The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

**Erosion (accelerated)**

Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

**Erosion (geologic)**

Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

**Erosion pavement**

A surficial lag concentration or layer of gravel and other rock fragments that remains on the soil surface after sheet or rill erosion or wind has removed the finer soil particles and that tends to protect the underlying soil from further erosion.

**Erosion surface**

A land surface shaped by the action of erosion, especially by running water.

**Escarpment**

A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Most commonly applied to cliffs produced by differential erosion. Synonym: scarp.

**Escarpment, bedrock (map symbol)**

A relatively continuous and steep slope or cliff, produced by erosion or faulting, that breaks the general continuity of more gently sloping land surfaces. Exposed material is hard or soft bedrock.

**Escarpment, nonbedrock (map symbol)**

A relatively continuous and steep slope or cliff, generally produced by erosion but in some places produced by faulting, that breaks the continuity of more gently sloping land surfaces. Exposed earthy material is nonsoil or very shallow soil.

**Esker**

A long, narrow, sinuous, steep-sided ridge of stratified sand and gravel deposited as the bed of a stream flowing in an ice tunnel within or below the ice (subglacial) or between ice walls on top of the ice of a wasting glacier and left behind as high ground when the ice melted. Eskers range in length from less than a kilometer to more than 160 kilometers and in height from 3 to 30 meters.

**Extrusive rock**

Igneous rock derived from deep-seated molten matter (magma) deposited and cooled on the earth's surface.

**Fallow**

Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown.

## Custom Soil Resource Report

The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

### **Fan remnant**

A general term for landforms that are the remaining parts of older fan landforms, such as alluvial fans, that have been either dissected or partially buried.

### **Fertility, soil**

The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

### **Fibric soil material (peat)**

The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

### **Field moisture capacity**

The moisture content of a soil, expressed as a percentage of the oven-dry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity*, *normal moisture capacity*, or *capillary capacity*.

### **Fill slope**

A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

### **Fine textured soil**

Sandy clay, silty clay, or clay.

### **Firebreak**

An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

### **First bottom**

An obsolete, informal term loosely applied to the lowest flood-plain steps that are subject to regular flooding.

### **Flaggy soil material**

Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

### **Flagstone**

A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

**Flood plain**

The nearly level plain that borders a stream and is subject to flooding unless protected artificially.

**Flood-plain landforms**

A variety of constructional and erosional features produced by stream channel migration and flooding. Examples include backswamps, flood-plain splays, meanders, meander belts, meander scrolls, oxbow lakes, and natural levees.

**Flood-plain splay**

A fan-shaped deposit or other outspread deposit formed where an overloaded stream breaks through a levee (natural or artificial) and deposits its material (commonly coarse grained) on the flood plain.

**Flood-plain step**

An essentially flat, terrace-like alluvial surface within a valley that is frequently covered by floodwater from the present stream; any approximately horizontal surface still actively modified by fluvial scour and/or deposition. May occur individually or as a series of steps.

**Fluvial**

Of or pertaining to rivers or streams; produced by stream or river action.

**Foothills**

A region of steeply sloping hills that fringes a mountain range or high-plateau escarpment. The hills have relief of as much as 1,000 feet (300 meters).

**Footslope**

The concave surface at the base of a hillslope. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

**Forb**

Any herbaceous plant not a grass or a sedge.

**Forest cover**

All trees and other woody plants (underbrush) covering the ground in a forest.

**Forest type**

A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

**Fragipan**

A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

**Genesis, soil**

The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

**Gilgai**

Commonly, a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.

**Glaciofluvial deposits**

Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur in the form of outwash plains, valley trains, deltas, kames, eskers, and kame terraces.

**Glaciolacustrine deposits**

Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are bedded or laminated.

**Gleyed soil**

Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

**Graded stripcropping**

Growing crops in strips that grade toward a protected waterway.

**Grassed waterway**

A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

**Gravel**

Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

**Gravel pit (map symbol)**

An open excavation from which soil and underlying material have been removed and used, without crushing, as a source of sand or gravel.

**Gravelly soil material**

Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

**Gravelly spot (map symbol)**

A spot where the surface layer has more than 35 percent, by volume, rock fragments that are mostly less than 3 inches in diameter in an area that has less than 15 percent rock fragments.

**Green manure crop (agronomy)**

A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

**Ground water**

Water filling all the unblocked pores of the material below the water table.

**Gully (map symbol)**

A small, steep-sided channel caused by erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage whereas a rill is of lesser depth and can be smoothed over by ordinary tillage.

**Hard bedrock**

Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

**Hard to reclaim**

Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

**Hardpan**

A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

**Head slope (geomorphology)**

A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

**Hemic soil material (mucky peat)**

Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

**High-residue crops**

Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

**Hill**

A generic term for an elevated area of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline. Slopes are generally more than 15 percent. The distinction between a hill and a mountain is arbitrary and may depend on local usage.



### **Hillslope**

A generic term for the steeper part of a hill between its summit and the drainage line, valley flat, or depression floor at the base of a hill.

### **Horizon, soil**

A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

*O horizon:* An organic layer of fresh and decaying plant residue.

*L horizon:* A layer of organic and mineral limnic materials, including coprogenous earth (sedimentary peat), diatomaceous earth, and marl.

*A horizon:* The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

*E horizon:* The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

*B horizon:* The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

*C horizon:* The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

*Cr horizon:* Soft, consolidated bedrock beneath the soil.

*R layer:* Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

*M layer:* A root-limiting subsoil layer consisting of nearly continuous, horizontally oriented, human-manufactured materials.

*W layer:* A layer of water within or beneath the soil.

### **Humus**

The well decomposed, more or less stable part of the organic matter in mineral soils.

### **Hydrologic soil groups**

Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties include depth to a seasonal high water table, the infiltration rate, and depth to a layer that significantly restricts the downward movement of water. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

**Igneous rock**

Rock that was formed by cooling and solidification of magma and that has not been changed appreciably by weathering since its formation. Major varieties include plutonic and volcanic rock (e.g., andesite, basalt, and granite).

**Illuviation**

The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

**Impervious soil**

A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

**Increasesers**

Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasesers commonly are the shorter plants and the less palatable to livestock.

**Infiltration**

The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

**Infiltration capacity**

The maximum rate at which water can infiltrate into a soil under a given set of conditions.

**Infiltration rate**

The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

**Intake rate**

The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

- Very low:* Less than 0.2
- Low:* 0.2 to 0.4
- Moderately low:* 0.4 to 0.75
- Moderate:* 0.75 to 1.25
- Moderately high:* 1.25 to 1.75
- High:* 1.75 to 2.5
- Very high:* More than 2.5

### **Interfluve**

A landform composed of the relatively undissected upland or ridge between two adjacent valleys containing streams flowing in the same general direction. An elevated area between two drainageways that sheds water to those drainageways.

### **Interfluve (geomorphology)**

A geomorphic component of hills consisting of the uppermost, comparatively level or gently sloping area of a hill; shoulders of backwearing hillslopes can narrow the upland or can merge, resulting in a strongly convex shape.

### **Intermittent stream**

A stream, or reach of a stream, that does not flow year-round but that is commonly dry for 3 or more months out of 12 and whose channel is generally below the local water table. It flows only during wet periods or when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

### **Invaders**

On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

### **Iron depletions**

See Redoximorphic features.

### **Irrigation**

Application of water to soils to assist in production of crops. Methods of irrigation are:

*Basin:* Water is applied rapidly to nearly level plains surrounded by levees or dikes.

*Border:* Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

*Controlled flooding:* Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

*Corrugation:* Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

*Drip (or trickle):* Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

*Furrow:* Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

*Sprinkler:* Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

*Subirrigation:* Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

*Wild flooding:* Water, released at high points, is allowed to flow onto an area without controlled distribution.

**Kame**

A low mound, knob, hummock, or short irregular ridge composed of stratified sand and gravel deposited by a subglacial stream as a fan or delta at the margin of a melting glacier; by a supraglacial stream in a low place or hole on the surface of the glacier; or as a ponded deposit on the surface or at the margin of stagnant ice.

**Karst (topography)**

A kind of topography that formed in limestone, gypsum, or other soluble rocks by dissolution and that is characterized by closed depressions, sinkholes, caves, and underground drainage.

**Knoll**

A small, low, rounded hill rising above adjacent landforms.

**Ksat**

See Saturated hydraulic conductivity.

**Lacustrine deposit**

Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

**Lake plain**

A nearly level surface marking the floor of an extinct lake filled by well sorted, generally fine textured, stratified deposits, commonly containing varves.

**Lake terrace**

A narrow shelf, partly cut and partly built, produced along a lakeshore in front of a scarp line of low cliffs and later exposed when the water level falls.

**Landfill (map symbol)**

An area of accumulated waste products of human habitation, either above or below natural ground level.

**Landslide**

A general, encompassing term for most types of mass movement landforms and processes involving the downslope transport and outward deposition of soil and rock materials caused by gravitational forces; the movement may or may not involve saturated materials. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

**Large stones**

Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

**Lava flow (map symbol)**

A solidified, commonly lobate body of rock formed through lateral, surface outpouring of molten lava from a vent or fissure.

**Leaching**

The removal of soluble material from soil or other material by percolating water.

**Levee (map symbol)**

An embankment that confines or controls water, especially one built along the banks of a river to prevent overflow onto lowlands.

**Linear extensibility**

Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at  $1/3$ - or  $1/10$ -bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

**Liquid limit**

The moisture content at which the soil passes from a plastic to a liquid state.

**Loam**

Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

**Loess**

Material transported and deposited by wind and consisting dominantly of silt-sized particles.

**Low strength**

The soil is not strong enough to support loads.

**Low-residue crops**

Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

**Marl**

An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal proportions; formed primarily under freshwater lacustrine conditions but also formed in more saline environments.

**Marsh or swamp (map symbol)**

A water-saturated, very poorly drained area that is intermittently or permanently covered by water. Sedges, cattails, and rushes are the dominant vegetation in marshes, and trees or shrubs are the dominant vegetation in swamps. Not used in map units where the named soils are poorly drained or very poorly drained.

**Mass movement**

A generic term for the dislodgment and downslope transport of soil and rock material as a unit under direct gravitational stress.

**Masses**

See Redoximorphic features.

**Meander belt**

The zone within which migration of a meandering channel occurs; the flood-plain area included between two imaginary lines drawn tangential to the outer bends of active channel loops.

**Meander scar**

A crescent-shaped, concave or linear mark on the face of a bluff or valley wall, produced by the lateral erosion of a meandering stream that impinged upon and undercut the bluff.

**Meander scroll**

One of a series of long, parallel, close-fitting, crescent-shaped ridges and troughs formed along the inner bank of a stream meander as the channel migrated laterally down-valley and toward the outer bank.

**Mechanical treatment**

Use of mechanical equipment for seeding, brush management, and other management practices.

**Medium textured soil**

Very fine sandy loam, loam, silt loam, or silt.

**Mesa**

A broad, nearly flat topped and commonly isolated landmass bounded by steep slopes or precipitous cliffs and capped by layers of resistant, nearly horizontal rocky material. The summit width is characteristically greater than the height of the bounding escarpments.

**Metamorphic rock**

Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement at depth in the earth's crust. Nearly all such rocks are crystalline.

**Mine or quarry (map symbol)**

An open excavation from which soil and underlying material have been removed and in which bedrock is exposed. Also denotes surface openings to underground mines.

**Mine spoil**

An accumulation of displaced earthy material, rock, or other waste material removed during mining or excavation. Also called earthy fill.

**Mineral soil**

Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

**Minimum tillage**

Only the tillage essential to crop production and prevention of soil damage.

**Miscellaneous area**

A kind of map unit that has little or no natural soil and supports little or no vegetation.

**Miscellaneous water (map symbol)**

Small, constructed bodies of water that are used for industrial, sanitary, or mining applications and that contain water most of the year.

**Moderately coarse textured soil**

Coarse sandy loam, sandy loam, or fine sandy loam.

**Moderately fine textured soil**

Clay loam, sandy clay loam, or silty clay loam.

**Mollic epipedon**

A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

**Moraine**

In terms of glacial geology, a mound, ridge, or other topographically distinct accumulation of unsorted, unstratified drift, predominantly till, deposited primarily by the direct action of glacial ice in a variety of landforms. Also, a general term for a landform composed mainly of till (except for kame moraines, which are composed mainly of stratified outwash) that has been deposited by a glacier. Some types of moraines are disintegration, end, ground, kame, lateral, recessional, and terminal.

**Morphology, soil**

The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

**Mottling, soil**

Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few*, *common*, and *many*; size—*fine*, *medium*, and *coarse*; and contrast—*faint*, *distinct*, and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

**Mountain**

A generic term for an elevated area of the land surface, rising more than 1,000 feet (300 meters) above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range. Mountains are formed primarily by tectonic activity and/or volcanic action but can also be formed by differential erosion.

**Muck**

Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

**Mucky peat**

See Hemic soil material.

**Mudstone**

A blocky or massive, fine grained sedimentary rock in which the proportions of clay and silt are approximately equal. Also, a general term for such material as clay, silt, claystone, siltstone, shale, and argillite and that should be used only when the amounts of clay and silt are not known or cannot be precisely identified.

