TETRA TECH EM INC.

September 26, 2006

Mr. Roy Crossland
START Project Officer
U.S. Environmental Protection Agency, Region 7
901 North 5th Street
Kansas City, Kansas 66101

Subject: Removal Site Evaluation Report
United Zinc #1 Site, Iola, Kansas
U.S. EPA Region 7 START 3, Contract No. EP-S7-06-01, Task Order No. 0011.000
Task Monitor: Eddie McGlasson, EPA On-Scene Coordinator

Dear Mr. Crossland:

Tetra Tech EM Inc., is submitting the attached Removal Site Evaluation Report for the above-referenced site. If you have any questions or comments regarding this submittal, please contact the project manager at 913-908-4649.

Sincerely,

for

Rick Claytor, CHMM
START Project Manager

Ted Faile, PG, CHMM
START Program Manager

Enclosures

9004/06.0011.000

30291335

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REMOVAL SITE EVALUATION REPORT

UNITED ZINC #1 SITE – IOLA, KANSAS

Superfund Technical Assessment and Response Team (START) 3
Contract No. EP-S7-06-01, Task Order No. 0011.000

Prepared For:

U.S. Environmental Protection Agency
Region 7
901 North 5th Street
Kansas City, Kansas 66101

September 26, 2006

Prepared By:

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1.0 INTRODUCTION

Tetra Tech EM Inc., (Tetra Tech) was tasked by the U.S. Environmental Protection Agency (EPA) Region 7 Superfund Division, under Superfund Technical Assessment and Response Team (START) 3 Contract Number EP-S7-06-01, Task Order Number 0011, to conduct a removal site evaluation (RSE) at the United Zinc (UZ) #1 site in Iola, Kansas. The primary objective of the RSE was to assess the extent of lead, zinc, arsenic, and cadmium contamination in surface soils as a result of historic zinc and lead smelting activities in the area. To accomplish the objective, Tetra Tech START conducted field screening of surface soils with a portable x-ray fluorescence (XRF) spectrometer at daycare facilities, schools, parks, and residential properties. Soil samples from approximately 10 percent of the screened locations were collected and submitted to the Region 7 EPA laboratory in Kansas City, Kansas, for laboratory confirmation analyses of lead, zinc, arsenic, and cadmium. The following sections discuss previous investigations at the site, procedures used during this investigation, and analytical data obtained during this RSE.

2.0 SITE DESCRIPTION AND PREVIOUS INVESTIGATIONS

The UZ #1 site is located in and around the city limits of Iola, Kansas. The site location is illustrated on Figure 1 in Appendix A. The area of concern is a mix of residential and commercial properties, along with schools, daycares, and historical smelting areas.

With the discovery of natural gas in the area, ample fuel became available to support numerous zinc and lead smelting operations in the region. From 1902 until 1912, the United Zinc and Chemical Company utilized the site for lead and zinc smelting and processing operations.

Under the Kansas Department of Health and Environment's (KDHE) State Water Plan (SWP) program, a Phase I Focused Former Smelter Assessment was completed at the UZ #1 site in December 2003. The assessment identified the site as a potential source of heavy metals contamination due to the historical activities at the site. In December 2004, a KDHE contractor conducted a Phase II assessment at the site and identified elevated concentrations of lead, cadmium, arsenic, and zinc on the former United Zinc and Chemical Company property. Concentrations of those metals were detected as high as 49,000 milligrams per kilogram (mg/kg) for lead, 380 mg/kg for cadmium, 1,800 mg/kg for arsenic, and 52,000 mg/kg for zinc. The assessment also identified the potential for elevated levels of lead on nearby residential, school, and daycare properties.

In June 2005, KDHE screened the right-of-ways of 50 residential properties around the UZ #1 site. Discrete surface soil samples were collected at each property and analyzed (using both field screening and laboratory methods) for lead, arsenic, cadmium, and zinc. The results of this investigation identified lead-contaminated soils (i.e., exceeding 400 mg/kg) at 36 percent of the properties. Relative concentrations of the other metals of concern typically mimicked the lead levels.

In September 2005, a Preliminary Removal Site Evaluation was conducted by a KDHE contractor at sensitive receptor areas identified during previous investigations. This involved the collection of discrete soil samples from the McKinley Elementary School and the Iola Preschool. Lead concentrations greater than 400 mg/kg were identified in soils on and adjacent to the McKinley Elementary School property; however, no elevated concentrations of metals were found in the samples collected from the Iola Preschool.

3.0 REMOVAL SITE EVALUATION ACTIVITIES

Tetra Tech START conducted sampling activities at the UZ #1 site during the six-week period between April 11 and May 19, 2006, to identify contaminated soils meeting removal criteria. The Tetra Tech START members involved in those activities included Rick Claytor, Andy Haner, and Anthony Brewer. Eddie McGlasson, the EPA Region 7 on-scene coordinator (OSC), was also present during most of the sampling activities. The fieldwork was conducted in accordance with a quality assurance project plan (QAPP) prepared by Tetra Tech START and approved by EPA Region 7. A summary of those activities and the resulting data follows.

3.1 XRF SCREENING

For the RSE, residential properties, schoolyards, parks, and daycare centers were selected for assessment. At each identified property, after receiving consent for access from the owner, Tetra Tech START divided the property into multiple cells for screening purposes. From each cell, a composite sample consisting of nine aliquots was collected from 0 to 2 inches below ground surface (bgs), placed in an aluminum pie pan, and homogenized. Three separate readings for lead were taken of each homogenized sample using a field portable XRF. These readings were recorded on a screening form prepared for each property. The average of these three readings was calculated and also recorded on the screening form (see Appendix B). The property owner was provided a sketch of the property with the lead concentrations identified in each cell.

During the RSE, 260 properties were screened. Those properties consisted of 234 residential properties, 15 daycare centers, five public schoolyards, two churches, and four commercial properties. Figure 2 in Appendix A identifies the highest XRF values recorded at each property. At ten residential properties, XRF screening identified lead concentrations in soil exceeding the removal action level of 800 mg/kg. At three of the four commercial properties, XRF screening identified lead concentrations in soil exceeding the removal action level of 1,000 mg/kg for commercial properties. For schools, daycare facilities, and residences where a child with an elevated blood-lead (EBL) level resides, a removal action level of 400 mg/kg was established. XRF readings at two school properties, eight daycare facilities, and one residence where a child with an EBL level lived were greater than 400 mg/kg in surface soils. In all, 24 properties were identified with lead concentrations that supported a time-critical removal action, based on XRF data.

3.2 SOIL SAMPLING FOR XRF CONFIRMATION

In accordance with the QAPP, approximately 10 percent of the screened samples were submitted for laboratory confirmation analyses of arsenic, zinc, cadmium, and lead. The 75 samples selected for submittal to the laboratory (EMA78Q00/3001-1 through 75, including one field duplicate) were placed into 8-ounce glass jars, labeled, and placed into coolers, pending delivery to the EPA Region 7 laboratory in Kansas City, Kansas. Sample collection field sheets and chain-of-custody (COC) records were submitted to the laboratory with the soil samples (see Appendix C).

3.3 SOIL SAMPLING FOR BIOAVAILABILITY STUDY

On June 6, 2006, Mr. Claytor and Mr. Haner returned to Iola to collect multi-aliquot surface soil samples from six properties that had been previously screened and identified as containing elevated lead concentrations. Samples were collected in one cell from each of the six properties (EPA Property IDs 7, 21, 48, 54, 138a, and 223; see Appendix A, Figure 2) in the same manner as previously described. Each soil sample was split, with one split sample submitted to the EPA Region 7 laboratory and the other sent to a laboratory at the University of Colorado in Boulder, Colorado, under contract to Tetra Tech. Both sets of split samples were analyzed to determine the bioavailability of lead in the samples.

4.0 DATA SUMMARY

The data package from the EPA Region 7 laboratory for analyses to confirm the XRF readings is included in Attachment 1. The bioavailability data from the EPA Region 7 laboratory is included in Attachment 2

and the bioavailability data from the University of Colorado laboratory, along with Tetra Tech START's data validation report, is included as Attachment 3. The following sections summarize those laboratory data obtained for the RSE.

4.1 SOIL SAMPLES FOR XRF CONFIRMATION

The EPA Region 7 laboratory in Kansas City, Kansas, analyzed 75 soil samples to determine total concentrations of lead, zinc, arsenic, and cadmium (see Attachment 1). These samples represented approximately 10 percent of the samples screened with the XRF. Table 1 lists the XRF readings and corresponding laboratory results for lead in those samples. XRF readings for lead in those samples ranged from 143 to 1,410 mg/kg, while the laboratory results ranged from 106 to 2,290 mg/kg. Table 1 also contains the laboratory sample numbers and EPA identification numbers of the properties where the samples were collected, along with the addresses, cell numbers, and sample collection dates.

XRF data are considered valid if a comparison between the XRF values and the corresponding laboratory results yields a regression coefficient (r^2) of at least 0.7. The regression coefficient for the data collected for this RSE was 0.738. Therefore, the remaining XRF readings are considered valid screening level data.

TABLE 1
SUMMARY OF XRF AND LABORATORY LEAD CONCENTRATIONS
UNITED ZINC #1 SITE – IOLA, KANSAS

Sample Number	EPA Property ID	Property Address	Cell Number	Date Collected	XRF Reading (mg/kg)	Lab Result (mg/kg)
1,2&2-FD	2	204 S. Kentucky	1 & 8	4/11/2006	273 - 411	585 (596 & 496)
4	3	300 S. Jefferson	7	4/12/2006	485	501
5	4	700 N. Jefferson	3	4/12/2006	251	263
6 & 7	5	600 East St.	8 & 2	4/12/2006	311 - 216	284 - 223
8 & 10	6	300 E. Jackson	3 & 16	4/13/2006	247 - 211	210 - 228
9	13	304 N. Buckeye	2	4/14/2006	653	961
11	7	Kansas Dr. & Hwy 54	1	4/13/2006	665	736
12	12	605 N. Walnut	2	4/13/2006	333	806
13	10	411 N. Cottonwood	1	4/14/2006	793	869
14	14	19 S. Ohio	3	4/14/2006	492	539
15	28	1282 2,000th	2	4/18/2006	178	135
16	42	423 S. Washington	3	4/19/2006	369	420
17	37	502 S. Jefferson	1	4/19/2006	307	434
18	48	508 South St.	1	4/19/2006	811	2,290
19	39	605 South St.	1	4/19/2006	343	440
20	35	429 S. Kentucky	4	4/20/2006	415	582
21	16	116 S. Ohio	4	4/20/2006	443	745
22	29	18 S. Tennessee	2	4/20/2006	354	571
23	30	20 S. Tennessee	1	4/20/2006	503	681
24	50	1101 N. Sycamore	1	4/21/2006	373	567
25	56	205 S. 4th	1	4/21/2006	985	1,040

TABLE 1 (Continued)
SUMMARY OF XRF AND LABORATORY LEAD CONCENTRATIONS
UNITED ZINC #1 SITE – IOLA, KANSAS

Sample Number	EPA Property ID	Property Address	Cell Number	Date Collected	XRF Reading (mg/kg)	Lab Result (mg/kg)
26	58	701 N. Walnut	1	4/24/2006	606	769
27	76	812 N. Walnut	3	4/25/2006	386	1,050
28	64	910 N. Walnut	1	4/25/2006	575	1,150
29	80	220 S. Kentucky	3	4/25/2006	316	490
30	81	502 Kennedy Dr	4	4/26/2006	180	246
31	67	210 N. 1st	1	4/26/2006	241	288
32	87	316 W. Jackson	1	4/26/2006	924	1,200
33	102	416 E. Jackson	2	4/27/2006	359	704
34	92	203 S. 2nd	1	4/27/2006	378	556
35	89	230 S. Tennessee	1	4/27/2006	295	417
36	137	417 E. Madison	1	5/1/2006	219	284
37	107	502-504 N. Cottonwood	1	5/2/2006	278	616
38	110	301-303 N. 2nd	1	5/2/2006	165	246
39	142	818-820 Kansas Dr.	2	5/2/2006	167	209
40	144	317 S. Buckeye	1	5/2/2006	356	578
41	144	317 S. Buckeye	3	5/2/2006	556	798 J
42	141	302-304 Eisenhower	1	5/3/2006	175	249
43	148	330-332 Eisenhower	1	5/3/2006	143	106
44	158	426 Eisenhower	1	5/3/2006	149	148
45	156	419-421 Eisenhower	2	5/3/2006	255	342
46	171	702 N. Kentucky	2	5/4/2006	237	282
47	183	402 S. Sycamore	1	5/8/2006	319	530
48	179	302 S. Buckeye	2	5/8/2006	281	411
49	190	510 N. 2nd	1	5/9/2006	238	336
50	185	515 S. Cottonwood	1	5/10/2006	295	397
51	201	514 N. Kentucky	1	5/10/2006	445	764
52	198	427 N. Ohio	1	5/10/2006	421	562
53	205	610 N. Ohio	1	5/11/2006	153	186
54	197	613 N. Ohio	1	5/11/2006	385	504
55	208	502 N. Tennessee	2	5/11/2006	150	258
56	216	309 S. Colborn	1	5/15/2006	359	496
57	218	402 S. Colborn	2	5/15/2006	366	494
58	220	524 S. Oak	1	5/15/2006	639	837
59	221	323 S. Oak	1	5/15/2006	424	614
60	234	5 E. Irwin	2	5/16/2006	647	872
61	229	216 S. 1st	3	5/16/2006	329	362
62	225	221 S. 1st	1	5/16/2006	475	551
63	223	221 E. Elm	1	5/16/2006	1,410	1,960
64	233	422 S. 2nd	1	5/16/2006	326	618
65	237	112 S. 3rd	2	5/16/2006	303	323
66	239	105 S. 3rd	1	5/17/2006	270	386
67	236	101 S. 3rd	2	5/17/2006	442	509
68	248	202 E. Jackson	3	5/17/2006	555	628
69	243	606 N. Buckeye	1	5/17/2006	317	460
70	244	610 N. Buckeye	3	5/17/2006	487	554
71	246	709 N. Buckeye	1	5/17/2006	415	633
72	246	709 N. Buckeye	3	5/17/2006	1,059	1,360
73	249	201 N. Sycamore	1	5/18/2006	472	585
74	255	307 N. Sycamore	1	5/18/2006	655	844

TABLE 1 (Continued)
SUMMARY OF XRF AND LABORATORY LEAD CONCENTRATIONS
UNITED ZINC #1 SITE – IOLA, KANSAS

Sample Number	EPA Property ID	Property Address	Cell Number	Date Collected	XRF Reading (mg/kg)	Lab Result (mg/kg)
75	257	705 N. Sycamore	1	5/18/2006	500	464

Notes:

EPA	U.S. Environmental Protection Agency
ID	Identification
J	Estimated value
mg/kg	Milligrams per kilogram
XRF	X-ray fluorescence

Based on the laboratory results, ten additional properties were identified where lead concentrations exceeded the aforementioned removal action levels of 400 or 800 mg/kg (where XRF readings were below 400 or 800 mg/kg). Those samples were collected from EPA Property IDs 102 and 183 (daycare facilities), along with 10, 12, 13, 64, 76, 220, 234, and 255 (residences). Consequently, 34 properties were identified where XRF and/or laboratory data indicated lead concentrations warranting a time-critical removal action. Of these 34 properties, 19 are private residences (one where a child with an EBL level resides), ten are daycare facilities, two are elementary schools, and three are commercial properties (see Figure 2 in Appendix A). Table 2 identifies the properties that met criteria for a time-critical removal action.

TABLE 2
SUMMARY OF PROPERTIES MEETING TIME-CRITICAL REMOVAL CRITERIA
UNITED ZINC #1 SITE – IOLA, KANSAS

Property ID	Classification	Lead Concentration (mg/kg)		Criteria Met for Time-Critical Removal Action
		XRF[a]	Laboratory	
2	School	411	585	School/daycare >400 mg/kg (XRF & laboratory)
3	School	485	501	School/daycare >400 mg/kg (XRF & laboratory)
7	Commercial	6,443	NS	Commercial >1,000 mg/kg (XRF)
10	Residential	793	869	Residence >800 mg/kg (laboratory)
12	Residential	333	806	Residence >800 mg/kg (laboratory)
13	Residential	653	961	Residence >800 mg/kg (laboratory)
21	Daycare	1,135	NS	School/daycare >400 mg/kg (XRF)
41	Residential	1,163	NS	Residence >800 mg/kg (XRF)
46	Daycare	708	NS	School/daycare >400 mg/kg (XRF)
48	Residential	1,293	NS	Residence >800 mg/kg (XRF)
49	Residential	816	NS	Residence >800 mg/kg (XRF), EBL residence >400 mg/kg
54	Residential	1,443	NS	Residence >800 mg/kg (XRF)
56	Residential	985	1,040	Residence >800 mg/kg (XRF & laboratory)
64	Residential	575	1,150	Residence >800 mg/kg (laboratory)
65	Residential	807	NS	Residence >800 mg/kg (XRF)
76	Residential	386	1,050	Residence >800 mg/kg (laboratory)
87	Daycare	924	1,200	School/daycare >400 mg/kg (XRF & laboratory)
92	Daycare	813[b]	556	School/daycare >400 mg/kg (XRF & laboratory)
93	Daycare	459	NS	School/daycare >400 mg/kg (XRF)
102	Daycare	359	704	School/daycare >400 mg/kg (laboratory)
103	Daycare	430	NS	School/daycare >400 mg/kg (XRF)
138a	Commercial	1,405	NS	Commercial >1,000 mg/kg (XRF)
138c	Commercial	4,000	NS	Commercial >1,000 mg/kg (XRF)
183	Daycare	337	530	School/daycare >400 mg/kg (laboratory)
213	Residential	979	NS	Residence >800 mg/kg (XRF)
220	Residential	639	837	Residence >800 mg/kg (laboratory)
223	Residential	1,410	1,960	Residence >800 mg/kg (XRF & laboratory)
232	Daycare	744	NS	School/daycare >400 mg/kg (XRF)
234	Residential	647	872	Residence >800 mg/kg (laboratory)
246	Residential	1,059	1360	Residence >800 mg/kg (XRF & laboratory)
251	Residential	930	NS	Residence >800 mg/kg (XRF)
254	Daycare	478	NS	School/daycare >400 mg/kg (XRF)
255	Residential	655	844	Residence >800 mg/kg (laboratory)
256	Residential	844	NS	Residence >800 mg/kg (XRF)

Notes:

EBL	Elevated blood-lead
ID	Identification
mg/kg	Milligrams per kilogram
NS	No corresponding sample collected for laboratory analysis
XRF	X-ray fluorescence
a	Highest reading obtained for the property
b	Re-screening result; initial XRF screening value was 378 mg/kg

4.2 SOIL SAMPLES FOR BIOAVAILABILITY STUDY

Six soil samples containing elevated lead concentrations were split and submitted to the EPA Region 7 laboratory and the University of Colorado (UC) laboratory in Boulder for comparative analysis of bioavailability of lead. These analyses were conducted to determine the percentage of lead in site soils that would theoretically become bioavailable over time (see Attachments 2 and 3). Table 3 summarizes the results of the analyses conducted by both laboratories, along with XRF readings for lead in surface soils where those samples were collected. The EPA laboratory identified bioavailability of lead ranging from 62.8 to 86.5 percent, while the CU laboratory results ranged from 67 to 86 percent. The good correlation between the results from both laboratories supports a conclusion that a significant portion of lead in the soil would be bioavailable.

TABLE 3
SUMMARY OF BIOAVAILABILITY SAMPLING RESULTS
UNITED ZINC #1 SITE – IOLA, KANSAS

Sample Number	EPA Property ID	EPA Result for % Relative Lead Bioavailability	UC Result for % Relative Lead Bioavailability	XRF Lead Value (mg/kg)
1	7	62.8	74	6,433
2	138a	70.6	72	1,405
3	21	77.2	85	1,135
4	54	79.8	79	1,557
5	48	86.5	86	1,293
6	223	70.3	67	1,410

Notes:
EPA U.S. Environmental Protection Agency
ID Identification
mg/kg Milligrams per kilogram
UC University of Colorado
XRF X-ray fluorescence

5.0 CONCLUSIONS

From April 11 to May 19, 2006, Tetra Tech conducted RSE activities at the UZ #1 site, located in Iola, Kansas. Field activities included surface soil sampling and XRF screening of 260 properties throughout Iola. At ten residential properties, XRF screening indicated lead concentrations in soil exceeding the removal action level of 800 mg/kg. XRF readings for lead at three commercial properties exceeded a removal action level of 1,000 mg/kg established for commercial properties. In addition, two school

properties, eight daycare facilities, and one residence where a child with an EBL level lived had soils with lead concentrations greater than 400 mg/kg—the removal action level established for these types of properties. Also, ten additional properties (two daycares and eight residences) were identified by laboratory analysis where lead concentrations exceeded the appropriate removal action level. Consequently, a total of 34 properties were identified where XRF and/or laboratory data indicated lead concentrations warranting a time-critical removal action.

5.1 REMOVAL CONSIDERATIONS

A time-critical EPA-funded removal action appears warranted at 19 private residences (one where a child with an EBL level resides), ten daycare facilities, two elementary schools, and three commercial properties, where lead concentrations in surface soils have been found that exceed site-specific removal action levels. Removal activities at these properties would likely involve excavation and off-site disposal of contaminated soils, along with backfilling and restoration of excavated areas. Removal considerations are summarized in Appendix D.

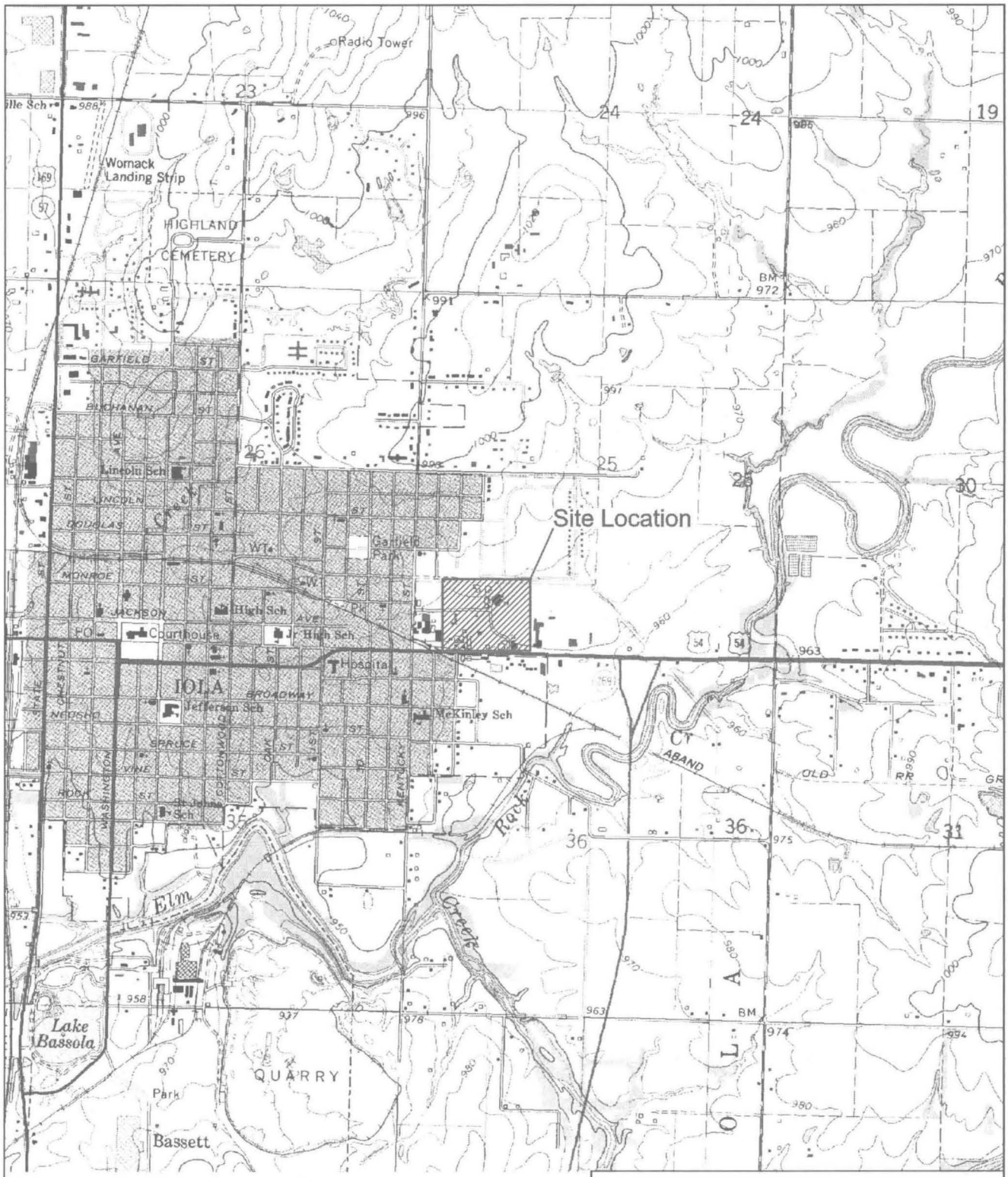
5.2 PRE-REMEDIAL CONSIDERATIONS

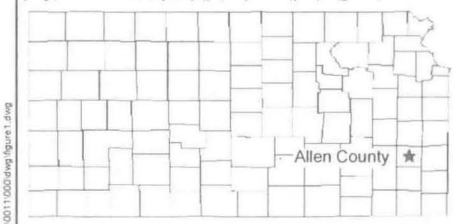
Pre-remedial issues at the UZ #1 site are currently being addressed by a combined Preliminary Assessment and Site Inspection (PA/SI) conducted by Tetra Tech START. Field data accumulated during this RSE will be incorporated into the PA/SI to determine whether further pre-remedial investigation is warranted.

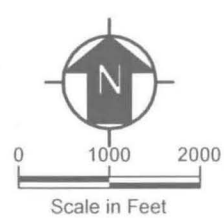
APPENDIX A

FIGURES

(Two Pages)







Source: USGS Allen County, KS 7.5 Minute Topo Quad, 1959, PR 1984

United Zinc #1 Smelter Site
Iola, Kansas

Figure 1
Site Location Map

Tetra Tech EM Inc.

Date: 04/5/06 Drawn By: Bill Yinking Project No. 19004.L06.0011.000

G:\G\9004\0011\000\dwg\figure1.dwg

Legend

School/Day Care XRF Results

- < 400 parts per million (ppm)
- >= 400 ppm

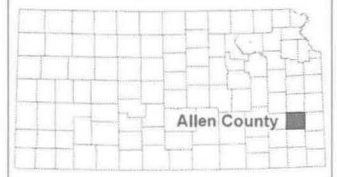
Residential and Commercial XRF Results

- < 400 ppm
- 400 - 799 ppm
- 800 - 1,199 ppm
- >= 1,200 ppm

- Highway
- Major Road
- Local Road
- Minor Road
- Other Road
- EPA Property ID Number

Note: Property 0092 re-screened at >400 ppm; initial value <400 ppm.

County Locator Map



N

400 0 400

Feet

Source: Allen Co., Kansas DOQQ Tileset, 2005

United Zinc #1 Site
Iola, Kansas

Figure 2
XRF Screening Results Map

Tetra Tech EM Inc.

APPENDIX B

PROPERTY SCREENING FORMS

(265 Pages)

THE FOLLOWING PAGES HAVE BEEN REMOVED:

19 through 377

DUE TO CONFIDENTIAL BUSINESS INFORMATION (CBI)

APPENDIX C

SAMPLE COLLECTION FIELD SHEETS AND CHAIN-OF-CUSTODY RECORDS

(88 Pages)

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 1 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-1-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #2 Coll Pc 1

External Sample Number: _____

Expected Conc: (or Circle One: Low (Medium) High) **Date** **Time(24 hr**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/11/06 15:15
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidify,<4 Deg C~~	180 Days	1 Metals in ~~Water~~ Solids by ~~ICP~~ ECP

Sample Comments:

(N/A)

273

SR Number: 3001 **Sample Number:** 3 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-~~1~~ 2 __

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
roject Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

ocation Desc: EPA #2 Cell 8

External Sample Number: _____

xpected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/11/06 15:58
Longitude: ___ ___ ___ **End:** __/__/__ __:__

aboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 ~~Liter Cubitainer~~ 8 oz	~~HNO3 acidify; 4~~ Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

ample Comments:

I/A)

411

ample Collected By: RC

SR Number: 3001 **Sample Number:** 2 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-2-_FD

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #2 Cell 8

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/11/06 15:50
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
- ~~1 Liter Cubitainer~~ 8 oz Glass	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solids by ICP

Sample Comments:

(N/A)

Duplicate Sample

4/11

Sample Collected By: RC

SR Number: 3001 **Sample Number:** 4 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-4-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
roject Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

ocation Desc: EPA #3 Cell 7

External Sample Number: _____

xpected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/12/06 09:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

aboratory Analyses:

Container	Preservative	Holding Time	Analysis
- ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidify,~~ 4 Deg C	180 Days	1 Metals In ~~Water~~ Solids by ICP

ample Comments:

J/A)

300 S. Jefferson

485

ample Collected By: ~~BC~~ AH

SR Number: 3001 **Sample Number:** 5 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-5-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #4 Cell 3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/12/06 13:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 ~~Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~ 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:

N/A)

700 N. Jefferson

25(

Sample Collected By: BG AH

.SR Number: 3001 **Sample Number:** 6 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-6-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
'roject Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

ocation Desc: EPA # 5 Cell 8

External Sample Number: _____

xpected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/12/06 15:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

.aboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 ~~Liter Cubitainer~~ 5 + 2	~~HNO3 Acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

ample Comments:

J/A)

600 East St

3(

;ample Collected By: ~~RC~~ AH

ISR Number: 3001 **Sample Number:** 7 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-7-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 5 Cell 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/12/06 15:15
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
- 1 ~~Liter Cubitainer~~ 8oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solids by ICP

Sample Comments:

N/A)

600 East St

216

Sample Collected By: ~~RC~~ AH

ISR Number: 3001 Sample Number: 8 QC Code: __ Matrix: ~~Water~~ Solid Tag ID: 3001-8-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #6 Cell 3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/13/06 08:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
- ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solids by ICP

Sample Comments:

(N/A)

300 E. Jackson

247

Sample Collected By: RC

ISR Number: 3001 **Sample Number:** 9 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-9-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EMA #13 Cell 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/13/06 08:55
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
~~1 Liter Cubitainer~~ 5 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
N/A)

304 N. Buckeye

653

Sample Collected By: RC

SR Number: 3001 **Sample Number:** 10 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-10-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

ocation Desc: EPA #6 Cell 16

External Sample Number: _____

xpected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/13/06 11:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

aboratory Analyses:

Container	Preservative	Holding Time	Analysis
- 1 ~~Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals In ~~Water~~ Solid by ICP

ample Comments:

N/A)

300 E. Jackson.

2C

ample Collected By: RC

SR Number: 3001 **Sample Number:** 11 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-11-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

ocation Desc: EPA #7 Cell

External Sample Number: _____

xpected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/13/06 14:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

aboratory Analyses:

Container	Preservative	Holding Time	Analysis
- ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

ample Comments:

N/A)

Kansas Dr & Hwy 54

665

ample Collected By: RC

ISR Number: 3001 **Sample Number:** 12 **QC Code:** __ **Matrix:** ~~Water~~ Soil **Tag ID:** 3001-12-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EA #12 Cell 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/13/08 16:32
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
- 1 ~~liter Cubitainer~~ 8oz	~~HNO3 acidify~~ 4 Deg C	180 Days	1 Metals in ~~Water~~ Soil by ICP

Sample Comments:

N/A)

605 N. Walnut

333

Sample Collected By: ~~RC~~ AH

SR Number: 3001 **Sample Number:** 13 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-13-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
roject Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

ocation Desc: EPA #10 Cell 1

External Sample Number: _____

xpected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/14/06 08:50
Longitude: ___ ___ ___ **End:** __/__/__ __:__

aboratory Analyses:

Container	Preservative	Holding Time	Analysis
~~1 Liter Cubitainer~~ 5 oz	~~HNO3 acidify,~~ 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

ample Comments:

I/A) 411 N. Cottonwood

293

ample Collected By: ~~RC~~ AH

SR Number: 3001 **Sample Number:** 14 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-14-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
roject Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

ocation Desc: EPA # 19 Cell 3

External Sample Number: _____

xpected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/14/06 13:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

aboratory Analyses:

Container	Preservative	Holding Time	Analysis
- ~~1 Liter Cubitainer~~ 3oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

ample Comments:

I/A) 19 S. Ohio

492

ample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 15 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-15-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #28 Cell 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/18/06 12:15
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:

(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 16 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-16-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #42 Cell 3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/19/06 08:45
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidify,~~ 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 17 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-17-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #37 Cell 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/19/06 11:15
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidifiy~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:

(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 18 **QC Code:** __ **Matrix:** Water **Tag ID:** 3001-18-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 48 Cell 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/19/06 13:35
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	HNO3 acidify, 4 Deg C	180 Days	1 Metals in Water by ICP

Sample Comments:
(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 19 **QC Code:** __ **Matrix:** Water **Tag ID:** 3001-19-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA#39 Cell 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/19/06 15:20
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	HNO3 acidify, 4 Deg C	180 Days	1 Metals in Water by ICP

Sample Comments:
(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 20 **QC Code:** __ **Matrix:** Water **Tag ID:** 3001-20-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 35 Cell 4

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/20/06 08:25
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	HNO3 acidify, 4 Deg C	180 Days	1 Metals in Water by ICP

Sample Comments:
(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 21 **QC Code:** __ **Matrix:** Water **Tag ID:** 3001-21-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #16 Cell 4

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/20/06 10:15
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	HNO3 acidify, 4 Deg C	180 Days	1 Metals in Water by ICP

Sample Comments:
(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 22 **QC Code:** __ **Matrix:** Water **Tag ID:** 3001-22-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #29 Cell 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/20/06 14:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	HNO3 acidify, 4 Deg C	180 Days	1 Metals in Water by ICP

Sample Comments:
(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 23 **QC Code:** __ **Matrix:** Water **Tag ID:** 3001-23-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #30 Cell I

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/20/06 15:15
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	HNO3 acidify, 4 Deg C	180 Days	1 Metals in Water by ICP

Sample Comments:
(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 24 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-24-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA#50 Cell 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/21/06 08:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8-2	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals In ~~Water~~ Soil by ICP

Sample Comments:
(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 25 **QC Code:** __ **Matrix:** ~~Water~~ Soil **Tag ID:** 3001-25-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 56 C I

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/21/06 11:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Soil by ICP

Sample Comments:

(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 26 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-26-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 58 Cell 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/24/06 15:15
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 ~~Liter Cubitainer~~ 8 oz	~~HNO3 acidify,~~ 4 Deg C	180 Days	1 ~~Metals~~ Solid in Water by ICP

Sample Comments:

(N/A)

606

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 27 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-27-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 76 Cell 3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/25/06 08:15
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:

(N/A)

386

Sample Collected By: ~~RC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 28 **QC Code:** __ **Matrix:** ~~Water~~ Soil **Tag ID:** 3001-28-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 64 Cell 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/25/06 10:05
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Soils by ICP

Sample Comments:
(N/A)

575

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 29 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-29-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 80 Cell 3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/15/04 17:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 ~~Metals in Water~~ Metals in Soil by ICP

Sample Comments:
(N/A)

316

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 30 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-30-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 81 Cell 4

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/26/06 __:__
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

180

Sample Collected By: ~~RE~~ AB

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 31 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-31-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 67 Cell 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/26/06 11:18
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:

(N/A)

210 N 1st

241

Sample Collected By: ~~RC~~ AB

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 32 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-32-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 87 Cell 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/26/06 16:21
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

3 (6 G). Jackson

929

Sample Collected By: ~~RC~~ AB

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 33 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-33-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 102 Cell 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/27/06 08:53
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 ~~Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

416 E. Jackson.

359

Sample Collected By: ~~RC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 34 **QC Code:** __ **Matrix:** ~~Water~~ Soil **Tag ID:** 3001-34-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 72 Cell 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/17/06 13:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 ~~Liter Cubitainer~~ 8oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Soil by ICP

Sample Comments:
(N/A)

203 5.2 ad

378

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 35 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-35-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 89 Cell 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/27/06 15:45

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:

(N/A)

130 S. Tennessee

295

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 36 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-36-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 137 Cell #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/1/06 17:15
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidify,~~ 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

417 E. Madison

219

Sample Collected By: ~~RC~~ AH RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 37 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-37-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 107 Cell 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/2/06 08:45
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

502-504 N. Cottonwood

278

Sample Collected By: ~~JC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 38 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-38-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 110 Cell #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/2/06 10:10
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals ~~in Water~~ Solid by ICP

Sample Comments:
(N/A)

301-303 N. 2nd

165

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 39 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-39-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 141 Cell #2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/2/06 13:59
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

819-820 Elevated DL

162

Sample Collected By: ~~RC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 40 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-40-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 144 Cell #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/2/06 14:50
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~ 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

317 S. Buckeye

356

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 41 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-41-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 144 Cell 3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/2/06 15:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidify,~~ 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

317 S. Buckeye

556

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 42 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-42-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 141 Cell 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/3/06 09:05
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8oz	~~HNO3 acidify,~~ 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

302-304 Eisenhower DR.

175

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 43 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-43-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 148 Cell #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/3/06 10:31
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 ~~Liter Subcontainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

330-332 Eisenhower DR.

143

Sample Collected By: ~~RC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 44 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-44-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 158 Cell #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/3/06 14:18
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 ~~Liter~~ 8oz Cubitainer	~~HNO3 acidify,~~ 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

426 Eisenhower Dr

149

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 45 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-45-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 156 Cell #2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/3/06 14:33
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals ~~In Water~~ Solid by ICP

Sample Comments:
(N/A) 419-421 Eisenhower Dr

255

Sample Collected By: ~~RC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 46 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-46-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA171 Cell #2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/4/06 15:48
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Subtainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

702 N. Kentucky

237

Sample Collected By: ~~RE~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 47 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-47-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 183 Cell #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/8/06 13:10
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

402 S. Sycamore

319

Sample Collected By: ~~RC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 48 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-48-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 179 Cell #2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/8/06 14:47
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 ~~liter Cubitainer~~ 8 oz	~~HNO3 acidify,~~ 4 Deg C	180 Days	1 Metals In ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

302 S. Buckeye

281

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 49 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-49-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 190 Cell #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/9/06 13:55
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 ~~liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

510 N. 2nd

238

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 50 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-50-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 185 Cell #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/10/06 09:03
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 ~~Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

515 S. Cottonwood

295

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 51 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-51-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 20c Cell #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/10/06 13:06
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 ~~Liter Cubitainer~~ 8oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

514 N. Keafacky

495

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 52 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-52-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 198 Cell # 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/10/06 15:50
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 ~~Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

427 N. Ohio

421

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 53 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-53-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 205 Cell # 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: __ __ __ **Sample Collection: Start:** 5/11/06 08:47
Longitude: __ __ __ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 ~~liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals In ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

610 N. Ohio

153

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 54 **QC Code:** __ **Matrix:** ~~Water~~ Soil **Tag ID:** 3001-54-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 197 Cell #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/11/06 09:10
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Soil by ICP

Sample Comments:
(N/A)

613 N. Ohio

385

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 55 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-55-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 208 Cell #2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/11/06 14:05
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 ~~Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:

(N/A)

501 N. Tennessee

150

Sample Collected By: ~~RC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 56 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-56-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 2lle C1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/15/06 11:55
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

309 S Colborn

359

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 57 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-57-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 218 C2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/15/06 13:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 ~~Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

402 S Colborn

366

Sample Collected By: ~~RC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 58 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-58-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 220 C1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/15/06 13:35
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

524 S. OAK

639

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 59 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-59-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 221 C1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/15/06 16:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:

(N/A) 323 S OAK.

424

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 60 **QC Code:** __ **Matrix:** ~~Water~~ Soil **Tag ID:** 3001-60-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 234 C2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/16/06 08:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Soil by ICP

Sample Comments:

(N/A)

5 E IRWIN

647

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 61 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-61-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 229 C3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/16/06 10:25
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

216 S. 1ST ST.

329

Sample Collected By: ~~RC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 62 **QC Code:** __ **Matrix:** ~~Water~~ Soil **Tag ID:** 3001-62-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 225 C1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/16/06 11:05
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 ~~Liter Cubitainer~~ 8 oz	~~HNO3 addify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Soil by ICP

Sample Comments:
(N/A)

221 S 1ST ST.

475

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 63 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-63-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 223 C1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/16/06 13:05
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 ~~Liter Cubitainer~~ 8oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals In ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

221 S ELM ST.

HID

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 64 **QC Code:** __ **Matrix:** ~~Water~~ Soil **Tag ID:** 3001-64-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 223 C1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/16/06 14:55
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 ~~Liter~~ 8 oz Cubitainer	~~HNO3 acidify~~ 4 Deg C	180 Days	1 Metals in ~~Water~~ Soil by ICP

Sample Comments:
(N/A)

422 S. 2nd ST

326

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 65 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-65-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 237 C2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/16/06 16:55
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 ~~Liter Cubitainer~~ 8 oz	~~HNO3 acidify,~~ 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

112 S. 3rd ST.

303

Sample Collected By: ~~RC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 66 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-66-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 239 C1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/17/06 08:45
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Soil by ICP

Sample Comments:
(N/A)

105 S 3rd St.

270

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 67 **QC Code:** __ **Matrix:** ~~Water~~ Soil **Tag ID:** 3001-67-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 236 C2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/17/06 09:31
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 ~~Liter Cubitainer~~ 5oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Soil by ICP

Sample Comments:
(N/A)

101 S. 3rd ST.

442

Sample Collected By: ~~RC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 68 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-68-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 248 C3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/17/06 10:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acid~~ify, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

202 E. JACKSON

555

Sample Collected By: ~~RC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 69 **QC Code:** __ **Matrix:** ~~Water~~ SoGS **Tag ID:** 3001-69-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 243 C1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/17/06 12:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ SoGS by ICP

Sample Comments:

(N/A)

606 N. Buckeye

317

Sample Collected By: ~~RS~~ RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 70 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-70-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 244 C3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/17/06 12:40
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
(N/A) 610 N Buckeye

487

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 71 **QC Code:** __ **Matrix:** ~~Water~~ Soil **Tag ID:** 3001-71-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 246 C1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/17/06 1305
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 ~~Liter Subitainer~~ 8oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Soil by ICP

Sample Comments:

(N/A)

709 N. BUCKEYE

508

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 72 **QC Code:** __ **Matrix:** ~~Water~~ Soil **Tag ID:** 3001-72-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 246 C3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/17/06 13:10
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Soil by ICP

Sample Comments:

(N/A)

709 N. BUCKEYE

1059

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 73 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-73-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 249 C1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/18/06 08:25
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~4 Liter Cubitainer~~ 8 oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:

(N/A)

201 N SYCAMORE

472

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 74 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-74-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 255 C1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/18/06 10:15
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8oz	~~HNO3 acidify~~, 4 Deg C	180 Days	1 Metals in ~~Water~~ Solid by ICP

Sample Comments:
(N/A)

307 N Sycamore

655

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3001 **Sample Number:** 75 **QC Code:** __ **Matrix:** ~~Water~~ Solid **Tag ID:** 3001-75-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 257 ~~255~~ RC Cell 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 5/18/06 12:55
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - ~~1 Liter Cubitainer~~ 8oz	~~HNO3 acidify, 4~~ Deg C	180 Days	1 Metals ~~in Water~~ Solid by ICP

Sample Comments:
(N/A)

705 N. Sycamore

500

Sample Collected By: ~~RC~~ AB

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY / MONTH / YEAR)	SHEET
Eddie McGlasson	United Inc #1	11-14 / 04 / 06	1 of 1

CONTENTS OF SHIPMENT

SAMPLE NUMBER	TYPE OF CONTAINERS: CUBITAINER	8oz BOTTLE	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
EMA78000-3001-1		1					X				
-2		1					X				
-2FD		1					X				
-4		1					X				
-5		1					X				
-6		1					X				
-7		1					X				
-8		1					X				
-9		1					X				
-10		1					X				
-11		1					X				
-12		1					X				
-13		1					X				
-14		1					X				

DESCRIPTION OF SHIPMENT

_____ PIECE(S) CONSISTING OF 1 BOX(ES)

_____ ICE CHEST(S); OTHER _____

MODE OF SHIPMENT

_____ COMMERCIAL CARRIER: _____

_____ COURIER

X SAMPLER CONVEYED

_____ (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
[signature] SEALED UNSEALED X	4/7/06	1440	[signature] SEALED UNSEALED	
RELINQUISHED BY SEALED UNSEALED	DATE	TIME	RECEIVED BY SEALED UNSEALED	REASON FOR CHANGE OF CUSTODY
RELINQUISHED BY SEALED UNSEALED	DATE	TIME	RECEIVED BY SEALED UNSEALED	REASON FOR CHANGE OF CUSTODY

7-EPA-9262(Revised 5/85)

*U.S. GPO: 2002-756-917/40053

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY MONTH YEAR)	SHEET
Eddie McGlasson	United Zinc #1	18 19 20 21 04 06	1 of 1

CONTENTS OF SHIPMENT

SAMPLE NUMBER	TYPE OF CONTAINERS: CUBITAINER	BOTTLE 8oz	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
EMA28Q00 3001-15		1					X				
-16		1					X				
-17		1					X				
18		1					X				
19		1					X				
20		1					X				
21		1					X				
22		1					X				
23		1					X				
24		1					X				
25		1					X				

DESCRIPTION OF SHIPMENT

_____ PIECE(S) CONSISTING OF _____ BOX(ES)

1 ICE CHEST(S): OTHER _____

MODE OF SHIPMENT

_____ COMMERCIAL CARRIER: _____

_____ COURIER

_____ SAMPLER CONVEYED

_____ (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
[signature] SEALED UNSEALED ☒	4/24/06	0935	SEALED UNSEALED	Del. to Lab
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
SEALED UNSEALED			SEALED UNSEALED	
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
SEALED UNSEALED			SEALED UNSEALED	

7-EPA-9262(Revised 5/85)

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER (Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY / MONTH / YEAR)	SHEET
Eddie McGibbson	United Zinc #1	24-27 04 06	1 of 1

CONTENTS OF SHIPMENT

SAMPLE NUMBER	TYPE OF CONTAINERS: CUBITAINER	8 oz BOTTLE	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
EMA78Q00 3001-26		1					X				
27		1					X				
28		1					X				
29		1					X				
30		1					X				
31		1					X				
32		1					X				
33		1					X				
34		1					X				
35		1					X				

DESCRIPTION OF SHIPMENT

_____ PIECE(S) CONSISTING OF _____ BOX(ES)

1 ICE CHEST(S). OTHER _____

MODE OF SHIPMENT

_____ COMMERCIAL CARRIER: _____

_____ COURIER

_____ SAMPLER CONVEYED

_____ (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
☐ SEALED ☐ UNSEALED			☐ SEALED ☐ UNSEALED	
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
☐ SEALED ☐ UNSEALED			☐ SEALED ☐ UNSEALED	
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
☐ SEALED ☐ UNSEALED			☐ SEALED ☐ UNSEALED	

7-EPA-9262 (Revised 5/85)

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION	SHEET
Eddie McGlasson	United Zinc #1	1-3-4 (DAY) 05 (MONTH) 06 (YEAR)	1 of 1

CONTENTS OF SHIPMENT

SAMPLE NUMBER	TYPE OF CONTAINERS: CUBITAINER	8oz BOTTLE	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
EMA78Q00 3001-36		1					X				
37		1					X				
38		1					X				
39		1					X				
40		1					X				
41		1					X				
42		1					X				
43		1					X				
44		1					X				
45		1					X				
46		1					X				

DESCRIPTION OF SHIPMENT

____ PIECE(S) CONSISTING OF ____ BOX(ES)

1 ICE CHEST(S); OTHER ____

MODE OF SHIPMENT

____ COMMERCIAL CARRIER: ____

____ COURIER

X SAMPLER CONVEYED

____ (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
Robert L Coyton ☐ SEALED UNSEALED ☒	5-5-06	1059	☐ SEALED UNSEALED ☐	
RELINQUISHED BY ☐ SEALED UNSEALED ☐	DATE	TIME	RECEIVED BY ☐ SEALED UNSEALED ☐	REASON FOR CHANGE OF CUSTODY
RELINQUISHED BY ☐ SEALED UNSEALED ☐	DATE	TIME	RECEIVED BY ☐ SEALED UNSEALED ☐	REASON FOR CHANGE OF CUSTODY

7-EPA-9262(Revised 5/85)

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY / MONTH / YEAR)	SHEET
Eddie McGlasson	United Zinc #1	8 9 10 11 / 05 / 06	1 of 1

CONTENTS OF SHIPMENT

SAMPLE NUMBER	TYPE OF CONTAINERS: CUBITAINER	BOTTLE (80z)	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
EM478806 3001 - 47		1					X				
48		1					X				
49		1					X				
50		1					X				
51		1					X				
52		1					X				
53		1					X				
54		1					X				
55		1					X				

DESCRIPTION OF SHIPMENT

_____ PIECE(S) CONSISTING OF 1 BOX(ES)

_____ ICE CHEST(S); OTHER _____

MODE OF SHIPMENT

_____ COMMERCIAL CARRIER: _____

_____ COURIER

X SAMPLER CONVEYED

_____ (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
Rob Clayton ☐ SEALED ☒ UNSEALED	5/12/06	1148	☐ SEALED ☐ UNSEALED	
RELINQUISHED BY ☐ SEALED ☐ UNSEALED	DATE	TIME	RECEIVED BY ☐ SEALED ☐ UNSEALED	REASON FOR CHANGE OF CUSTODY
RELINQUISHED BY ☐ SEALED ☐ UNSEALED	DATE	TIME	RECEIVED BY ☐ SEALED ☐ UNSEALED	REASON FOR CHANGE OF CUSTODY

7-EPA-9262(Revised 5/85)

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY MONTH YEAR)	SHEET
Eddy McGlasson	United Zinc #1	13 16 17 18 05 06	1 of 1

CONTENTS OF SHIPMENT

SAMPLE NUMBER	TYPE OF CONTAINERS: CUBITAINER	BOTTLE (802)	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
EMA78Q00 3001 - 56		1					X				
57		1					X				
58		1					X				
59		1					X				
60		1					X				
61		1					X				
62		1					X				
63		1					X				
64		1					X				
65		1					X				
66		1					X				
67		1					X				
68		1					X				
69		1					X				
70		1					X				
71		1					X				
72		1					X				
73		1					X				
74		1					X				
75		1					X				
			Nothing More to Follow								

DESCRIPTION OF SHIPMENT

_____ PIECE(S) CONSISTING OF 1 BOX(ES)

_____ ICE CHEST(S); OTHER _____

MODE OF SHIPMENT

_____ COMMERCIAL CARRIER: _____

_____ COURIER

X SAMPLER CONVEYED

_____ (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
Rick Clayton ☐ SEALED UNSEALED X	5/18/06	17:25	☐ SEALED UNSEALED ☐	Del. to Lab.
RELINQUISHED BY ☐ SEALED UNSEALED ☐	DATE	TIME	RECEIVED BY ☐ SEALED UNSEALED ☐	REASON FOR CHANGE OF CUSTODY
RELINQUISHED BY ☐ SEALED UNSEALED ☐	DATE	TIME	RECEIVED BY ☐ SEALED UNSEALED ☐	REASON FOR CHANGE OF CUSTODY

7-EPA-9262(Revised 5/85)

*U.S. GPO: 2002-756-917/40053

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3057 **Sample Number:** 1 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3057-1-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #7 Cell 3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: __ __ __ **Sample Collection: Start:** 6/6/06 11:10
Longitude: __ __ __ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) Kansas DR & Hwy 54

Sample Collected By: ~~EM/AR~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3057 **Sample Number:** 2 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3057-2-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA# 138a Cell 3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 6/6/06 11:29
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 1508 E. Monroe

Sample Collected By: ~~EMFR~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3057 **Sample Number:** 3 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3057-3-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #21 Cell 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: __ __ __ **Sample Collection: Start:** 6/6/06 11:50
Longitude: __ __ __ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

206 S. 4th

Sample Collected By: ~~EM/AR~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3057 **Sample Number:** 4 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3057-4-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #54 Cell 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: __ __ __ **Sample Collection: Start:** 6/6/06 12:20
Longitude: __ __ __ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 403 South St.

Sample Collected By: ~~EM/AR~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3057 **Sample Number:** 5 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3057-5-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #48 Cell 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 6/6/06 12:35
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 508 South St.

Sample Collected By: ~~EM/AR~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3057 **Sample Number:** 6 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3057-6-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #223 Cell 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 6/6/06 12:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

221 S. Elm

Sample Collected By: ~~EM/AR~~ AH

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY / MONTH / YEAR)	SHEET
Eddie McGlasson	United Zinc	6 / 6 / 06	1 of 1

CONTENTS OF SHIPMENT

SAMPLE NUMBER	TYPE OF CONTAINERS: 8oz CUBITAINER	BOTTLE	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
EMAZ8Q00 3057-1	1						X				
2	1						X				
3	1						X				
4	1						X				
5	1						X				
6	1						X				

Waffling Hue

Tom Lee

DESCRIPTION OF SHIPMENT

____ PIECE(S) CONSISTING OF ____ BOX(ES)

1 ICE CHEST(S): OTHER ____

MODE OF SHIPMENT

____ COMMERCIAL CARRIER: ____

____ COURIER

X SAMPLER CONVEYED

(SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
Neil Clayton — SEALED ☐ UNSEALED ☑	6/6/06	1503	SEALED ☐ UNSEALED ☐	Del. to Lab for Analysis
RELINQUISHED BY — SEALED ☐ UNSEALED ☐	DATE	TIME	RECEIVED BY — SEALED ☐ UNSEALED ☐	REASON FOR CHANGE OF CUSTODY
RELINQUISHED BY — SEALED ☐ UNSEALED ☐	DATE	TIME	RECEIVED BY — SEALED ☐ UNSEALED ☐	REASON FOR CHANGE OF CUSTODY

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APPENDIX D

REMOVAL SITE EVALUATION FORM

(Six Pages)

SUPERFUND REMOVAL SITE EVALUATION
and
REMOVAL PRELIMINARY ASSESSMENT

I. SITE NAME AND LOCATION:

NAME: United Zinc #1 Site

ADDRESS OR OTHER LOCATION IDENTIFIER: Eastern portion of Iola, Kansas

CITY: Iola	**STATE:** Kansas	**ZIP:** 66749

DIRECTIONS TO SITE: From Kansas City, go south on U.S. Highway 169 approximately 90 miles to U.S. Highway 54. Go west on U.S. Highway 54 to the site.

MAP ATTACHED: See Figure 1 with Removal Site Evaluation Report

II. PROGRAM CONTACTS:

REQUESTED BY: Eddie McGlasson	**DATE OF REQUEST:** 01/30/2006

AGENCY/OFFICE: U.S. EPA Region 7 Superfund Division

MAILING ADDRESS: 901 N. 5th Street

CITY: Kansas City	**STATE:** Kansas	**ZIP:** 66101
TELEPHONE: (913) 551-7756	**FAX:** (913) 551-7948	

EVALUATOR: Rick Claytor

AGENCY/OFFICE: Tetra Tech EM Inc./Seagull Environmental Technologies, Inc.

MAILING ADDRESS: 8030 Flint Street

CITY: Lenexa	**STATE:** Kansas	**ZIP:** 66214
TELEPHONE: (913) 908-4649	**FAX:** (816) 734-9663	

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

IS THERE A RELEASE AS DEFINED BY THE NCP: **YES** ☒ **or NO** ☐

EXPLAIN: Residential soils containing lead at concentrations greater than 400 milligrams per kilogram (mg/kg) were identified at the site, well above background levels.

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

IS THE SOURCE A FACILITY OR VESSEL AS DEFINED BY THE NCP: **YES** ☒ **or NO** ☐

EXPLAIN: The site is considered a facility as defined by the NCP.

*(A **FACILITY** is defined as any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or POTW), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, or aircraft or any site or area, where a hazardous substance has been deposited, stored, disposed of, or placed, or otherwise come to be located; but does not include any consumer product in consumer use or any vessel. A **VESSEL** is defined as any description of watercraft or other artificial contrivance used, or capable of being used, as a means of transportation on water other than a public vessel.)*

SUPERFUND REMOVAL SITE EVALUATION
and
REMOVAL PRELIMINARY ASSESSMENT

DOES THE RELEASE INVOLVE A HAZARDOUS SUBSTANCE, OR POLLUTANT OR CONTAMINANT AS DEFINED BY THE NCP: **YES ☒ or NO ☐**

EXPLAIN: Elevated concentrations of lead were identified in residential soils at the site.

*(A **HAZARDOUS SUBSTANCE** means any substance, element, compound, mixture, solution, hazardous waste, toxic pollutant, hazardous air pollutant, or imminently hazardous chemical substance or mixture designated pursuant to the CWA, CERCLA, SDWA, CAA or TSCA. The term does not include petroleum products, natural gas, natural gas liquids, liquefied natural gas, synthetic gas or mixtures of natural and synthetic gas. The definition of **POLLUTANT or CONTAMINANT** includes, but is not limited to, any element, substance, compound, or mixture, including disease-causing agents, which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions or physical deformations, in such organisms or their offspring. The term does not include petroleum products, natural gas, natural gas liquids, liquefied natural gas, synthetic gas or mixtures of natural and synthetic gas).*

IS THE RELEASE SUBJECT TO THE LIMITATIONS ON RESPONSE: **YES ☐ or NO ☒**

EXPLAIN: There are no limitations on response.

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

DOES THE QUANTITY OR CONCENTRATION WARRANT RESPONSE: **YES ☒ or NO ☐**

EXPLAIN: Approximately 30 properties have been identified where surface soils contain lead above site-specific removal action levels (RAL). For this site, a RAL for lead has been established at 400 mg/kg for schools, daycare centers, and residences where children with elevated blood-lead (EBL) levels reside. An RAL of 800 mg/kg will apply to other residential and commercial properties.

HAS A PRP BEEN IDENTIFIED: **YES ☐ or NO ☒**

EXPLAIN: Investigation of potentially responsible parties (PRP) is being conducted by EPA.

IV. CONDITIONS TO WARRANT REMOVAL [40 CFR 300.415(B)(2)]:

ACTUAL OR POTENTIAL EXPOSURE TO HAZARDOUS SUBSTANCES, POLLUTANTS, OR CONTAMINANTS: **YES ☒ or NO ☐**

EXPLAIN: Residential soils containing lead at concentrations greater than 400 mg/kg were identified at the site.

ACTUAL OR POTENTIAL CONTAMINATION OF DRINKING WATER SUPPLIES: **YES ☐ or NO ☒**

EXPLAIN: Drinking water for the site area is provided by a public water supply.

HAZARDOUS SUBSTANCES, POLLUTANTS, OR CONTAMINANTS IN DRUMS, BARRELS,OR BULK STORAGE CONTAINERS: **YES ☐ or NO ☒**

EXPLAIN: The site does not contain hazardous substances stored in bulk storage containers.

HIGH LEVELS OF HAZARDOUS SUBSTANCES, POLLUTANTS, OR CONTAMINANTS IN NEAR-SURFACE SOILS: **YES ☒ or NO ☐**

EXPLAIN: Elevated concentrations of lead were detected in surface soil samples collected from the site.

SUPERFUND REMOVAL SITE EVALUATION
and
REMOVAL PRELIMINARY ASSESSMENT

CONDITIONS SUSCEPTIBLE TO IMPACT FROM ADVERSE WEATHER CONDITIONS: YES ☒ or NO ☐

EXPLAIN: The presence of elevated concentrations of lead in surface soils could lead to contaminated runoff or migration of lead contamination via windblown dust or leaching to groundwater.

THREAT OF FIRE OR EXPLOSION: YES ☐ or NO ☒

EXPLAIN: No threat of fire or explosion exists at the site.

POTENTIAL FOR OTHER FEDERAL OR STATE RESPONSE MECHANISMS: YES ☒ or NO ☐

EXPLAIN: The Kansas Department of Health and Environment (KDHE) has been involved with potential contamination issues related to this site.

OTHER SITUATIONS OR FACTORS WHICH POSE A THREAT: YES ☐ or NO ☒

EXPLAIN: No other situations or factors exist that could pose a threat.

V. POTENTIAL REMOVAL ACTIONS [40 CFR 300.415(D)]:

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

SITE SECURITY: YES ☐ or NO ☒

EXPLAIN: The site is not fenced; however, because the site encompasses a large residential area, it is not practical to secure the entire area of contamination.

STABILIZATION OR REMOVAL OF SURFACE IMPOUNDMENTS: YES ☐ or NO ☒

EXPLAIN: No surface impoundments exist at the site.

CAPPING OF CONTAMINATED SOIL: YES ☒ or NO ☐

EXPLAIN: Because elevated concentrations of lead were identified in surface soil, capping could be warranted in certain areas.

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

EXPLAIN: No chemicals would likely be used to control or retard the spread of contamination from site soils as a removal action.

CONTAMINATED SOIL EXCAVATION: YES ☒ or NO ☐

EXPLAIN: Contaminated soils were identified at the site that will likely require excavation.

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

EXPLAIN: No bulk storage containers are present on site.

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

EXPLAIN: Treatment and/or disposal of excavated soils would be required at this site.

PROVIDE ALTERNATIVE WATER SUPPLIES: YES ☐ or NO ☒

EXPLAIN: Contaminated drinking water was not identified at the site.

SUPERFUND REMOVAL SITE EVALUATION
and
REMOVAL PRELIMINARY ASSESSMENT

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

	REMOVAL NOT WARRANTED—REMOVAL SITE EVALUATION TERMINATED		
(Cite one or more of the criteria from SECTION III. REMOVAL SITE EVALUATION CRITERIA, as the basis for the above determination.)			
	NOT A RELEASE		NOT A FACILITY OR VESSEL
	NOT A HAZARDOUS SUBSTANCE OR POLLUTANT OR CONTAMINANT		SUBJECT TO RESPONSE LIMITATIONS
	INSUFFICIENT QUANTITY OR CONCENTRATION		WILLING/CAPABLE PRP IDENTIFIED

COMMENT:

X	REMOVAL RECOMMENDED [EMERGENCY X TIME-CRITICAL ___ NON-TIME-CRITICAL]				
(Cite one or more of the conditions or factors from Section IV. CONDITIONS TO WARRANT A REMOVAL ACTION, as a basis for recommend that a removal action be conducted.)					
	X	EXPOSURE TO HAZARDOUS SUBSTANCES OR POLLUTANTS OR CONTAMINANTS		X	ADVERSE WEATHER IMPACTS
		CONTAMINATED DRINKING WATER	FIRE/EXPLOSION THREAT	X	CONTAMINATED SOIL
		DRUMS, BARRELS OR CONTAINERS	NO OTHER RESPONSE MECHANISM		OTHER FACTORS
(Identify one or more of the removal actions listed in Section V. REMOVAL ACTIONS WHICH MAY BE APPROPRIATE, as examples of the types of response actions which are recommended.)					
		SITE SECURITY	DRAINAGE CONTROL		IMPOUNDMENT STABILIZATION
		REMOVAL OF DRUMS, BARRELS, ETC.	X SOIL CAPPING	X	SOIL EXCAVATION
	X	CONTAIN/TREAT/DISPOSE OF WASTES	CHEMICAL CONTROLS		ALT. DRINKING WATER SUPPLIES

COMMENT: Excavation and off-site disposal of lead-contaminated soils from schools, daycare centers, and residential (and possibly commercial) properties would likely be the primary removal action conducted at this site.

	ADDITIONAL REMOVAL SITE EVALUATION RECOMMENDED				
(Cite one or more of the conditions or factors from Section IV. CONDITIONS TO WARRANT A REMOVAL ACTION, as a basis for recommending that additional site evaluation be performed.)					
		EXPOSURE TO HAZARDOUS SUBSTANCES OR POLLUTANTS OR CONTAMINANTS			ADVERSE WEATHER IMPACTS
		CONTAMINATED DRINKING WATER	FIRE/EXPLOSION THREAT		CONTAMINATED SOIL
		DRUMS, BARRELS OR CONTAINERS	NO OTHER RESPONSE MECHANISM		OTHER FACTORS
(Identify one or more of the removal actions listed in Section V. REMOVAL ACTIONS WHICH MAY BE APPROPRIATE, as examples of the types of response actions which may be appropriate pending the results of further site evaluation.)					
		SITE SECURITY	DRAINAGE CONTROL		IMPOUNDMENT STABILIZATION
		REMOVAL OF DRUMS, BARRELS, ETC.	SOIL CAPPING		SOIL EXCAVATION
		CONTAIN/TREAT/DISPOSE OF WASTE	CHEMICAL CONTROLS		ALTERNATIVE DRINKING WATER SUPPLIES

COMMENT:

SUPERFUND REMOVAL SITE EVALUATION
and
REMOVAL PRELIMINARY ASSESSMENT

VII. ADDITIONAL INFORMATION OR COMMENTS:

EPA USE ONLY

VIII. CERTIFICATION

SIGNATURE: **DATE:**
POSITION/TITLE:
OFFICE/AGENCY:

SUPERFUND REMOVAL SITE EVALUATION
and
REMOVAL PRELIMINARY ASSESSMENT
(Supplemental Waste Inventory Sheet)

IX. HAZARDOUS SUBSTANCES, POLLUTANTS OR CONTAMINANT INFORMATION:

MATERIAL DESCRIPTION	CONTAINER INFORMATION					
TRADE NAME/ACTIVE INGREDIENTS	NUMBER of CONTAINERS	SIZE	TYPE	SOLID or LIQUID	% FULL	CONDITION

ATTACHMENT 1

DATA FROM EPA REGION 7 LABORATORY FOR XRF CONFIRMATION SAMPLES

(25 Pages)

United States Environmental Protection Agency
Region 7
901 N. 5th Street
Kansas City, KS 66101

Date: 06/07/2006

Subject: Transmittal of Sample Analysis Results for ASR #: 3001

Project ID: EMA78Q00

Project Description: United Zinc No. 1 site sampling

From: Dale I. Bates, Director
Regional Laboratory, Environmental Services Division

To: Eddie McGlasson
SUPR/ER&R

Enclosed are the analytical data for the above-referenced Analytical Services Request (ASR) and Project. The Regional Laboratory has reviewed and verified the results in accordance with procedures described in our Quality Manual (QM). In addition to all of the analytical results, this transmittal contains pertinent information that may have influenced the reported results and documents any deviations from the established requirements of the QM.

Please contact us within 14 days of receipt of this package if you determine there is a need for any changes. Please complete the enclosed Customer Satisfaction Survey and Data Disposition/Sample Release memo for this ASR as soon as possible. The process of disposing of the samples for this ASR will be initiated 30 days from the date of this transmittal unless an alternate release date is specified on the Data Disposition/Sample Release memo.

If you have any questions or concerns relating to this data package, contact our customer service line at 913-551-5295.

Enclosures

cc: Analytical Data File.

Project Manager: Eddie McGlasson **Org:** SUPR/ER&R **Phone:** 913-551-7756
Project ID: EMA78Q00
Project Desc: United Zinc No. 1 site sampling
Location: Iola **State:** Kansas **Program:** Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00
Purpose: Site Characterization

Explanation of Codes, Units and Qualifiers used on this report

Sample QC Codes: QC Codes identify the type of sample for quality control purpose.

__ = Field Sample
FD = Field Duplicate

Units: Specific units in which results are reported.

% = Percent
mg/kg = Milligrams per Kilogram

Data Qualifiers: Specific codes used in conjunction with data values to provide additional information on the quality of reported results, or used to explain the absence of a specific value.

(Blank) = Values have been reviewed and found acceptable for use.
J = The identification of the analyte is acceptable; the reported value is an estimate.
U = The analyte was not detected at or above the reporting limit.

ASR Number: 3001 **Sample Information Summary** **06/07/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Sample No	QC Code	Matrix	Location Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
1 -	__	Solid	EPA #2, Cell 2		04/11/2006	15:15			04/17/2006
2 -	__	Solid	EPA #2, Cell 8		04/11/2006	15:50			04/17/2006
2 -	FD	Solid	EPA #2, Cell 8/Field Duplicate of sample 2		04/11/2006	15:50			04/17/2006
4 -	__	Solid	EPA #3, Cell 7		04/12/2006				04/17/2006
5 -	__	Solid	EPA #4, Cell 3		04/12/2006	13:30			04/17/2006
6 -	__	Solid	EPA #5, Cell 8		04/12/2006	15:30			04/17/2006
7 -	__	Solid	EPA #5, Cell 2		04/12/2006	15:15			04/17/2006
8 -	__	Solid	EPA #6, Cell 3		04/13/2006	09:30			04/17/2006
9 -	__	Solid	EPA #13, Cell 2		04/13/2006	09:55			04/17/2006
10 -	__	Solid	EPA #6, Cell 16		04/13/2006	11:30			04/17/2006
11 -	__	Solid	EPA #7, Cell 1		04/13/2006	14:00			04/17/2006
12 -	__	Solid	EPA #12, Cell 2		04/13/2006	16:32			04/17/2006
13 -	__	Solid	EPA #10, Cell 1		04/14/2006	08:50			04/17/2006
14 -	__	Solid	EPA #14, Cell 3		04/14/2006	13:20			04/17/2006
15 -	__	Solid	EPA #28, Cell 2		04/18/2006	12:15			04/25/2006
16 -	__	Solid	EPA #42, Cell 3		04/19/2006	08:45			04/25/2006
17 -	__	Solid	EPA #37, Cell 1		04/19/2006	11:15			04/25/2006
18 -	__	Solid	EPA #48, Cell 1		04/19/2006	13:35			04/25/2006
19 -	__	Solid	EPA #39, Cell 1		04/19/2006	15:20			04/25/2006
20 -	__	Solid	EPA #35, Cell 4		04/20/2006	08:25			04/25/2006
21 -	__	Solid	EPA #16, Cell 4		04/20/2006	10:15			04/25/2006
22 -	__	Solid	EPA #29, Cell 2		04/20/2006	14:30			04/25/2006
23 -	__	Solid	EPA #30, Cell 1		04/20/2006	15:15			04/25/2006
24 -	__	Solid	EPA #50, Cell 1		04/21/2006	08:30			04/25/2006
25 -	__	Solid	EPA #56, Cell 1		04/21/2006	11:30			04/25/2006
26 -	__	Solid	EPA 58, Cell 1		04/24/2006	15:15			05/01/2006
27 -	__	Solid	EPA 76, Cell 3		04/25/2006	09:15			05/01/2006
28 -	__	Solid	EPA 64, Cell 1		04/25/2006	10:05			05/01/2006
29 -	__	Solid	EPA 80, Cell 3		04/25/2006	17:00			05/01/2006
30 -	__	Solid	EPA 81, Cell 4		04/26/2006				05/01/2006
31 -	__	Solid	EPA 67, Cell 1		04/26/2006	11:18			05/01/2006
32 -	__	Solid	EPA 87, Cell 1		04/26/2006	16:21			05/01/2006
33 -	__	Solid	EPA 102, Cell 2		04/27/2006	08:33			05/01/2006
34 -	__	Solid	EPA 92, Cell 1		04/27/2006	13:30			05/01/2006
35 -	__	Solid	EPA 89, Cell 1		04/27/2006	15:45			05/01/2006
36 -	__	Solid	EPA 137, Cell 1		05/01/2006	17:15			05/05/2006
37 -	__	Solid	EPA 107, Cell 1		05/02/2006	09:45			05/05/2006
38 -	__	Solid	EPA 110, Cell 1		05/02/2006	10:10			05/05/2006
39 -	__	Solid	EPA 142, Cell 2		05/02/2006	13:59			05/05/2006
40 -	__	Solid	EPA 144, Cell 1		05/02/2006	14:50			05/05/2006
41 -	__	Solid	EPA 144, Cell 3		05/02/2006	15:00			05/05/2006
42 -	__	Solid	EPA 141, Cell 1		05/03/2006	09:05			05/05/2006
43 -	__	Solid	EPA 148, Cell 1		05/03/2006	10:31			05/05/2006
44 -	__	Solid	EPA 158, Cell 1		05/03/2006	14:18			05/05/2006

ASR Number: 3001 **Sample Information Summary** **06/07/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Sample No	QC Code	Matrix	Location Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
45 -	__	Solid	EPA 156, Cell 2		05/03/2006	14:33			05/05/2006
46 -	__	Solid	EPA 171, Cell 2		05/04/2006	15:48			05/05/2006
47 -	__	Solid	EPA 183, Cell #1		05/08/2006	13:10			05/16/2006
48 -	__	Solid	EPA 179, Cell #2		05/08/2006	14:47			05/16/2006
49 -	__	Solid	EPA 190, Cell #1		05/09/2006	13:55			05/16/2006
50 -	__	Solid	EPA 185, Cell #1		05/10/2006	09:03			05/16/2006
51 -	__	Solid	EPA 201, Cell #1		05/10/2006	13:06			05/16/2006
52 -	__	Solid	EPA 198, Cell #1		05/10/2006	15:50			05/16/2006
53 -	__	Solid	EPA 205, Cell #1		05/11/2006	08:47			05/16/2006
54 -	__	Solid	EPA 197, Cell #1		05/11/2006	09:10			05/16/2006
55 -	__	Solid	EPA 208, Cell #2		05/11/2006	14:05			05/16/2006
56 -	__	Solid	EPA 216, Cell #1		05/15/2006	11:55			05/22/2006
57 -	__	Solid	EPA 218, Cell #2		05/15/2006	13:00			05/22/2006
58 -	__	Solid	EPA 220, Cell #1		05/15/2006	13:35			05/22/2006
59 -	__	Solid	EPA 221, Cell #1		05/15/2006	16:00			05/22/2006
60 -	__	Solid	EPA 234, Cell #2		05/16/2006	08:30			05/22/2006
61 -	__	Solid	EPA 229, Cell #3		05/16/2006	10:25			05/22/2006
62 -	__	Solid	EPA 225, Cell #1		05/16/2006	11:05			05/22/2006
63 -	__	Solid	EPA 223, Cell #1		05/16/2006	13:05			05/22/2006
64 -	__	Solid	EPA 223, Cell #1		05/16/2006	14:55			05/22/2006
65 -	__	Solid	EPA 237, Cell #2		05/16/2006	16:55			05/22/2006
66 -	__	Solid	EPA 239, Cell #1		05/17/2006	08:45			05/22/2006
67 -	__	Solid	EPA 236, Cell #2		05/17/2006	09:31			05/22/2006
68 -	__	Solid	EPA 248, Cell #3		05/17/2006	10:30			05/22/2006
69 -	__	Solid	EPA 243, Cell #1		05/17/2006	12:00			05/22/2006
70 -	__	Solid	EPA 244, Cell #3		05/17/2006	12:40			05/22/2006
71 -	__	Solid	EPA 246, Cell #1		05/17/2006	13:05			05/22/2006
72 -	__	Solid	EPA 246, Cell #3		05/17/2006	13:10			05/22/2006
73 -	__	Solid	EPA 249, Cell #1		05/18/2006	08:25			05/22/2006
74 -	__	Solid	EPA 255, Cell #1		05/18/2006	10:15			05/22/2006
75 -	__	Solid	EPA #255, Cell #1		05/18/2006	12:55			05/22/2006

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis	Comments About Results For This Analysis

1 Metals in Solids by ICP

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3122.3B

Samples:						
1-__	2-__	2-FD	4-__	5-__	6-__	7-__
8-__	9-__	10-__	11-__	12-__	13-__	14-__
15-__	16-__	17-__	18-__	19-__	20-__	21-__
22-__	23-__	24-__	25-__	26-__	27-__	28-__
29-__	30-__	31-__	32-__	33-__	34-__	35-__
36-__	37-__	38-__	39-__	40-__	41-__	42-__
43-__	44-__	45-__	46-__	47-__	48-__	49-__
50-__	51-__	52-__	53-__	54-__	55-__	56-__
57-__	58-__	59-__	60-__	61-__	62-__	63-__
64-__	65-__	66-__	67-__	68-__	69-__	70-__
71-__	72-__	73-__	74-__	75-__		

Comments:

Zinc was J-coded in sample 1, 21, 41 and 61. Although the analyte in question has been positively identified in the sample, the quantitation is an estimate (J-coded) due to low recovery of this analyte in the laboratory matrix spike. The actual concentration for this analyte may be higher than the reported value.

Arsenic was J-coded in sample 21. Although the analyte in question has been positively identified in the sample, the quantitation is an estimate (J-coded) due to high recovery of this analyte in the laboratory matrix spike. The actual concentration for this analyte may be lower than the reported value.

Lead was J-coded in sample 41. Although the analyte in question has been positively identified in the sample, the quantitation is an estimate (J-coded) due to poor precision obtained for this analyte in the laboratory matrix spike and matrix spike duplicate.

1 Percent Solid

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3142.9D

Samples:						
1-__	2-__	2-FD	4-__	5-__	6-__	7-__
8-__	9-__	10-__	11-__	12-__	13-__	14-__
15-__	16-__	17-__	18-__	19-__	20-__	21-__
22-__	23-__	24-__	25-__	26-__	27-__	28-__
29-__	30-__	31-__	32-__	33-__	34-__	35-__
36-__	37-__	38-__	39-__	40-__	41-__	42-__
43-__	44-__	45-__	46-__	47-__	48-__	49-__
50-__	51-__	52-__	53-__	54-__	55-__	56-__
57-__	58-__	59-__	60-__	61-__	62-__	63-__
64-__	65-__	66-__	67-__	68-__	69-__	70-__
71-__	72-__	73-__	74-__	75-__		

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis	Comments About Results For This Analysis

Comments:
(N/A)

ASR Number: 3001 **RLAB Approved Sample Analysis Results** **06/07/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	1-__	2-__	2-FD	4-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	8.75	7.82	5.38	13.4
Barium	mg/kg	117	139	142	177
Cadmium	mg/kg	7.81	4.42	4.09	9.02
Lead	mg/kg	585	596	496	501
Zinc	mg/kg	1340 J	851	841	1550
1 Percent Solid					
Solids, percent	%	67.8	81.4	80.9	88.5

ASR Number: 3001 **RLAB Approved Sample Analysis Results** **06/07/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	5-__	6-__	7-__	8-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	8.86	5.47	6.46	4.71
Barium	mg/kg	125	133	161	150
Cadmium	mg/kg	4.38	5.05	5.84	4.40
Lead	mg/kg	263	284	223	210
Zinc	mg/kg	472	836	684	536
1 Percent Solid					
Solids, percent	%	90.0	89.8	93.8	91.3

ASR Number: 3001 **RLAB Approved Sample Analysis Results** **06/07/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	9-__	10-__	11-__	12-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	11.0	5.42	7.47	13.5
Barium	mg/kg	139	172	144	184
Cadmium	mg/kg	10.3	6.92	31.5	8.21
Lead	mg/kg	961	228	736	806
Zinc	mg/kg	1740	677	3090	1610
1 Percent Solid					
Solids, percent	%	78.9	84.3	81.2	90.5

ASR Number: 3001 **RLAB Approved Sample Analysis Results** **06/07/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	13-__	14-__	15-__	16-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	108	10.6	6.55	11.4
Barium	mg/kg	140	159	334	168
Cadmium	mg/kg	15.7	11.2	6.95	6.58
Lead	mg/kg	869	539	135	420
Zinc	mg/kg	2280	1420	444	900
1 Percent Solid					
Solids, percent	%	84.7	91.0	90.1	87.7

ASR Number: 3001 **RLAB Approved Sample Analysis Results** **06/07/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	17-__	18-__	19-__	20-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	7.30	12.1	7.62	7.44
Barium	mg/kg	149	158	174	196
Cadmium	mg/kg	7.08	8.97	6.05	7.21
Lead	mg/kg	434	2290	440	582
Zinc	mg/kg	1130	1690	750	1010
1 Percent Solid					
Solids, percent	%	83.7	79.8	89.7	89.7

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	21-__	22-__	23-__	24-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	7.37 J	8.40	10.1	11.7
Barium	mg/kg	257	159	155	168
Cadmium	mg/kg	8.20	10.9	12.2	8.00
Lead	mg/kg	745	571	681	567
Zinc	mg/kg	1160 J	1480	1600	985
1 Percent Solid					
Solids, percent	%	87.3	91.4	93.3	81.6

ASR Number: 3001 **RLAB Approved Sample Analysis Results** **06/07/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	25-__	26-__	27-__	28-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	19.2	21.0	7.46	14.8
Barium	mg/kg	140	162	160	149
Cadmium	mg/kg	9.74	8.26	9.53	8.37
Lead	mg/kg	1040	769	1050	1150
Zinc	mg/kg	1730	1470	1180	2140
1 Percent Solid					
Solids, percent	%	89.1	71.0	68.5	72.3

ASR Number: 3001 **RLAB Approved Sample Analysis Results** **06/07/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	29-__	30-__	31-__	32-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	5.30	7.91	7.85	17.9
Barium	mg/kg	128	99.4	130	152
Cadmium	mg/kg	7.92	8.92	7.01	17.3
Lead	mg/kg	490	246	288	1200
Zinc	mg/kg	1140	852	833	2400
1 Percent Solid					
Solids, percent	%	69.4	75.5	73.4	76.9

ASR Number: 3001 **RLAB Approved Sample Analysis Results** **06/07/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	33-__	34-__	35-__	36-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	10.3	8.01	7.51	5 U
Barium	mg/kg	175	136	142	187
Cadmium	mg/kg	7.52	6.35	9.05	7.68
Lead	mg/kg	704	556	417	284
Zinc	mg/kg	1310	745	1150	1140
1 Percent Solid					
Solids, percent	%	62.9	74.2	76.0	73.9

ASR Number: 3001 **RLAB Approved Sample Analysis Results** **06/07/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	37-__	38-__	39-__	40-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	7.66	5 U	6.70	9.94
Barium	mg/kg	163	129	139	127
Cadmium	mg/kg	7.69	4.68	8.16	9.23
Lead	mg/kg	616	246	209	578
Zinc	mg/kg	1080	762	766	1860
1 Percent Solid					
Solids, percent	%	71.8	69.8	73.6	61.6

ASR Number: 3001 **RLAB Approved Sample Analysis Results** **06/07/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	41-__	42-__	43-__	44-__
1 Metals In Solids by ICP					
Arsenic	mg/kg	14.8	6.09	3.96	6.86
Barium	mg/kg	150	172	198	190
Cadmium	mg/kg	6.74	8.84	5.47	5.65
Lead	mg/kg	798 J	249	106	148
Zinc	mg/kg	1210 J	1020	483	515
1 Percent Solid					
Solids, percent	%	69.8	71.2	70.2	82.5

ASR Number: 3001 **RLAB Approved Sample Analysis Results** **06/07/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	45-__	46-__	47-__	48-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	8.20	5.43	13.2	7.42
Barium	mg/kg	150	172	126	107
Cadmium	mg/kg	11.0	6.12	7.84	6.80
Lead	mg/kg	342	282	530	411
Zinc	mg/kg	1090	588	1290	1120
1 Percent Solid					
Solids, percent	%	75.8	71.8	67.1	65.9

ASR Number: 3001 **RLAB Approved Sample Analysis Results** **06/07/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	49-__	50-__	51-__	52-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	12.0	5.80	8.04	9.28
Barium	mg/kg	112	117	107	129
Cadmium	mg/kg	6.37	5.53	27.7	7.15
Lead	mg/kg	336	397	764	562
Zinc	mg/kg	785	741	2470	1100
1 Percent Solid					
Solids, percent	%	65.9	73.7	64.4	71.8

ASR Number: 3001 **RLAB Approved Sample Analysis Results** **06/07/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	53-__	54-__	55-__	56-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	7.18	7.55	5.22	5.27
Barium	mg/kg	121	114	120	180
Cadmium	mg/kg	6.52	7.68	7.89	6.95
Lead	mg/kg	186	504	258	496
Zinc	mg/kg	578	1080	856	1030
1 Percent Solid					
Solids, percent	%	64.3	69.6	67.2	75.2

ASR Number: 3001 **RLAB Approved Sample Analysis Results** **06/07/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	57-__	58-__	59-__	60-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	7.36	8.48	8.80	16.2
Barium	mg/kg	117	140	118	200
Cadmium	mg/kg	6.35	7.03	7.46	9.85
Lead	mg/kg	494	837	614	872
Zinc	mg/kg	1080	1040	1460	1530
1 Percent Solid					
Solids, percent	%	81.3	80.6	78.3	78.8

ASR Number: 3001 **RLAB Approved Sample Analysis Results** **06/07/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	61-__	62-__	63-__	64-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	6.62	9.00	49.2	6.59
Barium	mg/kg	271	149	131	188
Cadmium	mg/kg	5.81	6.75	14.6	9.71
Lead	mg/kg	362	551	1960	618
Zinc	mg/kg	723 J	1010	2880	1260
1 Percent Solid					
Solids, percent	%	86.5	80.1	79.4	71.3

ASR Number: 3001 **RLAB Approved Sample Analysis Results** **06/07/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	65-__	66-__	67-__	68-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	7.89	5.10	7.10	11.7
Barium	mg/kg	7.35	127	111	137
Cadmium	mg/kg	5.82	6.66	6.86	7.89
Lead	mg/kg	323	386	509	628
Zinc	mg/kg	864	1010	1590	1320
1 Percent Solid					
Solids, percent	%	84.7	76.2	80.7	84.6

ASR Number: 3001 **RLAB Approved Sample Analysis Results** **06/07/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	69-__	70-__	71-__	72-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	8.24	16.5	9.26	21.4
Barium	mg/kg	155	1254	136	151
Cadmium	mg/kg	5.76	8.04	5.32	8.16
Lead	mg/kg	460	554	633	1360
Zinc	mg/kg	935	1240	1020	1690
1 Percent Solid					
Solids, percent	%	85.2	88.2	87.3	88.3

ASR Number: 3001 **RLAB Approved Sample Analysis Results** **06/07/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	73-__	74-__	75-__
1 Metals in Solids by ICP				
Arsenic	mg/kg	7.52	16.8	16.6
Barium	mg/kg	157	158	137
Cadmium	mg/kg	6.52	8.80	6.79
Lead	mg/kg	585	844	464
Zinc	mg/kg	1270	1530	1200
1 Percent Solid				
Solids, percent	%	78.2	77.1	80.3

ATTACHMENT 2

DATA FROM EPA REGION 7 LABORATORY FOR BIOAVAILABILITY SAMPLES

(Six Pages)

United States Environmental Protection Agency
Region 7
901 N. 5th Street
Kansas City, KS 66101

Date: 06/16/2006

Subject: Transmittal of Sample Analysis Results for ASR #: 3057

Project ID: EMA78Q00

Project Description: United Zinc No. 1 site sampling

From: Dale I. Bates, Director
Regional Laboratory, Environmental Services Division

To: Eddie McGlasson
SUPR/ER&R

Enclosed are the analytical data for the above-referenced Analytical Services Request (ASR) and Project. The Regional Laboratory has reviewed and verified the results in accordance with procedures described in our Quality Manual (QM). In addition to all of the analytical results, this transmittal contains pertinent information that may have influenced the reported results and documents any deviations from the established requirements of the QM.

