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Class I Waste-Disposal Wells and Class II Brine-Injection Wells in Kentucky

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Class I Waste-Disposal Wells and Class II Brine-Injection Wells in Kentucky

Thomas N. Sparks, David C. Harris, and J. Richard Bowersox

Explanation	
[Red Triangle]	Class I Waste-Disposal Wells
[Green Triangle]	Hazardous waste disposal
[Yellow Triangle]	Nonhazardous industrial waste disposal

Label Key	
[Red Triangle]	Class I Waste Label
[Green Triangle]	EPA ID
[Yellow Triangle]	Injection zone
[Triangle]	Measured depth (ft)
[Triangle]	Status

Waste Disposal Well (unclassified)	
[Yellow Triangle]	Hazardous waste disposal (pre-EPA)

Unclassified Waste Label	
[Yellow Triangle]	Operator name
[Yellow Triangle]	Lease name
[Yellow Triangle]	Injection zone
[Yellow Triangle]	Measured depth (ft)
[Yellow Triangle]	Status

Class II Brine-Disposal Wells	
[Yellow Triangle]	Active
[Red Triangle]	Inactive
[Green Triangle]	Pending

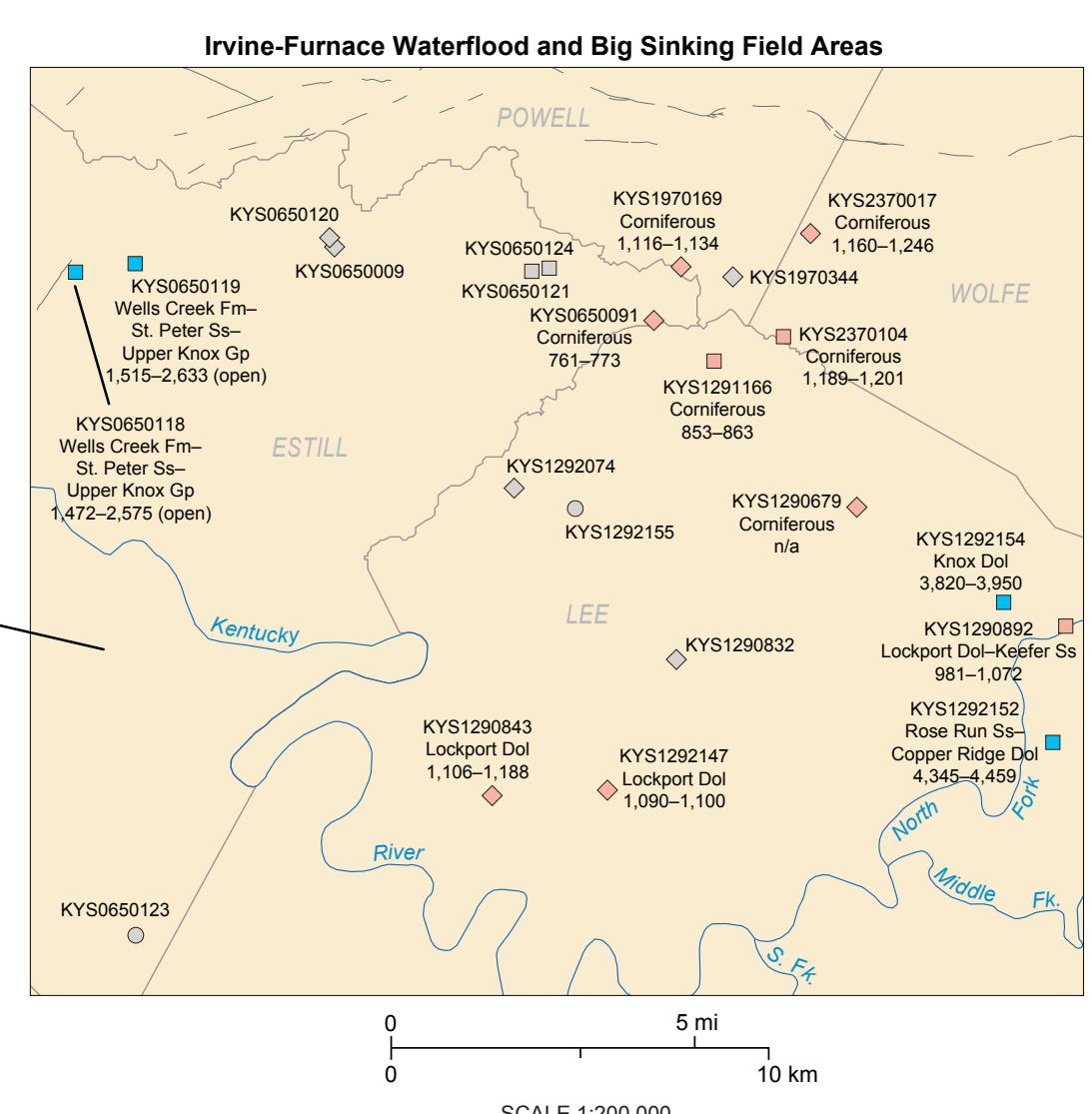
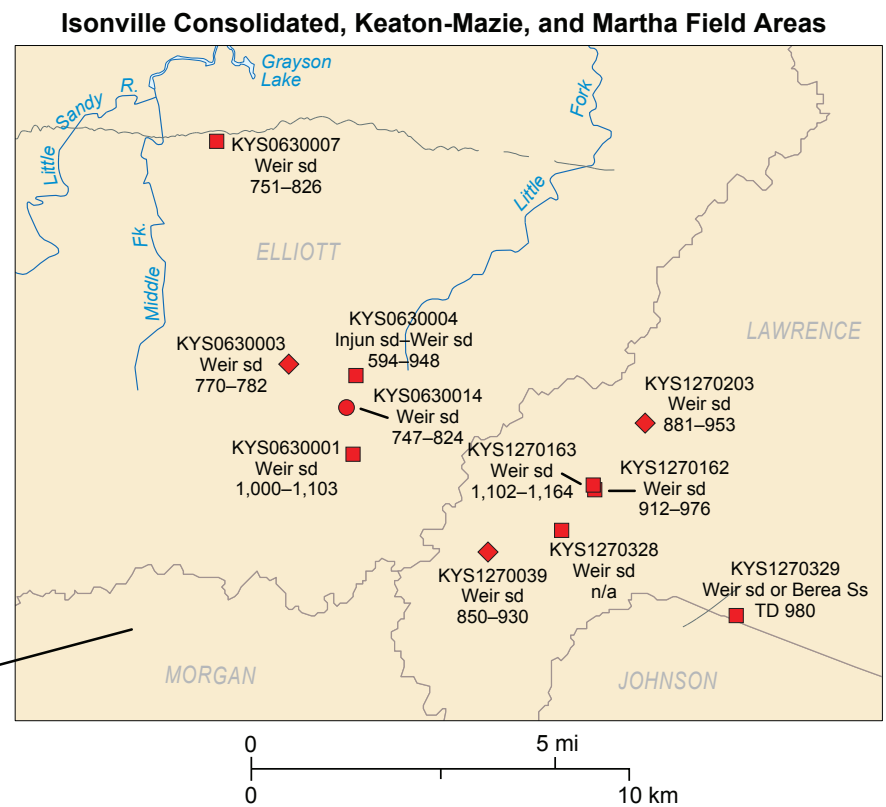
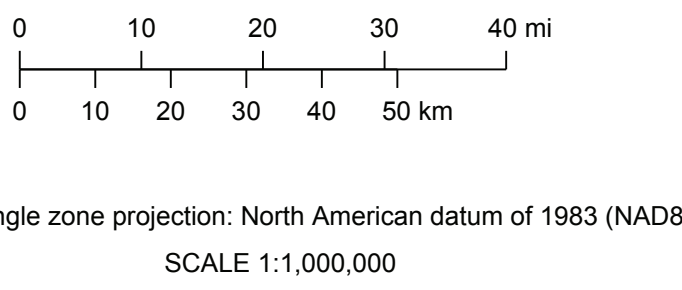
Class II Brine Label	
[Yellow Triangle]	EPA ID
[Yellow Triangle]	Injection zone
[Yellow Triangle]	Measured depth (ft)