**Munsell notation**

A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

**Natric horizon**

A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

**Neutral soil**

A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

**Nodules**

See Redoximorphic features.

**Nose slope (geomorphology)**

A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent. Nose slopes consist dominantly of colluvium and slope-wash sediments (for example, slope alluvium).

**Nutrient, plant**

Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.



**Organic matter**

Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

*Very low:* Less than 0.5 percent

*Low:* 0.5 to 1.0 percent

*Moderately low:* 1.0 to 2.0 percent

*Moderate:* 2.0 to 4.0 percent

*High:* 4.0 to 8.0 percent

*Very high:* More than 8.0 percent

**Outwash**

Stratified and sorted sediments (chiefly sand and gravel) removed or “washed out” from a glacier by meltwater streams and deposited in front of or beyond the end moraine or the margin of a glacier. The coarser material is deposited nearer to the ice.

**Outwash plain**

An extensive lowland area of coarse textured glaciofluvial material. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

**Paleoterrace**

An erosional remnant of a terrace that retains the surface form and alluvial deposits of its origin but was not emplaced by, and commonly does not grade to, a present-day stream or drainage network.

**Pan**

A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan*, *fragipan*, *claypan*, *plowpan*, and *traffic pan*.

**Parent material**

The unconsolidated organic and mineral material in which soil forms.

**Peat**

Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

**Ped**

An individual natural soil aggregate, such as a granule, a prism, or a block.

**Pedisediment**

A layer of sediment, eroded from the shoulder and backslope of an erosional slope, that lies on and is being (or was) transported across a gently sloping erosional surface at the foot of a receding hill or mountain slope.

**Pedon**

The smallest volume that can be called “a soil.” A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

**Percolation**

The movement of water through the soil.

**Perennial water (map symbol)**

Small, natural or constructed lakes, ponds, or pits that contain water most of the year.

**Permafrost**

Ground, soil, or rock that remains at or below 0 degrees C for at least 2 years. It is defined on the basis of temperature and is not necessarily frozen.

**pH value**

A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

**Phase, soil**

A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

**Piping**

Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

**Pitting**

Pits caused by melting around ice. They form on the soil after plant cover is removed.

**Plastic limit**

The moisture content at which a soil changes from semisolid to plastic.

**Plasticity index**

The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

**Plateau (geomorphology)**

A comparatively flat area of great extent and elevation; specifically, an extensive land region that is considerably elevated (more than 100 meters) above the adjacent lower lying terrain, is commonly limited on at least one side by an abrupt descent, and has a flat or nearly level surface. A comparatively large part of a plateau surface is near summit level.

**Playa**

The generally dry and nearly level lake plain that occupies the lowest parts of closed depressions, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff. Playa deposits are fine grained and may or may not have a high water table and saline conditions.

**Plinthite**

The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

**Plowpan**

A compacted layer formed in the soil directly below the plowed layer.

**Ponding**

Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

**Poorly graded**

Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

**Pore linings**

See Redoximorphic features.

**Potential native plant community**

See Climax plant community.

**Potential rooting depth (effective rooting depth)**

Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

**Prescribed burning**

Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

**Productivity, soil**

The capability of a soil for producing a specified plant or sequence of plants under specific management.

**Profile, soil**

A vertical section of the soil extending through all its horizons and into the parent material.

### **Proper grazing use**

Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

### **Rangeland**

Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

### **Reaction, soil**

A measure of acidity or alkalinity of a soil, expressed as pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

*Ultra acid:* Less than 3.5

*Extremely acid:* 3.5 to 4.4

*Very strongly acid:* 4.5 to 5.0

*Strongly acid:* 5.1 to 5.5

*Moderately acid:* 5.6 to 6.0

*Slightly acid:* 6.1 to 6.5

*Neutral:* 6.6 to 7.3

*Slightly alkaline:* 7.4 to 7.8

*Moderately alkaline:* 7.9 to 8.4

*Strongly alkaline:* 8.5 to 9.0

*Very strongly alkaline:* 9.1 and higher

### **Red beds**

Sedimentary strata that are mainly red and are made up largely of sandstone and shale.

### **Redoximorphic concentrations**

See Redoximorphic features.

### **Redoximorphic depletions**

See Redoximorphic features.

### **Redoximorphic features**

Redoximorphic features are associated with wetness and result from alternating periods of reduction and oxidation of iron and manganese compounds in the soil. Reduction occurs during saturation with water, and oxidation occurs when the soil is not saturated. Characteristic color patterns are created by these processes. The reduced iron and manganese ions may be removed from a soil if vertical or lateral fluxes of water occur, in which case there is no iron or manganese precipitation in that soil. Wherever the iron and manganese are oxidized and precipitated, they

form either soft masses or hard concretions or nodules. Movement of iron and manganese as a result of redoximorphic processes in a soil may result in redoximorphic features that are defined as follows:

1. Redoximorphic concentrations.—These are zones of apparent accumulation of iron-manganese oxides, including:
  - A. Nodules and concretions, which are cemented bodies that can be removed from the soil intact. Concretions are distinguished from nodules on the basis of internal organization. A concretion typically has concentric layers that are visible to the naked eye. Nodules do not have visible organized internal structure; *and*
  - B. Masses, which are noncemented concentrations of substances within the soil matrix; *and*
  - C. Pore linings, i.e., zones of accumulation along pores that may be either coatings on pore surfaces or impregnations from the matrix adjacent to the pores.
2. Redoximorphic depletions.—These are zones of low chroma (chromas less than those in the matrix) where either iron-manganese oxides alone or both iron-manganese oxides and clay have been stripped out, including:
  - A. Iron depletions, i.e., zones that contain low amounts of iron and manganese oxides but have a clay content similar to that of the adjacent matrix; *and*
  - B. Clay depletions, i.e., zones that contain low amounts of iron, manganese, and clay (often referred to as silt coatings or skeletalans).
3. Reduced matrix.—This is a soil matrix that has low chroma *in situ* but undergoes a change in hue or chroma within 30 minutes after the soil material has been exposed to air.

**Reduced matrix**

See Redoximorphic features.

**Regolith**

All unconsolidated earth materials above the solid bedrock. It includes material weathered in place from all kinds of bedrock and alluvial, glacial, eolian, lacustrine, and pyroclastic deposits.

**Relief**

The relative difference in elevation between the upland summits and the lowlands or valleys of a given region.

**Residuum (residual soil material)**

Unconsolidated, weathered or partly weathered mineral material that accumulated as bedrock disintegrated in place.

**Rill**

A very small, steep-sided channel resulting from erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. A rill generally is not an obstacle to wheeled vehicles and is shallow enough to be smoothed over by ordinary tillage.

**Riser**

The vertical or steep side slope (e.g., escarpment) of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural, steplike landforms, such as successive stream terraces.

**Road cut**

A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

**Rock fragments**

Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

**Rock outcrop (map symbol)**

An exposure of bedrock at the surface of the earth. Not used where the named soils of the surrounding map unit are shallow over bedrock or where "Rock outcrop" is a named component of the map unit.

**Root zone**

The part of the soil that can be penetrated by plant roots.

**Runoff**

The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

**Saline soil**

A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

**Saline spot (map symbol)**

An area where the surface layer has an electrical conductivity of 8 mmhos/cm more than the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has an electrical conductivity of 2 mmhos/cm or less.

**Sand**

As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

**Sandstone**

Sedimentary rock containing dominantly sand-sized particles.

**Sandy spot (map symbol)**

A spot where the surface layer is loamy fine sand or coarser in areas where the surface layer of the named soils in the surrounding map unit is very fine sandy loam or finer.

**Sapric soil material (muck)**

The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

**Saturated hydraulic conductivity (Ksat)**

The ease with which pores of a saturated soil transmit water. Formally, the proportionality coefficient that expresses the relationship of the rate of water movement to hydraulic gradient in Darcy's Law, a law that describes the rate of water movement through porous media. Commonly abbreviated as "Ksat." Terms describing saturated hydraulic conductivity are:

*Very high:* 100 or more micrometers per second (14.17 or more inches per hour)

*High:* 10 to 100 micrometers per second (1.417 to 14.17 inches per hour)

*Moderately high:* 1 to 10 micrometers per second (0.1417 inch to 1.417 inches per hour)

*Moderately low:* 0.1 to 1 micrometer per second (0.01417 to 0.1417 inch per hour)

*Low:* 0.01 to 0.1 micrometer per second (0.001417 to 0.01417 inch per hour)

*Very low:* Less than 0.01 micrometer per second (less than 0.001417 inch per hour).

To convert inches per hour to micrometers per second, multiply inches per hour by 7.0572. To convert micrometers per second to inches per hour, multiply micrometers per second by 0.1417.

**Saturation**

Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

**Scarification**

The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

**Sedimentary rock**

A consolidated deposit of clastic particles, chemical precipitates, or organic remains accumulated at or near the surface of the earth under normal low temperature and pressure conditions. Sedimentary rocks include consolidated equivalents of alluvium, colluvium, drift, and eolian, lacustrine, and marine deposits. Examples are sandstone, siltstone, mudstone, claystone, shale, conglomerate, limestone, dolomite, and coal.

**Sequum**

A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

**Series, soil**

A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

**Severely eroded spot (map symbol)**

An area where, on the average, 75 percent or more of the original surface layer has been lost because of accelerated erosion. Not used in map units in which “severely eroded,” “very severely eroded,” or “gullied” is part of the map unit name.

**Shale**

Sedimentary rock that formed by the hardening of a deposit of clay, silty clay, or silty clay loam and that has a tendency to split into thin layers.

**Sheet erosion**

The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

**Short, steep slope (map symbol)**

A narrow area of soil having slopes that are at least two slope classes steeper than the slope class of the surrounding map unit.

**Shoulder**

The convex, erosional surface near the top of a hillslope. A shoulder is a transition from summit to backslope.

**Shrink-swell**

The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

**Shrub-coppice dune**

A small, streamlined dune that forms around brush and clump vegetation.

**Side slope (geomorphology)**

A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel. Side slopes are dominantly colluvium and slope-wash sediments.

**Silica**

A combination of silicon and oxygen. The mineral form is called quartz.

**Silica-sesquioxide ratio**

The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.



**Silt**

As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

**Siltstone**

An indurated silt having the texture and composition of shale but lacking its fine lamination or fissility; a massive mudstone in which silt predominates over clay.

**Similar soils**

Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

**Sinkhole (map symbol)**

A closed, circular or elliptical depression, commonly funnel shaped, characterized by subsurface drainage and formed either by dissolution of the surface of underlying bedrock (e.g., limestone, gypsum, or salt) or by collapse of underlying caves within bedrock. Complexes of sinkholes in carbonate-rock terrain are the main components of karst topography.

**Site index**

A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

**Slickensides (pedogenic)**

Grooved, striated, and/or glossy (shiny) slip faces on structural peds, such as wedges; produced by shrink-swell processes, most commonly in soils that have a high content of expansive clays.

**Slide or slip (map symbol)**

A prominent landform scar or ridge caused by fairly recent mass movement or descent of earthy material resulting from failure of earth or rock under shear stress along one or several surfaces.

**Slope**

The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

**Slope alluvium**

Sediment gradually transported down the slopes of mountains or hills primarily by nonchannel alluvial processes (i.e., slope-wash processes) and characterized by particle sorting. Lateral particle sorting is evident on long slopes. In a profile sequence, sediments may be distinguished by differences in size and/or specific gravity of rock fragments and may be separated by stone lines. Burnished peds

and sorting of rounded or subrounded pebbles or cobbles distinguish these materials from unsorted colluvial deposits.

**Slow refill**

The slow filling of ponds, resulting from restricted water transmission in the soil.

**Slow water movement**

Restricted downward movement of water through the soil. See Saturated hydraulic conductivity.

**Sodic (alkali) soil**

A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

**Sodic spot (map symbol)**

An area where the surface layer has a sodium adsorption ratio that is at least 10 more than that of the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has a sodium adsorption ratio of 5 or less.

**Sodicity**

The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of  $\text{Na}^+$  to  $\text{Ca}^{++} + \text{Mg}^{++}$ . The degrees of sodicity and their respective ratios are:

*Slight:* Less than 13:1

*Moderate:* 13-30:1

*Strong:* More than 30:1

**Sodium adsorption ratio (SAR)**

A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

**Soft bedrock**

Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

**Soil**

A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief and by the passage of time.

**Soil separates**

Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

## Custom Soil Resource Report

*Very coarse sand:* 2.0 to 1.0

*Coarse sand:* 1.0 to 0.5

*Medium sand:* 0.5 to 0.25

*Fine sand:* 0.25 to 0.10

*Very fine sand:* 0.10 to 0.05

*Silt:* 0.05 to 0.002

*Clay:* Less than 0.002

### **Solum**

The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

### **Spoil area (map symbol)**

A pile of earthy materials, either smoothed or uneven, resulting from human activity.