Please contact us within 14 days of receipt of this package if you determine there is a need for any changes. Please complete the enclosed Customer Satisfaction Survey and Data Disposition/Sample Release memo for this ASR as soon as possible. The process of disposing of the samples for this ASR will be initiated 30 days from the date of this transmittal unless an alternate release date is specified on the Data Disposition/Sample Release memo.

If you have any questions or concerns relating to this data package, contact our customer service line at 913-551-5295.

Enclosures

cc: Analytical Data File.

Project Manager: Eddie McGlasson **Org:** SUPR/ER&R **Phone:** 913-551-7756

Project ID: EMA78Q00

Project Desc: United Zinc No. 1 site sampling

Location: Iola **State:** Kansas **Program:** Superfund

Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Purpose: Site Characterization

Explanation of Codes, Units and Qualifiers used on this report

Sample QC Codes: QC Codes identify the type of sample for quality control purpose.

__ = Field Sample

Units: Specific units in which results are reported.

% = Percent

Data Qualifiers: Specific codes used in conjunction with data values to provide additional information on the quality of reported results, or used to explain the absence of a specific value.

(Blank)= Values have been reviewed and found acceptable for use.

ASR Number: 3057 **Sample Information Summary** **06/16/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Sample No	QC Code	Matrix	Location Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
1 -	__	Solid	EPA #7, Cell #3 (KS Drive and Highway 54)		06/06/2006	11:10			06/07/2006
2 -	__	Solid	EPA #138A, Cell #3 (1508 East Monroe)		06/06/2006	11:29			06/07/2006
3 -	__	Solid	EPA #21, Cell #2 (206 South 4th)		06/06/2006	11:50			06/07/2006
4 -	__	Solid	EPA #54, Cell #1 (403 South Street)		06/06/2006	12:20			06/07/2006
5 -	__	Solid	EPA #48, Cell #2 (508 South Street)		06/06/2006	12:35			06/07/2006
6 -	__	Solid	EPA #223, Cell #1 (221 South Elm)		06/06/2006	12:00			06/07/2006

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis	Comments About Results For This Analysis

1 Bioaccessible Lead in Soil by ICP

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3122.3B Applied to Samples Digested for "Bioavailable" Results

Samples: 1-__ 2-__ 3-__ 4-__ 5-__ 6-__

Comments:
(N/A)

ASR Number: 3057 **RLAB Approved Sample Analysis Results** **06/16/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	1-__	2-__	3-__	4-__
1 Bioaccessible Lead in Soil by ICP					
Lead, Bioaccessible	%	62.8	70.6	77.2	79.8

ASR Number: 3057 **RLAB Approved Sample Analysis Results** **06/16/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	5-__	6-__
1 Bioaccessible Lead in Soil by ICP			
Lead, Bioaccessible	%	86.5	70.3

ATTACHMENT 3

DATA FROM UNIVERSITY OF COLORADO LABORATORY FOR BIOAVAILABILITY SAMPLES AND DATA VALIDATION REPORT

(Four Pages)

TABLE 2. Preliminary Summary Of In Vitro Bioassay Results

Sample	ID	Pb in <250u bulk soil mg/kg	mass soil (g)	calc Pb #1	ICP Pb (mg/l)	solution amt (l)	% Relative Pb Bioavailability
UZ-1	EPA 7 C#3	7043	1.00047	7.05	52.48	0.1	74
UZ-2	EPA 138a C#3	2496	1.00052	2.50	18.08	0.1	72
UZ-3	EPA 21 C#2	5113	1.0004	5.12	43.27	0.1	85
UZ-4	EPA 54 C#1	2285	1.00097	2.29	18.05	0.1	79
UZ-5	EPA 48 C#2	861	1.00087	0.86	7.42	0.1	86
UZ-6	EPA 223 C#1	3383	1.00041	3.38	22.54	0.1	67

Tetra Tech EM Inc.
DATA VALIDATION REPORT
LEVEL II

Site:	United Zinc #1 Site
Laboratory:	Laboratory of Environment and Geological Sciences (LEGS) University of Colorado, Boulder
Data Reviewer:	Nancy McDonald, Tetra Tech EM Inc. (Tetra Tech)
Review Date	July 28, 2006
Sample Delivery Group (SDG):	Not Specified
Sample Numbers:	UZ-1 through UZ-6
Matrix / Number of Samples:	6 soils

The data were qualified according to the U.S. Environmental Protection Agency (EPA) Region 7 document entitled "Contract Laboratory Program Data Validation Functional Guidelines for Evaluating Inorganic Analytical Data" (2430.4C, March 1995). In addition, the Tetra Tech document "Review of Data Packages from Subcontracted Laboratories" (February 2002) was used along with other criteria specified in the LEGS Standard Operating Procedure (SOP).

The review was intended to identify problems and quality control (QC) deficiencies that were readily apparent from the summary data package. The following sections discuss any problems or deficiencies that were found, and data qualifications applied because of non-compliant QC. The data review was limited to the available field and laboratory QC information submitted with the project specific data package.

I, Nancy McDonald, certify that all data validation criteria outlined in the above referenced documents were assessed, and any qualifications made to the data were in accordance with those documents.

Emily Flohr for 8/9/06

Certified by Nancy McDonald, Chemist Date

DATA VALIDATION QUALIFIERS

U	—	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	—	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
R	—	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

DATA ASSESSMENT

The data package included six (6) soil environmental samples. The samples were analyzed for relative lead bioavailability by the LEGS SOP for relative bioavailability leaching procedure and EPA Method 6010B. There were no field blanks, field duplicates, or performance evaluation samples associated with this data package. The following summarizes the data validation that was performed.

I. Holding Time and Chain of Custody (COC) Requirements

The samples were received by the laboratory and processed within established holding times. No data were qualified.

II. Serial Dilution

A five-fold serial dilution analysis was not performed with the samples in this SDG. No data were qualified because of this data gap.

III. Matrix Spike (MS)

A MS analysis was not performed on a sample from this data package. No data were qualified because of this data gap.

IV. Blanks

Low-level concentrations of lead were detected in the blanks. No data were qualified because sample results were greater than 10 times the blank concentrations.

V. Laboratory Control Sample (LCS)

LCS data were not reported with this data package. Therefore, lead results are considered estimated (J) in all samples.

VI. Comments

There are no additional comments on this SDG.

VII. Overall Assessment of Data

Overall data quality is acceptable, with the following qualifications. Lead results are considered estimated (J) in all samples because both LCS and MS results were omitted from the data package. All data are usable for their intended purposes.

RISK-BASED STANDARDS FOR KANSAS
RSK MANUAL – 4th VERSION

JUNE 2007

KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT

DIVISION OF ENVIRONMENT

BUREAU OF ENVIRONMENTAL REMEDIATION

PREFACE:

The Kansas Department of Health and Environment (KDHE)/Bureau of Environmental Remediation (BER) originally developed the Risk-Based Standards for Kansas (RSK) Manual in March of 1999. Chemical-specific and media-specific risk-based cleanup goals were calculated using guidance and directives from the United States Environmental Protection Agency and various other technical resources. Prior to initial development of the RSK Manual, an Environmental Workgroup was established consisting of members of industry and the public to assist in determining appropriate risk-based cleanup levels. The risk-based cleanup levels determined by the Environmental Workgroup are incorporated into the RSK Manual. The RSK Manual assists KDHE/BER project managers to fairly and consistently address contaminated sites in the State of Kansas.

This June 2007 RSK Manual, the fourth version, replaces the March 1, 2003 version. All previous versions are obsolete and should not be used for future decisions related to the characterization or remediation of contaminated properties/sites. This June 2007 version of the RSK Manual contains several updates to the existing text, tables, and appendices. KDHE/BER has edited and reorganized the text for improved clarity. In addition, this fourth version of the RSK Manual includes a new discussion on acceptable concentrations of contaminants in indoor air at residences, along with corresponding values in Appendix A-2. Modifications to the other appendices are highlighted.

The RSK Manual is only applicable to contaminated properties or sites participating in appropriate state cleanup programs. Use of risk-based values established within the RSK Manual without KDHE/BER oversight may constitute misapplication of the RSK Manual and may result in risk management decisions not supported by KDHE/BER. A more detailed discussion of the appropriate use of the RSK Manual is included in Section 2.2.

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RISK-BASED STANDARDS FOR KANSAS

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RISK-BASED STANDARDS FOR KANSAS

1.0 INTRODUCTION

The Risk-Based Standards for Kansas (RSK) Manual is a guidance document which describes the process for establishing chemical-specific and site-specific cleanup goals for soil and ground water that are protective of human health and the environment. This document was created to establish a consistent and streamlined decision-making process for addressing contaminated sites managed by the Kansas Department of Health and Environment (KDHE)/Bureau of Environmental Remediation (BER). The RSK Manual is meant to serve as a tool for evaluation of the need for additional assessment or cleanup at contaminated sites, when considered in conjunction with other site-specific conditions. The RSK Manual is a compilation of risk-based cleanup goals for contaminants in soil and ground water for which federal standards have not been established; ground water cleanup goals based on federal Safe Drinking Water Act Maximum Contaminant Levels (MCLs) for public drinking water supplies; risk-based acceptable concentrations of contaminants in indoor air at residences; and supporting chemical, physical, and toxicological properties for the contaminants considered herein.

The procedures and methodologies contained in this document have been employed to be consistent with federal guidance and directives to assess potential human health risk posed by exposure to environmental contamination. Federal guidance and directives were established subsequent to the promulgation of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). KDHE believes that proper employment of this manual will result in risk-based remediation that is consistent with federally promulgated standards, including the Safe Drinking Water Act, and is protective of human health as defined by the National Contingency Plan (NCP).

KDHE calculated the chemical-specific and media-specific risk-based cleanup goals in this document using guidance and directives from the United States Environmental Protection Agency (EPA) and other technical resources, which are referenced throughout this document and listed in Section 8, "REFERENCES." This document is the fourth version of the Risk-Based Standards for Kansas Manual and supercedes all previous versions.

2.0 PUBLIC USE OF THE RSK MANUAL

2.1 Benefits of the RSK Manual

The primary benefit of the RSK Manual is the predetermination of acceptable cleanup goals without requiring the performance of costly and time-consuming baseline risk assessments and/or contaminant fate and transport models. The RSK Manual provides the public with a streamlined, cost-effective approach to determine whether some form of remedial action is warranted at a

contaminated site. Use of the RSK Manual by Kansas industry, Kansas residents, and KDHE/BER will also promote consistency of remedial requirements at contaminated sites and ensure that remedial actions are protective of human health and the environment. The RSK Manual promotes flexibility by providing tabulated risk-based cleanup goals as well as the opportunity to develop site-specific cleanup goals, based on factors including land use and institutional controls.

2.2 Limitations of Use

The RSK Manual is only applicable to contaminated properties or sites that are participating in appropriate state cleanup programs. KDHE/BER project managers will work with the public and regulated community to ensure appropriate application of this guidance. Risk-based cleanup levels defined in this manual are applicable for a single contaminant, in a single medium, under standard and conservative default exposure assumptions. Risk-based cleanup levels have several additional limitations. Specifically excluded from consideration in the RSK Manual are cumulative risk from multiple contaminants or media, relative source contribution, and risk to ecological receptors. KDHE/BER recommends consideration of the following additional limitations when using the RSK Manual:

- Additional state, federal, and/or local laws or regulations may be applicable at certain sites. Examples of such applicable or relevant and appropriate requirements include local public health laws and ordinances, requirements of ground water management districts, zoning for land use designation, and compliance with Resource Conservation and Recovery Act (RCRA) regulations.
- Aesthetic or other criteria may drive the need for remediation independent of risk-based standards;
- The risk-based cleanup values for soils do not apply to sediments. Users of the RSK Manual must consult with the KDHE/BER project manager regarding appropriate sediment screening and remediation goals, and also follow KDHE/BER policy. "BER-ARS-045 - Sediment Policy."
- The risk-based cleanup values for ground water do not apply to surface water. Surface water cleanup levels shall meet the Kansas surface water quality criteria as established in K.A.R. 28-16-28.

The RSK Manual should not be used for environmental audits, environmental assessments, or other non-KDHE/BER managed activities. Use of risk-based values established within the RSK Manual without KDHE/BER oversight may constitute misapplication of the RSK Manual and may result in risk management decisions not supported by KDHE/BER. The RSK Manual is not intended for use by environmental consultants on contaminated sites in the State of Kansas that are not participating in a KDHE/BER cleanup program.

The KDHE/BER project manager will make the final determination if the risk-base cleanup values in this manual are appropriate for the current and future use of a contaminated site.

3.0 TIERED APPROACH

A primary goal of KDHE/BER programs is to insure contaminated sites are remediated to the extent necessary to protect the public from unacceptable risks potentially caused by exposure to contaminated media. The RSK Manual provides a tiered approach for establishing cleanup goals at contaminated sites in Kansas. The tiers are summarized as follows:

- Tier 1 is a comparison of the concentration of a naturally occurring contaminant to the background concentration of that contaminant in the affected medium, using methods approved by KDHE/BER to determine background.
- Tier 2 is a comparison of the concentration of a contaminant to the risk-based cleanup values in the KDHE Tier 2 Risk-Based Summary Table, found in Appendix A of this document.
- Tier 3 involves collecting the necessary data, under KDHE/BER direction, to replace default values in the Tier 2 equations with site-specific information.

The following sections of the RSK Manual contain detailed information on definitions, formulas, input parameters and the use of the three tiers, including a discussion of the rationale and process for determining soil and ground water cleanup levels for contaminated sites.

The tiered approach presented in the RSK Manual is not acceptable at all contaminated sites. In some instances, KDHE/BER may require a full baseline risk assessment. Examples of such instances include sites at which a cumulative risk from multiple contaminants must be examined and sites at which the remedial efforts must be consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). Coordination with the appropriate state program is necessary to determine if the tiered approach in the RSK Manual is applicable to a contaminated site.

3.1 Tier 1 - Comparison to Background

Tier 1 cleanup levels may be determined for contaminants of concern that are naturally present in the environment. This class of contaminants includes metals such as lead, arsenic, cadmium, and chromium, among others, and inorganic pollutants such as nitrate and chloride, among others. In addition, certain substances that are endemically enriched in various environments, such as industrial tracts or agricultural lands, as a result of their widespread employment by humans may be evaluated as a Tier 1 contaminant. For sites with naturally-occurring contaminants, KDHE/BER may allow the background concentration to be the cleanup goal in that medium.

To establish Tier 1 cleanup levels, background concentrations of naturally-occurring contaminants must be determined at the site. If pre-existing background environmental quality data is not available or not representative of the site, then the collection and analysis of background samples will be required to determine background environmental quality. A site-specific number of samples, approved by KDHE/BER, must be collected. Review and approval of the background sampling plan by the KDHE/BER project manager is necessary prior to the collection of any background samples.

3.2 Tier 2 Risk-Based Summary Table

Appendix A of the RSK Manual is the Tier 2 Risk-Based Summary Table. The table contains chemical-specific, risk-based cleanup values for over 170 contaminants in soil and ground water, including metals, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, herbicides, and polychlorinated biphenyls (PCBs). These cleanup values, based upon current EPA toxicity values for the contaminants and default exposure factors, represent the concentrations at which the contaminants pose an acceptable human health risk to receptors, including sensitive groups (children or the elderly), over a lifetime.

3.2.1 Contaminant Toxicity

Human health risk can be described as the probability of suffering harm as a consequence of chronic, or long-term, exposure to contaminated media. Human health risk effects are generally classified into two separate categories. *Non-carcinogens* are contaminants that lack evidence of increasing the potential for developing cancer over a lifetime. *Carcinogens* are contaminants that have the potential to increase the potential for developing cancer over the lifetime of an exposed individual.

For *non-carcinogens* a threshold concentration is quantified for each contaminant based upon clinically-determined critical toxicological effects such as liver damage, kidney damage, central nervous system disorders, etc. The threshold concentration is referred to as the reference dose or RfD. The lower the RfD value for a contaminant, the more toxic it is relative to contaminants with higher RfDs. Exposure to a contaminant concentration below the RfD should not cause a critical toxicological effect; however, exposure to a contaminant concentration exceeding the RfD may cause a critical toxicological effect. Risk assessors calculate the ratio of a contaminant concentration to the RfD to determine the Hazard Index (HI). If the HI is less than or equal to 1, the contaminant concentration is considered acceptable. The Tier 2 cleanup values in Appendix A for non-carcinogens are based upon an HI equal to 1.

For carcinogens, the probability of increasing the potential for developing a cancer as a result of chronic exposure to contaminated media is quantified based upon clinical studies of exposed populations, including humans, where available, or test animals in the absence of documented human exposures. The contaminant-specific carcinogenic risk factor is referred to as the slope factor. Contrary to RfDs, the higher the slope factor value for a carcinogenic contaminant, the more toxic it is relative to carcinogenic contaminants with lower slope factors. Risk assessors quantify the probability of developing a cancer as a result of chronic exposure to carcinogenic contaminated media by multiplying the contaminant concentration by the contaminant slope factor. The resulting value is expressed in terms of one additional cancer incidence per population exposed; for example, one additional cancer incidence per ten thousand (1 in 10,000) exposed individuals, which may be expressed as 1×10^{-4}. EPA regulations state the 1×10^{-6} risk level shall be used as the point of departure for determining remediation goals for alternatives when applicable or relevant and

appropriate requirements (ARARs) are not available or are not sufficiently protective because of the presence of multiple contaminants or multiple pathways of exposure. The Tier 2 cleanup values in Appendix A for carcinogens are based upon a 1×10^{-5} risk.

For the purpose of developing the Tier 2 Risk-Based Summary Table, KDHE/BER used established contaminant-specific toxicity values developed and maintained by the EPA. EPA-approved toxicological data were obtained from the *Integrated Risk Information System* (IRIS), the *Health Effects Assessment Summary Table* (HEAST) through June 2001, EPA's National Center for Environmental Assessment (NCEA, formerly known as ECAO), or other appropriate EPA resources. The priority sequence among the referenced toxicological databases used from the most preferred to the least preferred is as follows: (1) IRIS, (2) HEAST, (3) NCEA, (4) withdrawn from IRIS or HEAST and under review, and (5) other governmental resources approved by KDHE. Contaminant toxicological data used in developing the Tier 2 Risk-Based Summary Table are provided in Appendix C.

KDHE/BER evaluated the contaminants in Appendix A for both carcinogenic and non-carcinogenic health effects. The determining risk-based concentration is based upon the lower contaminant concentration of the carcinogenic risk or non-carcinogenic risk.

For contaminants which lack toxicological data for a given route of exposure, KDHE/BER used route-to-route extrapolations. For example, an oral reference dose may be used in the inhalation and dermal exposure pathways for a contaminant if the oral reference dose is the only existing toxicological value.

3.2.2 Exposure Factors

Individuals exposed to environmental contaminants are referred to as receptors. For the Tier 2 Risk-Based Summary Table, KDHE/BER has identified two general categories of receptors, residents and non-residents, according to the appropriate land-use designation for each site. The significant differences between the two receptor classes include exposure frequency, exposure duration, and the consideration that children are potentially exposed at residential land-use scenarios and are more sensitive to environmental contaminants. The non-residential land-use scenario is based upon industrial or commercial settings where adult workers are considered the potentially exposed receptor.

Human health risk-based contaminant concentrations for both residential and non-residential scenarios were calculated for soil and ground water. The soil exposure pathways evaluated in the human health risk-based calculations include incidental ingestion of soil, inhalation of airborne particulates (dusts), inhalation of chemicals volatilizing from the soil (volatile compounds only), and dermal contact with soil (organic compounds only). The reasoning for evaluating dermal contact for organic contaminants only is based upon chemical-specific absorption factors. For organic contaminants, the absorption factor is generally 1 to 30 percent; however, for non-organic

contaminants, the absorption factor is generally less than 1 percent. Exposure pathways for ground water include ingestion, inhalation of chemicals volatilizing from the water (volatile compounds only), and dermal contact with water.

Default exposure factors were obtained primarily from *Risk Assessment Guidance for Superfund Supplemental Guidance Standard Default Exposure Factors* (OSWER Directive, 9285.6-03), dated March 25, 1991, and more recent information from EPA Office of Solid Waste and Emergency Response and EPA Office of Research and Development. Exposure factors used in the Tier 2 Risk-Based Summary Table are presented in Table 1 and Table 2 for ground water and soil, respectively.

For the residential land use scenario, child exposure parameters were used to evaluate non-carcinogenic risks in both soil and ground water, since child exposure parameters are more sensitive to this class of environmental contaminants. Adult exposure parameters were used to evaluate carcinogenic risks for residents because, as a result of the methodologies used to calculate risk, the exposure to adults is the most significant receptor category. Adult exposure parameters were used to evaluate both carcinogenic and non-carcinogenic risks for non-residents as they are typically the only receptors in a non-residential land-use scenario.

3.2.3 Ground Water

The Tier 2 Risk-Based Summary Table ground water concentrations presented in Appendix A are derived with the assumption that aquifers in Kansas are sources of potable water. (For a detailed discussion on aquifer use, RSK Manual users are encouraged to refer to KDHE/BER policy "BER-RS-045 - Considerations for Groundwater Use and Applying RSK Standards to Contaminated Groundwater.") Accordingly, for those contaminants for which the federal Safe Drinking Water Act has promulgated primary maximum contaminant levels (MCLs), Tier 2 ground water cleanup concentrations for both residential and non-residential land use scenarios are the MCLs. For all other contaminants addressed within this document, cleanup values are risk-based and are the product of Equations 1 and 2, for carcinogenic and non-carcinogenic contaminants, respectively. In the event ground water is to be used as a source of drinking water, the ground water cleanup concentration defaults to the residential land use concentration irrespective of land use. Exposure factors used in the equations are provided in Table 1. Contaminant chemical, physical, and toxicological data are provided in Appendices B and C.

Independent of the MCLs and risk-based cleanup standards in Appendix A, KDHE/BER requires remediation at all sites with non-aqueous phase liquid (NAPL) contaminants present in the ground water.

3.2.4 Soils

KDHE/BER has identified three potential conditions which must be assessed collectively to determine the appropriate Tier 2 concentration for a contaminant in soil. The first condition is impact to human health via ingestion of contaminated soil, inhalation of VOCs and/or fugitive emission dusts, and dermal contact with contaminated soil. The second condition to be assessed is the contaminant concentration in soil which would be protective of ground water. The third condition is provided for in *Risk Assessment Guidance for Superfund: Volume 1-Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals)*, which indicates the soil saturation concentration for each contaminant be quantified to determine the concentration at which it could be reasonably assumed that free phase product is present. Under such a condition, KDHE would require remediation of the soils to mitigate the free phase contamination.

KDHE/BER calculated the risk-based cleanup values for each contaminant in soil using the exposure factors provided in Table 2, the contaminant chemical, physical, and toxicological data provided in Appendices B and C, and Equations 3 and 4 (for carcinogens and non-carcinogens, respectively). For each of the two land use scenarios, the Tier 2 Risk-Based Summary Table provides two separate soil concentration values. Under the "Soil Pathway" column, each chemical-specific concentration is based upon either the threat to human health or the soil saturation concentration, whichever is less. Each chemical-specific concentration has a letter beside to inform the user of the adverse health effect upon which the Tier 2 Soil Pathway is based. For carcinogenic risk, the notation is "c". For non-carcinogenic risk, the notation is "n." If the soil saturation concentration is used, the notation is "s." The appropriate Tier 2 soil cleanup concentration is the lesser of the calculated values for acceptable impact to human health, the soil saturation concentration, or potential threat to ground water.

The methodology used to determine soil cleanup levels incorporates the additive adverse human health effects associated with the inhalation of vapors from soil contaminated with VOCs. EPA toxicity data indicate that risks posed from exposure to certain contaminants in soil via the inhalation pathway far outweigh the risks posed via ingestion; therefore, the human health risk-based concentrations have been calculated to address this pathway as well. For the purposes of this document, VOCs are those organic chemicals having a Henry's Law constant greater than 1×10^{-5} atmospheres per cubic meter per mole (atm-m3/mol) and a molecular weight less than 200 grams/mole. These contaminants are evaluated for potential volatilization from soil or water to air using volatilization factors that are identified in Appendix B under the column "Volatilization Factor" (VF). To calculate inhalation exposure risk, each contaminant's VF must first be calculated. The VF is assumed to be 0.5 liters per cubic meter (L/m^3) for volatilization from water to air based upon studies by Andelman 1990. The soil-to-air VF is used to define the relationship between the concentration of the contaminant in soil and the flux of the volatilized contaminant to air. The VF equation (Equation 5) represents a dispersion model that simulates the dispersion of contaminants into the atmosphere.

The soil saturation concentration corresponds to the contaminant concentration in soil at which the absorptive limits of the soil particles, the solubility limits of the soil pore water, and saturation of soil pore air have been reached. Above this concentration, the contaminant may be present as a pure liquid phase for contaminants that are liquid at ambient soil temperatures and pure solid phase for compounds that are solid at ambient soil temperatures. KDHE/BER has calculated a soil saturation concentration using Equation 6 for each organic compound in the Tier 2 Risk-Based Summary Table. If the chemical-specific soil saturation concentration is less than its corresponding human health risk-based concentration, the soil saturation concentration is used as the Tier 2 cleanup value.

3.2.5 Soil to Ground Water Protection

Contaminants leaching from soil to ground water may pose a significant threat to ground water quality. Soil contamination cleanups may be driven by chemical-specific soil to ground water pathway concentrations to protect ground water quality. The methodology for calculating soil concentrations sufficiently protective to prevent the migration of soil contaminants to ground water was derived from the document titled, "*Soil Screening Guidance: Technical Background Document,*" OSWER 9355.4-17A, EPA/540/R-95/128 May 1996. The "*Soil Screening Guidance*" document was employed because it is supported by EPA, has been extensively peer-reviewed, and the methodology presented therein is relatively simple.

Migration of a contaminant from soil to ground water can be simplified for modeling purposes to a two-stage process: (1) release of the contaminant in soil leachate and (2) transport of the contaminant soil leachate through the underlying soil to the aquifer and, conceptually, to a receptor well at that location. For the purposes of this document, KDHE/BER's Tier 2 Risk-Based Summary Table assumes the receptor well to be at the source area; therefore, fate and transport modeling is not an element of the Tier 2 Risk-Based Summary Table. KDHE/BER has adopted EPA's screening dilution factor of 20 for calculating chemical-specific soil-to-ground water pathway concentrations.

Equation 7 is the soil-water partition equation used to calculate the concentration of a contaminant in soil above which a threat of the contaminant entering the ground water is a concern. Tier 2 soil-to-ground water pathway concentrations are back-calculated from acceptable ground water concentrations (MCLs or human health risk-based concentrations determined using Equations 1 and 2). The acceptable ground water concentration is multiplied by the dilution factor of 20 to obtain a target leachate concentration.

Although simplified, the methodology described in this section is theoretically and operationally consistent with investigation and modeling efforts that are conducted to develop soil cleanup goals and cleanup levels for protection of ground water at Superfund sites. Simplifying assumptions for the migration to ground water pathway include:

- The source is infinite (i.e., steady-state concentrations will be maintained in ground water over the exposure period);
- Contaminants are uniformly distributed throughout the zone of contamination;
- Soil contamination extends from the surface to the ground water table (i.e., adsorption sites are filled in the unsaturated zone beneath the area of contamination);
- There is no chemical or biological degradation in the unsaturated zone;
- Equilibrium soil/water partitioning is instantaneous and linear in the contaminated soil;
- The receptor well is at the source area (i.e., there is no dilution from recharge down-gradient of the property and the well is screened within the plume);
- The aquifer is unconsolidated and unconfined (surficial);
- Aquifer properties are homogenous and isotropic;
- There is no attenuation (i.e., adsorption or degradation) of contaminants in the aquifer; and,
- The contaminant does not exist as free product in the soil at the property.

3.2.6 Exceptions to Tier 2 Methodology

For a few contaminants listed in the Tier 2 Risk-Based Summary Table, alternative methods were employed to determine chemical-specific concentrations that are protective of human health, are environmentally safe, or preserve the aesthetic quality of drinking water supplies. Alternative methods include the use of health advisory data in the absence of chemical-specific toxicological data, consideration of drinking water odor and taste thresholds, and the consideration of potential for explosive environments, as examples. For these contaminants, the cleanup concentrations are generally more stringent than strictly human health risk-based concentrations.

3.3 Tier 3

Tier 3 offers the opportunity to determine site-specific risk-based contaminant concentrations that are protective of human health and the environment. Tier 3 involves the substitution of site-specific parameters into the equations used to calculate Tier 2 cleanup values. Tier 3 evaluations can be a substantial increase in effort relative to Tier 2, and must be performed with KDHE/BER oversight, including the submittal of appropriate work plans to perform any necessary additional work. KDHE/BER will not authorize the performance of a Tier 3 analysis for contaminants of concern that are regulated by federal, state or local laws, such as the federal Safe Drinking Water Act which mandates MCLs for drinking water aquifers.

Default assumption parameters employed by KDHE/BER to calculate Tier 2 risk-based cleanup goals are included in Equations 5, 6, and 7. Parameters for which site-specific data may be substituted to perform a Tier 3 analysis are denoted with an asterisk. Data which may be necessary to complete a Tier 3 evaluation can include additional geological, geophysical or hydrological data, including items such as unsaturated zone physical and geological properties (vertical distribution profiling of fraction organic carbon, bulk density, total porosity, air-filled porosity, water-filled porosity, etc.), thickness of unsaturated zone, thickness of the saturated aquifer, aquifer transmissivity, hydraulic conductivity, gradient, infiltration rate, and longitudinal, lateral, and vertical dispersivities.

The following are examples of measures that may be undertaken as part of a Tier 3 analysis:

- The use of property-specific numerical soil or ground water modeling to predict the effect of contaminant fate and transport mechanisms, including heterogeneous geological conditions (Any model used for a Tier 3 evaluation must be approved by the department project manager and must be a public domain model. In the event a proprietary model or any other model that KDHE/BER does not possess is used in a Tier 3 analysis, the department may request a copy of the model for review and approval.);
- Characterization of property sources and exposure pathways by using property assessment data to identify relevant sources, transport mechanisms, impacted media, and exposure pathways;
- Research to determine appropriate pesticide-specific standard application rates, followed by a comparison of site-specific pesticide contaminant levels to the modeled pesticide levels in the contaminated media based upon proper application;
- Identification of all potential receptors. Actual or potential receptors should be differentiated based on current and likely future land use, and upon the ability to place institutional controls at the property to eliminate potential exposure pathways;
- An evaluation of potential remedial actions that would reduce the human health or environmental risk to acceptable levels; and,
- Recalculation of health-based risk considering the site-specific speciation of metal contaminants. (Tier 2 uses the most toxic form of each metal.)

In the event a site-specific Tier 3 analysis determines that Tier 2 cleanup goals are not protective of human health or the environment, the more stringent Tier 3 cleanup goals will be the site-specific cleanup goals for the site.

4.0 INDOOR AIR CONCENTRATIONS

VOC contamination may migrate from soil and/or ground water into dwellings or other occupied structures. Appendix A-2 of the RSK Manual contains the concentrations of contaminants in indoor air at or above which KDHE/BER may require actions to mitigate the potential risk to human health posed by inhalation of those contaminants. Indoor air concentrations are provided for the residential scenario for each VOC present in the Tier 2 Risk-Based Summary Table in Appendix A. Because not all laboratories report air sample analytical results in the same manner, Appendix A-2 includes concentrations in both micrograms per cubic meter ($\mu g/m^3$) and parts per billion by volume (ppbv) for each VOC. KDHE/BER provides a detailed discussion on sampling of indoor air at residences and interpretation of data in *Kansas Vapor Intrusion Guidance - Chemical Vapor Intrusion and Residential Indoor Air*, dated June 2007.

KDHE/BER calculated the concentrations in Appendix A-2 using Equations 8 and 9 for carcinogenic and non-carcinogenic contaminants, respectively. For each VOC contaminant, the default exposure factors (from Table 3) and toxicity data (Appendix C) used to establish indoor air concentrations were the same as those used for the calculations of soil and ground water cleanup values. The indoor air concentrations in Appendix A-2 for non-carcinogens are based upon an HI equal to 1; the concentrations for carcinogens are based upon a 1×10^{-5} risk level.

The indoor air concentrations in Appendix A-2 are considered acceptable for only a single contaminant, and do not consider potential cumulative adverse health effects of multiple chemicals. The concentrations also do not consider cumulative effects of exposure to the same contaminant through multiple pathways. Consultation with the KDHE/BER project manager is essential before applying the concentrations in Appendix A-2 to a residence. If multiple contaminants are present in the home, or more than one exposure pathway exists, a Baseline Risk Assessment may be necessary to evaluate the health risk to exposed residents.

5.0 TOTAL PETROLEUM HYDROCARBONS

Total petroleum hydrocarbons (TPH) for the purpose of this section of the RSK Manual include all undifferentiated hydrocarbon compounds with carbon ranges C^5 through C^{35}, and containing various percentages of straight chain alkanes, branched chain alkanes, cycloalkanes, straight chain alkenes, branched chain alkenes, cycloalkenes, alkyl benzenes, naphtheno benzenes, alkyl naphthalenes and polynuclear aromatics. TPH cleanup concentrations in soil and ground water, as related to Tier 2 of this RSK Manual, must be quantified by summing TPH using EPA SW-846 modified method 8015, or laboratory analytical methods OA1 for gasoline range organics (GRO) and OA2 for diesel range organics (DRO).

The use of Tier 2 values for TPH-GRO and TPH-DRO must be used in conjunction with the values for individual constituents in order to determine site cleanup goals. These constituents include but are not limited to benzene, toluene, ethylbenzene, total xylenes (BTEX), methyl-tert-butyl-ether (MTBE), ethylene dibromide (EDB), and 1,2-dichloroethane (1,2-DCA) for TPH-GRO and naphthalene, chrysene, pyrene, benzo[a]pyrene, and anthracene for TPH-DRO.

Considering that TPH detected at a site is commonly found as either GRO or DRO, KDHE has developed two separate Tier 2 risk-based concentrations based upon whether the TPH is entirely GRO or DRO. For pure GRO-type TPH, the Tier 2 cleanup concentrations are based upon the physical, chemical and toxicological properties of n-hexane. For pure DRO-type TPH, the Tier 2 cleanup concentrations are based upon the physical, chemical and toxicological properties of pyrene.

If the site has only one type of TPH (GRO or DRO), the risk-based cleanup concentrations are based upon their petroleum type as provided in Tier 2 of the RSK Manual. For sites where both types of TPH are detected, the sum of the ratios of each hydrocarbon type must be calculated as follows:

$$\frac{X}{\text{GRO Tier 2 Value}} + \frac{Y}{\text{DRO Tier 2 Value}} = N$$

Where:

X = Detected GRO Concentration
Y = Detected DRO Concentration
N = Sum

For instance, where GRO and DRO are detected at 22 mg/kg and 1,000 mg/kg respectively, the hazard index would be determined as N = (22/220) + (1,000/2,000). Accordingly, N = 0.6, which is less than 1.0, therefore this scenario would be acceptable. Any N value greater than 1.0 would be considered an excessive risk and may require corrective action as determined by the KDHE/BER project manager.

Non-residential TPH standards should not be used in the following situations unless approved by the KDHE/BER project manager:

- sites where contamination is caused by a responsible party that does not own or control the property;
- sites where an Environmental Use Control cannot be used to control future use of the property; and
- sites where contamination is located on the responsible party's property but is migrating or threatening to migrate to an adjacent property not under the ownership or control of the responsible party.

The current and future use of the property and the ownership of the property must be considered when determining the use of "Non-Residential" TPH Tier 2 levels. In most cases, the residential standards should be used as the target cleanup levels.

Independent of the TPH Tier 2 levels presented in Appendix A of this RSK Manual, all free product, including hydrocarbon saturated soil, must be addressed. KDHE has calculated soil saturation values for TPH GRO and TPH DRO of 3,300 mg/kg and 70,000 mg/kg, respectively, using the methodology described above in Section 3.2.4. These values are estimates, and site-specific soil saturation values can vary based upon the nature of the product released at each site. However, these soil saturation values provide a default when a site-specific soil saturation value has not been calculated using Tier 3 methodology.

KDHE considers any apparent product on the ground water surface to be a likely indicator of soil saturation, and therefore an indicator of the need to further evaluate the potential for free product and possible remediation at the site.

6.0 NITRATE, NITRITE, AND AMMONIA

Nitrate and ammonium are common soil contaminants of concern in Kansas related to agricultural fertilizer spills, animal wastes, septic systems, and a variety of other sources. These contaminants are treated differently from other Tier 2 contaminants as the soil cleanup guidelines provided below are not based on their potential toxicity to humans through exposure to contaminated soil, but on the potential for contamination in the soil to leach to ground water. Nitrate and/or nitrite in ground water pose significant threats of toxicity to human and animal infants, and cleanup of nitrate in ground water can be an expensive, difficult, and time-consuming prospect. The soil cleanup guidelines provided below were developed by KDHE/BER in consultation with Kansas State University agronomy experts to provide non-site specific soil cleanup goals that are generally protective of ground water and capable of sustaining vegetative growth.

Nitrate, nitrite, and ammonia or ammonium concentrations are typically reported "as nitrogen" or "as N." Analytical results expressed "as ammonia," "as nitrate," or "as nitrite" must be converted to "as N" based on the ratios of the molecular weight of nitrogen to the molecular weights of the compounds in question for comparison to the soil cleanup guidelines and ground water standards provided below.

Soil Pathway:

- In areas where no vegetation is present (i.e., contamination in a gravel roadway, parking area, etc.) the following RSK standards apply:

  Upper 8 inches of soil - 85 milligrams/kilogram (mg/kg) total nitrate plus ammonia (N);

  Below 8 inches in depth - 40 mg/kg nitrate plus ammonia (N).

- In areas where vegetation is present (i.e, cultivated and cropped agricultural ground, pasture, lawn, etc.) the following RSK standards apply:

  Upper 24 inches of soil - 200 mg/kg total nitrate plus ammonia (N), or the maximum application rate recommended by Kansas State University for the particular crop;

  Below 24 inches in depth - 40 mg/kg nitrate plus ammonia (N).

Ground Water Pathway:

- The MCL for nitrate is 10.0 milligrams/liter (mg/L); the MCL for nitrite is 1.0 mg/L.

KDHE/BER will also consider the following site-specific conditions when determining the appropriate response action for a site contaminated by nitrate and/or ammonia.

1) If it is not possible to excavate soil to reach a 40 mg/kg total nitrate plus ammonia (N) level then the responsible party must determine the vertical extent of total nitrate plus ammonia (N) contamination through vertical profiling approved by KDHE/BER.

2) If ground water is 50 feet or less in depth then ground water monitoring wells may be requested by KDHE/BER in the area of contamination and hydraulically downgradient to the nitrate concentration in ground water. Additional actions may be required:

a) If nitrate (N) in groundwater exceeds 20 mg/l then the responsible party may be required by KDHE/BER to install a remedial system to hydraulically contain and/or remove the contamination.

b) If nitrate (N) in ground water is below the drinking water standard, or if the nitrate is shown to be from off-site sources, the monitoring points must be sampled in accordance with KDHE/BER identified sites reclassification criteria to monitor ground water quality. Please refer to KDHE/BER policy "BER-RS-024 - Reclassification Plan."

3) If ground water depth exceeds 50 feet, the need for installation of monitoring wells will be determined by KDHE/BER on a case by case basis depending on ground water usage, soil type, and soil concentration of nitrate plus ammonia (N). Depending on nitrate and nitrite concentrations in ground water, additional actions may be required.

4) If vertical soil profiling indicates the presence of impervious bedrock (e.g., shale) isolating the nitrate/ammonia from ground water, up to 200 mg/kg nitrate plus ammonia (N) can be left in place (as determined in consultation with the KDHE/BER project manager).

Excavation is commonly implemented as an appropriate response action to address soil contaminated with nitrate and/or ammonia. Nitrate and ammonia contaminated soil can be land applied on cultivated land at approved application rates. This approach requires the completion of the KDHE Land Application Work Plan and Agreement Form available from the KDHE/BER project manager.

Similar to the Tier 3 evaluations (see Section 3.3) for other contaminants, KDHE/BER will consider the use of site-specific information to modify nitrate cleanup goals. KDHE/BER will also consider cost/benefit analyses in the determination of cleanup goals.

7.0 TABLES, FORMULAS, AND EQUATIONS

TABLE 1

GROUND WATER EXPOSURE FACTORS

ID	Description	Residents	Non-Residents
TR	Target cancer risk	1E-06, 1E-05, 1E-04	1E-06, 1E-05, 1E-04
THI	Target hazard index	1	1
BW	Body weight (kg)		
Bwa	Adult	70	70
BWc	Child (0-6 years)	15	NA
Irw	Daily water ingestion rate (L/day)		
Irwa	Adult	2	1
Irwc	Child	1	NA
INH	Inhalation rate (m3/day)		
INHa	Adult	20	20
INHc	Child	10	NA
VFw	Volatilization Factor (L/m3)	0.5	0.5
CF	Conversion Factor (L/cm3)	0.001	0.001
SA	Skin Surface Area (cm2)		
Saa	Adult	20,000	20,000
Sac	Child	7,000	NA
Kp	Permeability coefficient (cm/hr)	Chemical-specific	Chemical-specific
ET	Exposure Time (hours/day)	1	0.5
EF	Exposure Frequency (days/year)	350	250
ED	Exposure Duration (years)		
Edca	Cancer (adult)	30	25
Ednca	Noncancer (adult)	30	25
Ednce	Noncancer (Child)	6	NA
AT	Averaging Time		
ATca	Cancer (adult)	70	70
Atnca	Noncancer (adult)	30	25
Atnce	Noncancer (child)	6	NA
SF	Slope Factor (carcinogens)	Chemical-specific	Chemical-specific
RfD	Reference Dose	Chemical-specific	Chemical-specific

Risk Assessment Guidance for Superfund Volume 1 Human Health Evaluation Manual (Part A) EPA, 1991 Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors".

Risk Assessment Guidance for Superfund, Part B: Development of Risk-based Preliminary Remediation Goals.

EQUATION 1

GROUND WATER / CARCINOGENS

$$\text{RBC (mg/L)} = \frac{TR \times BW \times AT \times 365 \text{ days / year}}{EF \times ED\,[(IR_w \times SF_o) + (VF_w \times Inh \times SF_i) + (ET \times CF \times SA \times Kp \times SF_o)]}$$

EQUATION 2

GROUND WATER / NON-CARCINOGENS

$$\text{RBC (mg/l)} = \frac{THI \times BW \times AT \times 365 \text{ days / year}}{EF \times ED \times [(IR_w \times 1/RfD_o) + (VF_w \times Inh \times 1/RfD_i) + (ET \times CF \times SA \times Kp \times 1/RfD_o)]}$$

TABLE 2

SOIL EXPOSURE FACTORS

ID	Description	Residents	Non-Residents
TR	Target cancer risk	1E-06, 1E-05, 1E-04	1E-06, 1E-05, 1E-04
THI	Target hazard index	1	1
BW	Body weight (kg)		
Bwa	Adult	70	70
BWc	Child (0-6 years)	15	NA
INGs	Soil ingestion rate (mg/day)		
INGsa	Adult	100	50
INGsc	Child	200	NA
INH	Soil inhalation rate (m3/day)		
INHa	Adult	20	20
INHc	Child	10	NA
VFs	Soil Volatilization Factor (m3/kg)	Chemical-specific	Chemical-specific
CF	Conversion Factor (kg/mg)	1E-06	1E-06
PEF	Particulate Emission Factor (m3/kg)	1.18E+09	1.18E+09
SA	Skin Surface Area (cm2/day)		
Saa	Adult	5000	5000
Sac	Child	1750	NA
ABS	Absorption Factor (fraction)	0.1	0.1
AF	Adherence Factor (mg/cm2)	0.2	0.2
EF	Exposure Frequency (days/year)	350	250
ED	Exposure Duration (years)		
Edca	Cancer (adult)	30	25
Ednca	Noncancer (adult)	30	25
Edncc	Noncancer (child)	6	NA
AT	Averaging Time		
Atca	Cancer (adult)	70	70
Atnca	Noncancer (adult)	30	25
Atncc	Noncancer (child)	6	NA
SF	Slope Factor (carcinogens)	Chemical-specific	Chemical-specific
RfD	Reference Dose	Chemical-specific	Chemical-specific

See references in Table 1

EQUATION 3

SOIL / CARCINOGENS

$$RBC\ (mg/kg) = \frac{TR \times BW \times AT \times 365\ days / year}{EF \times ED\ [(ING_s \times CF \times SF_o) + (INH \times SF_i \times \{1/VF_s + 1/PEF\}) + (SF_o \times CF \times SA \times AF \times ABS)]}$$

EQUATION 4

SOIL / NON-CARCINOGENS

$$RBC\ (mg/kg) = \frac{THI \times BW \times AT \times 365\ days / year}{EF \times ED \times [(ING_s \times CF \times 1/RfD_o) + (1/RfD_i \times INH \times \{1/VF_s + 1/PEF\}) + (1/RfD_o \times CF \times SA \times AF \times ABS)]}$$

EQUATION 5 VOLATILIZATION FACTOR EQUATION AND PARAMETERS

$$VF\ (m^3/kg) = \frac{Q}{C} * \frac{[(3.14)(D_A)(T)]^{1/2}}{2 \times \rho_b x D_A} x10^{-4} (m^2/cm^2)$$

$$\text{where } D_A = \frac{[(\theta_a^{10/3} D_i H' + \theta_w^{10/3} D_w)/n^2]}{\rho_b K_d + \theta_w + \theta_a H'}$$

Chemical-Specific Parameters	Default
VF = Volatilization factor (m^3/kg)	--
D_A = Apparent diffusivity (cm^2/s)	--
Q/C = Inverse of the mean concentration at the center of square source (g/m^2-s per kg/m^3)	81.64
T = Exposure interval (seconds) Residential Non-residential	 9.5 E+08 7.9 E+08
ρ_b = Dry soil bulk density (g/cm^3)	1.5 *
θ_a= Air filled soil porosity (Lair/Lsoil)	0.28 *
n = Total soil porosity (Lpore/Lsoil)	0.43 *
θ_w= Water filled soil porosity (Lwater/Lsoil)	0.15 *
ρ_s = Soil particle density (g/cm^3)	2.65 *
Di = Diffusivity in air (cm^2/s)	Chemical-specific
RG = Universal Gas Constant (atm-m3/mole-K)	0.000082
TEMP = Temperature (K)	293
H = Henry's Law constant (atm-m^3/mol)	Chemical-specific
H' = Dimensionless Henry's Law constant	H/(RG x TEMP)
D_w = Diffusivity in water (cm^2/s)	Chemical-specific
Kd = Soil-water partition coefficient (cm3/g) = Kocfoc	Chemical-specific
Koc = Soil organic carbon-water partition coefficient (cm3/g)	Chemical-specific
Foc = Fraction organic carbon in soil (g/g)	0.01 *

* *Asterisk notes the chemical-specific parameters that may be modified in a property-specific Tier 3 analyses.*

EQUATION 6 SOIL SATURATION EQUATION AND PARAMETERS

$$C_{sat} = \frac{S}{P_b}(K_d P_b + \theta_w + H'\theta_a)$$

Parameter Definition (units)	Default
Csat = Soil saturation concentration (mg/kg)	--
S = Solubility in water (mg/L-water)	chemical-specific
ρb = Dry soil bulk density (kg/L)	1.5 *
Kd = Soil-water partition coefficient (L/kg)	Koc × foc (chemical-specific)
Koc = Soil organic carbon/water partition coefficient (L/kg)	chemical-specific
foc = Fraction organic carbon in soil (g/g)	0.01 *
θw = Water-filled soil porosity (Lwater/Lsoil)	0.15 *
H' = Dimensionless Henry's law constant	Chemical-specific
θa = Air-filled soil porosity (Lair/Lsoil)	0.28 *
n = Total soil porosity (Lpore/Lsoil)	0.43 *
ρs = Soil particle density (kg/L)	2.65 *

* *Asterisk notes the physical and chemical-specific parameters that may be modified in a property-specific Tier 3 analysis.*

EQUATION 7 SOIL TO GROUND WATER MIGRATION PATHWAY EQUATION

$$C_t = C_w \left\langle (K_d) + \frac{\theta_w + \theta_a H'}{\rho_b} \right\rangle$$

SOIL TO GROUND WATER PROTECTION PARAMETERS

Parameter Definition (units)	Default
Ct = Screening level in soil (mg/kg)	--
Cw = Target soil leachate concentration (mg/l)	(non-zero MCLG, MCL, or RBC) x 20 DAF
Koc = Soil organic carbon/water partition coefficient (l/kg)	Chemical-specific (see Appendix B)
foc = Fraction organic carbon in soil (g/g)	0.01 *
Kd = Soil-water partition coefficient (L/kg)	Chemical specific for inorganic contaminants; Koc × foc for organic contaminants
θw = Water-filled soil porosity (Lwater/Lsoil)	0.30 *
θa = Air-filled soil porosity (Lair/Lsoil)	0.13 *
n = Total soil porosity (Lpore/Lsoil)	0.43 *
ρb = Dry soil bulk density (kg/L)	1.5 *
ρs = Soil particle density (kg/L)	2.65 *
RG = Universal gas constant (atm-m3/mole-K)	0.000082
TEMP = Temperature (K)	293
H' = Dimensionless Henry's Law constant	H/(RG x TEMP)
H = Henry's Law constant (atm-m3/mol)	Chemical-specific (see Appendix B)

* *Asterisk notes the physical and chemical-specific parameters that may be modified in a property-specific Tier 3 analysis.*

EQUATION 8 INDOOR AIR / CARCINOGENS

$$RBC\ (\mu g/m^3) = \frac{TR \times BW \times AT \times 365\ days / year}{EF \times ED \times Inh\ X\ CF \times SF_i}$$

EQUATION 9 INDOOR AIR / NON-CARCINOGENS

$$RBC\ (\mu g/m^3) = \frac{THI \times BW \times AT \times 365\ days / year}{EF \times ED \times Inh \times CF \times 1/RfD_i}$$

TABLE 3
INDOOR AIR EXPOSURE FACTORS

ID	Description	Value
TR	Target cancer risk	1E-06, 1E-05, 1E-04
THI	Target hazard index	1
BW	Body weight (kg)	
	Adult	70
	Child	15
Inh	Inhalation rate (m^3/day)	
	Adult	20
	Child	10
CF	Conversion factor (mg/µg)	1E-03
EF	Exposure frequency (days/year)	350
ED	Exposure duration (years)	
	Cancer (adult)	30
	Non-cancer (adult)	30
	Non-cancer (child)	6
AT	Averaging time (years)	
	Cancer (adult)	70
	Non-cancer (adult)	30
	Non-cancer (child)	6
SF_i	Slope factor, inhalation	Chemical-specific
RfD_i	Reference dose, inhalation	Chemical-specific

See references in Table 1

8.0 REFERENCES

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APPENDIX A
KDHE TIER 2 RISK-BASED SUMMARY TABLE

		RESIDENTIAL SCENARIOS			NON-RESIDENTIAL SCENARIOS		
Chemical Name	CAS No.	Soil Pathway (mg/kg)	Soil to Ground Water Protection Pathway (mg/kg)	Ground Water Pathway (mg/L)	Soil Pathway (mg/kg)	Soil to Ground Water Protection Pathway (mg/kg)	Ground Water Pathway (mg/L)
Acenaphthene	83-32-9	300 s	190	0.13 n	300 s	300 s	0.49 n
Acetochlor	34256-82-1	696.00 s	20.10	0.312 n	696.00 s	124.1	1.927 n
Acetone	67-64-1	1700 n	1.1	0.26 n	6200 n	3.8	0.93 n
Acetophenone	98-86-2	0.86 n	2.6E-04	2.E-05 n	2.54 n	7.9E-04	6.E-05 n
Acrolein	107-02-8	0.13 n	1.5E-04	1.8E-05 n	0.41 n	4.8E-04	5.8E-05 n
Acrylamide	79-06-1	1.9 c	0.0008	0.0002 c	4.2 c	0.003	0.0006 c
Acrylonitrile	107-13-1	12 c	0.002	0.0005 c	25 c	0.004	0.001 c
Alachlor (Lasso)	15972-60-8	110 c	0.08	0.002 m	240 c	0.08	0.002 m
Aldicarb (Temik)	116-06-3	67 n	0.05	0.007 m	680 n	0.05	0.007 m
Aldrin	309-00-2	0.50 c	24	5E-05 c	1.1 c	81	0.0002 c
Anthracene	120-12-7	13 s	13 s	0.62 n	13 s	13 s	2.3 n
Antimony and compounds	7440-36-0	31 n	N/A	0.006 m	820 n	N/A	0.006 m
Arsenic	7440-38-2	11 c	N/A	0.01 m	38 c	N/A	0.01 m
Atrazine	1912-24-9	38 c	0.26	0.003 m	86 c	0.26	0.003 m
Barium	7440-39-3	5500 n	N/A	2.0 m	140000 n	N/A	2.0 m
Bentazon	25057-89-0	237.5 s	5.28	0.460 n	237.5 s	34.22	2.977 n
Benzene	71-43-2	9.8 n	0.08	0.005 m	17 c	0.08	0.005 m
Benzidine	92-87-5	0.04 c	5.E-05	4E-06 c	0.08 c	0.0002	1E-05 c
Benzo(a)anthracene	56-55-3	12 c	10	0.0001 c	26 c	35	0.0004 c
Benzo(b)fluoranthene	205-99-2	12 c	19 s	9.E-05 c	19 s	19 s	0.0003 c
Benzo(k)fluoranthene	207-08-9	10 s	10 s	0.001 c	10 s	10 s	0.003 c
Benzo(a)pyrene	50-32-8	1.2 c	16 s	0.0002 m	2.6 c	16 s	0.0002 m
Benzyl Chloride	100-44-7	6.4 c	0.02	0.0008 c	10 c	0.03	0.002 c
Beryllium	7440-41-7	160 n	N/A	0.004 m	4100 n	N/A	0.004 m
Bis(2-chloroethyl)ether	111-44-4	2.3 c	0.0009	0.0001 c	3.9 c	0.002	0.0002 c
Bis(2-chloroisopropyl)ether	39638-32-9	47 c	0.25	0.003 c	82 c	0.49	0.007 c
Bis(chloromethyl)ether	542-88-1	0.004 c	4.E-06	7.E-07 c	0.006 c	7.E-06	1.E-06 c
Bis(2-ethylhexyl)phthalate	117-81-7	600 c	18000	0.006 m	1400 c	18000	0.006 m
Bromacil	314-40-9	294 s	16.2	1.56 n	294 s	105	10.12 n
Bromodichloromethane	75-27-4	14 c	1.21	0.08 m	23 c	1.21	0.08 m
Bromoform	75-25-2	1100 c	1.72	0.08 m	2400 c	1.72	0.08 m

APPENDIX A
KDHE TIER 2 RISK-BASED SUMMARY TABLE

		RESIDENTIAL SCENARIOS			NON-RESIDENTIAL SCENARIOS		
Chemical Name	CAS No.	Soil Pathway	Soil to Ground Water Protection Pathway	Ground Water Pathway	Soil Pathway	Soil to Ground Water Protection Pathway	Ground Water Pathway
		(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/L)
Bromomethane	74-83-9	4.8 n	0.02	0.004 n	15 n	0.09	0.01 n
1,3-Butadiene	106-99-0	0.14 c	0.004	0.0001 c	0.21 c	0.007	0.0003 c
Butylate	2008-41-5	282 s	64.0	0.503 n	282 s	282 s	2.847 n
n-Butylbenzene	104-51-8	190 n	11.9	0.021 n	395 s	45.2	0.08 n
sec-Butylbenzene	135-98-8	156 n	9.8	0.022 n	378 s	35.6	0.08 n
Butyl Benzyl Phthalate	85-68-7	1500 s	1500 s	2.1 n	1500 s	1500 s	12 n
Cadmium	7440-43-9	39 n	N/A	0.005 m	1000 n	N/A	0.005 m
Captan	133-06-2	8.8 s	8.8 s	0.24 c	8.8 s	8.8 s	0.81 c
Carbaryl (Sevin)	63-25-2	230 s	69	1.5 n	230 s	230 s	9.7 n
Carbazole	86-74-8	250 s	16	0.02 c	250 s	54	0.08 c
Carbofuran (Furadan)	1563-66-2	150 s	0.47	0.04 m	150 s	0.47	0.04 m
Carbon Disulfide	75-15-0	460 n	0.14	0.009 n	950 s	0.45	0.03 n
Carbon Tetrachloride	56-23-5	2.5 n	0.20	0.005 m	7.0 c	0.20	0.005 m
Chlordane	57-74-9	24 c	48	0.002 m	55 c	48	0.002 m
Chlorobenzene	108-90-7	78 n	4.8	0.1 m	240 n	4.8	0.1 m
Chloroethane	75-00-3	35.1 c	0.457	0.048 c	53.9 c	0.848	0.089 c
Chloroform	67-66-3	3.9 c	0.96	0.08 m	6.0 c	0.96	0.08 m
Chloromethane	74-87-3	86 c	0.11	0.02 c	140 c	0.22	0.04 c
2-Chloronaphthalene	91-58-7	188 s	58	0.181 n	188 s	188.00 s	0.665 n
Chlorpyrifos (Lorsban/Dursban)	2921-88-2	200 n	1100	0.04 n	1700 s	1700 s	0.21 n
Chromium (total)	18540-29-9	390 n	N/A	0.1 m	4000 c	N/A	0.1 m
Chrysene	218-01-9	6.4 s	6.4 s	0.01 c	6.4 s	6.4 s	0.04 c
Copper	7440-50-8	2900 n	N/A	1.3 m	76000 n	N/A	1.3 m
Cumene	98-82-8	512 s	37.7	0.224 n	512 s	138.6	0.824 n
Cyanazine (Bladex)	21725-46-2	10 c	0.03	0.001 c	23 c	0.11	0.003 c
Cyanide (free)	57-12-5	1600 n	N/A	0.2 m	41000 n	N/A	0.2 m
Dacthal	1861-32-1	1.45 s	1.45 s	0.137 n	1.45 s	1.45 s	0.854 n
DDD	72-54-8	35 c	190	0.0009 c	79 c	620	0.003 c
DDE	72-55-9	25 c	650	0.0007 c	56 c	2200	0.002 c
DDT	50-29-3	25 c	250	0.0005 c	56 c	660 s	0.002 c
Diazinon	333-41-5	60 n	54000 s	0.01 n	610 n	54000 s	0.08 n

APPENDIX A
KDHE TIER 2 RISK-BASED SUMMARY TABLE

		RESIDENTIAL SCENARIOS			NON-RESIDENTIAL SCENARIOS		
Chemical Name	CAS No.	Soil Pathway (mg/kg)	Soil to Ground Water Protection Pathway (mg/kg)	Ground Water Pathway (mg/L)	Soil Pathway (mg/kg)	Soil to Ground Water Protection Pathway (mg/kg)	Ground Water Pathway (mg/L)
Dibenzo(a,h)anthracene	53-70-3	1.2 c	3.1	4.E-06 c	2.6 c	11	1.E-05 c
Dibenzofuran	132-64-9	252 n	27	0.01 n	1351 s	86.5	0.032 n
1,4-Dibromobenzene	106-37-6	670 n	3700	0.13 n	6800 n	11000 s	0.76 n
Dibromochloromethane	124-48-1	100 c	1.33	0.08 m	230 c	1.33	0.08 m
Dicamba	1918-00-9	1997 n	23.3	0.468 n	10755 s	146.4	2.94 n
1,2-Dichlorobenzene	95-50-1	990 s	77	0.6 m	990 s	77	0.6 m
1,4-Dichlorobenzene	106-46-7	57 c	9.5	0.075 m	92 c	9.5	0.075 m
Dichlorodifluoromethane	75-71-8	98 n	7.0	0.17 n	290 n	23	0.57 n
1,1-Dichloroethane	75-34-3	660 n	3.7	0.34 n	2100 s	13	1.3 n
1,2-Dichloroethane	107-06-2	4.7 c	0.04	0.005 m	7.3 c	0.04	0.005 m
1,1-Dichloroethene	75-35-4	0.90 c	0.12	0.007 m	1.4 c	0.12	0.007 m
1,2-Dichloroethene (cis)	156-59-2	57 n	0.80	0.07 m	180 n	0.80	0.07 m
1,2-Dichloroethene (trans)	156-60-5	94 n	1.5	0.1 m	290 n	1.5	0.1 m
2,4-Dichlorophenol	120-83-2	200 n	8.8	0.04 n	2000 n	54	0.25 n
2,4-Dichlorophenoxyacetic acid (2,4-D)	94-75-7	670 n	6.6	0.07 m	3100 s	6.6	0.07 m
1,2-Dichloropropane	78-87-5	6.0 c	0.06	0.005 m	9.3 c	0.06	0.005 m
1,3-Dichloropropene	542-75-6	1.6 c	0.01	0.001 c	2.5 c	0.03	0.002 c
Dichlorvos	62-73-7	29 c	0.03	0.003 c	66 c	0.09	0.01 c
Dieldrin	60-57-1	0.53 c	0.20	5.E-05 c	1.2 c	0.66	0.0002 c
Diethyl Phthalate	84-66-2	3200 s	740	12 n	3200 s	3200 s	78 n
2,4-Dimethylphenol	105-67-9	1300 n	13	0.28 n	14000 n	81	1.8 n
Dimethylphthalate	131-11-3	665629 n	1781	156 n	6812563 n	11456	1005.0 n
Di-n-butyl Phthalate	84-74-2	3798 s	3798 s	1.5 n	3798 s	3798 s	6.39 n
2,4-Dinitrophenol	51-28-5	130 n	0.33	0.03 n	1200 s	2.1	0.20 n
2,4-Dinitrotoluene	121-14-2	13 c	0.03	0.001 c	28 c	0.09	0.004 c
2,6-Dinitrotoluene	606-20-2	13 c	0.02	0.001 c	28 c	0.07	0.004 c
Di-n-octyl Phthalate	117-84-0	1300 n	17000 s	0.010 n	14000 n	17000 s	0.048 n
1,4-Dioxane	123-91-1	770 c	0.32	0.08 c	1700 c	1.1	0.26 c
Diuron	330-54-1	133 n	3.08	0.031 n	205 s	18.99	0.191 n
Endosulfan	115-29-7	11 s	11 s	0.09 n	11 s	11 s	0.59 n
Endrin	72-20-8	20 n	4.9	0.002 m	30 s	4.9	0.002 m

APPENDIX A
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Chemical Name	CAS No.	Soil Pathway	Soil to Ground Water Protection Pathway	Ground Water Pathway	Soil Pathway	Soil to Ground Water Protection Pathway	Ground Water Pathway
		(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/L)
EPTC (Ethyl-dithiopropylcarbamate, s-)	759-94-4	1700 n	97	0.33 n	5300 s	590	2.0 n
Ethylbenzene	100-41-4	650 s	55	0.7 m	650 s	55	0.7 m
Ethylene dibromide	106-93-4	0.09 c	0.0006	5.E-05 m	0.20 c	0.0006	5.E-05 m
Ethylene glycol	107-21-1	133126 n	125.34	31.27 n	1362513 n	818.64	204.23 n
Fluoranthene	206-44-0	220 s	220 s	0.18 n	220 s	220 s	0.89 n
Fluorene	86-73-7	270 s	200	0.07 n	270 s	270 s	0.28 n
Fonofos (Dyfonate)	944-22-9	130 n	9.6	0.02 n	250 s	57	0.15 n
Formaldehyde	50-00-0	10000 n	13	3.0 n	60000 s	84	20 n
Freon - 113	76-13-1	955 s	955 s	25.22 n	955 s	955 s	84.87 n
Furan	110-00-9	3.2 n	0.02	0.003 n	9.9 n	0.08	0.009 n
Glyphosate (Roundup)	1071-83-6	6700 n	300	0.7 m	68000 n	300	0.7 m
Heptachlor	76-44-8	1.9 c	110	0.0004 m	4.2 c	110	0.0004 m
Heptachlor Epoxide	1024-57-3	0.87 n	3.3	0.0002 m	2.1 c	3.3	0.0002 m
Hexachlorobenzene	118-74-1	5.3 c	11	0.001 m	12 c	11	0.001 m
Hexachlorobutadiene	87-68-3	13 n	18	0.002 n	140 n	100	0.009 n
Hexachlorocyclopentadiene	77-47-4	398 n	1989	0.05 m	3581 s	1989	0.05 m
Hexachloroethane	67-72-1	67 n	4.3	0.01 n	680 n	26	0.07 n
n-Hexane	110-54-3	220 s	39	0.11 n	220 s	150	0.41 n
HMX	2691-41-0	0.67 s	0.67 s	0.78 n	0.67 s	0.67 s	5.1 n
Hydrazine	302-01-2	2.8 c	100000 s	0.0003 c	6.4 c	100000 s	0.001 c
Hydrazine Sulfate	10034-93-2	2.8 c	N/A	0.0003 c	6.4 c	N/A	0.001 c
Indeno(1,2,3-cd)pyrene	193-39-5	0.76 s	0.76 s	6.E-05 c	0.76 s	0.76 s	0.0002 c
Kepone	143-50-0	0.47 c	1.5	5.E-05 c	1.1 c	5.0	0.0002 c
Lead	7439-92-1	400	N/A	0.015 m	1000	N/A	0.015 m
Lindane	58-89-9	6.6 c	0.04	0.0002 m	15 c	0.04	0.0002 m
Malathion	121-75-5	330 s	15	0.31 n	330 s	97	2.0 n
Manganese	7439-96-5	3600 n	N/A	0.05 M	95000 n	N/A	0.05 M
Mercury	7439-97-6	2 n	N/A	0.002 m	20 n	N/A	0.002 m
Methoxychlor	72-43-5	44 s	44 s	0.04 m	44 s	44 s	0.04 m
Methylene Chloride	75-09-2	150 c	0.03	0.005 m	230 c	0.03	0.005 m
Methyl Ethyl Ketone (2-Butanone)	78-93-3	6400 n	3.6	0.82 n	21000 n	12	2.8 n

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		RESIDENTIAL SCENARIOS			NON-RESIDENTIAL SCENARIOS		
Chemical Name	CAS No.	Soil Pathway (mg/kg)	Soil to Ground Water Protection Pathway (mg/kg)	Ground Water Pathway (mg/L)	Soil Pathway (mg/kg)	Soil to Ground Water Protection Pathway (mg/kg)	Ground Water Pathway (mg/L)
Methyl Isobutyl Ketone	108-10-1	1000 n	0.41	0.07 n	3600 n	1.4	0.23 n
2-Methylnaphthalene	91-57-6	213 n	12.2	0.009 n	1461 n	45.0	0.033 n
2-Methylphenol	95-48-7	3300 n	4.6	0.74 n	6500 s	29	4.7 n
3-Methylphenol	108-39-4	3300 n	8.1	0.74 n	6500 s	29	4.7 n
4-Methylphenol	106-44-5	330 n	1.0	0.08 n	3400 n	6.5	0.47 n
Methyl Tertbutyl Ether	1634-04-4	2400 n	0.09	0.020 h	15000 n	0.09	0.020 h
Metolachlor (Dual)	51218-45-2	390 s	41	2.3 n	390 s	260	15 n
Metribuzin (Sencor)	21087-64-9	740 s	5.6	0.39 n	740 s	36	2.5 n
Naphthalene	91-20-3	104 n	1.05	0.003 n	325 n	3.52	0.009 n
Nickel	7440-02-0	1600 n	N/A	0.10 h	41000 n	N/A	0.10 h
Nitrobenzene	98-95-3	21 n	0.02	0.001 n	110 n	0.09	0.005 n
Nitrofurazone	59-87-0	5.7 c	0.002	0.0006 c	13 c	0.008	0.002 c
Nitroguanidine	556-88-7	6700 n	190	1.6 n	12000 s	1200	10 n
2-Nitropropane	79-46-9	83.6 n	0.08	0.015 n	296 n	0.29	0.053 n
Oxamyl	23135-22-0	1700 n	1.2	0.2 m	17000 n	1.2	0.2 m
Paraquat	1910-42-5	300 n	210	0.07 n	3100 n	1400	0.45 n
Parathion	56-38-2	380 s	98	0.08 n	380 s	380 s	0.52 n
PCBs (Polychlorinated Biphenyl)	1336-36-3	4.3 c	53	0.0005 m	9.5 c	53	0.0005 m
Pendimethalin (Prowl)	40487-42-1	37 s	37 s	0.63 n	37 s	37 s	4.1 n
Pentachlorophenol	87-86-5	71 c	20	0.001 m	160 c	20	0.001 m
Perchlorate	7790-98-9	54.75 n	0.044	0.011 n	1430 n	0.288	0.072 n
Permethrin (Ambush)	52645-53-1	2.4 s	2.4 s	0.002 n	2.4 s	2.4 s	0.01 n
Phenol	108-95-2	32000 s	88	9.0 n	32000 s	560	58 n
Phenylphenol	90-43-7	4400 c	1.4	0.35 c	9800 c	4.7	1.2 c
Phosphine	7803-51-2	20 n	0.02	0.005 n	37 s	0.12	0.03 n
Picloram (Tordon)	1918-02-1	4659 n	3.40	0.500 m	47688 n	3.40	0.50 m
Profluralin	26399-36-0	100 s	100 s	0.09 n	100 s	100 s	0.61 n
Prometon	1610-18-0	998 n	7.7	0.218 n	1252 s	48.8	1.385 n
Propachlor (Ramrod)	1918-16-7	550 s	4.0	0.20 n	550 s	26	1.3 n
Propazine (Miloguard)	139-40-2	5.1 s	5.1 s	0.29 n	5.1 s	5.1 s	1.9 n
n-Propylbenzene	103-65-1	190 n	11.3	0.02 n	395 s	45.2	0.08 n

APPENDIX A
KDHE TIER 2 RISK-BASED SUMMARY TABLE

		RESIDENTIAL SCENARIOS			NON-RESIDENTIAL SCENARIOS		
Chemical Name	CAS No.	Soil Pathway	Soil to Ground Water Protection Pathway	Ground Water Pathway	Soil Pathway	Soil to Ground Water Protection Pathway	Ground Water Pathway
		(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/L)
Pyrene	129-00-0	140 s	140 s	0.14 n	140 s	140 s	0.72 n
Pyridine	110-86-1	33 n	0.01	0.003 n	150 n	0.05	0.009 n
RDX	121-82-4	44 s	0.13	0.008 c	44 s	0.43	0.03 c
Selenium	7782-49-2	390 n	N/A	0.05 m	10000 n	N/A	0.05 m
Silver	7440-22-4	390 n	N/A	0.1 M	10000 n	N/A	0.1 M
Simazine (Princap)	122-34-9	9.3 s	0.13	0.004 m	9.3 s	0.13	0.004 m
Styrene	100-42-5	2400 s	16	0.1 m	2400 s	16	0.1 m
Tert-butyl Alcohol (TBA)	75-65-0	1054 c	0.49	0.043 c	1853 c	0.90	0.079 c
2,4,5-T as Acid	93-76-5	670 n	53	0.15 n	4800 s	340	0.94 n
2,3,7,8-TCDD (Dioxin)	1746-01-6	6.E-05 c	0.02	3.E-08 m	0.0001 c	0.02	3.E-08 m
Terbacil (Sinbar)	5902-51-2	520 s	3.3	0.20 n	520 s	22	1.3 n
Terbufos (Counter)	13071-79-9	1.7 n	0.04	0.0003 n	17 n	0.23	0.002 n
1,1,1,2-Tetrachloroethane	630-20-6	29 c	0.17	0.005 c	45 c	0.33	0.01 c
1,1,2,2-Tetrachloroethane	79-34-5	7.1 c	0.02	0.0007 c	12 c	0.03	0.001 c
Tetrachloroethene (PCE)	127-18-4	79 c	0.18	0.005 m	140 c	0.18	0.005 m
2,3,4,6-Tetrachlorophenol	58-90-2	2000 n	1200	0.27 n	20000 n	6800	1.5 n
Tetryl	479-45-8	45 s	2.2	0.16	45 s	14	1.0 n
Toluene	108-88-3	930 n	40	1 m	1000 s	40	1 m
TPH GRO		220 n	39	0.500 n	450 n	150	0.500 n
TPH DRO		2000 n	3000	0.500 n	20000 n	15000	0.720 n
Toxaphene	8001-35-2	7.7 c	150	0.003 m	17 c	150	0.003 m
2,4,5-TP (Silvex)	93-72-1	530 n	55	0.05 m	5500 n	55	0.05 m
1,2,4-Trichlorobenzene	120-82-1	600 n	25	0.07 m	4900 n	25	0.07 m
1,1,1-Trichloroethane	71-55-6	880 n	5.5	0.2 m	1800 s	5.5	0.2 m
1,1,2-Trichloroethane	79-00-5	13 c	0.07	0.005 m	20 c	0.07	0.005 m
Trichloroethene (TCE)	79-01-6	62 c	0.20	0.005 m	98 c	0.20	0.005 m
2,4,5-Trichlorophenol	95-95-4	6700 n	1600	1.2 n	68000 n	9200	6.7 n
2,4,6-Trichlorophenol	88-06-2	770 c	45	0.05 c	1700 c	150	0.17 c
1,2,3-Trichloropropane	96-18-4	0.17 c	0.0004	2.E-05 c	0.28 c	0.0007	4.E-05 c
Triflualine (Treflan)	1582-09-8	500 n	1800	0.05 c	2500 c	6000	0.18 c
1,2,4-Trimethylbenzene	95-63-6	36.5 n	0.78	0.005 n	109.4 n	2.6	0.017 n

APPENDIX A
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		RESIDENTIAL SCENARIOS			NON-RESIDENTIAL SCENARIOS		
Chemical Name	CAS No.	Soil Pathway	Soil to Ground Water Protection Pathway	Ground Water Pathway	Soil Pathway	Soil to Ground Water Protection Pathway	Ground Water Pathway
		(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/L)
1,3,5-Trimethylbenzene	108-67-8	31.4 n	0.77	0.005 n	94.0 n	2.51	0.017 n
2,4,6-Trinitrotoluene	118-96-7	14 s	0.05	0.008 n	14 s	3.3	0.05 n
Vanadium	7440-62-2	550 n	N/A	0.11 n	14000 n	N/A	0.71 n
Vinyl Chloride	75-01-4	0.34 c	0.02	0.002 m	0.54 c	0.02	0.002 m
Xylene (mixed)	1330-20-7	700 s	700 s	10 m	700 s	700 s	10 m
Zinc	7440-66-6	23000 n	N/A	5 M	610000 n	N/A	5 M

Notes

n - non-carcinogenic risk, HI = 1

c - carcinogenic risk, risk = 1×10^{-5}

s - soil saturation

m - primary maximum contaminant level (MCL)

M - secondary maximum contaminant level (MCL)

h - health advisory

N/A - insufficient data to calculate value

All soil values are to be compared to analytical results on a dry-weight basis.

Spreadsheet values with modifications since the printing of the 03 RSK Manual are denoted by the shaded cells.