Formation Age	
[Red]	Pennsylvanian
[Orange]	Mississippian
[Yellow]	Mississippian-Devonian
[Green]	Silurian
[Blue]	Ordovician
[Grey]	Not available or unknown

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County	EPA ID	Company Name	Well Name and Number	Ky. Permit	Status	KGS Record No.
Butler	KYS0310117	Aleris Recycling Inc.	International Metal Co. Inc. 1	82572	AC	104629
Jefferson	(UIC KY1 0001)	E.I. du Pont de Nemours & Co. Inc.	E.I. du Pont de Nemours & Co. Inc. 1 WAD	24578	P&A	111169
Jefferson	(UIC KY1 0002)	E.I. du Pont de Nemours & Co. Inc.	E.I. du Pont de Nemours & Co. Inc. 2 WAD	25288	P&A	111170
Kenton	N/A	Sohio Petroleum Co. Inc.	Latoria Refinery Caustic Disposal 1	N/A	AB	11250
Mason	KYS1610001	Carmeuse Lime & Stone Inc.	UIC Well 08-1	N/A	UC	-
Mason	KYS1610002	Dravo Lime Co.	Dravo Lime Co. 1	N/A	UC	-
Mason	KYS1610003	Dravo Lime Co.	Maysville 3	N/A	UC	-
Mason	KYS1610004	Dravo Lime Co.	Dravo Lime Co. 2	N/A	UC	-
Pendleton	KYS1910001	Dravo Lime Co.	Black River 2	N/A	UC	105222
Pendleton	KYS1910002	Dravo Lime Co.	Black River 1	83005	UC	-
Pendleton	KYS1910003	Dravo Lime Co.	Black River 3	N/A	UC	-

Introduction and Purpose
This map shows locations of disposal wells permitted and regulated by the U.S. Environmental Protection Agency under parts of their Underground Injection Control program. Only UIC Class I and Class II disposal wells are illustrated and described. EPA defines Class I as industrial and municipal waste-disposal wells and Class II as oil- and gas-related injection wells (EPA, 2012a). Disposal wells are designed to protect underground sources of drinking water. The primary function of this map is to provide general information about type, name, location, geology, and depth of injection zone for these disposal wells on a statewide basis.

UIC Class I Waste-Disposal Wells—Hazardous and Nonhazardous
Class I wells are regulated to inject industrial and municipal waste into deep rock formations thousands of feet below the lower underground source of drinking water. There have been three hazardous waste-disposal wells in Kentucky, two at the Jefferson County E.I. du Pont de Nemours facility and one at the Kenton County Sohio Latoria refinery. Prior to the formation of the EPA, the Kenton County caustic disposal well was in operation from 1947 until 1970, when the Latoria refinery was dismantled. Two UIC Class I hazardous waste-disposal wells were operated by DuPont in Jefferson County from 1973 to 1992 and were used for hydrochloric acid disposal into the Cambrian-Ordovician Knox Group. The acid waste was neutralized by reaction with dolomite rock within a very short distance from the wells. The site was approved No-Migration Demonstration by EPA in 1991 following DuPont's analysis that showed that waste migrated before buffering by the host rock. The wells were plugged and abandoned in 1993 (Clark and others, 2005). There are no currently listed Class I hazardous-waste-disposal wells in Kentucky.

The Butler County nonhazardous disposal well is regulated to inject industrial wastewater associated with the recycling industry. In addition, seven nonhazardous industrial-waste wells are currently listed by EPA as under construction by new permits for disposal of wastewater associated with limestone mining activity in Mason and Pendleton Counties. All past and current waste-disposal wells (both hazardous and nonhazardous) are summarized in Table 2 from locations provided by EPA and from the KGS oil and gas wells database.