### **Stone line**

In a vertical cross section, a line formed by scattered fragments or a discrete layer of angular and subangular rock fragments (commonly a gravel- or cobble-sized lag concentration) that formerly was draped across a topographic surface and was later buried by additional sediments. A stone line generally caps material that was subject to weathering, soil formation, and erosion before burial. Many stone lines seem to be buried erosion pavements, originally formed by sheet and rill erosion across the land surface.

### **Stones**

Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

### **Stony**

Refers to a soil containing stones in numbers that interfere with or prevent tillage.

### **Stony spot (map symbol)**

A spot where 0.01 to 0.1 percent of the soil surface is covered by rock fragments that are more than 10 inches in diameter in areas where the surrounding soil has no surface stones.

### **Strath terrace**

A type of stream terrace; formed as an erosional surface cut on bedrock and thinly mantled with stream deposits (alluvium).

### **Stream terrace**

One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel, originally formed near the level of the stream; represents

the remnants of an abandoned flood plain, stream bed, or valley floor produced during a former state of fluvial erosion or deposition.

### **Stripcropping**

Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

### **Structure, soil**

The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are:

*Platy*: Flat and laminated

*Prismatic*: Vertically elongated and having flat tops

*Columnar*: Vertically elongated and having rounded tops

*Angular blocky*: Having faces that intersect at sharp angles (planes)

*Subangular blocky*: Having subrounded and planar faces (no sharp angles)

*Granular*: Small structural units with curved or very irregular faces

Structureless soil horizons are defined as follows:

*Single grained*: Entirely noncoherent (each grain by itself), as in loose sand

*Massive*: Occurring as a coherent mass

### **Stubble mulch**

Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

### **Subsoil**

Technically, the B horizon; roughly, the part of the solum below plow depth.

### **Subsoiling**

Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

### **Substratum**

The part of the soil below the solum.

### **Subsurface layer**

Any surface soil horizon (A, E, AB, or EB) below the surface layer.

### **Summer fallow**

The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

**Summit**

The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

**Surface layer**

The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

**Surface soil**

The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

**Talus**

Rock fragments of any size or shape (commonly coarse and angular) derived from and lying at the base of a cliff or very steep rock slope. The accumulated mass of such loose broken rock formed chiefly by falling, rolling, or sliding.

**Taxadjuncts**

Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

**Terminal moraine**

An end moraine that marks the farthest advance of a glacier. It typically has the form of a massive arcuate or concentric ridge, or complex of ridges, and is underlain by till and other types of drift.

**Terrace (conservation)**

An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

**Terrace (geomorphology)**

A steplike surface, bordering a valley floor or shoreline, that represents the former position of a flood plain, lake, or seashore. The term is usually applied both to the relatively flat summit surface (tread) that was cut or built by stream or wave action and to the steeper descending slope (scarp or riser) that has graded to a lower base level of erosion.

**Terracettes**

Small, irregular steplike forms on steep hillslopes, especially in pasture, formed by creep or erosion of surficial materials that may be induced or enhanced by trampling of livestock, such as sheep or cattle.

**Texture, soil**

The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand*, *loamy sand*, *sandy loam*, *loam*, *silt loam*, *silt*, *sandy clay loam*, *clay loam*, *silty clay loam*, *sandy clay*, *silty clay*, and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying “coarse,” “fine,” or “very fine.”

**Thin layer**

Otherwise suitable soil material that is too thin for the specified use.

**Till**

Dominantly unsorted and nonstratified drift, generally unconsolidated and deposited directly by a glacier without subsequent reworking by meltwater, and consisting of a heterogeneous mixture of clay, silt, sand, gravel, stones, and boulders; rock fragments of various lithologies are embedded within a finer matrix that can range from clay to sandy loam.

**Till plain**

An extensive area of level to gently undulating soils underlain predominantly by till and bounded at the distal end by subordinate recessional or end moraines.

**Tilth, soil**

The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

**Toeslope**

The gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

**Topsoil**

The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

**Trace elements**

Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

**Tread**

The flat to gently sloping, topmost, laterally extensive slope of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural steplike landforms, such as successive stream terraces.

**Tuff**

A generic term for any consolidated or cemented deposit that is 50 percent or more volcanic ash.

**Upland**

An informal, general term for the higher ground of a region, in contrast with a low-lying adjacent area, such as a valley or plain, or for land at a higher elevation than the flood plain or low stream terrace; land above the footslope zone of the hillslope continuum.

**Valley fill**

The unconsolidated sediment deposited by any agent (water, wind, ice, or mass wasting) so as to fill or partly fill a valley.

**Variiegation**

Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

**Varve**

A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

**Very stony spot (map symbol)**

A spot where 0.1 to 3.0 percent of the soil surface is covered by rock fragments that are more than 10 inches in diameter in areas where the surface of the surrounding soil is covered by less than 0.01 percent stones.

**Water bars**

Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

**Weathering**

All physical disintegration, chemical decomposition, and biologically induced changes in rocks or other deposits at or near the earth's surface by atmospheric or biologic agents or by circulating surface waters but involving essentially no transport of the altered material.

**Well graded**

Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

**Wet spot (map symbol)**

A somewhat poorly drained to very poorly drained area that is at least two drainage classes wetter than the named soils in the surrounding map unit.

**Wilting point (or permanent wilting point)**

The moisture content of soil, on an oven-dry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

**Windthrow**

The uprooting and tipping over of trees by the wind.



## APPENDIX D

**KY 107 & I-24 Interchange Justification Study-US**  
Hopkinsville, KY 42240

Inquiry Number: 3703129.1s  
August 23, 2013

**EDR DataMap™ Area Study**

***Thank you for your business.***  
Please contact EDR at 1-800-352-0050  
with any questions or comments.

**Disclaimer - Copyright and Trademark Notice**

This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. **NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OF DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT.** Purchaser accepts this Report "AS IS". Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2013 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc., or its affiliates, is prohibited without prior written permission.

EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.

# EXECUTIVE SUMMARY

## TARGET PROPERTY INFORMATION

### ADDRESS

HOPKINSVILLE, KY 42240  
HOPKINSVILLE, KY 42240

## DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records within the requested search area for the following databases:

## FEDERAL RECORDS

NPL	National Priority List
Proposed NPL	Proposed National Priority List Sites
Delisted NPL	National Priority List Deletions
NPL LIENS	Federal Superfund Liens
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CERC-NFRAP	CERCLIS No Further Remedial Action Planned
LIENS 2	CERCLA Lien Information
CORRACTS	Corrective Action Report
RCRA-TSDF	RCRA - Treatment, Storage and Disposal
RCRA-LQG	RCRA - Large Quantity Generators
RCRA-SQG	RCRA - Small Quantity Generators
RCRA-CESQG	RCRA - Conditionally Exempt Small Quantity Generator
RCRA NonGen / NLR	RCRA - Non Generators
US ENG CONTROLS	Engineering Controls Sites List
US INST CONTROL	Sites with Institutional Controls
ERNS	Emergency Response Notification System
HMIRS	Hazardous Materials Information Reporting System
DOT OPS	Incident and Accident Data
US CDL	Clandestine Drug Labs
US BROWNFIELDS	A Listing of Brownfields Sites
DOD	Department of Defense Sites
FUDS	Formerly Used Defense Sites
LUCIS	Land Use Control Information System
CONSENT	Superfund (CERCLA) Consent Decrees
ROD	Records Of Decision
UMTRA	Uranium Mill Tailings Sites
DEBRIS REGION 9	Torres Martinez Reservation Illegal Dump Site Locations
ODI	Open Dump Inventory
US MINES	Mines Master Index File
TRIS	Toxic Chemical Release Inventory System
TSCA	Toxic Substances Control Act
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
SSTS	Section 7 Tracking Systems

## EXECUTIVE SUMMARY

ICIS.....	Integrated Compliance Information System
PADS.....	PCB Activity Database System
MLTS.....	Material Licensing Tracking System
RADINFO.....	Radiation Information Database
FINDS.....	Facility Index System/Facility Registry System
RAATS.....	RCRA Administrative Action Tracking System
RMP.....	Risk Management Plans
COAL ASH EPA.....	Coal Combustion Residues Surface Impoundments List
SCRD DRYCLEANERS.....	State Coalition for Remediation of Drycleaners Listing
US HIST CDL.....	National Clandestine Laboratory Register
PCB TRANSFORMER.....	PCB Transformer Registration Database
FEDERAL FACILITY.....	Federal Facility Site Information listing
US FIN ASSUR.....	Financial Assurance Information
EPA WATCH LIST.....	EPA WATCH LIST
PRP.....	Potentially Responsible Parties
2020 COR ACTION.....	2020 Corrective Action Program List
COAL ASH DOE.....	Steam-Electric Plant Operation Data
FEMA UST.....	Underground Storage Tank Listing
LEAD SMELTERS.....	Lead Smelter Sites
US AIRS.....	Aerometric Information Retrieval System Facility Subsystem

### **STATE AND LOCAL RECORDS**

SHWS.....	State Leads List
SWF/LF.....	Solid Waste Facilities List
UIC.....	UIC Information
SWRCY.....	Recycling Facilities
HIST LF.....	Historical Landfills
SB193.....	SB193 Branch Site Inventory List
UST.....	Underground Storage Tank Database
SPILLS.....	State spills
ENG CONTROLS.....	Engineering Controls Site Listing
INST CONTROL.....	State Superfund Database
VCP.....	Voluntary Cleanup Program Sites
DRYCLEANERS.....	Drycleaner Listing
BROWNFIELDS.....	Kentucky Brownfield Inventory
CDL.....	Clandestine Drug Lab Location Listing
NPDES.....	Permitted Facility Listing
AIRS.....	Permitted Airs Facility Listing
PSTEAF.....	Facility Ranking List
LEAD.....	Environmental Lead Program Report Tracking Database
COAL ASH.....	Coal Ash Disposal Sites

### **TRIBAL RECORDS**

INDIAN RESERV.....	Indian Reservations
INDIAN ODI.....	Report on the Status of Open Dumps on Indian Lands
INDIAN LUST.....	Leaking Underground Storage Tanks on Indian Land
INDIAN UST.....	Underground Storage Tanks on Indian Land
INDIAN VCP.....	Voluntary Cleanup Priority Listing

### **EDR PROPRIETARY RECORDS**

EDR MGP.....	EDR Proprietary Manufactured Gas Plants
EDR US Hist Auto Stat.....	EDR Exclusive Historic Gas Stations

## EXECUTIVE SUMMARY

EDR US Hist Cleaners..... EDR Exclusive Historic Dry Cleaners

### **SURROUNDING SITES: SEARCH RESULTS**

Surrounding sites were not identified.

Unmappable (orphan) sites are not considered in the foregoing analysis.

## **EXECUTIVE SUMMARY**

Please refer to the end of the findings report for unmapped orphan sites due to poor or inadequate address information.

MAP FINDINGS SUMMARY

<u>Database</u>	<u>Total Plotted</u>
<b><u>FEDERAL RECORDS</u></b>	
NPL	0
Proposed NPL	0
Delisted NPL	0
NPL LIENS	0
CERCLIS	0
CERC-NFRAP	0
LIENS 2	0
CORRACTS	0
RCRA-TSDF	0
RCRA-LQG	0
RCRA-SQG	0
RCRA-CESQG	0
RCRA NonGen / NLR	0
US ENG CONTROLS	0
US INST CONTROL	0
ERNS	0
HMIRS	0
DOT OPS	0
US CDL	0
US BROWNFIELDS	0
DOD	0
FUDS	0
LUCIS	0
CONSENT	0
ROD	0
UMTRA	0
DEBRIS REGION 9	0
ODI	0
US MINES	0
TRIS	0
TSCA	0
FTTS	0
HIST FTTS	0
SSTS	0
ICIS	0
PADS	0
MLTS	0
RADINFO	0
FINDS	0
RAATS	0
RMP	0
COAL ASH EPA	0
SCRD DRYCLEANERS	0
US HIST CDL	0
PCB TRANSFORMER	0
FEDERAL FACILITY	0
US FIN ASSUR	0
EPA WATCH LIST	0

MAP FINDINGS SUMMARY

<u>Database</u>	<u>Total Plotted</u>
PRP	0
2020 COR ACTION	0
COAL ASH DOE	0
FEMA UST	0
LEAD SMELTERS	0
US AIRS	0
<b><u>STATE AND LOCAL RECORDS</u></b>	
SHWS	0
SWF/LF	0
UIC	0
SWRCY	0
HIST LF	0
SB193	0
UST	0
SPILLS	0
ENG CONTROLS	0
INST CONTROL	0
VCP	0
DRYCLEANERS	0
BROWNFIELDS	0
CDL	0
NPDES	0
AIRS	0
PSTEAF	0
LEAD	0
COAL ASH	0
<b><u>TRIBAL RECORDS</u></b>	
INDIAN RESERV	0
INDIAN ODI	0
INDIAN LUST	0
INDIAN UST	0
INDIAN VCP	0
<b><u>EDR PROPRIETARY RECORDS</u></b>	
EDR MGP	0
EDR US Hist Auto Stat	0
EDR US Hist Cleaners	0

NOTES:

Sites may be listed in more than one database



MAP FINDINGS

Map ID  
Direction  
Distance  
Distance (ft.)Site

EDR ID Number

Database(s) EPA ID Number

NO SITES FOUND

## ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
HERNDON	U001184176	ROBERT HESTER SERVICE STATION	HWY 107	42236	UST
HERNDON	S107602750	MILES CAUGHEY	7309 BINNS MILL RD	42236	SWF/LF
HOPKINSVILLE	U001185227	NORA MATHEWS	RT 1	42240	UST
HOPKINSVILLE	S106884455	TEXACO BULK - HOPKINSVILLE	14TH ST & CSX RAILROAD	42240	SHWS
HOPKINSVILLE	U003974446	CRAWFORDS GROCERY	HWY 508	42240	UST
HOPKINSVILLE	1003868089	PENNYRILE INDUSTRIAL	HWY 68	42240	CERC-NFRAP
HOPKINSVILLE	1001459964	CHRISTIAN COUNTY ROAD DEPT	2701 HWY 68 E	42240	RCRA NonGen / NLR, FINDS
HOPKINSVILLE	U003416275	CHRISTIAN CO ROAD DEPT	2701 HWY 68 E	42240	UST
HOPKINSVILLE	U003974476	RED BRIDGE GROCERY	HWY 800	42240	UST
HOPKINSVILLE	U001182009	FRANK M CHRISTOPHER	RT 9	42240	UST
HOPKINSVILLE	S108083574	TG AUTOMOTIVE SEALING KY	501 FRANK YOST LN	42240	NPDES, AIRS
HOPKINSVILLE	1011825223	FP INTERNATIONAL - HOPKINSVILLE, KY	1 GRAHAM WAY	42240	RMP
HOPKINSVILLE	1011827724	HOPKINSVILLE, KY SATELLITE	INDUSTRIAL DR	42240	RMP
HOPKINSVILLE	S113192548	KY 756 RELOCATION	JUNCTION OF KY 756TH & USHY 41A	42240	NPDES
HOPKINSVILLE	1015945902	KY 756 RELOCATION	JUNCTION OF KY 756TH & USHY 41A		FINDS
HOPKINSVILLE	S107602223	CLARKE PETROLEUM ELECTRONICS	MADISONVILLE RD	42240	SWF/LF
HOPKINSVILLE	S109229518	HOPKINSVILLE WATER ENVIRONMENT AUTHORITY	1000 METCALFE LN	42240	SWF/LF, NPDES
HOPKINSVILLE	S103593348	CHRISTIAN COUNTY CONVENIENCE CENTER	E MOUNT ZOAR RD	42240	HIST LF
HOPKINSVILLE	S107602215	CHRISTIAN CO CONVENIENCE CENTER	E MOUNT ZOAR RD	42240	SWF/LF
HOPKINSVILLE	S107602154	BROWNS TIRES	5240 MOUNT ZOAR HOPKINSVILLE RD	42240	SWF/LF
HOPKINSVILLE	S109012557	CHRISTIAN CO RESIDENT ENGINEERS OFFICE	1010 OLD CONCORD LN	42240	SHWS
HOPKINSVILLE	S106884445	SHILOH CHURCH RD DRUMS	SHILOH CHURCH RD	42240	SHWS
HOPKINSVILLE	S110350091	HOPKINSVILLE, KY 161KV SUBSTAT	SUBSTATION RD	42240	SPILLS, NPDES
HOPKINSVILLE	1012223034	HOPKINSVILLE, KY 161KV SUBSTAT	255 SUBSTATION RD		FINDS
HOPKINSVILLE	S109943897	HOWARD NED GRAY PROPERTY	TOM BURSE RD	42240	SHWS
HOPKINSVILLE	U003555423	SPAIN PROPERTY	USHY 41A	42240	UST
OAK GROVE	U000807423	MONARCH OIL	6500 HWY 41A	42262	SB193, UST, PSTEAF
OAK GROVE	U000718721	RAES CAR CARE CENTER	HWY 41A	42262	UST
OAK GROVE	S107602889	PO BOYS USED TIRES	15030 FORT CAMPBELL BLVD	42262	SWF/LF
OAK GROVE	S113704594	OAK GROVE LANDFARM	NONE	42262	SWF/LF
OAK GROVE	U003070961	ABANDONED US 41 A STATION	USHY 41 A	42262	UST
OAK GROVE	U000811173	AMERICAN BREAD COMPANY	USHY 41 A	42262	UST
OAK GROVE	1005579487	OAK GROVE CONCRETE MIX CO	USHY 41A	42262	FINDS, UST

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

**Number of Days to Update:** Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

## FEDERAL RECORDS

### NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 04/26/2013	Source: EPA
Date Data Arrived at EDR: 05/09/2013	Telephone: N/A
Date Made Active in Reports: 07/10/2013	Last EDR Contact: 05/09/2013
Number of Days to Update: 62	Next Scheduled EDR Contact: 07/22/2013
	Data Release Frequency: Quarterly

### NPL Site Boundaries

#### Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)  
Telephone: 202-564-7333

EPA Region 1  
Telephone 617-918-1143

EPA Region 6  
Telephone: 214-655-6659

EPA Region 3  
Telephone 215-814-5418

EPA Region 7  
Telephone: 913-551-7247

EPA Region 4  
Telephone 404-562-8033

EPA Region 8  
Telephone: 303-312-6774

EPA Region 5  
Telephone 312-886-6686

EPA Region 9  
Telephone: 415-947-4246

EPA Region 10  
Telephone 206-553-8665

### Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 04/26/2013	Source: EPA
Date Data Arrived at EDR: 05/09/2013	Telephone: N/A
Date Made Active in Reports: 07/10/2013	Last EDR Contact: 05/09/2013
Number of Days to Update: 62	Next Scheduled EDR Contact: 07/22/2013
	Data Release Frequency: Quarterly

### DELISTED NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 04/26/2013	Source: EPA
Date Data Arrived at EDR: 05/09/2013	Telephone: N/A
Date Made Active in Reports: 07/10/2013	Last EDR Contact: 05/09/2013
Number of Days to Update: 62	Next Scheduled EDR Contact: 07/22/2013
	Data Release Frequency: Quarterly

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991	Source: EPA
Date Data Arrived at EDR: 02/02/1994	Telephone: 202-564-4267
Date Made Active in Reports: 03/30/1994	Last EDR Contact: 08/15/2011
Number of Days to Update: 56	Next Scheduled EDR Contact: 11/28/2011
	Data Release Frequency: No Update Planned

## CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 04/26/2013	Source: EPA
Date Data Arrived at EDR: 05/29/2013	Telephone: 703-412-9810
Date Made Active in Reports: 08/09/2013	Last EDR Contact: 05/29/2013
Number of Days to Update: 72	Next Scheduled EDR Contact: 09/09/2013
	Data Release Frequency: Quarterly

## CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 04/26/2013	Source: EPA
Date Data Arrived at EDR: 05/29/2013	Telephone: 703-412-9810
Date Made Active in Reports: 08/09/2013	Last EDR Contact: 05/29/2013
Number of Days to Update: 72	Next Scheduled EDR Contact: 05/09/2013
	Data Release Frequency: Quarterly

## LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/06/2013	Source: Environmental Protection Agency
Date Data Arrived at EDR: 04/25/2013	Telephone: 202-564-6023
Date Made Active in Reports: 05/10/2013	Last EDR Contact: 07/24/2013
Number of Days to Update: 15	Next Scheduled EDR Contact: 11/11/2013
	Data Release Frequency: Varies

## CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 02/12/2013	Source: EPA
Date Data Arrived at EDR: 02/21/2013	Telephone: 800-424-9346
Date Made Active in Reports: 02/27/2013	Last EDR Contact: 08/08/2013
Number of Days to Update: 6	Next Scheduled EDR Contact: 10/14/2013
	Data Release Frequency: Quarterly

## RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 06/18/2013  
Date Data Arrived at EDR: 07/01/2013  
Date Made Active in Reports: 08/09/2013  
Number of Days to Update: 39

Source: Environmental Protection Agency  
Telephone: (404) 562-8651  
Last EDR Contact: 08/08/2013  
Next Scheduled EDR Contact: 10/14/2013  
Data Release Frequency: Quarterly

## RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 06/18/2013  
Date Data Arrived at EDR: 07/01/2013  
Date Made Active in Reports: 08/09/2013  
Number of Days to Update: 39

Source: Environmental Protection Agency  
Telephone: (404) 562-8651  
Last EDR Contact: 08/08/2013  
Next Scheduled EDR Contact: 10/14/2013  
Data Release Frequency: Quarterly

## RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 06/18/2013  
Date Data Arrived at EDR: 07/01/2013  
Date Made Active in Reports: 08/09/2013  
Number of Days to Update: 39

Source: Environmental Protection Agency  
Telephone: (404) 562-8651  
Last EDR Contact: 08/08/2013  
Next Scheduled EDR Contact: 10/14/2013  
Data Release Frequency: Quarterly

## RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 06/18/2013  
Date Data Arrived at EDR: 07/01/2013  
Date Made Active in Reports: 08/09/2013  
Number of Days to Update: 39

Source: Environmental Protection Agency  
Telephone: (404) 562-8651  
Last EDR Contact: 08/08/2013  
Next Scheduled EDR Contact: 10/14/2013  
Data Release Frequency: Varies

## RCRA NonGen / NLR: RCRA - Non Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 06/18/2013  
Date Data Arrived at EDR: 07/01/2013  
Date Made Active in Reports: 08/09/2013  
Number of Days to Update: 39

Source: Environmental Protection Agency  
Telephone: (404) 562-8651  
Last EDR Contact: 08/08/2013  
Next Scheduled EDR Contact: 10/14/2013  
Data Release Frequency: Varies

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

### US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 03/14/2013	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/29/2013	Telephone: 703-603-0695
Date Made Active in Reports: 05/10/2013	Last EDR Contact: 06/10/2013
Number of Days to Update: 42	Next Scheduled EDR Contact: 09/23/2013
	Data Release Frequency: Varies

### US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 03/14/2013	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/29/2013	Telephone: 703-603-0695
Date Made Active in Reports: 05/10/2013	Last EDR Contact: 06/10/2013
Number of Days to Update: 42	Next Scheduled EDR Contact: 09/23/2013
	Data Release Frequency: Varies

### ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/2012	Source: National Response Center, United States Coast Guard
Date Data Arrived at EDR: 01/17/2013	Telephone: 202-267-2180
Date Made Active in Reports: 02/15/2013	Last EDR Contact: 07/01/2013
Number of Days to Update: 29	Next Scheduled EDR Contact: 10/14/2013
	Data Release Frequency: Annually

### HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/31/2012	Source: U.S. Department of Transportation
Date Data Arrived at EDR: 01/03/2013	Telephone: 202-366-4555
Date Made Active in Reports: 02/27/2013	Last EDR Contact: 07/01/2013
Number of Days to Update: 55	Next Scheduled EDR Contact: 10/14/2013
	Data Release Frequency: Annually

### DOT OPS: Incident and Accident Data

Department of Transportation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012	Source: Department of Transportation, Office of Pipeline Safety
Date Data Arrived at EDR: 08/07/2012	Telephone: 202-366-4595
Date Made Active in Reports: 09/18/2012	Last EDR Contact: 08/05/2013
Number of Days to Update: 42	Next Scheduled EDR Contact: 11/18/2013
	Data Release Frequency: Varies

### US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 03/04/2013  
Date Data Arrived at EDR: 03/12/2013  
Date Made Active in Reports: 05/10/2013  
Number of Days to Update: 59

Source: Drug Enforcement Administration  
Telephone: 202-307-1000  
Last EDR Contact: 06/03/2013  
Next Scheduled EDR Contact: 09/16/2013  
Data Release Frequency: Quarterly

## US BROWNFIELDS: A Listing of Brownfields Sites

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 06/24/2013  
Date Data Arrived at EDR: 06/25/2013  
Date Made Active in Reports: 08/09/2013  
Number of Days to Update: 45

Source: Environmental Protection Agency  
Telephone: 202-566-2777  
Last EDR Contact: 08/05/2013  
Next Scheduled EDR Contact: 10/07/2013  
Data Release Frequency: Semi-Annually

## DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005  
Date Data Arrived at EDR: 11/10/2006  
Date Made Active in Reports: 01/11/2007  
Number of Days to Update: 62

Source: USGS  
Telephone: 888-275-8747  
Last EDR Contact: 07/19/2013  
Next Scheduled EDR Contact: 10/28/2013  
Data Release Frequency: Semi-Annually

## FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/2011  
Date Data Arrived at EDR: 02/26/2013  
Date Made Active in Reports: 03/13/2013  
Number of Days to Update: 15

Source: U.S. Army Corps of Engineers  
Telephone: 202-528-4285  
Last EDR Contact: 06/10/2013  
Next Scheduled EDR Contact: 09/23/2013  
Data Release Frequency: Varies

## LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 12/09/2005  
Date Data Arrived at EDR: 12/11/2006  
Date Made Active in Reports: 01/11/2007  
Number of Days to Update: 31