APPENDIX A-2
TIER 2 RISK-BASED INDOOR AIR VALUES

Chemical Name	CAS No.	Contaminant Concentrations ug/m3		ppbv	MW
Acenaphthene	83-32-9	93.857	n	14.627	154
Acetone	67-64-1	156.429	n	64.729	58
Acetophenone	98-86-2	0.009	n	0.002	120
Acrolein	107-02-8	0.009	n	0.004	56
Acrylonitrile	107-13-1	0.358	c	0.162	53
Anthracene	120-12-7	469.286	n	63.275	178
Benzene	71-43-2	2.675	n	0.823	78
Benzyl Chloride	100-44-7	0.501	c	0.095	127
Bis(2-chloroethyl)ether	111-44-4	0.074	c	0.012	143
Bis(2-chloroisopropyl)ether	39638-32-9	2.433	c	0.341	171
Bis(chloromethyl)ether	542-88-1	3.92E-04	c	8.181E-05	115
Bromodichloromethane	75-27-4	1.374	c	0.201	164
Bromomethane	74-83-9	2.237	n	0.565	95
1,3-Butadiene	106-99-0	0.087	c	0.039	54
n-Butylbenzene	104-51-8	15.643	n	2.802	134
sec-Butylbenzene	135-98-8	15.643	n	2.802	134
Carbon Disulfide	75-15-0	312.857	n	98.797	76
Carbon Tetrachloride	56-23-5	0.893	n	0.139	154
Chlorobenzene	108-90-7	8.939	n	1.899	113
Chloroethane	75-00-3	29.368	c	10.844	65
Chloroform	67-66-3	1.058	c	0.213	119
Chloromethane	74-87-3	13.519	c	6.489	50
2-Chloronaphthalene	91-58-7	125.143	n	18.426	163
Cumene	98-82-8	156.429	n	31.286	120
Dibenzofuran	132-64-9	6.257	n	0.894	168
1,2-Dichlorobenzene	95-50-1	89.388	n	14.594	147
1,4-Dichlorobenzene	106-46-7	3.549	c	0.579	147
Dichlorodifluoromethane	75-71-8	89.388	n	17.730	121
1,1-Dichloroethane	75-34-3	223.469	n	54.174	99
1,2-Dichloroethane	107-06-2	0.936	c	0.227	99
1,1-Dichloroethene	75-35-4	0.487	c	0.120	97
1,2-Dichloroethene (cis)	156-59-2	15.643	n	3.870	97
1,2-Dichloroethene (trans)	156-60-5	31.286	n	7.741	97
1,2-Dichloropropane	78-87-5	1.252	c	0.266	113
1,3-Dichloropropene	542-75-6	0.655	c	0.139	113
Ethylbenzene	100-41-4	453.643	n	102.712	106
Ethylene dibromide	106-93-4	0.089	n	0.011	188
Fluorene	86-73-7	62.571	n	9.046	166
Freon - 113	76-13-1	13452.857	n	1726.570	187
Furan	110-00-9	1.564	n	0.552	68
n-Hexane	110-54-3	89.388	n	24.945	86
Methylene Chloride	75-09-2	51.773	c	14.618	85
Methyl Ethyl Ketone (2-Butanone)	78-93-3	446.939	n	148.980	72
Methyl Isobutyl Ketone	108-10-1	35.755	n	8.581	100
2-Methylnaphthalene	91-57-6	6.257	n	1.058	142
Methyl Tertbutyl Ether	1634-04-4	1340.816	n	365.677	88
Naphthalene	91-20-3	1.341	n	0.251	128
Nitrobenzene	98-95-3	0.893	n	0.174	123
2-Nitropropane	79-46-9	0.009	c	0.002	89

APPENDIX A-2
TIER 2 RISK-BASED INDOOR AIR VALUES

Chemical Name	CAS No.	Contaminant Concentrations ug/m3		ppbv	MW
n-Propylbenzene	103-65-1	15.643	n	3.129	120
Styrene	100-42-5	453.643	n	104.687	104
Tert-butyl Alcohol (TBA)	75-65-0	25.808	c	8.370	74
1,1,1,2-Tetrachloroethane	630-20-6	3.288	c	0.470	168
1,1,2,2-Tetrachloroethane	79-34-5	0.420	c	0.060	168
Tetrachloroethene (PCE)	127-18-4	41.954	c	6.066	166
Toluene	108-88-3	172.071	n	44.888	92
1,2,4-Trichlorobenzene	120-82-1	89.164	n	11.823	181
1,1,1-Trichloroethane	71-55-6	446.939	n	80.651	133
1,1,2-Trichloroethane	79-00-5	1.521	c	0.274	133
Trichloroethene (TCE)	79-01-6	14.194	c	2.600	131
1,2,3-Trichloropropane	96-18-4	0.012	c	0.002	147
1,2,4-Trimethylbenzene	95-63-6	2.659	n	0.532	120
1,3,5-Trimethylbenzene	108-67-8	2.659	n	0.532	120
Vinyl Chloride	75-01-4	0.284	c	0.108	63
Xylene (mixed)	1330-20-7	46.929	n	10.625	106

Notes

n - non-carcinogenic risk, HI = 1

c - carcinogenic risk, risk = 1×10^{-5}

Concentrations in micrograms per cubic meter (ug/m3) were calculated using equations 3-5 and 3-6, and the toxicity information in Appendix C.

Concentrations in parts per billion by volume (ppbv) were calculated by multiplying the ug/m3 value by 24, then dividing by the contaminant's molecular weight (MW).

APPENDIX B
CONTAMINANT-SPECIFIC PARAMETERS

Chemical Name	Solubility (mg/L)		Log Kow		Log Koc		Kd for inorganics or Koc * foc for organics	HLC		Diffusivity in Air		Diffusivity in Water	Kp		Volatilization Factor Residential	Volatilization Factor Industrial
Acenaphthene	4.24	a	3.92	a	3.85	a	71	1.55E-04	a	0.04	a	7.69E-06	0.150	m	3.3E+05	3.0E+05
Acetochlor	223	u	3.03	u	2.48	e	3.02	5.40E-11	u				0.0061	m		
Acetone	1.00E+06	a	-0.24	a	-0.24	a	0.01	3.88E-05	a	0.12	a	1.14E-05	0.0012	m	1.5E+04	1.3E+04
Acetophenone	6.10E+03	r			1.66	r	0.46	1.00E-05	r	0.06	r	8.73E-06	0.0047	r	9.6E+04	8.7E+04
Acrolein	2.13E+05	b	-0.01	b	1.33	c	0.21	1.22E-04	b	0.11	c	1.22E-05	0.00074	l	1.5E+04	1.4E+04
Acrylamide	6.40E+05	b	-0.96	b	-0.94	d	0.0011	1.00E-09	b				0.00024	l		
Acrylonitrile	7.4.E+04	b	0.25	b	-0.07	c	0.01	1.03E-04	b	0.11	c	1.34E-05	0.0014	l	1.6E+05	1.5E+05
Alachlor (Lasso)	242						1.9	2.07E-08	g				0.014	m		
Aldicarb (Temik)	6030	b	1.11	b	1.09	d	0.12	1.44E-09	b				0.00084	m		
Aldrin	0.18	a	6.50	a	6.39	a	24535	1.70E-04	a	0.01	a	4.86E-06	0.0016	l		
Anthracene	0.04	a	4.55	a	4.47	a	297	6.50E-05	a	0.03	a	7.74E-06	0.23	m	1.2E+06	1.1E+06
Antimony and compounds							45						0.0010	l		
Arsenic							29						0.0010	l		
Atrazine	70	b	2.65	b	2.61	d	4.0	4.53E-03	b				0.0083	m		
Barium							41						0.0010	l		
Bentazon	500.00	r			1.57	r	0.375	2.10E-09	r				0.003	r		
Benzene	1750	a	2.13	a	1.77	a	0.58	5.55E-03	a	0.09	a	9.80E-06	0.021	l	3.8E+03	3.5E+03
Benzidine	500	b	1.66	b	1.63	d	0.43	3.88E-11	b				0.0013	l		
Benzo(a)anthracene	0.01	a	5.70	a	5.60	a	4012	3.35E-06	a	0.05	a	9.00E-06	0.81	l		
Benzo(b)fluoranthene	0.0015	a	6.20	a	6.09	a	12442	1.11E-04	a	0.02	a	5.56E-06	1.2	l		
Benzo(k)fluoranthene	0.0008	a	6.20	a	6.09	a	12442	8.29E-07	a	0.02	a	5.56E-06	1.1	m		
Benzo(a)pyrene	0.0016	a	6.11	a	6.01	a	10149	1.13E-06	a	0.04	a	9.00E-06	1.2	l		
Benzyl Chloride	525	b	2.30	b	1.70	c	0.50	4.15E-04	b	0.07	c	7.80E-06	0.014	l	1.5E+04	1.3E+04
Beryllium							790						0.0010	l		
Bis(2-chloroethyl)ether	1.7.E+04	a	1.21	a	1.19	a	0.15	1.80E-05	a	0.07	a	7.53E-06	0.0021	l	4.5E+04	4.1E+04
Bis(2-chloroisopropyl)ether	1310	b	2.58	b	1.79	c	0.61	1.13E-04	b	0.06	c	6.40E-06	0.010	m	3.1E+04	2.9E+04
Bis(chloromethyl)ether	3.8E+04	b	1.04	b	0.08	c	0.01	1.18E-04	c	0.09	c	9.40E-06	0.00038	m	1.0E+04	9.4E+03
Bis(2-ethylhexyl)phthalate	0.34	a	7.30	a	7.18	a	150031	1.02E-07	a	0.04	a	3.66E-06	0.033	m		
Bromacil	700	g	1.88	g	1.51	g	0.32	1.48E-10	g				0.001	m		
Bromodichloromethane	6740	a	2.10	a	1.74	a	0.55	1.60E-03	a	0.03	a	1.06E-05	0.0058	l	1.2E+04	1.1E+04
Bromoform	3100	a	2.35	a	1.94	a	0.87	5.35E-04	a	0.01	a	1.03E-05	0.0026	l		
Bromomethane	1.5.E+04	b	1.19	b	0.95	c	0.09	6.24E-03	b	0.07	c	1.20E-05	0.0035	l	2.3E+03	2.1E+03
1,3-Butadiene	735	b	1.99	b	2.08	c	1.20	7.36E-02	b	0.10	c	1.10E-05	0.023	l	1.6E+03	1.5E+03
Butylate	45	r			2.79	r	6.16	8.30E-05	r				0.0795	r		
n-Butylbenzene	14	b	4.01	b	3.45	c	28	1.30E-02	b	0.075	c	7.80E-06	0.204	m	1.7E+04	1.6E+04

APPENDIX B
CONTAMINANT-SPECIFIC PARAMETERS

Chemical Name	Solubility (mg/L)		Log Kow		Log Koc		Kd for inorganics or Koc * foc for organics	HLC		Diffusivity in Air		Diffusivity in Water	Kp		Volatilization Factor Residential	Volatilization Factor Industrial
sec-Butylbenzene	17	b	3.94	b	3.34	c	22	1.90E-02	b	0.075	c	7.80E-06	0.182	m	1.3E+04	1.2E+04
Butyl Benzyl Phthalate	2.7	a	4.84	a	4.76	a	573	1.26E-06	a	0.02	a	4.83E-06	0.073	m		
Cadmium							75						0.0010	l		
Captan	3.3	b	2.45	b	2.41	d	2.6	7.19E-06	b				0.0013	l		
Carbaryl (Sevin)	104	b	2.36	b	2.32	d	2.1	3.46E-09	b				0.0053	m		
Carbazole	7.5	a	3.59	a	3.53	a	34	1.53E-08	a	0.04	a	7.03E-06	0.080	m		
Carbofuran (Furadan)	320	b	1.61	b	1.58	d	0.38	9.20E-05	b				0.0038	m		
Carbon Disulfide	1190	a	2.00	a	1.66	a	0.46	3.03E-02	a	0.10	a	1.00E-05	0.024	l	1.6E+03	1.4E+03
Carbon Tetrachloride	793	a	2.73	a	2.24	a	1.74	3.04E-02	a	0.08	a	8.80E-06	0.022	l	2.9E+03	2.7E+03
Chlordane	0.06	a	6.32	a	5.08	a	1211	4.86E-05	a	0.01	a	4.37E-06	0.052	l		
Chlorobenzene	472	a	2.86	a	2.34	a	2.2	3.70E-03	a	0.07	a	8.70E-06	0.041	l	9.2E+03	8.4E+03
Chloroethane	6710	r			1.38	r	0.2	1.09E-02	r	0.27	r	1.15E-05	0.008	r	1.2E+03	1.1E+03
Chloroform	7920	a	1.92	a	1.60	a	0.40	3.67E-03	a	0.10	a	1.00E-05	0.0089	l	3.7E+03	3.4E+03
Chloromethane	5330	b	0.91	b	1.54	c	0.35	8.82E-03	b	0.11	c	6.50E-06	0.0042	l	7.3E+03	6.7E+03
2-Chloronaphthalene	11.7	r			3.02	q	16	3.12E-04	q	0.035	q	8.80E-06	0.13	r	1.2E+05	1.1E+05
Chlorpyrifos (Lorsban/Dursban)	1.12	b	5.26	b	5.17	d	1482	2.87E-05	f				0.046	m		
Chromium (trivalent)							2.E+06						0.0010	l		
Chromium (hexavalent)							19									
Chrysene	0.0016	a	5.70	a	5.60	a	4012	9.46E-05	a	0.02	a	6.21E-06	0.81	l		
Copper													0.0010	l		
Cumene	61.3	r			2.91	r	8.17	1.13E-02	r	0.07	r	7.10E-06	0.14	r	1.1E+04	9.8E+03
Cyanazine (Bladex)	171	b	2.20	b	2.16	d	1.5	1.00E-10	b				0.0024	m		
Cyanide (free)							9.9						0.0010	l		
Dacthal	0.5	r			2.45	r	2.8	2.14E-06	r				0.0197	r		
DDD	0.09	a	6.10	a	6.00	a	9922	4.00E-06	a	0.02	a	4.76E-06	0.28	l		
DDE	0.12	a	6.76	a	6.65	a	44194	2.10E-05	a	0.01	a	5.87E-06	0.24	l		
DDT	0.03	a	6.53	a	6.42	a	26259	8.10E-06	a	0.01	a	4.95E-06	0.43	l		
Diazinon	40	b	3.35	b	3.29	d	20						0.013	m		
Dibenzo(a,h)anthracene	0.0025	a	6.69	a	6.58	a	37718	1.47E-08	a	0.02	a	5.18E-06	2.7	l		
Dibenzofuran	10.0	b	4.20	b	4.13	d	135	1.26E-05	b	0.06	q	1.00E-05	0.173	m	7.8E+05	7.1E+05
1,4-Dibromobenzene	3.45		3.75		3.05	e	11	4.00E+02	j				0.034	m		
Dibromochloromethane	2600	b	2.17	b	1.80	e	0.63	7.83E-04	b				0.0035	m		
Dicamba	4500	b	2.40	b	2.36	d	2.29	7.90E-09	b				0.0043	m		
1,2-Dichlorobenzene	156	a	3.43	a	2.79	a	6.2	1.90E-03	a	0.07	a	7.90E-06	0.061	l	2.2E+04	2.0E+04
1,4-Dichlorobenzene	74.0	a	3.42	a	2.79	a	6.1	2.43E-03	a	0.07	a	7.90E-06	0.062	l	1.9E+04	1.8E+04

APPENDIX B
CONTAMINANT-SPECIFIC PARAMETERS

Chemical Name	Solubility (mg/L)		Log Kow		Log Koc		Kd for inorganics or Koc * foc for organics	HLC		Diffusivity in Air		Diffusivity in Water	Kp		Volatilization Factor Residential	Volatilization Factor Industrial
Dichlorodifluoromethane	280	b	2.16	b	1.76	c	0.58	3.43E-01	b	0.08	c	1.05E-05	0.012	l	1.1E+03	1.0E+03
1,1-Dichloroethane	5060	a	1.79	a	1.50	a	0.31	5.62E-03	a	0.07	a	1.05E-05	0.0089	l	3.3E+03	3.0E+03
1,2-Dichloroethane	8520	a	1.47	a	1.24	a	0.17	9.79E-04	a	0.10	a	9.90E-06	0.0053	l	5.2E+03	4.8E+03
1,1-Dichloroethene	2250	a	2.13	a	1.77	a	0.58	2.61E-02	a	0.09	a	1.04E-05	0.016	l	1.9E+03	1.8E+03
1,2-Dichloroethene (cis)	3500	a	1.86	a	1.55	a	0.36	4.08E-03	a	0.07	a	1.13E-05	0.010	m	4.0E+03	3.7E+03
1,2-Dichloroethene (trans)	6300	a	2.07	a	1.72	a	0.52	9.38E-03	a	0.07	a	1.19E-05	0.014	m	3.2E+03	2.9E+03
2,4-Dichlorophenol	4500	a	3.08	a	3.03	d	11	3.16E-06	a	0.03	a	8.77E-06	0.023	l		
2,4-Dichlorophenoxyacetic acid (2,4-D	677	b	2.70	b	2.65	d	4.5	1.02E-08	b				0.0084	m		
1,2-Dichloropropane	2800	a	1.97	a	1.64	a	0.43	2.80E-03	a	0.08	a	8.73E-06	0.010	l	5.0E+03	4.6E+03
1,3-Dichloropropene	2800	a	2.00	a	1.66	a	0.46	1.77E-02	a	0.06	a	1.00E-05	0.0055	l	2.5E+03	2.3E+03
Dichlorvos	1.0.E+04	b	1.43	b	1.41	d	0.25	1.54E-03	b				0.0010	l		
Dieldrin	0.20	a	5.37	a	4.33	a	214	1.51E-05	a	0.01	a	4.74E-06	0.016	l		
Diethyl Phthalate	1080	a	2.50	a	2.46	a	2.87	4.50E-07	a	0.03	a	6.35E-06	0.0048	l		
2,4-Dimethylphenol	7870	a	2.36	a	2.32	a	2.09	2.00E-06	a	0.06	a	8.69E-06	0.015	l		
Dimethylphthalate	4000	b	1.60	b	1.57	d	0.37	1.10E-07	b				0.0017	m		
Di-n-butyl Phthalate	11.2	a			4.53	a	339	9.38E-10	a				0.06	r		
2,4-Dinitrophenol	2790	a	1.55	a	1.52	d	0.33	4.43E-07	a	0.03	a	9.06E-06	0.0018	l		
2,4-Dinitrotoluene	270	a	2.01	a	1.98	a	0.95	9.26E-08	a	0.20	a	7.06E-06	0.0038	l		
2,6-Dinitrotoluene	180	a	1.87	a	1.84	a	0.69	7.47E-07	a	0.03	a	7.26E-06	0.0025	l		
Di-n-octyl Phthalate	0.02	a	8.06	a	7.92	a	8.4.E+05	6.68E-05	a	0.02	a	3.58E-06	4.168	m		
1,4-Dioxane	1.00E+06	b	-0.39	b	-0.23	e	0.01	4.80E-06	b				0.00036	l		
Diuron	42	g	2.80	g	2.68	g	4.77	5.03E-10	g				0.007	m		
Endosulfan	0.51	a	4.10	a	3.33	a	21	1.12E-05	a	0.01	a	4.55E-06	0.0033	m		
Endrin	0.25	a	5.06	a	4.09	a	122	7.52E-06	a	0.01	a	4.74E-06	0.016	l		
EPTC (Ethyl-dithiopropylcarbamate, s-	370	b	3.21	b	3.16	d	14	1.07E-04	b				0.025	m		
Ethylbenzene	169	a	3.14	a	2.56	a	3.7	7.88E-03	a	0.08	a	7.80E-06	0.074	l	8.0E+03	7.3E+03
Ethylene dibromide	4180	b	1.96	b	1.45	c	0.28	7.43E-04	b	0.07	c	8.06E-06	0.0034	l	8.4E+03	7.6E+03
Ethylene glycol	1.0E+06	b	-1.40	b	-1.38	d	0.00042	6.00E-08	b				8.08E-05	m		
Fluoranthene	0.21	a	5.12	a	5.03	a	1080	1.61E-05	a	0.03	a	6.35E-06	0.36	l		
Fluorene	2.0	a	4.21	a	4.14	a	138	6.36E-05	a	0.04	a	7.88E-06	0.36	m	7.6E+05	7.0E+05
Fonofos (Dyfonate)	13	g					19	6.48E-06	g				0.038	m		
Formaldehyde	5.50E+05	b	-0.05	b	-0.05	d	0.01	3.36E-07	b				0.0022	l		
Freon - 113	170	k			2.20	q	1.6	5.20E-01	q	0.029	q	8.10E-06	0.0240	m	2.0E+03	1.8E+03
Furan	1.0.E+04	b	1.34	b	1.08	c	0.12	5.40E-03	b	0.10	c	1.22E-05	0.0065	m	2.1E+03	2.0E+03
Glyphosate (Roundup)	1.3.E+04	g					21	1.38E-12	g				0.00018	m		

APPENDIX B
CONTAMINANT-SPECIFIC PARAMETERS

Chemical Name	Solubility (mg/L)		Log Kow		Log Koc		Kd for inorganics or Koc * foc for organics	HLC		Diffusivity in Air		Diffusivity in Water	Kp		Volatilization Factor Residential	Volatilization Factor Industrial
Heptachlor	0.18	a	6.26	a	6.15	a	14251	1.48E+00	b	0.01	a	5.69E-06	0.011	l	9.2E+04	
Heptachlor Epoxide	0.20	a	5.00	a	4.92	a	823	9.50E-06	a	0.01	a	4.23E-06 cm^2		m		
Hexachlorobenzene	6.2	a	5.89	a	4.74	a	553	1.32E-03	a	0.05	a	5.91E-06	0.21	l		
Hexachlorobutadiene	3.2	a	4.81	a	4.73	a	535	8.15E-03	a	0.06	a	6.16E-06	0.12	l		
Hexachlorocyclopentadiene	1.8	a	5.39	a	5.30	d	1989	2.66E-02	a				0.16	r		
Hexachloroethane	50	a	4.00	a	3.25	a	18	3.89E-03	a	0.00	a	6.80E-06	0.042	l		
n-Hexane	12	b	4.00	b	2.95	c	8.9	1.43E-02	b	0.20	c	7.77E-06	0.33	m	5.6E+03	5.1E+03
HMX	5	n	0.26	n	0.54	n	0.035	2.60E-15	n				0.000046	m		
Hydrazine	1.00E+06	b	-2.07	b	-2.03	d	0.00009	4.61E-04	l				0.000041	l		
Hydrazine sulfate													0.000041	l		
Indeno(1,2,3-cd)pyrene	0.000022	a	6.65	a	6.54	a	34453	1.60E-06	a	0.02	a	5.66E-06	1.9	l		
Kepone	7.6	b	5.30	b	5.21	d	1622	2.50E-08	b				0.0030	m		
Lead													0.0010	l		
Lindane	6.8	a	3.73	a	3.03	a	11	1.40E-05	a	0.01	a	7.34E-06	0.014	l		
Malathion	143	b	2.86	b	2.34	e	2.2	4.89E-09	b				0.0009	m		
Manganese													0.0010	l		
Mercury							52	1.14E-02	b	0.03	a	6.30E-06	0.0010	l		
Methoxychlor	0.05	a	5.08	a	4.99	a	986	1.58E-05	a	0.02	a	4.46E-06	0.043	m		
Methylene Chloride	13000	a	1.25	a	1.07	a	0.12	2.19E-03	a	0.10	a	1.17E-05	0.0045	l	3.2E+03	3.0E+03
Methyl Ethyl Ketone	2.23E+05	b	0.28	b	0.65	c	0.05	5.59E-05	b	0.09	c	9.80E-06	0.0011	l	1.7E+04	1.5E+04
Methyl Isobutyl Ketone	1.90E+04	b	1.19	b	2.11	c	1.3	1.38E-04	b	0.08	c	7.80E-06	0.0033	m	3.7E+04	3.3E+04
2-Methylnaphthalene	2.50E+01	b	3.90	b	3.83	d	68.23	5.09E-04	r	0.048	r	7.84E-06	0.1420	r	1.7E+05	1.5E+05
2-Methylphenol (o-Cresol)	3.10E+04	b	2.06	b	1.04	c	0.11	1.10E-06	b				0.0101	r		
3-Methylphenol (m-Cresol)	2.50E+04	b	2.06	b	1.54	c	0.35	1.50E-06	b				0.0103	r		
4-Methylphenol (p-Cresol)	2.15E+04	b	2.06	b	1.69	c	0.49	1.00E-06	b				0.00995	r		
Methyl Tertbutyl Ether	5.00E+04	n	1.24	n	1.04	n	0.11	5.85E-04	n	0.08	o		0.0026	m	6.7E+03	6.1E+03
Metolachlor (Dual)	488	g					0.70	2.41E-08	g				0.0059	m		
Metribuzin (Sencor)	1200	b	1.70	b			0.52	8.78E-02	b				0.0015	m		
Naphthalene	31	a	3.36	a	3.30	a	20	4.83E-04	a	0.06	a	7.50E-06	0.069	l	8.4E+04	7.6E+04
Nickel							65						0.0010	l		
Nitrobenzene	2090	a	1.84	a	1.81	a	0.64	2.40E-05	a	0.08	a	8.60E-06	0.0070	m	6.3E+04	5.8E+04
Nitrofurazone													0.00017	m		
Nitroguanidine	1950.00	p	1.62	p	2.77	k	5.9	2.71E-07	p				0.00011	p		
2-Nitropropane	2.E+04	b	0.87	b	0.86	d	0.07	1.23E-04	b	0.092	r	1.01E-05	0.0010	l	1.2E+04	1.1E+04
Oxamyl	3.E+05	g					0.09	3.85E-13	g				0.00019	m		

APPENDIX B
CONTAMINANT-SPECIFIC PARAMETERS

Chemical Name	Solubility (mg/L)		Log Kow		Log Koc		Kd for inorganics or Koc * foc for organics	HLC		Diffusivity in Air		Diffusivity in Water	Kp		Volatilization Factor Residential	Volatilization Factor Industrial
Paraquat	1.E+06	h					155	1.00E-09	k				0.0053			
Parathion (ethyl)	6.5	b	3.83	b	3.77	d	58	5.65E-07	b				0.017	l		
PCBs (Polychlorinated Biphenyl)	0.07	b	6.04	b	5.49	a	3090	2.60E-03	b				0.0050			
Pendimethalin (Prowl)	0.28	g					134	1.21E-05	g				0.000037	m		
Pentachlorophenol	1950	a	5.09	a	5.00	d	1009	2.44E-08	a	0.06	a	6.10E-06	0.65	l		
Perchlorate	245000	r					0	0.00E+00	a				0.001	l		
Permethrin (Ambush)	0.01	g					393	1.87E-06	g				45	m		
Phenol	8.E+04	a	1.48	a	1.46	a	0.29	3.97E-07	a	0.08	a	9.10E-06	0.0055	l		
Phenylphenol													0.027	m		
Phosphine	370	b		b									0.0012	m		
Picloram (Tordon)	430	r	1.36	r	1.155	e	0.14	5.20E-14	r				0.000592	r		
Profluralin	0.10	g					1000	2.88E-04	g				0.000015	m		
Prometon	750.00	r			2.19	r	1.57	3.10E-09	r				0.0107	r		
Propachlor (Ramros)	613	g					0.80	1.05E-07	g				0.0034	m		
Propazine (Miloguard)	3.0	g					1.6	1.28E-08	g				0.0091	m		
n-Propylbenzene	14.0	c	3.51	d	3.45	c	28	1.30E-02	c	0.075	c	7.80E-06	0.099	m	1.7E+04	1.6E+04
Pyrene	0.14	a	5.11	a	5.02	a	1055	1.10E-05	a	0.03	a	7.24E-06	0.33	m		
Pyridine	1.00E+06	b	0.67	b	0.66	d	0.05	8.88E-06	b	0.09	o		0.0018	m		
RDX	6.10E+01	n	0.87	n	1.80	n	0.63	1.20E-05	n				0.0018	m		
Selenium							5.0						0.0010	l		
Silver							8.3						0.0010	l		
Simazine (Princap)	6.2	g					1.4	9.67E-10	g				0.0040	m		
Styrene	310	a	2.94	a	2.89	a	7.8	2.75E-03	a	0.07	a	8.00E-06	0.055	l	2.0E+04	1.8E+04
Tert-butyl alcohol	235000	t	0.35	s	1.57	s	0.4	1.15E-05	s	0.085	t	9.11E-06	0.00119	m	6.9E+04	6.3E+04
2,4,5-Trichlorophenoxyacetic acid	268	b	3.31	b	3.25	d	18	8.68E-09	b				0.0088	m		
2,3,7,8-TCDD (Dioxin)	7.9E-06	b	6.53	b	6.42	d	26259	7.92E-05	b				1.4	l		
Terbacil (Sinbar)	710	g					0.63	1.88E-10	g				0.0020	m		
Terbufos (Counter)	4.5	g					6.5	2.67E-05	g				0.050	m		
1,1,1,2-Tetrachloroethane	1100	b	2.63	b	2.16	e	1.45	2.42E-03	b	0.07	c	7.90E-06	0.028	m	9.5E+03	8.7E+03
1,1,2,2-Tetrachloroethane	2970	a	2.39	a	1.97	a	0.94	3.45E-04	a	0.07	a	7.90E-06	0.0090	l	2.0E+04	1.9E+04
Tetrachloroethene (PCE)	200	a	2.67	a	2.19	a	1.56	1.84E-02	a	0.07	a	8.20E-06	0.048	l	3.7E+03	3.3E+03
2,3,4,6-Tetrachlorophenol	100	b	4.44	b	4.36	d	232	4.39E-06	b				0.11	m		
Tetryl	80	p	1.65	p	1.69	p	0.49	2.69E-11	p				0.0005	p		
Toluene	526	a	2.75	a	2.26	a	1.80	6.64E-03	a	0.09	a	8.60E-06	0.045	l	5.8E+03	5.3E+03
TPH GRO	12	b	4.00	b	2.95	c	8.90	1.43E-02	b	0.20	c	7.77E-06	0.330	m	5.6E+03	5.1E+03

APPENDIX B
CONTAMINANT-SPECIFIC PARAMETERS

Chemical Name	Solubility (mg/L)		Log Kow		Log Koc		Kd for inorganics or Koc * foc for organics	HLC		Diffusivity in Air		Diffusivity in Water	Kp		Volatilization Factor Residential	Volatilization Factor Industrial
TPH DRO	0.14	a	5.11	a	5.02	a	1055	1.10E-05	a	0.03	a	7.24E-06	0.330	m		
Toxaphene	0.74	a	5.50	a	5.41	a	2551	6.00E-06	a	0.01	a	4.34E-06	0.015	l		
2,4,5-TP (Silvex)	140	b	3.80	b	3.74	d	54	7.83E-11	b				0.011	l		
1,2,4-Trichlorobenzene	300	a	4.01	a	3.25	a	18	1.42E-03	a	0.03	a	8.23E-06	0.10	l	6.5E+04	5.9E+04
1,1,1-Trichloroethane	1330	a	2.48	a	2.04	a	1.10	1.72E-02	a	0.08	a	8.80E-06	0.017	l	3.1E+03	2.9E+03
1,1,2-Trichloroethane	4420	a	2.05	a	1.70	a	0.50	9.13E-04	a	0.08	a	8.80E-06	0.0084	l	9.2E+03	8.4E+03
Trichloroethene (TCE)	1100	a	2.71	a	2.22	a	1.68	1.03E-02	a	0.08	a	9.10E-06	0.016	l	4.7E+03	4.3E+03
2,4,5-Trichlorophenol	1200	a	3.90	a	3.83	d	68	4.33E-06	a	0.03	a	7.03E-06	0.052	m		
2,4,6-Trichlorophenol	800	a	3.70	a	3.64	d	43	7.79E-06	a	0.03	a	6.25E-06	0.050	l		
1,2,3-Trichloropropane	1750	b	2.25	b	1.86	e	0.72	4.09E-04	b	0.07	c	7.90E-06	0.010	m	1.7E+04	1.5E+04
Trifluralin (Treflan)	8.1	b	5.32	b	5.23	d	1698	2.64E-05	b				0.11	m		
1,2,4-Trimethylbenzene	57	r			2.86	r	7.18	6.05E-03	r	0.0644	r	7.92E-06	0.133	r	1.39E+04	1.26E+04
1,3,5-Trimethylbenzene	48.2	r			2.85	r	7.03	8.62E-03	r	0.0602	r	8.67E-06	0.094	r	1.19E+04	1.09E+04
2,4,6-Trinitrotoluene	120	n	1.60	n	0.20	n	0.016	4.90E-09	n				0.0011	m		
Vanadium							1000						0.0010	l		
Vinyl Chloride	2760	a	1.50	a	1.27	a	0.18	2.70E-02	a	0.11	a	1.23E-06	0.0073	l	1.3E+03	1.2E+03
Xylene (mixed)	175	c	3.17	c	2.59	e	3.9	5.71E-03	c	0.08	c	8.40E-06	0.080	l	9.4E+03	8.6E+03
Zinc							62						0.0010	l		

Notes:

Solubility: the ability or tendency of one substance to blend uniformly with another

Kow: octanol-water partition coefficient

Koc: organic carbon normalized soil-water partition coefficient for organic compounds

Kd: soil-water partition coefficient for inorganic constituents

HLC: Henry's Law constant (atm-m^3/mol)

Kp: skin permeability coefficient (cm/hr)

Spreadsheet values with modifications since the printing of the 03 RSK Manual are denoted by the shaded cells.

Information Source Key

a=EPA's Soil Screening Guidance (May 1996)

b = Superfund Chemical Data Matrix http://www.epa.gov/superfund/oerr/products/scdm/scdm.htm

c= from EPA Region IX PRG list, 1996

d = calculated using nonionizing organic compound equation #70 from EPA's Soil Screening Guidance (May 1996)

e = calculated using equation for VOCs, chlorinated benzenes, and certain chlorinated pesticides [equation #71 from EPA's Soil Screening Guidance (May 1996)]

f = Table A-1 Water Solubility, Vapor Pressure, Henry's Law Constant, Koc, and Kow Data for Selected Chemicals, Source: KDHE
http://www3.bae.ncsu.edu/info1/courses/bae573/models/gleams/www-docs/tabp2.txt

g = ARS Pesticide Properties http://www.arsusda.gov/rsml/ppdb3

h = Table P-2 Characteristics of Pesticides sorted by Common Name

i = calculated using equation #68 from EPA's Soil Screening Guidance: Technical Background Document (May 1996): HLC = (VP)(M)/(S)

j = Schwarzenbch et al., 1993 Properties of Some Organic Compounds http://www.uc.edu/www/geology/org-cont/refer/propert.html

k = HSDB *Hazardous Substance Data Bank*. Online search for specified chemicals. 1994

l = USEPA, Dermal Exposure Assessment Principles & Applications, EPA/600/8-9/011B, January 1992

m = Calculated Kp using equation from EPA's Dermal Exposure Assessment 1/92: log Kp=-2.72+0.71log kow - 0.0061 MW

n = Agency for Toxic Substances and Disease Registry

o = EPA March93 451/R-93/001. Air/Superfund National Technical Guidance Study Series, Model for Estimating Air Emission Rates from Superfund Remedial Action

p = U.S. Army Biomedical Research & Development Laboraty; Technical Report 8901

q = EPA Region 9 PRG Tables

r = Risk Assessment Information System (RAIS) website, sponsored by U.S. Dept. of Energy, www.rais.ornl.gov

s = *Interagency Assessment of Oxygenated Fuels*, National Science and Technology Council (NSTC), 1997

t = Texas Commisson on Environment Quality, TRRP website, April 2007

u = United States National Library of Medicine, Toxnet website, www.toxnet.nlm.nih.gov, March 2003

APPENDIX C
CONTAMINANT TOXICITY DATA

Chemical Name	SFo (kg-day/mg)		SFi (kg-day/mg)		SFd (kg-day/mg)		RfDo (mg/kg-day)		RfDi (mg/kg-day)		RfDd (mg/kg-day)	
Acenaphthene							6.00E-02	i	6.00E-02	r	6.00E-02	r
Acetochlor							2.00E-02	i3	2.00E-02	r	2.00E-02	r
Acetone							1.00E-01	i	1.00E-01	r	1.00E-01	r
Acetophenone							1.00E-01	i	5.71E-06	i	1.00E-01	r
Acrolein							5.00E-04	i3	5.71E-06	i3	5.00E-04	i3
Acrylamide	4.55E+00	i	4.55E+00	c	4.55E+00	r	2.00E-04	i	2.00E-04	r	2.00E-04	r
Acrylonitrile	5.40E-01	i	2.38E-01	c	5.40E-01	r	1.00E-03	h	5.71E-04	c	1.00E-03	r
Alachlor (Lasso)	8.05E-02	h	8.00E-02	r	8.05E-02	r	1.00E-02	i	1.00E-02	r	1.00E-02	r
Aldicarb (Temik)							1.00E-03	i	1.00E-03	r	1.00E-03	r
Aldrin	1.70E+01	i	1.72E+01	r	1.70E+01	r	3.00E-05	i	3.00E-05	r	3.00E-05	r
Anthracene							3.00E-01	i	3.00E-01	r	3.00E-01	r
Antimony and compounds							4.00E-04	i				
Arsenic	1.50E+00	i	1.51E+01	c	1.50E+00	r	3.00E-04	i				
Atrazine	2.22E-01	h	2.22E-01	r	2.22E-01	r	3.50E-02	h	3.50E-02	r	3.50E-02	r
Barium							7.00E-02	i	1.43E-04	h		
Bentazon							3.00E-02	i3	3.00E-02	r	3.00E-02	r
Benzene	2.90E-02	i	2.90E-02	c	2.90E-02	r	3.00E-03	n	1.71E-03	n	3.00E-03	r
Benzidine	2.30E+02	i	2.30E+02	r	2.30E+02	r	3.00E-03	i	3.00E-03	r	3.00E-03	r
Benzo(a)anthracene	7.30E-01	n	3.10E-01	n	7.30E-01	r						
Benzo(b)fluoranthene	7.30E-01	n	3.10E-01	n	7.30E-01	r						
Benzo(k)fluoranthene	7.30E-02	n	3.10E-02	n	7.30E-02	r						
Benzo(a)pyrene	7.30E+00	n	3.10E+00	n	7.30E+00	r						
Benzyl Chloride	1.70E-01	i	1.70E-01	r	1.70E-01	r						
Beryllium			8.40E+00	c			2.00E-03	i	5.71E-06	i	2.00E-03	r
Bis(2-chloroethyl)ether	1.10E+00	i	1.16E+00	c	1.10E+00	r						
Bis(2-chloroisopropyl)ether	7.00E-02	h	3.50E-02	c	7.00E-02	r	4.00E-02	i	4.00E-02	r	4.00E-02	r
Bis(chloromethyl)ether	2.20E+02	i	2.17E+02	c	2.20E+02	r						
Bis(2-ethylhexyl)phthalate	1.40E-02	i	1.40E-02	r	1.40E-02	r	2.00E-02	i	2.00E-02	r	2.00E-02	r
Bromacil							1.00E-01	e	1.00E-01	r	1.00E-01	r
Bromodichloromethane	6.20E-02	i	6.20E-02	r	6.20E-02	r	2.00E-02	i	2.00E-02	r	2.00E-02	r
Bromoform	7.90E-03	i	3.85E-03	c	7.90E-03	r	2.00E-02	i	2.00E-02	r	2.00E-02	r
Bromomethane							1.40E-03	i	1.43E-03	c	1.40E-03	r
1,3-Butadiene	9.80E-01	r	9.80E-01	c	9.80E-01	r						
Butylate							5.00E-02	i3	5.00E-02	r	5.00E-02	r
n-Butylbenzene							1.00E-02	n	1.00E-02	n	1.00E-02	n

APPENDIX C
CONTAMINANT TOXICITY DATA

Chemical Name	SFo (kg-day/mg)	SFi (kg-day/mg)	SFd (kg-day/mg)	RfDo (mg/kg-day)	RfDi (mg/kg-day)	RfDd (mg/kg-day)
sec-Butylbenzene				1.00E-02 n	1.00E-02 n	1.00E-02 n
Butyl Benzyl Phthalate				2.00E-01 i	2.00E-01 r	2.00E-01 r
Cadmium		6.30E+00 c		5.00E-04 i		
Captan	3.50E-03 h	3.50E-03 r	3.50E-03 r	1.30E-01 i	1.30E-01 r	1.30E-01 r
Carbaryl (Sevin)				1.00E-01 i	1.00E-01 r	1.00E-01 r
Carbazole	2.00E-02 h	2.00E-02 r	2.00E-02 r			
Carbofuran (Furadan)				5.00E-03 i	5.00E-03 r	5.00E-03 r
Carbon Disulfide				1.00E-01 i	2.00E-01 i	1.00E-01 r
Carbon Tetrachloride	1.30E-01 i	5.25E-02 c	1.30E-01 r	7.00E-04 i	5.71E-04 n	7.00E-04 r
Chlordane	3.50E-01 i	3.50E-01 c	3.50E-01 r	5.00E-04 i	5.00E-04 r	5.00E-04 r
Chlorobenzene				2.00E-02 i	5.71E-03 h	2.00E-02 r
Chloroethane	2.90E-03 n	2.90E-03 r	2.90E-03 r	4.00E-01 n	2.86E+00 i3	4.00E-01 r
Chloroform	6.10E-03 i	8.05E-02 c	6.10E-03 r	1.00E-02 i	1.00E-02 r	1.00E-02 r
Chloromethane	1.30E-02 h	6.30E-03 c	1.30E-02 r			
2-Chloronaphthalene				8.00E-02 i3	8.00E-02 r	8.00E-02 r
Chlorpyrifos (Lorsban/Dursban)				3.00E-03 i	3.00E-03 r	3.00E-03 r
Chromium (trivalent)				1.00E+00 i		
Chromium (hexavalent)		4.20E+01 c		5.00E-03 i		
Chrysene	7.30E-03 n	3.10E-03 n	7.30E-03 r			
Copper				3.71E-02 h		
Cumene				1.00E-01 i3	1.00E-01 r	1.00E-01 r
Cyanazine (Bladex)	8.40E-01 h	8.40E-01 r	8.40E-01 r	2.00E-03 h	2.00E-03 r	2.00E-03 r
Cyanide (free)				2.00E-02 i		
Dacthal				1.00E-02 i	1.00E-02 r	1.00E-02 r
DDD	2.40E-01 i	2.40E-01 r	2.40E-01 r			
DDE	3.40E-01 i	3.40E-01 r	3.40E-01 r			
DDT	3.40E-01 i	3.40E-01 c	3.40E-01 r	5.00E-04 i	5.00E-04 r	5.00E-04 r
Diazinon				9.00E-04 h	9.00E-04 r	9.00E-04 r
Dibenzo(a,h)anthracene	7.30E+00 n	3.10E+00 n	7.30E+00 r			
Dibenzofuran				4.00E-03 n	4.00E-03 n	4.00E-03 n
1,4-Dibromobenzene				1.00E-02 i	1.00E-02 r	1.00E-02 r
Dibromochloromethane	8.40E-02 i	8.40E-02 r	8.40E-02 r	2.00E-02 i	2.00E-02 r	2.00E-02 r
Dicamba				3.00E-02 i3	3.00E-02 r	3.00E-02 r
1,2-Dichlorobenzene				9.00E-02 i	5.71E-02 c	9.00E-02 r
1,4-Dichlorobenzene	2.40E-02 h	2.40E-02 r	2.40E-02 r	2.00E-01 n	2.29E-01 c	2.29E-01 r

APPENDIX C
CONTAMINANT TOXICITY DATA

Chemical Name	SFo (kg-day/mg)		SFi (kg-day/mg)		SFd (kg-day/mg)		RfDo (mg/kg-day)		RfDi (mg/kg-day)		RfDd (mg/kg-day)	
Dichlorodifluoromethane							2.00E-01	i	5.71E-02	h	2.00E-01	r
1,1-Dichloroethane							1.00E-01	h	1.43E-01	c	1.00E-01	r
1,2-Dichloroethane	9.10E-02	i	9.10E-02	c	9.10E-02	r						
1,1-Dichloroethene	6.00E-01	i	1.75E-01	l	6.00E-01	r	9.00E-03	i	9.00E-03	r	9.00E-03	r
1,2-Dichloroethene (cis)							1.00E-02	h	1.00E-02	r	1.00E-02	r
1,2-Dichloroethene (trans)							2.00E-02	i	2.00E-02	r	2.00E-02	r
2,4-Dichlorophenol							3.00E-03	i	3.00E-03	r	3.00E-03	r
2,4-Dichlorophenoxyacetic acid (2,4-D)							1.00E-02	i	1.00E-02	r	1.00E-02	r
1,2-Dichloropropane	6.80E-02	h	6.80E-02	r	6.80E-02	r	1.10E-03	r	1.10E-03	i	1.10E-03	r
1,3-Dichloropropene	1.80E-01	h	1.30E-01	c	1.80E-01	r	3.00E-04	i	5.71E-03	c	3.00E-04	r
Dichlorvos	2.90E-01	i	2.90E-01	r	2.90E-01	r	5.00E-04	i	1.43E-04	c	5.00E-04	r
Dieldrin	1.60E+01	i	1.61E+01	c	1.60E+01	r	5.00E-05	i	5.00E-05	r	5.00E-05	r
Diethyl Phthalate							8.00E-01	i	8.00E-01	r	8.00E-01	r
2,4-Dimethylphenol							2.00E-02	i	2.00E-02	r	2.00E-02	r
Dimethylphthalate							1.00E+01	e	1.00E+01	r	1.00E+01	r
Di-n-butyl Phthalate							1.00E-01	i3	1.00E-01	r	1.00E-01	r
2,4-Dinitrophenol							2.00E-03	i	2.00E-03	r	2.00E-03	r
2,4-Dinitrotoluene	6.80E-01	i	6.80E-01	r	6.80E-01	r	2.00E-03	i	2.00E-03	r	2.00E-03	r
2,6-Dinitrotoluene	6.80E-01	i	6.80E-01	r	6.80E-01	r	1.00E-03	h	1.00E-03	r	1.00E-03	r
Di-n-octyl Phthalate							2.00E-02	h	2.00E-02	r	2.00E-02	r
1,4-Dioxane	1.10E-02	i	1.10E-02	r	1.10E-02	r						
Diuron							2.00E-03	i2	2.00E-03	r	2.00E-03	r
Endosulfan							6.00E-03	i	6.00E-03	r	6.00E-03	r
Endrin							3.00E-04	i	3.00E-04	r	3.00E-04	r
EPTC (Ethyl-dithiopropylcarbamate, s-)							2.50E-02	i	2.50E-02	r	2.50E-02	r
Ethylbenzene							1.00E-01	l	2.90E-01	c	1.00E-01	r
Ethylene dibromide	8.50E+01	i	7.70E-01	c	8.50E+01	r	5.70E-05	r	5.70E-05	h	5.70E-05	r
Ethylene glycol							2.00E+00	i3	2.00E+00	r	2.00E+00	r
Fluoranthene							4.00E-02	i	4.00E-02	r	4.00E-02	r
Fluorene							4.00E-02	i	4.00E-02	r	4.00E-02	r
Fonofos (Dyfonate)							2.00E-03	i	2.00E-03	r	2.00E-03	r
Formaldehyde			4.55E-02	c			1.50E-01	i			1.50E-01	r
Freon - 113							3.00E+01	i3	8.60E+00	h	3.00E+01	r
Furan							1.00E-03	i	1.00E-03	r	1.00E-03	r
Glyphosate (Roundup)							1.00E-01	i	1.00E-01	r	1.00E-01	r

APPENDIX C
CONTAMINANT TOXICITY DATA

Chemical Name	SFo (kg-day/mg)	SFi (kg-day/mg)	SFd (kg-day/mg)	RfDo (mg/kg-day)	RfDi (mg/kg-day)	RfDd (mg/kg-day)
Heptachlor	4.50E+00 i	4.55E+00 c	4.50E+00 r	5.00E-04 i	5.00E-04 r	5.00E-04 r
Heptachlor Epoxide	9.10E+00 i	9.10E+00 c	9.10E+00 r	1.30E-05 i	1.30E-05 r	1.30E-05 r
Hexachlorobenzene	1.60E+00 i	1.61E+00 c	1.60E+00 r	8.00E-04 i	8.00E-04 r	8.00E-04 r
Hexachlorobutadiene	7.80E-02 i	7.70E-02 c	7.80E-02 r	2.00E-04 h	2.00E-04 r	2.00E-04 r
Hexachlorocyclopentadiene				6.00E-03 i3	5.75E-05 i3	6.00E-03 i3
Hexachloroethane	1.40E-02 i	1.40E-02 c	1.40E-02 r	1.00E-03 i	1.00E-03 r	1.00E-03 r
n-Hexane				6.00E-02 h	5.71E-02 c	6.00E-02 r
HMX				5.00E-02 i	5.00E-02 i	5.00E-02 r
Hydrazine	3.00E+00 i	1.72E+01 c	3.00E+00 r			
Hydrazine sulfate	3.00E+00 i	1.72E+01 c	3.00E+00 r			
Indeno(1,2,3-cd)pyrene	7.30E-01 n	3.10E-01 n	7.30E-01 r			
Kepone	1.80E+01 n	1.80E+01 r	1.80E+01 r			
Lead						
Lindane	1.30E+00 h	1.30E+00 r	1.30E+00 r	3.00E-04 I	3.00E-04 r	3.00E-04 r
Malathion				2.00E-02 i	2.00E-02 r	2.00E-02 r
Manganese				4.67E-02 i	1.40E-05 c	4.67E-02 r
Mercury				3.00E-04 h	8.57E-05 c	3.00E-04 r
Methoxychlor				5.00E-03 i	5.00E-03 r	5.00E-03 r
Methylene Chloride	7.50E-03 i	1.65E-03 c	7.50E-03 r	6.00E-02 i	8.57E-01 c	6.00E-02 r
Methyl Ethyl Ketone				6.00E-01 i	2.86E-01 c	6.00E-01 r
Methyl Isobutyl Ketone				8.00E-02 h	2.29E-02 c	8.00E-02 r
2-Methylnaphthalene				4.00E-03 i3	4.00E-03 r	4.00E-03 r
2-Methylphenol				5.00E-02 i	5.00E-02 r	5.00E-02 r
3-Methylphenol				5.00E-02 i	5.00E-02 r	5.00E-02 r
4-Methylphenol				5.00E-03 h	5.00E-03 r	5.00E-03 r
Methyl Tertbutyl Ether				5.00E-02 n	8.57E-01 c	5.00E-02 r
Metolachlor (Dual)				1.50E-01 i	1.50E-01 r	1.50E-01 r
Metribuzin (Sencor)				2.50E-02 i	2.50E-02 r	2.50E-02 r
Naphthalene				2.00E-02 i	8.57E-04 i	2.00E-02 r
Nickel				2.00E-02 i		
Nitrobenzene				5.00E-04 i	5.71E-04 c	5.00E-04 r
Nitrofurazone	1.50E+00 h	9.40E+00 h	1.50E+00 r			
Nitroguanidine				1.00E-01 i	1.00E-01 r	1.00E-01 r
2-Nitropropane				5.71E-03 r	5.71E-03 i3	5.71E-03 r
Oxamyl				2.50E-02 i	2.50E-02 r	2.50E-02 r

APPENDIX C
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Chemical Name	SFo (kg-day/mg)		SFi (kg-day/mg)		SFd (kg-day/mg)		RfDo (mg/kg-day)		RfDi (mg/kg-day)		RfDd (mg/kg-day)	
Paraquat							4.50E-03	i	4.50E-03	r	4.50E-03	r
Parathion							6.00E-03	h	6.00E-03	r	6.00E-03	r
PCBs (Polychlorinated Biphenyl)	2.00E+00	i	2.00E+00	r	2.00E+00	r						
Pendimethalin (Prowl)							4.00E-02	i	4.00E-02	r	4.00E-02	r
Pentachlorophenol	1.20E-01	i	1.20E-01	r	1.20E-01	r	3.00E-02	i	3.00E-02	r	3.00E-02	r
Perchlorate							7.00E-04	i3	7.00E-04	r	7.00E-04	r
Permethrin (Ambush)							5.00E-02	i	5.00E-02	r	5.00E-02	r
Phenol							6.00E-01	l	6.00E-01	r	6.00E-01	r
Phenylphenol	1.94E-03	h	1.90E-03	r	1.94E-03	r						
Phosphine							3.00E-04	i	8.57E-05	c	3.00E-04	r
Picloram							7.00E-02	i3	7.00E-02	r	7.00E-02	r
Profluralin							6.00E-03	h	6.00E-03	r	6.00E-03	r
Prometon							1.50E-02	i3	1.50E-02	r	1.50E-02	r
Propachlor (Ramros)							1.30E-02	i	1.30E-02	r	1.30E-02	r
Propazine (Miloguard)							2.00E-02	i	2.00E-02	r	2.00E-02	r
n-Propylbenzene							1.00E-02	n	1.00E-02	n	1.00E-02	n
Pyrene							3.00E-02	i	3.00E-02	r	3.00E-02	r
Pyridine							1.00E-03	i	1.00E-03	r	1.00E-03	r
RDX	1.10E-01	i	1.10E-01	i	1.10E-01	r	3.00E-03	i	3.00E-03	i	3.00E-03	r
Selenium							5.00E-03	i				
Silver							5.00E-03	i				
Simazine (Princap)	1.20E-01	h	1.20E-01	r	1.20E-01	r	5.00E-03	i	5.00E-03	r	5.00E-03	r
Styrene							2.00E-01	i	2.90E-01	c	2.00E-01	r
Tert-butyl Alcohol (TBA)	3.30E-03	o	3.30E-03	r	3.30E-03	r						
2,4,5-T as Acid							1.00E-02	i	1.00E-02	r	1.00E-02	r
2,3,7,8-TCDD (Dioxin)	1.50E+05	h	1.50E+05	h	1.50E+05	r						
Terbacil (Sinbar)							1.30E-02	i	1.30E-02	r	1.30E-02	r
Terbufos (Counter)							2.50E-05	h	2.50E-05	r	2.50E-05	r
1,1,1,2-Tetrachloroethane	2.60E-02	i	2.59E-02	c	2.60E-02	r	3.00E-02	i	3.00E-02	r	3.00E-02	r
1,1,2,2-Tetrachloroethane	2.00E-01	i	2.03E-01	c	2.00E-01	r						
Tetrachloroethene (PCE)	5.20E-02	n	2.03E-03	n	5.20E-02	r	1.00E-02	i	1.14E-01	n	1.00E-02	r
2,3,4,6-Tetrachlorophenol							3.00E-02	i	3.00E-02	r	3.00E-02	r
Tetryl							1.00E-02	h	1.00E-02	r	1.00E-02	r
Toluene							2.00E-01	i	1.10E-01	c	2.00E-01	r
TPH GRO							6.00E-02	h	5.71E-02	c	6.00E-02	r

APPENDIX C
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Chemical Name	SFo (kg-day/mg)		SFi (kg-day/mg)		SFd (kg-day/mg)		RfDo (mg/kg-day)		RfDi (mg/kg-day)		RfDd (mg/kg-day)	
TPH DRO							3.00E-02	i	3.00E-02	r	3.00E-02	r
Toxaphene	1.10E+00	i	1.12E+00	c	1.10E+00	r						
2,4,5-TP (Silvex)							8.00E-03	i	8.00E-03	r	8.00E-03	r
1,2,4-Trichlorobenzene							1.00E-02	i	5.70E-02	c	1.00E-02	r
1,1,1-Trichloroethane							3.50E-02	n	2.86E-01	n	3.50E-02	r
1,1,2-Trichloroethane	5.70E-02	i	5.60E-02	c	5.70E-02	r	4.00E-03	i	4.00E-03	r	4.00E-03	r
Trichloroethene (TCE)	1.10E-02	n	6.00E-03	n	1.10E-02	r						
2,4,5-Trichlorophenol							1.00E-01	i	1.00E-01	r	1.00E-01	r
2,4,6-Trichlorophenol	1.10E-02	i	1.09E-02	c	1.10E-02	r						
1,2,3-Trichloropropane	7.00E+00	h	7.00E+00	r	7.00E+00	r	6.00E-03	i	6.00E-03	r	6.00E-03	r
Triflualine (Treflan)	7.70E-03	i	7.70E-03	r	7.70E-03	r	7.50E-03	i	7.50E-03	r	7.50E-03	r
1,2,4-Trimethylbenzene							5.00E-02	i	1.70E-03	i	5.00E-02	r
1,3,5-Trimethylbenzene							5.00E-02	i	1.70E-03	i	5.00E-02	r
2,4,6-Trinitrotoluene	3.00E-02	i	3.00E-02	i	3.00E-02	r	5.00E-04	i	5.00E-04	i	5.00E-04	r
Vanadium							7.00E-03	h				
Vinyl Chloride	1.90E+00	h	3.00E-01	c	1.90E+00	r						
Xylene (mixed)							2.00E+00	i	2.00E+00	r	2.00E+00	r
Zinc							3.00E-01	i				

Notes

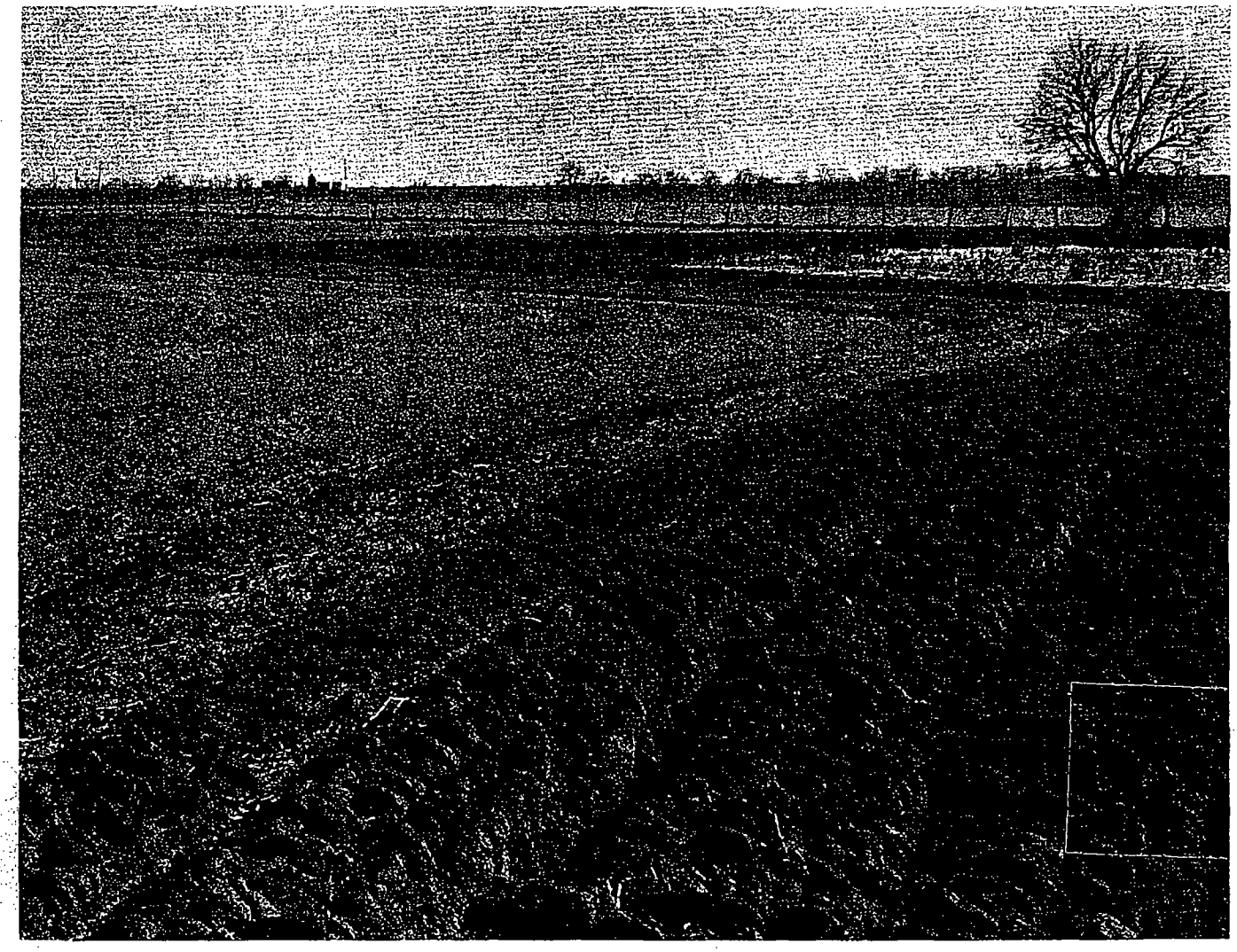
Spreadsheet values with modifications since the printing of the 03 RSK Manual are denoted by the shaded cells.

SFo = oral slope factor — RfDo = oral reference dose
SFi = inhalation slope factor — RfDi = inhalation reference dose
SFd = dermal slope factor — RfDd = dermal reference dose

i = Integrated Risk Information System (IRIS), EPA, 1997
i2 = Integrated Risk Information System (IRIS), EPA, 2002
i3 = Integrated Risk Information System (IRIS), EPA, 2003-2007
h = Health Effects Assessment Summary Tables (HEAST), EPA, 1997
n = National Center for Environmental Assessment (NCEA, formerly ECAO)
r = Route to Route Extrapolation
c = Calculated from Inhalation RfC or Unit Risk
e = other EPA resources as approved by KDHE
o = California Office of Environmental Health Hazard Assessment, 1999

SOIL SURVEY OF

Allen County, Kansas



OFFICIAL OFFICE OF
CONGRESSMAN BOB WHITTAKER
5TH DISTRICT OF KANSAS

United States Department of Agriculture
Soil Conservation Service
in cooperation with
Kansas Agricultural Experiment Station

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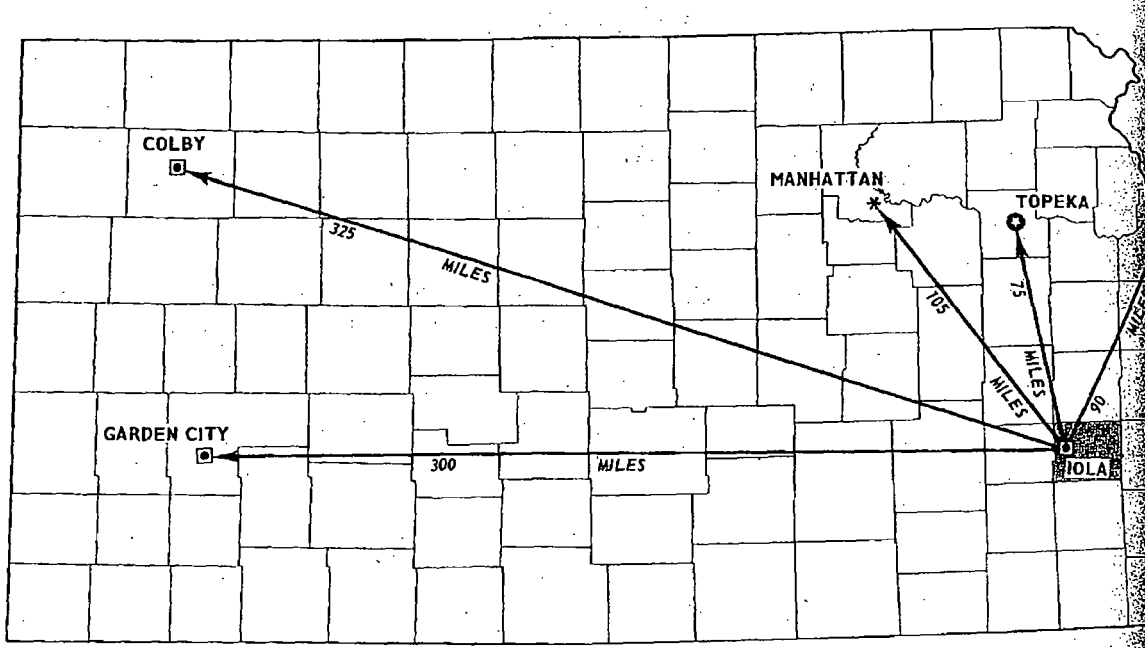


* State Agricultural Experiment Station

Location of Allen County in Kansas.

SOIL SURVEY OF ALLEN COUNTY, KANSAS

By Edward L. Fleming, Jim R. Fortner, and Deane W. Swanson,
Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service,
in cooperation with Kansas Agricultural Experiment Station

ALLEN COUNTY is in the southeastern part of Kansas (see facing page). It has a total area of 505 square miles, or about 323,136 acres. Iola, which is in the west-central part of the county, is the county seat. The population of the county is 15,343 (*5*).

The boundaries of Allen County were designated by the Territorial Legislature of 1855, and the organization was completed in 1856. The county was named in honor of William Allen, ex-Governor of Ohio. The town of Iola was organized on January 1, 1859.

Farming and related services are the most important enterprises in Allen County. According to the 1969 Census of Agriculture, the average farm is about 276 acres. About 55 percent of the acreage is cropland, 35 percent pasture and range, 5 percent woodland, and 5 percent other areas, such as urban areas and water areas. Grain sorghum, soybeans, wheat, and alfalfa are the main crops. Beef cattle is the chief kind of livestock. There are several dairy herds and a few hog farms.

General nature of the county

This section gives general information concerning the county. It discusses physiography, drainage, and relief; water supply; natural resources; climate; and farming.

Physiography, drainage, and relief

Allen County lies within the Osage Plains section of the Central Lowland physiographic province and the Cherokee Prairies land resource area. The land surface is dominantly nearly level to gently rolling and has few outstanding differences in relief (fig. 1). The surface is dissected by a number of stream valleys.

The Neosho River flows from north to south through the western part of the county in a shallow valley. The river and its tributaries drain all of the county but the eastern one-quarter, which is drained by the Little Osage and Marmaton Rivers and their tributaries. The Little Osage and Marmaton Rivers flow in a generally easterly direction into Bourbon County. In Allen County the Neosho River has an average gradient of about 1.5 feet per mile.

Elevation in most areas ranges from about 950 to 1,100 feet above sea level. It is about 950 feet at Iola, 1,110 feet at Moran in the eastern part of the county, 960 feet at Humboldt in the southwestern part, 1,010 feet at Geneva in the northwestern part, and 1,058 feet at Savonburg in the southeastern part.

Water supply

The water supply in most of Allen County varies. A dependable supply of ground water is not available in many parts of the county. In most of the county, adequate drilled wells on uplands are difficult to obtain. Most successful wells are drilled in the shallow alluvial deposits along small drainageways. Yields from wells range from 1 gallon to 5 gallons per minute.

The water supply is generally adequate in the valley of the Neosho River and the lower reaches of the larger stream valleys. Wells that yield 10 to 100 gallons per minute can be developed successfully in these areas. Smaller streams and ground water discharged by seeps and springs are sources of water, but the streams and the seeps and springs can dry up during prolonged periods of low rainfall.

The principal source of water for livestock is surface water impounded by dams on intermittent streams. In 1974, there were about 2,822 farm ponds that had an approximate storage capacity of 25,000 acre-feet of water.

Rural water districts supply water to farmers in most areas of the county.

Natural resources

Soil is the most important natural resource in the county. Crops produced on farms and livestock that graze the grassland are marketable products affected by the soil.

Other mineral resources are oil and gas, limestone, sand and gravel, and shale. The limestone is quarried for cement, road material, riprap, subgrade, and embankment

material. The sand and gravel deposits are restricted to the valleys of the major streams and to areas of Olpe soils, 3 to 15 percent slopes. The shale is used in the manufacture of brick.

Climate

By L. DEAN BARK, climatologist, Kansas Agricultural Experiment Station, Manhattan, Kans.

The climate of Allen County is typical continental, as would be expected of a location in the interior of a large land mass in the middle latitudes. Such a climate is characterized by large diurnal and annual variations in temperature. Allen County is far enough east to be out of the rain shadow of the Rocky Mountains and in the path of the moisture-laden air currents from the Gulf of Mexico. Precipitation is heaviest late in spring and early in summer. Most of it falls late in the evening, or as nighttime thunderstorms. Although prolonged dry periods occur during the growing season, they are not so frequent as in western Kansas. A surplus of precipitation often produces muddy fields that delay planting and harvesting.

Table 1 provides data on temperature and precipitation for Allen County, as recorded at Iola for the period 1941 to 1970 (*4*). Table 2 shows the probable dates of the first freeze in fall and the last freeze in spring (*3*). Table 3 provides data on the length of the growing season.

In winter, the average temperature is 56.6 degrees F and the average daily minimum is 45.5 degrees. The lowest temperature on record, which occurred at Iola on January 30, 1949, is 20 degrees below zero. In summer, the average temperature is 77.4 degrees and the average daily maximum is 88.3 degrees. The highest temperature, which was recorded on July 18, 1954, is 115 degrees.

The annual precipitation is 36.45 inches. Of this total, 26.41 inches, or 72 percent, usually falls during the period April through September, which includes the growing season for most crops. During 2 years in 10, the April-September rainfall is less than 19.16 inches. The heaviest 1-day rainfall during the period of record was 6.78 inches at Iola on September 12, 1926.

The average annual snowfall is 12.1 inches. The winters with the greatest total snowfall were 1911-12 and 1955-56, when 35.7 inches of snow was recorded. In an average year, 15 days have at least 1 inch of snow on the ground, but the number of days varies greatly from year to year. Snow cover seldom remains on the ground for more than a day or two. In January and February of 1956, however, there was snow on the ground continuously for over 3 weeks.

The average relative humidity at midafternoon in spring is less than 65 percent. During the rest of the year, it is about 55 percent. Humidity is higher at night in all seasons and averages about 80 percent at dawn. The average percentage of possible sunshine is 75 in summer and 55 in winter. The prevailing wind direction is usually southerly, but is northerly during February. The average annual windspeed is 12 miles per hour. The windspeed is highest in March and April.

Tornadoes and severe thunderstorms occur in Allen County. These storms are usually loc and of short duration so that the risk of dam Hail occurs infrequently during the warme year. It is local in extent. Crop damage by h this part of the State than in western Kansas

Farming

Farming has developed in Allen County raising of livestock, mainly beef cattle, and th cash crops. The main crops are soybeans, gr and wheat. Forage sorghum and alfalfa are al 1973, about 61,000 acres of soybeans, 20,000 sorghum, 18,000 acres of wheat, and 12,000 were harvested. These acreages fluctuate year according to market prices. In 1973, acres of alfalfa, 17,000 acres of native hay acres of tall fescue were harvested (*6*).

Beef cattle outnumber other kinds of live are several dairy herds and a few small ho number of sheep and chickens fluctuates year.

How this survey was made

Soil scientists made this survey to learn w soil are in the survey area, where they are, a can be used. The soil scientists went into the ing they likely would locate many soils they a something about and perhaps identify som never seen before. They observed the steep and shape of slopes; the size of streams an pattern of drainage; the kinds of native pla the kinds of rock; and many facts about th dug many holes to expose soil profiles. A sequence of natural layers, or horizons, in tends from the surface down into the par which has been changed very little by leachi action of plant roots.

The soil scientists recorded the character profiles they studied, and they compared th with others in counties nearby and in places Thus, through correlation, they classified an soils according to nationwide, uniform pro *soil series* and the *soil phase* are the categ classification most used in a local survey.

Soils that have profiles almost alike make ries. Except for different texture in the surf the soils of one series have major horiz similar in thickness, arrangement, and othe characteristics. Soil series commonly are nam or other geographic features near the place were first observed and mapped. Dennis a for example, are the names of two soil series in the United States. Soils of the same series sentially alike in characteristics.

Soils of one series can differ in texture of the surface layer and in slope, stoniness, or some other characteristic that affects use of the soils by man. On the basis of such differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, Bates loam, 1 to 4 percent slopes, is one of several phases within the Bates series.

After a guide for classifying and naming the soils was worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, roads, and other details that help in drawing boundaries accurately. The soil map at the back of this publication was prepared from aerial photographs.

The areas shown on a soil map are called soil mapping units. Some mapping units are made up of one kind of soil, others are made up of two or more kinds of soil, and a few have little or no soil material at all. Mapping units are discussed in the section "Soil maps for detailed planning."

While a soil survey is in progress, samples of soils are taken as needed for laboratory measurements and for engineering tests. The soils are field tested, and their interpretations are modified as necessary during the course of the survey. New interpretations are added to meet local needs, mainly through field observations of different kinds of soil in different uses under different levels of management. Also, data are assembled from other sources, such as test results, records, field experience, and information available from State and local specialists. For example, data on crop yields under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it is readily useful to different groups of users, among them farmers, managers of rangeland and woodland, engineers, planners, developers and builders, homebuyers, and those seeking recreation.

General soil map for broad land-use planning

The general soil map at the back of this publication shows, in color, the soil units for broad land-use planning described in this survey. Each soil unit is a unique natural landscape that has a distinct pattern of soils and of relief and drainage features. A unit typically consists of one or more soils of major extent and some soils of minor extent. It is named for the major soils. The kinds of soil in one unit can occur in other soil units, but in a different pattern.

The map provides a broad perspective of the soils and landscapes in the survey area. It provides a basis for comparing the potential of large areas for general kinds of land use. Areas that are generally suitable for certain kinds of farming or other land uses can be identified on the map. Likewise, areas of soils having properties that are distinctly unfavorable for certain land uses can be located.

Because of its small scale, the map does not show the kind of soil at a specific site. Thus, it is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure; the kinds of soils in any one soil unit ordinarily differ from place to place in slope, depth, stoniness, drainage, or other characteristics that affect their management.

1. Kenoma-Woodson-Dennis

Deep, nearly level to gently sloping, moderately well drained and somewhat poorly drained soils that have a dominantly silty clay subsoil; on uplands

This unit is on broad ridgetops and long side slopes that are dissected by shallow drainageways. The landscape is nearly level to gently sloping. This unit consists of the claypan areas of the county.

This unit occupies about 37 percent of the county. It is about 38 percent Kenoma soils, 24 percent Woodson soils, 10 percent Dennis soils, and 28 percent minor soils (fig. 2).

Kenoma soils are on ridgetops. They are nearly level to gently sloping and are moderately well drained. The surface layer typically is very dark gray silt loam about 8 inches thick. It rests abruptly on a silty clay subsoil. The upper part of the subsoil is very dark grayish brown, and the lower part to a depth of more than 60 inches is mixed strong brown and gray.

Woodson soils are in broad, nearly level areas. They are somewhat poorly drained. The surface layer typically is very dark gray silt loam about 8 inches thick. It rests abruptly on a very firm silty clay subsoil. The upper part of the subsoil is very dark gray, and the lower part to a depth of more than 60 inches is gray.

Dennis soils are on low knolls and gentle side slopes. They are nearly level to gently sloping and are moderately well drained. The surface layer typically is very dark brown silt loam about 10 inches thick. The subsoil is more than 50 inches thick. It is dark brown silty clay loam and silty clay in the upper part and brown and light brownish gray silty clay in the lower part.

Of minor extent in this unit are Catoosa, Verdigris, and Zaar soils. The silty Verdigris soils occupy the nearly level flood plains of narrow drainageways. The clayey Zaar soils are on gentle foot slopes and in swales and concave drainageways. The nearly level silty Catoosa soils are on ridgetops throughout the unit.

Most of this unit is cultivated. Some areas are used for hay and range. All locally suited crops are grown. The largest acreage is planted to wheat, grain sorghum, and soybeans.

The main concerns of management are improving drainage, controlling water erosion, and maintaining tilth

and fertility. In some years seasonal wetness or droughtiness may affect crop production.

2. Catoosa-Kenoma-Zaar

Moderately deep and deep, nearly level to moderately sloping, well drained to somewhat poorly drained soils that have a silty clay loam and silty clay subsoil; on uplands

This unit is along drainageways and on ridgetops. The landscape is dominantly nearly level to moderately sloping, but is steeper along the few large drainageways dissecting the unit. The steeper slopes generally are short.

This unit occupies about 35 percent of the county. It is about 37 percent Catoosa soils, 20 percent Kenoma soils, 15 percent Zaar soils, and 28 percent minor soils (fig. 3).

Catoosa soils are on ridgetops and side slopes. They are moderately deep, nearly level to moderately sloping, and well drained. The surface layer typically is dark reddish brown silt loam about 11 inches thick. The subsoil is dark reddish brown silty clay loam. Hard limestone is at a depth of about 27 inches.

Kenoma soils are on ridgetops. They are deep, gently sloping, and moderately well drained. The surface layer typically is very dark gray silt loam about 8 inches thick. It rests abruptly on a silty clay subsoil. The upper part of the subsoil is very dark grayish brown, and the lower part to a depth of more than 60 inches is mixed strong brown and gray.

Zaar soils are along drainageways and on low slopes below Catoosa soils. They are deep, gently sloping to moderately sloping, and somewhat poorly drained. The surface layer typically is black silty clay about 18 inches thick. The subsoil is silty clay. The upper part is black and very dark grayish brown, and the lower part is dark brown. The underlying material is olive brown and dark yellowish brown silty clay.

Of minor extent in this unit are Dennis, Eram, Mason, Nowata, Olpe, and Verdigris soils. The gently sloping to moderately sloping Dennis soils are on side slopes throughout the unit. The gently sloping to moderately sloping Eram soils are on low hills and side slopes. The nearly level silty Verdigris soils occupy the flood plains of narrow drainageways. The nearly level Mason soils are on terraces along streams. The moderately sloping Nowata soils are on the valley sides along the Marmaton River and Big Creek. The moderately sloping to strongly sloping Olpe soils are on low hills and side slopes in the northwestern part of the county.

About half of this unit is cultivated. The more sloping or stony soils are used for range. Deciduous trees grow along most of the larger drainageways and streams. All locally suited crops are grown. The largest acreage is planted to wheat, grain sorghum, soybeans, and corn.

The main concerns of management are controlling water erosion, improving drainage, and maintaining tilth and fertility. Good range management is needed if this unit is used for range. Invasion of brush, trees, and weeds is a problem.

3. Bates-Dennis-Kenoma

Moderately deep and deep, gently slopin sloping, moderately well drained and that have a dominantly silty clay and on uplands

This unit is on low hills and ridge drainageways. The landscape is gen moderately sloping.

This unit occupies about 21 percent of about 20 percent Bates soils, 17 percent percent Kenoma soils, and 48 percent min

Bates soils are gently sloping on moderately sloping on side slopes. They deep and well drained. The surface layer dark brown loam about 10 inches thick about 22 inches thick. The upper part is ish brown loam, and the lower part is loam. Soft sandstone and shale are at inches.

Dennis soils are gently sloping on ridge sloping to moderately sloping on side sl deep and moderately well drained. The sur cally is very dark brown silt loam about The subsoil is more than 50 inches thick is dark brown silty clay loam and silty clay part is brown and light brownish gray silt

Kenoma soils are on ridgetops. They a sloping, and moderately well drained. The typically is very dark gray silt loam about It rests abruptly on a silty clay subsoil tends to a depth of more than 60 inches is very dark grayish brown, and the lowe strong brown and gray.

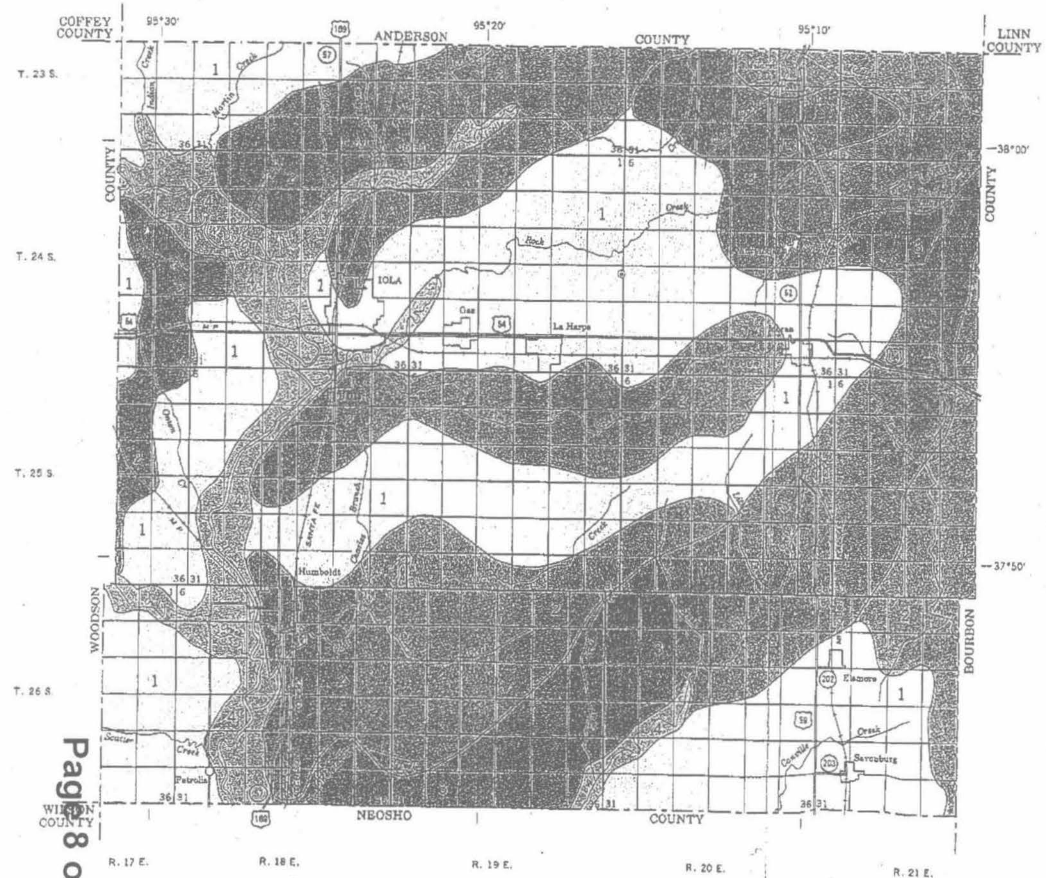
Of minor extent in this unit are Catoo Nowata, Verdigris, and Zaar soils. The moderately sloping silty Catoosa and Now ridgetops and side slopes throughout the Collinsville soils are on low hills and side moderately sloping to strongly sloping. Th silty Verdigris soils occupy the flood pl drainageways. The gently sloping clayey Z foot slopes and in swales and concave drain

Most of this unit is cultivated. Some are hay and range. All locally suited crops are gest acreage is planted to wheat, grain soybeans.

The main concerns of management water erosion, improving drainage, and m and fertility. In some years seasonal wetne ness affects crop production.

4. Verdigris-Osage-Mason

Deep, nearly level, well drained, moderately and poorly drained soils that have a silt clay subsoil; on flood plains and low strea



U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

KANSAS AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP
ALLEN COUNTY, KANSAS

Scale 1:190,080
1 0 1 2 3 4 Miles

SOIL LEGEND

- **1** Kenoma–Woodson–Dennis: Deep, nearly level to gently sloping, moderately well drained and somewhat poorly drained soils that have a dominantly silty clay subsoil; on uplands
- Catoosa–Kenoma–Zaar: Moderately deep and deep, nearly level to moderately sloping, well drained to somewhat poorly drained soils that have a silty clay loam and silty clay subsoil; on uplands
- Bates–Dennis–Kenoma: Moderately deep and deep, gently sloping to moderately sloping, moderately well drained and well drained soils that have a dominantly silty clay and clay loam subsoil; on uplands
- Verdigris–Osage–Mason: Deep, nearly level, well drained, moderately well drained, and poorly drained soils that have a silt loam to silty clay subsoil; on flood plains and low stream terraces

Compiled 1978

SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

...ea outlined on this map consists of ...an one kind of soil. The map is thus ...or general planning rather than a basis ...sions on the use of specific tracts.

Public School REVIEW
public elementary, middle, and high schools

You searched for **Jefferson Elementary School**, on Google. Find this info below, or use our advanced search pa

Home > Kansas > Allen County > Jefferson Elementary School

Jefferson Elementary School

300 S Jefferson, Iola, KS, 66749-3398 - Map

tel: (620)365-4840

Input this school's website!

View current housing listings in Kansas

Review this school!

Find your graduating class!