UIC Class II Injection Wells—Brine Disposal
Class II wells inject fluids associated with oil and natural gas production. EPA recognizes three types of Class II wells: (1) enhanced-recovery wells, (2) disposal wells, and (3) hydrocarbon-storage wells (EPA, 2012b). Numerous Class II enhanced-oil-recovery injection wells have been permitted in Kentucky, but they are not included on this map. Disposal wells inject brines

(salt water) that are brought to the surface with oil and gas production back into the same or similar porous underground formation from which they were initially produced. This practice of brine disposal also ensures the protection of underground sources of drinking water.

Database
In March and November 2012, the KGS Energy and Minerals Section filed Freedom of Information Act requests for information on all current Class I industrial-waste wells and Class II brine-injection wells in Kentucky. EPA provided two lists of identified wells in documents 04-FOI-00384-12, March 19, 2012, and EPA-R4-2013-001010, November 16, 2012. A database of 100 georeferenced locations was created from the latitude-longitude coordinates provided by EPA. These data were cross-referenced with the KGS oil and gas wells database, matching either spatial information or the EPA state number with the KGS permit number. In total, 73 wells were identified as also being present in the KGS database. Because the remaining wells had either limited or incomplete location information, their locations were posted from the information provided as is.

The map labels are attributed with geologic information provided from the KGS oil and gas wells database (geologic formation and depth of injection zone). Table 3 shows county, EPA ID, well name, well name, state number, status, and KGS record number (if available) of all Class II disposal wells. The six status codes used by EPA were condensed to three symbols on the map: active, inactive (abandoned, temporarily abandoned, shut in), and pending (under construction, under review).

References Cited
Clark, J.E., Bonura, D.K., Miller, C., and Fischer, F.T. 2005. Demonstration of presence and size of a CO₂-rich fluid phase after HCl injection in carbonate rock, in Tsang, C.F., and Apps, J.A., eds., Underground injection science and technology. New York, Elsevier, Developments in Water Science, v. 52, p. 451–458.

EPA, 2012a. Water: Underground injection control, classes of wells: U.S. Environmental Protection Agency. www.water.epa.gov/type/groundwater/uic/wells.cfm [accessed 10/24/2012].

EPA, 2012b. Water: Class II wells—Oil and gas related injection wells: U.S. Environmental Protection Agency. www.water.epa.gov/type/groundwater/uic/class2/index.cfm [accessed 10/24/2012].

These data are as is, provided by EPA R4-2013-001010, November 16, 2012. The KGS record number has been added where available.

County	EPA ID	Company Name	Well Name and Number	Ky. Permit	Status	KGS Record No.	
Adair	KYS0010045	Miller Brothers Energy	James Bennett (J. Holladay) A-5	109195	UR	142761	
Allen	KYS0030001	Gene Weaver	Alton Nichols 1	-	AB	-	
Allen	KYS0030002	Williams Oil Company Inc.	Willoughby/Oliver 1-1	84017	AC	106874	
Allen	KYS0030003	Lollis Vernon	Lollis Tabor 1-V	-	SI	-	
Barren	KYS0900007	Manekis Energy LLC	Russell Barrick 1-V	93140	AC	123667	
Boyd	KYS0190003	Magnum Drilling of Ohio Inc.	Magnum Drilling 1	90921	TA	120954	
Butler	KYS0310115	Goff, H.D.	C.L. McKinney	-	TA	-	
Christian	KYS0470117	Eroco Inc.	Albert Jordan	-	AB	-	
Christian	KYS0470141	Central Energy Group LLC	Kitty Martin 29	88221	UC	114306	
Clinton	KYS0530013	Ohio Kentucky Oil Corp.	Ferguson Brothers 34	93340	AC	124089	
Elliott	KYS0630001	Hay E Exploration Inc.	Jesse K. Gilliam 2	77974	-	AC	77974
Elliott	KYS0630003	EQT Production	O.A. Adkins 2	57032	SI	34444	
Elliott	KYS0630004	Ison, Samuel M.	Ison 1	50790	AC	30389	
Elliott	KYS0630007	Trud Resources Inc.	Albert Gillum G-1A	87589	AC	87589	
Elliott	KYS0630014	Peters Oil and Gas	Paul Peters 1	62388	UC	36167	
Estill	KYS0650009	Bloom, James F.	Gillespie 2	-	AB	-	
Estill	KYS0650091	Bretagne, G.P.	P.M.G. Tract 1 55W	55518	TA	25954	
Estill	KYS0650118	UAE Investco 1 (Estill) LLC	Thomas Henderson 35	104792	AC	136970	
Estill	KYS0650119	UAE Investco 1 (Estill) LLC	Floyd & Paul Rogers 54	104433	AC	136650	
Estill	KYS0650120	UAE Investco 1 (Estill) LLC	Gillespie 6	-	AB	-	
Estill	KYS0650121	Thacker, Ken	Ken Thacker 1A	-	AC	48726	
Estill	KYS0650123	Appalachian Resources of Florida LLC	Kentucky Mountain Resources 5	105841	UR	138159	
Estill	KYS0650124	Wagner, Doug	Wagner Farm 2	117852	AC	-	
Green	KYS0870006	Summit Petroleum Corp. of Indiana	Ed Sharpe 1	-	AB	25353	
Green	KYS0870013	Viking Petroleum Producers Inc.	W.E. Sharpe 4	31087	AB	2016640	
Green	KYS0870025	Collins Petroleum Inc.	Ron Akin 25WD	103169	AC	135307	
Greenup	KYS0890002	Nytis Exploration Co. LLC	Henry Potter 1	76234	TA	84459	
Harlan	KYS0950001	Daugherty Petroleum Inc.	Hillers Cove 4	87191	AC	112542	