Source: Department of the Navy  
Telephone: 843-820-7326  
Last EDR Contact: 08/15/2013  
Next Scheduled EDR Contact: 09/02/2013  
Data Release Frequency: Varies

## CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2011  
Date Data Arrived at EDR: 01/15/2013  
Date Made Active in Reports: 03/13/2013  
Number of Days to Update: 57

Source: Department of Justice, Consent Decree Library  
Telephone: Varies  
Last EDR Contact: 06/25/2013  
Next Scheduled EDR Contact: 10/14/2013  
Data Release Frequency: Varies

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 12/18/2012	Source: EPA
Date Data Arrived at EDR: 03/13/2013	Telephone: 703-416-0223
Date Made Active in Reports: 04/12/2013	Last EDR Contact: 06/11/2013
Number of Days to Update: 30	Next Scheduled EDR Contact: 09/23/2013
	Data Release Frequency: Annually

## UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010	Source: Department of Energy
Date Data Arrived at EDR: 10/07/2011	Telephone: 505-845-0011
Date Made Active in Reports: 03/01/2012	Last EDR Contact: 05/28/2013
Number of Days to Update: 146	Next Scheduled EDR Contact: 09/09/2013
	Data Release Frequency: Varies

## ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985	Source: Environmental Protection Agency
Date Data Arrived at EDR: 08/09/2004	Telephone: 800-424-9346
Date Made Active in Reports: 09/17/2004	Last EDR Contact: 06/09/2004
Number of Days to Update: 39	Next Scheduled EDR Contact: N/A
	Data Release Frequency: No Update Planned

## DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009	Source: EPA, Region 9
Date Data Arrived at EDR: 05/07/2009	Telephone: 415-947-4219
Date Made Active in Reports: 09/21/2009	Last EDR Contact: 07/26/2013
Number of Days to Update: 137	Next Scheduled EDR Contact: 11/11/2013
	Data Release Frequency: No Update Planned

## US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 02/05/2013	Source: Department of Labor, Mine Safety and Health Administration
Date Data Arrived at EDR: 04/18/2013	Telephone: 303-231-5959
Date Made Active in Reports: 05/10/2013	Last EDR Contact: 06/04/2013
Number of Days to Update: 22	Next Scheduled EDR Contact: 09/16/2013
	Data Release Frequency: Semi-Annually

## TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2009	Source: EPA
Date Data Arrived at EDR: 09/01/2011	Telephone: 202-566-0250
Date Made Active in Reports: 01/10/2012	Last EDR Contact: 05/29/2013
Number of Days to Update: 131	Next Scheduled EDR Contact: 09/09/2013
	Data Release Frequency: Annually



# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2006	Source: EPA
Date Data Arrived at EDR: 09/29/2010	Telephone: 202-260-5521
Date Made Active in Reports: 12/02/2010	Last EDR Contact: 06/25/2013
Number of Days to Update: 64	Next Scheduled EDR Contact: 10/07/2013
	Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)  
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009	Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Date Data Arrived at EDR: 04/16/2009	Telephone: 202-566-1667
Date Made Active in Reports: 05/11/2009	Last EDR Contact: 08/22/2013
Number of Days to Update: 25	Next Scheduled EDR Contact: 12/09/2013
	Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)  
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009	Source: EPA
Date Data Arrived at EDR: 04/16/2009	Telephone: 202-566-1667
Date Made Active in Reports: 05/11/2009	Last EDR Contact: 08/22/2013
Number of Days to Update: 25	Next Scheduled EDR Contact: 12/09/2013
	Data Release Frequency: Quarterly

## HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/01/2007	Telephone: 202-564-2501
Date Made Active in Reports: 04/10/2007	Last EDR Contact: 12/17/2007
Number of Days to Update: 40	Next Scheduled EDR Contact: 03/17/2008
	Data Release Frequency: No Update Planned

## HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/01/2007	Telephone: 202-564-2501
Date Made Active in Reports: 04/10/2007	Last EDR Contact: 12/17/2008
Number of Days to Update: 40	Next Scheduled EDR Contact: 03/17/2008
	Data Release Frequency: No Update Planned

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009	Source: EPA
Date Data Arrived at EDR: 12/10/2010	Telephone: 202-564-4203
Date Made Active in Reports: 02/25/2011	Last EDR Contact: 07/24/2013
Number of Days to Update: 77	Next Scheduled EDR Contact: 11/11/2013
	Data Release Frequency: Annually

## ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 07/20/2011	Source: Environmental Protection Agency
Date Data Arrived at EDR: 11/10/2011	Telephone: 202-564-5088
Date Made Active in Reports: 01/10/2012	Last EDR Contact: 07/01/2013
Number of Days to Update: 61	Next Scheduled EDR Contact: 10/28/2013
	Data Release Frequency: Quarterly

## PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 11/01/2012	Source: EPA
Date Data Arrived at EDR: 01/16/2013	Telephone: 202-566-0500
Date Made Active in Reports: 05/10/2013	Last EDR Contact: 07/17/2013
Number of Days to Update: 114	Next Scheduled EDR Contact: 10/28/2013
	Data Release Frequency: Annually

## MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 03/14/2013	Source: Nuclear Regulatory Commission
Date Data Arrived at EDR: 03/20/2013	Telephone: 301-415-7169
Date Made Active in Reports: 07/10/2013	Last EDR Contact: 07/10/2013
Number of Days to Update: 112	Next Scheduled EDR Contact: 09/23/2013
	Data Release Frequency: Quarterly

## RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 04/09/2013	Source: Environmental Protection Agency
Date Data Arrived at EDR: 04/11/2013	Telephone: 202-343-9775
Date Made Active in Reports: 05/10/2013	Last EDR Contact: 07/12/2013
Number of Days to Update: 29	Next Scheduled EDR Contact: 10/21/2013
	Data Release Frequency: Quarterly

## FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 03/08/2013  
Date Data Arrived at EDR: 03/21/2013  
Date Made Active in Reports: 07/10/2013  
Number of Days to Update: 111

Source: EPA  
Telephone: (404) 562-9900  
Last EDR Contact: 08/15/2013  
Next Scheduled EDR Contact: 09/23/2013  
Data Release Frequency: Quarterly

## RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995  
Date Data Arrived at EDR: 07/03/1995  
Date Made Active in Reports: 08/07/1995  
Number of Days to Update: 35

Source: EPA  
Telephone: 202-564-4104  
Last EDR Contact: 06/02/2008  
Next Scheduled EDR Contact: 09/01/2008  
Data Release Frequency: No Update Planned

## RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 05/08/2012  
Date Data Arrived at EDR: 05/25/2012  
Date Made Active in Reports: 07/10/2012  
Number of Days to Update: 46

Source: Environmental Protection Agency  
Telephone: 202-564-8600  
Last EDR Contact: 07/24/2013  
Next Scheduled EDR Contact: 11/11/2013  
Data Release Frequency: Varies

## BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2011  
Date Data Arrived at EDR: 02/26/2013  
Date Made Active in Reports: 04/19/2013  
Number of Days to Update: 52

Source: EPA/NTIS  
Telephone: 800-424-9346  
Last EDR Contact: 05/30/2013  
Next Scheduled EDR Contact: 09/09/2013  
Data Release Frequency: Biennially

## FEMA UST: Underground Storage Tank Listing

A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010  
Date Data Arrived at EDR: 02/16/2010  
Date Made Active in Reports: 04/12/2010  
Number of Days to Update: 55

Source: FEMA  
Telephone: 202-646-5797  
Last EDR Contact: 07/19/2013  
Next Scheduled EDR Contact: 10/28/2013  
Data Release Frequency: Varies

## COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

A listing of coal combustion residues surface impoundments with high hazard potential ratings.

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 08/17/2010  
Date Data Arrived at EDR: 01/03/2011  
Date Made Active in Reports: 03/21/2011  
Number of Days to Update: 77

Source: Environmental Protection Agency  
Telephone: N/A  
Last EDR Contact: 06/14/2013  
Next Scheduled EDR Contact: 09/23/2013  
Data Release Frequency: Varies

## FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 07/31/2012  
Date Data Arrived at EDR: 10/09/2012  
Date Made Active in Reports: 12/20/2012  
Number of Days to Update: 72

Source: Environmental Protection Agency  
Telephone: 703-603-8704  
Last EDR Contact: 07/08/2013  
Next Scheduled EDR Contact: 10/21/2013  
Data Release Frequency: Varies

## LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 01/29/2013  
Date Data Arrived at EDR: 02/14/2013  
Date Made Active in Reports: 02/27/2013  
Number of Days to Update: 13

Source: Environmental Protection Agency  
Telephone: 703-603-8787  
Last EDR Contact: 07/03/2013  
Next Scheduled EDR Contact: 10/21/2013  
Data Release Frequency: Varies

## LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931 and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001  
Date Data Arrived at EDR: 10/27/2010  
Date Made Active in Reports: 12/02/2010  
Number of Days to Update: 36

Source: American Journal of Public Health  
Telephone: 703-305-6451  
Last EDR Contact: 12/02/2009  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

## COAL ASH DOE: Sleam-Electric Plan Operation Data

A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005  
Date Data Arrived at EDR: 08/07/2009  
Date Made Active in Reports: 10/22/2009  
Number of Days to Update: 76

Source: Department of Energy  
Telephone: 202-586-8719  
Last EDR Contact: 07/19/2013  
Next Scheduled EDR Contact: 10/28/2013  
Data Release Frequency: Varies

## PCB TRANSFORMER: PCB Transformer Registration Database

The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011  
Date Data Arrived at EDR: 10/19/2011  
Date Made Active in Reports: 01/10/2012  
Number of Days to Update: 83

Source: Environmental Protection Agency  
Telephone: 202-566-0517  
Last EDR Contact: 08/02/2013  
Next Scheduled EDR Contact: 11/11/2013  
Data Release Frequency: Varies

## US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 09/01/2007  
Date Data Arrived at EDR: 11/19/2008  
Date Made Active in Reports: 03/30/2009  
Number of Days to Update: 131

Source: Drug Enforcement Administration  
Telephone: 202-307-1000  
Last EDR Contact: 03/23/2009  
Next Scheduled EDR Contact: 06/22/2009  
Data Release Frequency: No Update Planned

## US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 03/04/2013  
Date Data Arrived at EDR: 03/15/2013  
Date Made Active in Reports: 05/10/2013  
Number of Days to Update: 56

Source: Environmental Protection Agency  
Telephone: 202-566-1917  
Last EDR Contact: 05/20/2013  
Next Scheduled EDR Contact: 09/02/2013  
Data Release Frequency: Quarterly

## EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 12/31/2012  
Date Data Arrived at EDR: 02/18/2013  
Date Made Active in Reports: 05/10/2013  
Number of Days to Update: 81

Source: Environmental Protection Agency  
Telephone: 617-520-3000  
Last EDR Contact: 08/07/2013  
Next Scheduled EDR Contact: 11/25/2013  
Data Release Frequency: Quarterly

## 2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 11/11/2011  
Date Data Arrived at EDR: 05/18/2012  
Date Made Active in Reports: 05/25/2012  
Number of Days to Update: 7

Source: Environmental Protection Agency  
Telephone: 703-308-4044  
Last EDR Contact: 08/16/2013  
Next Scheduled EDR Contact: 11/25/2013  
Data Release Frequency: Varies

## US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 01/23/2013  
Date Data Arrived at EDR: 01/30/2013  
Date Made Active in Reports: 05/10/2013  
Number of Days to Update: 100

Source: EPA  
Telephone: 202-564-5962  
Last EDR Contact: 06/25/2013  
Next Scheduled EDR Contact: 10/14/2013  
Data Release Frequency: Annually

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/09/2011	Telephone: 615-532-8599
Date Made Active in Reports: 05/02/2011	Last EDR Contact: 08/01/2013
Number of Days to Update: 54	Next Scheduled EDR Contact: 11/04/2013
	Data Release Frequency: Varies

## PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 12/18/2012	Source: EPA
Date Data Arrived at EDR: 04/04/2013	Telephone: 202-564-6023
Date Made Active in Reports: 07/10/2013	Last EDR Contact: 07/03/2013
Number of Days to Update: 97	Next Scheduled EDR Contact: 10/14/2013
	Data Release Frequency: Quarterly

## US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 01/23/2013	Source: EPA
Date Data Arrived at EDR: 01/30/2013	Telephone: 202-564-5962
Date Made Active in Reports: 05/10/2013	Last EDR Contact: 06/25/2013
Number of Days to Update: 100	Next Scheduled EDR Contact: 10/14/2013
	Data Release Frequency: Annually

## STATE AND LOCAL RECORDS

### SHWS: State Leads List

State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: 06/27/2013	Source: Department of Environmental Protection
Date Data Arrived at EDR: 06/28/2013	Telephone: 502-564-6716
Date Made Active in Reports: 07/17/2013	Last EDR Contact: 06/03/2013
Number of Days to Update: 19	Next Scheduled EDR Contact: 09/16/2013
	Data Release Frequency: Quarterly

### SWF/LF: Solid Waste Facilities List

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 07/22/2013	Source: Department of Environmental Protection
Date Data Arrived at EDR: 07/22/2013	Telephone: 502-564-6716
Date Made Active in Reports: 07/31/2013	Last EDR Contact: 07/19/2013
Number of Days to Update: 9	Next Scheduled EDR Contact: 11/18/2013
	Data Release Frequency: Semi-Annually

### UIC: UIC Information

A listing of underground injection control wells.