Buffalo School Friends
Find High School Friends. at Reunion.com - Free Registration.
www.Reunion.com/Schools

School
Find Listings For Public Schools - Elementary, Middle & High School.
Education.YellowPages.com

Ads by Google

Sc
Rev
Review

Public Sc
Evaluating
Types of P
Attending
Public Sch
Public Sch

School Overview:

Definition of Terms	Jefferson Elementary School
School Level	Primary school
Grades Offered	Grades KG - 5
County	Allen County, KS
Students & Faculty	
Total Students	239 students
% Male / % Female	51% / 49%
Total Classroom Teachers	18 teachers
Students by Grade	Kind - 25 students Grade 1 - 37 students Grade 2 - 37 students Grade 3 - 34 students Grade 4 - 34 students Grade 5 - 38 students Grade Not Listed - 34 students

	This School	(KS) School Average
Teacher : Student Ratio	1:13	*1:14*

Students by Ethnicity	This School	(KS) School Average
% American Indian	n/a	*1%*
% Asian	3%	*2%*
% Hispanic	2%	*11%*
% Black	1%	*7%*
% White	90%	*76%*
% Unknown	4 %	*5%*

Additional Student Information	This School	(KS) School Average
% Eligible for Free Lunch	36%	*32%*

Page 1 of 3

% Eligible for Reduced Lunch	19%	*10%*
% Migrant Students Enrolled	2%	*1%*

School Performance:

(KS) Statewide Testing Performance

School Statewide Performance View Education Department Test Scores

School District:

School District Name Iola School District

	This School's Agency	(KS) District Average
Number of Schools Managed	6	*3*
Number of Students Managed	1,478 students	*622 students*
District Total Revenue	$13,232,000	*$5,576,000*
District Expenditure	$12,622,000	*$5,392,000*
District Revenue / Student	$8,953	*$9,227*
District Expenditure / Student	$8,540	*$9,193*

School Notes:

- Add information about this school (e.g., awards, news stories, notable alumni, fun facts)

School Zip Code:

About This Zip Code (66749)	School Zip (66749)	(KS) State Average
Population (Approximate)	8,572 people	*2,568,742 people*
% (age 25+) w/College Degree	28%	*24%*
Population Average Age	38 years old	*35.2 years old*
Average Household size	2.4 persons	*2.4 persons*
Median Household Income	$31,607	*$42,855*
Avg. # of Rooms in Household	5.4 rooms	*5.6 rooms*
Median Age of Housing Structure	50 years old	*42 years old*
	View current housing listings in Kansas	
% Owning / % Renting	72% / 28%	*67% / 33%*

School Map:

Get: driving directions Weather: 10-day forecast or monthly climate averages.

Nearby Schools:

1. Lincoln Elementary School - 239 students - view location

2. Mckinley Elementary School - 144 students - view location

3. Laharpe Elementary School - 77 students - view location

4. C R Richardson Elementary School - 107 students - view location

5. Humboldt Elementary School - 253 students - view location

View all schools in: Iola Town, Allen County, Zip 66749

Tip: Zoom in/out using the slider below. View aerial photos using the Satellite or Hybrid buttons.

Map data ©2008 Tele Atlas - Terms of Use

Note: Data has been gathered from several government and commercial data sources. School data reflects years 2002-04 statistics (most recent years available). Area and demographic data reflects year 2000 statistics. Public School Review does not ensure the timeliness or accuracy of the information on this site.

Quick Links:

- Find housing: View current housing listings in Kansas
- Reconnect: Find your graduating class at Classmates.com
- Review: Submit a review for this school
- Tools: Search schools by zip, Compare schools side-by-side
- More schools: Private schools, Boarding schools & military schools
- Return to: Allen County public schools, Kansas public schools, Home

28

Public School REVIEW
public elementary, middle, and high schools

You searched for **McKinley Elementary School**, on Google . Find this info below, or use our advanced search pa

Home > Kansas > Allen County > Mckinley Elementary School

Mckinley Elementary School

209 S Kentucky, Iola, KS, 66749-3598 - Map

tel: (620)365-4860

Input this school's website!

View current housing listings in Kansas

Review this school!

Find your graduating class!

Mckinley High School
Search & reunite with friends from Mckinley High School.
www.reunion.com

Elementary Schools
Elementary Schools Directory. Find It Near You!
www.usdirectory.com

School
Find Listings for Public Schools - Elementary, Middle & High School.
Education.YellowPages.com/Chicago

High School Student
High School Juniors & Seniors - Get Into Your College of Choice Today!
www.ApplyWise.com

Ads by Google

Sc
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Review

Public Sc
Evaluating
Types of P
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Public Sch
Public Sch

School Overview:	
Definition of Terms	Mckinley Elementary School
School Level	Primary school
Grades Offered	Grades KG - 5
County	Allen County, KS
Students & Faculty	
Total Students	144 students
% Male / % Female	57% / 43%
Total Classroom Teachers	11 teachers
Students by Grade	Kind - 16 students Grade 1 - 19 students Grade 2 - 19 students Grade 3 - 13 students Grade 4 - 27 students Grade 5 - 37 students Grade Not Listed - 13 students

	This School	(KS) School Average
Teacher : Student Ratio	1:13	*1:14*
Students by Ethnicity	This School	(KS) School Average
% American Indian	n/a	*1%*
% Asian	n/a	*2%*
% Hispanic	3%	*11%*
% Black	1%	*7%*
% White	96%	*76%*
Additional Student Information	This School	(KS) School Average
% Eligible for Free Lunch	56%	*32%*
% Eligible for Reduced Lunch	13%	*10%*

% Migrant Students Enrolled	n/a	*1%*

School Performance:

(KS) Statewide Testing Performance

School Statewide Performance — View Education Department Test Scores

School District:

School District Name — Iola School District

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View all schools in: Iola Town, Allen County, Zip 66749

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- More schools: Private schools, Boarding schools & military schools
- Return to: Allen County public schools, Kansas public schools, Home

Reference 29

State & County QuickFacts

Allen County, Kansas

People QuickFacts	Allen County	Kansas
Population, 2011 estimate	NA	2,871,238
Population, 2010	13,371	2,853,118
Population, percent change, 2000 to 2010	-7.0%	6.1%
Population, 2000	14,385	2,688,418
Persons under 5 years, percent, 2010	6.6%	7.2%
Persons under 18 years, percent, 2010	23.5%	25.5%
Persons 65 years and over, percent, 2010	18.3%	13.2%
Female persons, percent, 2010	51.2%	50.4%
White persons, percent, 2010 (a)	93.3%	83.8%
Black persons, percent, 2010 (a)	1.9%	5.9%
American Indian and Alaska Native persons, percent, 2010 (a)	0.8%	1.0%
Asian persons, percent, 2010 (a)	0.5%	2.4%
Native Hawaiian and Other Pacific Islander, percent, 2010 (a)	0.0%	0.1%
Persons reporting two or more races, percent, 2010	2.5%	3.0%
Persons of Hispanic or Latino origin, percent, 2010 (b)	2.9%	10.5%
White persons not Hispanic, percent, 2010	91.9%	78.2%
Living in same house 1 year & over, 2006-2010	83.8%	82.2%
Foreign born persons, percent, 2006-2010	0.6%	6.3%
Language other than English spoken at home, pct age 5+, 2006-2010	1.0%	10.5%
High school graduates, percent of persons age 25+, 2006-2010	89.3%	89.2%
Bachelor's degree or higher, pct of persons age 25+, 2006-2010	17.7%	29.3%
Veterans, 2006-2010	1,342	228,805
Mean travel time to work (minutes), workers age 16+, 2006 -2010	16.8	18.8
Housing units, 2010	6,226	1,233,215
Homeownership rate, 2006-2010	78.0%	69.4%
Housing units in multi-unit structures, percent, 2006-2010	7.2%	17.4%
Median value of owner-occupied housing units, 2006-2010	$64,400	$122,600
Households, 2006-2010	5,575	1,101,672
Persons per household, 2006-2010	2.36	2.48
Per capita money income in past 12 months (2010 dollars) 2006-2010	$20,195	$25,907
Median household income 2006-2010	$41,546	$49,424
Persons below poverty level, percent, 2006-2010	12.7%	12.4%

Business QuickFacts	Allen County	Kansas
Private nonfarm establishments, 2009	392	74,698[1]
Private nonfarm employment, 2009	4,567	1,146,263[1]

Reference 29

Private nonfarm employment, percent change 2000-2009	-12.2%	1.6%[1]
Nonemployer establishments, 2009	823	173,946
Total number of firms, 2007	926	237,040
Black-owned firms, percent, 2007	F	2.4%
American Indian- and Alaska Native-owned firms, percent, 2007	F	0.9%
Asian-owned firms, percent, 2007	S	2.0%
Native Hawaiian and Other Pacific Islander-owned firms, percent, 2007	F	S
Hispanic-owned firms, percent, 2007	F	2.4%
Women-owned firms, percent, 2007	28.4%	27.5%
Manufacturers shipments, 2007 ($1000)	434,704	76,751,828
Merchant wholesaler sales, 2007 ($1000)	37,176	45,863,865
Retail sales, 2007 ($1000)	121,694	34,538,332
Retail sales per capita, 2007	$9,077	$12,444
Accommodation and food services sales, 2007 ($1000)	12,409	4,192,347
Building permits, 2010	16	5,140
Federal spending, 2009	120,661	29,571,725[1]

Geography QuickFacts	Allen County	Kansas
Land area in square miles, 2010	500.30	81,758.72
Persons per square mile, 2010	26.7	34.9
FIPS Code	001	20
Metropolitan or Micropolitan Statistical Area	None	

1: Includes data not distributed by county.

Population estimates for counties will be available in April, 2012 and for cities in June, 2012.

(a) Includes persons reporting only one race.
(b) Hispanics may be of any race, so also are included in applicable race categories.

D: Suppressed to avoid disclosure of confidential information
F: Fewer than 100 firms
FN: Footnote on this item for this area in place of data
NA: Not available
S: Suppressed; does not meet publication standards
X: Not applicable
Z: Value greater than zero but less than half unit of measure shown

Source U.S. Census Bureau: State and County QuickFacts. Data derived from Population Estimates, American Community Survey, Census of Population and Housing, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits, Consolidated Federal Funds Report
Last Revised: Tuesday, 31-Jan-2012 16:50:53 EST

Pyakuryal, Kumud

From: Quick.Michelle@epamail.epa.gov
Sent: Thursday, April 17, 2008 11:54 AM
To: Pyakuryal, Kumud

Attachments: ASR# 3001 SQL.XLS

30

ASR# 3001 SQL.XLS (229 KB)

Michelle,

Attached is a spreadsheet for ASR# 3001 with the requested SQL's.

Barry

(See attached file: ASR# 3001 SQL.XLS)

Michelle Quick

U.S. EPA - Region 7
913-551-7335 Fax 913-551-9335
quick.michelle@epa.gov

ASR#	Sample#	QC_Code	Analyte_Name	Units	Final_Result	Detection_ID	SQL
3001	23	__	Arsenic	mg/kg	10.1		5.10
3001	33	__	Arsenic	mg/kg	10.3		7.72
3001	14	__	Arsenic	mg/kg	10.6		5.14
3001	13	__	Arsenic	mg/kg	108		5.90
3001	9	__	Arsenic	mg/kg	11.0		5.98
3001	16	__	Arsenic	mg/kg	11.4		5.19
3001	24	__	Arsenic	mg/kg	11.7		5.95
3001	68	__	Arsenic	mg/kg	11.7		5.58
3001	49	__	Arsenic	mg/kg	12.0		7.03
3001	18	__	Arsenic	mg/kg	12.1		6.02
3001	47	__	Arsenic	mg/kg	13.2		6.65
3001	4	__	Arsenic	mg/kg	13.4		5.65
3001	12	__	Arsenic	mg/kg	13.5		5.31
3001	28	__	Arsenic	mg/kg	14.8		6.52
3001	41	__	Arsenic	mg/kg	14.8		6.45
3001	60	__	Arsenic	mg/kg	16.2		6.22
3001	70	__	Arsenic	mg/kg	16.5		5.67
3001	75	__	Arsenic	mg/kg	16.6		5.76
3001	74	__	Arsenic	mg/kg	16.8		6.24
3001	32	__	Arsenic	mg/kg	17.9		5.91
3001	25	__	Arsenic	mg/kg	19.2		5.39
3001	26	__	Arsenic	mg/kg	21.0		6.64
3001	72	__	Arsenic	mg/kg	21.4		5.50
3001	43	__	Arsenic	mg/kg	3.96		6.41
3001	8	__	Arsenic	mg/kg	4.71		5.07
3001	63	__	Arsenic	mg/kg	49.2		6.18
3001	36	__	Arsenic	mg/kg	5	U	6.45
3001	38	__	Arsenic	mg/kg	5	U	6.83
3001	66	__	Arsenic	mg/kg	5.10		6.25
3001	55	__	Arsenic	mg/kg	5.22		7.30
3001	56	__	Arsenic	mg/kg	5.27		6.58
3001	29	__	Arsenic	mg/kg	5.30		6.86
3001	2	FD	Arsenic	mg/kg	5.38		5.72
3001	10	__	Arsenic	mg/kg	5.42		5.88
3001	46	__	Arsenic	mg/kg	5.43		6.16
3001	6	__	Arsenic	mg/kg	5.47		5.35
3001	50	__	Arsenic	mg/kg	5.80		6.12
3001	42	__	Arsenic	mg/kg	6.09		1.80
3001	7	__	Arsenic	mg/kg	6.46		5.17
3001	15	__	Arsenic	mg/kg	6.55		5.45
3001	64	__	Arsenic	mg/kg	6.59		6.81
3001	61	__	Arsenic	mg/kg	6.62		5.40
3001	39	__	Arsenic	mg/kg	6.70		6.35
3001	44	__	Arsenic	mg/kg	6.86		5.78
3001	67	__	Arsenic	mg/kg	7.10		5.79
3001	53	__	Arsenic	mg/kg	7.18		7.47
3001	17	__	Arsenic	mg/kg	7.30		5.53
3001	57	__	Arsenic	mg/kg	7.36		5.91
3001	21	__	Arsenic	mg/kg	7.37	J	6.90
3001	48	__	Arsenic	mg/kg	7.42		7.16

3001	20	__	Arsenic	mg/kg	7.44	5.51
3001	27	__	Arsenic	mg/kg	7.46	7.16
3001	11	__	Arsenic	mg/kg	7.47	6.16
3001	35	__	Arsenic	mg/kg	7.51	6.09
3001	73	__	Arsenic	mg/kg	7.52	6.14
3001	54	__	Arsenic	mg/kg	7.55	6.25
3001	19	__	Arsenic	mg/kg	7.62	5.31
3001	37	__	Arsenic	mg/kg	7.66	6.76
3001	2	__	Arsenic	mg/kg	7.82	5.80
3001	31	__	Arsenic	mg/kg	7.85	6.31
3001	65	__	Arsenic	mg/kg	7.89	5.73
3001	30	__	Arsenic	mg/kg	7.91	6.19
3001	34	__	Arsenic	mg/kg	8.01	6.24
3001	51	__	Arsenic	mg/kg	8.04	6.99
3001	45	__	Arsenic	mg/kg	8.20	6.29
3001	69	__	Arsenic	mg/kg	8.24	5.44
3001	22	__	Arsenic	mg/kg	8.40	5.16
3001	58	__	Arsenic	mg/kg	8.48	6.08
3001	1	__	Arsenic	mg/kg	8.75	6.96
3001	59	__	Arsenic	mg/kg	8.80	6.19
3001	5	__	Arsenic	mg/kg	8.86	5.34
3001	62	__	Arsenic	mg/kg	9.00	5.78
3001	71	__	Arsenic	mg/kg	9.26	5.51
3001	52	__	Arsenic	mg/kg	9.28	6.64
3001	40	__	Arsenic	mg/kg	9.94	7.73
3001	48	__	Barium	mg/kg	107	2.86
3001	51	__	Barium	mg/kg	107	2.80
3001	67	__	Barium	mg/kg	111	2.32
3001	49	__	Barium	mg/kg	112	2.81
3001	54	__	Barium	mg/kg	114	2.50
3001	1	__	Barium	mg/kg	117	2.78
3001	50	__	Barium	mg/kg	117	2.45
3001	57	__	Barium	mg/kg	117	2.36
3001	59	__	Barium	mg/kg	118	2.48
3001	55	__	Barium	mg/kg	120	2.92
3001	53	__	Barium	mg/kg	121	2.99
3001	5	__	Barium	mg/kg	125	2.14
3001	70	__	Barium	mg/kg	1254	2.27
3001	47	__	Barium	mg/kg	126	2.66
3001	40	__	Barium	mg/kg	127	3.09
3001	66	__	Barium	mg/kg	127	2.50
3001	29	__	Barium	mg/kg	128	2.74
3001	38	__	Barium	mg/kg	129	2.73
3001	52	__	Barium	mg/kg	129	2.66
3001	31	__	Barium	mg/kg	130	2.52
3001	63	__	Barium	mg/kg	131	2.47
3001	6	__	Barium	mg/kg	133	2.14
3001	34	__	Barium	mg/kg	136	2.50
3001	71	__	Barium	mg/kg	136	2.20
3001	68	__	Barium	mg/kg	137	2.23
3001	75	__	Barium	mg/kg	137	2.31

3001	2	__	Barium	mg/kg	139	2.32
3001	9	__	Barium	mg/kg	139	2.39
3001	39	__	Barium	mg/kg	139	2.54
3001	13	__	Barium	mg/kg	140	2.36
3001	25	__	Barium	mg/kg	140	2.16
3001	58	__	Barium	mg/kg	140	2.43
3001	2	FD	Barium	mg/kg	142	2.29
3001	35	__	Barium	mg/kg	142	2.44
3001	11	__	Barium	mg/kg	144	2.46
3001	17	__	Barium	mg/kg	149	2.21
3001	28	__	Barium	mg/kg	149	2.61
3001	62	__	Barium	mg/kg	149	2.31
3001	8	__	Barium	mg/kg	150	2.03
3001	41	__	Barium	mg/kg	150	2.58
3001	45	__	Barium	mg/kg	150	2.51
3001	72	__	Barium	mg/kg	151	2.20
3001	32	__	Barium	mg/kg	152	2.36
3001	23	__	Barium	mg/kg	155	2.04
3001	69	__	Barium	mg/kg	155	2.17
3001	73	__	Barium	mg/kg	157	2.46
3001	18	__	Barium	mg/kg	158	2.41
3001	74	__	Barium	mg/kg	158	2.50
3001	14	__	Barium	mg/kg	159	2.05
3001	22	__	Barium	mg/kg	159	2.06
3001	27	__	Barium	mg/kg	160	2.86
3001	7	__	Barium	mg/kg	161	2.07
3001	26	__	Barium	mg/kg	162	2.66
3001	37	__	Barium	mg/kg	163	2.70
3001	16	__	Barium	mg/kg	168	2.07
3001	24	__	Barium	mg/kg	168	2.38
3001	10	__	Barium	mg/kg	172	2.35
3001	42	__	Barium	mg/kg	172	0.721
3001	46	__	Barium	mg/kg	172	2.47
3001	19	__	Barium	mg/kg	174	2.12
3001	33	__	Barium	mg/kg	175	3.09
3001	4	__	Barium	mg/kg	177	2.26
3001	56	__	Barium	mg/kg	180	2.63
3001	12	__	Barium	mg/kg	184	2.13
3001	36	__	Barium	mg/kg	187	2.58
3001	64	__	Barium	mg/kg	188	2.72
3001	44	__	Barium	mg/kg	190	2.31
3001	20	__	Barium	mg/kg	196	2.21
3001	43	__	Barium	mg/kg	198	2.57
3001	60	__	Barium	mg/kg	200	2.49
3001	21	__	Barium	mg/kg	257	2.76
3001	61	__	Barium	mg/kg	271	2.16
3001	15	__	Barium	mg/kg	334	2.18
3001	65	__	Barium	mg/kg	7.35	2.29
3001	30	__	Barium	mg/kg	99.4	2.47
3001	9	__	Cadmium	mg/kg	10.3	1.20
3001	22	__	Cadmium	mg/kg	10.9	1.03

3001	45	__	Cadmium	mg/kg	11.0	1.26
3001	14	__	Cadmium	mg/kg	11.2	1.03
3001	23	__	Cadmium	mg/kg	12.2	1.02
3001	63	__	Cadmium	mg/kg	14.6	1.24
3001	13	__	Cadmium	mg/kg	15.7	1.18
3001	32	__	Cadmium	mg/kg	17.3	1.18
3001	51	__	Cadmium	mg/kg	27.7	1.40
3001	11	__	Cadmium	mg/kg	31.5	1.23
3001	2	FD	Cadmium	mg/kg	4.09	1.14
3001	5	__	Cadmium	mg/kg	4.38	1.07
3001	8	__	Cadmium	mg/kg	4.40	1.01
3001	2	__	Cadmium	mg/kg	4.42	1.16
3001	38	__	Cadmium	mg/kg	4.68	1.37
3001	6	__	Cadmium	mg/kg	5.05	1.07
3001	71	__	Cadmium	mg/kg	5.32	1.10
3001	43	__	Cadmium	mg/kg	5.47	1.28
3001	50	__	Cadmium	mg/kg	5.53	1.22
3001	44	__	Cadmium	mg/kg	5.65	1.16
3001	69	__	Cadmium	mg/kg	5.76	1.09
3001	61	__	Cadmium	mg/kg	5.81	1.08
3001	65	__	Cadmium	mg/kg	5.82	1.15
3001	7	__	Cadmium	mg/kg	5.84	1.03
3001	19	__	Cadmium	mg/kg	6.05	1.06
3001	46	__	Cadmium	mg/kg	6.12	1.23
3001	34	__	Cadmium	mg/kg	6.35	1.25
3001	57	__	Cadmium	mg/kg	6.35	1.18
3001	49	__	Cadmium	mg/kg	6.37	1.41
3001	53	__	Cadmium	mg/kg	6.52	1.49
3001	73	__	Cadmium	mg/kg	6.52	1.23
3001	16	__	Cadmium	mg/kg	6.58	1.04
3001	66	__	Cadmium	mg/kg	6.66	1.25
3001	41	__	Cadmium	mg/kg	6.74	1.29
3001	62	__	Cadmium	mg/kg	6.75	1.16
3001	75	__	Cadmium	mg/kg	6.79	1.15
3001	48	__	Cadmium	mg/kg	6.80	1.43
3001	67	__	Cadmium	mg/kg	6.86	1.16
3001	10	__	Cadmium	mg/kg	6.92	1.18
3001	15	__	Cadmium	mg/kg	6.95	1.09
3001	56	__	Cadmium	mg/kg	6.95	1.32
3001	31	__	Cadmium	mg/kg	7.01	1.26
3001	58	__	Cadmium	mg/kg	7.03	1.22
3001	17	__	Cadmium	mg/kg	7.08	1.11
3001	52	__	Cadmium	mg/kg	7.15	1.33
3001	20	__	Cadmium	mg/kg	7.21	1.10
3001	59	__	Cadmium	mg/kg	7.46	1.24
3001	33	__	Cadmium	mg/kg	7.52	1.54
3001	36	__	Cadmium	mg/kg	7.68	1.29
3001	54	__	Cadmium	mg/kg	7.68	1.25
3001	37	__	Cadmium	mg/kg	7.69	1.35
3001	1	__	Cadmium	mg/kg	7.81	1.39
3001	47	__	Cadmium	mg/kg	7.84	1.33

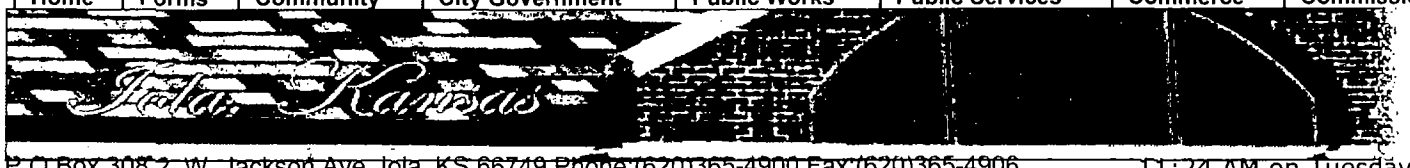
3001	55	__	Cadmium	mg/kg	7.89	1.46
3001	68	__	Cadmium	mg/kg	7.89	1.12
3001	29	__	Cadmium	mg/kg	7.92	1.37
3001	24	__	Cadmium	mg/kg	8.00	1.19
3001	70	__	Cadmium	mg/kg	8.04	1.13
3001	39	__	Cadmium	mg/kg	8.16	1.27
3001	72	__	Cadmium	mg/kg	8.16	1.10
3001	21	__	Cadmium	mg/kg	8.20	1.38
3001	12	__	Cadmium	mg/kg	8.21	1.06
3001	26	__	Cadmium	mg/kg	8.26	1.33
3001	28	__	Cadmium	mg/kg	8.37	1.30
3001	74	__	Cadmium	mg/kg	8.80	1.25
3001	42	__	Cadmium	mg/kg	8.84	0.361
3001	30	__	Cadmium	mg/kg	8.92	1.24
3001	18	__	Cadmium	mg/kg	8.97	1.20
3001	4	__	Cadmium	mg/kg	9.02	1.13
3001	35	__	Cadmium	mg/kg	9.05	1.22
3001	40	__	Cadmium	mg/kg	9.23	1.55
3001	27	__	Cadmium	mg/kg	9.53	1.43
3001	64	__	Cadmium	mg/kg	9.71	1.36
3001	25	__	Cadmium	mg/kg	9.74	1.08
3001	60	__	Cadmium	mg/kg	9.85	1.24
3001	25	__	Lead	mg/kg	1040	5.39
3001	27	__	Lead	mg/kg	1050	7.16
3001	43	__	Lead	mg/kg	106	6.41
3001	28	__	Lead	mg/kg	1150	6.52
3001	32	__	Lead	mg/kg	1200	5.91
3001	15	__	Lead	mg/kg	135	5.45
3001	72	__	Lead	mg/kg	1360	5.50
3001	44	__	Lead	mg/kg	148	5.78
3001	53	__	Lead	mg/kg	186	7.47
3001	63	__	Lead	mg/kg	1960	6.18
3001	39	__	Lead	mg/kg	209	6.35
3001	8	__	Lead	mg/kg	210	5.07
3001	7	__	Lead	mg/kg	223	5.17
3001	10	__	Lead	mg/kg	228	5.88
3001	18	__	Lead	mg/kg	2290	6.02
3001	30	__	Lead	mg/kg	246	6.19
3001	38	__	Lead	mg/kg	246	6.83
3001	42	__	Lead	mg/kg	249	1.80
3001	55	__	Lead	mg/kg	258	7.30
3001	5	__	Lead	mg/kg	263	5.34
3001	46	__	Lead	mg/kg	282	6.16
3001	6	__	Lead	mg/kg	284	5.35
3001	36	__	Lead	mg/kg	284	6.45
3001	31	__	Lead	mg/kg	288	6.31
3001	65	__	Lead	mg/kg	323	5.73
3001	49	__	Lead	mg/kg	336	7.03
3001	45	__	Lead	mg/kg	342	6.29
3001	61	__	Lead	mg/kg	362	5.40
3001	66	__	Lead	mg/kg	386	6.25

3001	50	__	Lead	mg/kg	397		6.12
3001	48	__	Lead	mg/kg	411		7.16
3001	35	__	Lead	mg/kg	417		6.09
3001	16	__	Lead	mg/kg	420		5.19
3001	17	__	Lead	mg/kg	434		5.53
3001	19	__	Lead	mg/kg	440		5.31
3001	69	__	Lead	mg/kg	460		5.44
3001	75	__	Lead	mg/kg	464		5.76
3001	29	__	Lead	mg/kg	490		6.86
3001	57	__	Lead	mg/kg	494		5.91
3001	2	FD	Lead	mg/kg	496		5.72
3001	56	__	Lead	mg/kg	496		6.58
3001	4	__	Lead	mg/kg	501		5.65
3001	54	__	Lead	mg/kg	504		6.25
3001	67	__	Lead	mg/kg	509		5.79
3001	47	__	Lead	mg/kg	530		6.65
3001	14	__	Lead	mg/kg	539		5.14
3001	62	__	Lead	mg/kg	551		5.78
3001	70	__	Lead	mg/kg	554		5.67
3001	34	__	Lead	mg/kg	556		6.24
3001	52	__	Lead	mg/kg	562		6.64
3001	24	__	Lead	mg/kg	567		5.95
3001	22	__	Lead	mg/kg	571		5.16
3001	40	__	Lead	mg/kg	578		7.73
3001	20	__	Lead	mg/kg	582		5.51
3001	1	__	Lead	mg/kg	585		6.96
3001	73	__	Lead	mg/kg	585		6.14
3001	2	__	Lead	mg/kg	596		5.80
3001	59	__	Lead	mg/kg	614		6.19
3001	37	__	Lead	mg/kg	616		6.76
3001	64	__	Lead	mg/kg	618		6.81
3001	68	__	Lead	mg/kg	628		5.58
3001	71	__	Lead	mg/kg	633		5.51
3001	23	__	Lead	mg/kg	681		5.10
3001	33	__	Lead	mg/kg	704		7.72
3001	11	__	Lead	mg/kg	736		6.16
3001	21	__	Lead	mg/kg	745		6.90
3001	51	__	Lead	mg/kg	764		6.99
3001	26	__	Lead	mg/kg	769		6.64
3001	41	__	Lead	mg/kg	798	J	6.45
3001	12	__	Lead	mg/kg	806		5.31
3001	58	__	Lead	mg/kg	837		6.08
3001	74	__	Lead	mg/kg	844		6.24
3001	13	__	Lead	mg/kg	869		5.90
3001	60	__	Lead	mg/kg	872		6.22
3001	9	__	Lead	mg/kg	961		5.98
3001	40	__	Solids, percent	%	61.6		
3001	33	__	Solids, percent	%	62.9		
3001	53	__	Solids, percent	%	64.3		
3001	51	__	Solids, percent	%	64.4		
3001	48	__	Solids, percent	%	65.9		

3001	49	__	Solids, percent	%	65.9
3001	47	__	Solids, percent	%	67.1
3001	55	__	Solids, percent	%	67.2
3001	1	__	Solids, percent	%	67.8
3001	27	__	Solids, percent	%	68.5
3001	29	__	Solids, percent	%	69.4
3001	54	__	Solids, percent	%	69.6
3001	38	__	Solids, percent	%	69.8
3001	41	__	Solids, percent	%	69.8
3001	43	__	Solids, percent	%	70.2
3001	26	__	Solids, percent	%	71.0
3001	42	__	Solids, percent	%	71.2
3001	64	__	Solids, percent	%	71.3
3001	37	__	Solids, percent	%	71.8
3001	46	__	Solids, percent	%	71.8
3001	52	__	Solids, percent	%	71.8
3001	28	__	Solids, percent	%	72.3
3001	31	__	Solids, percent	%	73.4
3001	39	__	Solids, percent	%	73.6
3001	50	__	Solids, percent	%	73.7
3001	36	__	Solids, percent	%	73.9
3001	34	__	Solids, percent	%	74.2
3001	56	__	Solids, percent	%	75.2
3001	30	__	Solids, percent	%	75.5
3001	45	__	Solids, percent	%	75.8
3001	35	__	Solids, percent	%	76.0
3001	66	__	Solids, percent	%	76.2
3001	32	__	Solids, percent	%	76.9
3001	74	__	Solids, percent	%	77.1
3001	73	__	Solids, percent	%	78.2
3001	59	__	Solids, percent	%	78.3
3001	60	__	Solids, percent	%	78.8
3001	9	__	Solids, percent	%	78.9
3001	63	__	Solids, percent	%	79.4
3001	18	__	Solids, percent	%	79.8
3001	62	__	Solids, percent	%	80.1
3001	75	__	Solids, percent	%	80.3
3001	58	__	Solids, percent	%	80.6
3001	67	__	Solids, percent	%	80.7
3001	2	FD	Solids, percent	%	80.9
3001	11	__	Solids, percent	%	81.2
3001	57	__	Solids, percent	%	81.3
3001	2	__	Solids, percent	%	81.4
3001	24	__	Solids, percent	%	81.6
3001	44	__	Solids, percent	%	82.5
3001	17	__	Solids, percent	%	83.7
3001	10	__	Solids, percent	%	84.3
3001	68	__	Solids, percent	%	84.6
3001	13	__	Solids, percent	%	84.7
3001	65	__	Solids, percent	%	84.7
3001	69	__	Solids, percent	%	85.2

3001	61	__	Solids, percent	%	86.5		
3001	21	__	Solids, percent	%	87.3		
3001	71	__	Solids, percent	%	87.3		
3001	16	__	Solids, percent	%	87.7		
3001	70	__	Solids, percent	%	88.2		
3001	72	__	Solids, percent	%	88.3		
3001	4	__	Solids, percent	%	88.5		
3001	25	__	Solids, percent	%	89.1		
3001	19	__	Solids, percent	%	89.7		
3001	20	__	Solids, percent	%	89.7		
3001	6	__	Solids, percent	%	89.8		
3001	5	__	Solids, percent	%	90.0		
3001	15	__	Solids, percent	%	90.1		
3001	12	__	Solids, percent	%	90.5		
3001	14	__	Solids, percent	%	91.0		
3001	8	__	Solids, percent	%	91.3		
3001	22	__	Solids, percent	%	91.4		
3001	23	__	Solids, percent	%	93.3		
3001	7	__	Solids, percent	%	93.8		
3001	20	__	Zinc	mg/kg	1010		5.51
3001	62	__	Zinc	mg/kg	1010		5.78
3001	66	__	Zinc	mg/kg	1010		6.25
3001	42	__	Zinc	mg/kg	1020		1.80
3001	71	__	Zinc	mg/kg	1020		5.51
3001	56	__	Zinc	mg/kg	1030		6.58
3001	58	__	Zinc	mg/kg	1040		6.08
3001	37	__	Zinc	mg/kg	1080		6.76
3001	54	__	Zinc	mg/kg	1080		6.25
3001	57	__	Zinc	mg/kg	1080		5.91
3001	45	__	Zinc	mg/kg	1090		6.29
3001	52	__	Zinc	mg/kg	1100		6.64
3001	48	__	Zinc	mg/kg	1120		7.16
3001	17	__	Zinc	mg/kg	1130		5.53
3001	29	__	Zinc	mg/kg	1140		6.86
3001	36	__	Zinc	mg/kg	1140		6.45
3001	35	__	Zinc	mg/kg	1150		6.09
3001	21	__	Zinc	mg/kg	1160	J	6.90
3001	27	__	Zinc	mg/kg	1180		7.16
3001	75	__	Zinc	mg/kg	1200		5.76
3001	41	__	Zinc	mg/kg	1210	J	6.45
3001	70	__	Zinc	mg/kg	1240		5.67
3001	64	__	Zinc	mg/kg	1260		6.81
3001	73	__	Zinc	mg/kg	1270		6.14
3001	47	__	Zinc	mg/kg	1290		6.65
3001	33	__	Zinc	mg/kg	1310		7.72
3001	68	__	Zinc	mg/kg	1320		5.58
3001	1	__	Zinc	mg/kg	1340	J	6.96
3001	14	__	Zinc	mg/kg	1420		5.14
3001	59	__	Zinc	mg/kg	1460		6.19
3001	26	__	Zinc	mg/kg	1470		6.64
3001	22	__	Zinc	mg/kg	1480		5.16

3001	60	__	Zinc	mg/kg	1530		6.22
3001	74	__	Zinc	mg/kg	1530		6.24
3001	4	__	Zinc	mg/kg	1550		5.65
3001	67	__	Zinc	mg/kg	1590		5.79
3001	23	__	Zinc	mg/kg	1600		5.10
3001	12	__	Zinc	mg/kg	1610		5.31
3001	18	__	Zinc	mg/kg	1690		6.02
3001	72	__	Zinc	mg/kg	1690		5.50
3001	25	__	Zinc	mg/kg	1730		5.39
3001	9	__	Zinc	mg/kg	1740		5.98
3001	40	__	Zinc	mg/kg	1860		7.73
3001	28	__	Zinc	mg/kg	2140		6.52
3001	13	__	Zinc	mg/kg	2280		5.90
3001	32	__	Zinc	mg/kg	2400		5.91
3001	51	__	Zinc	mg/kg	2470		6.99
3001	63	__	Zinc	mg/kg	2880		6.18
3001	11	__	Zinc	mg/kg	3090		6.16
3001	15	__	Zinc	mg/kg	444		5.45
3001	5	__	Zinc	mg/kg	472		5.34
3001	43	__	Zinc	mg/kg	483		6.41
3001	44	__	Zinc	mg/kg	515		5.78
3001	8	__	Zinc	mg/kg	536		5.07
3001	53	__	Zinc	mg/kg	578		7.47
3001	46	__	Zinc	mg/kg	588		6.16
3001	10	__	Zinc	mg/kg	677		5.88
3001	7	__	Zinc	mg/kg	684		5.17
3001	61	__	Zinc	mg/kg	723	J	5.40
3001	50	__	Zinc	mg/kg	741		6.12
3001	34	__	Zinc	mg/kg	745		6.24
3001	19	__	Zinc	mg/kg	750		5.31
3001	38	__	Zinc	mg/kg	762		6.83
3001	39	__	Zinc	mg/kg	766		6.35
3001	49	__	Zinc	mg/kg	785		7.03
3001	31	__	Zinc	mg/kg	833		6.31
3001	6	__	Zinc	mg/kg	836		5.35
3001	2	FD	Zinc	mg/kg	841		5.72
3001	2	__	Zinc	mg/kg	851		5.80
3001	30	__	Zinc	mg/kg	852		6.19
3001	55	__	Zinc	mg/kg	856		7.30
3001	65	__	Zinc	mg/kg	864		5.73
3001	16	__	Zinc	mg/kg	900		5.19
3001	69	__	Zinc	mg/kg	935		5.44
3001	24	__	Zinc	mg/kg	985		5.95



P.O Box 308 2. W. Jackson Ave. Iola, KS 66749 Phone:(620)365-4900 Fax:(620)365-4906 11:24 AM on Tuesday, 1st July

History

Pick a section

Local Historical Organizations

Humboldt Civil War Days

Meets in Members' homes
1st Saturday each month

Allen County Historical Society

Meets at:
Allen County Historical Museum
20 South Washington
P.O. Box 163
Iola, Ks 66749
(620) 365-3051
Email

Sifers Candy Co.

Vintage Photos

Electric Park

In January 1859, a group of settlers gathered to discuss plans to develop a new town. Many of these people who lived in the county and in the nearby towns of Cofachique and Humboldt were looking to relocate Allen County's seat. After much discussion, it was decided that the new town would be called "Iola", in tribute to Iola Colborn--the daughter of Mr. J.F. Colborn who had built the first frame-style home in the area. The land was surveyed and platted with wide streets and a four-block square downtown. In 1860, two small general stores moved from Cofachique to Iola. Soon came a dry goods store, a grocery, clothing store, and drug store. In 1865, Iola became the seat of Allen County. By 1870, the population had increased to 1,500, and the railroads had arrived. However, due to various local and national misfortunes, the town population remained stagnant for the next twenty-five years. Then, in 1895, a great surge in population and expansion hit Iola--giant natural gas pools were discovered in the area. In just nine years, from 1895 to 1904, Iola grew from a town of 1,567 people, to a city of over 11,000. With this great population explosion, came many of the homes and buildings still standing today. A water plant and electric generation plant were built; streets were paved, schools were constructed, and Iola prospered. In 1910 the Commission form of Government was adopted, and three City Commissioners elected.

Unfortunately, the natural gas began to run out, which forced many of the town's industries (such as the smelters) to leave for richer fields. There was little positive change in Iola during the 1920s and 1930s. Two exceptions were the Pet Milk plant, which located here in 1924, and the development of H.L. Miller & Sons dressmakers around 1933. Prior to World War II, the Riverside Park complex was built, many of the older school buildings were replaced, streets and utilities were upgraded, and businesses and homes were constructed. After WW II, Iola continued to expand its utilities, improve its water purification system, resurface and pave residential streets, and build a new

Allen County Postcard Project

hospital, National Guard Armory, business structures and homes. In the 1970's and 1980's the Thompson Poultry Company and the Lehigh Cement Plant began to decline in Iola; however, new industry such as Gates Rubber Company, Haldex, and Russell Stover Candies have reinvigorated Iola's economy.

The City of Iola is proud to serve the citizens and businesses in the community, and we look forward to providing these services in the years ahead! We hope it helps citizens and visitors understand the role of their local government and the commitment we have to providing quality services at affordable costs.

Page 3 of 6

IOLA
RIVERSIDE PARK

Page 5 of 6

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Page 1 of 4

USD 257

Iola, Gas & LaHarpe

HOME | CALENDAR | BOARD OF EDUCATION | ABOUT US | DISTRICT INFORMATION

- Powerschool
  - Parents
  - Teachers
  - Administrators
- Food Service / Menus
- Web Site Information
- Student Links
- Teacher Links
- USD 257 Video
  NEW
  2008 IHS Graduation

Tuesday July 1, 2008

- Have a Great Summer!

ZIP: 66749
Temp. Wind
N
W 3 MPH E
S
87.0°F

"Inspiring All Our Students To Succeed!"

Central Office
408 North Cottonwood
Iola, KS 66749
(620) 365-4700

Dr. Craig Neuenswander
Superintendent

Iola High School
300 East Jackson
Iola, KS 66749
(620) 365-4715

Iola Middle School
600 East Street
Iola, KS 66749
(620) 365-4785

McKinley Elementary
209 South Kentucky
Iola, KS 66749
(620) 365-4860

Lincoln Elementary
700 North Jefferson
Iola, KS 66749
(620) 365-4820

Jefferson Element
300 South Jefferson
Iola, KS 66749
(620) 365-4840

LaHarpe Elementary
902 South Washington
LaHarpe, KS 66751
(620) 496-2261

USD 257 is an equal opportunity employer and shall not discriminate because of an individual's race, color, religion, sex, age, disability or national origin.

Page 1 of 4

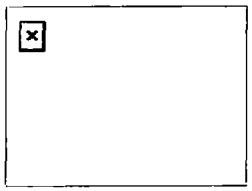
32

Helpful Phone Numbers

Jefferson School Office	365-4840
Jefferson School Counselor	365-4850

More Helpful Numbers

LaHarpe School Office	365-4860
Lincoln School Office	365-4820
McKinley School Office	365-4860
Iola Middle School	365-4785
Iola Sr. High School	365-4715
School Psychologist Office	365-4751



Page 3 of 4

WeatherBug

Current conditions at the Jefferson Elementary weather reporting station.

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Page 4 of 4

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KANSAS STATE UNIVERSITY | College of Agriculture
Department of Agronomy
Crop, Soil, and Range Sciences

July 25, 2012

Kumud Pyakuryal
Tetra Tech, Inc 415
Oak Street Kansas
City, MO 64106

Dear Sir:

As requested, I am providing wind rose data for Kansas. The first set of data is from the early 1900's and consists of 4 images per year for a 5 year period (1901-1905). During this time, only the prevailing direction was presented. I have included the annual map, as well as the maps for March and September since these are months that typically have a great deal of variability.

A second set of wind rose images were built on the hourly data from the mid-1900's (1951-1955). Since your area of interest is Iola, KS, I've included annual wind rose for Emporia and Chanute. These are the two nearest locations. There is one image per station, as these have the various component directions as well as the predominant vector.

The final set of images covers the most recent 5 year period – 2007 through 2011. Again, these are based on hourly data and are for the two closest stations to the target location. All wind speeds are in miles per hour.

The raw hourly data used to produce the images has also been included. If you have questions or need additional information, please let me know.

Sincerely,

Mary Christine Knapp

Mary Knapp
State Climatologist 2004
Throckmorton Hall
Kansas State University
Manhattan, KS

2004 Throckmorton Plant Sciences Center, Manhattan, KS 66506-5501 | (785) 532-6101 | fax: (785) 532-6094

U. S. DEPARTMENT OF AGRICULTURE.

ANNUAL SUMMARY. 1901.

KANSAS S F,CTION

OF THE

CLIMATE AND CROP SERVICE

OF THE

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P R EP ARED UN DER. DI R

WILLIS L. MOORE,

CHIEF OF W EAT H ER BUREAU.

BY

T. B. JENNINGS,

SECTION DIRECTOR.

TOPEKA, KANS.:
WEATHER BUREAU OFFICE.
1901.

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1905.

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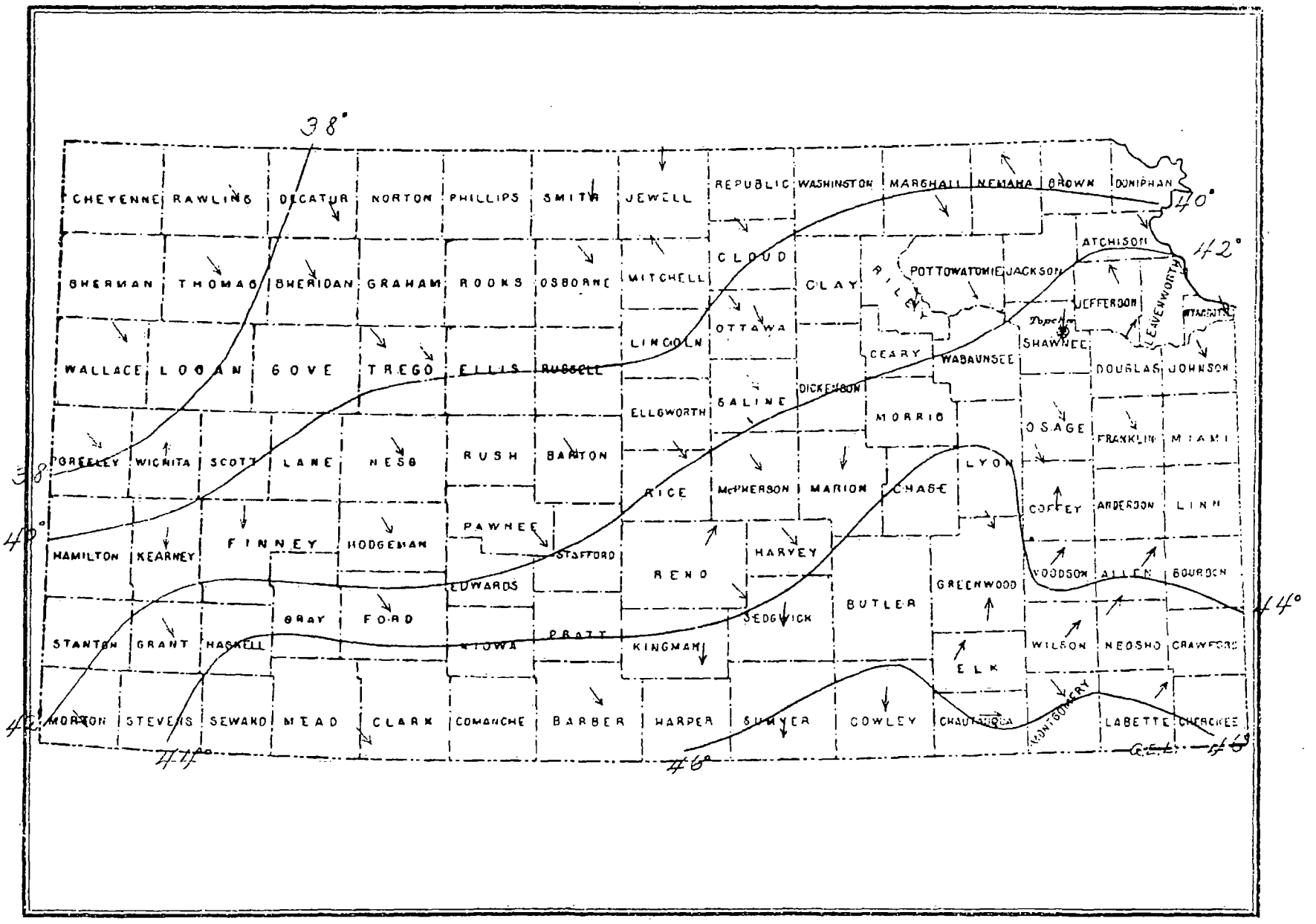
WEATHER BUREAU OFFICE,
1906.

Monthly Mean Isotherms and Prevailing Winds for March.

(Arrows fly with the wind.)



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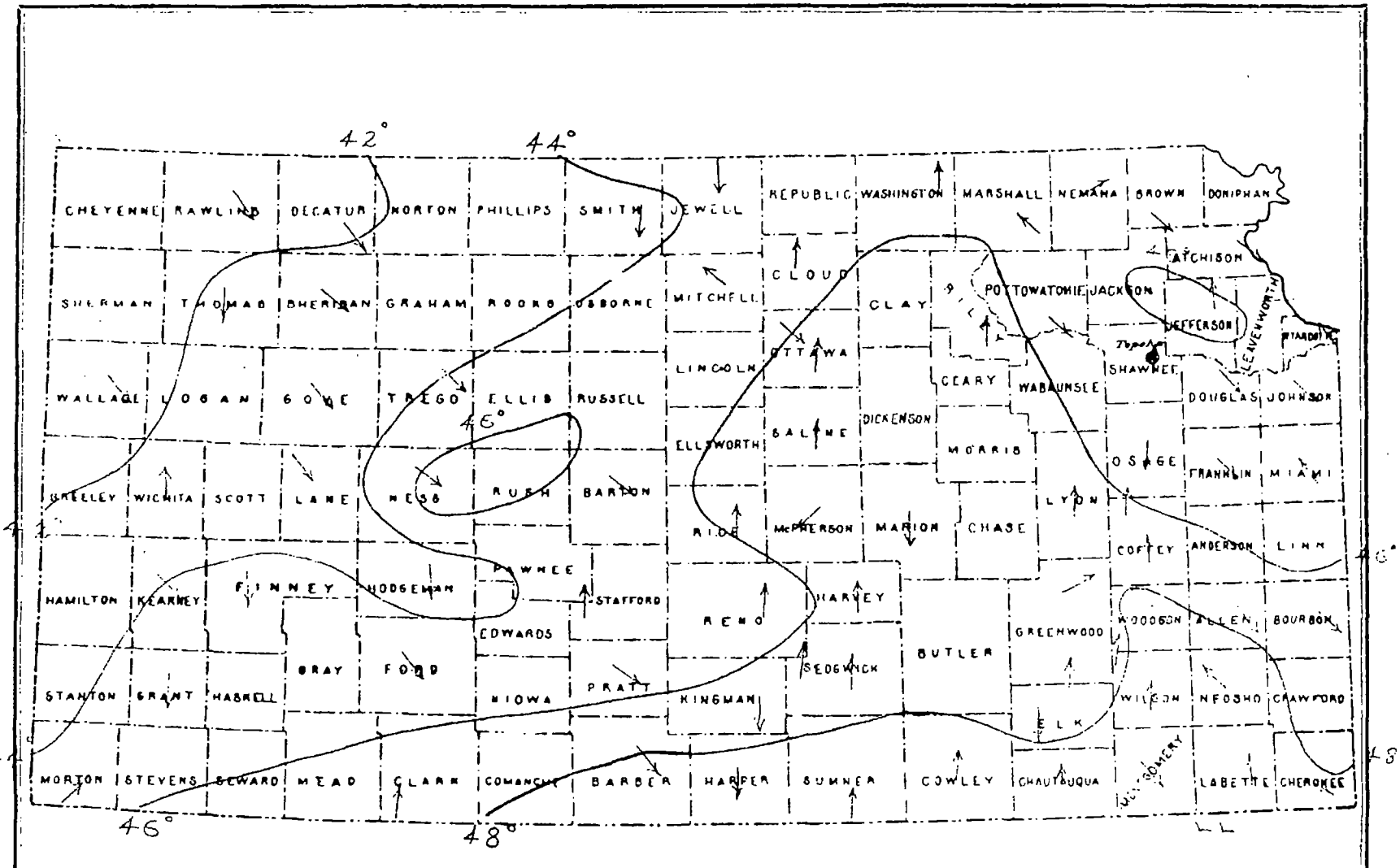

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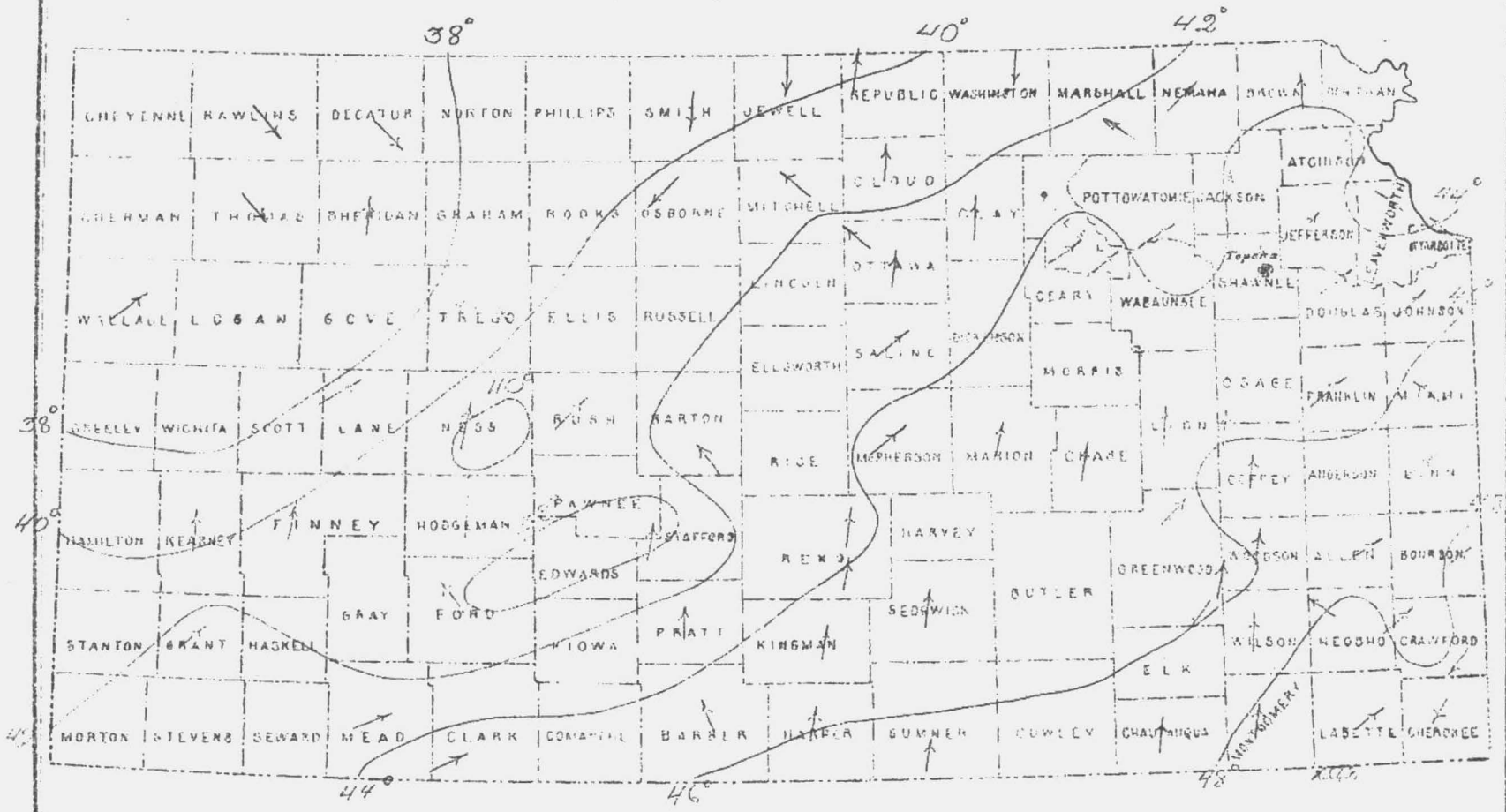

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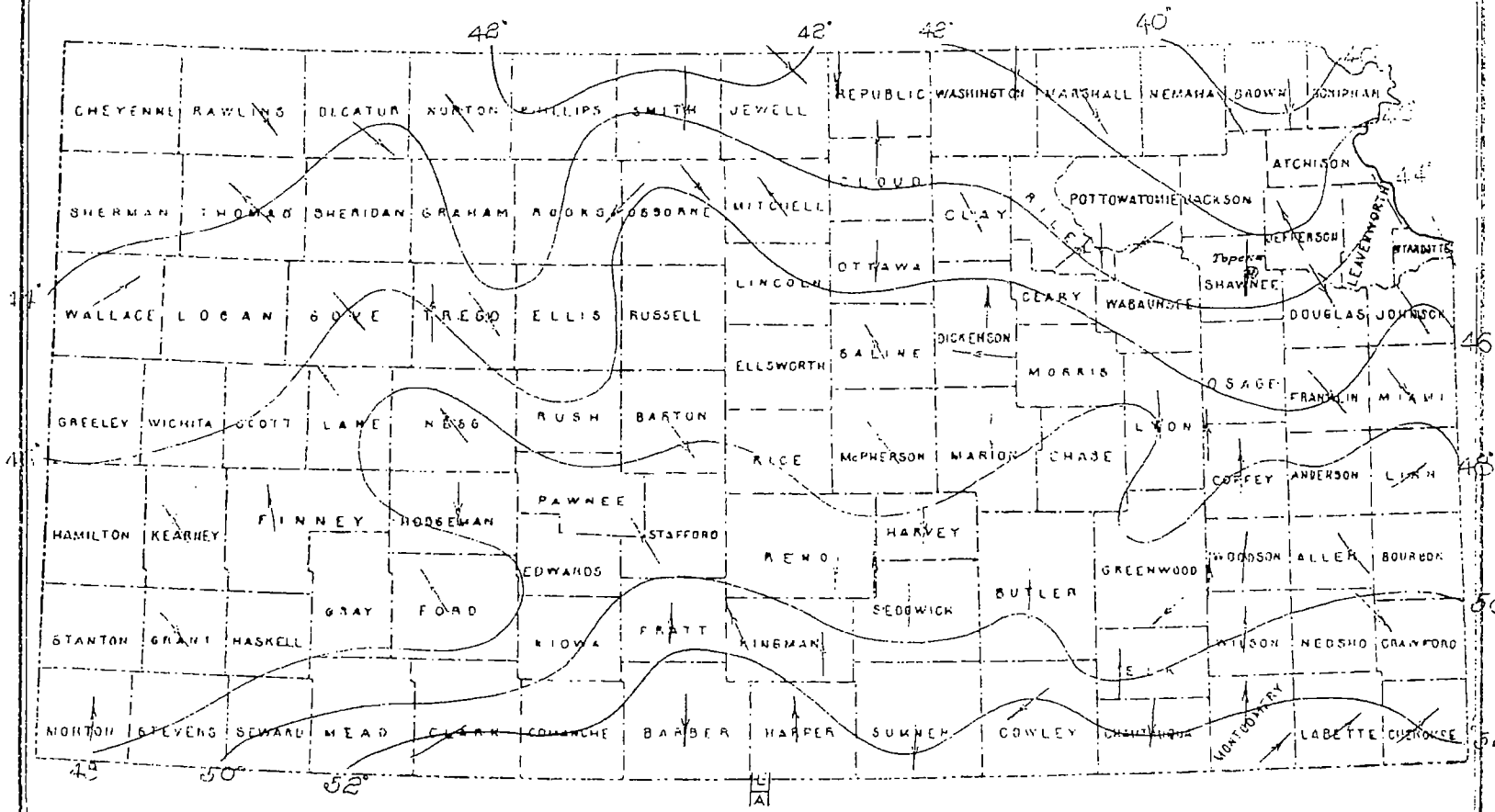

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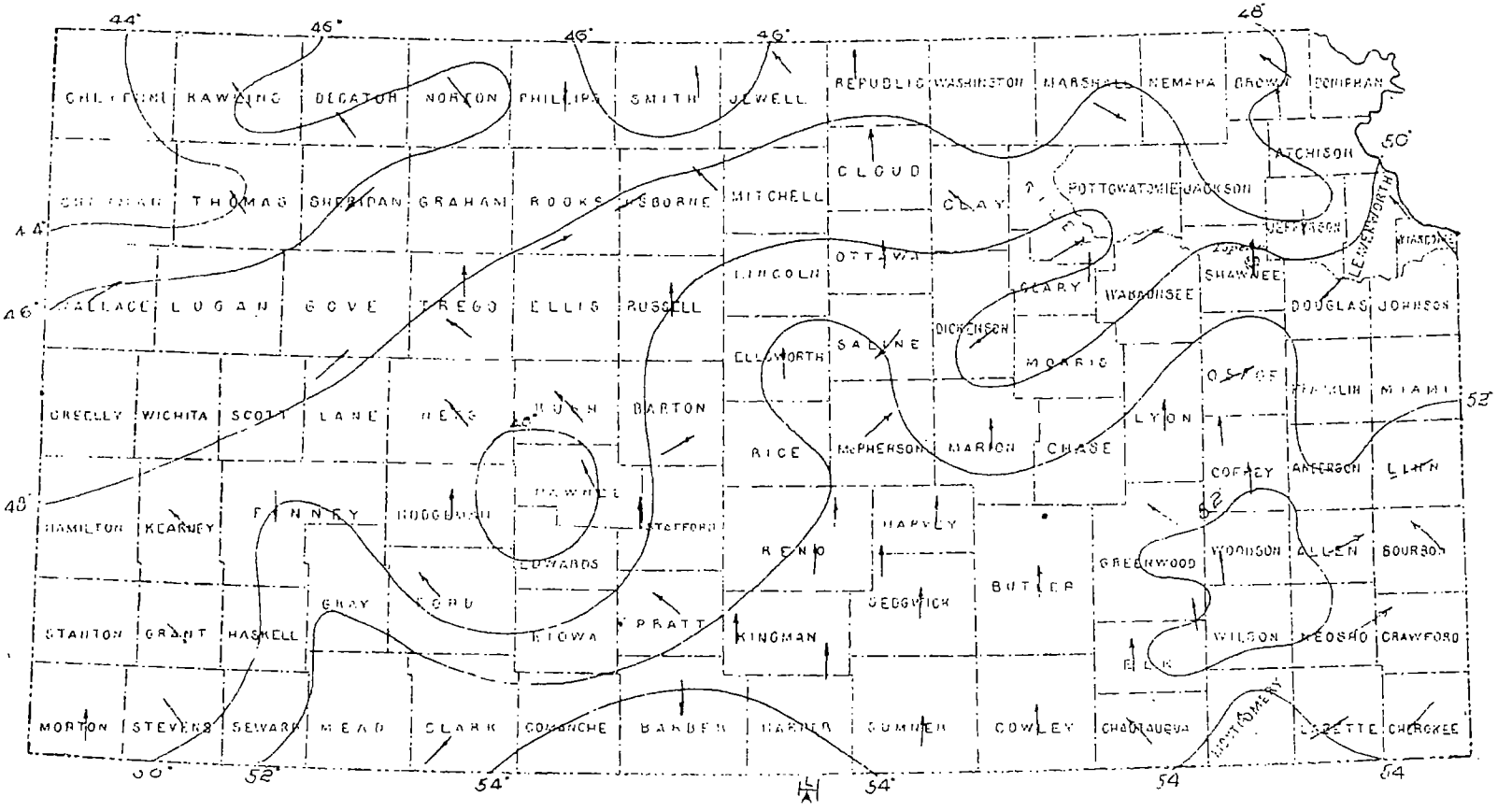

Monthly Mean Isotherms and Prevailing Winds for October.

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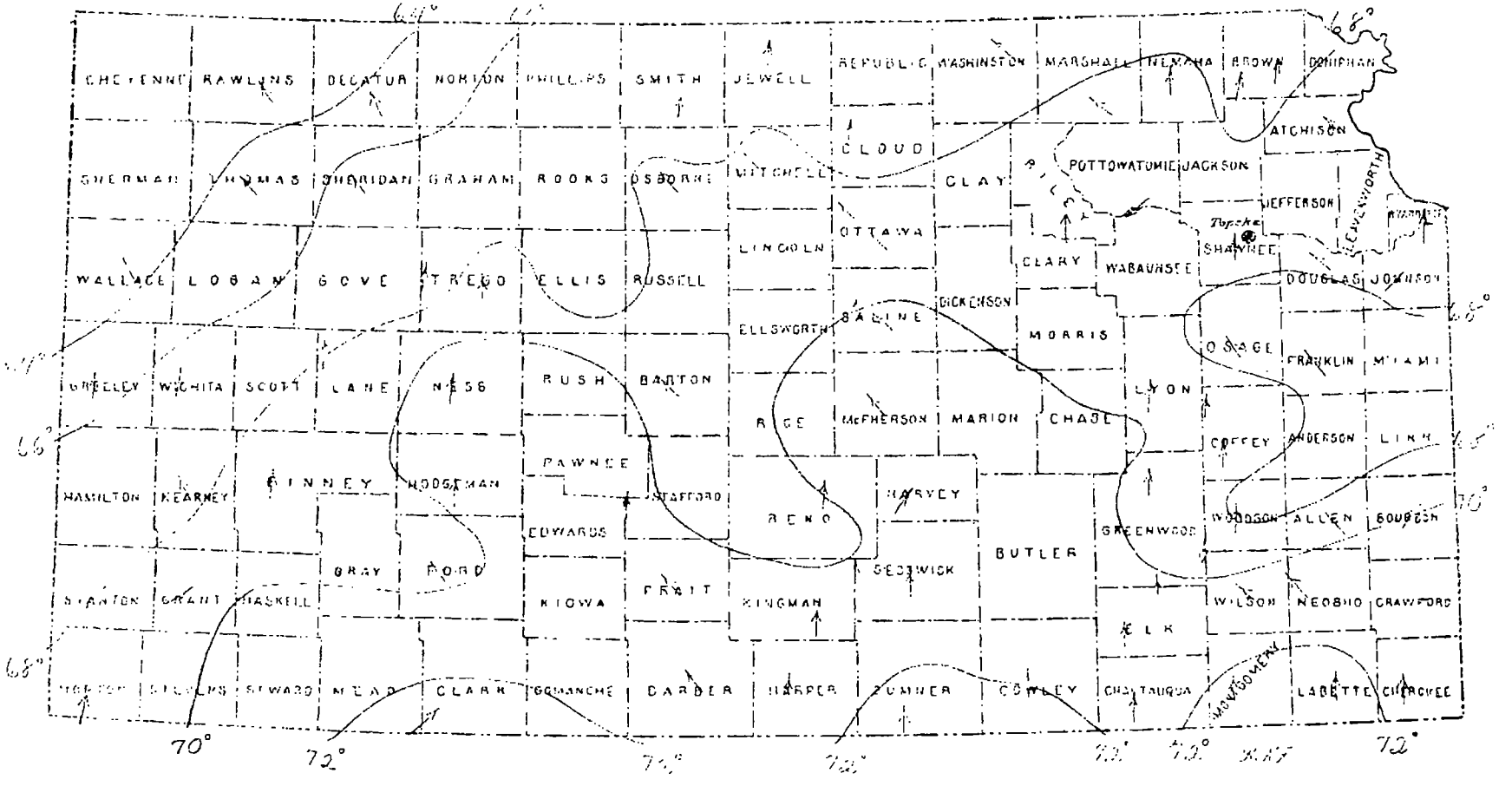

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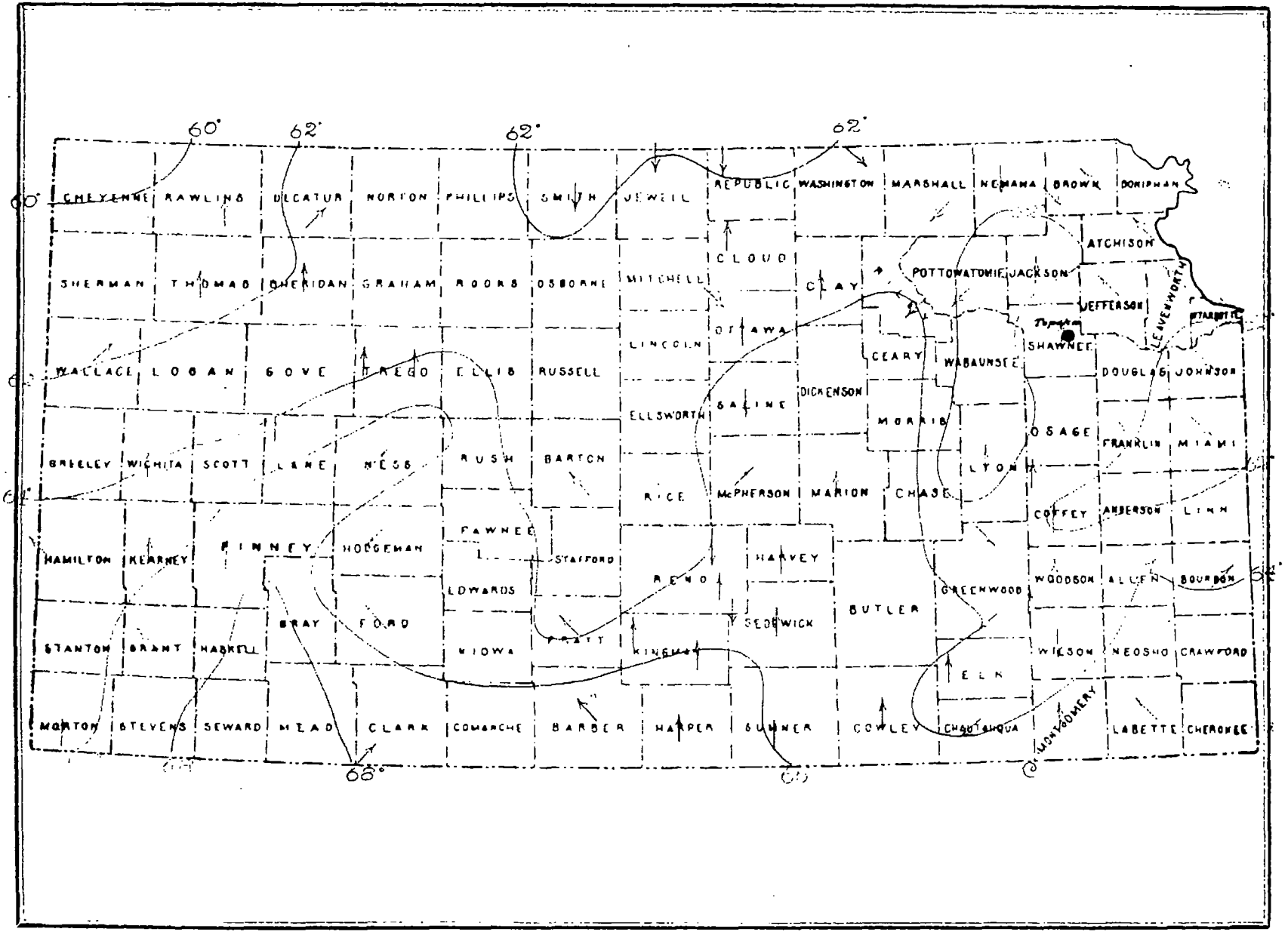

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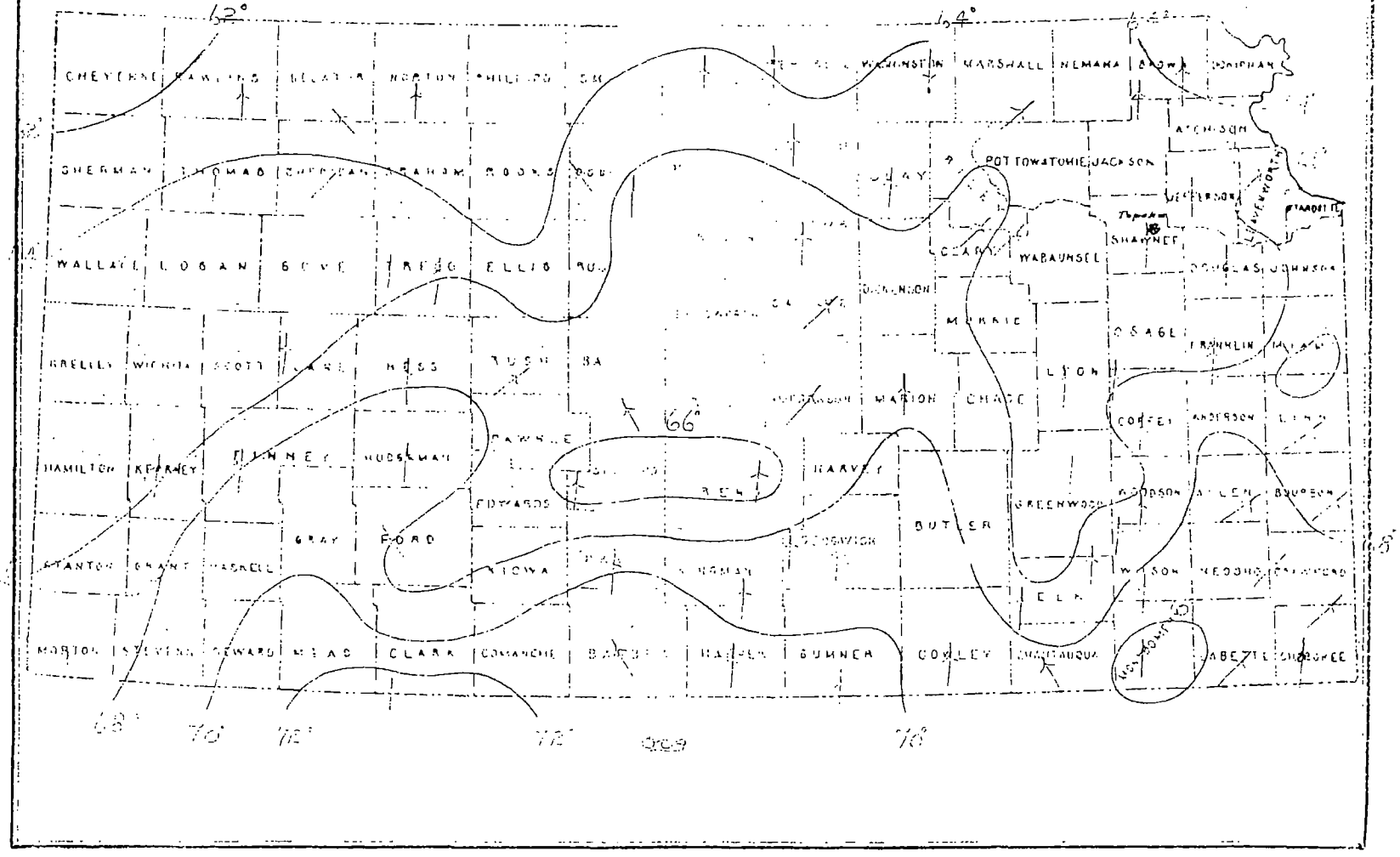

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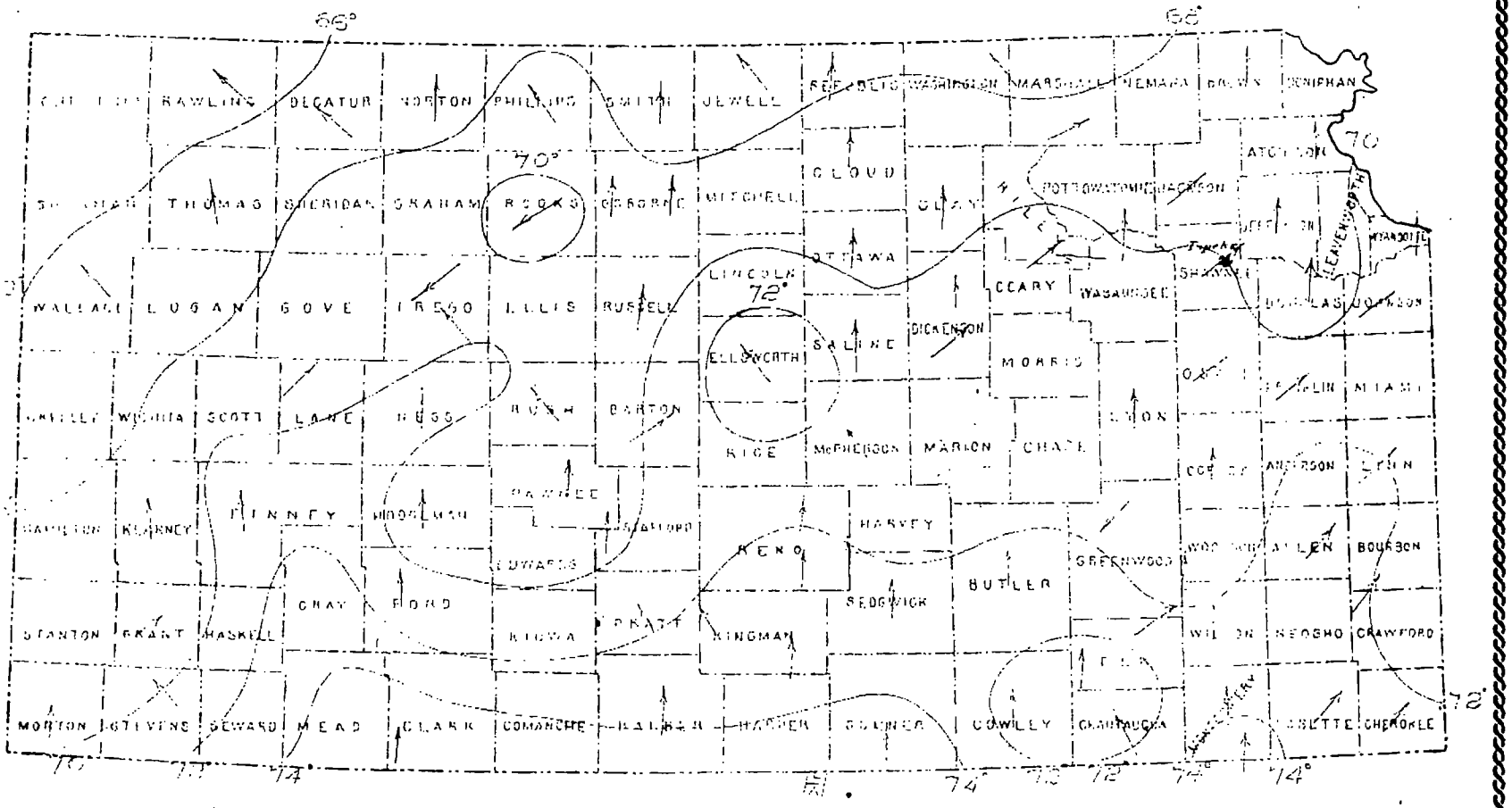

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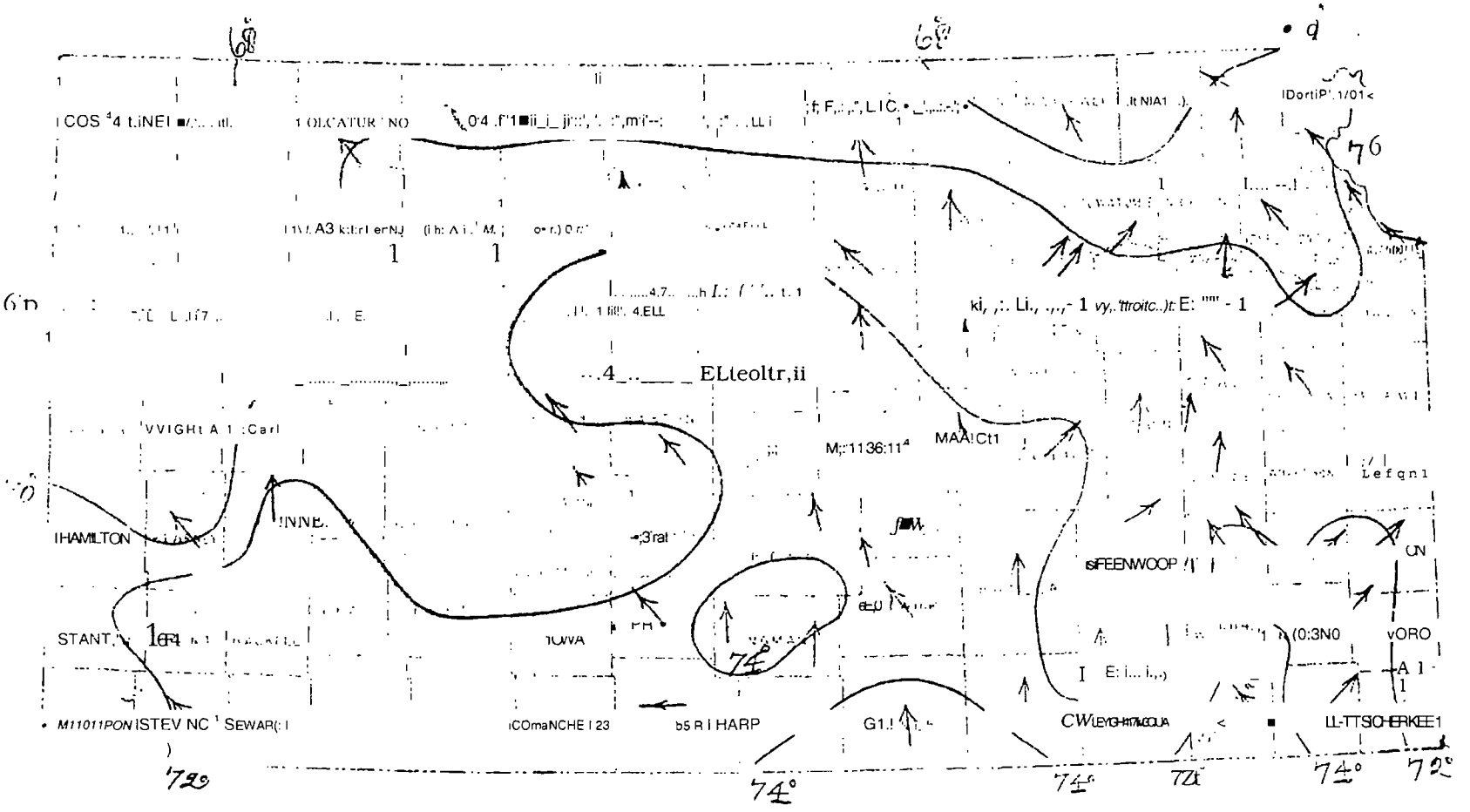
(Arrows tiv with the wind.)



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Mean Isotherms and Prevailing Winds for the Year 1901.