County	EPA ID	Company Name	Well Name and Number	Ky. Permit	Status	KGS Record No.
Hart	KYS0990012	Clendening, John	Clarence Wilson 3	87437	AC	113014
Hart	KYS0990017	Resources Energy Technology LLC	Marvin Meredith 1	95117	AC	126492
Hart	KYS0990018	Logsdon Valley Oil Co. Inc.	Charles Silson 6	37849	AC	9993
Henderson	KYS1010391	Countymark Energy Resources LLC	North Smith Mills 2	-	AC	92464
Henderson	KYS1010392	Energy Enterprises LLC	J.H. Bowers 1	8431-WF	AC	92557
Henderson	KYS1010411	Jeager Oil LLC	Gladys Spencer 1	31656	AC	25006
Henderson	KYS1010412	Big Man Oil Co. Inc.	Gip Bennett No. 2WI	65200	AC	45898
Henderson	KYS1010413	Big Man Oil Co. Inc.	Bennett-Williams 1	65737	AC	47333
Henderson	KYS1010588	Wildcat Oil LLC	Francis Dempewolf 8	70436	UC	62406
Henderson	KYS1010592	Continental Resources Inc.	George Whittington 8a	105580	UC	137885
Hopkins	KYS1070067	Marsh Oil and Gas Field Services	Sanderfur-Hancock-Smith Unit 1	18004	TA	20834
Laurel	KYS1250001	Taylor Equipment Service Inc.	Robert Taylor 2	88377	AC	114484
Lawrence	KYS1270039	Carson Associates Inc.	Martin-Hay 1	32055	SI	36131
Lawrence	KYS1270162	Sparks, Pearlman	Sparks 3	41611	AC	11573
Lawrence	KYS1270163	Sparks, Pearlman	Sparks 2	41612	AC	11572
Lawrence	KYS1270202	Ky Minerals Limited	L.K. Winslow Heirs 6	76181	AC	84289
Lawrence	KYS1270203	Elna Oil Co. Inc.	Robert Neely 10	34518	SI	35065
Lawrence	KYS1270328	Gibraltar Energy LLC	Robert Fyffe J21	15656E	AC	36215
Lawrence	KYS1270329	Abarta Oil & Gas Co. Inc.	J. Ward et al. 1 SWD	106795	AC	139274
Lee	KYS1290679	Appalachian Resources of Florida LLC	E. Williams W-1	9521	AB	2022378
Lee	KYS1290832	Buffalo Oil LLC	Shoestring 5	45160	SI	11786
Lee	KYS1290843	Appalachian Resources of Florida LLC	Shoestring 11 A	5881	AC	48187
Lee	KYS1290892	Triad Hunter LLC	Bill Abner 31	42095	AC	12095
Lee	KYS1291166	Bretagne, G.P.	E.L. Rogers 24 W	-	AB	-
Lee	KYS1292074	Oscar Benton	J.F. Raines W-1	-	AB	-
Lee	KYS1292147	Rokel Oil Co.	Clyde Rogers Tract 2 11	112183	AC	132383
Lee	KYS1292154	Union Disposal LLC	Minnie Hill 1-D	103152	AC	135333
Lee	KYS1292155	Bretagne LLC	Donald Kincaid 1-T	107362	AC	144045
Lee	KYS1292155	Basin Energy Co.	J.D. Crabtree Heirs P23	108618	UR	142120
Magoffin	KYS1530298	Walker Resources Co. LLC	Carrie Patton 10	108442	UR	141916
Magoffin	KYS1530299	Helit Investments Inc.	Daniel Fisher 16	80517	UR	102655
McLean	KYS1490215	Smith, Donald B.	F.M. Robertson 4	54052	TA	23723