Date of Government Version: 07/18/2013	Source: Kentucky Geological Survey
Date Data Arrived at EDR: 07/22/2013	Telephone: 859-323-0544
Date Made Active in Reports: 08/14/2013	Last EDR Contact: 07/22/2013
Number of Days to Update: 23	Next Scheduled EDR Contact: 11/04/2013
	Data Release Frequency: Quarterly

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## SWRCY: Recycling Facilities

A listing of recycling facilities located in the state of Kentucky.

Date of Government Version: 10/26/2010	Source: Department of Environmental Protection
Date Data Arrived at EDR: 11/04/2010	Telephone: 502-564-6716
Date Made Active in Reports: 01/11/2011	Last EDR Contact: 07/26/2013
Number of Days to Update: 68	Next Scheduled EDR Contact: 11/04/2013
	Data Release Frequency: Varies

## HIST LF: Historical Landfills

This solid waste facility listing contains detail information that is not included in the landfill listing. A listing with detail information is no longer available by the Department of Environmental Protection.

Date of Government Version: 05/01/2003	Source: Department of Environmental Protection
Date Data Arrived at EDR: 03/30/2006	Telephone: 502-564-6716
Date Made Active in Reports: 05/01/2006	Last EDR Contact: 02/23/2009
Number of Days to Update: 32	Next Scheduled EDR Contact: 05/25/2009
	Data Release Frequency: No Update Planned

## SB193: SB193 Branch Site Inventory List

The inventory indicates facilities that have performed permanent closure activities at a regulated underground storage tank facility and have known soil and/or groundwater contamination.

Date of Government Version: 09/05/2006	Source: Department of Environmental Protection
Date Data Arrived at EDR: 09/13/2006	Telephone: 502-564-5981
Date Made Active in Reports: 10/18/2006	Last EDR Contact: 07/15/2013
Number of Days to Update: 35	Next Scheduled EDR Contact: 10/28/2013
	Data Release Frequency: No Update Planned

## UST: Underground Storage Tank Database

Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 05/14/2013	Source: Department of Environmental Protection
Date Data Arrived at EDR: 06/04/2013	Telephone: 502-564-5981
Date Made Active in Reports: 07/17/2013	Last EDR Contact: 06/04/2013
Number of Days to Update: 43	Next Scheduled EDR Contact: 09/16/2013
	Data Release Frequency: Quarterly

## SPILLS: State spills

A listing of spill and/or release related incidents.

Date of Government Version: 05/16/2013	Source: DEP, Emergency Response
Date Data Arrived at EDR: 05/24/2013	Telephone: 502-564-2380
Date Made Active in Reports: 06/03/2013	Last EDR Contact: 07/18/2013
Number of Days to Update: 10	Next Scheduled EDR Contact: 11/04/2013
	Data Release Frequency: Varies

## ENG CONTROLS: Engineering Controls Site Listing

A listing of sites that use engineering controls.

Date of Government Version: 06/26/2013	Source: Department of Environmental Protection
Date Data Arrived at EDR: 06/26/2013	Telephone: 502-564-6716
Date Made Active in Reports: 07/17/2013	Last EDR Contact: 06/03/2013
Number of Days to Update: 21	Next Scheduled EDR Contact: 09/16/2013
	Data Release Frequency: Varies

## INST CONTROL: State Superfund Database

A list of closed sites in the State Superfund Database. Institutional controls would be in place at any site that uses Contained or Managed as a Closure Option.

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 06/26/2013  
Date Data Arrived at EDR: 06/26/2013  
Date Made Active in Reports: 07/17/2013  
Number of Days to Update: 21

Source: Department of Environmental Protection  
Telephone: 502-564-6716  
Last EDR Contact: 06/03/2013  
Next Scheduled EDR Contact: 09/16/2013  
Data Release Frequency: Varies

## VCP: Voluntary Cleanup Program Sites

Sites that have been accepted into the Voluntary Cleanup Program or have submitted an application.

Date of Government Version: 06/26/2013  
Date Data Arrived at EDR: 06/26/2013  
Date Made Active in Reports: 07/17/2013  
Number of Days to Update: 21

Source: Department of Environmental Protection  
Telephone: 502-564-6716  
Last EDR Contact: 06/03/2013  
Next Scheduled EDR Contact: 06/17/2013  
Data Release Frequency: Varies

## DRYCLEANERS: Drycleaner Listing

A listing of drycleaner facility locations.

Date of Government Version: 06/03/2013  
Date Data Arrived at EDR: 06/04/2013  
Date Made Active in Reports: 07/17/2013  
Number of Days to Update: 43

Source: Department of Environmental Protection  
Telephone: 502-573-3382  
Last EDR Contact: 06/03/2013  
Next Scheduled EDR Contact: 09/16/2013  
Data Release Frequency: Varies

## BROWNFIELDS: Kentucky Brownfield Inventory

The Kentucky Brownfield Program has created an inventory of brownfield sites in order to market the properties to those interested in brownfield redevelopment. The Kentucky Brownfield Program is working to promote the redevelopment of these sites by helping to remove barriers that prevent reuse, providing useful information to communities, developers and the public and encouraging a climate that fosters redevelopment of contaminated sites.

Date of Government Version: 08/05/2013  
Date Data Arrived at EDR: 08/07/2013  
Date Made Active in Reports: 08/13/2013  
Number of Days to Update: 6

Source: Division of Compliance Assistance  
Telephone: 502-564-0323  
Last EDR Contact: 07/18/2013  
Next Scheduled EDR Contact: 11/04/2013  
Data Release Frequency: Varies

## CDL: Clandestine Drug Lab Location Listing

Clandestine drug lab site locations.

Date of Government Version: 06/26/2013  
Date Data Arrived at EDR: 06/26/2013  
Date Made Active in Reports: 07/17/2013  
Number of Days to Update: 21

Source: Department of Environmental Protection  
Telephone: 502-564-6716  
Last EDR Contact: 06/03/2013  
Next Scheduled EDR Contact: 09/16/2013  
Data Release Frequency: Varies

## NPDES: Permitted Facility Listing

A listing of permitted wastewater facilities.

Date of Government Version: 08/06/2013  
Date Data Arrived at EDR: 08/07/2013  
Date Made Active in Reports: 08/14/2013  
Number of Days to Update: 7

Source: Department of Environmental Protection  
Telephone: 502-564-3410  
Last EDR Contact: 07/16/2013  
Next Scheduled EDR Contact: 08/26/2013  
Data Release Frequency: Varies

## AIRS: Permitted Airs Facility Listing

A listing of permitted Airs facilities.

Date of Government Version: 06/03/2013  
Date Data Arrived at EDR: 06/04/2013  
Date Made Active in Reports: 07/17/2013  
Number of Days to Update: 43

Source: Department of Environmental Protection  
Telephone: 502-573-3382  
Last EDR Contact: 06/03/2013  
Next Scheduled EDR Contact: 09/16/2013  
Data Release Frequency: Varies



# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## PSTEAF: Facility Ranking List

The Underground Storage Tank Branch (USTB) has ranked all PSTEAF reimbursable facilities requiring corrective action, in accordance with 401 KAR 42:290. Directive letters will be issued on the basis of facility ranking and available PSTEAF funding in sequential order as ranked. For example, Rank 2 facilities will be issued directives before Rank 3 facilities.

Date of Government Version: 07/01/2013  
Date Data Arrived at EDR: 07/16/2013  
Date Made Active in Reports: 07/31/2013  
Number of Days to Update: 15

Source: Department of Environmental Protection  
Telephone: 502-564-5981  
Last EDR Contact: 07/16/2013  
Next Scheduled EDR Contact: 10/28/2013  
Data Release Frequency: Quarterly

## LEAD: Environmental Lead Program Report Tracking Database

Lead Report Tracking Database

Date of Government Version: 07/10/2013  
Date Data Arrived at EDR: 07/16/2013  
Date Made Active in Reports: 07/31/2013  
Number of Days to Update: 15

Source: Department of Public Health  
Telephone: 502-564-4537  
Last EDR Contact: 08/08/2013  
Next Scheduled EDR Contact: 11/25/2013  
Data Release Frequency: Varies

## COAL ASH: Coal Ash Disposal Sites

A listing of coal ash pond site locations.

Date of Government Version: 02/05/2013  
Date Data Arrived at EDR: 03/25/2013  
Date Made Active in Reports: 03/29/2013  
Number of Days to Update: 4

Source: Department of Environmental Protection  
Telephone: 502-564-6716  
Last EDR Contact: 08/01/2013  
Next Scheduled EDR Contact: 11/18/2013  
Data Release Frequency: Varies

## TRIBAL RECORDS

### INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005  
Date Data Arrived at EDR: 12/08/2006  
Date Made Active in Reports: 01/11/2007  
Number of Days to Update: 34

Source: USGS  
Telephone: 202-208-3710  
Last EDR Contact: 07/19/2013  
Next Scheduled EDR Contact: 10/28/2013  
Data Release Frequency: Semi-Annually

### INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998  
Date Data Arrived at EDR: 12/03/2007  
Date Made Active in Reports: 01/24/2008  
Number of Days to Update: 52

Source: Environmental Protection Agency  
Telephone: 703-308-8245  
Last EDR Contact: 07/31/2013  
Next Scheduled EDR Contact: 11/18/2013  
Data Release Frequency: Varies

### INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 08/27/2012  
Date Data Arrived at EDR: 08/28/2012  
Date Made Active in Reports: 10/16/2012  
Number of Days to Update: 49

Source: EPA Region 8  
Telephone: 303-312-6271  
Last EDR Contact: 07/24/2013  
Next Scheduled EDR Contact: 11/11/2013  
Data Release Frequency: Quarterly

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land  
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 12/31/2012	Source: EPA Region 7
Date Data Arrived at EDR: 02/28/2013	Telephone: 913-551-7003
Date Made Active in Reports: 04/12/2013	Last EDR Contact: 07/24/2013
Number of Days to Update: 43	Next Scheduled EDR Contact: 11/11/2013
	Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land  
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 02/06/2013	Source: EPA Region 4
Date Data Arrived at EDR: 02/08/2013	Telephone: 404-562-8677
Date Made Active in Reports: 04/12/2013	Last EDR Contact: 07/24/2013
Number of Days to Update: 63	Next Scheduled EDR Contact: 11/11/2013
	Data Release Frequency: Semi-Annually

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land  
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 09/28/2012	Source: EPA Region 1
Date Data Arrived at EDR: 11/01/2012	Telephone: 617-918-1313
Date Made Active in Reports: 04/12/2013	Last EDR Contact: 08/02/2013
Number of Days to Update: 162	Next Scheduled EDR Contact: 11/11/2013
	Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land  
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 03/01/2013	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/01/2013	Telephone: 415-972-3372
Date Made Active in Reports: 04/12/2013	Last EDR Contact: 07/24/2013
Number of Days to Update: 42	Next Scheduled EDR Contact: 11/11/2013
	Data Release Frequency: Quarterly

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land  
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 02/05/2013	Source: EPA Region 10
Date Data Arrived at EDR: 02/06/2013	Telephone: 206-553-2857
Date Made Active in Reports: 04/12/2013	Last EDR Contact: 07/24/2013
Number of Days to Update: 65	Next Scheduled EDR Contact: 11/11/2013
	Data Release Frequency: Quarterly

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land  
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 09/12/2011	Source: EPA Region 6
Date Data Arrived at EDR: 09/13/2011	Telephone: 214-665-6597
Date Made Active in Reports: 11/11/2011	Last EDR Contact: 07/24/2013
Number of Days to Update: 59	Next Scheduled EDR Contact: 11/11/2013
	Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 09/28/2012	Source: EPA, Region 1
Date Data Arrived at EDR: 11/07/2012	Telephone: 617-918-1313
Date Made Active in Reports: 04/12/2013	Last EDR Contact: 08/02/2013
Number of Days to Update: 156	Next Scheduled EDR Contact: 11/11/2013
	Data Release Frequency: Varies

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 02/06/2013	Source: EPA Region 4
Date Data Arrived at EDR: 02/08/2013	Telephone: 404-562-9424
Date Made Active in Reports: 04/12/2013	Last EDR Contact: 07/24/2013
Number of Days to Update: 63	Next Scheduled EDR Contact: 11/11/2013
	Data Release Frequency: Semi-Annually

## INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 08/02/2012	Source: EPA Region 5
Date Data Arrived at EDR: 08/03/2012	Telephone: 312-886-6136
Date Made Active in Reports: 11/05/2012	Last EDR Contact: 07/24/2013
Number of Days to Update: 94	Next Scheduled EDR Contact: 11/11/2013
	Data Release Frequency: Varies

## INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 05/10/2011	Source: EPA Region 6
Date Data Arrived at EDR: 05/11/2011	Telephone: 214-665-7591
Date Made Active in Reports: 06/14/2011	Last EDR Contact: 07/24/2013
Number of Days to Update: 34	Next Scheduled EDR Contact: 11/11/2013
	Data Release Frequency: Semi-Annually

## INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 12/31/2012	Source: EPA Region 7
Date Data Arrived at EDR: 02/28/2013	Telephone: 913-551-7003
Date Made Active in Reports: 04/12/2013	Last EDR Contact: 07/24/2013
Number of Days to Update: 43	Next Scheduled EDR Contact: 11/11/2013
	Data Release Frequency: Varies

## INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 08/27/2012	Source: EPA Region 8
Date Data Arrived at EDR: 08/28/2012	Telephone: 303-312-6137
Date Made Active in Reports: 10/16/2012	Last EDR Contact: 07/24/2013
Number of Days to Update: 49	Next Scheduled EDR Contact: 11/11/2013
	Data Release Frequency: Quarterly

## INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 02/21/2013	Source: EPA Region 9
Date Data Arrived at EDR: 02/26/2013	Telephone: 415-972-3368
Date Made Active in Reports: 04/12/2013	Last EDR Contact: 07/24/2013
Number of Days to Update: 45	Next Scheduled EDR Contact: 11/11/2013
	Data Release Frequency: Quarterly

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 02/05/2013	Source: EPA Region 10
Date Data Arrived at EDR: 02/06/2013	Telephone: 206-553-2857
Date Made Active in Reports: 04/12/2013	Last EDR Contact: 07/24/2013
Number of Days to Update: 65	Next Scheduled EDR Contact: 11/11/2013
	Data Release Frequency: Quarterly

## INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 09/28/2012	Source: EPA, Region 1
Date Data Arrived at EDR: 10/02/2012	Telephone: 617-918-1102
Date Made Active in Reports: 10/16/2012	Last EDR Contact: 07/02/2013
Number of Days to Update: 14	Next Scheduled EDR Contact: 10/14/2013
	Data Release Frequency: Varies

## INDIAN VCP R7: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008	Source: EPA, Region 7
Date Data Arrived at EDR: 04/22/2008	Telephone: 913-551-7365
Date Made Active in Reports: 05/19/2008	Last EDR Contact: 04/20/2009
Number of Days to Update: 27	Next Scheduled EDR Contact: 07/20/2009
	Data Release Frequency: Varies

## EDR PROPRIETARY RECORDS

### EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A	Source: EDR, Inc.
Date Data Arrived at EDR: N/A	Telephone: N/A
Date Made Active in Reports: N/A	Last EDR Contact: N/A
Number of Days to Update: N/A	Next Scheduled EDR Contact: N/A
	Data Release Frequency: No Update Planned

### EDR US Hist Auto Stat: EDR Exclusive Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A	Source: EDR, Inc.
Date Data Arrived at EDR: N/A	Telephone: N/A
Date Made Active in Reports: N/A	Last EDR Contact: N/A
Number of Days to Update: N/A	Next Scheduled EDR Contact: N/A
	Data Release Frequency: Varies

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## EDR US Hist Cleaners: EDR Exclusive Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A	Source: EDR, Inc.
Date Data Arrived at EDR: N/A	Telephone: N/A
Date Made Active in Reports: N/A	Last EDR Contact: N/A
Number of Days to Update: N/A	Next Scheduled EDR Contact: N/A
	Data Release Frequency: Varies

## EDR US Hist Cleaners: EDR Proprietary Historic Dry Cleaners - Cole

Date of Government Version: N/A	Source: N/A
Date Data Arrived at EDR: N/A	Telephone: N/A
Date Made Active in Reports: N/A	Last EDR Contact: N/A
Number of Days to Update: N/A	Next Scheduled EDR Contact: N/A
	Data Release Frequency: Varies

## EDR US Hist Auto Stat: EDR Proprietary Historic Gas Stations - Cole

Date of Government Version: N/A	Source: N/A
Date Data Arrived at EDR: N/A	Telephone: N/A
Date Made Active in Reports: N/A	Last EDR Contact: N/A
Number of Days to Update: N/A	Next Scheduled EDR Contact: N/A
	Data Release Frequency: Varies

## OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

### CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 05/20/2013	Source: Department of Energy & Environmental Protection
Date Data Arrived at EDR: 05/21/2013	Telephone: 860-424-3375
Date Made Active in Reports: 06/27/2013	Last EDR Contact: 08/19/2013
Number of Days to Update: 37	Next Scheduled EDR Contact: 12/02/2013
	Data Release Frequency: Annually

### NJ MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2011	Source: Department of Environmental Protection
Date Data Arrived at EDR: 07/19/2012	Telephone: N/A
Date Made Active in Reports: 08/28/2012	Last EDR Contact: 07/19/2013
Number of Days to Update: 40	Next Scheduled EDR Contact: 10/28/2013
	Data Release Frequency: Annually

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 05/01/2013  
Date Data Arrived at EDR: 05/09/2013  
Date Made Active in Reports: 07/10/2013  
Number of Days to Update: 62

Source: Department of Environmental Conservation  
Telephone: 518-402-8651  
Last EDR Contact: 08/07/2013  
Next Scheduled EDR Contact: 11/18/2013  
Data Release Frequency: Annually

## PA MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2012  
Date Data Arrived at EDR: 07/24/2013  
Date Made Active in Reports: 08/19/2013  
Number of Days to Update: 26

Source: Department of Environmental Protection  
Telephone: 717-783-8990  
Last EDR Contact: 07/18/2013  
Next Scheduled EDR Contact: 11/04/2013  
Data Release Frequency: Annually

## RI MANIFEST: Manifest information

Hazardous waste manifest information

Date of Government Version: 12/31/2012  
Date Data Arrived at EDR: 06/21/2013  
Date Made Active in Reports: 08/05/2013  
Number of Days to Update: 45

Source: Department of Environmental Management  
Telephone: 401-222-2797  
Last EDR Contact: 05/28/2013  
Next Scheduled EDR Contact: 09/09/2013  
Data Release Frequency: Annually

## WI MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2011  
Date Data Arrived at EDR: 07/19/2012  
Date Made Active in Reports: 09/27/2012  
Number of Days to Update: 70

Source: Department of Natural Resources  
Telephone: N/A  
Last EDR Contact: 07/17/2013  
Next Scheduled EDR Contact: 09/30/2013  
Data Release Frequency: Annually

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

### AHA Hospitals:

Source: American Hospital Association, Inc.  
Telephone: 312-280-5991

The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

### Medical Centers: Provider of Services Listing

Source: Centers for Medicare & Medicaid Services  
Telephone: 410-786-3000

A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

### Nursing Homes

Source: National Institutes of Health  
Telephone: 301-594-6248

Information on Medicare and Medicaid certified nursing homes in the United States.

### Public Schools

Source: National Center for Education Statistics  
Telephone: 202-502-7300

The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

### Private Schools

Source: National Center for Education Statistics

Telephone: 202-502-7300

The National Center for Education Statistics' primary database on private school locations in the United States.

### Daycare Centers: Certified Child Care Homes

Source: Cabinet for Families & Children

Telephone: 502-564-7130

**Flood Zone Data:** This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

**NWI:** National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

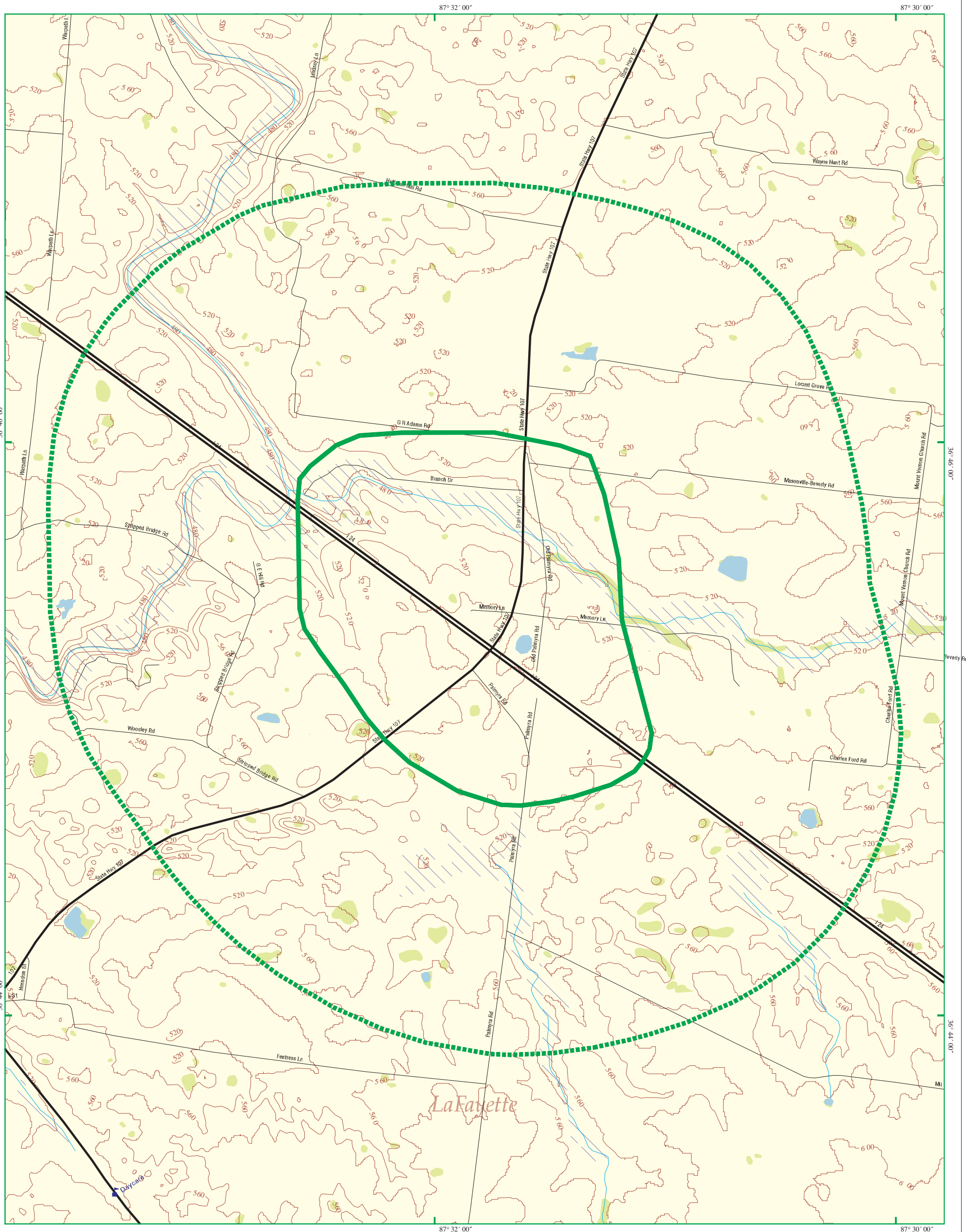
### State Wetlands Data: Wetland Polygon Features

Source: Environmental Protection & Public Protection Cabinet

Telephone: 502-564-5174

### STREET AND ADDRESS INFORMATION

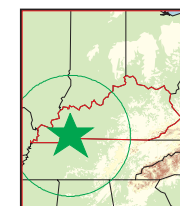
© 2010 Tele Atlas North America, Inc. All rights reserved. This material is proprietary and the subject of copyright protection and other intellectual property rights owned by or licensed to Tele Atlas North America, Inc. The use of this material is subject to the terms of a license agreement. You will be held liable for any unauthorized copying or disclosure of this material.