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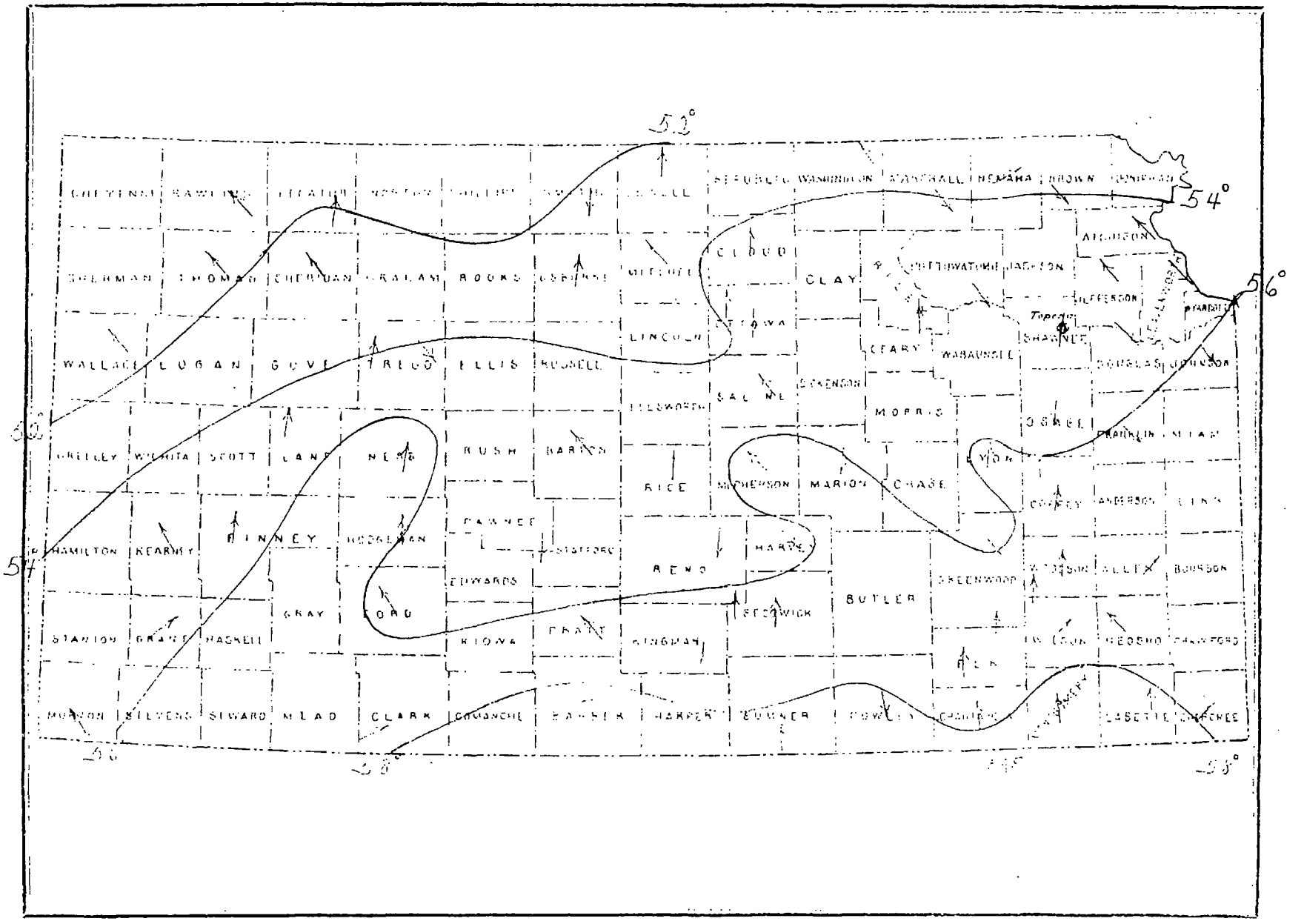

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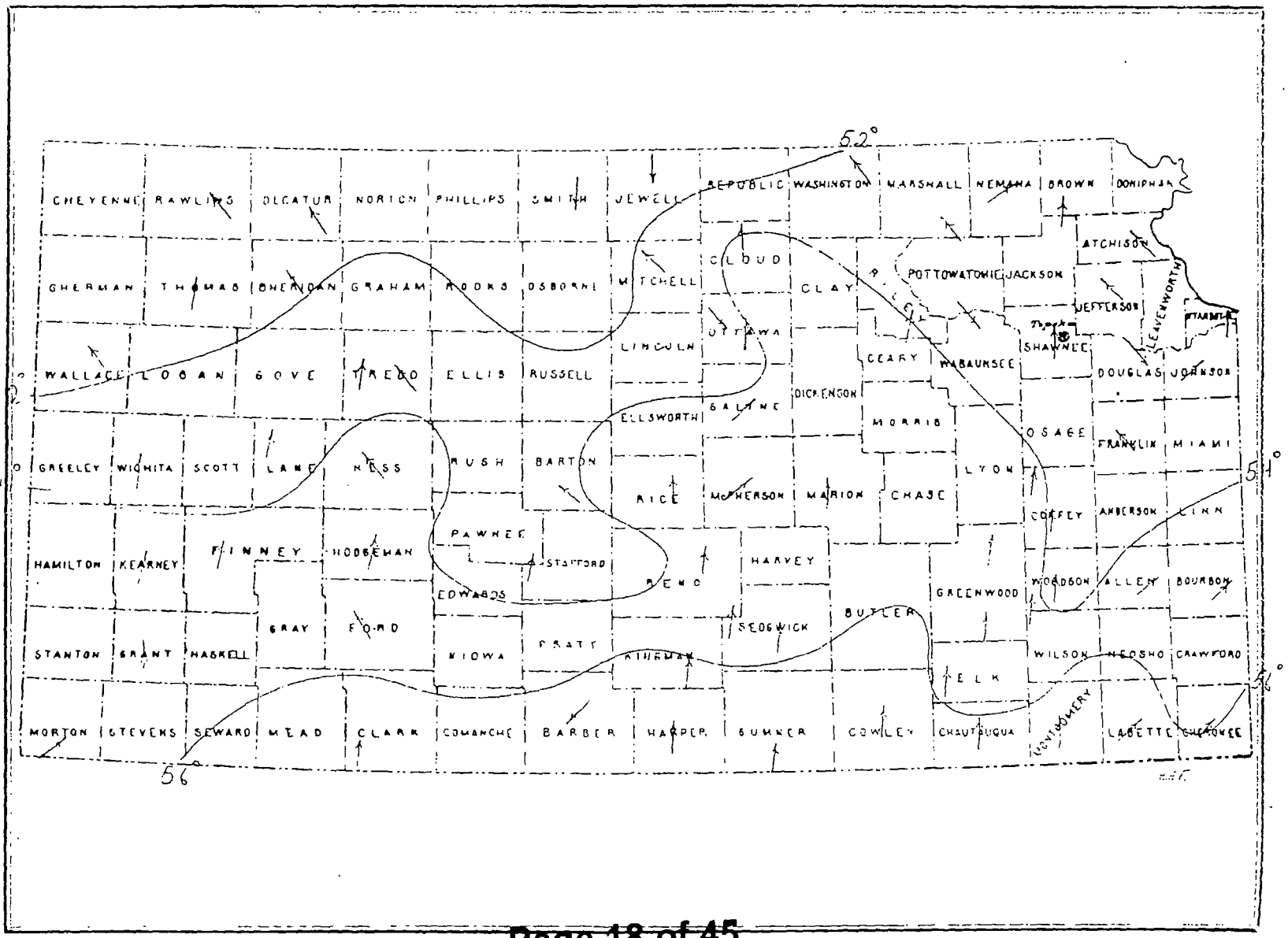

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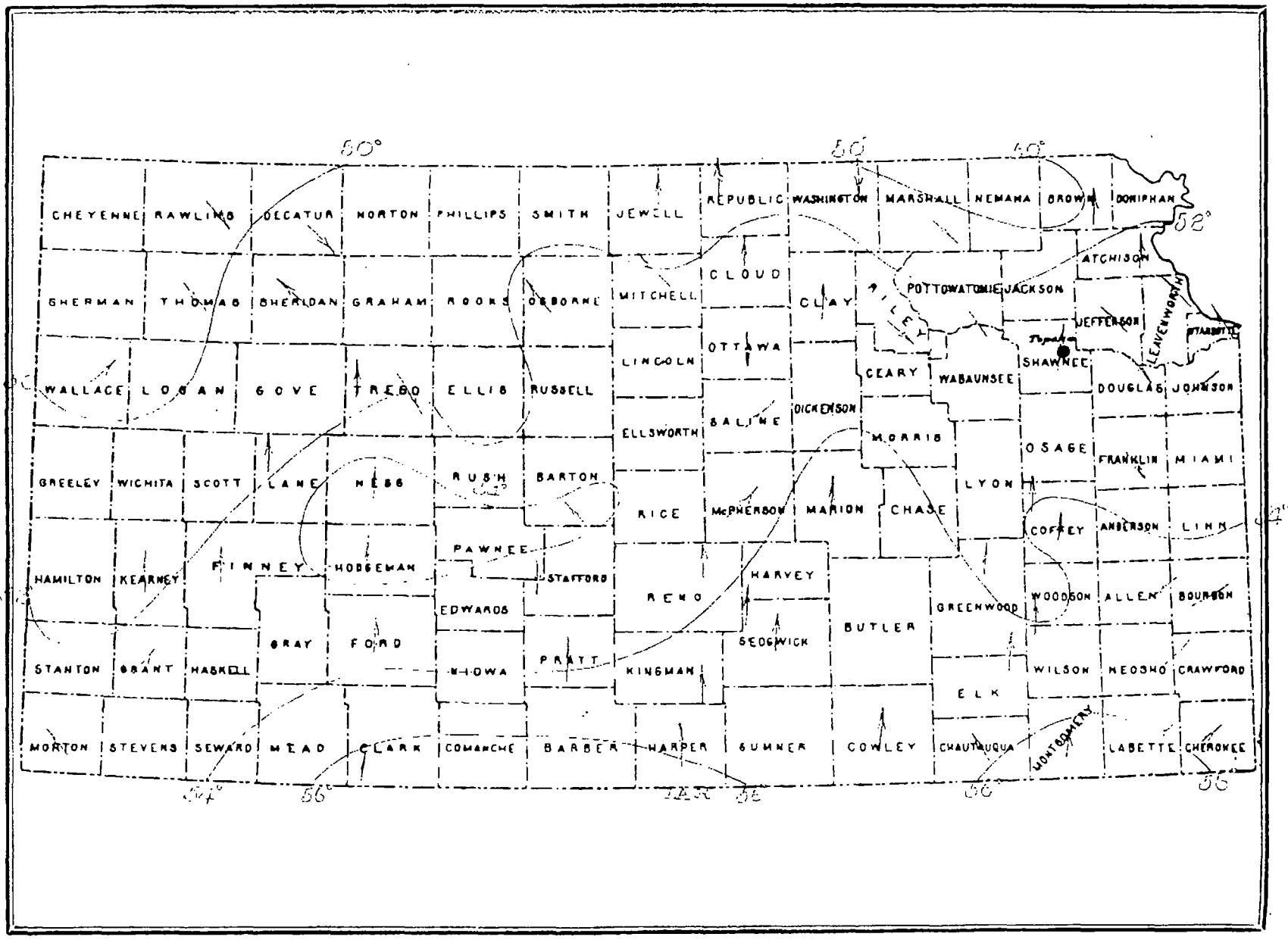

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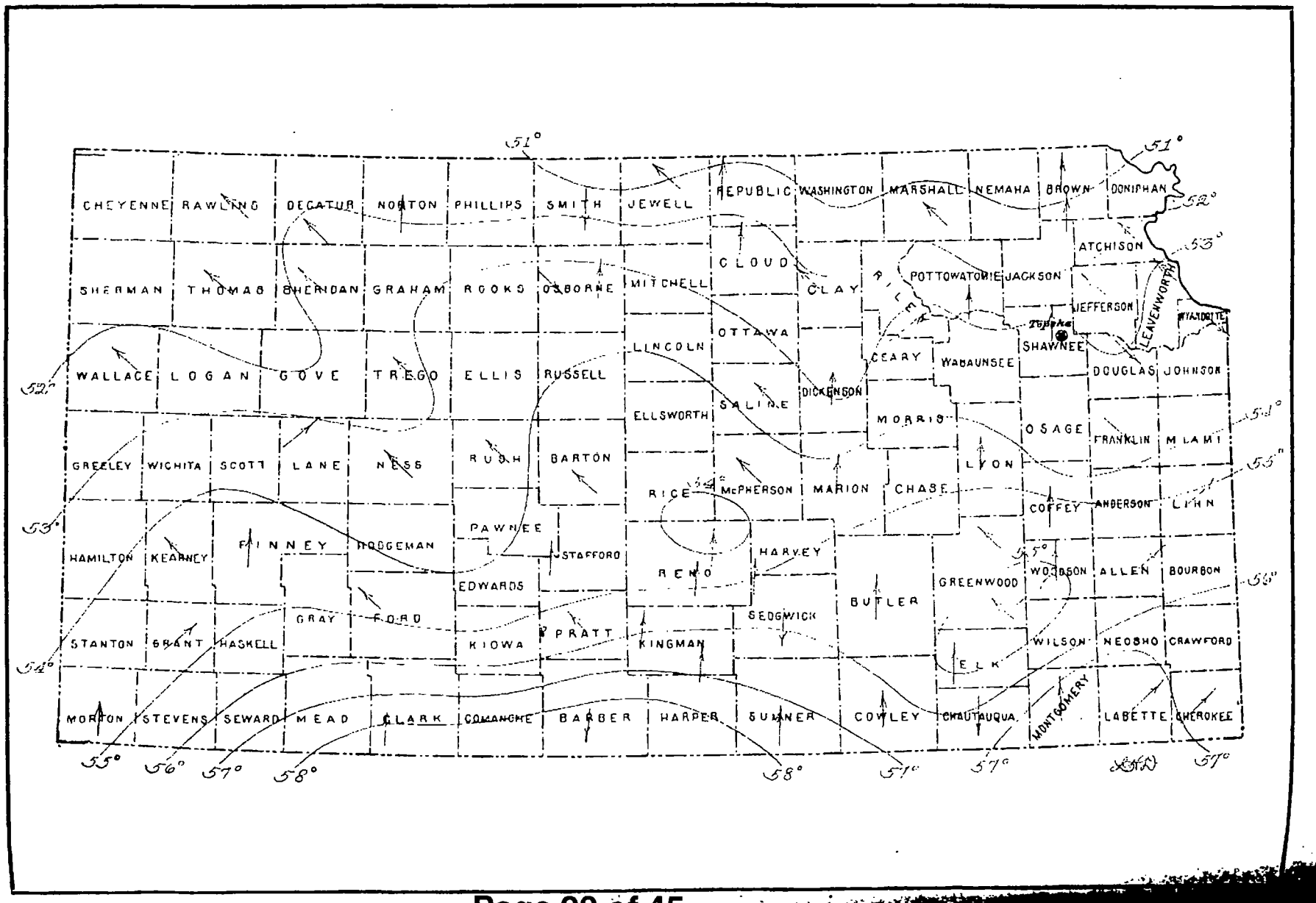

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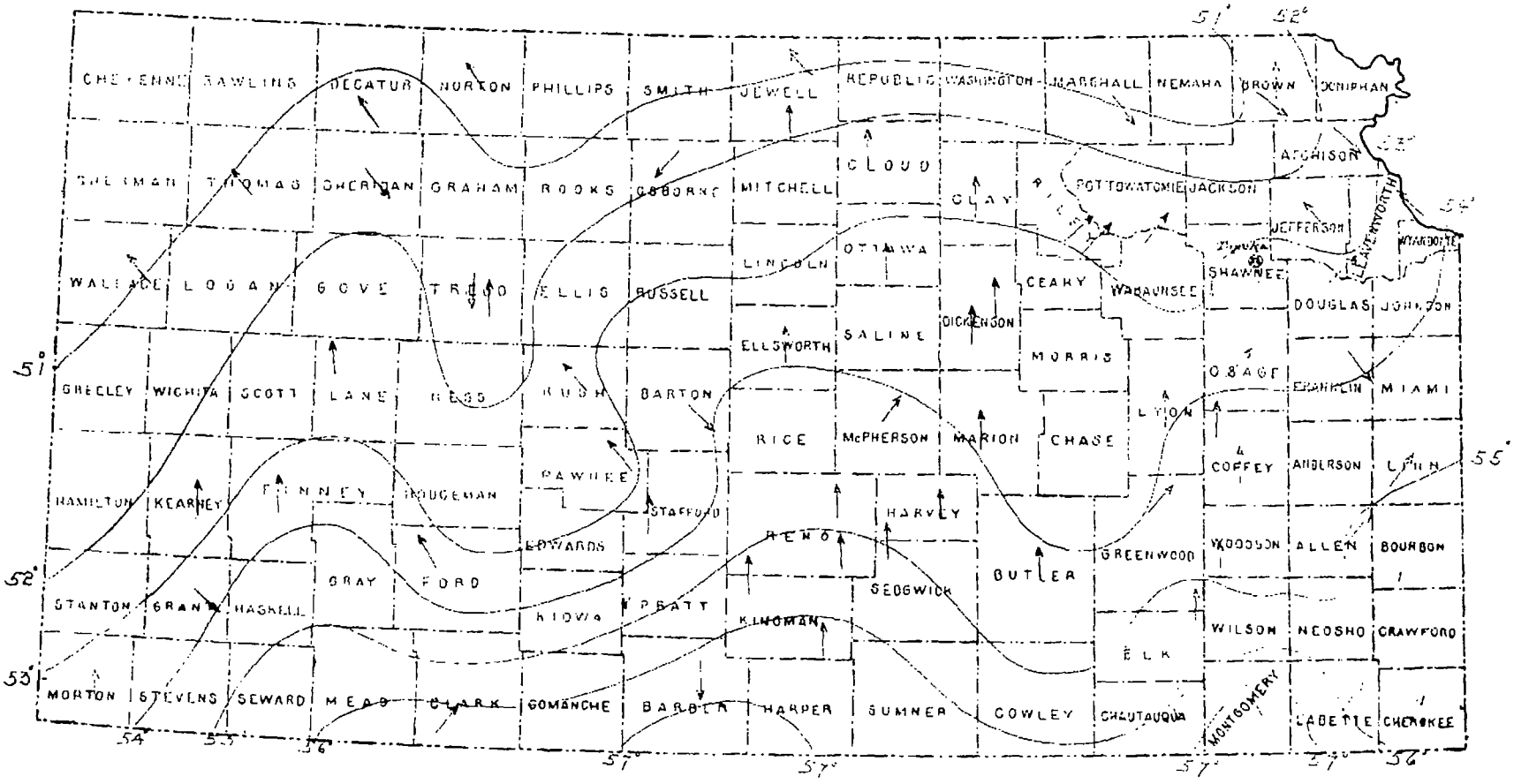

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PREPARED UNDER DIR

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CHIEF OF WEATHER BUREAU.

BY

T. B. JENNINGS,

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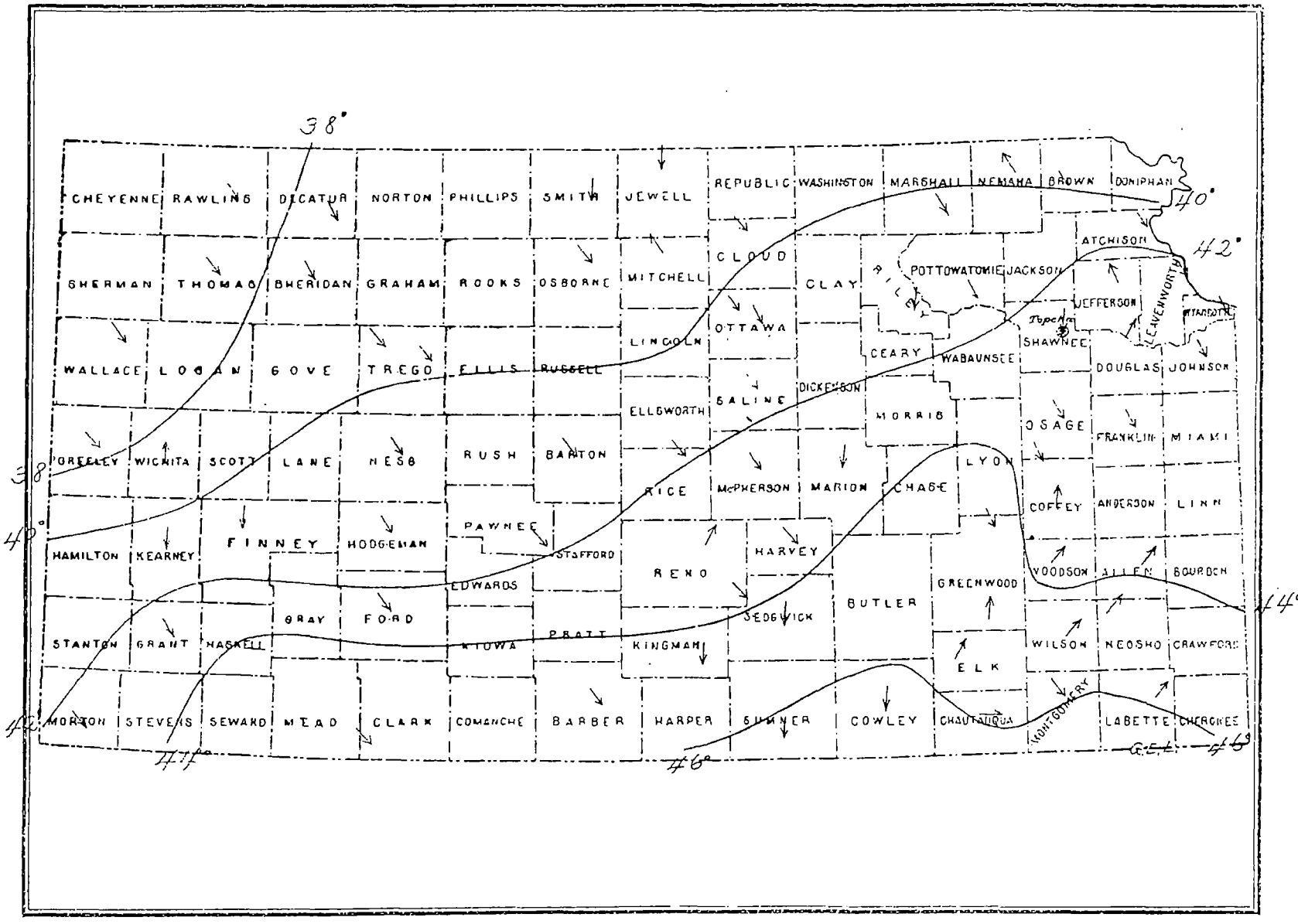

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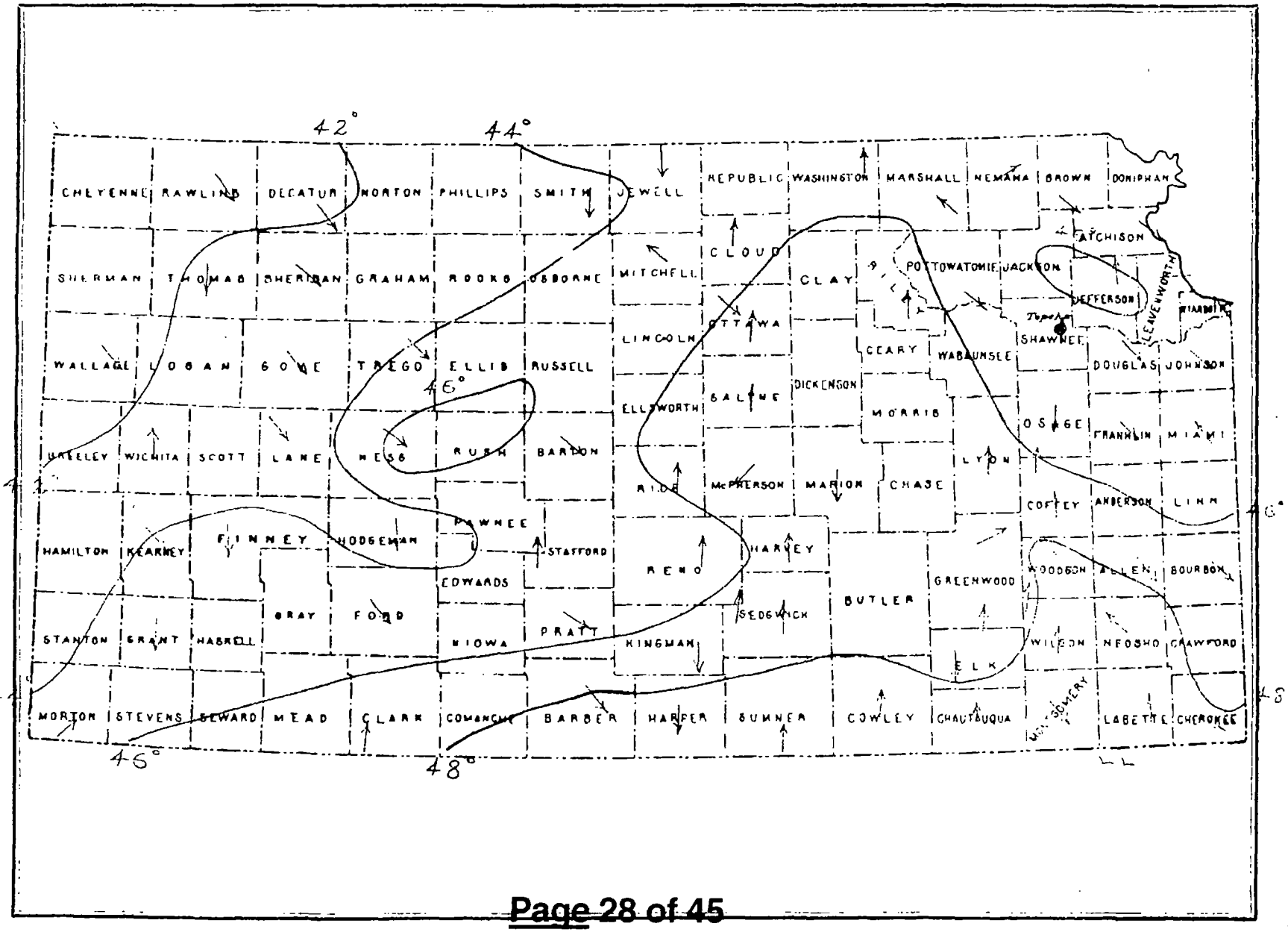

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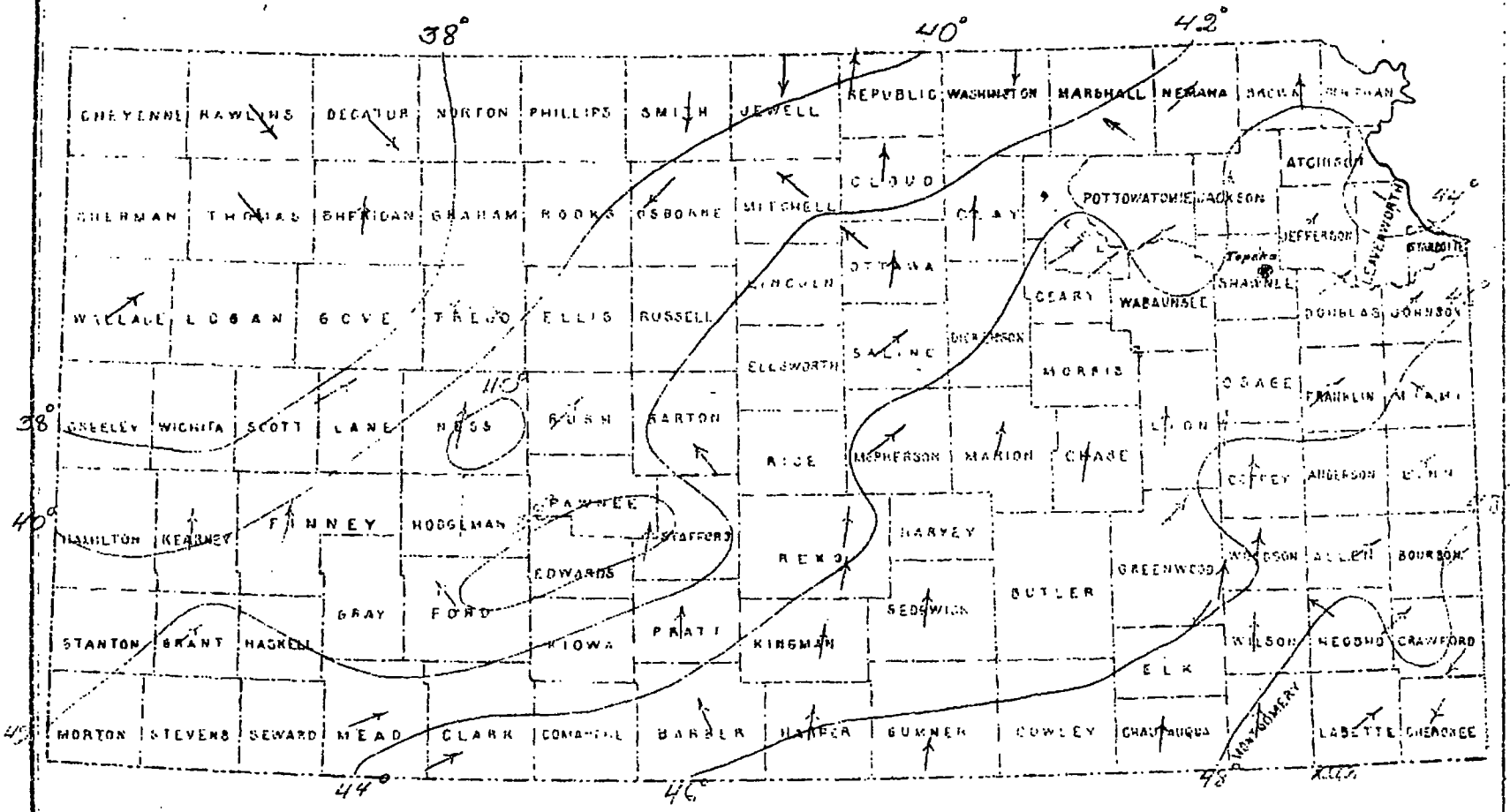

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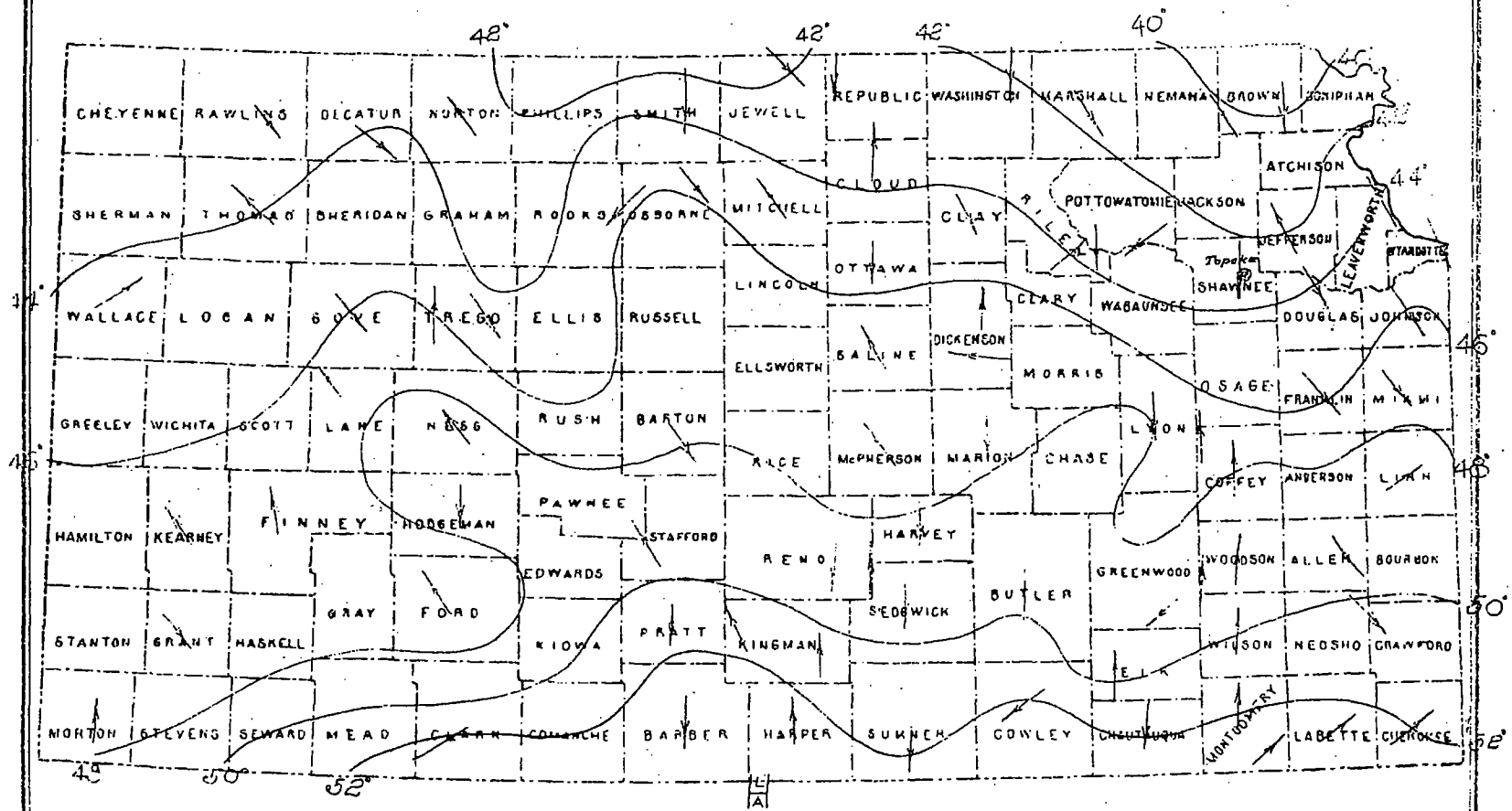

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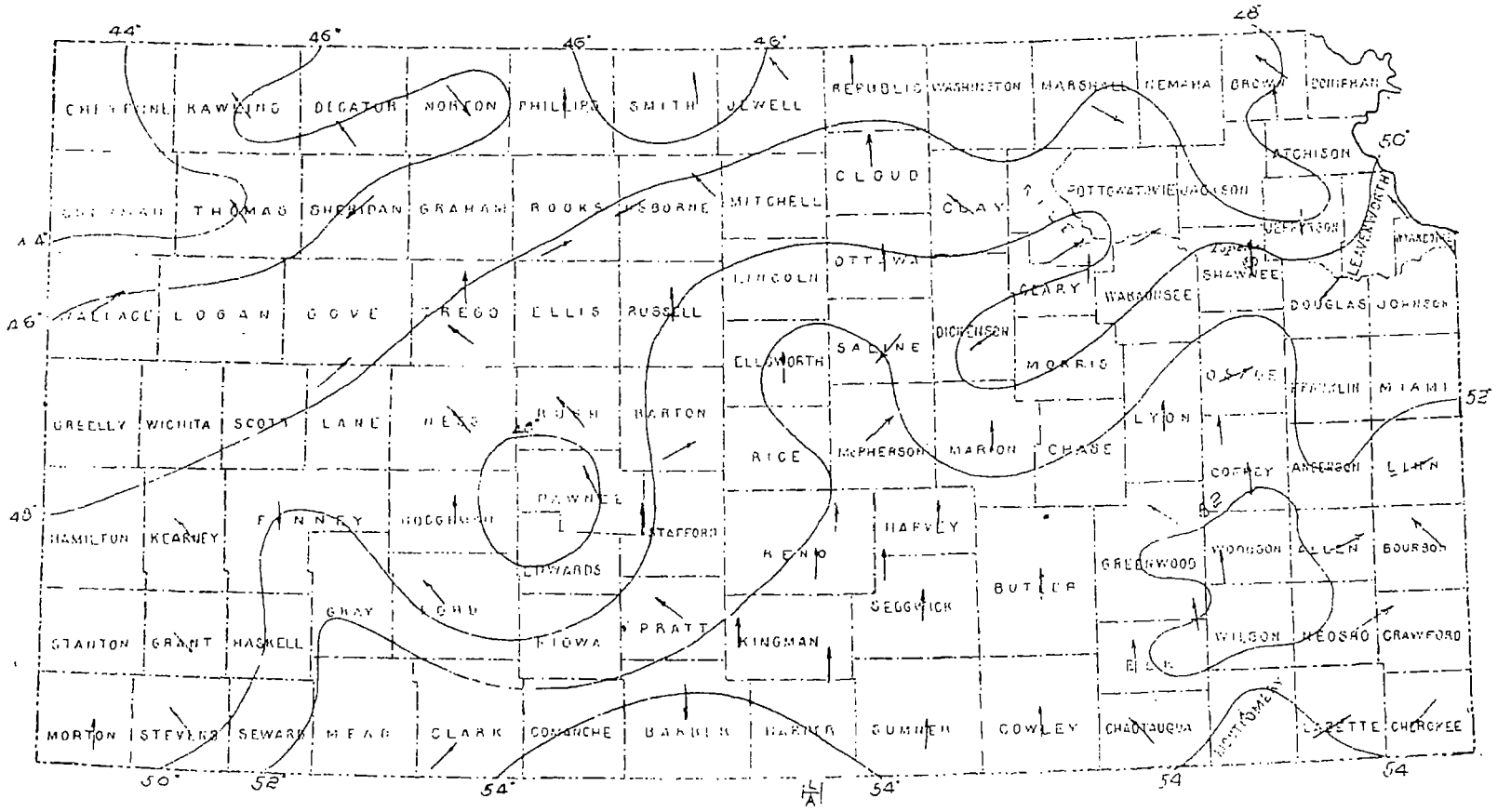

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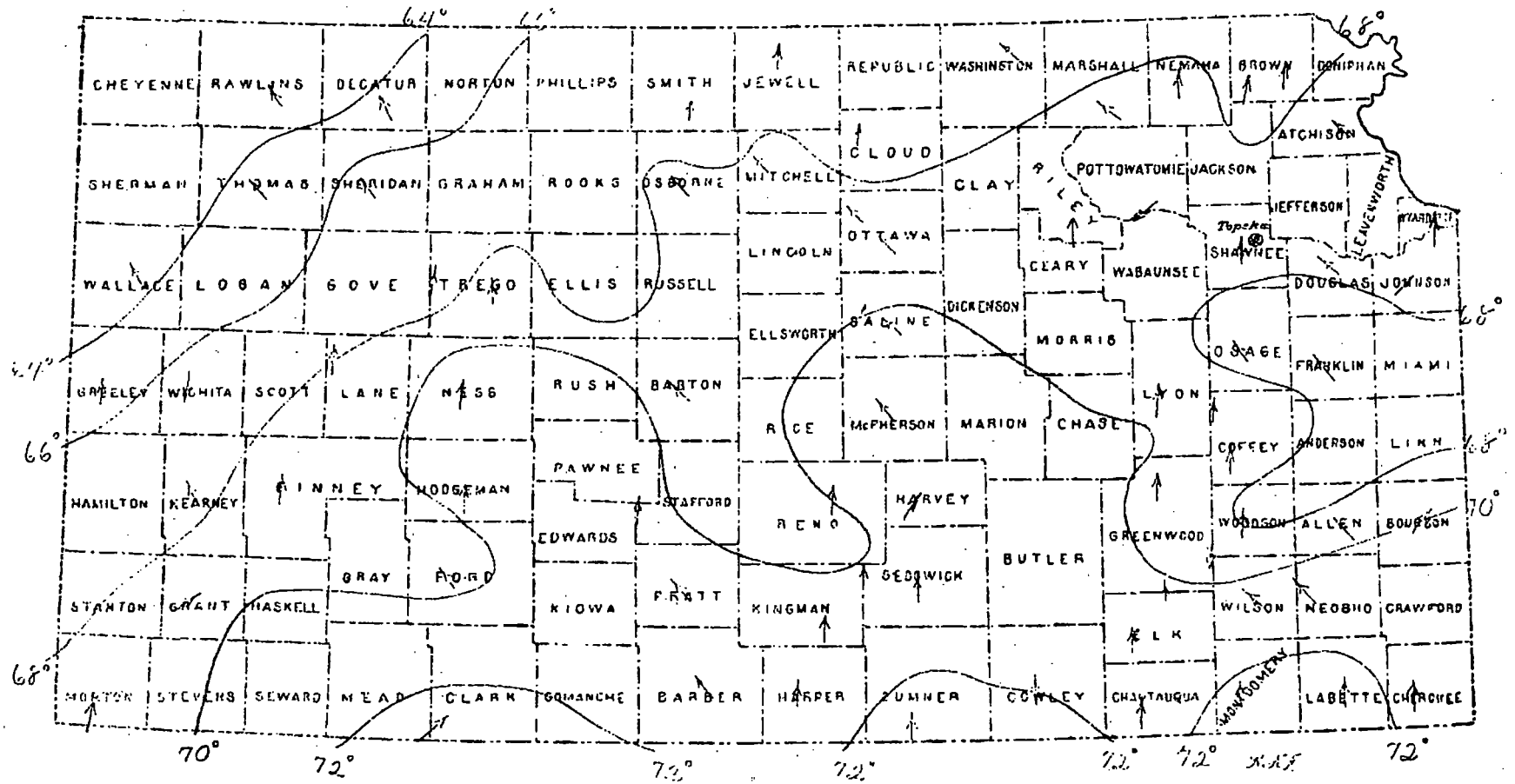

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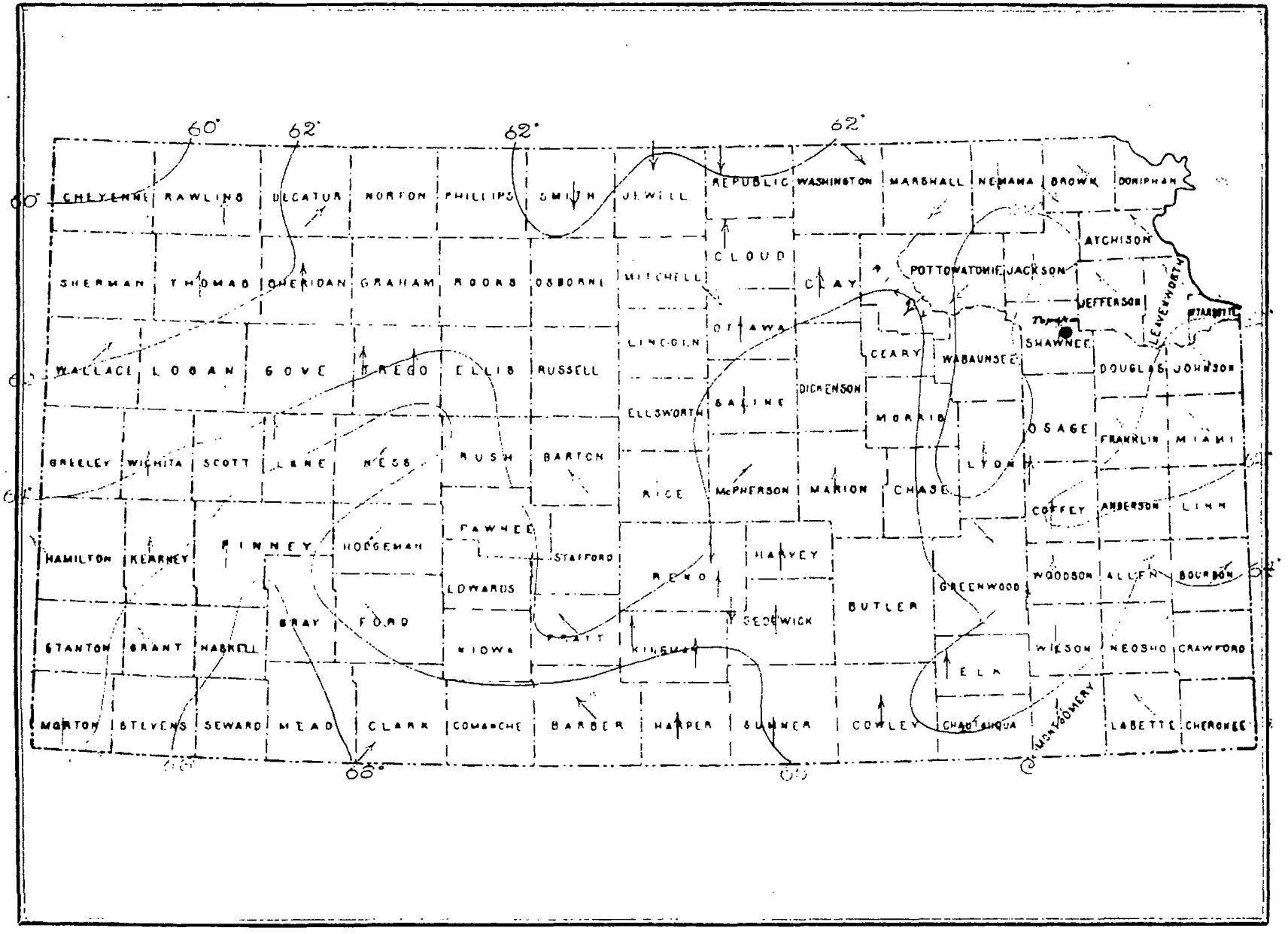

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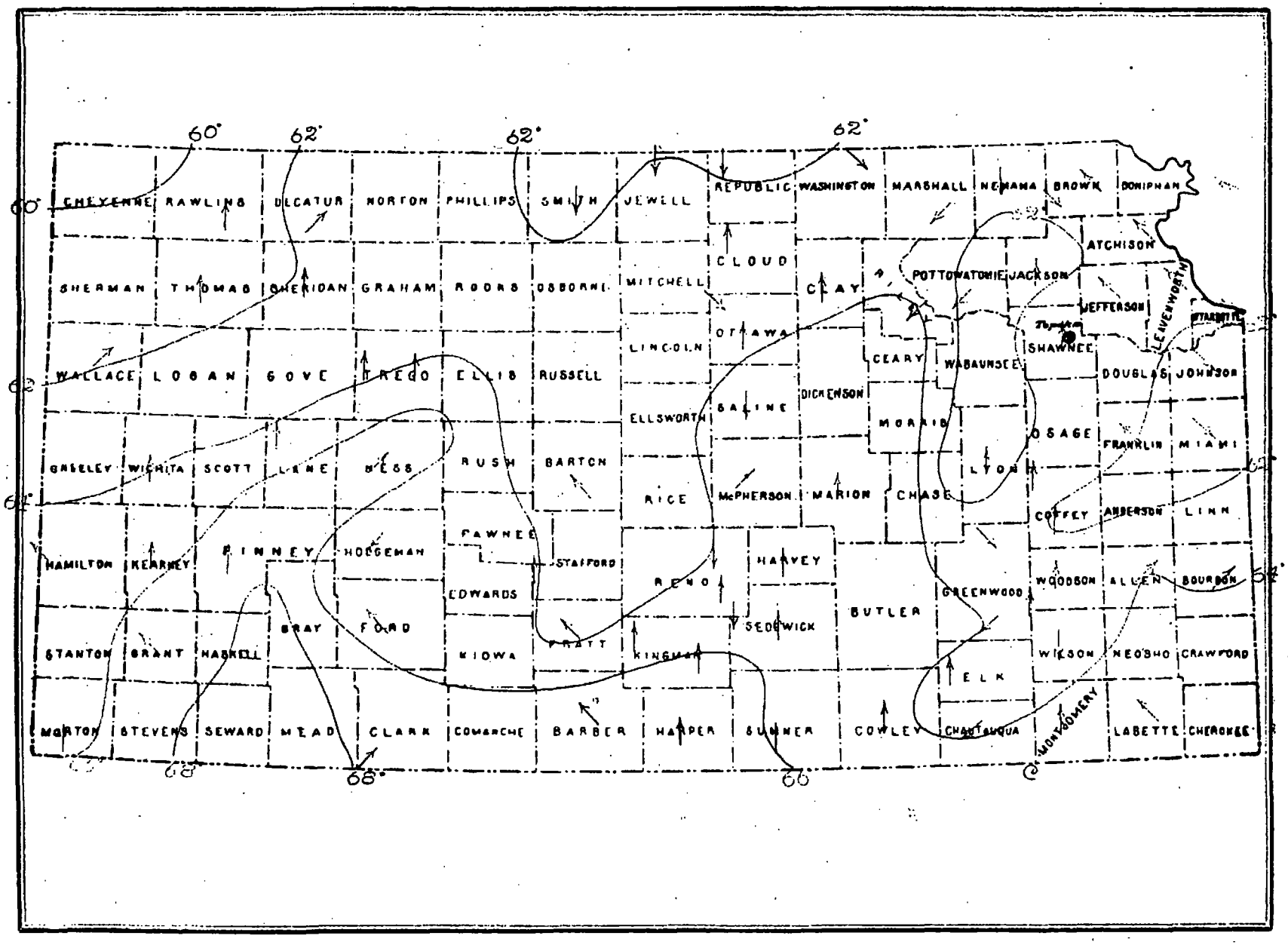
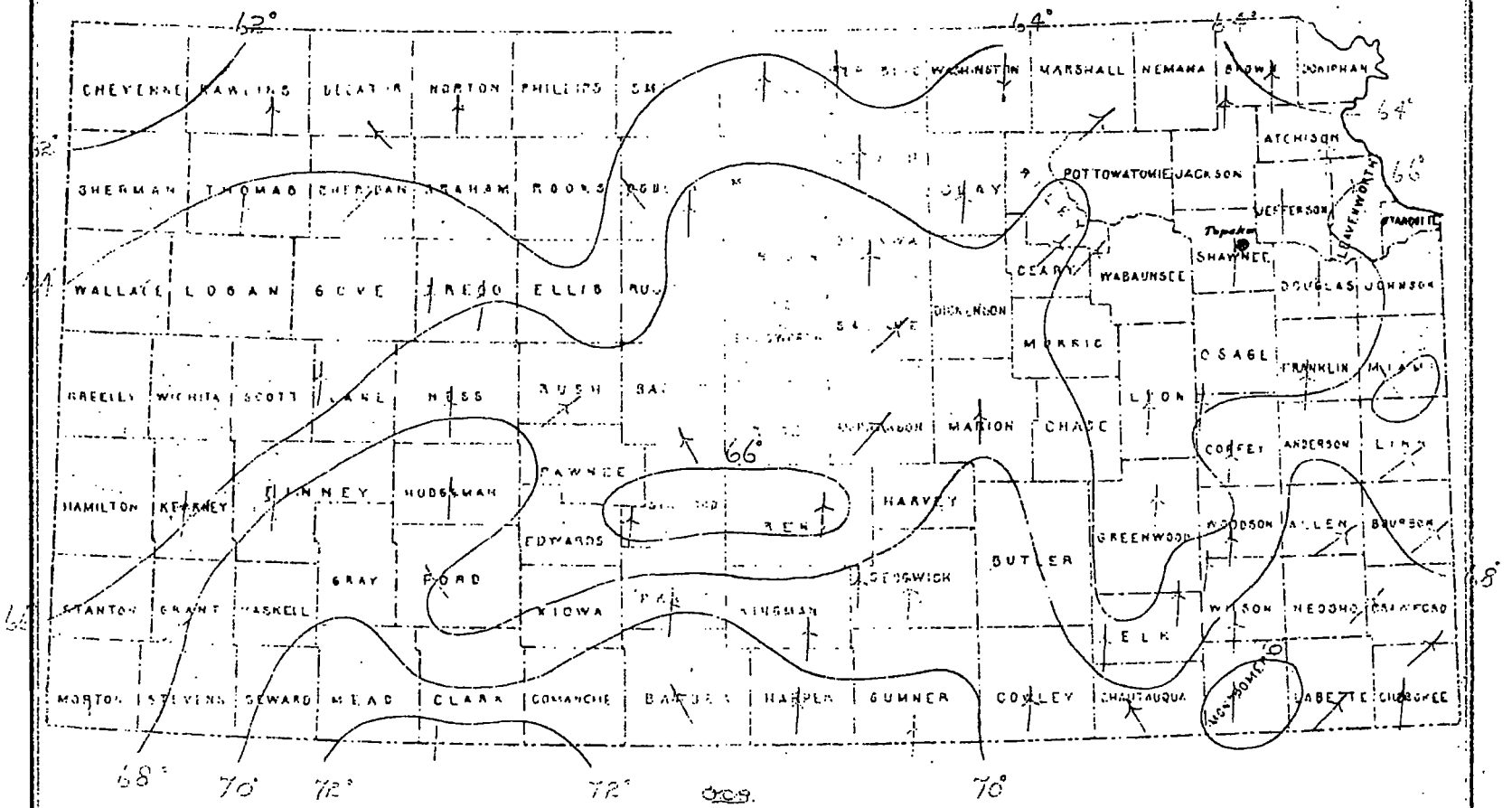


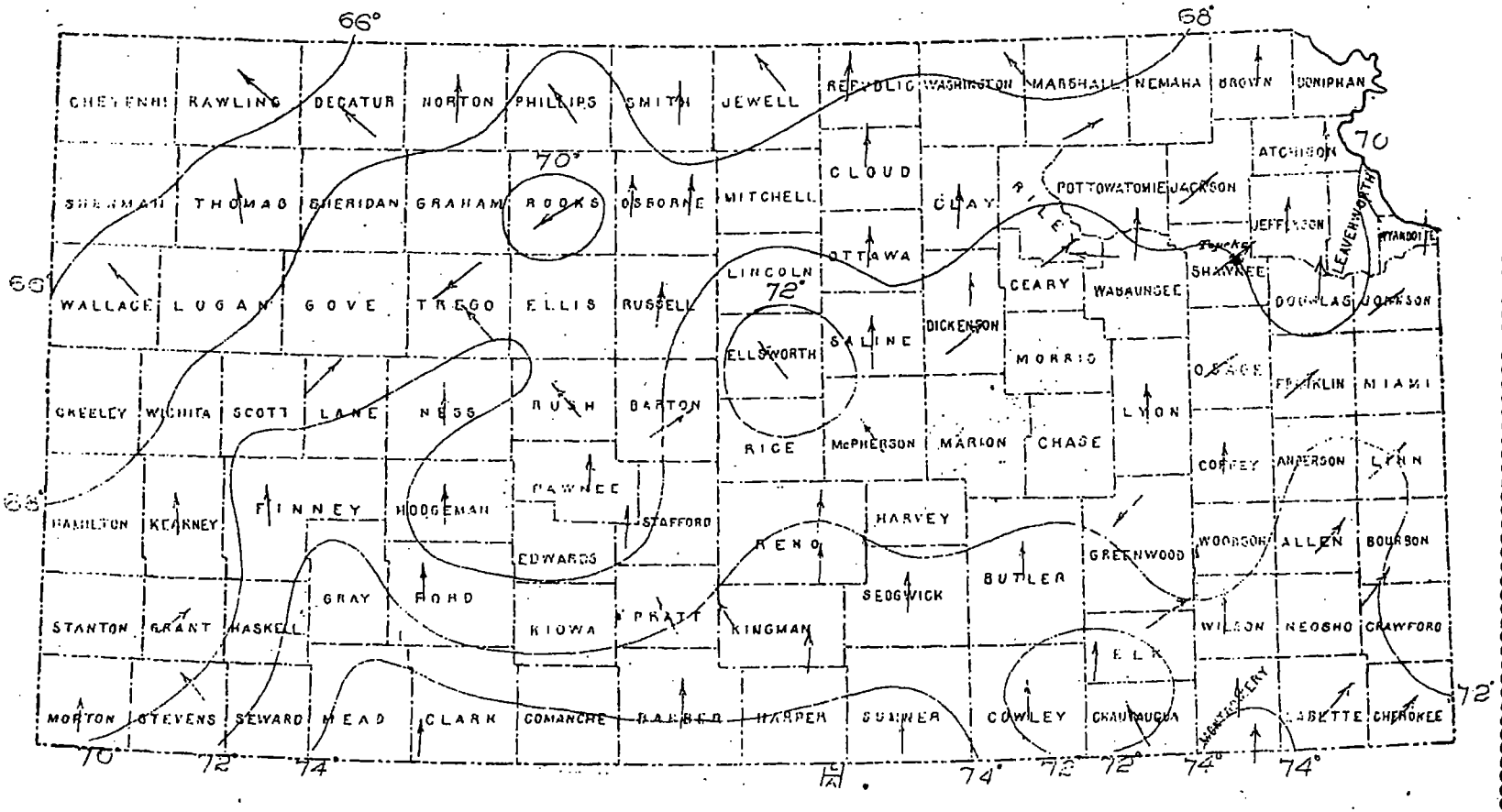
Mean Isotherms and Prevailing Winds for September, 1903.

(Arrows fly with the wind.)



Mean Isotherms and Prevailing Winds for September, 1904.

(Arrows fly with the wind.)



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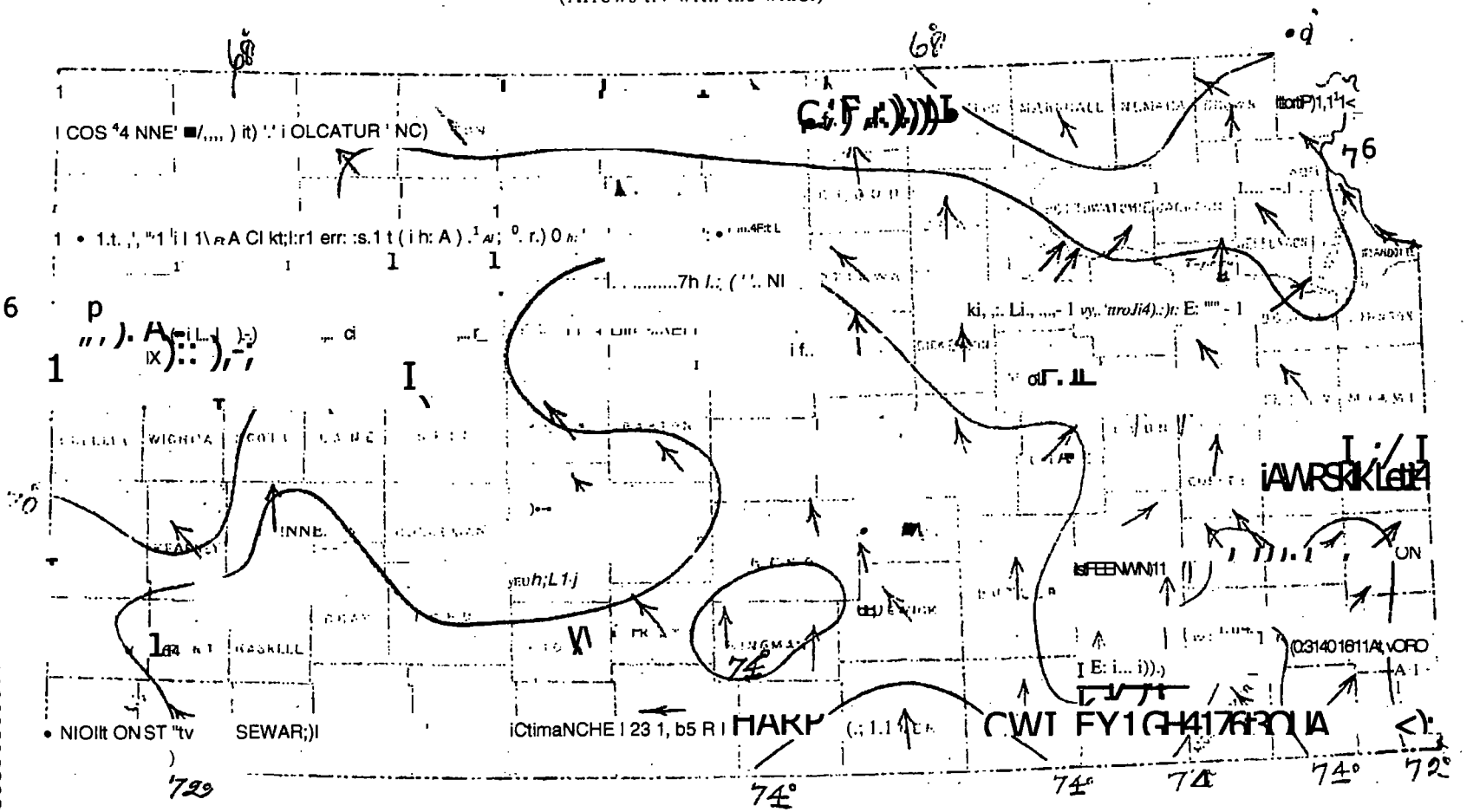

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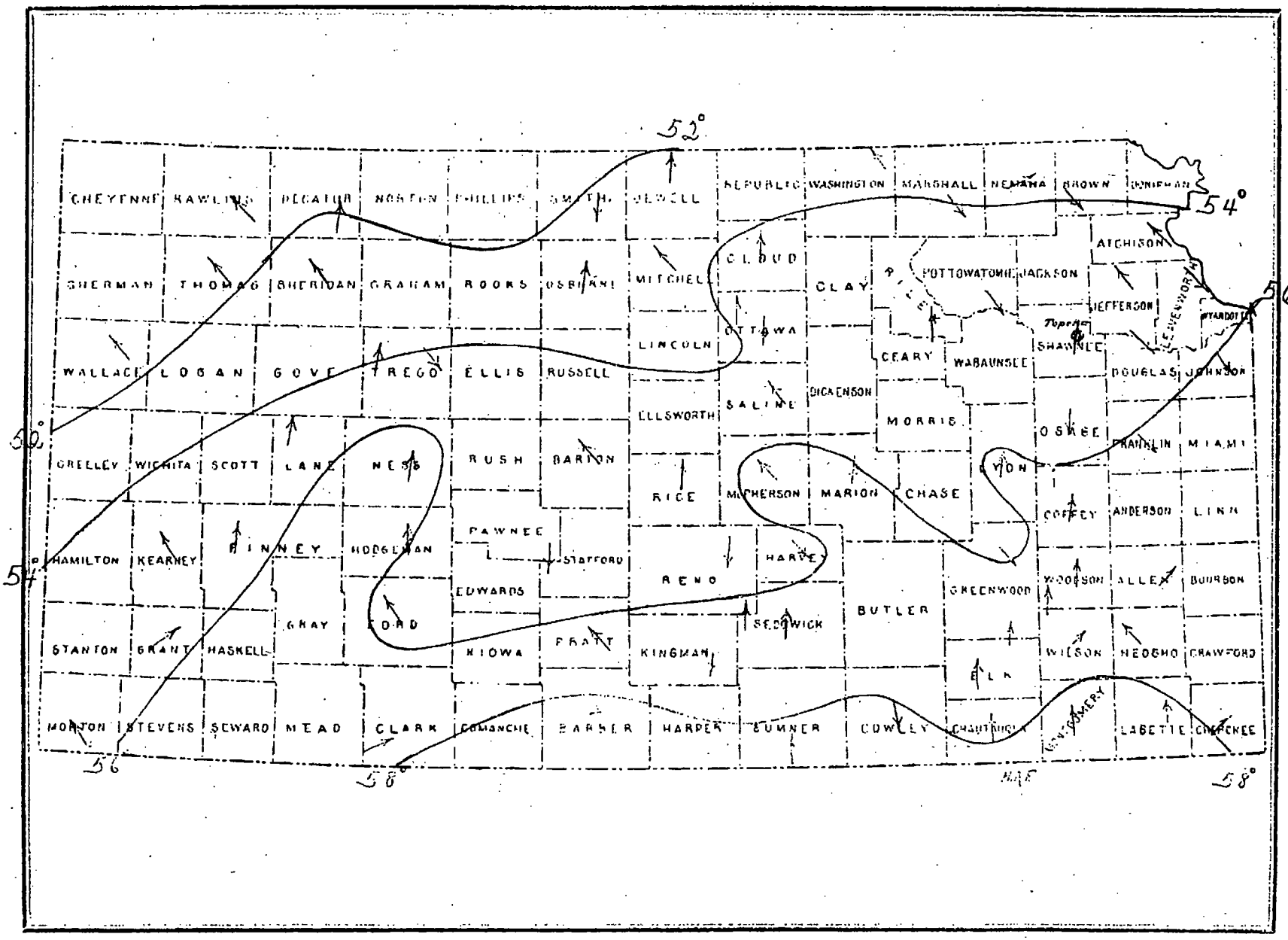

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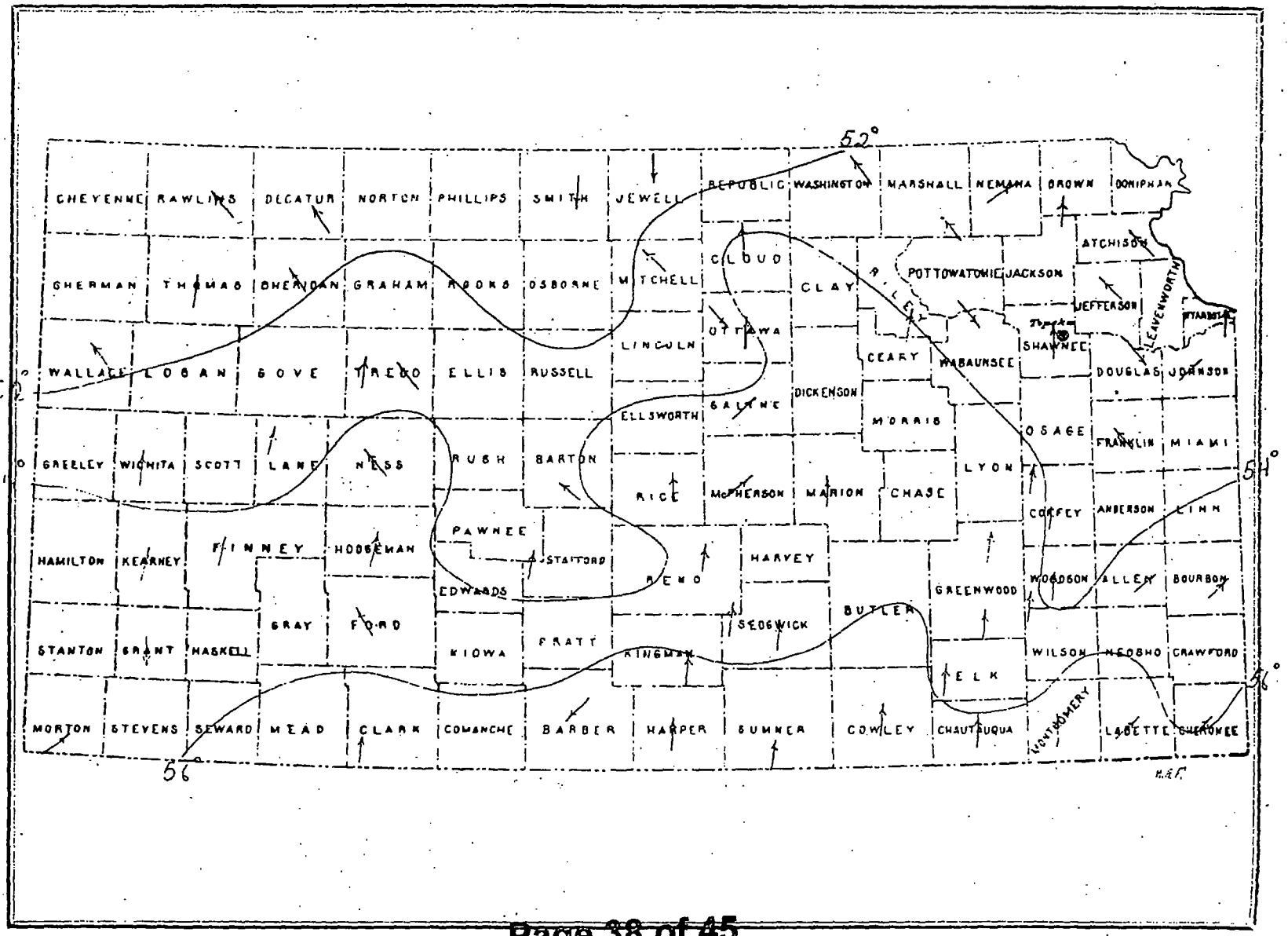

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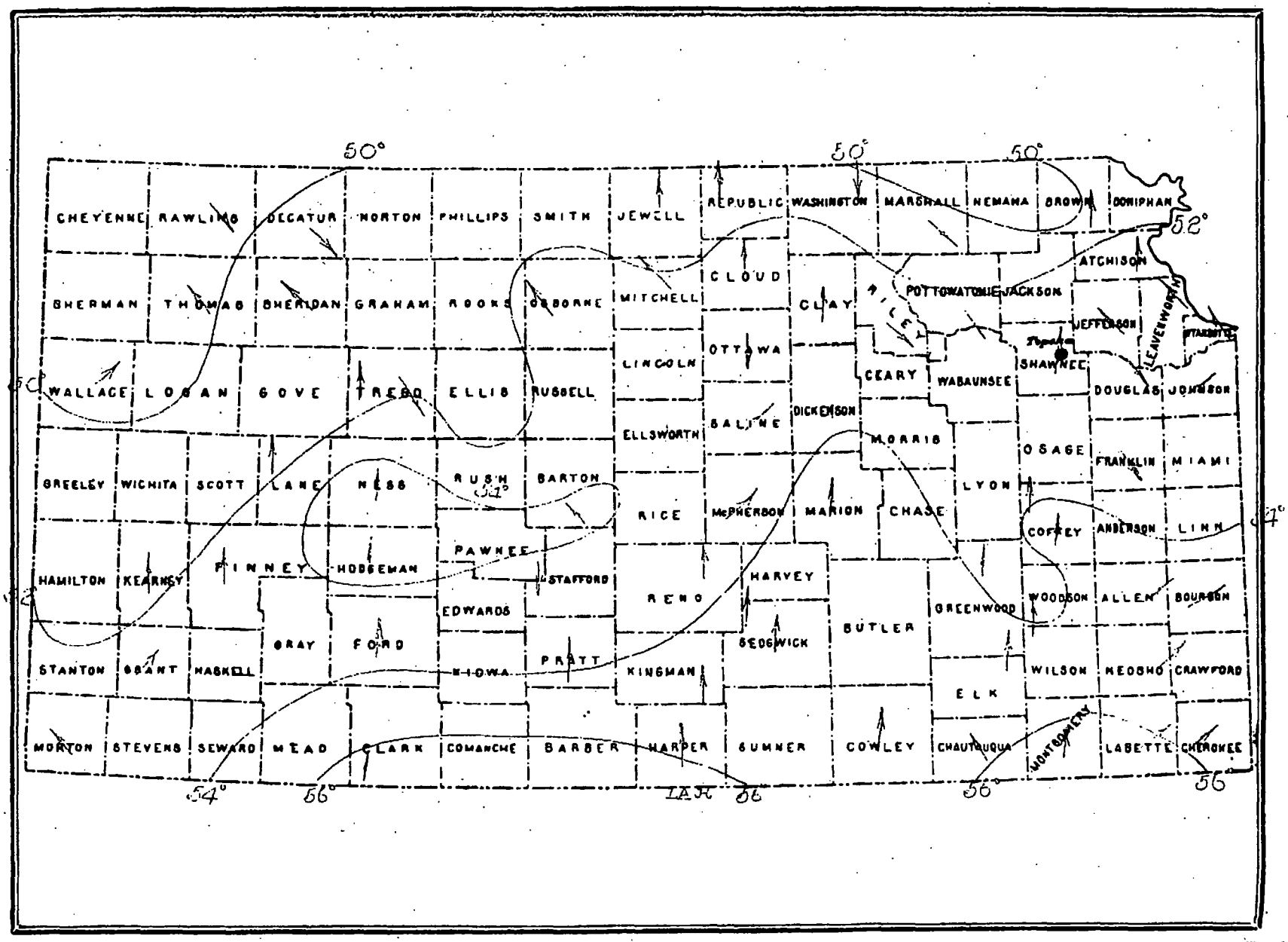

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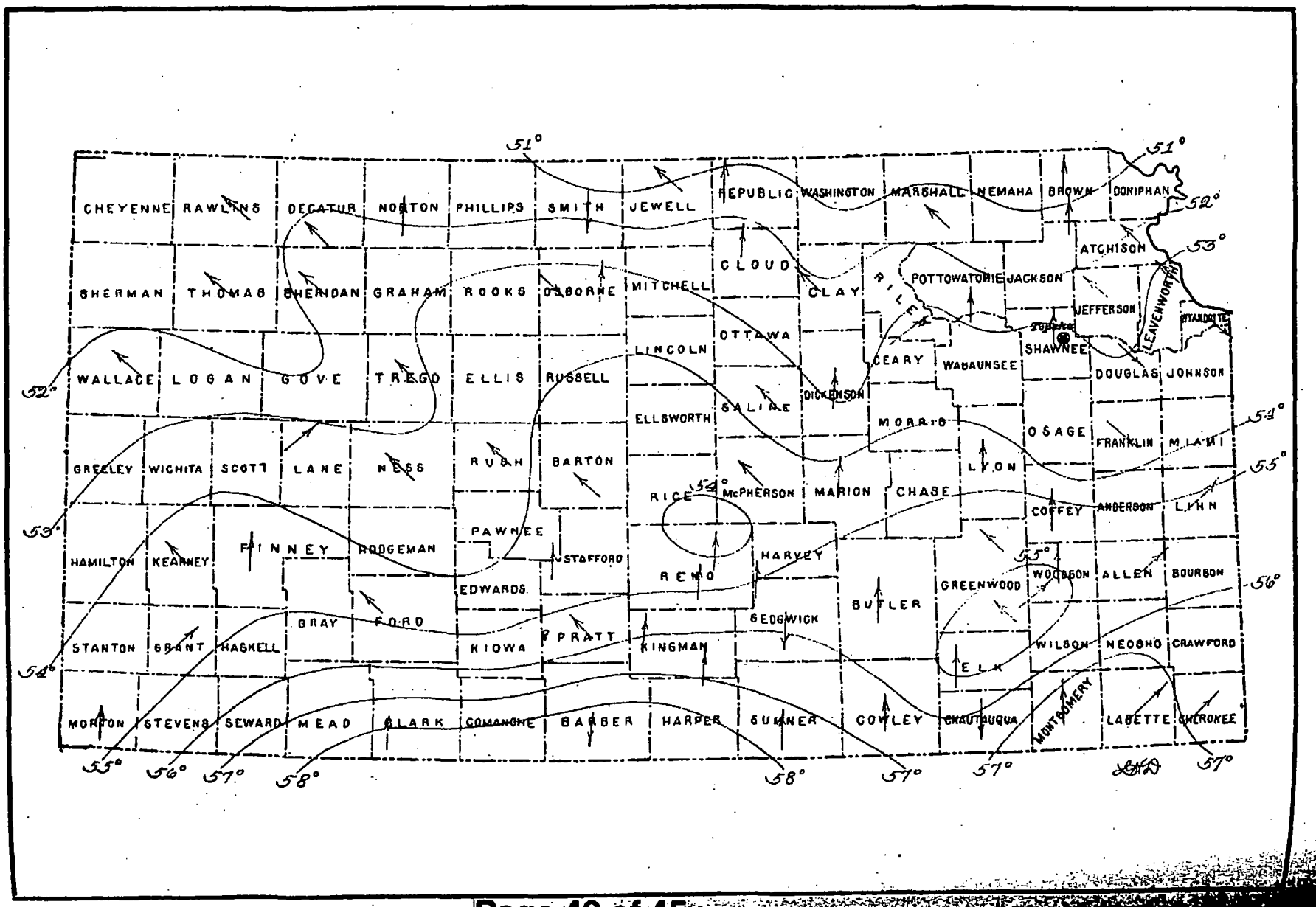
(ARROWS FLY WITH THE WIND.)



MEAN TEMPERATURE AND PREVAILING WINDS FOR THE YEAR, 1905.