County	EPA ID	Company Name	Well Name and Number	Ky. Permit	Status	KGS Record No.
Meadow	KYS1630001	Comstock Oil & Gas Inc.	Swan SWD 1	87899	AC	113962
Meadow	KYS1630003	Comstock Oil & Gas Inc.	Aulbach SWD1	89991	AC	116239
Meadow	KYS1630005	Comstock Oil & Gas Inc.	John Cohn SWD 1	91615	AC	121562
Meadow	KYS1630006	Comstock Oil & Gas Inc.	Gordon Board SWD 33	92772	AC	123552
Meadow	KYS1630007	Breitburn Operating LP	Olín SWD 2J23S41	-	UC	-
Metcalfe	KYS1690011	Kop Inc.	Max Well 2	106952	UC	130462
Metcalfe	KYS1690012	Saap Energy Inc.	Sorell 3	-	UC	142179
Metcalfe	KYS1690013	Saap Energy Inc.	Harper 5	-	UC	-
Metcalfe	KYS1690014	Saap Energy Inc.	Vanzant 2	-	UC	-
Muhlenberg	KYS1770076	Whitney Oil & Gas Co. LLC	Gardner Disposal Well 1	76585	AC	86313
Muhlenberg	KYS1770122	Intersite Drilling Co. Inc.	Tract 7 M-O-C	-	AB	-
Muhlenberg	KYS1770212	Central Energy Group LLC	L.D. Clair 3	102818	AC	134727
Powell	KYS1970169	Lyle Energy & Development Inc.	MPG Heirs Corp "E" 93	45637	TA	16419
Powell	KYS1970344	Bretagne, G.P.	P.M.G. Tract 3 50W	-	TA	-
Russell	KYS2070001	Travis Coomer Well Services	Joe Irwin Lease 2	72021	SI	67720
Taylor	KYS2170009	Greensburg Oil LLC	Greensburg Oil LLC 1	101299	AC	132658
Union	KYS2250087	Countymark Energy Resources LLC	Camp Breckinridge Tract 3 F-2-C	16316	AC	20029
Union	KYS2250088	Bissett, James C.	Tract 7 M-O-C	1014	AC	20012
Union	KYS2250254	Union Petro. Inc.	J.D. Ruark et al. 1	101715	AC	133675
Warren	KYS2270014	Lyle, Norman	Charles McKinney	227005	AB	-
Webster	KYS2330085	Morgan Oil USA LLC	Frank Stull 2	-	AB	61839
Webster	KYS2330107	Marsh Oil and Gas Field Services	Sellers 1	-	AC	18295
Webster	KYS2330172	W.W. Petroleum Service Inc.	L.L. Wilson 4	48432	AC	18295
Webster	KYS2330178	Blanford, Philip	S.J. Melton 4	N-18371	UC	-
Wolfe	KYS2370017	Shefa-Loe Oil Co. Inc.	Lefford White 60	43702	SI	18430
Wolfe	KYS2370104	Bretagne, G.P.	A.J. Adams 14 W	48162	AC	25951

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