# EDR DataMap® - Area Study



## KY 107 & I-24 Interchange Justification Study-US



Hopkinsville, KY

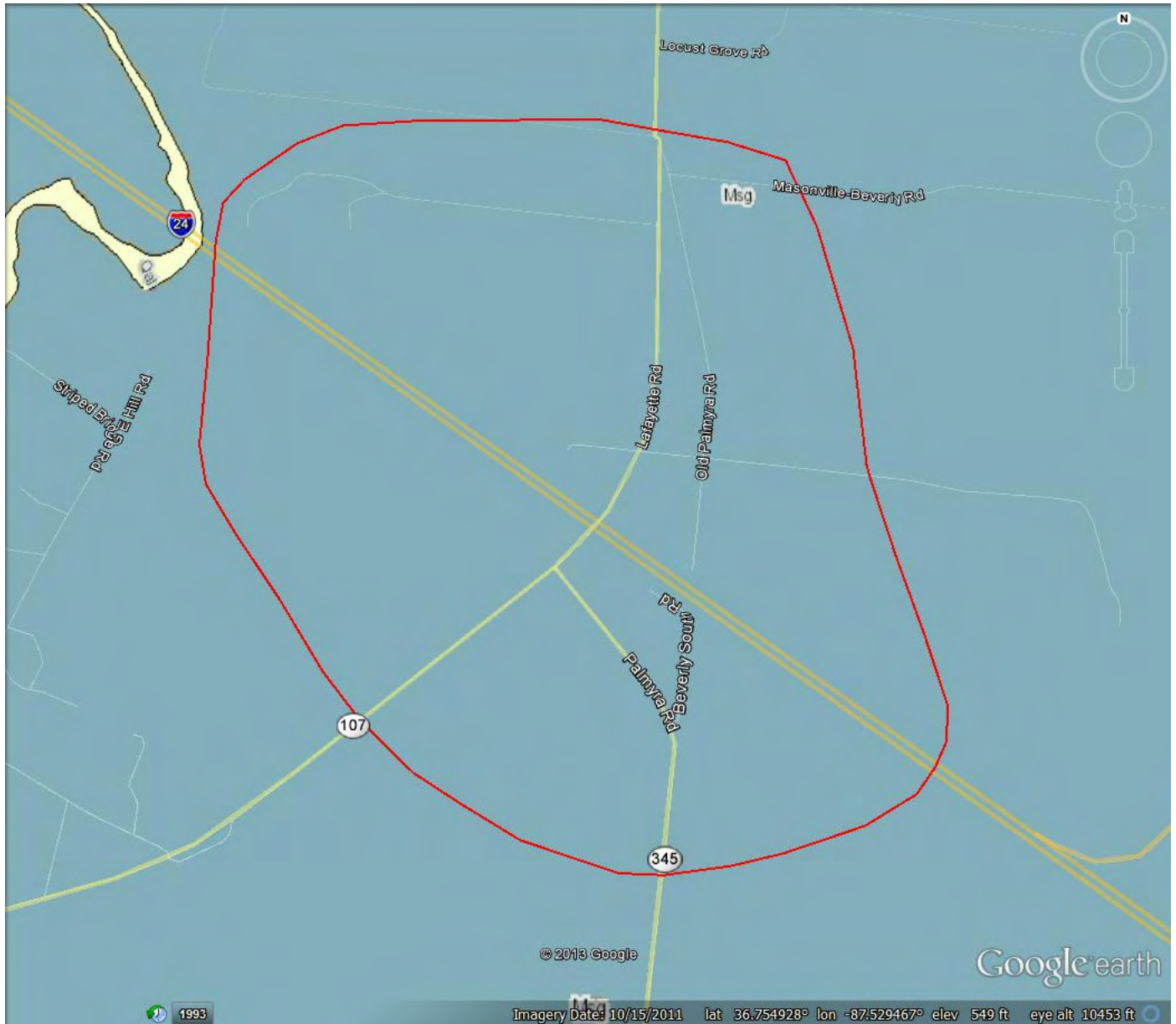
- |  |               |             |                         |
|--|---------------|-------------|-------------------------|
| Listed Sites                                 | Major Roads   | Pipelines   | Superfund Sites         |
| Earthquake Epicenters (Richter 5 or greater) | Waterways     | Powerlines  | Federal DOD Sites       |
| Search Boundary                              | Railroads     | Fault Lines | Indian Reservations BIA |
| Roads  | Contour Lines | Water       | 100-Yr Flood Zones      |



Scale in Miles



## Appendix F KGS Geologic Map

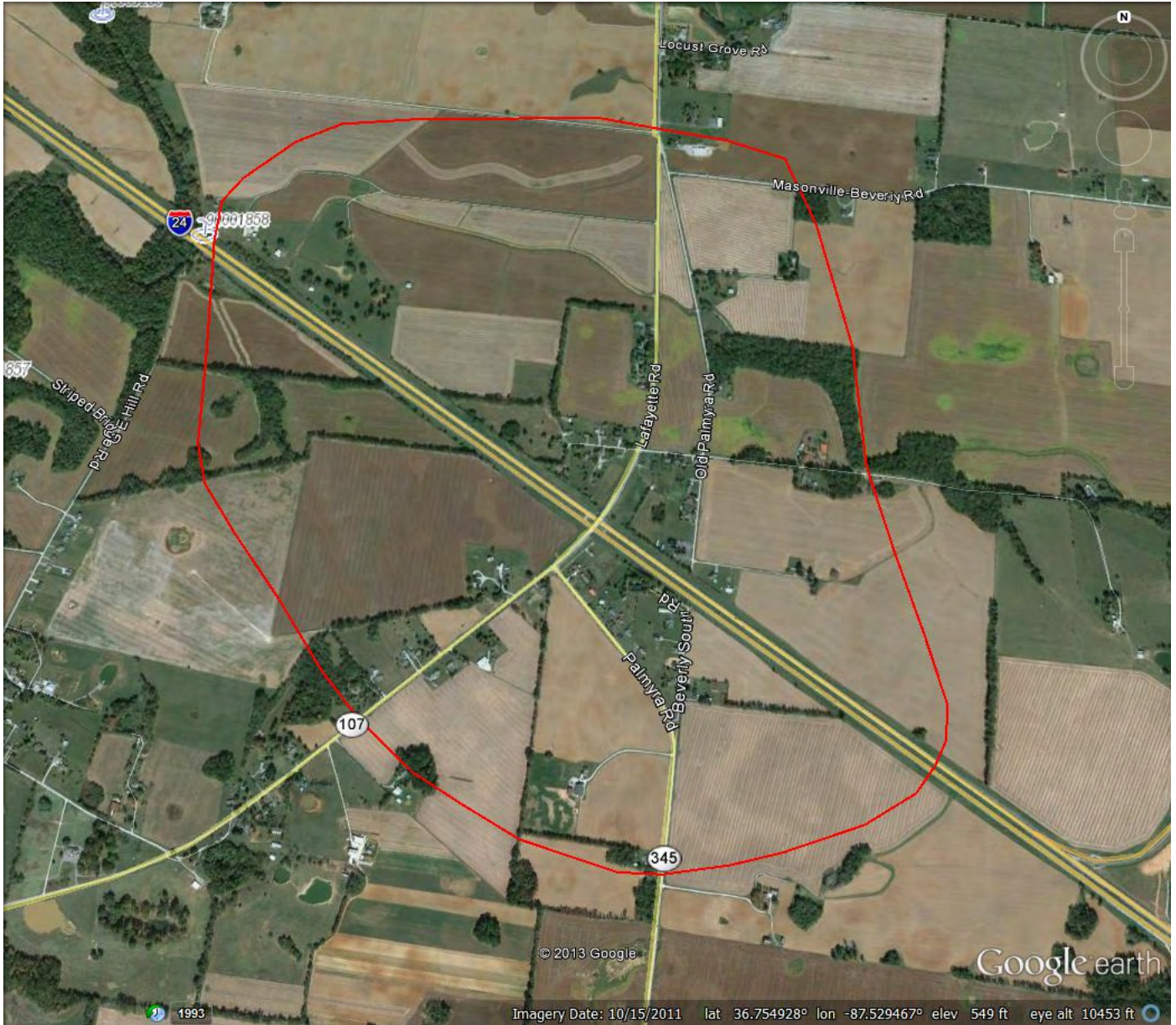


Msg	<p><b>Ste. Genevieve Limestone</b> (Upper Mississippian - Upper Mississippian)</p>
	<p><b>STE. GENEVIEVE LIMESTONE</b>  <b>USGS Unit Info: <a href="#">GEOLEX (id: 3964)</a></b>  <b>Primary Lithology:</b> Limestone and minor shale  Limestone and minor shale: Limestone, very light to medium-gray, fine to very coarse bioclastic, oolitic, and commonly crossbedded. Thin beds of light-gray to pale-yellowish-brown fine-grained limestone, locally dolomitic, occur between thicker more massive beds of coarse-grained limestone but are not easily traced between outcrops. Green shale lenses as much as 1 foot thick are common 30 to 45 feet below top of unit; shale lower in unit is very sparse; some limestone beds are silty and argillaceous. Data from water wells and outcrops along Little River indicate that upper two-thirds of unit is generally oolitic and noncherty. Surficial chert scattered over much of area forms blocky silicified clastic and oolitic residuum from beds 2 to 12 inches thick. Abundance of chert increases toward base of unit; lower 70 to 85 feet contains prominent fine-grained nodular and spheroidal ("ball") chert masses, 1 to 8 inches in diameter. Top of this zone of abundant nodular chert is mappable in residuum and outcrop in vicinity of Little River but cannot be traced in remainder of quadrangle. Fenestellid bryozoans and brachiopods common in chalky weathering chert near base. Mantle of dark-red and reddish-brown clay soil and residuum, as much as 40 feet thick in water wells, covers most of unit and is nearly chert free in northern part of quadrangle.</p>

# Appendix G KGS Sinkholes Map

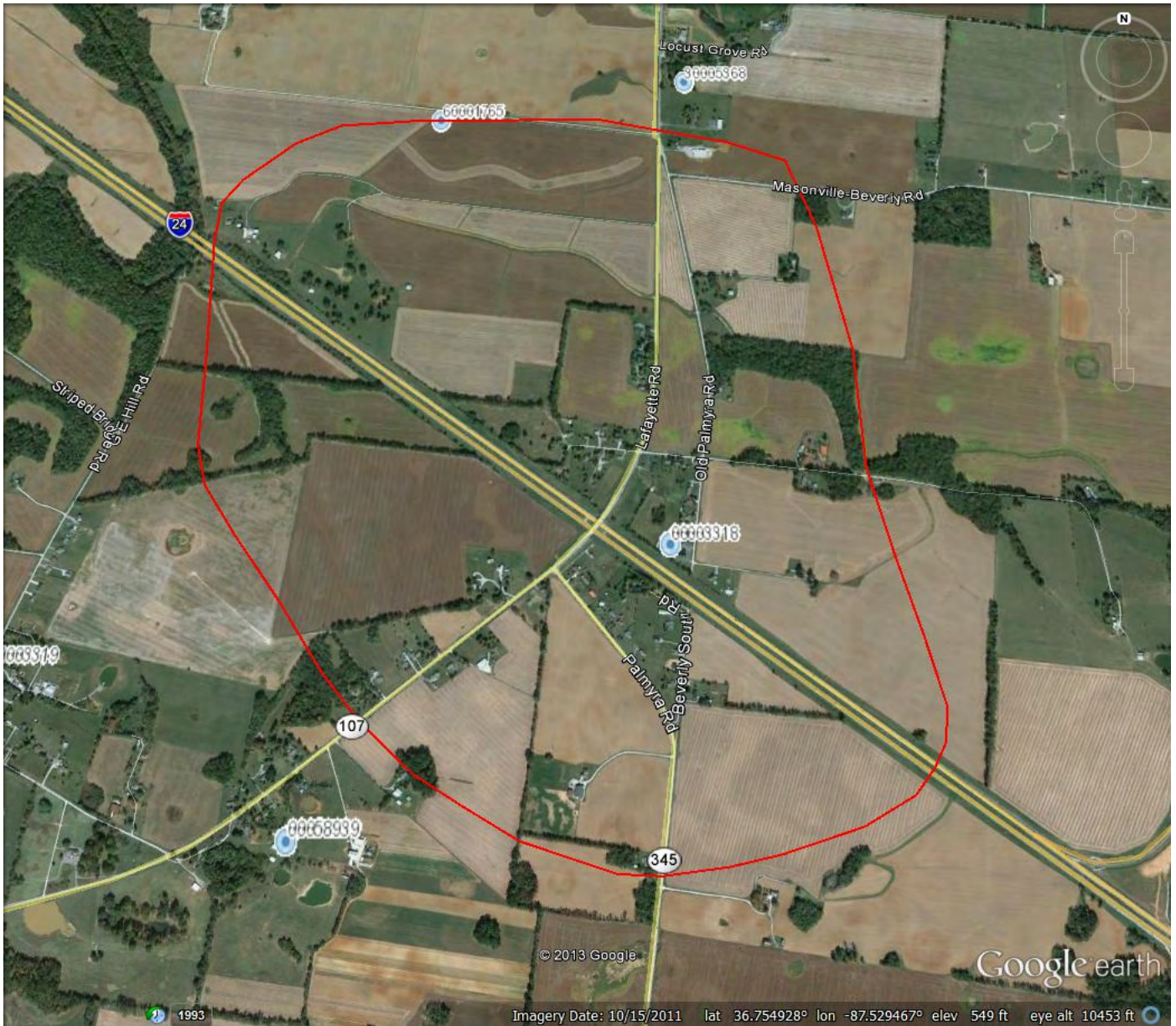


## Appendix H KGS Springs Map



<b>Springs</b>					
Symbol	AKGWA #	Primary Use	Spring Name	Spring Type	Flow Type
	<b><u>90001858</u></b>	n/a	Interstate Spring	Bluehole (Rising)	Perennial

## Appendix I KGS Water Wells Map



### Water Wells

Symbol	AKGWA #	Primary Use	Elevation	Depth	Bedrock Depth	H <sub>2</sub> O Depth
•	<u>00003318</u>	Domestic - Single Household	535	150	40	50
•	<u>30005368</u>	Domestic - Single Household	n/a	60	n/a	n/a
•	<u>60001765</u>	Domestic - Single Household	n/a	n/a	35	n/a