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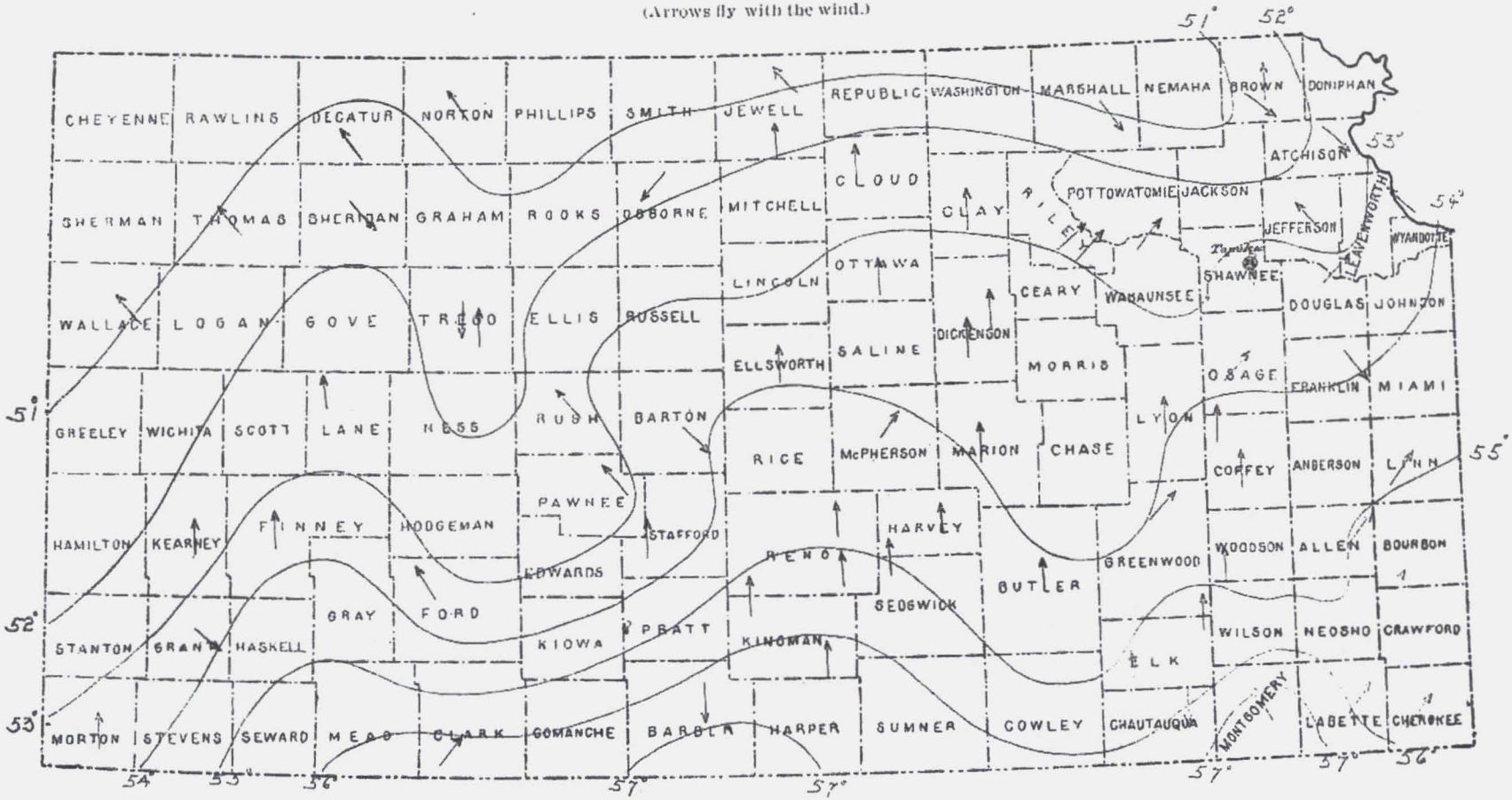

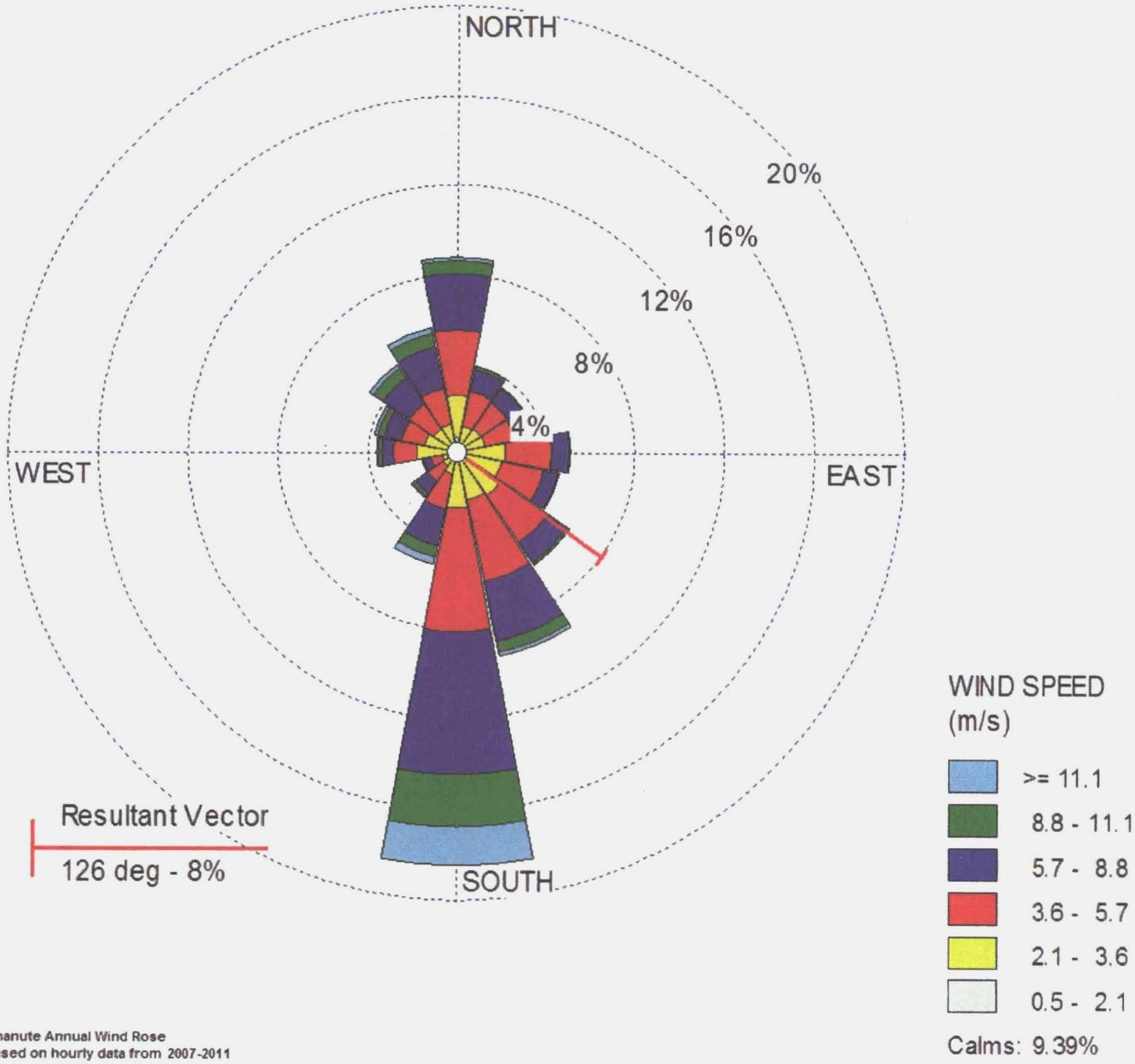

Chanute Annual Wind Rose
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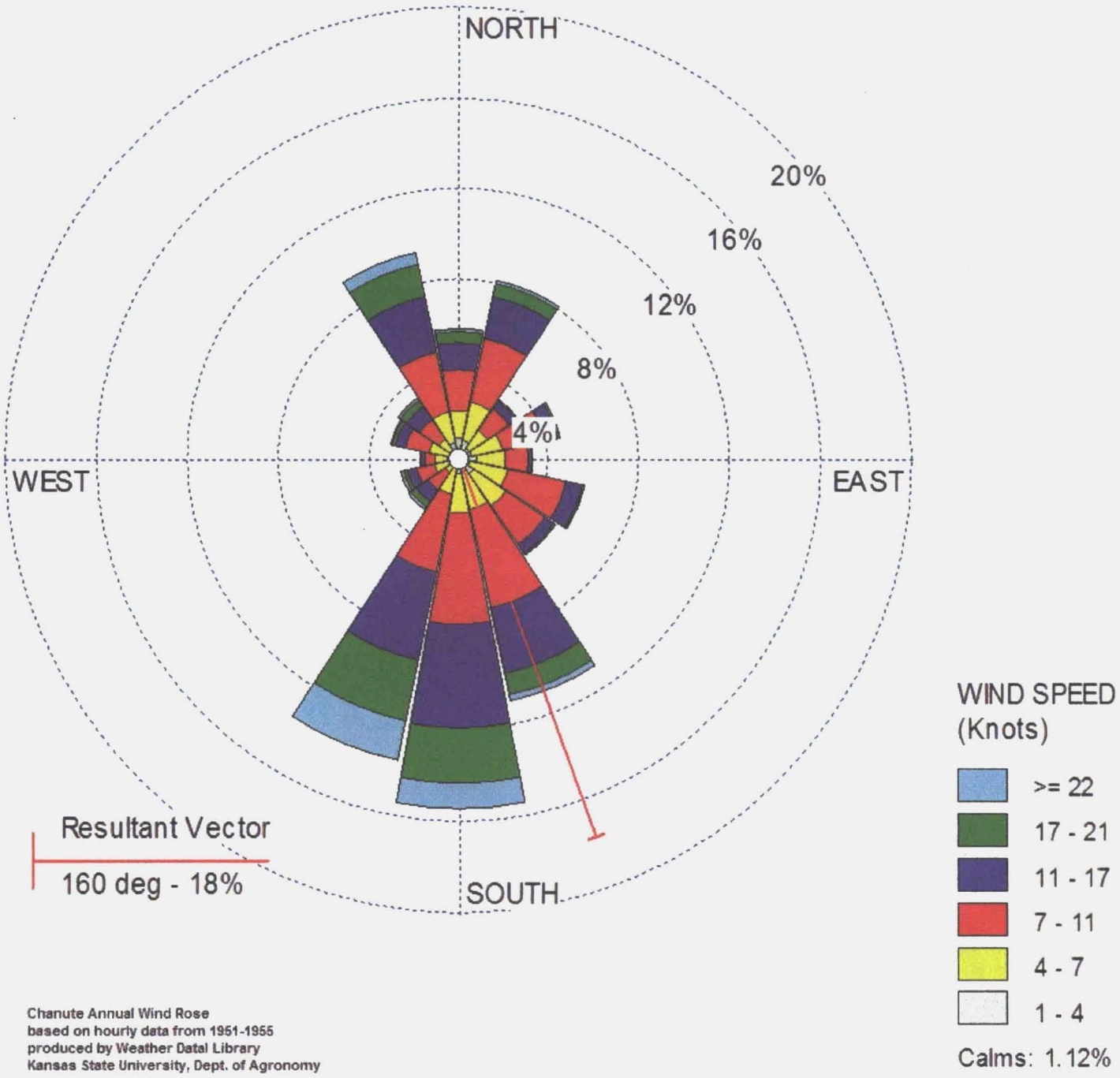
Kansas State University, Dept. of Agronomy



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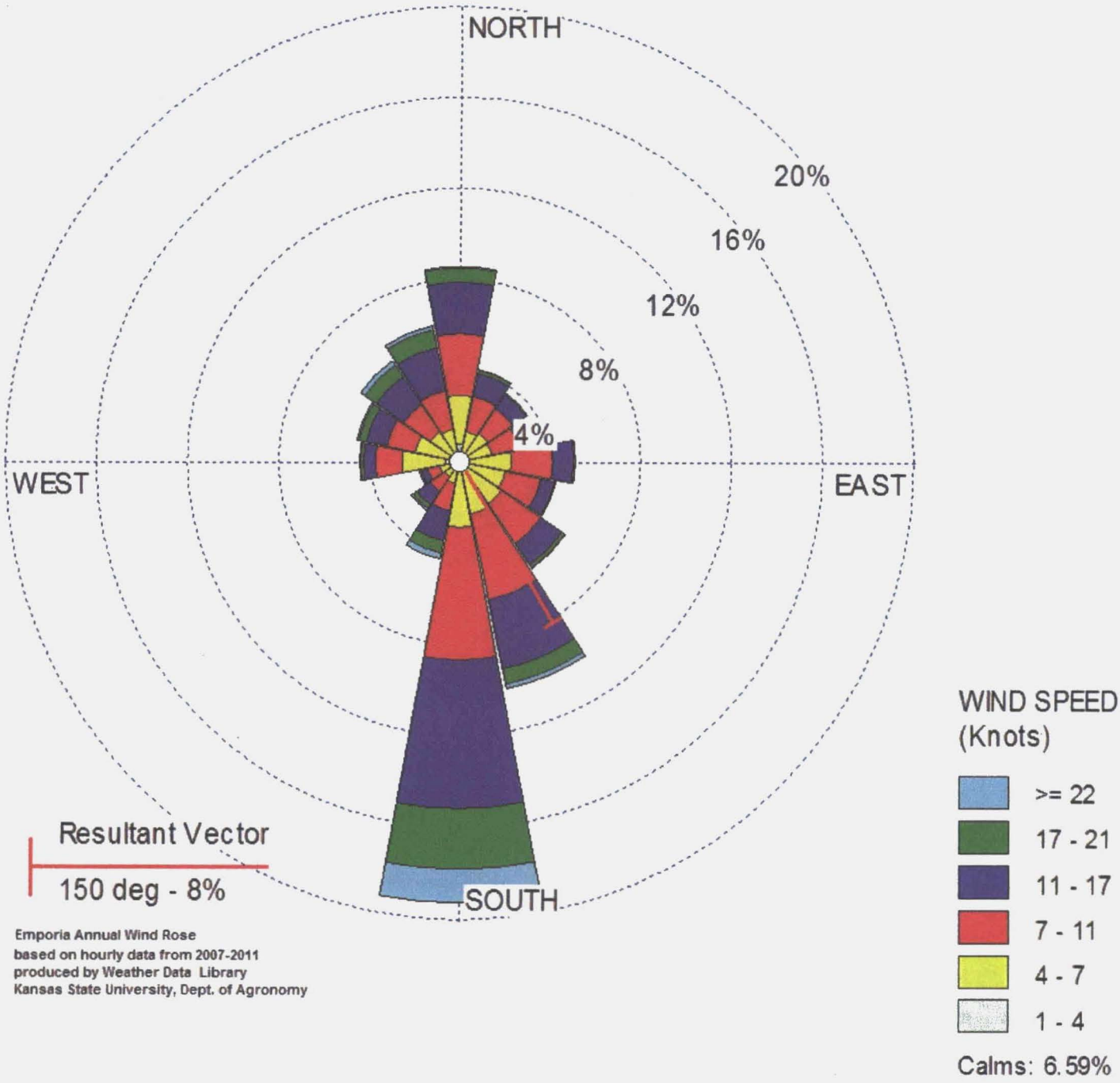

Emporia Annual Wind Rose
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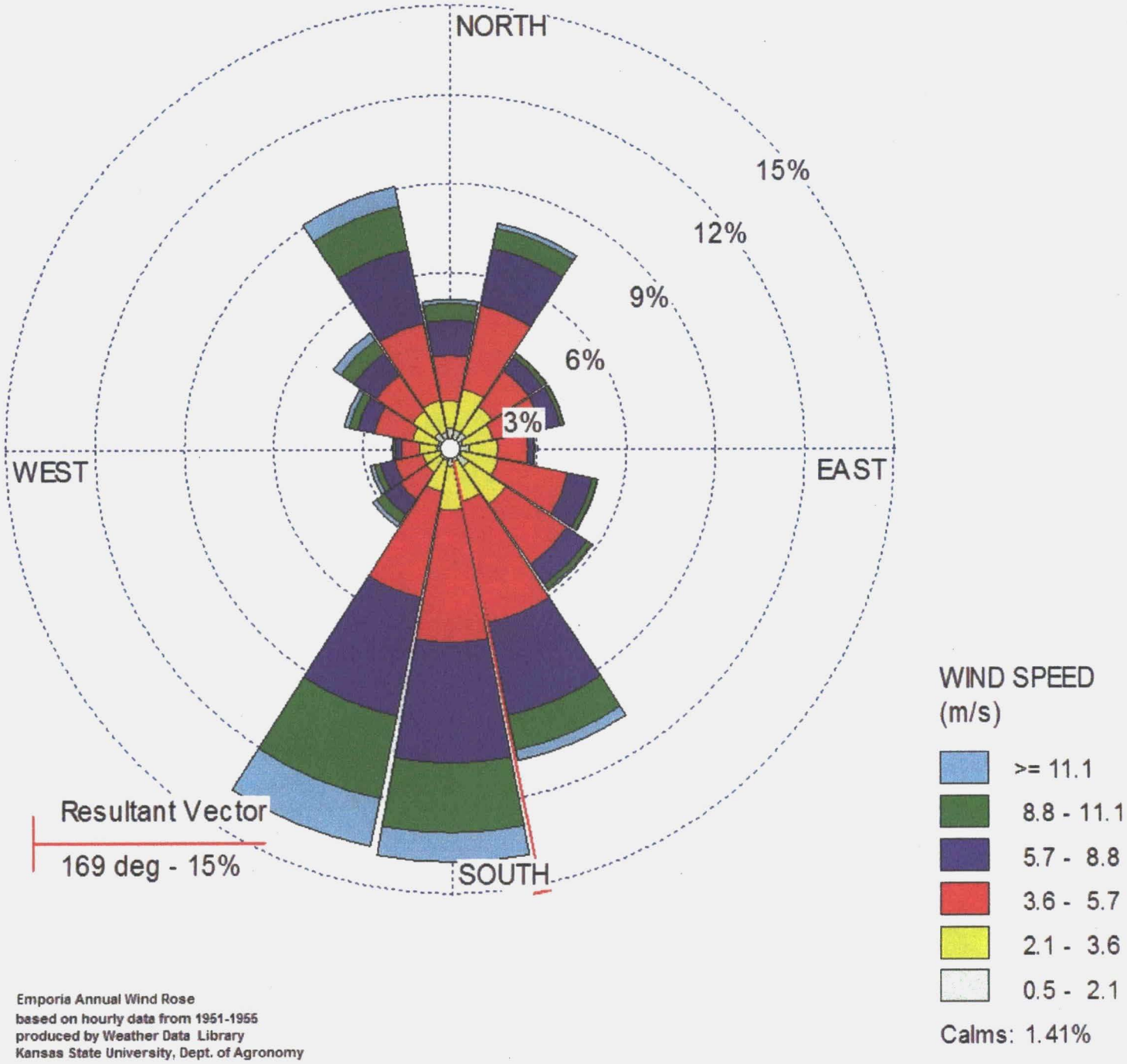

Emporia Annual Wind Rose
based on hourly data from 1951-1955
produced by Weather Data Library
Kansas State University, Dept. of Agronomy

34

Pyakuryal, Kumud

From: Michelle Quick <Quick.Michelle@epamail.epa.gov>
Sent: Wednesday, March 21, 2012 9:26 AM
To: Pyakuryal, Kumud
Subject: Fw: VCP SITES AND MAP
Attachments: Iola Smelter sites map VCPRP.pdf; Iola Smelter Sites Summary final (2).doc

Thanks,
Michelle

Michelle Quick

U.S. EPA - Region 7
913-551-7335 Fax 913-551-9335
quick.michelle@epa.gov
----- Forwarded by Michelle Quick/SUPR/R7/USEPA/US on 03/21/2012 09:25 AM -----

From: Rick Bean <rbean@kdheks.gov>
To: Michelle Quick/SUPR/R7/USEPA/US@EPA, Dave Drake/R7/USEPA/US@EPA, Kenneth Buchholz/R7/USEPA/US@EPA, Donald Bahnke/R7/USEPA/US@EPA
Cc: Gary Blackburn <gblackburn@kdheks.gov>, Bob Jurgens <bjurgens@kdheks.gov>
Date: 03/02/2012 10:11 AM
Subject: VCP SITES AND MAP

Attached is a list of VCP sites with an associated map.

VCP sites include the following properties: Hiser Implement; East Iola Smelter; Larry Macha Property; Iola Medical Developers, Citizen Bank Property and the Lorence Barnett property. All of these properties have been redeveloped into an implement facility, hotel, gas station and store, theater, storage facility and bank through state-lead programs. All are close to being resolved with deed restrictions (EUCs).

The Allen County Hospital Sites (#1, #2 and #3) are no longer in the VCP and are the actual source properties for United Zinc. We have a lot of site investigation data on sites #1 and #2 that EPA does not have. The Hospital board was going to build their hospital on these properties but because of a burial pit containing foundry sand and smelter slag that was 15 plus feet deep they decided not to because of the added expense. Again these properties are not in the VCP and need to be addressed.

Please let me know if you need anything else.

Rick L. Bean, L.G.
Chief, Remedial Section
KDHE Bureau of Environmental Remediation
Curtis State Office Building
1000 SW Jackson, Suite 410
Topeka KS 66612-1367
(785) 296-1675
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email: rbean@kdheks.gov
web site: http://www.kdhe.state.ks.us/ber/remedial

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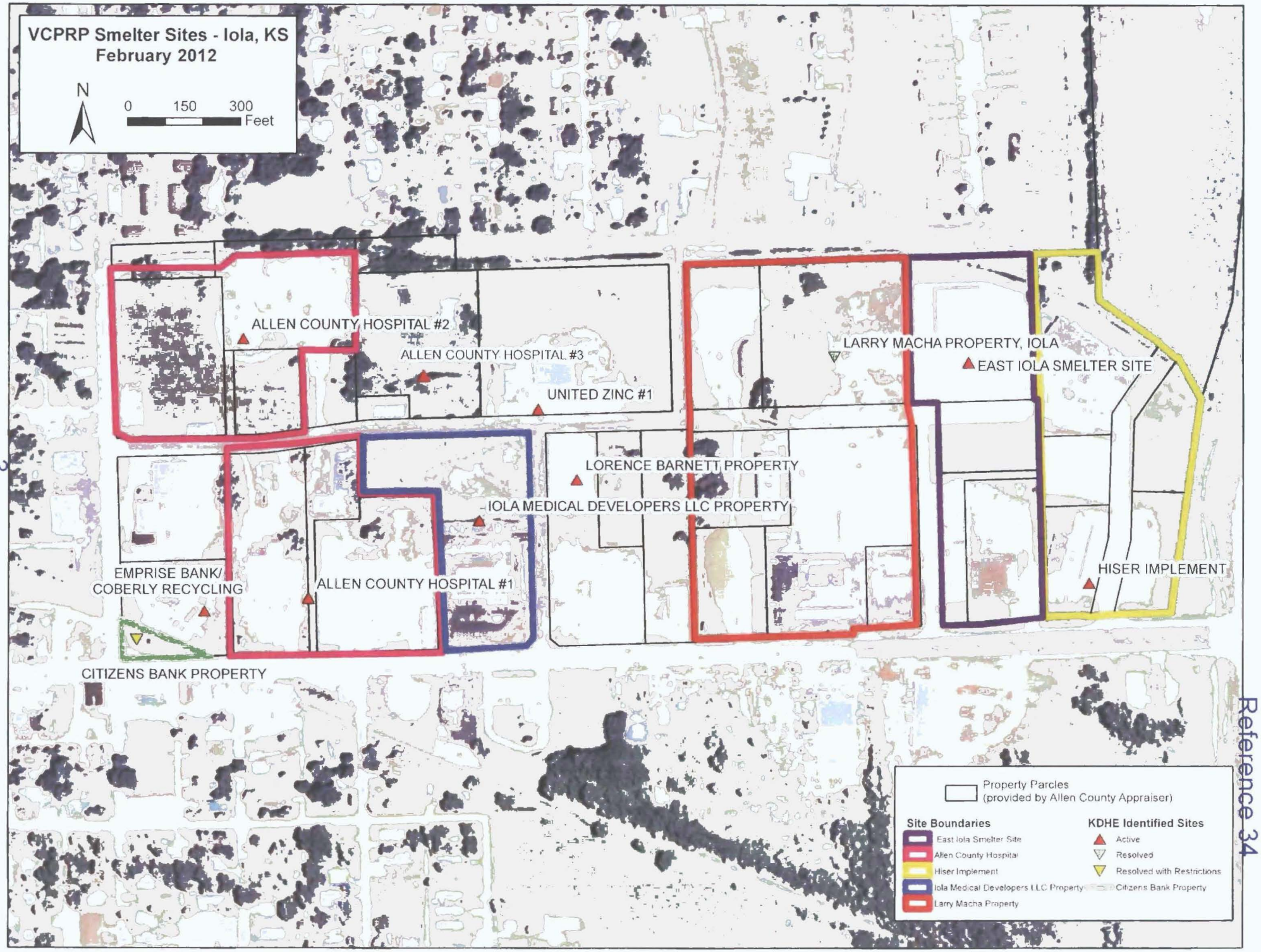
Kansas Department of Health and Environment http://www.kdheks.gov/remedial/index.html

www.kdheks.gov/brownfields/

(See attached file: Iola Smelter sites map VCPRP.pdf)(See attached file: Iola Smelter Sites Summary final (2).doc)



Reference 34

VCPRP Sites

Hiser Implement C3-001-70948 (active)

Voluntary Party:	Wayne Hiser
Activities completed:	VCI complete, VC Proposal complete, IRM conducted, VC Plan submitted (unapproved)
Next activities:	submit revised VC Plan, implement VC Plan, process EUC application
Schedule of activities:	initiate VC Plan implementation within 6 months after KDHE approval

A revised cleanup plan to close out the site with an EUC will be submitted and implemented in 2011.

East Iola Smelter C3-001-03004 (active)

Voluntary Party:	Larry Macha
Activities completed:	VCI complete, VC Proposal complete, IRM conducted, VC Plan submitted (unapproved)
Next activities:	submit revised VC Plan, implement VC Plan, process EUC application
Schedule of activities:	initiate VC Plan implementation within 6 months after KDHE approval

Interim remedial work consisted of capping three areas of impacts on the property. One small area of impact remains in the northeast corner of the property (near drainage ditch). This area of impact will need to be addressed either by removal action or another cap. The drainage ditch is part of a City Easement and not part of the site. KDHE declared the shallow seasonally perched groundwater as non-potable on June 21, 2011. An EUC application was submitted for East Iola. Since the groundwater issue is now addressed, KDHE is proceeding with the EUC application. Another KDHE letter was sent on January 25, 2012 requesting a revised Cleanup Plan for the small area of impact that remains north of the ditch.

Larry Macha Property C3-001-71862 (resolved)

Voluntary Party:	Larry Macha
Activities completed:	NFA

This site was once part of the East Iola Smelter Site. Impacted soil was removed and consolidated on the east half of the East Iola property prior to enrollment into the VCPRP. KDHE issued a NFA (no restrictions) on 2/20/2004. The Voluntary Agreement terminated on 6/3/2004.

Iola Medical Developers LLC C3-001-72227 (active)

Voluntary Party:	Iola Medical Developers, LLC
Activities completed:	VCI, VC Proposal, VC Plan, VC Plan implementation, EUC filed
Next activities:	submit final VC report, conduct minor cap repair
Schedule of activities:	spring 2012

An approved Cleanup Plan was implemented and is essentially complete except for minor cap erosion repair and revegetation. A final Cleanup Report needs to be submitted. An EUC was placed on the property on 11/8/2010. Once the cap maintenance is complete and the VC report approved, the site is eligible for a NFA with restrictions.

Citizen Bank Property C3-001-71870 (resolved with restrictions)

Voluntary Party:	Citizens Bank, N.A.
Activities completed:	VCI, VC Proposal, VC Plan, VC Plan implementation, EUC, NFA

The VCI was completed at the subject property and the data indicated contamination existing in soils at levels above residential RSK, but below non-residential RSK. A cleanup plan was approved by KDHE consisting of capping the impacted soil at the property (by the bank building itself, the asphalt/concrete parking lots, and an 18" clay layer in

the landscaped areas). In addition, a EUC was attached to the property deed. Construction of the bank building was complete in August 2006. KDHE issued a NFA with restrictions on July 3, 2007.

Allen County Hospital C3-001-72736 (parcels #1, #2 and #3)

Voluntary Party:	Allen County Hospital Board
Activities completed:	none
Next activities:	mutually terminated the Voluntary Agreement (March 2012) because the Hospital Board decided it would be too expensive to build on the property.

The Allen County Hospital Board submitted an application to the Voluntary Cleanup Program for both Allen County Hospital #1 and #2 sites in April 2011. The board decided not to build on this property due to a variety of reasons. The agreement was mutually terminated from the VCPRP.

Lorence Barnett Property C3-001-72167 (EUC only)

An EUC was placed on property on 11/22/2006 due to lead contamination above 400 mg/kg but below 1000 mg/kg. A storage facility was built on top of the minor contamination as serves as a cap.

CHENEGA GLOBAL SERVICES, LLC

726 E. 9th Ave

Anchorage, AK 90501

Former United Zinc Smelter Iola, Allen County, KS

Potentially Responsible Party (PRP) Report

PREPARED FOR:

U.S. ENVIRONMENTAL AGENCY REGION 7, SUPERFUND DIVISION

901 N. 5th STREET, KANSAS CITY, KANSAS 66101

FINAL July 2010

Task Order Number:
0005

Date Submitted:
July 2010

Contract Number:
A78QRP00

EPA Work Assignment Manager:
Michelle Quick

Telephone Number:
913-551-7335

On-Site Manager:
Gabrielle E. Haenn

Telephone Number:
913-551-7154

Project Manager:
Eric D. Bailey

Telephone Number:
856-217-7871

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Figure 13: Former United Zinc Site Location Map ..... Attachment D: Maps

Figure 14: Allen County Smelters Location Map ..... Attachment D: Maps

POTENTIALLY RESPONSIBLE PARTY SUMMARY

Chenega Global Services, LLC (CGS) received Task Order 0005, Project Code A78QRP00, from the U.S. Environmental Protection Agency (EPA) Region 7 office, under the Superfund Contract Number EP-S7-09-08. The purpose of this task order is to provide EPA's Superfund Division with a vehicle through which to perform expedited site-specific Potentially Responsible Party (PRP) searches in support of the EPA Task Order/Project Officer (TOPO) search activities.

This Potentially Responsible Party Report for the East Iola Smelter Site (the "Site") summarizes the research conducted by the Records Specialists (RS) and Regulatory Analysts (RA) to determine the Site history. The following Potentially Responsible Party Search Report provides for the ownership/lease history, operational information, Site boundaries, and corporate successors of PRPs for the Former United Zinc Site in Allen County, Kansas.

CGS research revealed the following PRPs pursuant to CERCLA Section 107(a) liability law:

PRP	Viability	Reason	CERCLA Liability Law
William Lanyon	No – deceased	Owner: 1901-1902	107(a)(2)
United Zinc & Chemical Company	No – forfeited 1986	Owner: 1900-1915	107(a)(2)
Advance Chemical Distribution, Inc.	Yes – merged in 2001 into Brenntag Southwest, Inc.	Current Owner	107(a)(1)
American Self Storage, LLC	Yes	Current Owner	107(a)(1)
Iola Bank and Trust Company, trustee for [redacted]	Unknown	Current Owner	107(a)(1)
City of Iola	Yes	Current Owner	107(a)(1)
MFA Enterprises, Inc.	Yes	Current Owner	107(a)(1)
NL and R Properties, LLC	Yes	Current Owner	107(a)(1)
[redacted]	[redacted]	[redacted]	[redacted]

[redacted] Parties

I. INTRODUCTION

PROJECT BACKGROUND

Chenega Global Services, LLC (CGS) received Task Order 0005, Project Code A78QRP00, from the U.S. Environmental Protection Agency (EPA) Region 7 office, under the Superfund Contract Number EP-S7-09-08. The purpose of this task order is to provide EPA's Superfund Division with a vehicle through which to perform expedited site-specific potentially responsible parties (PRPs) in support of the EPA Task Order/Project Officer (TOPO) search activities.

This Potentially Responsible Party Report for the Former United Zinc Site (the "Site") summarizes the research conducted by the Records Specialists (RS) and Regulatory Analysts (RA) to determine the Site history.

PROJECT APPROACH

The U.S. Environmental Protection Agency, Region 7, Superfund Division, Kansas City, Kansas contracted Chenega Global Services, Anchorage, AK to perform the PRP search and report.

LIST OF CONTACTS

- Allen County Register of Deeds
- Allen County Appraiser
- Allen County Zoning Commission
- EPA Region 7 CERCLA Records Center
- Iola City Zoning Commission
- Kansas Department of Health and Environment
- Kansas State Historical Society
- Kansas Secretary of State

SITE DESCRIPTION

The Site is located in the southwest quarter of section 25, township 24, range 18 east, north of Highway 54 and east of Kentucky Street in Iola, Allen County, Kansas.

Figure 1: United Zinc Site with Tracts A - H

Title documents indicate that William Lanyon owned the Site from 1901 to 1902. A history of Allen and Woodson Counties, Kansas indicates that William Lanyon operated a sulfuric acid plant during his ownership under the name 'Standard Acid Company' (6). It is unclear if the company operated under lease, however a Sanborn map from 1901 and a mining journal published in 1902 reference Standard Acid's operations of a sulfuric acid works on-site in 1901 (14, 10). According to mining journal reports published in 1902 and 1905, Standard Acid Co. and a company owned by August R. Meyer, called Southwestern Chemical Company, consolidated to form the United Zinc & Chemical Company (10, 5).

United Zinc & Chemical Company owned the Site from 1902 to 1925 (27-476, 85-305[1]). The company purchased the Site from William Lanyon in 1902 and operated a zinc smelter on-site from 1902 to 1910 (12, 8, 27-476). By 1910, the Site was no longer operational, but United Zinc retained property ownership (13, 8). In 1925, United Zinc sold the property to individual owners who continued to parcel off the land.

Several companies had ownership of the land from 1940 to the present; a full list is included in Table 5: Corporate Property Owners (for sources see Attachment H). Based on the

[1] This citation format is used for title instrument book and page numbers throughout the report.

evidence collected, there is no indication that these companies engaged in on-site operations that could contribute to the type of waste found on the Site property. Currently, multiple individuals own the Site; Table 2 provides details for each parcel.

SITE TIMELINE

The timeline below provides a parallel view of owner and operator activities on-site during active smelter years. For references, see the 'References' section of the report body. A larger image is included in Attachment G of this report.

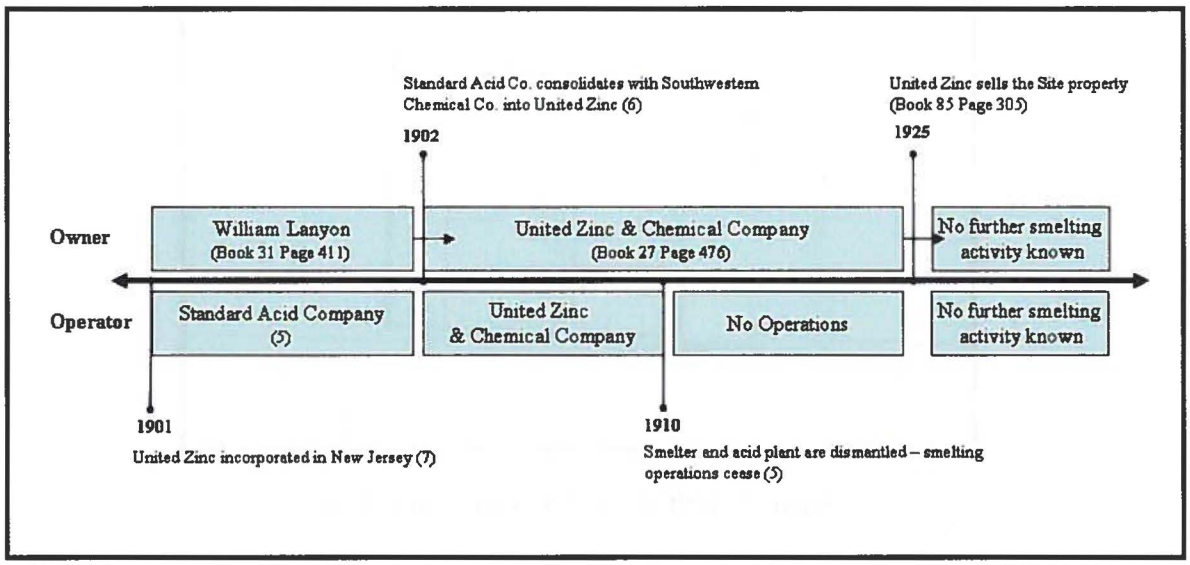

Figure 2: Site Timeline

CONTAMINANTS OF CONCERN

The primary contaminant of concern associated with the Site is lead. On-site smelting activities produced wastes, often in the form of slag, containing high concentrations of heavy metals, such as lead. Often the waste material was reprocessed to extract valuable metal contents, or used as fill for construction. (2)

Kansas Department of Health and Environment (KDHE) investigations revealed elevated levels of lead on the Site and surrounding areas. EPA field screening processes began in 2006 and showed similar results, indicating elevated lead levels on both commercial and residential properties. (16)

II. Ownership History

Review of Title Documents

The RA and RS were instructed to review all title/deed documents relevant to historic smelting activities on the Site property. The RA and RS used pertinent title/deed documents to determine site boundaries. The research determined smelting activities occurred across an area currently divided into eight parcels of land, referenced as Tracts A - H. 'Attachment B: Chain of Title Tables' contains the legal descriptions of the parcels. The current owner information for the Site parcels is listed in the Table 1 below:

Assessors Parcel No	Tract	Current Owner	Mailing and Property Address
077-25-0-30-19-007.00-0	A	[redacted]	1420 E Monroe 66749
077-25-0-30-19-005.00-00	B	N L & R Properties, LLC	1508 E Monroe 66749
077-25-0-30-19-008.00-00	C	Iola Bank & Trust Co.; Trustee for James P. McFadden under his will	1402 E Monroe 66749
077-25-0-30-19-018.00-0	D	City of Iola; Family Physician's	1408 East St 66749
077-25-0-30-19-018.01-0	E	Benny L Beurskens and Dana A Watson (American Self Storage LLC)	1505 E Monroe 66749
077-25-0-30-19-019.00-0	F	MFA Enterprises Inc.	1520 East St 66749
077-25-0-30-19-004.01-0	G	N L & R Properties, LLC	E Monroe, 66749
077-25-0-30-19-004.00-0	H	Advance Chemical Distribution Inc, (Brenntag Southwest Inc.)	1602 East 66749

Table 2: Current Parcel Information (4)

Figure 3: United Zinc Site with color-coded tracts A-H

Current and Past Ownership History

'Attachment B: Chain of Title Tables' summarizes the historical and current ownership of the Site in chronological order.

Mortgages (Deeds of Trust)

CGS found one mortgage during the ownership period covering Tract E of the Site property:

> American Self Storage, LLC, Benny Beurskens and wife, and Dana Watson and wife (Mortgagors) entered into a Mortgage Security Instrument with First National Bank (Mortgagee) on February 15, 2008. The transaction was recorded in book 2008, page 0352 of the Allen County Register of Deeds.

Leases

CGS found no leases during the ownership period (1901-Current).

AGREEMENTS

CGS found no agreements during the ownership period (1901-Current).

ZONING

According to the City of Iola Zoning Commission, all parcels of the Former United Zinc Site are zoned as 'General Business'.

TITLE TREES

Title Trees can be found for Tracts A-H of the Site in 'Attachment A: Title Trees'.

III. POTENTIALLY RESPONSIBLE PARTIES

A. WILLIAM LANYON

SUMMARY

Historical evidence indicates that during William Lanyon's period of ownership Standard Acid Company operated a sulfuric acid works on-site[2]. Sulfuric acid manufacture is known to have occurred on-site and may be a source of the lead contamination detected in the soil at the Site. Based on available information, Standard Acid Company cannot be legally tied to the Former United Zinc property.

Under CERCLA Section 107(a) (2) PRP liability law, William Lanyon is considered a PRP because he was an owner of the Site property at the time of disposal. William Lanyon was born in Wisconsin on December 16, 1862 and is now deceased (19).

See page 14 for Standard Acid Company's operational information.

OWNERSHIP / LEASE HISTORY

William Lanyon acquired the entire Site property on January 31, 1901 from the Iola Realty Company. The transaction was recorded in book 31, page 411 of the Allen County Register of Deeds. On February 25, 1902, Lanyon sold the property to United Zinc & Chemical Company. The transaction was recorded in book 27, page 476 of the Allen County Register of Deeds.

[2] For a detailed account and references refer to Standard Acid Company's operational information section (Page 15)

OPERATIONAL INFORMATION

Standard Acid Company

Summary

Sulfuric acid manufacture, which occurred at the Standard Acid Company's works, can produce lead contaminated cinder wastes (15). At this time, under CERCLA Section 107(a)(2), PRP liability cannot be applied to Standard Acid Company because there is no legal evidence to support their on-site operations.

On-site Operations

Standard Acid Company does not appear on any title instruments related to the Site property. The company's only ties to the property are based on historical evidence; for this reason, the company is not included as a PRP.

Duncan L. Wallace, in his "History of Allen and Woodson Counties, Kansas", reports that William Lanyon owned and operated Standard Acid Company prior to its consolidation into United Zinc (6). Likewise, a Kansas State Geological Survey publication from 1970 recounted the history of smelting in southeastern Kansas, stating that William Lanyon managed the Standard Acid Company's smelter at Iola (7).

A 1901 publication detailing the economic geology of Iola directly references the Standard Acid Company's plant operations in Iola. The acid manufacture process is described in detail, referring often to the lead piping used throughout the works. The Iola plant treated forty-five (45) tons of ore a day, yielding fifty (50) tons of acid that was stored in tanks and tank cars on-site. The final sulfuric acid product was intended for use in fertilizers, petroleum refining, alum, soda ash, and blue vitriol. (9)

Date	Activity	Source
1901	Standard Acid Co. works has 3 blocks	11

Table 3: Standard Acid Operational Capacity

The RA and RS searched the Kansas Secretary of State, KSHS, NY Department of State, Missouri Secretary of State, and the New Jersey Secretary of State. No legal records were located. (31)

In 1902, the Standard Acid Company consolidated with Southwestern Chemical Co. to form the United Zinc & Chemical Company (10, 5, 7). Operations at the Site continued as United Zinc & Chemical Company[3].

[3] See PRP Section A for Corporate History information on United Zinc & Chemical Company.

PROPERTY BOUNDARY/SITE DESCRIPTION:

CGS did not find any reference to the Standard Acid Company on title deeds or leases. Their presence is noted on a Sanborn fire insurance map from 1901:

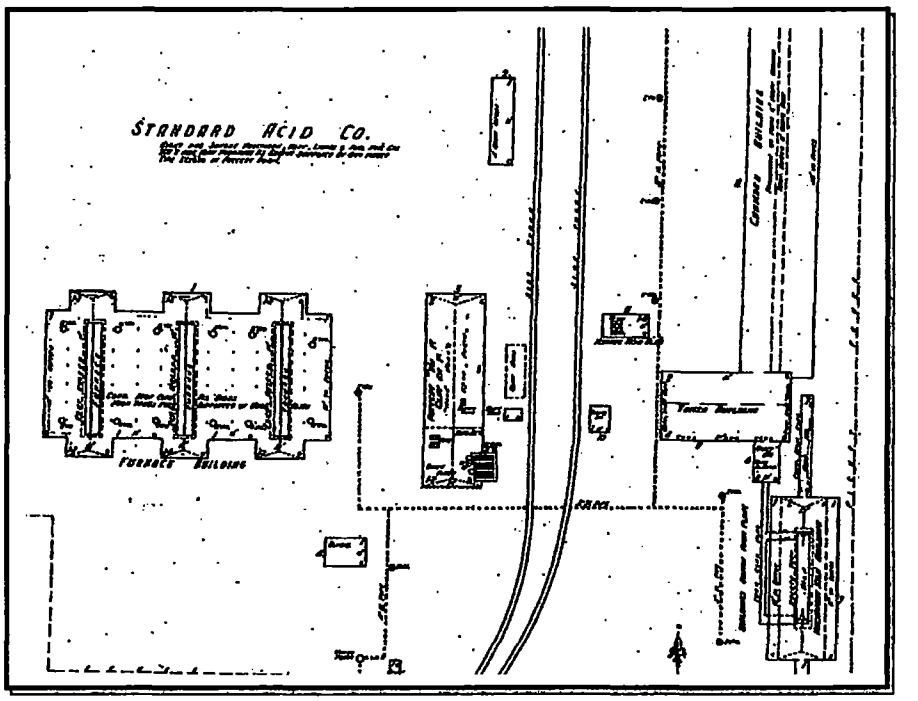

Figure 4: Standard Acid Company Sanborn 1901 (14)

B. UNITED ZINC & CHEMICAL COMPANY

SUMMARY

United Zinc & Chemical Company owned the entire Site property from 1902 to 1925, and operated on-site from 1902 to 1910. Smelting is known to have occurred on-site and may be a source of the lead contamination detected in the soil at the Site. Under CERCLA Section 107(a) (2) liability law, United Zinc & Chemical Company is classified as a PRP, as it was an owner and operator at the time of disposal. The company incorporated in New Jersey in 1902 and, according to documentation provided by the EPA, United Zinc & Chemical Company forfeited their charter for failure to file an annual report on July 15, 1986. No corporate successors were located.

OWNERSHIP / LEASE HISTORY

United Zinc & Chemical Company purchased Tracts A-H of the Site property from William Lanyon on February 25, 1902. The transaction was recorded in deed book 27, page 476 of the Allen County Register of Deeds. The company maintained ownership until 1925, when, under the direction of Alfred R. Meyer, it sold the property to R.A. and R.U. Fry, two

individuals. The transaction took place on April 25, 1925, and was recorded in deed book 85, page 305 of the Allen County Register of Deeds.

In addition to title documents, a court case from 1922 identifies United Zinc & Chemical Company as owners of the Site property:

Court Case '258 US 268 United Zinc & Chemical Company v. Britt et ux.' was decided in the US Supreme Court on March 27, 1922. The Britt's, residents of Iola, sued the United Zinc & Chemical Company after two boys died on the Company's property. Only a brick lined basement remained after the United Zinc & Chemical Company's plant was torn down in 1910. Water had collected within the structure, resembling a clear pool. On July 27, 1916, the boys went into the water, were poisoned, and died. Although clear, the water contained sulfuric acid and zinc sulfate contamination. The courts ruled in favor of the Company, claiming that it could not be held liable for the deaths. (1)

OPERATIONAL INFORMATION

Date	Activity	Source
1902	United Zinc erects a smelter works in connection with the existing sulfuric acid plant	3
1903	Smelter plant becomes operational	3
1907	2 Iola works are listed; 4 furnaces at 2,304 retorts, and 2 furnaces at 480 retorts	17
1909	One Iola plant listed with 6 furnaces at 2,784 retorts	18
1910	Listed as 'plants dismantled or abandoned' – 2,624 retorts	8

Table 4: United Zinc Operational Capacity

CORPORATE HISTORY

Incorporation

United Zinc & Chemical Company was incorporated in Hudson County, New Jersey on November 1, 1901 by Horace S. Gould, John I. Billings, and Kenneth K. McLaren (32). Article 3 of the Articles of Incorporation states that the purpose of the company is to "mine, prepare for market, market and transport the ores of zinc, lead...to smelt all such ores", among other activities (32). Two mining industry reports published in 1902 and 1905 indicate that United Zinc & Chemical Company formed as a consolidation of Southwestern Chemical Co. and Standard Acid Co. (10, 5). A Sanborn fire insurance map from 1901 shows Standard Acid Co.'s works on-site during 1901 (14). August R. Meyer, president of the United Zinc & Chemical Company was the founder of the Southwestern Chemical Co. and initiated the consolidation. (5, 33) He remained in that capacity until his death in December

of 1905, at which time John Greenough took over as president (5, 34). No legal documentation was located regarding the supposed consolidation.

Increase of Capital Stock

A list of company stockholders during 1904 included August R. Meyer and William Lanyon as majority stockholders; Lanyon held the most shares, 2560 preferred and 1765 common (33). William Lanyon's weighty company interest is not out of place; there is historical evidence, documented by Duncan L. Wallace in his "History of Allen and Woodson Counties, Kansas", that William Lanyon operated The Standard Acid Company prior to its consolidation into United Zinc (6). Lanyon sold the Site property, including the acid works, to United Zinc in 1902 (27-476).

Application for Authority

In 1911, United Zinc and Chemical Company applied for authority to do business in Kansas, indicating their principal place of business as Argentine, Wyandotte County, KS (35). The application was approved on February 14, 1912 (35). At this time, according to a Sanborn map from 1912, the Iola works were no longer operational, but United Zinc maintained ownership of the property (13).

Withdraw from Kansas

On June 30, 1914, United Zinc & Chemical Co. petitioned to the Charter Board of Kansas to revoke their certificate of authority, claiming they had not transacted business in Kansas as of January 1, 1913. The petition was approved and the United Zinc & Chemical Company withdrew from Kansas. (36)

Dissolution

According to documentation provided to CGS by the EPA, the Kansas Secretary of State records show that United Zinc & Chemical Company forfeited their charter for failure to file an annual report on July 15, 1986 (38). CGS did not locate any legal documentation of the company's dissolution (37).

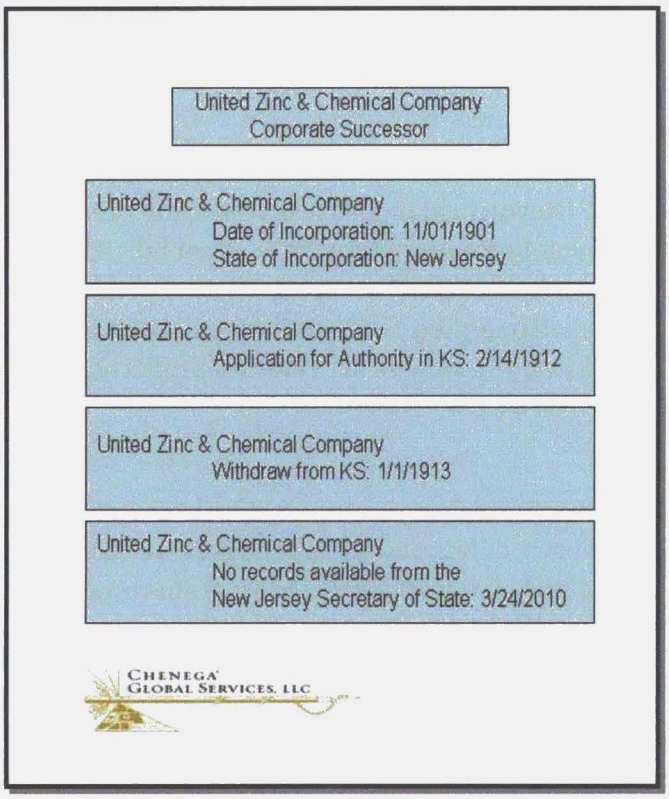

Figure 5: United Zinc & Chemical Company Corporate History Chart

PROPERTY BOUNDARY/SITE DESCRIPTION:

See Figure 6 below:

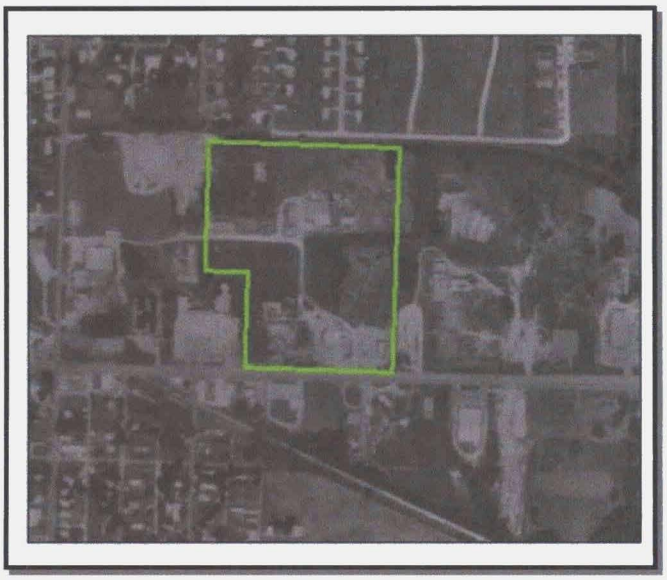

Figure 6: United Zinc & Chemical Company Property (27-476)

CURRENT OWNERS

C. ADVANCE CHEMICAL DISTRIBUTION, INC.

SUMMARY

Advance Chemical Distribution, Inc. acquired Tract H of the Site property in 1991 and is the current owner. The company incorporated in Oklahoma as Kimball Chemical Company, Inc. in 1962, changing its name to Advance Chemical Distribution, Inc. in 1982. In 2001, Advance merged with and into Brenntag Southwest, Inc. and has since been withdrawn from Kansas; Brenntag is now the parent company. As of May 2010 Brenntag Southwest, Inc. is delinquent in Kansas for failure to file an annual report.

Advance Chemical Distribution, Inc.'s registered agent in Kansas is:

Timothy J. Maher
1520 N Barwise
Wichita, KS 67214

Brenntag Southwest, Inc.'s registered agent in Kansas is:

The Corporation Company, Inc
515 South Kansas Ave.
Topeka, KS 66603

According to CERCLA Section 107(a) (1) PRP liability can be applied to Advance Chemical Distribution, Inc., as they are a current owner of the Site property.

OWNERSHIP / LEASE HISTORY

Advance Chemical Distribution, Inc. acquired Tract H of the Site property on July 31, 1991 from Treat-Rite Water Laboratories, Inc. The transaction was recorded in book 183, page 632 of the Allen County Register of Deeds. Advance Chemical is the current owner of Tract H.

OPERATIONAL INFORMATION

CGS found no operational information

CORPORATE HISTORY

Incorporation

On September 18, 1962, Kimball Chemical Company, Inc. incorporated in Oklahoma. Oklahoma Secretary of State signed and filed the Articles of Incorporation on September 20, 1962. (23)

The purpose of the business is listed as follows:

> To establish, carry on, and develop the business of producing, manufacturing, utilizing; and trading in any and all kinds of chemicals, organic and inorganic, crude

and refined, and products of similar character and any and all materials, products, and articles directly or indirectly related thereto in any way... (23)

The Directors listed are, Vernon N. Kidd, David L. Miller, and M.M. McDougal (23).

Amended Articles of Incorporation: Name Change

Amended Articles of Incorporation were filed with the Oklahoma Secretary of State on December 13, 1982. According to the Amended Articles, the name of the corporation is Advance Chemical Distribution, Inc. and was formerly Kimball Chemical Company, Inc. L. Dean Cox, Betty P. Cox, and Mitchell D. O'Donnell signed the Amended Articles on November 18, 1982. (20)

Mergers

A Certificate of Merger or Consolidation was signed on June 25, 2001, merging Advance Chemical Distribution, Inc., and Brenntag Southwest, Inc., a Texas corporation. The resulting corporation was Brenntag Southwest, Inc. The merger became effective on July 9, 2001. (21)

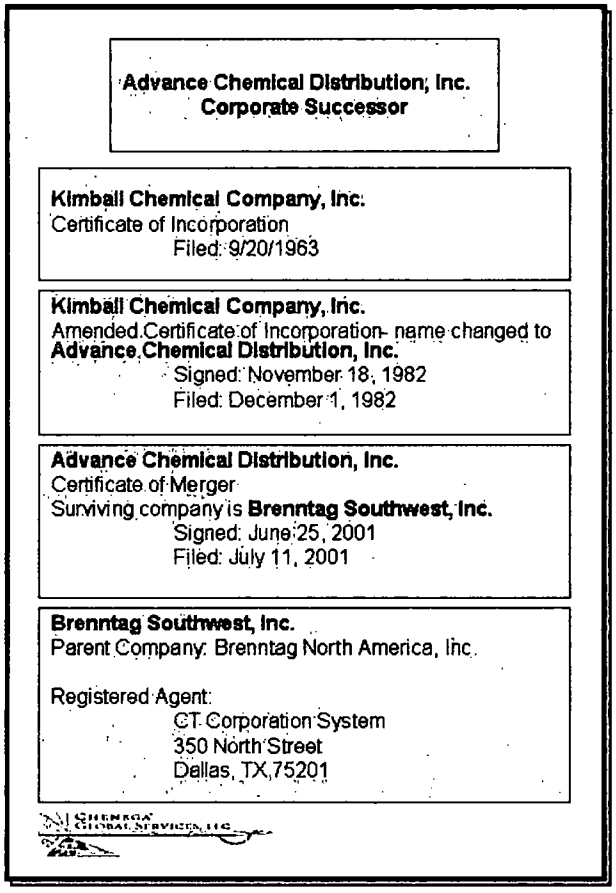

Figure 7: Advance Chemical Distribution, Inc. Corporate History Chart

PROPERTY BOUNDARY/SITE DESCRIPTION:

Advance Chemical Distribution, Inc. is the current owner of Tract H of the Site property (183-632). For a parcel map, see Figure 1 or Figure 3.

D. AMERICAN SELF STORAGE, LLC

SUMMARY

American Self Storage, LLC was incorporated in 2006 by Dana Watson and Benny Beurskens. In 2008, Watson and Beurskens sold Tract E of the Site property into their company name, American Self Storage, LLC; as of May 2010 the company is active and in good standing in Kansas.

According to CERCLA Section 107(a) (1) PRP liability can be applied to American Self Storage, LLC, as they are a current owner of the Site property.

OWNERSHIP / LEASE HISTORY

American Self Storage, LLC acquired Tract E of the Site property from Benny L. Beurskens and wife, and Dana Watson and wife on April 25, 2008. The Warranty Deed was recorded in book 2008, page 0867 of the Allen County Register of Deeds. The company is the current owner of Tract E.

OPERATIONAL INFORMATION

CGS found no operational information.

CORPORATE HISTORY

American Self Storage, LLC was incorporated in Kansas on October 05, 2006. Dana Watson and Benny Beurskens signed as the company's organizers. (22)

The Kansas Secretary of State lists the registered agent as:

American Self-Storage, LLC
1321 Oakhurst Place
Independence, KS 67301

PROPERTY BOUNDARY/SITE DESCRIPTION:

American Self Storage, LLC is the current owner of Tract E of the Site property (2008-0867). For a parcel map, see Figure 1 or Figure 2.

E. Iola Bank and Trust Co.

Summary

Iola Bank and Trust Co., trustee for James [redacted] under his will, is the current owner of Tract C of the Site property. According to CERCLA Section 107(a) (1), PRP liability can be applied to Iola Bank and Trust Co., as they are a current owner of the Site property.

Iola Bank and Trust Co. is currently inactive in Kansas due to its merger into Teambank, National Association in 2001. Teambank was subsequently acquired by Great Southern Bankcorp, Inc.; Great Southern Bank is currently active in Kansas.

Ownership / Lease History

In June of 1995, Iola Bank and Trust Co., acting as trustee for James P. McFadden under his will, transferred Tract A from McFadden's name to Jack W. McFadden, heir of James P. McFadden (190-394).

In March of 1977, Darrell R Turner and his wife sold Tract C of the Site property to James P. McFadden and his wife (161-488). Currently, Iola Bank and Trust Co. is listed as the owner of Tract C, acting as trustee for James P. McFadden under his will.

Operational Information

CGS found no operational information for Iola Bank and Trust Co.

Corporate History

Iola Bank and Trust Co. incorporated in Kansas on April 1, 1903 as Iola State Bank. The Kansas Secretary of State lists the company's current status as "converted to national/federal". According to financial search data, the company was acquired by Teambank, National Association, who was then acquired by Great Southern Bancorp, Inc. of Springfield, Missouri (for references see Iola Bank and Trust Co.'s PRP Profile Sheet).

Great Southern Bank is currently active and maintains an office in Iola at 119 East Madison St., Iola, KS 66749. The registered agent in Kansas is listed with the Kansas Secretary of State as:

Henry Heimsoth
8717 W. 110th Street, Suite 500
Overland Park, KS 66210

Property Boundary/Site Description:

For a parcel map see Figure 1.

F. IOLA, CITY OF

SUMMARY

The City of Iola has owned Tract D of the Site property since 2008. Currently, Family Physicians operates an on-site medical practice. No lease was located. According to CERCLA Section 107(a) (1), PRP liability can be applied to The City of Iola, as it is a current owner of the Site property.

OWNERSHIP / LEASE HISTORY

The City of Iola, Kansas acquired Tract D of the Site property from Iola Medical Developers on December 12, 2008. The transaction was recorded in book 2008, page 2542 of the Allen County Register of Deeds.

OPERATIONAL INFORMATION

The city's on-site operations are unknown, but the Allen County Assessor's tax listings indicate "Family Physicians" as the taxpayer at the property address. A general internet search of the property address indicates that Family Physicians operates an on-site medical practice. The Kansas Secretary of State has 'The Family Physicians, P.A.' a professional association, listed with a mailing address matching the property address at 1408 East Street, Iola, KS 66749. The resident agent is Brian D. Wolfe, 201 West Street, Iola, KS 66749.

CORPORATE HISTORY

A Dun & Bradstreet Business Information Report dated April 20, 2010 states that the City of Iola incorporated in Kansas in 1870 and is an active non-profit corporation. The directors are as follows:

Bill Maness, Mayor
Judy Brigham, Administrator
William Shirley, Commissioner
Craig Abbott, Commissioner

PROPERTY BOUNDARY/SITE DESCRIPTION:

The City of Iola is the current owner of Tract D of the Site property (2008-2542). For a parcel map, see Figure 1 or Figure 3.

G. MFA ENTERPRISES, INC.

SUMMARY

MFA Enterprises, Inc. is the current owner of Tract F of the Site property. The company was incorporated in 2001 and is a wholly owned subsidiary of MFA Incorporated. According to CERCLA Section 107(a) (1) PRP liability can be applied to MFA Enterprises, Inc., as it is a current owner of the Site property.

The Missouri Secretary of State lists the registered agent for MFA Enterprises, Inc. as:

J. Brian Griffith,
201 Ray Young Drive
Columbia, MO 65201-3599

OWNERSHIP / LEASE HISTORY

MFA Enterprises, Inc. acquired Tract F of the Site property on February 1, 2001 from Agro Distribution, LLC. The transaction was recorded in book A1, page 370 of the Allen County Register of Deeds. MFA Enterprises, Inc. is the current owner of Tract F.

Mortgages (Deeds of Trust)

On February 26, 2010, MFA Enterprises, Inc (mortgagor) entered into a mortgage deed of trust with MFA Incorporated (mortgagee), of which it is a subsidiary. The mortgage was recorded in book A2, page 130 of the Allen County Register of Deeds.

OPERATIONAL INFORMATION

CGS found no operational information.

CORPORATE HISTORY

Incorporation

On August 9, 1995, MFA of Oklahoma, Inc. signed their Articles of Incorporation. Three incorporators are listed as B.L. Frew, David Jobe, and Joe Powell. The purpose of the corporation is:

> To conduct livestock feed mill operations for the manufacture and sale of livestock feeds and to do and perform all acts necessary and incidental thereto; . . . and to engage in any other lawful act or activity for which corporations may be organized under The General and Business Corporation Law of Missouri.

B.L. Frew, David Jobe, and Joe Powell, signed by and filed The Articles with the Missouri Secretary of State on August 10, 1995. (24)

Amendment to the Articles of Incorporation: Name Change

On January 5, 2001, MFA of Oklahoma, Inc. amended its Articles of Incorporation, changing the corporate name to MFA Enterprises, Inc. The amendment was filed with the Missouri Secretary of State on January 10, 2001. (25)

Foreign Corporation Application

On January 11, 2001, MFA Enterprises, Inc. signed a Foreign Corporation Application indicating intent to commence business in Kansas on February 1, 2001. The application filed with the Kansas Secretary of State on January 26, 2001 lists the company's total net worth at $713,488.86. (26)

Billy G. Streeter, Vice President, and Brian Griffith, Secretary signed the Application. Other officers listed who did not sign the application include Don Copenhaver, President, and Allen Floyd, Treasurer. (26)

Mergers

MFA Enterprises, Inc. filed Articles of Merger with the Missouri Secretary of State on February 6, 2001. The articles merged Morris Farm Center, Inc. into MFA Enterprises, Inc., the surviving corporation. On January 25, 2001, Don Copenhaver for MFA Enterprises, Inc. and Don Copenhaver, President, for Morris Farm Center, Inc. signed the Articles of Merger (27).

MFA Enterprises, Inc. filed Articles of Merger with the Missouri Secretary of State on July 5, 2005. These articles merged West Central AGRIServices, L.L.C. into MFA Enterprises, Inc., the surviving corporation. Don Copenhaver, President, signed the Articles for MFA Enterprises, Inc. and Billy G. Streeter, listed as Sr. Vice-President of MFA, signed for West Central AGRIServices, L.L.C. (28)

Annual Report

A 2009 Annual Registration Report was filed with the Missouri Secretary of State on January 5, 2010. The report lists officers as Billy Streeter, President; J. Brian Griffith, Vice President; Janice Schuerman, Secretary; and Allen Floyd, Treasurer. Board of Directors is listed as J. Brian Griffith, Bill Streeter, and Allen Floyd. (29)

MFA Enterprises, Inc.
Corporate Successor

MFA of Oklahoma, Inc.
Date of Incorporation: 08/10/1995
State of Incorporation: Missouri

MFA Enterprises, Inc.
Corporate Name Change from MFA of Oklahoma, Inc. to MFA Enterprises, Inc.: 1/5/2001

MFA Enterprises, Inc.
KS Foreign Corporation Application: 01/26/2001

MFA Enterprises, Inc. (survivor)
Articles of Merger: 02/06/2001
Merged with Morris Farm Center, Inc.

MFA Enterprises, Inc. (survivor)
Articles of Merger: 07/05/2005
Merged with West Central AGRIServices, LLC

MFA Enterprises, Inc.
Annual Registration Report: 12/31/2009
Business Address: 201 Ray Young Drive
Columbia, MO 65201

Registered Agent KS: The Corporation Company, Inc.
515 South Kansas Ave
Topeka, KS 66603

CHENEGA GLOBAL SERVICES, LLC

Figure 8: MFA Enterprises, Inc. Corporate History Chart

PROPERTY BOUNDARY/SITE DESCRIPTION:

MFA Enterprises, Inc. is the current owner of Tract F of the Site property (A1-370). For a parcel map, see Figure 1 or Figure 3.

H. NL AND R PROPERTIES, LLC

SUMMARY

NL and R Properties, LLC is the current owner of Tracts B and G of the Site property. No corporate records were located. According to CERCLA Section 107(a) (1) PRP liability can be applied to NL and R Properties, LLC, as it is a current owner of the Site property.

OWNERSHIP / LEASE HISTORY

NL and R Properties, LLC acquired Tracts B and G on August 3, 2006 from Les Dietrich aka John L. Dietrich and Rita M. Dietrich in 2 separate transactions recorded in book A76, pages 540 and 541 of the Allen County Register of Deeds.

NL and R Properties, LLC currently owns Tracts B and G of the Site property.

OPERATIONAL INFORMATION

CGS found no operational information.

CORPORATE HISTORY

The Kansas Secretary of State found no record of NL and R Properties, LLC (30). No Dun & Bradstreet Business Information Report was located.

PROPERTY BOUNDARY/SITE DESCRIPTION:

N L and R Properties, LLC is the current owner of Tract B and Tract G of the Site property (A76-541; A76-540). For a parcel map, see Figure 1 or Figure 3.

I. [redacted]

SUMMARY

[redacted] acquired Tract A of the Site property in 1973. [redacted] Sherrill has maintained ownership of his percentage to the present. Iola Bank and Trust Co., trustee for [redacted] under his will, transferred the remaining portion to [redacted], heir of James [redacted] inherited his share of the title to Tract A.

According to CERCLA Section 107(a)(1), [redacted] are considered PRPs, as they are current owners of the Site property.

OWNERSHIP / LEASE HISTORY

On December 14, 1973, Belvah [redacted] sold Tract A of the Site property to [redacted] 156-306). In June of 1995, Iola Bank and Trust Co., trustee [redacted] to [redacted]). In 2005, [redacted] quit claimed the interest in title to Jack W. McFadden (A68-370).

[redacted] maintained his percentage of interest in title to the present; [redacted] are the current owners of Tract A of the Site property.

OPERATIONAL INFORMATION

CGS found no operational information.

CORPORATE HISTORY

N/A

PROPERTY BOUNDARY/SITE DESCRIPTION:

For a parcel map see Figure 1.

ADDITIONAL CORPORATE PROPERTY OWNERS

During the collection and review of Site title instruments, CGS found several corporations that owned Site property. EPA asked CGS to account for these businesses and their on-site operations. Based on the information gathered, the corporations listed cannot be classified as Potentially Responsible Parties. Business information available for these companies is provided in Table 4 of the report body and is duplicated in Attachment H: Corporate Property Owners

Company	Dates of Ownership	Tract	Nature of business / Notes	Source (Attachment H)
Acme Asphalt & Gas, Inc.	5/9/1940 – 7/31/1945	G, H	A Kansas corporation; operations unknown	
Agro Distribution, LLC	6/30/1999 – 2/1/2001	F	Wholesale Farm Suppliers	1
Farmers Friend & Associates	8/14/1997 – 8/3/2006	G, B	No information found	
Iola Industries, Inc.	5/8/1990 – 2/1/1994	B	Industrial development corporation	2
Iola Medical Developers, LLC	11/15/2006 – 12/12/2008	D	Medical building owner	3
Iola Oil & Gas Service, Inc.	9/29/1939 – 5/9/1940	G, H	A Kansas corporation; operations unknown	
Line-X Company	6/30/1950 – 8/6/1970	G, H	Protective coating spray products	8

Company	Dates of Ownership	Tract	Nature of business / Notes	Source (Attachment H)
M&M Packing Company, Inc.	4/6/1940 – 6/30/1944	B	Meat packaging and slaughterhouse	101-397; 6 129-590;
Iola Land & Cattle Company, Inc. (previously M&M Co Inc)	6/4/1947 – 2/1/1958	B	M&M Receives the property, then Iola Land and Cattle Company, Inc. appears on the title deed. Edward P Marquis signs as president.	171-56 5, 4
	10/1/1958 – 4/13/1983	B	Ed. P. Marquis was president of M&M Company, Inc. of Iola, formed in 1983	
Terra International, Inc.	10/30/1995 – 6/30/1999	D, F	Production of nitrogen products for agricultural, industrial, and environmental markets – facility was most likely a distribution/retail center.	9
The Iola Realty Company	3/3/1897 – 1/31/1901	All	No information found	
Treat-Rite Water Laboratories, Inc.	12/29/1971 – 7/31/1991	G, H	Water treatment chemicals and supplies	7

Table 5: Corporate Property Owners (for sources see Attachment H)

CONCLUSIONS

According to Chenega Global Services research, the following entities are considered Potentially Responsible Parties pursuant to CERCLA Section 107 (a) for the following reasons:

Sulfuric Acid Manufacture

William Lanyon's inclusion as a PRP is based on evidence that, during his period of Site ownership, Standard Acid Company operated a sulfuric acid works on-site. Sulfuric acid manufacture is known to have occurred on-site and may be a source of the lead contamination detected in the soil at the Site. Based on available information, Standard Acid Company cannot be legally tied to the Former United Zinc property.

Under CERCLA Section 107(a) (2) PRP liability law, William Lanyon is considered a PRP because he was an owner of the Site property at the time of disposal. William Lanyon was born in Wisconsin on December 16, 1862 and is now deceased.

Smelting Operations

United Zinc & Chemical Company, a New Jersey corporation, owned the entirety of the Former United Zinc Site property from 1902 to 1925. The company operated a smelting facility on-site from 1902 to 1910.

Smelting is known to have occurred on-site and may be a source of the lead contamination detected in the soil at the Site. Under CERCLA Section 107(a) (2) liability law, United Zinc & Chemical Company is classified as a PRP, as it was an owner and operator at the time of disposal. The company incorporated in New Jersey in 1902 and, according to documentation provided by the EPA, United Zinc & Chemical Company forfeited their charter for failure to file an annual report on July 15, 1986. No corporate successors were located.

Current Owners

According to CERCLA SECTION 107(a) (1) PRP liability can be applied to the following entities, as they are current owners of the Site property:

Advance Chemical Distribution, Inc. is a for-profit corporation organized in Oklahoma. The company is a current owner of approximately 1.8 acres of the Former United Zinc Site property. On June 25, 2001, Advance Chemical Distribution, Inc. merged with and into Brenntag Southwest, Inc., a Texas corporation. As of April 20, 2010, Advance Chemical Distribution, Inc. is inactive in Kansas.

American Self Storage, LLC, a Kansas limited liability company incorporated by Benny Beurskens and Dana Watson, is a current owner of a parcel of land located on the Former United Zinc Site property. As of April 20, 2010, the company is active in Kansas.

Iola Bank and Trust Co., trustee for James [redacted] under his will, is the current owner of Tract C of the Site property. Iola Bank and Trust Co. is currently inactive in Kansas due to

its merger into Teambank, National Association in 2001. Teambank was subsequently acquired by Great Southern Bankcorp, Inc.; Great Southern Bank is currently active in Kansas.

The City of Iola, Kansas is a current owner of approximately 3.7 acres of the Former United Zinc Site property. As of April 20, 2010, the municipality is an active Kansas corporation.

MFA Enterprises, Inc., a Missouri corporation, is a current owner of approximately 1.8 acres of the Former United Zinc Site property. The company is a wholly owned subsidiary of MFA Incorporated. As of April 20, 2010, MFA Enterprises, Inc. is active and in good standing with the Kansas and Missouri Secretary of State.

NL and R Properties, LLC is a current owner of two parcels of land located on the Former United Zinc Site property, Tracts B and G. No corporate records were located.

[redacted] are current owners of Tract A of the Site property. [redacted] acquired Tract A of the Site property in 1973. Dave [redacted] under his will, transferred the remaining portion to [redacted] inherited his share of the title to Tract A.

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Historical References

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3. Adams, George Irving, Erasmus Haworth, and Walter Richard Crane. "Economic Geology of the Iola Quadrangle, Kansas". Washington: Govt. print-off, 1904, pg 40-42.

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13. Sanborn Fire Insurance Map, City of Iola, Kansas. Sanborn Map Company. New York: Sanborn Map Company, May 1912.

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Corporate References

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21. Advance Chemical Distribution, Inc. 6/25/2001. *Certificate of Merger into Brenntag Southwest, Inc.* Oklahoma Secretary of State

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38. United Zinc & Chemical Company. 2/1/2006. *EPA Correspondence.* U.S. EPA Region 7

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B: Chain of Title Tables

C: Title Instruments

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CHENEGA GLOBAL SERVICES, LLC

726 E. 9th Ave

Anchorage, AK 90501

East Iola Smelter Site
Iola, Allen County, KS

Potentially Responsible Party (PRP) Report

PREPARED FOR:

U.S. ENVIRONMENTAL AGENCY REGION 7, SUPERFUND DIVISION

901 N. 5th STREET, KANSAS CITY, KANSAS 66101

FINAL August 2010

Task Order Number:
0001

Date Submitted:
August 2010

Contract Number:
A7R6RP00

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POTENTIALLY RESPONSIBLE PARTY SUMMARY

Chenega Global Services, LLC (CGS) received Task Order 0001, Project Code A7R6RP00, from the U.S. Environmental Protection Agency (EPA) Region 7 office, under the Superfund Contract Number EP-S7-09-08. The purpose of this task order is to provide EPA's Superfund Division with a vehicle through which to perform expedited site-specific Potentially Responsible Party (PRP) searches in support of the EPA Task Order/Project Officer (TOPO) search activities.

This Potentially Responsible Party Report for the East Iola Smelter Site (the "Site") summarizes the research conducted by the Records Specialists (RS) and Regulatory Analysts (RA) to determine the Site history. The following Potentially Responsible Party Search Report provides for the ownership/lease history, operational information, Site boundaries, and corporate successors of PRPs for the East Iola Smelter Site in Allen County, Kansas.

CGS research revealed the following PRPs pursuant to CERCLA Section 107(a) liability law:

PRP	Viability	Reason	CERCLA Liability Law
Iola Realty Company	No – expired 1917	Owner: 1897-1900	107(a)(2)
Iola Portland Cement Company	No – expired 1949	Owner: 1900-1915	107(a)(2)
George E. Nicholson	No - deceased	Owner: 1901-1902	107(a)(2)
Prime Western Spelter Company	No – dissolved 1924	Owner/Operator: 1902-1925	107(a)(2)
J.B. Kirk Gas & Smelting Company	No – dissolved 1995	Owner/Operator: 1920-1925 Arranger: 1953-1958	107(a)(2) 107(a)(3)
J.B. Kirk, individual	No – deceased	Arranger: 1953-1958	107(a)(3)
Cherryvale Zinc Company	No – dissolved 1977	Transporter: 1953-1957	107(a)(4)
B & B Movie Theatres, L.L.C.	**Yes**	**Current Owner**	107(a)(1)
Macha Enterprises, Inc.	**Yes**	**Current Owner**	107(a)(1)
[redacted]	**Yes - individual**	**Current Owner**	107(a)(1)

Table 1: Potentially Responsible Parties

I. Introduction

PROJECT BACKGROUND

Chenega Global Services, LLC (CGS) received Task Order 0001, Project Code A7R6RP00, from the U.S. Environmental Protection Agency (EPA) Region 7 office, under the Superfund Contract Number EP-S7-09-08. The purpose of this task order is to provide EPA's Superfund Division with a vehicle through which to perform expedited site-specific potentially responsible party (PRP) searches in support of the EPA Task Order/Project Officer (TOPO) search activities.

This Potentially Responsible Party report for the East Iola Smelter Site (the "Site") summarizes the research conducted by the Records Specialists (RS) and Regulatory Analysts (RA) to determine the Site history.

PROJECT APPROACH

The U.S. Environmental Protection Agency, Region 7, Superfund Division, Kansas City, Kansas contracted Chenega Global Services, Anchorage, Alaska to perform the PRP search and report.

LIST OF CONTACTS

- Allen County Register of Deeds
- Allen County Appraiser
- EPA Region 7 CERCLA Records Center
- Iola, Kansas - City Zoning Commission
- Kansas Department of Health and Environment
- Kansas State Historical Society
- Kansas Secretary of State

SITE DESCRIPTION

The Site is located on the eastern border of the City of Iola, within the city limits. It sits to the East of the central business district along the north side of US Highway 54. The Site is in the southeast quarter (SE/4), of the southwest quarter (SW/4), of Section 25, Township 24 South, Range 18 East, of Allen County, Kansas.

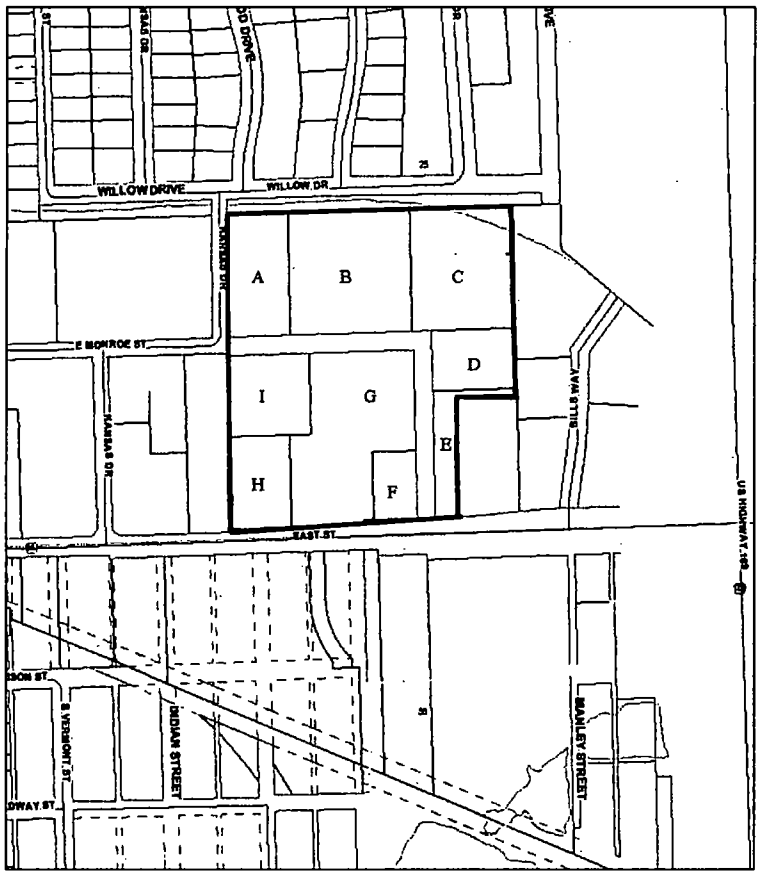


Figure 1: East Iola Site Map with Tracts A - I

The Iola Realty Company purchased the entire southwest quarter of Section 25, Township 24, Range 18 East from Henry P. Merriam and his wife in 1897 (19-318[1]). In 1898, during the realty company's ownership, George E. Nicholson built the first smelter on the property, beginning operations that same year (2). In May of 1900, the land sold to the Iola Portland Cement Company of Kansas (26-514). In August of 1901, George E. Nicholson purchased the land on which he had already commenced smelting operations (12, 27-191).

In January of 1902, Nicholson sold the Site and its smelting apparatuses to Prime Western Spelter Company (8, 33-626). A New York Times article from 1902 claims that New Jersey Zinc Company had a hand in this sale, and a mineral industry publication from the same year concurs (10, 8). No legal documentation confirming New Jersey Zinc Company's involvement was located. Prime Western owned the property from 1902 to1920, when its works went idle and the company sold to J.B. Kirk Gas & Smelting Company (6, 70-455).

J.B. Kirk Gas & Smelting Company operated the Site until 1925, when all smelter operations ceased (9). In 1934, J.B. Kirk Gas & Smelting Company sold a small portion of the property

[1] This citation format is used for title instrument book and page numbers throughout the report.

to the City of Iola, maintaining ownership of the remaining property until late 1958 (98-297). During the latter years of ownership, J.B. Kirk Gas & Smelting Company leased a portion of the Site property to J.B. Kirk, president of the company (M52-105). From 1953 to 1956, J.B. Kirk, as lessee of the Site, entered into an agreement with Cherryvale Zinc Company for quarrying and removal of an on-site cinder residue dump that resulted from past smelting operations (M52-110, M55-143).

J.B. Kirk Gas & Smelting Company sold the remaining Site property to Iola Industries, Inc. in April of 1959 (133-402). Following this sale, no further smelting activity occurred on the Site property.

From 1959 to the present, the Site property has transferred between multiple individuals. A full list of owners from 1897 to the present is included in 'Attachment B: Chain of Title Tables'.

Several companies had ownership of the land from 1940 to the present; a full list is included in Table 5 and duplicated in Attachment H. Based on the evidence collected, there is no indication that these companies engaged in on-site operations that could contribute to the type of waste found on the Site property.

Currently, the Site is divided into nine parcels. Lawrence Macha owns six parcels, Macha Enterprises, Inc. owns two, and B&B Movie Theatres, L.L.C. owns one. Details on the current parcels are included in Table 2.

SITE TIMELINES

The timelines below provide a parallel view of owner and operator activities on-site during active smelter years. For larger images, see Attachment G: Site Timeline.

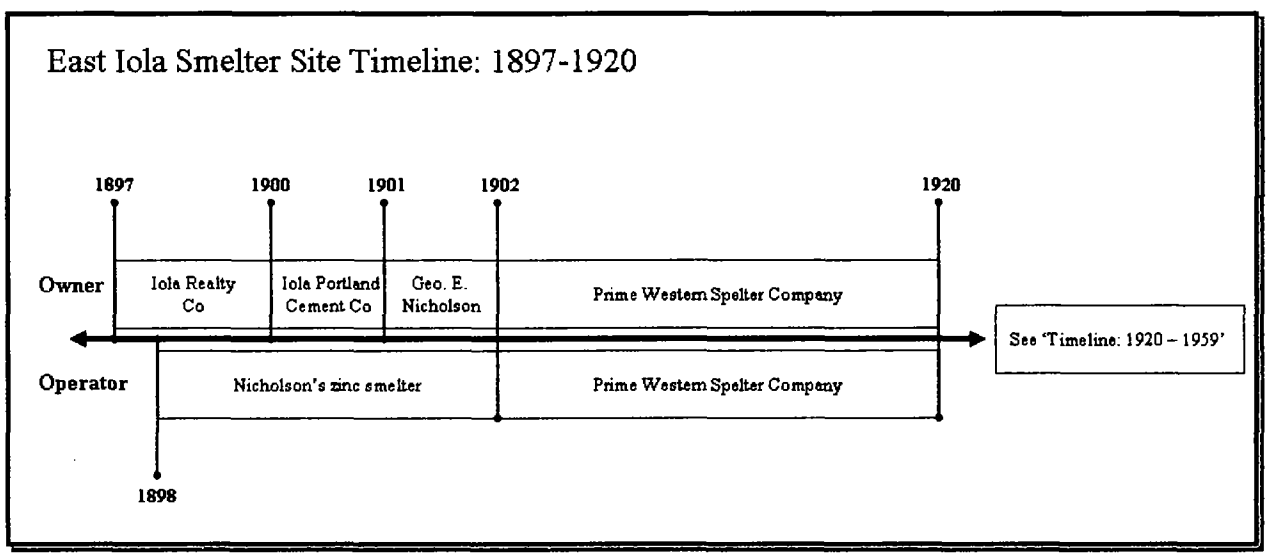


Figure 2: Site Timeline 1897-1920

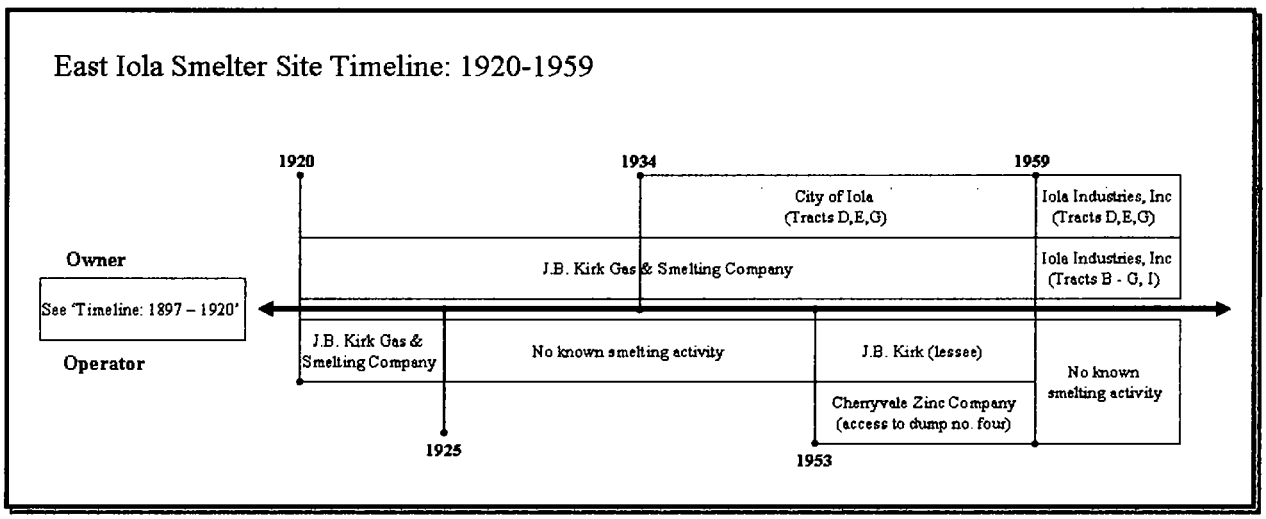


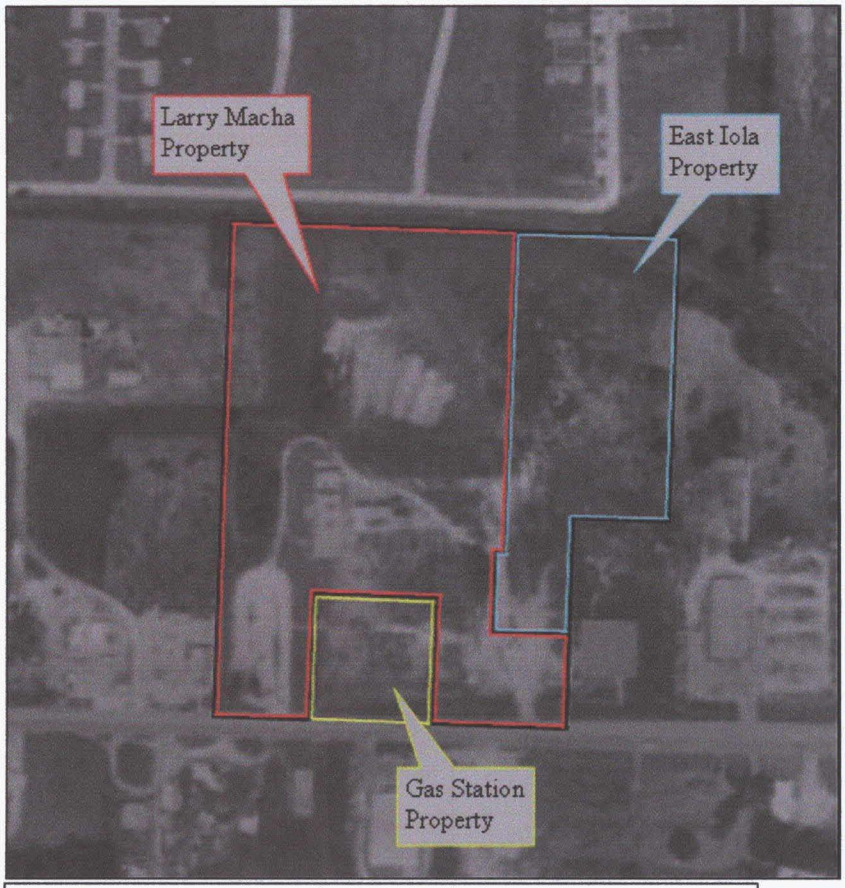
Figure 3: Site Timeline 1920-1959

CONTAMINANTS OF CONCERN

The primary contaminant of concern associated with the Site is lead. On-site smelting activities produced wastes, often in the form of slag, containing high concentrations of heavy metals, such as lead. Often the waste material was reprocessed to extract valuable metal contents, or used as fill for construction. (1)

Initial investigations began on-site in 1994, when Kansas Department of Health & Environment (KDHE) performed sampling on visible smelter waste piles. The analyzed samples revealed lead, cadmium, and arsenic exceeding acceptable levels. On June 1, 1999 Larry Macha, a current owner of Site property, entered the East Iola Smelter Site into the Voluntary Cleanup Property Redevelopment Program (VCPRP). Subsequent investigations showed lead impacts concentrated in the northeastern portion of the Site. (9)

In October of 1999, Allgeier, Martin & Associates, Inc. began lead excavating procedures from all areas except the northeast portion of the Site. Wastes were excavated from the Larry Macha property, deposited in the northeast corner, and capped. See Figure 4 for property divisions. (9)



Metes and Bounds Source: Survey Book 6 Page 68, Allen County Register of Deeds (2001)

Figure 4: 2001 VCPRP Survey Boundaries

II. Ownership History

Review of Title Documents

The RA and RS were instructed to review all title/deed documents relevant to historic smelting activities on the Site property. The RA and RS used pertinent title/deed documents to determine site boundaries. The research determined smelting activities occurred across an area that is now divided into nine parcels of land, referenced as Tracts A - I. Their legal descriptions can be found in 'Attachment B: Chain of Title Tables'. The current owner information for the Site parcels is listed in the Table 1 below:

Assessors Parcel No	Tract	Current Owner	Property Address	Mailing Address	On-Site Structures
077-25-0-30-19-002-10-0	A	[redacted]			Mini Warehouse (Built in 2003)
077-25-0-30-[redacted]	B	[redacted]	[redacted] 66749	[redacted]	[redacted]
077-25-0-30-19-002-01-0	C	B & B Movie Theatres, L.L.C.	1802 East St. Iola Kansas 66749	201 N Washington, Iola KS 66749	Cinema/Theatre (Built in 2001)
077-25-0-30-19-002-08-0	D	[redacted]			
077-25-0-30-19-002-03-0	E				
077-25-0-30-19-002-04-0	F	Macha Enterprises, Inc.	1702 East St. Iola Kansas 66749	PO Box 220 Gas KS 66742	Manual Car Wash (Built in 2000)
077-25-0-30-19-002-05-0	G	Macha Enterprises, Inc.	1700 East St. Iola Kansas 66749	PO Box 220 Gas KS 66742	Convenience Market (Built in 2000)
077-25-0-30-19-002-06-0	H	[redacted]			
077-25-0-30-19-002-07-0	I				

Table 2: Current Parce

Figure 5: East Iola Site with color-coded tracts

Current and Past Ownership History

Historical and current ownership of the Site is summarized in chronological order in 'Attachment B: Chain of Title Tables'. The title search revealed several gaps in ownership history. CGS, in partnership with the Allen County Recorder of Deeds, attempted to close the indicated gaps without success.

Leases

On August 28, 1953, the J.B. Kirk Gas & Smelting Company entered into a lease agreement with J.B. Kirk, the company's president, for the term of five years. The lease, recorded at the Allen County Register of Deeds in book M52, page 105, granted J.B. Kirk access to all cinder residues that resulted from previous on-site smelting activities. The Site property is referenced in the lease as 'Dump No. Four'.

Agreements

On August 28, 1953, J.B. Kirk entered into an agreement with Cherryvale Zinc, recorded in book M52, page 110 of the Allen County Register of Deeds. J.B. Kirk held a lease covering Tracts A – I, which contained a cinder residue dump. The agreement granted Cherryvale the option of purchasing and removing cinder residue from dump number 4 (renamed dump number 3 in the 1956 agreement) for a period of 6 months from the date of the agreement.

On October 24, 1956 the Estate of J.B. Kirk, deceased, represented by Stanley J. Kirk, Executor, entered into an agreement with Cherryvale Zinc Company, Inc. for the term of one year. The agreement granted Cherryvale the option of purchasing and removing cinder residue from dump number 3 (Tracts A-I of the Site property). The agreement is recorded in book M55 on page 143 of the Allen County Register of Deeds.

The on-site dump contained 14,210 tons of cinder residues. Figure 10 on page 30 shows the location of Dump No. 4 relative to the Site.

On August 26, 1971, an agreement was made between Corbett A. and Sandra T. Thompson (first party), Thompson Poultry, Inc. (second party), and Sell Constructors Inc. (third party). The agreement covered tracts B, C, F, G, H and I, and established that Sell Constructors Inc. would construct buildings in the present and future for Thompson Poultry, Inc. on the property. The agreement recorded in book M82, page 155 of the Allen County Register of Deeds.

On December 28, 1978, Thompson Poultry, Inc. and Tyson Foods, Inc. entered into an agreement pertaining to tracts B, C, F, G, H and I. The agreement assigned to Tyson Foods, Inc. a lease agreement already established with the City of Iola on June 1, 1972. The lease term was through 1992, giving Thompson the option to purchase the property on any June 1 or December 1 from 1982 to 1992. Thompson Poultry, Inc. exercised the option to purchase on January 10, 1989. The agreement assignment recorded in book M93, page 386 of the Allen County Register of Deeds.

ZONING

According to the City of Iola Zoning Commission, all parcels of the East Iola Smelter Site are zoned as 'General Business'.

TITLE TREES

Title Trees for Tracts A-I of the Site are in 'Attachment A: Title Trees'.

III. Potentially Responsible Parties

Owners at the Time of Disposal

Summary

Historical evidence indicates that from 1898 to 1902 a zinc smelter associated with George E. Nicholson operated on the East Iola Smelter Site property[2]. The exact corporate name of the on-site smelter is unknown. During the four-year time span three owners appeared on title instruments covering Site property: Iola Realty Company, Iola Portland Cement Company, and George E. Nicholson.

Smelting is known to have occurred on the Site property and may be a source of the lead contamination detected in the soil at the Site. Under CERCLA Section 107(a) (2) PRP liability law, Iola Realty Company, Iola Portland Cement Company, and George E. Nicholson are considered PRPs because each owned the Site property during the time of disposal.

PRP sections A, B and C provide available details on these three PRPs. The following section accounts for the on-site smelter operations between 1898 and 1902.

Nicholson Smelter Operational Information

Evidence of George E. Nicholson's on-site smelting activity from 1898-1902 is apparent in several historical sources. Table 3 provides a timeline of Nicholson's operational statistics.

Date	Activity	Source
1898	George E. Nicholson erects a zinc smelter of 1,200 retorts	2
1901	George E. Nicholson increased the smelting capacity at his works to 68 percent	5
1902	George E. Nicholson zinc smelter plant bought by Prime Western Spelter Company. New Jersey Zinc Company is involved in the purchase.	2

Table 3: Nicholson smelting activities

Additional evidence of George Nicholson's smelting activity prior to the plant's transfer to Prime Western is found in a table from the Bi-Monthly Bulletin of the American Institute of Mining Engineers (published 1905). The table details the growth of the zinc industry in the Midwest from 1863-1904. In 1902, the Prime Western Spelter Company, referred to as 'Prime Western Zinc Co.', included two plants in Gas, Kansas, and one plant called 'Nicholson Zinc Co.' in Iola.

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[2] For a detailed account of smelter operations refer to subheading 'Nicholson Smelter Operational Information' (Page 17)

Figure 6 provides an image of the table:

Year of Construction.	Name of Company.	Abandoned. No. of Retorts.	Abandoned. Total.	In Operation. No. of Retorts.	In Operation. Total.
	COAL-BURNING SMELTERS—ILLINOIS.				
1863	Matthiessen & Hegeler Zinc Co., LaSalle			3,344	
1869	Illinois Zinc Co., Peru			3,360	
1875	Lumaghi Zinc Works, Collinsville	244			
1888	Collinsville Zinc Co., Collinsville			1,536	
1892	Waukegan Zinc Works, Waukegan			672	
1891	Winona Zinc Works, Winona			448	
1897	Sandoval Zinc Works, Sandoval		244	672	10,022
	MISSOURI.				
1869	Missouri Zinc Works, Carondelet	1,620			
1872	Martindale Zinc Works				
	Edgar Zinc Co. Carondelet.			2,000	
1878	Carondelet Zinc Works				
1881	Joplin Zinc Works, Joplin	1,120			
1882	Rich Hill Zinc Works, Rich Hill			672	
1887	Robert Lanyon, Nevada	1,344			
1896	Geo. E. Nicholson, Nevada		3,484	672	3,344
	KANSAS.				
1874	Weir City Zinc Works, Weir City	1,200			
1878	Robert Lanyon, Pittsburg	1,200			
1881	S. H. Lanyon & Bro., Pittsburg	800			
1882	W. & J. Lanyon, Pittsburg	840			
1882	Granby Mining & Smelting Co., Pittsburg	912			
1888	Scammonville Zinc Works, Scammonville	400			
1886	Girard Zinc Works (old), Girard	448			
1890	Girard Zinc Works (new), Girard	896			
1891	Pittsburg & St. Louis, Pittsburg			896	
1890	Weir City North Works, Pittsburg			1,344	
1895	Chicopee Zinc Co., Cherokee	448			
1894	Midland Smelting Co., Bruce	1,120	8,064		2,240
	Totals		11,792		15,606
	NATURAL-GAS BURNING SMELTERS—INDIANA.				
1892	Columbia Zinc Works, Marion	800			
1893	Ingalls Zinc Works, Ingalls	744			
1893	Upland Zinc Works, Upland	600	2,144		
	KANSAS.				
1897	Lanyon Zinc Co. — Robert Lanyon Sons Spelter Co., Iola.				
1898	Lanyon Zinc Co. — Robert Lanyon Sons Spelter Co., La Harpe.			9,600	
1897	Lanyon Zinc Co. — W. & J. Lanyon, Iola.				
1898	Prime Western Zinc Co. — Prime Western Z. Co., Gas City.				
1902	Prime Western Zinc Co. — Nicholson Z. Wks., Iola.			8,900	
1902	Prime Western Zinc Co. — A. B. Cockerill, Gas City.				
1896	Cherokee-Lanyon Zinc Co., Gas City			2,400	
1898	Edgar Zinc Co., Cherryvale			4,800	
1901	United Zinc & Chemical, Iola			2,400	
1902	Granby Mining & S. Co., Neodesha			2,400	
1903	La Harpe Zinc Co., La Harpe			2,100	
1903	Chanute Zinc Co., Chanute			1,280	
1904	A. B. Cockerill, Altoona			1,800	
1904	Wm. Lanyon, Caney			1,800	37,480
	Total in gas-district		2,144		38,080
	Total in coal-district		11,792		15,606
	Grand total		13,936		53,686

Figure 6: Zinc Industry Statistics 1905 (Source: 4)

Based on available information, Nicholson's zinc smelter cannot be legally tied to the East Iola Smelter Site property.

A. Iola Realty Company

Summary

Historical evidence indicates that during Iola Realty Company's period of ownership a zinc smelter operated on-site[3]. Smelting is known to have occurred on the Site property and may be a source of the lead contamination detected in the soil at the Site. Under CERCLA Section 107(a) (2) PRP liability law, Iola Realty Company is considered a PRP because it owned the Site property at the time of disposal.

Ownership / Lease History

The Iola Realty Company purchased the entire southwest quarter of Section 25, Township 24, Range 18 East from Henry P. Merriam on March 3, 1897. The transaction recorded in book 19, page 318 of the Allen County Register of Deeds.

On May 2, 1900, Iola Realty sold the Site property to Iola Portland Cement Company (26-514).

Corporate History

On March 2, 1897, A.W. Beck, A.L. Taylor, J.A. Robinson, W.J. Evans, Geo. A. Bowlus, F.A. Northrup, and T.E. Kelly incorporated the Iola Realty Company in Kansas. The principal office was in Iola, KS and the purpose for which the company was formed was, "to buy sell and improve real estate for the benefit of its members". (24)

According to the Kansas State Historical Society's corporate dead jacket file, the company's term expired on March 2, 1917 (25). No other records were available.

Property Boundary/Site Description:

For a parcel map, see Figure 1 or Figure 5.

[3] For a detailed account of smelter operations refer to subheading 'Nicholson Smelter Operational Information' (Page 17)

B. Iola Portland Cement Company

Summary

Historical evidence indicates that during Iola Portland Cement Company's period of ownership a zinc smelter operated on-site[4]. Smelting is known to have occurred on the Site property and may be a source of the lead contamination detected in the soil at the Site. Under CERCLA SECTION 107 (a) (2) PRP liability law, Iola Portland Cement Company is considered a PRP because it owned the Site property at the time of disposal.

Ownership / Lease History

The Iola Portland Cement Company purchased the Site property from the Iola Realty Company on May 2, 1900 (26-514).

On January 8, 1901, Iola Portland Cement Company sold land covering Tracts B through G of the Site property to George E. Nicholson. The Transaction was recorded in book 27, page 191 of the Allen County Register of Deeds.

On April 16, 1902, Iola Portland Cement sold Nicholson a 25-foot wide tract directly to the West of his current land, covering parts of Tracts B and G. The transaction was recorded in book 33, page 404 of the Allen County Register of Deeds.

Iola Portland Cement sold the remaining Site property (Tracts ABGHI) to Prime Western Spelter Company on May 25, 1915 (43-75; 59-164).

Corporate History

The Iola Portland Cement Company applied for a Charter in Kansas on May 12, 1899. The Charter granted for a term of fifty years and filed with the Kansas Secretary of State on June 7, 1899. The directors were, John T. Holmes, William L. Holmes, Geo. A. Bowlus, Herschel Hatch, James French, Oscar Foust, and L.L. Northrup. (22)

According to the Kansas State Historical Society's corporate dead jacket file, the company's term expired on June 7, 1949 (23). No other records were available.

Property Boundary/Site Description:

For a parcel map, see Figure 1 and Figure 5.

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[4] For a detailed account of smelter operations refer to subheading 'Nicholson Smelter Operational Information' (Page 17)

C. George E. Nicholson

Summary

Historical evidence indicates that during George E. Nicholson's period of ownership a zinc smelter operated on-site[5]. Smelting is known to have occurred on the Site property and may be a source of the lead contamination detected in the soil at the Site. Under CERCLA Section 107(a) (2) PRP liability law, George E. Nicholson is considered a PRP because he was an owner of the Site property at the time of disposal. He was born in New York in 1861 and died on April 9, 1937 (10).

Ownership / Lease History

George E. Nicholson acquired Tracts B through G of the Site property from The Iola Portland Cement Company on January 8, 1901. The Transaction recorded in book 27, page 191 of the Allen County Register of Deeds.

On April 16, 1902, Iola Portland Cement sold Nicholson a 25-foot wide tract directly to the West of his current land, covering parts of Tracts B and G. The transaction recorded in book 33, page 404 of the Allen County Register of Deeds.

Nicholson maintained ownership until July 1, 1902, when he sold a section of land covering Tracts A, B, G, H, and I to Prime Western Spelter Company (33-626).

Corporate History

George E. Nicholson was born in New York in 1861 and died on April 9, 1937 (10).

Property Boundary/Site Description:

George E. Nicholson owned the entire Site property during 1901 and 1902, at which time a zinc smelter was in operation.

For a parcel map, see Figure 1 or Figure 5.

Smelters

D. Prime Western Spelter Company

Summary

Prime Western Spelter Company owned portions of the Site property from 1902 to 1925 and operated an on-site zinc smelter until 1920. Smelting is known to have occurred on the Site property and may be a source of the lead contamination detected in the soil at the Site. According to CERCLA Section107 (a) (2) PRP liability can be applied to Prime Western Spelter Company because it was an owner and operator of the Site property at the time of

[5] For a detailed account and references on smelter operations refer to subheading 'Nicholson Smelter Operational Information' (Page 17)

disposal. Prime Western dissolved on March 24, 1924; no corporate successors were located.

OWNERSHIP / LEASE HISTORY

Prime Western Spelter Company purchased Tracts B through G of the Site property from George E. Nicholson on July 1, 1902. The transaction was recorded in book 33, page 626 of the Allen County Register of Deeds. Zinc industry statistics from 1902 show that Prime Western absorbed George E. Nicholson's zinc smelter at Iola during this transaction (4). There is also evidence, documented in a U.S. Geological Survey publication from 1902 that implicates another company's involvement in the purchase:

> *In 1902, interests identified with the New Jersey Zinc Company purchased the works of the Prime Western Spelter Company and the new plant of Mr. A. B. Cockerill, both at Gas, Kans., and the two plants of Mr. George E. Nicholson, at Iola, Kans., and Nevada, Mo. (5)*

The documentation infers that New Jersey Zinc Company was not the direct purchaser, but it was involved in the purchase. At this time there is no conclusive evidence tying New Jersey Zinc Company to the transactions surrounding the Site property.

On May 24, 1915, Prime Western purchased the remaining property covering tracts A, B, G, H, and I from Iola Portland Cement Company. Two separate transactions recorded in book 43, page 75 and book 59, page 164 of the Allen County Register of Deeds.

Prime Western maintained ownership of the property until December 16, 1920, when the company sold property covering Tracts A, B, G, H, and I to J.B. Kirk Gas & Smelting Company. The transaction recorded in book 70, page 455 of the Allen County Register of Deeds.

OPERATIONAL INFORMATION

Date	Activity	Source
July 1902	Prime Western purchases the Site property and absorbs George Nicholson's smelter	4
1902	The New Jersey Zinc Company is involved in the purchase of the Iola works	2
1907	Iola plant has 3 furnaces and 3,220 retorts	13
1910	Iola plant has 10 zinc furnaces and 3,240 retorts	6
1920	Prime Western Spelter Company's works at Iola are idle	7

Table 4: Prime Western Spelter Operational Information

CORPORATE HISTORY

Incorporation

Prime Western Spelter Company incorporated in Missouri on August 22, 1898, "to mine and dig for minerals of all kinds, to conduct a milling or smelting business, to buy and sell real estate to lease and operate mining lands" (30). The incorporators were, L.T. McRae, L.H. Callaway, G.R. Godfrey, J.A. Daly, and F.M. Daly (30).

Application for Authority in Kansas

Prime Western Spelter Company applied on October 27, 1904 for permission to engage in business in Kansas as a foreign corporation. The Kansas Secretary of State approved the application on November 10, 1904. The Officers listed were as follows:

G. G. Palmer - President
William Hardenberg - Vice President
Henry G. Wardner - Treasurer
A. P. Cobb - Secretary (31)

Withdraw from Kansas

Prime Western Spelter Company withdrew from the State of Kansas on December 6, 1922 and published it's withdraw notice in the Iola Daily Register on November 22, 1922. Baxter McLain signed as the company's representative in Kansas. (32)

Dissolution

On March 19, 1924, Edgar Palmer, President of Prime Western Spelter Company, signed a Certificate of Dissolution, dissolving the company by way of stockholders meeting. (33)

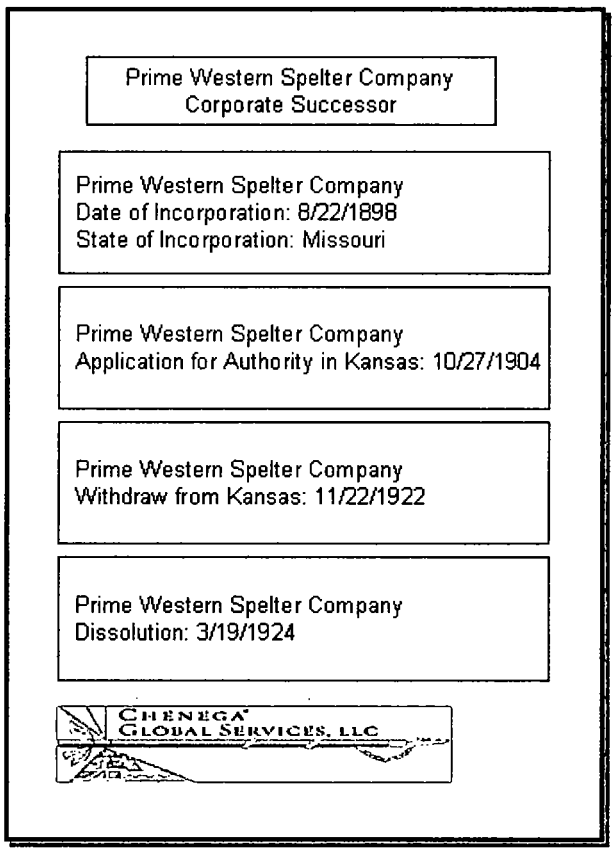

Figure 7: Prime Western Spelter Company Corporate Successor Chart

PROPERTY BOUNDARY/SITE DESCRIPTION:

Prime Western Spelter Company owned the Site property from 1902 to 1920. For a parcel map, see Figure 1 or Figure 5.

E. J.B. Kirk Gas & Smelting Company

Summary

J.B. Kirk Gas & Smelting Company operated the Site from 1920 until 1925, when all smelter operations ceased. They maintained ownership of certain tracts of Site property until 1959. During they company's final years of ownership, it leased the Site property to J.B. Kirk, granting him access to all cinder residues that resulted from previous on-site smelting activities. Kirk, the individual, then allowed Cherryvale Zinc Company access to the on-site dumps. In this capacity, J.B. Kirk Gas & Smelting Company arranged for the access and removal of on-site smelter wastes.

Smelting is known to have occurred on the Site property and may be a source of the lead contamination detected in the soil at the Site. According to CERCLA Section 107(a) (3) PRP liability can be applied to J.B. Kirk Gas & Smelting Company, as it was an arranger of the treatment of wastes. J.B. Kirk Gas & Smelting Company is dissolved; no corporate successor could be located.

Ownership / Lease History

J.B. Kirk Gas & Smelting Company purchased property covering Tracts A, B, G, H, and I from the Prime Western Spelter Company on December 16, 1920. The transaction was recorded in book 70, page 455 of the Allen County Register of Deeds.

On January 23, 1934, the company sold property covering Tract D, E, and G to the City of Iola (98-297).

J.B. Kirk Gas & Smelting Company sold its remaining Site property to Iola Industries, Inc. on 4/24/1959. The transaction covered Tracts B, C, D, E, F, G, and I, and recorded in book 133, page 402 of the Allen County Register of Deeds.

Leases

On August 28, 1953, the J.B. Kirk Gas & Smelting Company entered into a lease agreement with J.B. Kirk, the company's president for the term of five years. The lease recorded on book M52, page 105 of the Allen County Register of Deeds and granted J.B. Kirk access to all cinder residues that resulted from previous on-site smelting activities. The Site property is referenced in the lease as 'Dump No. 4'.

Agreements

During the period of J.B. Kirk Gas & Smelting Company ownership, J.B. Kirk, lessee of the Site property, entered into two consecutive agreements with Cherryvale Zinc Company to access the cinder residues of Dump No. 4 (M52-110, M55-143). Details regarding the agreements are included in Cherryvale Zinc Company's PRP Section of this report (see page 28).

Operational Information

J.B. Kirk Gas & Smelting Company operated the on-site smelter from 1920-1924. All operations ceased during 1925 (9). A Sanborn map from 1924 showed J.B. Kirk Gas & Smelting Company's Iola works on-site. No other operational information was located for J.B. Kirk Gas & Smelting Company.

CORPORATE HISTORY

The Kansas Secretary of State and the Kansas State Historical Society had no records available for J.B. Kirk Gas & Smelting Company. The Kansas Secretary of State provided a record of the company's dissolution.

Incorporation

The Kansas Secretary of State online database indicates that J.B. Kirk Gas & Smelting Company incorporated in Kansas on August 16, 1912. No other documentation of the company's incorporation was available. (26)

Dissolution

Stockholders meeting on July 19, 1995 dissolved J.B. Kirk Gas & Smelting Company, a Kansas corporation. Marvin E. Kraft, President and director, affixed his signature on the same date. The document was filed with the Kansas Secretary of State on September 13, 1995. (27)

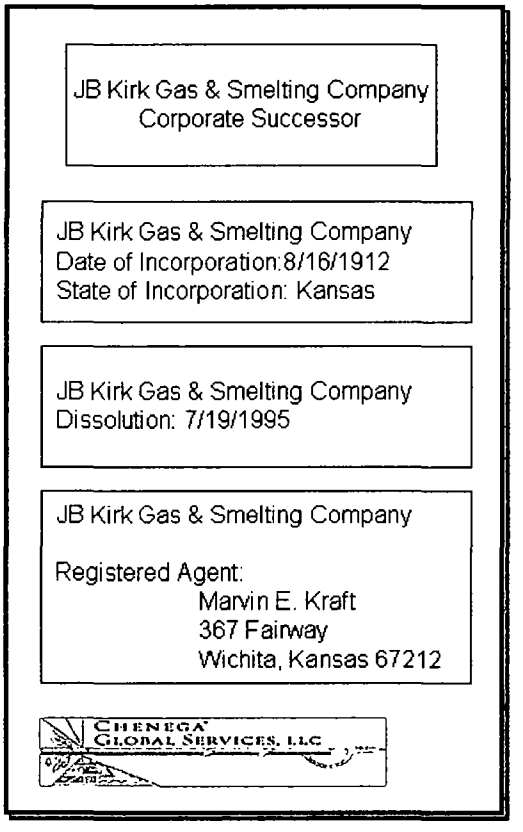

Figure 8: J.B. Kirk Gas & Smelting Company Corporate Successor Chart

PROPERTY BOUNDARY/SITE DESCRIPTION:

For a parcel map, see Figure 1 or Figure 5.

ARRANGERS
F. J.B. KIRK

SUMMARY
In 1953, J.B. Kirk leased an area known as Dump No. 4, which covered the entire Site property. During his five-year lease, he entered into an agreement that granted Cherryvale Zinc Company access to the cinder residues contained in Dump No. 4.

In this capacity, J.B. Kirk arranged for the access and removal of on-site smelter wastes. Smelting is known to have occurred on the Site property and may be a source of the lead contamination detected in the soil at the Site. According to CERCLA Section 107(a) (3), J.B. Kirk is considered a PRP, as he was an arranger of the treatment of wastes. J.B. Kirk is not a viable PRP; he is deceased (M55-143).

OWNERSHIP / LEASE HISTORY
Leases

On August 28, 1953, the J.B. Kirk Gas & Smelting Company entered into a lease agreement with J.B. Kirk, the company's president for the term of five years. The lease recorded on book M52, page 105 of the Allen County Register of Deeds and granted J.B. Kirk access to all cinder residues that resulted from previous on-site smelting activities.

The Site property is referenced in the lease as 'Dump No. 4'.

Agreements

On August 28, 1953, JB Kirk entered into an agreement with Cherryvale Zinc recorded in book M52, page 110 of the Allen County Register of Deeds[6]. On October 24, 1956 the Estate of JB Kirk, deceased, represented by Stanley J. Kirk, Executor, entered into an agreement with Cherryvale Zinc Company, Inc. for the term of one year.

CORPORATE HISTORY
A title document from October of 1956, identified J.B. Kirk as deceased (M55-143).

OPERATIONAL INFORMATION
CGS found no operational information.

PROPERTY BOUNDARY/SITE DESCRIPTION:
J.B. Kirk gained access to smelting waste on-site through a lease made with J.B. Kirk Gas & Smelting Company from 1953 through 1958. The cinder residue dump referenced in the lease covered the majority of the Site property. Figure 10 shows the dump area relative to the Site boundary.

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[6] For full details, see PRP Section G: Cherryvale Zinc Company

TRANSPORTERS
G. CHERRYVALE ZINC COMPANY

SUMMARY

Cherryvale Zinc Company did not own or lease the East Iola Site property. Between 1953 and 1957, the company was granted access to a cinder residue dump on-site. See below for details on the agreements.

Smelting is known to have occurred on the Site property and may be a source of the lead contamination detected in the soil at the Site. Cherryvale Zinc Company transported wastes found on the Site. According to CERCLA Section 107 (a) (3), PRP liability can be applied to Cherryvale Zinc Company because it was a transporter of smelter wastes. Cherryvale Zinc Company dissolved on August 26, 1977 and no corporate successors were located.

OWNERSHIP / LEASE HISTORY

Cherryvale Zinc Company did not own or lease the East Iola Smelter Site property. Between 1953 and 1957, the company accessed cinder residue dumps on-site. See below for details on the agreements.

Agreements

On August 28, 1953, J.B. Kirk entered into an agreement with Cherryvale Zinc recorded in book M52, page 110 of the Allen County Register of Deeds. J.B. Kirk held a lease covering Tracts A – I, which contained a cinder residue dump. The agreement allows Cherryvale the option of purchasing and removing cinder residue from Dump No. 4 (renamed Dump No.3 in the 1956 agreement) for a period of 6 months from the date of the agreement.

On October 24, 1956 the Estate of J.B. Kirk, deceased, represented by Stanley J. Kirk, Executor, entered into an agreement with Cherryvale Zinc Company, Inc. for the term of one year. The agreement granted Cherryvale the option of purchasing and removing cinder residue from Dump No. 3 (Tracts A-I of the Site property). The agreement recorded in book M55 on page 143 of the Allen County Register of Deeds. The on-site dump contained 14,210 tons of cinder residues

OPERATIONAL INFORMATION

CGS found no operational information.

CORPORATE HISTORY

Incorporation

Cherryvale Zinc Company, Inc. incorporated in the State of New York on January 1, 1950, "to carry on business to smelt, refine, and concentrate" (18). The incorporators were, Benno Elkan, C.H. Scherf, and Julian B. Beaty. (18)

Application for Authority as a Foreign Corporation in Kansas

On February 27, 1950, Cherryvale Zinc Company applied to the Charter Board of Kansas for permission to engage in business as a foreign corporation. The application approved February 27, 1950. The Officers listed were as follows (18):

Julian B. Beaty, President
O. Frohnknecht, Vice-President
C.H. Scherf, Treasurer
E. H. Mann, Secretary
Carl M. Elkan, Manager

Withdraw from the State of Kansas

On February 9, 1973, Cherryvale Zinc Company, Inc. surrendered its authority to transact business in the State of Kansas. The Certificate of Withdraw filed with the Kansas Secretary of State on May 10, 1973. (20)

Dissolution

Cherryvale Corporation dissolved by way of stockholders meeting on August 8, 1977.

R. Fred Baerwald, President and Stanley J. Titch, Secretary/Treasurer are listed as the company's only officers. The Certificate of Dissolution filed with the New York Secretary of State on August 26, 1977. (21)

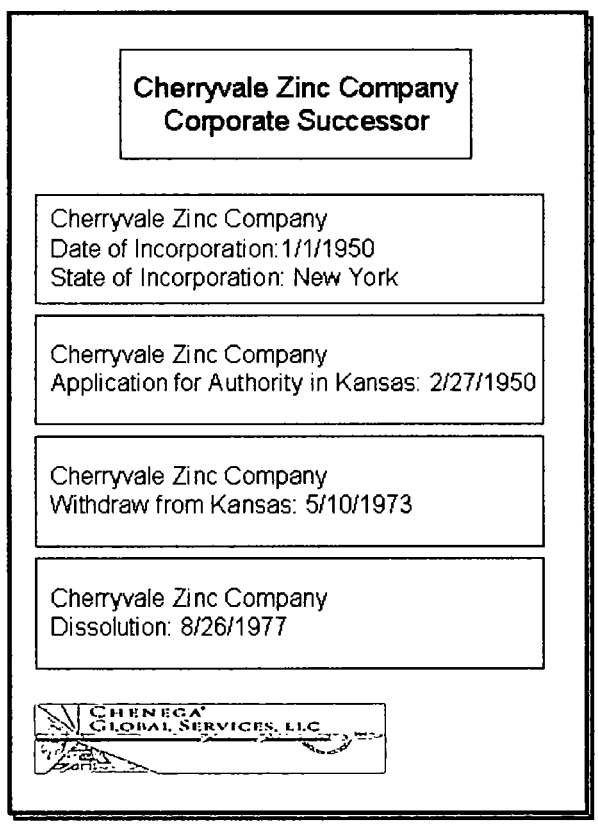

Figure 9: Cherryvale Zinc Company Corporate Successor

PROPERTY BOUNDARY/SITE DESCRIPTION:

Cherryvale Zinc Company gained access to smelting waste on-site through agreements made with J.B. Kirk from 1953 through 1957. The cinder residue dump covered the majority of the Site property. Figure 10 shows the dump area relative to the Site boundary:

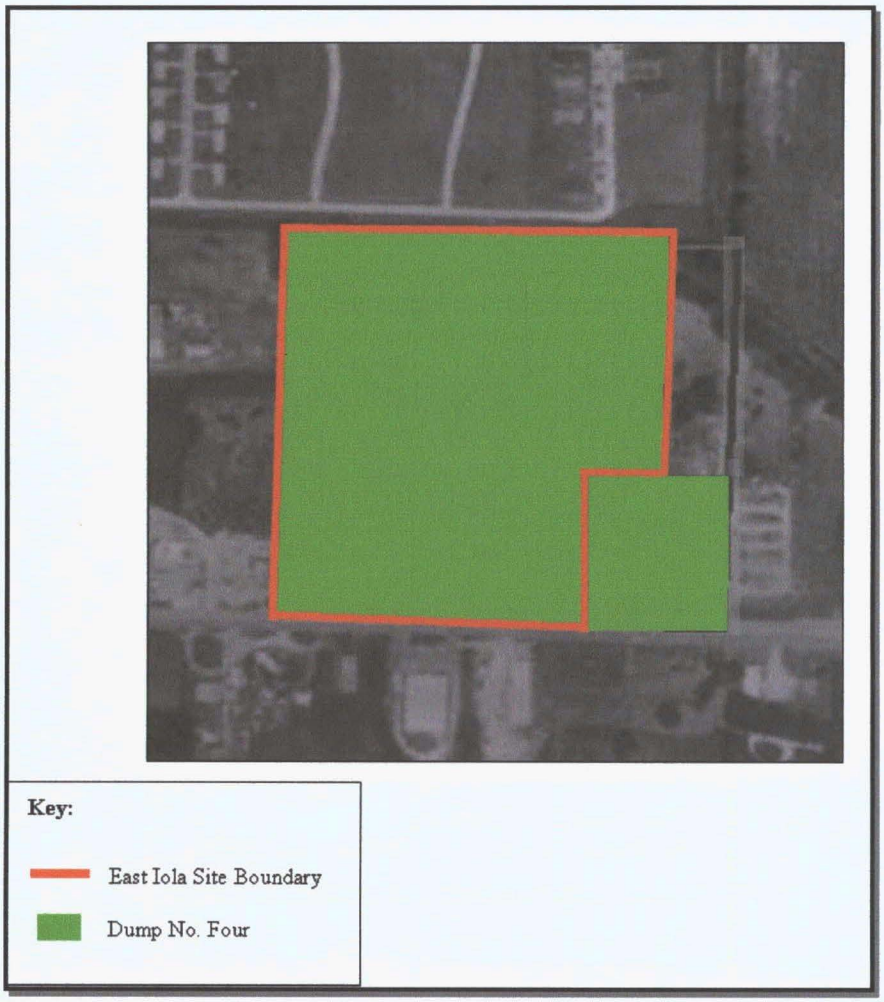

Figure 10: East Iola Site Dump No. 4.

CURRENT OWNERS
H. B & B MOVIE THEATRES, L.L.C.

SUMMARY

B & B Movie Theatres, L.L.C. has maintained ownership of Tract C of the Site property since 2007. The company operates a movie theatre on-site. According to CERCLA Section 107(a)(1), PRP liability can be applied to B & B Movie Theatres, L.L.C., as it is a current owner of the Site property. As of May 2010, the company is delinquent in Kansas.

OWNERSHIP / LEASE HISTORY

B & B Movie Theatres, L.L.C. purchased the majority of Tract C of the Site property from Lawrence Macha on September 7, 2001. The transaction recorded in book A8, page 103 of the Allen County Register of Deeds.

On November 21, 2007, B & B purchased the remaining land of Tract C from Lawrence and Virginia Macha. The transaction recorded in book 2007, page 0846 of the Allen County Register of Deeds.

B & B Movies Theatres, L.L.C. is the current owner of Tract C of the Site.

OPERATIONAL INFORMATION

The company operates a movie theatre on-site called 'Sterling Six' at 1802 East Street.

CORPORATE HISTORY

Incorporation

B & B Movie Theaters, L.L.C. incorporated in Missouri on November 8, 1996 to "acquire, own, build, develop, and manage movie theaters and book stores". The sole incorporator listed is David W. Walker.

Application for Authority in Kansas

On July 11, 2000 B & B applied for and was granted authority to "own real estate and receive rents" in Kansas.

Name Change

B & B changed its corporate name to B & B Movie Theatres, L.L.C. on May 14, 2003.

Current

According to the Kansas Secretary of Sate, the company's registered agent is:

Eric Olson
210 North Washington
Iola, KS 66749

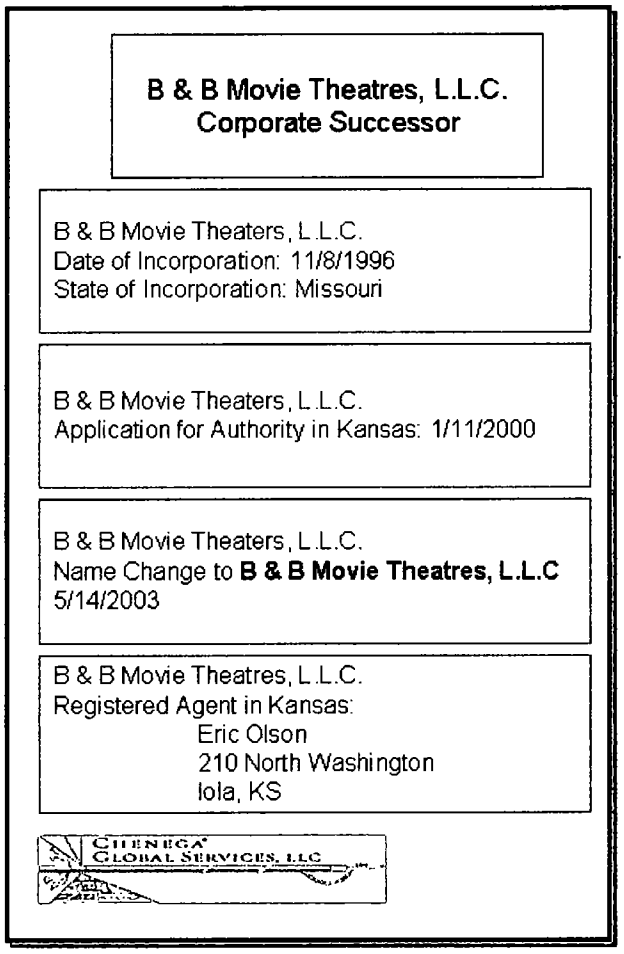

Figure 11: B & B Movie Theatres, L.L.C. Corporate Successor

PROPERTY BOUNDARY/SITE DESCRIPTION:

For a parcel map showing Tract C, see Figure 1 or Figure 5.

I. MACHA ENTERPRISES, INC.

SUMMARY

Macha Enterprises, Inc., an asphalt product and roadway repair company, is the current owner of Tracts F and G. According to CERCLA Section 107(a) (1), PRP liability can be applied to Macha Enterprises, Inc., as it is a current owner of the Site property. As of May 2010, the company is delinquent in Kansas.

OWNERSHIP/LEASE HISTORY

Macha Enterprises, Inc. purchased Tracts F and G of the Site property from Lawrence and Virginia Macha on January 11, 2008. The transaction recorded in book 2008, page 0095 of the Allen County Register of Deeds.

Macha Enterprises, Inc. is the current owner of Tracts F and G.

OPERATIONAL INFORMATION

CGS found no operational information.

CORPORATE HISTORY

Incorporation

Mach Enterprises, Inc. incorporated in Kansas on September 16, 1991. Lawrence and Robert Macha signed as the incorporators, intending to, "engage in...the business of producing, applying, or otherwise using asphalt and asphalt products or other materials in the construction and repair of roadways, streets or other surfaces or structures". (28)

As of May 2010, the business is listed as delinquent with the Kansas Secretary of State. Its registered agent is:

Lawrence L. Macha
515 South Main
Gas, KS 66742 (29)

A general internet search for the registered address revealed that also listed at this address is Se-Kan Asphalt Services, Inc.; Lawrence L. Macha is the CFO.

PROPERTY BOUNDARY/SITE DESCRIPTION:

For a parcel map with Tracts F and G, see Figure 1 or Figure 5.

J. [redacted]

SUMMARY

Lawrence L. Macha owned the entire Site property from 1990 until 2001. He is the current owner of Tracts A, B, D, E, H and I of the Site property. Any on-site operations are unknown. According to CERCLA Section 107(a) (1), PRP liability can be applied to Lawrence L. Macha, as he is a current owner of the Site property.

OWNERSHIP/LEASE HISTORY

On February 6, 1990, Lawrence L. Macha purchased the entire Site property from Thompson Poultry Inc. (181-288).

In 2001, Macha sold Tract C to B & B Movie Theatres, Inc. (A7-592). In January of 2008 Larry Macha sold Tracts F and G to Macha Enterprises, Inc., the company that he incorporated in 1991 (2008-0095).

As of May 2010, Lawrence Macha is the current owner of Tracts A, B, D, E, H and I of the Site property.

OPERATIONAL INFORMATION

CGS found no operational information for Lawrence L. Macha.

CORPORATE HISTORY

Lawrence Macha is listed as the registered agent of Macha Enterprises, Inc. As of May 2010, the business is delinquent in Kansas. Macha is also the CFO of Se-Kan Asphalt Services Inc., an active Kansas corporation.

Contact Information:

Lawrence (Larry) Macha
2805 N Funston St.
Iola, KS 66749
Phone: 620-365-8141

PROPERTY BOUNDARY/SITE DESCRIPTION:

For a parcel map, see Figure 1 or Figure 5.

ADDITIONAL CORPORATE PROPERTY OWNERS

During the collection and review of Site title instruments, CGS found several corporations that owned Site property. EPA asked CGS to account for these businesses and their on-site operations. Based on the information gathered, the corporations listed cannot be classified as Potentially Responsible Parties. Business information available for these companies is provided in Table 5 of the report body and is duplicated in Attachment H: Corporate Property Owners.

Company	Dates of Ownership	Tract	Nature of business / Notes	Source
Iola Industries, Inc.	4/24/1959 - 12/29/1961 4/24/1959 -9/7/1966	A, B, C, D, E, F, G, H, I	Industrial development corporation	1
Thompson Poultry, Inc.	12/28/1977 – 1/10/1989	A,B, C, D, E, F, G, H, I	Poultry processing – became Thompson Processors, Inc.	2
Thompson Processors, Inc.	9/25/1969 – 1/9/1970	B, C, D, E, F, G	Poultry processing – merged into Tyson Foods, Inc.	2
Tyson Foods, Inc.	12/28/1978	A, H, I	Chicken, beef, and pork processing and marketing	3

Table 5: Corporate Property Owners (for sources see Attachment H)

CONCLUSIONS

According to Chenega Global Services research, the following entities are considered potentially Responsible Parties pursuant to CERCLA Section 107 (a) for the following reasons:

Owners at the Time of Disposal

The following are included as PRPs based on evidence that, during their period of Site ownership, a smelter associated with George E. Nicholson operated on-site. Smelting is known to have occurred on the Site property and may be a source of the lead contamination detected in the soil at the Site. The on-site smelter's corporate name is unknown and cannot be legally tied to the East Iola Smelter Site property. According to CERCLA Section 107(a) (2) PRP liability can be applied to the following three parties, as they were owners of the Site property at the time of disposal:

Iola Realty Company, a Kansas corporation, owned the Site property from 1897 through 1900. The company expired on March 2, 1917; no corporate successor was located.

Iola Portland Cement Company, of Kansas, owned the Site property from 1900 to 1901. The company expired on June 7, 1949; no corporate successor was located.

George E. Nicholson, an individual, owned Site property during 1901 and 1902; he is deceased (April 9, 1937).

Smelting Operations

Smelting is known to have occurred on the Site property and may be a source of the lead contamination detected in the soil at the Site. According to CERCLA Section 107(a) (2) PRP liability can be applied to the following entities, as they were owners and operators at the time of disposal:

Prime Western Spelter Company, a Missouri corporation, owned the full Site property between 1902 and 1920, during which time it operated a smelting facility. Prime Western Spelter Company withdrew from Kansas on November 22, 1922 and dissolved on March 19, 1924. As of April 2010, no corporate successors were located.

J.B. Kirk Gas & Smelting Company, a Kansas corporation, owned portions of the Site property from 1920 to 1959. The company operated a smelting facility on-site until 1925 and then leased to J.B. Kirk, an individual, in 1953. J.B. Kirk Gas & Smelting Company dissolved on July 19, 1995; no corporate successors were located.

Arrangers

J.B. Kirk, an individual, leased the Site property from J.B. Kirk Gas & Smelting Company on August 28, 1953. The same day, he established an agreement with Cherryvale Zinc Company, allowing the zinc company to access and remove cinder residues that had resulted from previous smelting activities (referred to as Dump No. 4). In this capacity, J.B. Kirk arranged for the relocation of smelting wastes.

Smelting is known to have occurred on the Site property and may be a source of the lead contamination detected in the soil at the Site. According to CERCLA Section 107(a) (3), J.B. Kirk is considered a PRP, as he was an arranger of the treatment of wastes. A title document from October of 1956, identified J.B. Kirk as deceased (M55- 143).

Transporters

Cherryvale Zinc Company, a New York corporation, entered into an agreement with J.B. Kirk, lessee of the Site property, on August 28, 1953, to access and remove cinder residues that had resulted from previous smelting activities. The agreement spanned three years and was renewed at J.B. Kirk's death in 1956 for one year. In this capacity, Cherryvale Zinc Company transported lead-contaminated wastes.

Smelting is known to have occurred on the Site property and may be a source of the lead contamination detected in the soil at the Site. According to CERCLA Section 107(a) (4), Cherryvale Zinc Company is considered a PRP, as it was a transporter of smelter wastes. Cherryvale withdrew from Kansas on May 10, 1973 and was dissolved on August 26, 1977; no corporate successors were located.

Current Owners

According to CERCLA Section 107(a) (1) PRP liability can be applied to the following entities, as they are current owners of the Site property:

B & B Movie Theatres, L.L.C. is a limited liability company organized in Missouri. The company is a current owner of Tract C, approximately 2.96 acres, of the East Iola Smelter Site property. As of April 22, 2010, the company is active in both Kansas and Missouri.

Macha Enterprises, Inc., a for-profit Kansas corporation, is the current owner of Tracts F and G of the East Iola Smelter Site property. The tracts cover approximately 4.78 acres of land. Lawrence Macha, current owner of the remaining Site property, is the company's registered agent. As of April 2010, Macha Enterprises, Inc. is delinquent in Kansas.

[redacted] an individual, is the current owner of Tracts A, B, D, E, H and I of the Site property. He is also the registered agent for Macha Enterprises, Inc.

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15. B & B Movie Theatres, L.L.C. 7/11/2000. *Application for Authority in Kansas.* Kansas Secretary of State

16. B & B Movie Theatres, L.L.C. 5/14/2003. *Amended Articles of Organization.* Missouri Secretary of State

17. B & B Movie Theatres, L.L.C. 11/8/2005. *Change in Registered Agent.* Kansas Secretary of State.

18. Cherryvale Zinc Company. 1/1/1950. *Certificate of Incorporation.* Kansas State Historical Society.

19. Cherryvale Zinc Company. 2/27/1950. *Application for Authority to Engage in Business in the State of Kansas as a Foreign Corporation.* Kansas State Historical Society.

20. Cherryvale Zinc Company. 5/10/1973. *Certificate of Surrender of Authority and Withdrawal from the State of Kansas.* Kansas State Historical Society.

21. Cherryvale Zinc Company. 8/8/1977. *Certificate of Dissolution.* Kansas State Historical Society.

22. Iola Portland Cement Company. 6/7/1899. *Kansas Charter.* Kansas State Historical Society

23. Iola Portland Cement Company. 6/7/1949. *Corporate Dead Jacket File.* Kansas State Historical Society

24. Iola Realty Company. 3/2/1897. *Kansas Charter.* Kansas State Historical Society

25. Iola Realty Company. 3/2/1917. *Corporate Dead Jacket File.* Kansas State Historical Society

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27. J.B. Kirk Gas & Smelting Company. 9/13/1995. *Dissolution by Stockholders Meeting.* Kansas Secretary of State

28. Macha Enterprises, Inc. 9/16/1991. *Articles of Incorporation.* Kansas Secretary of State

29. Macha Enterprises, Inc. 4/23/2010. *Business Entity Search Result.* Kansas Secretary of State

30. Prime Western Spelter Company. 8/22/1898. *Articles of Association.* Missouri Secretary of State

31. Prime Western Spelter Company. 11/10/1904. *Application for Authority in Kansas.* Kansas State Historical Society

32. Prime Western Spelter Company. 6/22/1922. *Withdraw from Kansas.* Kansas State Historical Society

33. Prime Western Spelter Company. 3/19/1924. *Dissolution by Stockholders Meeting.* Missouri Secretary of State

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CHENEGA GLOBAL SERVICES, LLC

726 E. 9th Ave

Anchorage, AK 90501

IMP Boats
Iola, Allen County, KS
Potentially Responsible Party (PRP) Report

PREPARED FOR:

U.S. ENVIRONMENTAL AGENCY REGION 7, SUPERFUND DIVISION

901 N. 5th STREET, KANSAS CITY, KANSAS 66101

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POTENTIALLY RESPONSIBLE PARTY SUMMARY

Chenega Global Services, LLC (CGS) received Task Order 0003, Project Code 07KYRP00, from the U.S. Environmental Protection Agency (EPA) Region 7 office, under the Superfund Contract Number EP-S7-09-08. The purpose of this task order is to provide EPA's Superfund Division with a vehicle through which to perform expedited site-specific Potentially Responsible Party (PRP) searches in support of the EPA Task Order/Project Officer (TOPO) search activities.

This Potentially Responsible Party Report for the IMP Boats Site (the "Site") summarizes the research conducted by the Records Specialists (RS) and Regulatory Analysts (RA) to determine the Site history. The following Potentially Responsible Party Search Report provides for the ownership/lease history, operational information, Site boundaries, and corporate successors of PRPs for the IMP Boats Site in Allen County, Kansas.

CGS research revealed the following PRPs pursuant to CERCLA Section 107(a) liability law:

PRP	**Viability**	**Reason**	**CERCLA Liability Law**
W & J Lanyon	No	Owner: 1897-1899	107(a)(2)
Robert and William Lanyon d.b.a. Robert Lanyon Son's Spelter Company	No	Owner/Operator: 1896-1899	107(a)(2)
Lanyon Zinc Company	No – defunct 1912	Owner/Operator: 1899-1911	107(a)(2)
J.B. Kirk, individual	No – deceased	Arranger: 1953-1958	107(a)(3)
J.B. Kirk Gas & Smelting Company	No – dissolved 1995	Owner: 1916-1918 Arranger: 1953-1958	107(a)(2) 107(a)(3)
United States Smelting Company	No – withdrawn from Kansas 1920; merged into USSRM[1]	Owner/Operator: 1915-1918	107(a)(2)
Cherryvale Zinc Company	No – dissolved 1977	Transporter: 1953-1957	107(a)(4)

[1] See the United States Smelting Company PRP Section for important information regarding this merger.

PRP	Viability	Reason	CERCLA Liability Law
The City of Iola, Kansas	**Yes**	**Current Owner**	107(a)(1)
West Bottoms Property, Inc.	**Yes**	**Current Owner**	107(a)(1)
A.C.B., Inc.	**Yes**	**Current Owner**	107(a)(1)
[redacted]	**Yes - individuals**	**Current Owner**	107(a)(1)

Table 1: Potentially Responsible Parties

I. INTRODUCTION

PROJECT BACKGROUND

Chenega Global Services, LLC (CGS) received Task Order 0003, Project Code 07KYRP00, from the U.S. Environmental Protection Agency (EPA) Region 7 office, under the Superfund Contract Number EP-S7-09-08. The purpose of this task order is to provide EPA's Superfund Division with a vehicle through which to perform expedited site-specific Potentially Responsible Party (PRP) searches in support of the EPA Task Order/Project Officer (TOPO) search activities.

This Potentially Responsible Party Report for the IMP Boats Site (the "Site") summarizes the research conducted by the Records Specialists (RS) and Regulatory Analysts (RA) to determine the Site history.

PROJECT APPROACH

The U.S. Environmental Protection Agency, Region 7, Superfund Division, Kansas City, Kansas contracted Chenega Global Services, Anchorage, AK was to perform the PRP search and report.

LIST OF CONTACTS

- Allen County Register of Deeds
- Allen County Appraiser
- Allen County Zoning Commission
- EPA Region 7 CERCLA Records Center
- Kansas Department of Health and Environment
- Kansas State Historical Society
- Kansas Secretary of State

SITE DESCRIPTION

The IMP Boats Smelter Site is located primarily in the northeast quarter (NE/4) of the southeast quarter (SE/4) of Section 27, Township 24, Range 18 E, but also extends to the north into the southeast quarter (SE/4) of the northeast quarter (NE/4). The Site covers approximately 40 acres adjacent to the west of the right-of-way of the Atchison, Topeka, & Santa Fe Railway, with Lincoln Street dissecting the northern portion, made up of the Lots 1, 2, 7, and 8 of Iola Industrial Tract Number One, from the southern section, comprised of two parcels of unplatted land, all situated on the western edge of Iola, Allen County, KS.

Figure 1: IMP Boats Site Map with Tracts

The first Site smelting operations commenced in 1895 when Robert Lanyon Son's Spelter Company erected a zinc smelter on the southern area of the Site (Tracts 5, 6). In 1896, Robert Lanyon and William Lanyon leased this property for erecting a zinc smelter (M5-135[2]). Two years later, W. & J. Lanyon erected a smelter on the lands adjacent to the north (Tracts 1-4) (3). In 1899, the Lanyon Zinc Company was formed and obtained control of both smelters (12). The company continued to operate the Robert Lanyon Son's Spelter Company smelter under lease, but purchased the W. & J. Lanyon Works along with the land.

The two zinc smelters operated under the direction of Lanyon Zinc Company until 1910, when the company defaulted on bond interest payments and went into receivership (5). In

[2] This citation format is used to for title instrument book and page numbers throughout the report.

April of 1910, Lanyon Zinc Company foreclosed on its mortgage bonds and the property was sold to Charles H. Werner via an order of sale (17). Smelter operations remained under the direction of Lanyon Zinc Company's receivership until July 1910 when James O. Rogers, acting as receiver of Lanyon Zinc Company, leased the property's on-site smelter operations to The American Metal Company, a New Jersey corporation (17). Operations continued under lease to American Metal Company until December of that year, when the lease was surrendered and the smelters ceased operations (11). For a detailed account of this lease see Lanyon Zinc Company's PRP Section on page 15.

In February of 1911, the property was sold to Edmund L. Judson, who then sold to the Lanyon Zinc Smelting Company, a New York corporation, in March of the same year (57-122, 57-141).

In July of 1912, the Lanyon Zinc Smelting Company sold the smelter property, along with its gas and oil rights and leases, to J.B. Kirk, an individual (M22-125). J.B. Kirk transferred the property to the J.B. Kirk Gas & Smelting Company, a Kansas corporation of which he was president, the following month (M22-141).

In 1915, J.B. Kirk Gas & Smelting Company sold the larger smelter and its lands (Tracts 5, 6) to the United States Smelting Company, and commenced operations that year (24-534, 6). One year later, the United States Smelting Company sold the property back to the J. B. Kirk Gas and Smelting Company, but continued to operate on the Site, presumably under lease. This smelter ceased operations and was dismantled in 1918 (6, 8, 9, 10).

J.B. Kirk, in his name and as president of J.B. Kirk Gas & Smelting Company, executed a number of other transactions regarding the Site property from 1912 to the late 1950's. He owned the Site property, became a lessee, and then set in place an agreement with a third party (Cherryvale Zinc Company) to access a cinder residue dump on the land of which he was lessee (Attachment B: Chain of Title Tables).

In 1934, J.B. Kirk Gas & Smelting Company sold the northern area of the site (Tracts 1-4) to the City of Iola (98_299). This area was later platted as the Iola Industrial Tract Number One. Various small businesses have operated on these lots since, and The City of Iola has a number of government buildings on these properties.

The southeastern portion of the Site (Tracts 5 & 6) was sold in 1967 by the J. B. Kirk Gas & Smelting Company to Gerald L. and Mary Lea Wright, who sold it to the City of Iola the following year (145-605, 147-567). Portions of this property have been owned and used by several different companies, most notably IMP Boats, Inc., and a manufacturer of fiberglass boats. For a full list of current Site owners see Table 1.

CONTAMINANTS OF CONCERN

The primary contaminant of concern associated with the Site is lead. On-site smelting activities produced wastes, often in the form of slag, containing high concentrations of

heavy metals, such as lead. Often the waste material was reprocessed to extract valuable metal contents, or used as fill in construction.

Kansas Department of Health and Environment (KDHE) investigations revealed elevated levels of lead on the Site and surrounding areas. A Phase II Risk Assessment performed by Environmental Engineering Consultants for Iola Bank and Trust (EPA) in March 1991 showed elevated concentrations of lead, cadmium, and zinc, with some soil samples containing lead at levels as high a s 32,000 parts per million (13).

II. Ownership History

Review of Title Documents

The RA and RS were instructed to review all title/deed documents relevant to historic smelting activities on the Site property. The RA and RS used pertinent title/deed documents to determine site boundaries. The research determined smelting activities occurred across an area that is now divided into six parcels of land, referenced as Tracts 1-6. Their legal descriptions can be found in 'Attachment B: Chain of Title Tables'. The current owner information for the Site parcels is listed in the Table 1 below:

Assessor's Parcel No.	Chain of Title Tract Number	Chain of Title Lot Reference	Current Owner	Property Address
078-27-0-10-01-008.00-0-01	1		Douglas Rose, Kenneth Rose	N Industrial Rd. – Iola, KS 66749
078-27-0-10-01-012.00-0-01	2		City of Iola	801 N. Industrial Rd. Iola, KS 66749
078-27-0-40-03-001.00-0-01	3		Westbottom Properties, Inc.	W. Lincoln Rd. Iola, KS 66749
078-27-0-40-03-001.00-0-01	4	A	Westbottom Properties, Inc.	W. Lincoln Rd. Iola, KS 66749
078-27-0-40-02-001.00-0-01	4	B	Jack[redacted]	713 N. Industrial Rd. Iola, KS 66749
078-27-0-40-05-002.00-0-01	5		A C B, Inc	505 W. Lincoln Rd. Iola, KS 66749
078-27-0-40-05-001.00-0-01	6		A C B, Inc	W. Lincoln Rd. Iola, KS 66749

Table 2: Current Parcel Owners (2)

Current and Past Ownership History

Historical and current ownership of the Site is summarized in chronological order in 'Attachment B: Chain of Title Tables'.

LEASES

On June 1st, 1896 a lease was executed between Mary Northrup, et al and Robert H. Lanyon and William Lanyon. This lease was for the property in Tracts 5a and 6a. The lease stated it was for a period of twenty years, and specified that the Lanyon's were to:

> ...erect as soon as practicable on said premises a smelter or manufactory and employ therein during the first year of operation not less on an average than fifty (50) laborers or employees a year during the life of this lease, and to maintain and operate said smelter or manufactory during the life of this lease. (M5-135)

On July 16, 1910 James O. Rodgers, receiver for Lanyon Zinc Company, leased the Site property to American Metal Company. For details on this lease see Lanyon Zinc Company's PRP Section of this report (page 17).

On August 28, 1953 the J.B. Kirk Gas & Smelting Company entered into a lease agreement with J.B. Kirk, the company's president for the term of five years. The lease was recorded in Book M52, Page 105 of the Allen County Register of Deeds and granted J.B. Kirk access to all cinder residues that resulted from previous on-site smelting activities. The Site property is referenced in the lease as 'Dump No. Three'.

AGREEMENTS

On August 28, 1953, JB Kirk entered into an agreement with Cherryvale Zinc, which was recorded in Book M52, Page 110 of the Allen County Register of Deeds. JB Kirk held a lease covering Tracts 5A, 5B, 6A, 6B and 6C, which contained a cinder residue dump. The agreement allows Cherryvale the option of purchasing and removing cinder residue from dump number three (renamed Dump No. 2 in the 1956 agreement) for a period of 6 months from the date of the agreement.

On October 24, 1956 the Estate of JB Kirk, deceased, represented by Stanley J. Kirk, Executor, entered into an agreement with Cherryvale Zinc Company, Inc. for the term of one year. The agreement granted Cherryvale the option of purchasing and removing cinder residue from dump number three; it was recorded in Book M55, Page 143 of the Allen County Register of Deeds.

TITLE TREES

Title Trees for Tracts 1-6 of the Site are included in 'Attachment A: Title Trees'.

ZONING

According to the Allen County Zoning Commission, the entire IMP Boast Site property is zoned as 'Industrial'.

OPERATIONAL INFORMATION

Available operational information pertaining to the IMP Boats Site property is compiled in Table 3 below. The statistics were found in 'The Mineral Industry, Its Statistics, Technology, and Trade' and 'Mineral Resources of the United States' publications for the indicated years.

Year	Operator	Capacity/Notes
1907	Lanyon Zinc Company	5 furnaces / 3000 Ret.
1910	Lanyon Zinc Company – Under lease to American Metal Company	5 furnaces / 6660 Ret
1914	United States Smelting Company	Close of year: no retorts June 1915: 1400 Ret.
1915	United States Smelting Company	3440 retorts
1916	United States Smelting Company	3440 retorts
1917	United States Smelting Company	3440 retorts
1918	United States Smelting Company	dismantled

Table 3: IMP Boats Site Mineral Industry Statistics

III. POTENTIALLY RESPONSIBLE PARTIES

A. W. & J. LANYON

SUMMARY

W. &. J. Lanyon are included as PRPs based on evidence that, during their period of Site ownership, the W. & J. Lanyon Works, later renamed Lanyon Zinc Company Works No. 2, operated on-site. Smelting is known to have occurred on the Site property and may be a source of the lead contamination detected in the soil at the Site. According to CERCLA Section107 (a) (2), PRP liability can be applied to W. & J. Lanyon, as they were owners of the Site property at the time of disposal. No legal documentation was found regarding the smelter works.

OWNERSHIP / LEASE HISTORY

W & J Lanyon purchased Tracts 1-4, 5A, 6B and 6C of the Site from Seth Tozer on June 2, 1897 (22-173). CGS was not able to locate legal documentation indicating that the company

operated an on-site smelter. The property was sold to George M. Curtis, Jr. on February 10, 1899 (23-433).

OPERATIONAL INFORMATION

John Clark, in his book *'Towns and Minerals in Southeastern Kansas; A Study in Regional Industrialization, 1890-1930'*, informs the reader that W. & J. Lanyon established a zinc smelter at Iola in 1898.

CORPORATE HISTORY

No corporate information was located.

PROPERTY BOUNDARY/SITE DESCRIPTION:

For a parcel map, see Figure 1.

B. ROBERT LANYON AND WILLIAM LANYON D/B/A ROBERT LANYON SON'S SPELTER COMPANY

SUMMARY

Robert Lanyon Son's Spelter Company owned and leased parts of the Site from 1896 to 1899 and operated a zinc smelter on-site during that time. Historical records indicate that Lanyon Zinc Company absorbed Robert Lanyon Son's Spelter Company and its smelter in 1899 (1).

Smelting is known to have occurred on the Site property and may be a source of the lead contamination detected in the soil at the Site. According to CERCLA Section107 (a) (2), PRP liability can be applied to Robert Lanyon Son's Spelter Company, as they were owners and operators at the time of disposal.

OWNERSHIP / LEASE HISTORY

Robert and William Lanyon leased Tracts 5C and 6A from Mary Northrup et al. on June 2, 1896. The title document, recorded in Book M5, Page 135 of the Allen County Register of Deeds, indicated that the lease was for a term of 20 years and was made specifically for the purpose of erecting and operating a smelter:

> ...erect as soon as practicable on said premises a smelter or manufactory and employ therein during the first year of operation not less on an average than fifty (50) laborers or employees a year during the life of this lease, and to maintain and operate said smelter or manufactory during the life of this lease. (M5-135)

In addition to leasing, Robert and William Lanyon purchased Tract 6C from Walter P. Hull in July of 1896 (2-255). A Quit Claim Deed from Water Hull to Robert H. Lanyon, trustee for Robert H. & William Lanyon, lists the individuals as 'doing business as Robert Lanyon Son's Spelter Company' (20-18).

The Robert Lanyon Son's Spelter Company sold Tract 6C to Charles H. Werner on February 2, 1899 (23-429).

OPERATIONAL INFORMATION

No operational statistics were found for Robert Lanyon Son's Spelter Company

CORPORATE HISTORY

The New Jersey Department of Treasury and Kansas State Historical Society had no record of Robert Lanyon's Sons Spelter Company (40).

PROPERTY BOUNDARY/SITE DESCRIPTION:

For a parcel map, see Figure 1.

C. LANYON ZINC COMPANY

SUMMARY

Lanyon Zinc Company owned and operated on the IMP Boats Site from 1899 to 1911. The majority of the Site transactions pertaining to this company relate to Case No. 8464 of the District Court of Allen County: Trust Company of America, Trustee (Plaintiff) v. Lanyon Zinc Company, et al. (Defendants). In addition to complex court proceedings, the Lanyon Zinc Company was involved with two other companies that are mentioned in Case 8464; American Metal Company (New Jersey) and The American Metal Company, Limited (New York). The relationship between Lanyon Zinc Company and each of these entities is clearly defined in Lanyon's 'Operational History' section on page 19 of this report.

Lanyon Zinc Company conducted on-site smelting activities. Smelting is known to have occurred on the Site property and may be a source of the lead contamination detected in the soil at the Site. According to CERCLA Section107 (a) (2), PRP liability can be applied to Lanyon Zinc Company because it was an owner and operator of the Site property at the time of disposal. Lanyon Zinc Company is not a viable PRP; it is defunct and no corporate successors could be located.

Details of Lanyon Zinc Company's ownership history and Case No. 8464 are included in the subsequent sections.

OWNERSHIP HISTORY

On March 1, 1899, Lanyon Zinc Company purchased the Robert Lanyon Son's Spelter Company works. George M. Curtis conveyed the land covering Tracts 1 through 4, Tract 5c and Tract 6b of the Site and Charles H. Werner sold Tract 6c (23-501, 23-497). At the time of purchase, Lanyon Zinc took over the on-site works of Robert Lanyon Son's Spelter Company and W. & J. Lanyon (12). The company continued to operate the Robert Lanyon Son's Spelter Company smelter under a lease to Robert and William Lanyon from 1896 (Tracts 5A & 6A), but purchased the W. & J. Lanyon Works along with the land.

Renamed Lanyon Zinc Company Works No. 1 & No. 2, these smelters operated under the direction of Lanyon Zinc Company until 1910, when the company defaulted on bond interest payments and went into mortgage foreclosure and receivership to protect the bondholders' investments (17). The Trust Company of America, as trustee for the bondholders, brought suit against Lanyon Zinc Company for the defaulted payments; Case 8464 of the District Court of Allen County, Kansas, documented the proceedings; see Table 4 for a timeline of events.

Through an order of sale given during Case 8464 the Site property was sold to Charles H. Werner (17.d). The court ordered all the property of Lanyon Zinc Company, including leases, contracts and stocks in Allen County, to be sold as one parcel to satisfy the mortgage judgment lien that had been placed on the company. The terms of the sale transferred to Werner, the purchaser, "all pending contracts of said receiver in respect to the management and operation of said property...unpaid indebtedness and obligations or liabilities..." (17.d). On April 11, 1910 Charles H. Werner purchased the entire property at auction for $250,000.00. The purchase settled the company's debt to the bondholders, but did not release the property from its receivership.

On July 16, 1910, a court order issued through the same case allowed James O. Rogers, as receiver of Lanyon Zinc Company, to lease the property to The American Metal Company, a New Jersey Corporation. An unsigned copy of the lease was submitted as part of a court order in Case No. 8464; no original lease was located. There are several important aspects of the lease that pertain to the Site property and the parties involved. For a detailed description of the lease and its relevance to the Site see the section entitled 'Relationship with the American Metal Company of New Jersey' on page 19.

In February of 1911, Lanyon Zinc Company released the property from receivership and conveyed the property to Edmund L. Judson (17.f; 57-122).

CASE 8464: TRUST COMPANY OF AMERICA, TRUSTEE V. LANYON ZINC CO. ET AL.

On March 1, 1899 Lanyon Zinc Company executed $2,000,000 worth of mortgage bonds under trust to the Colonial Trust Company (merged into Trust Company of America on April 26, 1907) (17.a). The bonds were issued for a 30-year term at six percent annual interest, and payable semi-annually. On March 1, 1909, The Trust Company of America sued Lanyon Zinc Company for the defaulted payments; $1,792,000 of the bonds remained unpaid. Table 4 shows the progression of the court case from the issuance of the bonds through 1911, when Lanyon Zinc Company broke its final ties to the Site property.

Date	Event	Case 8464 Doc. No.
3/1/1899	Lanyon Zinc Company executes 2,000 first mortgage bonds at $1000 each.	17.a, page 3

Date	Event	Case 8464 Doc. No.
3/1/1909	Trust Company of America, trustee for the bondholders, petitions to the District Court of Allen County against Lanyon Zinc Company for defaulted bond payments. The trust company asks for immediate payment if payment is not made the mortgage will be foreclosed.	17.a
4/17/1909	James O. Rodgers is appointed receiver of Lanyon Zinc Company: "...said receiver is hereby authorized, empowered and directed to enter upon and take possession of all the smelting works of defendant Lanyon Zinc Company..."	17.b
2/23/1910	Lanyon Zinc Company's mortgage is foreclosed.	17.c
4/11/1910	Allen County Court orders the property sold as one parcel to the Sheriff of Allen County. Charles H. Werner purchases the property for $250,000.00 at the sheriff's sale. The purchase settles the company's debt to the bondholders, but does not release the property from its receivership.	17.d
7/16/1910	James O. Rogers, receiver, is granted an order to lease Lanyon Zinc Company's smelting works to American Metal Company	17.g
2/24/1911	J.B. Kirk is appointed receiver of Lanyon Zinc Company	17.e
2/10/1911	J.B. Kirk asks that the property be released from his receivership. Property is conveyed to Edmund L. Judson	17.f

Table 4: Allen County District Court, Case 8464 Timeline

OPERATIONAL HISTORY

On July 16, 1910 James O. Rodgers, receiver for Lanyon Zinc Company, petitioned the district court of Allen County, under Case 8464, for an order to lease the company's smelting works and other property conveyed to Charles H. Werner earlier that year. The order was issued that same day and included a copy of the proposed lease. The order and lease mention the involvement of two companies American Metal Company and The American Metal Company, Limited. In an effort to distinguish between the entities, the following sections detail each company's separate interaction with Lanyon Zinc Company.

RELATIONSHIP TO AMERICAN METAL COMPANY OF NEW JERSEY

According to a New Jersey Secretary of State publication from 1911, American Metal Company filed its certificate in New Jersey on May 25, 1904. Its Registered Agent is listed as Register & Transfer Co. with offices at 15 Exchange Place, Jersey City, NJ (21). Corporate documents for this entity could not be located. (20)

On July 16, 1910, James O. Rodgers, receiver of Lanyon Zinc Company, petitioned the district court of Allen County, KS and was granted permission to lease Lanyon's three smelter works to American Metal Company (17.g). In his application to the court Rodgers claimed that he was without sufficient capital to continue smelter operations and had the opportunity to lease the plants and property to American Metal Company, a New Jersey corporation. An unsigned copy of the proposed lease was included with the application; the term was set for six months, beginning at midnight on July 16, 1910.

- C O P Y -

INDENTURE OF LEASE, made this 16th day of July, 1910, by and between JAMES O. RODGERS, as Receiver of the Lanyon Zinc Company (hereinafter designated the "Lessor"), party of the first part and THE AMERICAN METAL COMPANY, a corporation organized and existing under the laws of the State of New Jersey (hereinafter called the "Lessee"), party of the second part:

W I T N E S E T H: THAT

WHEREAS, the Lessor by virtue of an order of the District Court of Allen County, Kansas, made April 17th, 1909 was appointed Receiver of all the property of the Lanyon Zinc Company, a New Jersey corporation, in an action for the foreclosure of its first mortgage, brought by The Trust Company of America as Trustee for bondholders; and

WHEREAS, all of the property, real and personal, of the Lanyon Zinc Company pursuant to a judgment of foreclosure and sale in said action was sold on April 11th, 1910; but said Receiver has not yet been discharged and continues in possession of the smelting plants and other property so sold, but is without sufficient capital for the proper operation thereof;

Figure 2: Lease to American Metal Company (New Jersey)

Article III of the lease releases James O. Rodgers from any obligation to The American Metal Company, Limited, of New York. The New York Corporation was not the lessee; The American Metal Company, Limited was a third party supplying ore for smelting purposes.

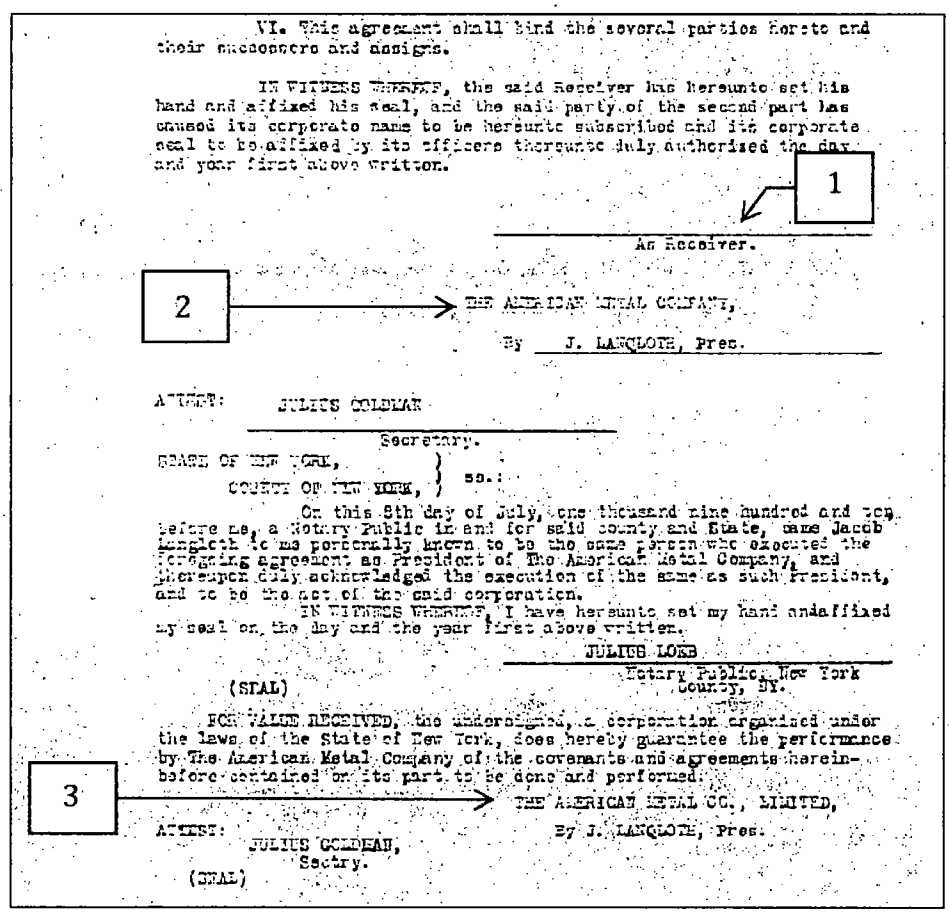
III. The American Metal Company hereby agrees, as a further consideration for the making of this lease by the Receiver, that it will cause said Receiver to be released from his obligation to The American Metal Company, Limited, a New York corporation, for the smelting of approximately six thousand (6000) tons of ore now on the premises hereby leased and such additional amount of ore as may be on route or contracted for by the said The American Metal Company, Limited. Nothing herein contained shall be construed as being intended to release, or procure the release of, the Receiver from any claim which The American Metal Company, Limited, may have against the Receiver growing out of the smelting by him heretofore of ores under the terms of his agreement with the said The American Metal Company, Limited.

Figure 3: Lease showing American Metal Company, Limited as a third party

The excerpt shown above clearly indicates that American Metal Company and The American Metal Company, Limited were involved with the Site in two different capacities.

There are several issues with the consistency of the lease copy. Each number corresponds to the callouts in Figure 4:

1. The lease is unsigned by James O. Rodgers, lesser.
2. J. Lanqloth is listed as American Metal Company's president.
3. J. Lanqloth is also listed as The American Metal Company, Limited's president. His name is spelled incorrectly; Jacob Langeloth was an incorporator of The American Metal Company, Limited (See Figure 5).



VI. This agreement shall bind the several parties hereto and their successors and assigns.

IN WITNESS WHEREOF, the said Receiver has hereunto set his hand and affixed his seal, and the said party of the second part has caused its corporate name to be hereunto subscribed and its corporate seal to be affixed by its officers thereunto duly authorized the day and year first above written.

1

As Receiver.

2

THE AMERICAN METAL COMPANY,

By J. LANQLOTH, Pres.

ATTEST: JULIUS GOLDEAN

Secretary.

STATE OF NEW YORK, } ss.:
COUNTY OF NEW YORK, }

On this 8th day of July, one thousand nine hundred and ten before me, a Notary Public in and for said county and State, came Jacob Langloth to me personally known to be the same person who executed the foregoing agreement as President of The American Metal Company, and thereupon duly acknowledged the execution of the same as such President, and to be the act of the said corporation.

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

JULIUS LOEB

Notary Public, New York County, NY.

(SEAL)

FOR VALUE RECEIVED, the undersigned, a corporation organized under the laws of the State of New York, does hereby guarantee the performance by The American Metal Company of the covenants and agreements hereinbefore contained on its part to be done and performed.

3

THE AMERICAN METAL CO., LIMITED,

By J. LANQLOTH, Pres.

ATTEST: JULIUS GOLDEAN,
Sectry.

(SEAL)

Figure 4: Case 8464 Lease Inconsistencies

CERTIFICATE of INCORPORATION

--of--

THE AMERICAN METAL COMPANY

22 (Limited.)

WE, ADOLF LADENBURG of the City, County and State of New York, ERNST THALMANN of the City, County and State of New York, ALEXANDER H. STEVENS of Queens County, State of New York, EDWARD LADENBURG of the City, County and State of New York, and JACOB LANGELOTH of the City, County and State of New York a majority of whom, to wit:

Figure 5: Jacob Langeloth of American Metal Company, Limited (19)

In addition to the lease, a receivers report made by J.B. Kirk as receiver of Lanyon Zinc Co. in 1912 designates American Metal Company as lessee (17.g). The report lists all payments received; including rents from American Metal Company during 1910 (see Figure 6).

1910	Oct. 14,	Amt. received of American Metal Metal Co. as rent to Oct. 15, 1910 under lease made by Jas. O. Rodgers as receiver,..... $100.00
1910	Nov. 1,	Amt. paid Campbell & Goshorn on salary as counsel to the Receiver for last half September,.....
	" 1,	Amt. paid Campbell & Goshorn salary as counsel to Receiver for October,.....
	" 2,	Amt. paid to American Sash & Door Company in full of claim,.....
	" 16,	Amt. received of American Metal Co. as rent to Nov. 15, 1910 under lease made by Jas. O. Rodgers Receiver,..... $100.00
1910	Dec. 16,	Amt. received of American Metal Co. in payment of rent to Dec. 15 under lease made by Jas. O. Rodgers as Receiver,..... $100.00
1910	July 1,	Amt. received of American Metal Co. as rent from Dec. 15 to Feb. 26, 1910 under lease made by Jas. O. Rodgers, Receiver,..... $19.33

Figure 6: Rents received of American Metal Company

The inconsistencies of the 1910 lease, in combination with the absence of any corporate filings for American Metal Company, of New Jersey, prevent a legal connection from being made between these corporations and the Site property.

Relationship to The American Metal Company, Limited of New York

The American Metal Company, Limited of New York was mentioned in the above lease as a supplier of ores for smelting. The company's involvement with Lanyon Zinc Company's operations at Iola is further described in Case No. 17,662 of the Supreme Court of Kansas. The metal company referred to herein as 'American Metal Company' is assumed 'American Metal Company, Limited'. The lack of consistency and the similarity in the two company names prevents any clear conclusions from being drawn.

Case No. 17,662 of the Supreme Court of Kansas affirms judgment on F.B. Vandegrift & Company v. Lanyon Zinc Company et al. The case was decided in favor of F.B. Vandegrift in January of 1912 and filed for record on June 8, 1912. J. Burch presided over the case and delivered the opinion, including a case history, summarized below:

> At its Iola and La Harpe smelters, Lanyon Zinc Company received ores from The American Metal Company, Limited, a New York corporation. Lanyon Zinc Co. treated the ores and then stored them:
>
> > The Lanyon Zinc Company, owning smelters at Iola and La Harpe, smelted imported lead and zinc ore for itself and others. Ultimately it confined its operations to treating ores for the American Metal Company on a toll basis. (14)
>
> After the ores were assayed, Lanyon Zinc paid duties to the revenue officers. In turn, The American Metal Company, Ltd paid Lanyon Zinc a fee based on the duty price; Lanyon turned a small profit on these transactions.
>
> It was later determined illegal duties were charged and collected by the government revenue officials. Lanyon Zinc protested these fees and hired F.B. Vandegrift & Company, the appellants, to recover the excessive duty charges, agreeing to pay F.B. Vandegrift 50% of those fees recovered.
>
> F.B. Vandegrift secured the return of large sums of duty fees to Lanyon Zinc Company. In April of 1909, Lanyon Zinc Company appointed J.O. Rogers, president of the Company, receiver. J.O. Rogers, as receiver of Lanyon Zinc Co, collected the returned fees for $22,533.18 in a government warrant.
>
> Immediately after receiving the fees, J.O. Rogers turned them over to The American Metal Company, Ltd. F.B. Vandegrift & Co. did not receive any compensation, and therefore sued J.O. Rogers and Lanyon Zinc Company for their 50%.

A judgment was passed and Rogers ordered to pay $11,266.69 to F.B. Vandegrift & Company. The defendant appealed, claiming that they should not be held liable for the sum because the ore on which duties were paid belonged to The American Metal Company, Ltd. who ultimately paid the excessive duties.

It was the court's opinion that the contract between Lanyon Zinc and The American Metal Company was of no concern to the case, and that Lanyon Zinc Company was owner of the properties in question. Further, the court ruled that James O. Rogers, as receiver of Lanyon Zinc Company, failed to present the recovered fund to the court where an order for the disposition of said funds could be issued. The opinion quotes, "He could not arbitrarily divest himself of the fund. It should be regarded as still in his possession and the plaintiffs [F.B. Vandegrift & Co] were entitled in equity to a lien upon it for their share" (14).

CORPORATE HISTORY

Incorporation

Lanyon Zinc Company incorporated in New Jersey on February 27, 1899 "to carry on the business of a mining, concentrating, smelting and refining company". The incorporators were, Benjamin Haskell, Martin W. Littleton, and L.B. Grant. (33)

Application to the Charter Board of Kansas

On March 30, 1899, Lanyon Zinc Company applied to the Charter Board of Kansas for permission to engage in business as a foreign corporation. The officers listed were as follows:

Benjamin Haskell, President
Louis B Grant, Secretary
Edmund L. Judson, Treasurer

Included within the application is 'Exhibit A: Assets and Liabilities,' which lists the complete holdings of Lanyon Zinc Company upon that date. The document explicitly states that the sole liabilities of Lanyon Zinc Company are as follows:

First Mortgage on all its property $2,000,000. (Bonds to the amount of $1,650,000 secured by this mortgage have been issued.)
Due employee[e]s about $10,000. (32)

Application for Authority as a Foreign Corporation in Kansas

Lanyon Zinc Company, under the direction of James S. Rogers, submitted an application for authority to engage in business in Kansas as a foreign corporation and was approved on January 18, 1900. The application included an updated account of the company's assets and liabilities, including land ownership of 1,269 acres in Allen County, KS.

In reference to its smelting operations, Lanyon Zinc Company attests:

That the capacity of the smelters owned by said Company is about 100 tons per day, or 36,500 tons per annum; that the capacity of its three smelters located at Iola and La

> *Harpe is about 90 tons per day...In addition, affiant [James S. Rogers] says that he manages said business of said Company and knows the profits made by said smelters during the past two years, and that he is confident that the profits of said Company from the operation of the smelters now owned by it will continuously pay more than six percent interest on $5,000,000. (31)*

Item number six under 'Exhibit C: List of Other Property Owned by Lanyon Zinc Company' of the application addresses the Allen County smelting properties:

> *Four smelting plants, two of which are located at Iola, Kansas, one near La Harpe, Kansas, and one at Pittsburg, Kansas, including machinery, tools, approximately 15 miles of pipe lines for conducting natural gas, plant to supply water to Iola smelters, the good will of the former owners giving said Company the control of the two best known brands of spelter in the trade; also including the control of the most efficient and economical roaster known covered by patent for de-sulphurizing ore; patents for introduction of air into furnaces, and other valuable patents on appliances connected with furnaces of the value of more than 1,500,000. (31)*

Decrease in Capital Stock

In 1906, Lanyon Zinc Company's stockholders voted to decrease the amount of capital stock. The certificate was signed by J.O. Rogers, President and Edmund L. Judson, Secretary and filed with the New York Secretary of State on February 21, 1907. Included with the certificate is a list of stockholders; notable individuals include The American Metal Co. 'Limited', J.O. Rogers, and the Estate of J.S. Rogers. (34)

Mortgage Foreclosure

In a letter dated February 2, 1912, Lanyon Zinc Company's legal representatives informed the Kansas Secretary of State that the company's property was sold at mortgage foreclosure in early 1910. The law firm also claimed that Lanyon Zinc Company was a defunct corporation. (35)

PROPERTY BOUNDARY/SITE DESCRIPTION:

Lanyon Zinc Company's Works No. 1 and No. 2 covered the Site property. Figure 7 shows the property held under lease compared to the property owned by Lanyon Zinc Company:

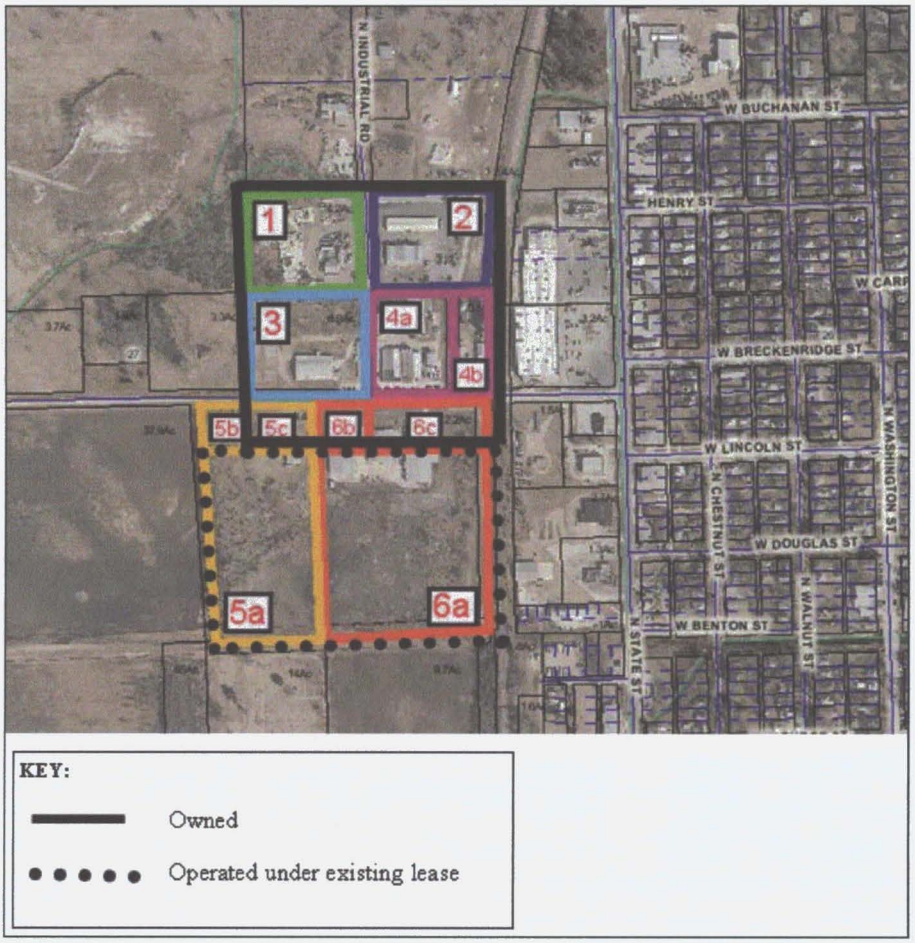


Figure 7: Lanyon Zinc Company ownership vs. property lease

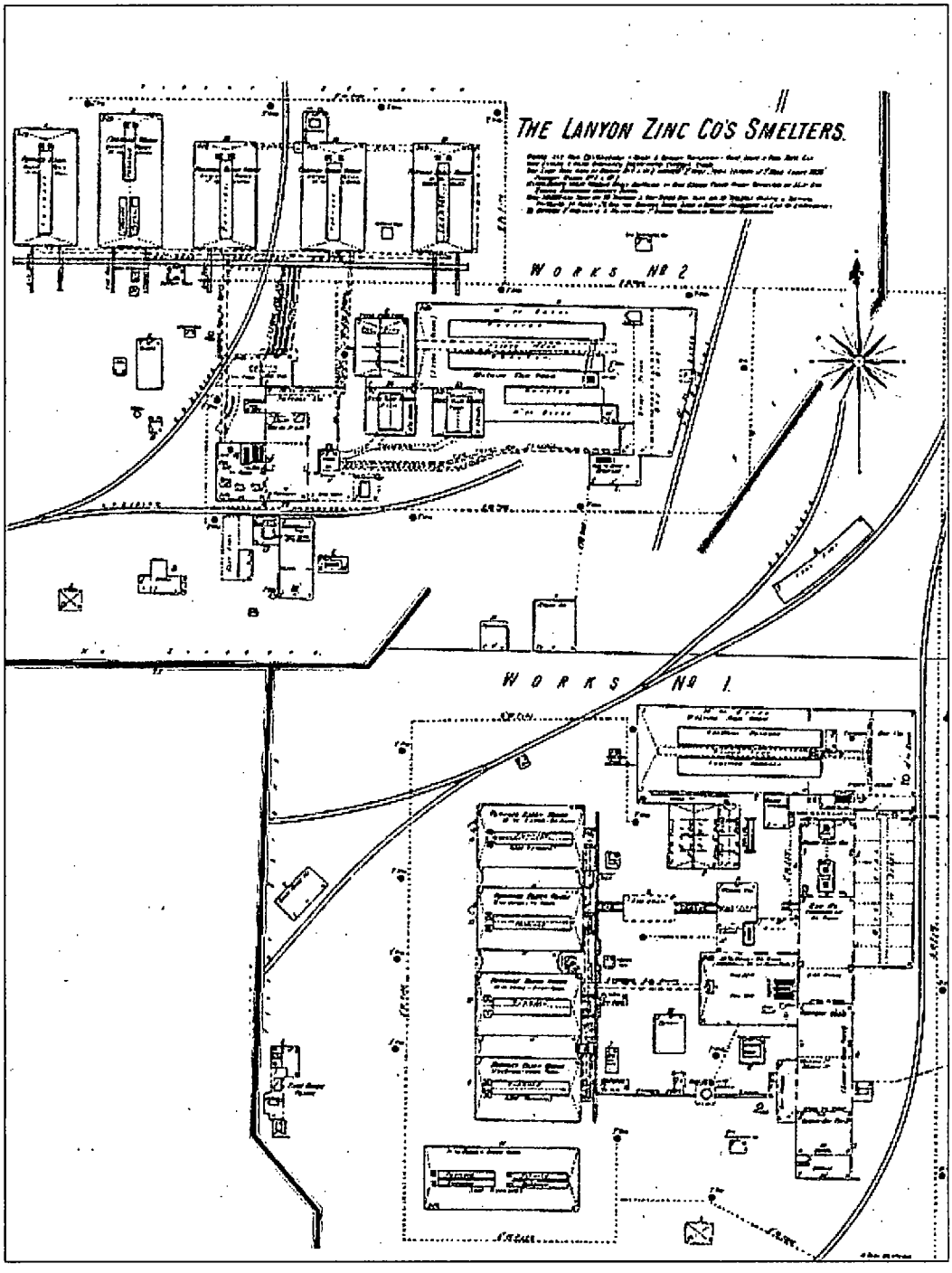


Figure 8: Lanyon Zinc Works No.1 & 2, 1901 Sanborn Map

D. J.B. Kirk Gas & Smelting Company

Summary

J.B. Kirk Gas & Smelting Company owned the Site property during the time that United States Smelting Company operated an on-site smelter (1916-1918). Smelting is known to have occurred on the Site property and may be sources of the heavy metal contamination detected in the soil at the Site. According to CERCLA Section 107(a) (2), J.B. Kirk Gas & Smelting Company can be considered a PRP, as it was an owner at the time of disposal.

J.B. Kirk Gas & Smelting Company maintained ownership of certain parcels, and in 1953, leased to J.B. Kirk, allowing him access to the on-site cinder residue dump. In this capacity, the company was an arranger for the treatment of smelting wastes. According to CERCLA Section 107(a) (3), J.B. Kirk Gas & Smelting Company can be considered a PRP, as it was an arranger of the treatment of smelting wastes. The company dissolved on September 13, 1995; no corporate successor was located.

Ownership / Lease History

J.B. Kirk Gas & Smelting Company purchased Tracts 1-4, 5C, 6B and 6C from J.B. and Estella Kirk on August 20, 1912 (M22-141). On November 19, 1914, the company acquired Tracts 5A and 6A from the heirs of L.L. Northrup and Thomas Bowlus (59-121).

In June of 1915, J.B. Kirk Gas & Smelting transferred Tracts 5A, 5C, and all of Tract 6 to United States Smelting Company, who then deeded the land back to J.B. Kirk Gas & Smelting Company in July of 1916 (24-534; 59-334).

On January 1, 1934, J.B. Kirk Gas & Smelting Company sold Tracts 1-4 (the northern portion of the Site) to the City of Iola (98-299). The company maintained ownership of Tracts 5A, 5C and all of Tract 6 until 1967 when it transferred the land to Gerald and Mary Lea Wright, two individuals (145-605).

Leases

On August 28, 1953, the J.B. Kirk Gas & Smelting Company entered into a lease agreement with J.B. Kirk, the company's president, for the term of five years. The lease was recorded in Book M52, Page 105 of the Allen County Register of Deeds and granted J.B. Kirk access to all cinder residues that resulted from previous on-site smelting activities. The Site property is referenced in the lease as 'Dump No. Three'.

Agreements

During the period of J.B. Kirk Gas & Smelting Company ownership, J.B. Kirk, lessee of the Site property, entered into two consecutive agreements with Cherryvale Zinc Company to access the cinder residues of 'Dump No. Three' (M52-110; M55-143). Details regarding the agreements are included in Cherryvale Zinc Company's PRP Section of this report (see page 31).

OPERATIONAL INFORMATION

No operational was located for the J.B. Kirk Gas & Smelting Company Iola works.

CORPORATE HISTORY

The Kansas Secretary of State and the Kansas State Historical Society had no records available for J.B. Kirk Gas & Smelting Company. The Kansas Secretary of State provided a record of the company's dissolution.

Incorporation

The Kansas Secretary of State online database indicates that J.B. Kirk Gas & Smelting Company incorporated in Kansas on August 16, 1912. No other documentation of the company's incorporation was available. (29)

Dissolution

J.B. Kirk Gas & Smelting Company, a Kansas corporation, was dissolved by stockholders meeting on July 19, 1995. Marvin E. Kraft, President and director, affixed his signature on the same date. The document was filed with the Kansas Secretary of State on September 13, 1995. (30)

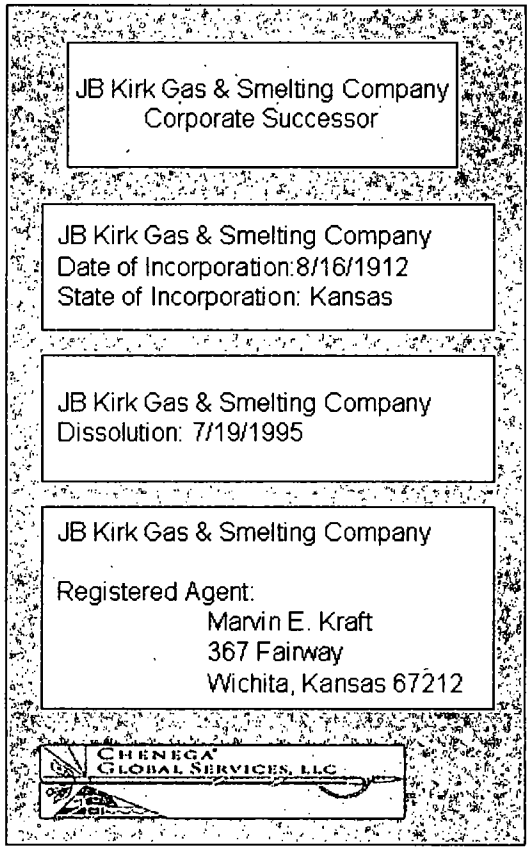


Figure 9: J.B. Kirk Gas & Smelting Company Corporate Successor Chart

PROPERTY BOUNDARY/SITE DESCRIPTION:

For a parcel map, see Figure 1.

E. J.B. KIRK

SUMMARY

J.B. Kirk was an intermediate Site owner for one month in 1912. In 1953, J.B. Kirk leased an area known as Dump No. 3, which covered the entire Site property. During his five-year lease, he entered into an agreement that granted Cherryvale Zinc Company access to the cinder residues contained in Dump No. 3.

In this capacity, J.B. Kirk arranged for the access and removal of on-site smelter wastes. Smelting is known to have occurred on the Site property and may be a source of the lead contamination detected in the soil at the Site. According to CERCLA Section 107(a) (3), J.B. Kirk is considered a PRP, as he was an arranger of the treatment of wastes. J.B. Kirk is not a viable PRP; he is deceased (M55-143).

OWNERSHIP / LEASE HISTORY

J.B. Kirk acquired Tracts 1-4, 5C, 6B and 6C of the IMP Boats Site from Lanyon Zinc Smelting Company on July 29, 1912 (M22-129). On August 20, 1912 J.B. Kirk transferred the land to J.B. Kirk Gas & Smelting Company (M22-141).

Leases

J.B. Kirk leased the southern portion of the IMP Boats Site, Tracts 5A, 5B, 6A, 6B and 6C from 1953 to 1958.

On August 28, 1953 the J.B. Kirk Gas & Smelting Company entered into a lease agreement with J.B. Kirk, the company's president, for the term of five years. The lease was recorded in Book M52, Page 105 of the Allen County Register of Deeds and granted J.B. Kirk access to all cinder residues that resulted from previous on-site smelting activities. The Site property is referenced in the lease as 'Dump No. Three'.

Agreements

On August 28, 1953, JB Kirk entered into an agreement with Cherryvale Zinc, which was recorded in Book M52, Page 110 of the Allen County Register of Deeds. For full details see Cherryvale Zinc Company's PRP Section on page 31.

On October 24, 1956 the Estate of JB Kirk, deceased, represented by Stanley J. Kirk, Executor, entered into an agreement with Cherryvale Zinc Company, Inc. for the term of one year. For full details see Cherryvale Zinc Company's PRP Section on page 31.

CORPORATE HISTORY

J.B. Kirk is deceased (M22-141).

OPERATIONAL INFORMATION

CGS found no operational information.

PROPERTY BOUNDARY/SITE DESCRIPTION:

J.B. Kirk gained access to smelting waste on-site through a lease made with J.B. Kirk Gas & Smelting Company from 1953 through 1958. The cinder residue dump referenced in the lease covered the majority of the Site property. Figure 11 shows the dump area relative to the Site boundary.

F. UNITED STATES SMELTING COMPANY

SUMMARY

United States Smelting Company owned Site property from June 1915 to July 1916. According to mineral industry statistics from 1915-1918, after deeding the land to J.B. Kirk Gas & Smelting Company, the United States Smelting Company continued to operate the on-site smelter.

Smelting is known to have occurred on the Site property and may be a source of the lead contamination detected in the soil at the Site. According to CERCLA Section 107 (a) (2), PRP liability can be applied to United States Smelting Company because it was an owner/operator at the time of disposal. United States Smelting Company's property was consumed by United States Smelting Refining and Mining Company in 1918; at the time, the Iola Site no longer belonged to United States Smelting Company; No corporate successor was located for United State Smelting Company in relation to the IMP Boats Site property.

OWNERSHIP / LEASE HISTORY

United States Smelting Company purchased Tracts 5A, 5C, and all of Tract 6 from J.B. Kirk Gas & Smelting Company on June 13, 1915 (24-534). On July 6, 1916 U.S. Smelting Company deeded the land back to J.B. Kirk Gas & Smelting Company (59-334).

OPERATIONAL INFORMATION

According to mineral industry publications, United States Smelting Company operated the on-site smelter from 1915 to late 1917 (see Table 3 for full operational statistics).

CORPORATE HISTORY

Certificate of Organization

On September 2, 1902, United States Smelting Company filed for Certificate of Organization with the Maine Secretary of State. The Certificate lists the purpose of said corporation as follows:

> *"... to carry on the business and license others to carry on the business of smelting, refining, dressing, amalgamating and preparing for market gold, silver, copper, zinc,*

> *iron, lead and coal, and all sorts of ore and metals, mineral substances and stone; ...and smelting corporations and other corporations formed for purposes similar to.. . " (46)*

The Certificate of Organization lists five directors as follows: C.A. Hight, L.L. Hight, M.G. Connellan, F.W. Batchelder, and W.F. Moller. Officers are listed as: C.A. Hight, President; LeRoy L. Hight is Clerk; L.L. Hight is treasurer; and C.A. Hight, L.L. Hight, and M.G. Connellan are Directors. (46)

Application for Authority in Kansas

On July 25, 1916, a letter was sent to the Kansas Secretary of State enclosing an Application for Authority to engage in business in the State of Kansas as a foreign corporation. The letter states:

> *". . . This concern is a very substantial institution and is now operating smelting plants at Iola, La Harpe, and Altoona, Kansas. It is doing no other business in the State of Kansas, except that of zinc smelting."* (44)

The Kansas Charter Board on August 16, 1916 approved the charter.

Acquisition

On October 1, 1918, the assets of the U. S. Smelting Company were liquidated and the United States Smelting, Refining, and Mining Company acquired all the assets of the United States Smelting Company held at La Harpe, Kansas (43). At the time of acquisition, United States Smelting Company had already sold the IMP Boats property to J.B. Kirk Gas & Smelting Company (59-334).

Withdraw from Kansas

On June 3, 1920, United States Smelting Company filed an Application of Foreign Corporation to withdraw from the State of Kansas. The Charter Board approved the application on June 3, 1920 and filed on June 8, 1920. (45)

Figure 10. U.S. Smelting Company Corporate Successor

G. Cherryvale Zinc Company

Summary

Cherryvale Zinc Company did not own or lease the IMP Boats Site property. Between 1953 and 1957, the company was granted access to a cinder residue dump on-site. See below for details on the agreements.

Smelting is known to have occurred on the Site property and may be a source of the lead contamination detected in the soil at the Site. Cherryvale Zinc Company transported wastes found on the Site. According to CERCLA Section 107 (a) (3), PRP liability can be applied to Cherryvale Zinc Company because it was a transporter of smelter wastes. Cherryvale Zinc Company dissolved on August 26, 1977 and no corporate successors were located.

Ownership / Lease History

Cherryvale Zinc Company did not own or lease the IMP Boats Site property. Between 1953 and 1957 the company was granted access to cinder residue dumps on-site. See below for details on the agreements.

Agreements

On August 28, 1953, JB Kirk entered into an agreement with Cherryvale Zinc, which was recorded in Book M52, Page 110 of the Allen County Register of Deeds. JB Kirk held a lease

covering Tracts 5A, 5B, 6A, 6B and 6C, which contained a cinder residue dump. The agreement allows Cherryvale the option of purchasing and removing cinder residue from dump number three (renamed dump number two in the 1956 agreement) for a period of 6 months from the date of the agreement.

On October 24, 1956 the Estate of JB Kirk, deceased, represented by Stanley J. Kirk, Executor, entered into an agreement with Cherryvale Zinc Company, Inc. for the term of one year. The agreement granted Cherryvale the option of purchasing and removing cinder residue from dump number three and was recorded in Book M55 on Page 143 of the Allen County Register of Deeds.

The on-site dump contained 8,841 tons of cinder residues.

OPERATIONAL INFORMATION

CGS found no operational information for Cherryvale Zinc Company.

CORPORATE HISTORY

Incorporation

Cherryvale Zinc Company, Inc. was incorporated in the State of New York on January 1, 1950, "to carry on business to smelt, refine, and concentrate" (22). The incorporators were, Benno Elkan, C.H. Scherf, and Julian B. Beaty.

Application for Authority as a Foreign Corporation in Kansas

On February 27, 1950, Cherryvale Zinc Company applied to the Charter Board of Kansas for permission to engage in business as a foreign corporation. The application was approved February 27, 1950. The Officers listed were as follows:

Julian B. Beaty, President
O. Frohnknecht, Vice-President
C.H. Scherf, Treasurer
E. H. Mann, Secretary
Carl M. Elkan, Manager (23)

Withdraw from the State of Kansas

On February 9, 1973, Cherryvale Zinc Company, Inc. surrendered its authority to transact business in the State of Kansas. The Certificate of Withdraw was filed with the Kansas Secretary of State on May 10, 1973. (24)

Dissolution

Cherryvale Corporation dissolved by way of stockholders meeting on August 8, 1977.

R. Fred Baerwald, President and Stanley J. Titch, Secretary/Treasurer are listed as the company's only officers. The Certificate of Dissolution was filed with the New York Secretary of State on August 26, 1977. (25)

PROPERTY BOUNDARY/SITE DESCRIPTION:

Cherryvale Zinc Company gained access to smelting waste on-site through agreements made with J.B. Kirk from 1953 through 1957. The cinder residue dump covered the southern portion of the Site property. Figure 11 shows the dump area relative to the Site boundary:

Figure 11: IMP Boats Site Dump Number Three

H. The City of Iola, Kansas

Summary

In 1934, The City of Iola acquired Tracts 1-4 of the Site property. It sold Tracts 1, 3 and 4, but maintained ownership of Tract 2 since 1934. According to CERCLA Section107 (a) (1), PRP liability can be applied to The City of Iola because it is a current owner of the Site property.

Ownership / Lease History

In 1934, the J.B. Kirk Gas & Smelting Company sold its lands north of W. Lincoln Street to the City of Iola (98-299). This land was to become platted as Iola Industrial Park Number One, comprised of eight lots. Only the southern four lots are identified in this report as being within Site boundaries. It sold the area identified in this report as Tract 1 in 1962, and the areas identified as Tract 3 and Tract 4 in 1960. It has maintained ownership of Tract 2 since 1934 (2).

Operational Information

Operational information for this site is not known.

Corporate History

A Dun & Bradstreet Business Information Report dated April 20, 2010 states that the City of Iola incorporated in Kansas in 1870 and is an active non-profit corporation[3]. The directors are as follows:

Bill Maness, Mayor
Judy Brigham, Administrator
William Shirley, Commissioner
Craig Abbott, Commissioner

Property Boundary/Site Description:

The City of Iola owns the portion of the Site described within this report as Tract 2, a parcel of land also described as Iola Industrial Tract Number One, Lot 2.

I. West Bottoms Property, Inc.

Summary

West Bottoms Property, Inc. also referred to as "Westbottom Properties, Inc." has maintained ownership of Tracts 2 and 4A since 1993. According to CERCLA Section 107 (a) (1), PRP liability can be applied to West Bottoms Property, Inc. because it is a current owner of the Site property.

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[3] For a full copy of the Dun & Bradstreet Report, see Attachment J: Dun & Bradstreet Reports.

OWNERSHIP / LEASE HISTORY

In 1993, Allen County, Kansas sold property to "Westbottom Properties, Inc." which included Tracts 3 and 4A (187-230). As of the date of the writing of this report, they still have ownership of the property (2).

OPERATIONAL INFORMATION

No corporate information could be found for "Westbottom Properties, Inc.," however, a Dun & Bradstreet report for "West Bottoms Property, Inc." was located[4], and a search of the Kansas Secretary of State's records shows a corporation on file of that name with a registered office address of 504 W. Lincoln, Iola, KS (located on the corresponding area of Site property). The Dun & Bradstreet[5] report specifies the corporation's line of business as "nonresidential building operator" (48). An aerial photograph of the site demonstrates there to be four large and numerous other structures on the property (See Figure 1: Parcel Map). This suggests that the corporation is leasing the structures on this portion of the land to commercial tenants, but no information about what businesses are currently in operation there were located.

CORPORATE HISTORY

West Bottoms Property, Inc. was formed in the state of Kansas on June 25th, 1993. The corporation is still active, but on the date of this report was delinquent for failure to file its 2009 Annual Report. The forfeiture date is listed as 7/15/2010 (2).

The registered agent is listed as West Bottoms Property, Inc., 504 W. Lincoln, Iola, Kansas, 66749 (48).

PROPERTY BOUNDARY/SITE DESCRIPTION:

West Bottom Property, Inc. (or Westbottom Properties, Inc.) owns Tracts 3 and the west portion of Tract 4, labeled 4A, which are the center two parcels of the site area (see Figure 1)

J. A.C.B., INC.

SUMMARY

A.C.B. Inc acquired Tract 6 in 1992, and Tract 5 in 2006; it is the current owner of both tracts. According to CERCLA Section 107(a) (1), PRP liability can be applied to A.C.B. Inc., as it is a current owner of the Site property.

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[4] For a full copy of the Dun & Bradstreet Report, see Attachment J: Dun & Bradstreet Reports.

[5] For a full copy of the Dun & Bradstreet Report, see Attachment J: Dun & Bradstreet Reports.

OWNERSHIP / LEASE HISTORY

In 1992, A.C.B., Inc. purchased the southeast portion of the Site area from the City of Iola, encompassing all of Tract 6 (185-601). In 2006, it also purchased the Tract adjacent to the west, previously occupied by the Marvin E. Boyer Oil Company (A70-563), identified in this report as Tract 5 (See Figure 1: Parcel Map). As of the date of this report, A.C.B., Inc. still owns both of these Tracts (2).

OPERATIONAL INFORMATION

A Dun & Bradstreet report was obtained for ACB, Incorporated with a business address of "Unknown, Iola, KS" that contained no specific information about the operations of the corporation or its officers[6].

CORPORATE HISTORY

A.C.B., Inc. incorporated as a for profit corporation in the state of Kansas in 1992. The corporation is still active, but on the date of this report was delinquent for failure to file its 2009 Annual Report. The forfeiture date is listed as 7/15/2010 (2).

The registered agent/address for the corporation is James M. Immel, Four East Jackson, Iola, Kansas 66749 (18).

PROPERTY BOUNDARY/SITE DESCRIPTION:

A.C.B., Inc. currently owns all of Tract 5 and Tract 6 as identified on Figure 1 of this report. This is all of the Site area that is located on the south side of W. Lincoln St.

K. DOUGLAS D. ROSE / KENNETH ROSE

SUMMARY

In 1992, Douglas D. Rose and Kenneth Rose, individuals, acquired Tract 1; they remain the current owners of this Site property. According to CERCLA Section 107(a) (1), PRP liability can be applied to Douglas Rose and Kenneth Rose, as they are current owners of Site property.

OWNERSHIP / LEASE HISTORY

In 1992, Douglas Rose and Kenneth Rose purchased Iola Industrial Tract 1 from Emprise Bank, who had owned it since 1985, when Iola Concrete Products suffered a mortgage foreclosure (185-187). As of the date of this report, they are still the listed owners of the property.

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[6] For a full copy of the Dun & Bradstreet Report, see Attachment J: Corporate Documents.

Operational Information

A general internet search of the mailing address associated with this property revealed that it is currently in use by Payless Concrete Products, Inc.

Corporate History

Payless Concrete Products, Inc. was incorporated in the state of Kansas in 2007. The corporation is current and active (39).

The registered agent/address is George B. Rose, 802 N. Industrial Road, P.O. box 664, Iola, Kansas 66749 (39).

Property Boundary/Site Description:

The Site property currently owned by Douglas Rose and Kenneth Rose is described as all of Lot 7 of Iola Industrial Tract Number One. For the purposes of this report, it is identified as all of Tract 1 (see Figure 1).

IV. Notable Corporate Owners

A. IMP Boats, Inc.

Summary

EPA requested that CGS note that IMP Boats, Inc. was a current owner when the property was identified as a Site of concern. According to CERCLA Section 107(a) (1), PRP liability can apply to current owners of the Site property. At the time of submission for this report, pursuant to CERCLA Section 107 (a) (1), IMP Boats, Inc. cannot be considered a PRP. IMP Boats, Inc. is dissolved. Russo Industries, a stockowner of IMP Boats from 1985, is currently inactive.

Ownership / Lease History

In 1978, the APECO Corporation deeded its Site property to IMP Boats, Inc. (164-109). This land included all of Tract 3, the western portion of Tract 4, identified as 4A, and all of Tract 6. Following the bankruptcy of IMP Boats, Tract 6 was deeded to the City of Iola in 1991 (182-536), and Tracts 3 and 4A were deeded to Allen County, Kansas in 1992 (185-603).

Operational Information

IMP Boats, Inc. was a manufacturer of fiberglass boats.

Corporate History

IMP Boats, Inc. was incorporated in the State of Kansas in 1978 by Webster L. Gordon. The purpose of the corporation was "to engage in any lawful act or activity for which corporations may be organized under the general corporation code of Kansas". At its

incorporation, the registered address and principal place of business were identified as 500 W. Lincoln Street in Iola (26)

IMP Boats changed its name in 1983 to The New IMP Boat Corporation in an Amendment to the Articles of Incorporation. In 1988, it again filed an Amendment, changing the name to International Marine Products (42, 28).

A memorandum date November 26, 1991, located in the EPA Site files, contained the following corporate information: The last annual report was filed in 1989 and listed the following officers: Donald G. Vincent – Pres.; Zoltan Olah – Secretary Treasurer; Joseph Russo – Board of Directors. All stock shares were owned by Russo Industries, Inc. Russo Industries, Inc. incorporated in the State of Texas in 1985, and is currently inactive (13).

A search of the Texas Secretary of State Corporations Division website confirmed that Russo Industries in inactive due to "Tax Forfeiture", effective February 2, 1993 (41).

International Marine Products, Inc. was administratively dissolved by the State of Kansas due to failure to file an Annual Report, effective May 15, 1991 (27).

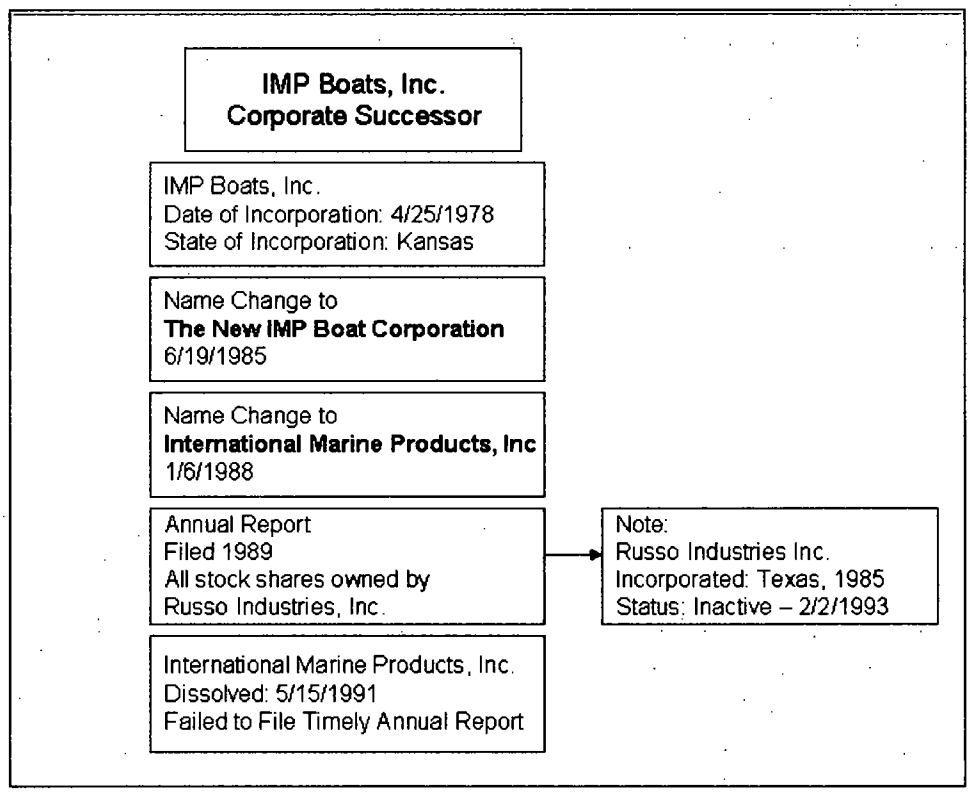

Figure 12: IMP Boats Corporate Successor

PROPERTY BOUNDARY/SITE DESCRIPTION:

For a parcel map, see Figure 1.

V. Non-operational On-Site Smelters

A. Lanyon Zinc Smelting Company

Summary

On March 9, 1911 Lanyon Zinc Smelting Company purchased Tracts 1-4, 5C, 6B and 6C from Edmund L. Judson, the company's secretary (57-141). The company sold the land to J. B. Kirk on July 29, 1912 (M22-129).

Operations during Lanyon Zinc Smelting Company's period of ownership are unknown; therefore the company cannot be classified as a PRP. The company dissolved on August 1, 1912; no corporate successor was located (33).

VI. Additional Corporate Property Owners

During the collection and review of Site title instruments, CGS found several corporations that owned Site property. EPA asked CGS to account for these businesses and their on-site operations. Based on the information gathered, the corporations listed cannot be classified as Potentially Responsible Parties. Business information available for these companies is provided in Table 5 of the report body and is duplicated in Attachment H: Corporate Property Owners.

Company	Dates of Ownership	Tract	Nature of business / Notes	Source
APECO Corporation / American Photocopy Equipment Corp.	1969 -1978	3, 4, 6 (all)	Manufacture and sale of photocopy equipment.	1
Emprise Bank	1985 -1992	1	A financial institution	2
The Iola Carriage and Omnibus Company	1887 - Unknown	5a, 6a	Manufacturer of coaches and carriages	3
Iola Concrete Products, Inc.	1972 - 1985	1	Brick and concrete block manufacturing	4
Iola Molded Plastics	1960 - 1969	3, 4, 6 (all)	Boat design and manufacture	1
Kansas City Testing Laboratories	Unknown - 1961	5b	unknown	none
Marvin E Boyer Oil Company, Inc	1969 - 2006	5 (all)	Oil drilling	none

Table 5: Corporate Property Owners

CONCLUSIONS

According to Chenega Global Services research, the following entities are considered Potentially Responsible Parties pursuant to CERCLA Section 107 (a) for the following reasons:

W. & J. Lanyon are included as PRPs based on evidence that, during their period of Site ownership, the W. & J. Lanyon Works, later renamed Lanyon Zinc Company Work No. 1, operated on-site. Smelting is known to have occurred on the Site property and may be a source of the lead contamination detected in the soil at the Site. According to CERCLA Section 107(a) (2) PRP liability can be applied to W. & J. Lanyon, as they were owners of the Site property at the time of disposal.

Robert Lanyon Son's Spelter Company operated a zinc smelter on-site during 1898 to 1899. Smelting is known to have occurred on the Site property and may be a source of the lead contamination detected in the soil at the Site. According to CERCLA Section 107(a) (2) PRP liability can be applied to Robert Lanyon Son's Spelter Company, as it was an operator of the Site property at the time of disposal. Historical evidence indicates that the company became Lanyon Zinc Company (Works No. 2) in 1899.

Lanyon Zinc Company owned Site property and operated two smelting facilities on-site from 1899 to 1911.

In a letter dated February 2, 1912, Lanyon Zinc Company's legal representatives informed the Kansas Secretary of State that the company's property was sold at mortgage foreclosure in early 1910. The law firm also claimed that Lanyon Zinc Company was a defunct corporation; no corporate successors were located. Smelting is known to have occurred on the Site property and may be a source of the lead contamination detected in the soil at the Site. According to CERCLA Section 107(a) (2) PRP liability can be applied to Lanyon Zinc Company, as it was an owner/operator of the Site property at the time of disposal.

J.B. Kirk Gas & Smelting Company, a Kansas corporation, owned portions of the Site property from 1912 to 1967. During their ownership United States Smelting Company operated the on-site smelter. In 1953, the company leased to J.B. Kirk, an individual, who then arranged for treatment of on-site cinder residues. Smelting is known to have occurred on the Site property and may be sources of the heavy metal contamination detected in the soil at the Site. According to CERCLA Section 107 (a) (2) and CERCLA Section 107 (a) (3), J.B. Kirk Gas & Smelting Company is considered a PRP because it was both an owner at the time of disposal, and an arranger for the treatment of smelter wastes. J.B. Kirk Gas & Smelting Company dissolved in 1995; no corporate successors were located.

J.B. Kirk, an individual, owned portions of the Site property from July to August of 1912. In August of 1953 he leased the Site property from J.B. Kirk Gas & Smelting Company. The same day, he established an agreement with Cherryvale Zinc Company, allowing the zinc company to access and remove cinder residues that had resulted from previous smelting activities (referred to as Dump No. 3).

Smelting is known to have occurred on the Site property and may be a source of the lead contamination detected in the soil at the Site. In this capacity, J.B. Kirk arranged for the relocation of smelting wastes. According to CERCLA Section 107(a) (3), J.B. Kirk is considered a PRP, as he was both an owner at the time of disposal and an arranger of disposal activities. A title document from October of 1956, identified J.B. Kirk as deceased (M55-143).

United States Smelting Company owned the Site property from June 1915 to July 1916 and operated the on-site smelter from 1915 to late 1917. Smelting is known to have occurred on the Site property and may be sources of the heavy metal contamination detected in the soil at the Site. According to CERCLA Section 107 (a) (2), PRP liability can be applied to United States Smelting Company because it was an owner/operator at the time of disposal. No corporate successor was located for United State Smelting Company in relation to the IMP Boats Site property.

Cherryvale Zinc Company, a New York corporation, entered into an agreement with J.B. Kirk, lessee of the Site property, on August 28, 1953, to access and remove cinder residues that had resulted from previous smelting activities. The agreement spanned three years and was renewed at J.B. Kirk's death in 1956 for one year. Cherryvale withdrew from Kansas on May 10, 1973 and was dissolved on August 26, 1977; no corporate successors were located.

Smelting is known to have occurred on the Site property and may be a source of the lead contamination detected in the soil at the Site. According to CERCLA Section 107(a) (4), Cherryvale Zinc Company is considered a PRP, as it was a transporter of smelter wastes.

Notable Corporate Property Owners

EPA requested that CGS note that IMP Boats, Inc. was a current owner when the property was identified as a Site of concern. According to CERCLA Section 107(a) (1), PRP liability can apply to current owners of the Site property. At the time of submission for this report, pursuant to CERCLA Section 107 (a) (1), IMP Boats, Inc. cannot be considered a PRP. IMP Boats, Inc. is dissolved. Russo Industries, a stockowner of IMP Boats from 1985, is currently inactive.

Current Owners

According to CERCLA Section 107(a) (1) PRP liability can be applied to the following entities, as they are current owners of the Site property:

The City of Iola, Kansas is the current owner of Tract 2 of the Site property; the City of Iola was incorporated in Kansas in 1870 and is listed as an active non-profit corporation.

West Bottom Property, Inc. (or Westbottom Properties, Inc.) owns Tracts 3 and 4A, which are the center two parcels of the Site area. The registered agent is listed as West Bottoms Property, Inc., 504 W. Lincoln, Iola, Kansas, 66749. As of April 2010, the company is delinquent in Kansas.

A.C.B., Inc. currently owns all of Tract 5 and Tract 6 of the Site property. As of April 2010, the Kansas Corporation is delinquent for failure to file an annual report with the Secretary of State. The registered agent/address for the corporation is James M. Immel, Four East Jackson, Iola, Kansas 66749.

Douglas Rose and Kenneth Rose purchased Iola Industrial Tract Number One Lot 7 in 1992. Their land is currently in use by Payless Concrete Products, Inc., an active Kansas corporation.

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    b. Document 02: *Order, 4/17/1909*
    c. Document 10: *Journal Entry: Mortgage Foreclosure, 2/23/1910*
    d. Document 11: *Order of Sale, 3/4/1910*
    e. Document 16: *Application of J.B. Kirk, Receiver, for Order to Quit Claim and Give Possession of the Rolling Mill Property, 2/24/1911*
    f. Document 17: *Application for the Release and Discharge of the Property from the Care, Custody, Management and Possession of Receivers, 2/24/1911*
    g. Document 33: *Lease to American Metal Company and Report of J.B. Kirk as Receiver of Lanyon Zinc Company, 7/19/1910*

Corporate References

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46. United States Smelting Company. Kansas Secretary of State, *Certificate of Organization of Corporation under General Law.* 9/2/1902

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ATTACHMENTS

A: Title Trees

B: Chain of Title Tables

C: Title Instruments

D: Maps

E: Corporate Documents (References 18-48)

F: Historical Documents (References 1-17)

G: Site Timeline

H: Corporate Property Owner Chart

I: Potentially Responsible Party Profile Sheets

J: Dun & Bradstreet Business Information Reports

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TETRA TECH EM INC.

February 28, 2007

Mr. Roy Crossland
START Project Officer
U.S. Environmental Protection Agency, Region 7
901 North 5th Street
Kansas City, Kansas 66101

Subject: Quality Assurance Project Plan
United Zinc No. 1, Iola, Kansas
U.S. EPA Region 7, START 3, Contract No. EP-S7-06-01
Task Order No. 0038.000
Task Monitor: Paul Roemerman, EPA Site Assessment Team Leader

Dear Mr. Crossland:

Tetra Tech EM Inc. is submitting the attached Quality Assurance Project Plan for additional Removal Site Evaluation activities at the United Zinc No. 1 site in Iola, Kansas. If you have any questions or comments, please contact me at (913) 495-3920.

Sincerely,

Stephanie Luebbering, CHMM
START Project Manager

Ted Faile, PG, CHMM
START Program Manager

Enclosures

8030 Flint Street, Lenexa, KS 66214
Tel 913.894.2600 Fax 913.894.6295
www.ttemi.com

QUALITY ASSURANCE PROJECT PLAN
FOR ADDITIONAL REMOVAL SITE EVALUATION ACTIVITIES
UNITED ZINC NO. 1
IOLA, KANSAS

CERCLIS ID: KSN000705026

Superfund Technical Assessment and Response Team (START) 3
Contract No. EP-S7-06-01, Task Order 0038.000

Prepared For:

U.S. Environmental Protection Agency
Region 7
Superfund Division
901 North 5th Street
Kansas City, Kansas 66101

February 28, 2007

Prepared By:
Tetra Tech EM Inc.
8030 Flint Street
Lenexa, Kansas 66214
913-894-2600

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Region 7 Superfund Program
Addendum to the QAPP for Superfund Integrated Site Assessment and Targeted Brownfields Assessment Activities (July 2005)
for the United Zinc No. 1 Site

Project Information:

Site Name: United Zinc No. 1		**City:** Iola	**State:** Kansas
EPA Project Manager: Paul Roemerman		**START Project Manager:** Stephanie Luebbering	
Approved By:	Stephanie Luebbering	**Prepared For:** EPA Region 7 Superfund Division	
Title:	START Project Manager	**Date:** 2/28/07	
Approved By:			
Title:	START Program Manager	**Date:** 2/28/07	
Approved By:	Kathleen Homes	**Prepared By:** Stephanie Luebbering	
Title:	START QA Manager	**Date:**	**Date:** 2/27/2007
Approved By:			
Title:	EPA Project Manager	**Date:**	
Approved By:		**Tetra Tech START Project Number:** X9004.06.0038.000	
Title:	EPA Region 7 QA Coordinator	**Date:**	

1.0 Project Management:

1.1 Distribution List

EPA—Region 7: Paul Roemerman, EPA Project Manager
Diane Harris, EPA Region 7 QA Coordinator

Tetra Tech START: Stephanie Luebbering, Project Manager

1.2 Project/Task Organization

Paul Roemerman, of the EPA Region 7 Superfund Division, will serve as the EPA project manager for the activities described in this QAPP. Stephanie Luebbering, of Tetra Tech EM Inc. (Tetra Tech), will serve as the START project manager.

1.3 Problem Definition/Background:

Description: This site-specific Quality Assurance Project Plan form is prepared as an addendum to the Generic **Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated July 2005)**, and contains site-specific data quality objectives for the sampling activities described herein.

☒ Description attached.

☐ Description in referenced report: _____ Title _____ Date

1.4 Project/Task Description:

☐ CERCLA PA ☐ CERCLA SI ☐ Brownfields Assessment
☒ Other (description attached): ☐ Pre-CERCLIS Site Screening ☐ Removal Assessment

Schedule: Field work is scheduled for March 2007.

☐ Description in referenced report: _____ Title _____ Date

1.5 Quality Objectives and Criteria for Measurement Data:

a. Accuracy:	☒ Identified in attached table.
b. Precision:	☒ Identified in attached table.
c. Representativeness:	☒ Identified in attached table.
d. Completeness*:	☒ Identified in attached table.
e. Comparability:	☒ Identified in attached table.

Other Description:

*A completeness goal of 100 percent has been established for this project. However, if the completeness goal is not met, EPA may still be able to make site decisions based on any or all of the remaining validated data.

1.6 Special Training/Certification Requirements:

☒ OSHA 1910 ☒ Special Equipment/Instrument Operator (describe below): Monitoring wells will be installed by a subcontractor. ☐ Other (describe below):

Region 7 Superfund Program
Addendum to the QAPP for Superfund Integrated Site Assessment and Targeted Brownfields Assessment Activities (July 2005)
for the United Zinc No. 1 Site

1.7 Documentation and Records:

☒ Field Sheets ☒ Site Log ☐ Trip Report ☒ Site Maps ☐ Video
☒ Chain of Custody ☒ Health and Safety Plan ☒ Letter Report ☒ Photos

☒ Sample documentation will follow EPA Region 7 SOP 2420.05D.
☒ Other: Analytical information will be handled according to procedures identified in Table 2.

2.0 Measurement and Data Acquisition:

2.1 Sampling Process Design:

☐ Random Sampling ☐ Transect Sampling ☒ Biased/Judgmental Sampling ☐ Stratified Random Sampling
☐ Search Sampling ☐ Systematic Grid ☐ Systematic Random Sampling ☒ Definitive Sampling
☐ Screening w/o Definitive Confirmation ☐ Screening w/ Definitive Confirmation
☒ Sample Maps Attached
☐ Other (Provide rationale behind each sample): See Attachment A for additional sampling information.

The proposed sampling scheme for groundwater from monitoring wells will be biased/judgmental, with definitive laboratory analysis, in accordance with procedures included in the *Guidance for Performing Site Inspections Under CERCLA*, OSWER Directive #9345.1-05, September 1992, and *Removal Program Representative Sampling Guidance, Volume 1: Soil*, OSWER Directive 9360.4-10, November 1991. All samples will be submitted for analysis by the EPA Region 7 laboratory. See Appendix A for additional site-specific information and maps. The proposed number of samples is a balance between cost and coverage, and represents a reasonable attempt to meet the study objectives while staying within the budget constraints of a typical site investigation.

Sample Summary Location	Matrix	# of Samples*	Analysis
Private drinking water wells	Groundwater	5	Arsenic and lead
Surface water intakes	Surface water	3	Arsenic and lead
Surface soil	Soil	5	Arsenic and lead
Off-site surface water bodies	Surface water	6	Arsenic and lead
Off-site surface water bodies	Sediment	6	Arsenic and lead

*NOTE: Background/QC samples are not included with these totals. See Table 1 for a complete sample summary.

2.2 Sample Methods Requirements:

Matrix	Sampling Method	EPA Region 7 SOP(s) & Methods
Groundwater – Private drinking water wells	Groundwater samples will be collected directly into sample containers from drinking water wells at spigots/faucets closest to the well heads and prior to any treatment. The samples will be collected into appropriate containers after the wells have been purged for a minimum of 5 minutes and field water quality parameters have stabilized.	SOP 4230.10A
Surface water – Public water intakes	Surface water samples will be collected directly into sample containers from the surface water intake taps/spigots prior to any treatment. The samples will be collected into appropriate containers after the intakes have been purged for a minimum of 5 minutes and field water quality parameters have stabilized.	SOP 4230.10A
Soil	Surface soil samples will be collected with disposable stainless steel spoons and field-screened with a XRF.	SOP 4331.2012
Water – Surface water	Surface water samples will be collected directly into appropriate containers from Rock Creek, Elm Creek, and the Neosho River.	SOP 4230.17A
Sediment	Sediment samples will be co-located with the surface water samples and will be collected from the top 2 inches of stream sediment using a clean, dedicated, stainless steel spoon in a dedicated container.	SOP 4230.08A

2.3 Sample Handling and Custody Requirements:

☒ Samples will be packaged and preserved in accordance with procedures defined in Region 7 EPA SOP 2420.06D.
☒ COC will be maintained as directed by Region 7 EPA SOP 2420.04C.
☒ Samples will be accepted according to Region 7 EPA SOP 2420.01E.
☐ Other (Describe):

Region 7 Superfund Program
Addendum to the QAPP for Superfund Integrated Site Assessment and Targeted Brownfields Assessment Activities (July 2005)
for the United Zinc No. 1 Site

2.4 Analytical Methods Requirements:

☒ Identified in attached table
☒ Rationale: The requested analyses have been selected based on the historical information on the site and program experience with similar types of sites.
☐ Other (Describe):

2.5 Quality Control Requirements:

☐ Not Applicable
☒ Identified in attached table
☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated July 2005).
☒ Field QC Samples: For this investigation, field QC samples will include a field blank prepared with DI water provided by the EPA Region 7 laboratory. The field blank will be collected to evaluate contamination of sampling containers and/or preservatives and to assess contamination potentially introduced during the sampling and laboratory procedure(s). All QC samples will be submitted for the analyses listed in the attached tables. Evaluation of blank samples depends on the levels of contamination found in environmental samples to determine whether the environmental samples are representative. Analytical results of blank samples will be evaluated on a qualitative basis by the EPA project manager and EPA contractor(s) to determine a general indication of field-introduced and/or lab-introduced contamination. Total method precision is not required for this event; therefore, field duplicates will not be collected.
☐ Other (Describe):

2.6 Instrument/Equipment Testing, Inspection, and Maintenance Requirements:

☐ Not Applicable
☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated July 2005).
☒ Other (Describe): Testing, inspection, and maintenance of field instruments (GPS unit, water quality meter, etc.) will be performed in accordance with manufacturers' recommendations. Testing, inspection, and maintenance of laboratory equipment will be performed in accordance with the previously referenced SOPs and/or manufacturers' recommendations.

2.7 Instrument Calibration and Frequency:

☐ Not Applicable
☒ Inspection/acceptance requirements are in accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated July 2005).
☒ Calibration of laboratory equipment will be performed as described in the previously referenced SOPs and/or manufacturers' recommendations.
☒ Other (Describe): Calibration of field instruments (water quality meter, etc.) will be performed daily, as described in the manufacturers' recommendations.

2.8 Inspection/Acceptance Requirements for Supplies and Consumables:

☐ Not Applicable
☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (Updated July 2005).
☒ All sample containers will meet EPA criteria for cleaning procedures for low-level chemical analysis. Sample containers will have Level II certifications provided by the manufacturer in accordance with pre-cleaning criteria established by EPA in *Specifications and Guidelines for Obtaining Contaminant-Free Containers*.
☐ Other (Describe):

2.9 Data Acquisition Requirements:

☐ Not Applicable
☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated July 2005).
☒ Previous data/information pertaining to the site (including other analytical data, reports, photos, maps, etc., which are referenced in this QAPP) have been compiled by EPA and/or its contractor(s) from other sources. Some of that data has not been verified by EPA and/or its contractor(s); however, the information will not be used for decision-making purposes by EPA without verification by an independent professional qualified to verify such data/information.
☐ Other (Describe):

2.10 Data Management:

☒ All laboratory data acquired will be managed in accordance with Region 7 EPA SOP 2410.01E.
☐ Other (Describe):

3.0 Assessment and Oversight:

3.1 Assessment and Response Actions:

☒ Peer Review ☒ Management Review ☐ Field Audit ☐ Lab Audit
☒ Assessment and response actions pertaining to analytical phases of the project are addressed in Region 7 EPA SOPs 2430.05C and 2430.12E.
☐ Other (Describe):

Region 7 Superfund Program
Addendum to the QAPP for Superfund Integrated Site Assessment and Targeted Brownfields Assessment Activities (July 2005)
for the United Zinc No. 1 Site

3.1A Corrective Action:

☒ Corrective actions will be taken at the discretion of the EPA project manager whenever there appear to be problems that could adversely affect data quality and/or resulting decisions affecting future response actions pertaining to the site.
☐ Other (Describe):

3.2 Reports to Management:

☐ Audit Report ☐ Data Validation Report ☐ Project Status Report ☐ None Required

☒ A letter report describing the sampling techniques, locations, problems encountered (with resolutions to those problems), and interpretation of analytical results will be prepared by START and submitted to the EPA.
☒ Reports will be prepared in accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated July 2005).
☐ Other (Describe):

4.0 Data Validation and Usability:

4.1 Data Review, Validation, and Verification Requirements:

☐ Identified in attached table
☒ Data review and verification will be performed in accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated July 2005).
☒ Data review and verification will be performed by a qualified analyst and the laboratory's section manager as described in Region 7 EPA SOPs 2430.05C and 2430.12E.
☐ Other (Describe):

4.2 Validation and Verification Methods:

☐ Identified in attached table
☒ The data will be validated in accordance with Region 7 EPA SOPs 2430.05C and 2430.12E.
☒ The EPA project manager will inspect the data to provide a final review. The EPA project manager will review the data, if applicable, for laboratory spikes, laboratory blanks, and the field blank to ensure that they are acceptable. The EPA project manager will also compare the sample descriptions with the field sheets for consistency and will ensure that any anomalies in the data are appropriately documented.
☐ Other (Describe):

4.3 Reconciliation with User Requirements:

☐ Identified in attached table
☒ If data quality indicators do not meet the project's requirements as outlined in this QAPP, the data may be discarded and re-sampling or re-analysis of the subject samples may be required by the EPA project manager.
☐ Other (Describe):

Region 7 Superfund Program
Addendum to the QAPP for Superfund Integrated Site Assessment and Targeted Brownfields Assessment Activities (July 2005)
for the United Zinc No. 1 Site

Table 1: Sample Summary

Site Name: United Zinc No. 1				**Location:** Iola, Kansas			
START Project Manager: Stephanie Luebbering				**Activity/ASR #:** To be determined			**Date:** February 27, 2007
No. of Samples	**Matrix**	**Location**	**Purpose**	**Depth or other Descriptor**	**Requested Analysis**	**Sampling Method**	**Analytical Method/SOP**
5	Groundwater	Private drinking water wells	To assess potential groundwater contamination from site operations	Unknown	Arsenic and lead	EPA SOP 4230.10A	EPA Method 6020
3	Drinking water from surface water source	Spigot from surface water intakes	To assess potential surface water (drinking water) contamination from site operations	Unknown	Arsenic and lead	EPA SOP 4230.10A	EPA Method 6020
5	Surface water	Surface water bodies near the site	To assess potential surface water contamination from site operations	N/A	Arsenic and lead	EPA SOP 4230.17A	EPA SOP 3122.03B
5	Sediment	Collocated with surface water samples	To assess potential sediment contamination from site operations	0-6 inches	Arsenic and lead	EPA SOP 4230.08A	EPA SOP 3122.03B
Background Samples							
1	Groundwater	Private drinking well upgradient of the site	To determine background level of contaminants of concern in groundwater	Unknown	Arsenic and lead	EPA SOP 4230.10A	EPA Method 6020
1	Drinking water from surface water source	Spigot from surface water intake upgradient of site	To determine background level of contaminants of concern in surface water (drinking water source)	Unknown	Arsenic and lead	EPA SOP 4230.10A	EPA Method 6020
5	Soil	Surface soil samples upgradient of the site	To determine background level of contaminants of concern in surface soil	0-2 inches	Arsenic and lead	EPA SOP 4231.2012	EPA SOP 3122.03B
1	Surface water	Surface water sample upgradient of the site	To determine background level of contaminants of concern in surface water	N/A	Arsenic and lead	EPA SOP 4230.17A	EPA SOP 3122.03B
1	Sediment	Co-located with surface water sample	To determine background level of contaminants of concern in sediment	0-6 inches	Arsenic and lead	EPA SOP 4230.08A	EPA SOP 3122.03B

Region 7 Superfund Program Addendum to the QAPP for Superfund Integrated Site Assessment and Targeted Brownfields Assessment Activities (July 2005) for the United Zinc No. 1 Site							
Table 1: Sample Summary (continued)							
Site Name: United Zinc No. 1				Location: Iola, Kansas			
START Project Manager: Stephanie Luebbering				Activity/ASR #: To be determined			Date: February 27, 2007
No. of Samples	Matrix	Location	Purpose	Depth or other Descriptor	Requested Analysis	Sampling Method	Analytical Method/SOP
QC Samples							
1	Water	Field blank	To assess field/laboratory-introduced contamination	N/A	Arsenic and lead	N/A	EPA Method 6020

Region 7 Superfund Program
Addendum to the QAPP for Superfund Integrated Site Assessment and Targeted Brownfields Assessment Activities (July 2005)
for the United Zinc No. 1 Site

Table 2: Data Quality Objective Summary

Site Name: United Zinc No. 1				**Location:** Iola, Kansas				
START Project Manager: Stephanie Luebbering				**Activity/ASR #:** To be determined			**Date:** February 27, 2007	
Analysis	Analytical Method	**Data Quality Measurements**					Sample Handling Procedures	Data Management Procedures
		Accuracy	Precision	Representativeness	Completeness	Comparability		
WATER (Groundwater and Surface Water)								
Arsenic and lead	see Table 1	per analytical method	per analytical method	biased/judgmental sampling based on professional judgment of the sampling team	100%; samples from private drinking water wells and surface water intakes are considered critical samples	Standardized procedures for sample collection and analysis will be used.	See Section 2.3 of QAPP form.	See Section 2.10 of QAPP form.
SOIL/SEDIMENT								
Arsenic and lead	see Table 1	per analytical method	per analytical method	biased/judgmental sampling based on professional judgment of the sampling team	100%; Soil samples from surface soil sample locations are critical samples.	Standardized procedures for sample collection and analysis will be used.	See Section 2.3 of QAPP form.	See Section 2.10 of QAPP form.

APPENDIX A

SITE-SPECIFIC INFORMATION FOR A SITE REASSESSMENT AT THE UNITED ZINC NO. 1

INTRODUCTION

The Tetra Tech EM Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) has been tasked by the U.S. Environmental Protection Agency (EPA) Region 7 Superfund Division to conduct additional Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Removal Site Evaluation (RSE) activities at the United Zinc No. 1 site in Iola, Allen County, Kansas.

The purpose of these activities is to determine whether any threats to human health or the environment exist as a result of releases to soil, groundwater, and surface water. This Quality Assurance Project Plan (QAPP) identifies site-specific features and addresses elements of the sampling strategy and analytical methods proposed for this investigation.

SITE LOCATION/DESCRIPTION

United Zinc is located within the city boundaries of Iola, Allen County, Kansas, on the north side of Highway 54 along Kansas Drive, and is the location of the former United Zinc and Chemical Company Zinc and Lead Smelter. The facility is located on the east side of Iola within a mixture of residential and commercial properties. United Zinc is located in Sections 25 and 36 of Township 24 South, Range 18 East (Kansas Department of Health and Environment [KDHE] 2005), as depicted on the U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle map of Iola, Kansas (USGS 1984). The approximate geographic coordinates for the central portion of the facility are 37.9222800 degrees north latitude and 95.385900 degrees west longitude (Maxim Technologies, Inc. [Maxim] 2003). The location of the facility is shown in Appendix A, Figure 1.

The former United Zinc smelter facility was comprised of 10 parcels of land, equivalent to approximately 17 acres, but the overall site area evaluated includes a much larger surrounding section. The property has been graded, leveled, and developed since the former smelter operations ceased in the 1920s (Maxim 2003). Most of the property where the former smelter was located is vacant but includes the following businesses: Brenntag Southwest, Inc. (Chemical Distribution Company), a MFA Distributor, the Superflea Flea Market, Tucker's Flea Market, a portion of a concrete mixing facility, and some pastureland (Maxim 2003, KDHE 2005). The facility is bordered on the north by residential properties; on the east by the East Iola Site (the location of the former Prime Western Smelting Company Works No. 3 and J.B. Kirk Gas and Smelting Company), a car wash, a former Tyson processing facility, and a movie theater; on the south by a restaurant, a dry cleaner, a car dealership, and agricultural land; and on the west

by the Colberly Site (the location of the former United Iron Works Company), a truck repair facility, and the remaining portion of the concrete mixing facility (Maxim 2003). The facility is also surrounded by residential neighborhoods and six schools (KDHE 2005). Investigations have focused specifically on the Iola Preschool for the Exceptional (Iola Preschool) is located northeast of United Zinc, and the McKinley Elementary School (McKinley School) located southwest of United Zinc (Terranext 2005). The facility layout is shown in Appendix A, Figure 2.

According to the historic plat maps and Sanborn fire insurance maps, activities at the United Zinc facility began as early as 1901. At that time, the facility was called the Standard Acid Company and included three furnaces, 12 retorts, and a pottery room with kilns. Mr. William Lanyon owned the property between 1901 and 1902. The property was transferred to United Zinc in 1902. United Zinc and Chemical Company owned and operated the primary zinc smelter until approximately 1912. No known active smelting facilities were documented on the property after 1912. Historical documentation indicates that the United Zinc facility contained four furnaces, eight kilns, 14 retorts, and several ore crushers and roasters (KDHE 2005). The United Zinc facility was designed to capture the sulfur dioxide fumes generated during roasting the ore to make sulfuric acid; therefore, United Zinc likely used the acid chambers associated with the Standard Acid facility (KDHE 2006).

During a 2003 Phase I site reconnaissance, smelter waste was observed at United Zinc, and the quantity was estimated as approximately 1,800 cubic yards concentrated in the southwest corner of the vacant property at United Zinc (Burns & McDonnell Engineering Company Inc. [Burns & McDonnell] 2004, Terranext 2005). Zinc smelter waste is known to contain elevated concentrations of heavy metals from smelting activities—including arsenic, cadmium, lead, and zinc. Sampling of the soil, groundwater, sediment, surface water, smelter waste, and surrounding areas began in 2004 to determine the potential impact from the former smelting operations at United Zinc.

The EPA has tasked Tetra Tech to perform additional sampling as part of the RSE to determine background concentrations of arsenic and lead in the surface soil, and to identify impacts to the groundwater and surface water pathways. Investigations to identify the levels of arsenic and lead in residential yards near the former United Zinc facility are continuing under the RSE, but background concentrations in the area have yet to be defined. The additional sampling will include surface soil east of the United Zinc facility in an area without existing industrial and commercial facilities. In addition existing private drinking water wells, surface water intakes that provide drinking water to the City of Iola,

and surface water and sediment samples from Rock Creek and Elm Creek will also be collected to evaluate the surface water pathway.

ENVIRONMENTAL SETTING

Iola is located within the Upper Neosho Watershed. The City of Iola obtains their drinking water from surface water according to the EPA's Safe Drinking Water Information System. No drinking water violations have been reported for the City of Iola since October 2005. Violations noted since 1992 included exceedences of total haloacetic acids, total trihalomethanes, and total coliform. The City of Iola responded to each health based violation and compliance was achieved (EPA 2007).

Allen County is located within the Osage Plains, and the land is predominantly level with few outstanding differences in the relief of the land. The U.S. Department of Agriculture (USDA) has classified soil in the area as Kenoma silt loam. The Kenoma soil type is described by the USDA as deep, moderately well-drained, very slowly permeable soils on the uplands. These soils are formed in material weathered from sediments high in content of silt and clay (USDA 1978).

PREVIOUS INVESTIGATIONS

Previous investigations at the United Zinc facility are as follows:

- A Phase I Focused Former Smelter Assessment (FFSA) was completed on behalf of the KDHE State Water Plan (SWP) program in December 2003. The FFSA identified a Recognized Environmental Condition (REC) at United Zinc based on observation of smelter waste during the site reconnaissance. The smelter waste appeared to have impacted the vegetative growth in the area of the former smelter operations. In addition, elevated concentrations of lead had been previously documented in the surface soils on the property immediately adjacent to United Zinc from other documented smelting operations, including the East Iola Site and the Colberly Site. A Phase II Assessment was recommended at United Zinc and in the area surrounding the smelting activities to investigate the potential risk of human exposure to heavy metal-impacted waste and surface soil (Maxim 2003).

- Sampling of the soil, smelter waste, groundwater, surface water, and sediment was conducted during the Phase II FFSA at United Zinc in December 2004 on behalf of the KDHE SWP. The sampling identified elevated levels of arsenic, cadmium, lead, and zinc

above the background soil sample concentrations. The Phase II FFSA also indicated potential contamination near residents and at both the McKinley School and the Iola Preschool (Burns & McDonnell 2004, KDHE 2005).

- KDHE collected samples in June 2005 from 50 residential yards located between United Zinc and the McKinley School and the Iola Preschool. Arsenic was detected above its KDHE Risk-Based Standards for Kansas (RSK) Residential Soil Pathway level of 11 milligrams per kilogram (mg/kg) in 18 of the residential samples (Terranext 2005, KDHE 2003). In addition, lead was found above its KDHE RSK Residential Soil Pathway level of 800 mg/kg in 12 of the residential samples, some of the same samples with elevated arsenic concentrations. Cadmium and zinc were detected in all of the soil samples at concentrations below their KDHE RSK Residential Soil Pathway values (Terranext 2005, KDHE 2003, 2005).

- A Preliminary RSE was conducted by KDHE in September 2005. In support of the 2005 RSE, KDHE collected additional samples from sensitive receptors areas near United Zinc, including the McKinley School and Iola Preschool. The results exhibited elevated levels of arsenic, cadmium, lead, and zinc at residential and non-residential properties. The presence of lead above 400 mg/kg was also identified within the McKinley School playground and adjacent areas. The Preliminary RSE recommended further removal site evaluation and removal action consideration (KDHE 2005).

- Tetra Tech START, under contract to the EPA, prepared a RSE report in September 2006. The sampling activities for the RSE were conducted during April and May 2006. During the RSE, approximately 260 properties were screened for lead using a XRF, and approximately 10 percent of the screened samples were submitted for laboratory confirmation analyses of arsenic, barium, cadmium, lead, and zinc. Thirty-four properties were identified where XRF and/or laboratory data indicated lead concentrations warranted a time-critical removal action (400 mg/kg for schools and daycares; 800 mg/kg for residential properties; and 1,000 mg/kg for commercial properties). The 34 properties included 19 private residences, 10 daycare facilities, two elementary schools, and three commercial properties (Tetra Tech 2006). In addition, 65 residential samples collected during the RSE contained concentrations of lead between 400 mg/kg and 800 mg/kg.

Contaminants potentially released at the site include the following:

- Metals – according to historical documents of the zinc smelting industry, smelting operations were known to generate large amounts of soot from burning coal, which was generally contaminated with elevated levels of lead, cadmium, arsenic, and zinc. In addition, the smelting operations generated large volumes of smelter waste, including impure smelting slag and slag blown from the retorts at the end of the smelting process that also contained heavy metals.

SAMPLING STRATEGY AND METHODOLOGY

The sampling activities are tentatively scheduled to begin in March 2007, and will require approximately three days to complete. The laboratory data obtained for all samples collected during this project will be compared to all applicable or relevant and appropriate requirements (ARAR) to assess whether further response is warranted.

Groundwater Sampling

Groundwater samples will be collected from five private drinking water wells (including one background location) (see Appendix B, Figure 3). At this time, Tetra Tech START has not received permission to sample all the wells; however, the intention is to gain permission and to sample these wells. Groundwater samples from the drinking water wells will be collected from taps/spigots located nearest the well heads, prior to any treatment systems. The system lines at active wells will be purged for approximately 5 minutes before the samples are collected. Any wells not currently in use will be purged for at least 15 minutes prior to sampling. Water quality parameters (pH, conductivity, and temperature) will be recorded as each well is purged until the parameters stabilize.

A field sheet will be completed for each groundwater sample location. The field sheets will include the following information: water quality parameters, purge times or estimated purge volumes, property ownership information, exact sample locations (depths and GPS coordinates), and analyses to be performed. The groundwater samples will be submitted to the EPA Region 7 laboratory for analyses of arsenic and lead. Water samples for metals analysis will be collected in 1-liter containers and preserved with nitric acid (HNO_3) to a pH <2. All water samples will be stored in coolers maintained at or below 4 C pending submittal to the EPA Region 7 laboratory.

Surface Water Sampling

Surface water samples will be collected from three surface water intakes used by the City of Iola to provide drinking water to the City (including one background location) (see Appendix B, Figure 3). At this time, Tetra Tech START has not received permission to sample the surface water intakes; however, the intention is to gain permission and to sample these intakes. Surface water samples from the water supply intakes will be collected from taps/spigots located nearest the intake, prior to any treatment systems. The system lines at active wells will be purged for approximately 5 minutes before the samples are collected. Water quality parameters (pH, conductivity, and temperature) will be recorded as each well is purged until the parameters stabilize.

A field sheet will be completed for each surface water sample location. The field sheets will include the following information: water quality parameters, purge times or estimated purge volumes, property ownership information, exact sample locations (depths and GPS coordinates), and analyses to be performed. The surface water samples will be submitted to the EPA Region 7 laboratory for analyses of arsenic and lead. Water samples for metals analysis will be collected in 1-liter containers and preserved with nitric acid (HNO_3) to a pH <2. All water samples will be stored in coolers maintained at or below 4 C pending submittal to the EPA Region 7 laboratory.

Soil Sampling

Surface soil samples will be collected and screened in the field at approximately five residential properties to determine the background concentrations of arsenic and lead in Iola in an area east of the former United Zinc facility. At each property, after receiving consent from the owner, Tetra Tech START will divide the property into distinct cells for screening purposes. While the maximum size of a cell will be 100 by 100 feet, the actual size of cells will be determined in the field based on site features. A cell will extend from the circumference defined by the drip zone around the building or house in all directions 100 feet or to the property line, whichever distance is shorter. Additional areas or cells to be screened include: the drip zone; fine-grained material if used for driveways, sidewalks, or under carports; vegetable gardens; and children's play areas at least 25 by 25 feet. A composite sample consisting of nine aliquots, each collected from 0 to 2 inches below ground surface (bgs), will be collected in each cell and placed in a labeled, sealed plastic bag.

Three separate readings for the metals of interest will be taken of each homogenized sample using a field portable x-ray fluorescence (XRF) analyzer; these readings will be recorded in the appropriate cell on the

field sheet for that property. The average of these three readings will be calculated and also recorded on the field sheet. All of the screened samples will be collected in an 8-ounce jar and will be submitted for laboratory confirmation analyses of arsenic and lead. All soil samples will be stored in coolers maintained at or below 4° C pending submittal to the EPA Region 7 laboratory.

Surface Water and Sediment Sampling

Runoff from the former United Zinc facility drains to the east to Rock Creek. Rock Creek flows to the south and drains into Elm Creek which leads to the confluence of the Neosho River. Two drinking water intakes exist 8 miles downstream of United Zinc, on the Neosho River. Surface water and sediment samples will be collected from Rock Creek, and Elm Creek, as shown in Figure 3 in Appendix B. A background surface water and sediment sample will be collected from Rock Creek upgradient of the former United Zinc facility. At each location, the surface water sample will be collected prior to the collection of the sediment sample. Water samples will be collected by immersing the sample containers directly into the water, whenever possible. All sampling procedures will follow the guidelines established in the EPA Standard Operating Procedures (SOP) identified in the QAPP.

Surface water samples will be submitted to the EPA Region 7 laboratory for analysis of arsenic and lead. Water samples to be analyzed for total metals will be collected in 1-liter containers and preserved with HNO_3 to a pH <2.

Sediment samples will be collected from the top 6 inches of stream sediment with a disposable stainless-steel spoon. The sediment will be placed in a disposable aluminum pie pan for homogenization and then transferred to an 8-ounce jar for analysis of the metals.

Pertinent data, including analyses to be performed and sample location data, will be recorded on field sheets for each sample. All surface water and sediment samples will be stored in coolers maintained at or below 4°C pending submittal to the EPA Region 7 laboratory.

A summary of all anticipated samples for this project is in Table 1 of the attached QAPP form. A summary of data quality objective summaries for this project is in Table 2 of the attached QAPP form. The SOPs and chain-of-custody procedures referenced in the QAPP will be followed throughout the sampling activities to verify the integrity of the samples from the time of collection until they are submitted to the laboratory for analysis.

Disposal of investigation-derived wastes (IDW) and procedures for equipment and personal decontamination will be addressed in a site-specific health and safety plan prepared by Tetra Tech START. IDW is expected to consist of disposable sampling supplies (gloves, paper towels, polyvinyl chloride liners, pie pans, etc.) that will be disposed of off site as uncontaminated solid waste.

Quality Control Samples

An off-site location will be selected for collecting background samples of soil, groundwater, surface water, and surface water and sediment. To evaluate sample quality control (QC), a field blank will be collected, as specified in Section 2.5 of the QAPP form.

ANALYTICAL METHODS

All samples will be submitted to the EPA Region 7 laboratory in Kansas City, Kansas, for analysis. The water samples will be analyzed for arsenic and lead. All samples will be analyzed according to SOP and methods referenced on the QAPP form. Standard detection limits for those methods will be adequate for this project. Appropriate containers and physical/chemical preservation techniques will be employed during the field activities to help verify that representative analytical results are obtained. An Analytical Services Request form has been completed by the Tetra Tech START Project Manager and submitted to the EPA Region 7 laboratory. Submittal of samples to the laboratory is expected in March 2007.

REFERENCES

Burns & McDonnell Engineering Company Inc. (Burns & McDonnell). 2004. Phase II Focused Former Smelter Assessment of the Former United Zinc #1 Smelter in Iola, Kansas. December.

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Maxim Technologies, Inc. (Maxim). 2003. Focused Former Smelter Phase I Report. Group B Smelters. United Zinc #1 in Iola, Kansas. December 19.

Terranext. 2005. Residential Yard Soil Sampling Report for United Zinc #1 in Iola, Kansas. June 27.

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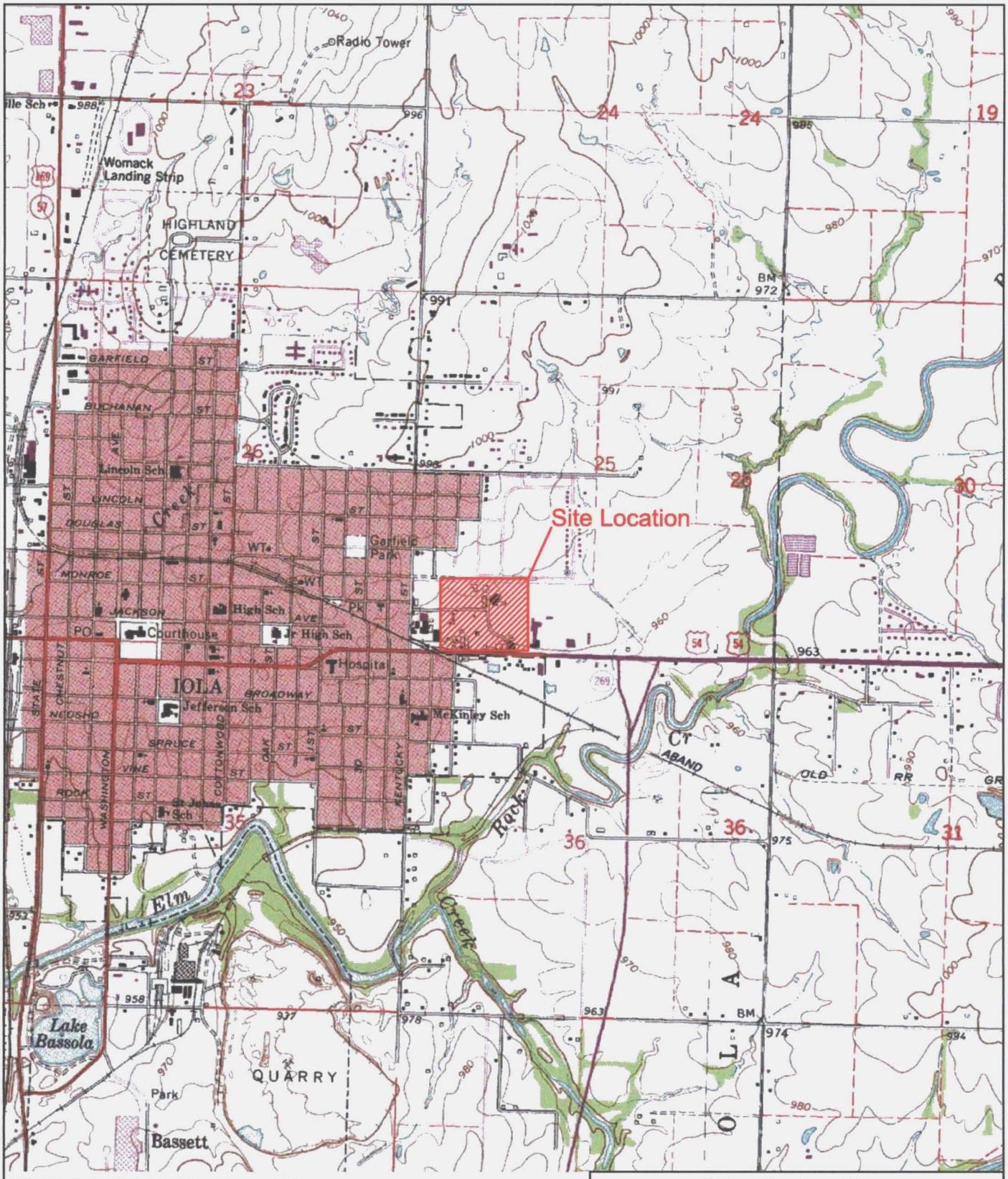
U.S. Department of Agriculture. 1978. Soil Survey of Allen County, Kansas. November.

U.S. Environmental Protection Agency. 2007. Safe Drinking Water Information System for the City of Iola. On-line Address: http://oaspub.epa.gov/enviro/sdw_report. Accessed February 26, 2007. Last updated February 26, 2007.

U.S. Geological Survey (USGS). 1984. Iola, Kansas, 7.5-minute topographic quadrangle.

APPENDIX A

FIGURES



Source: USGS Allen County, KS 7.5 Minute Topo Quad, 1959, PR 1984

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United Zinc Lead Site
Iola, Kansas

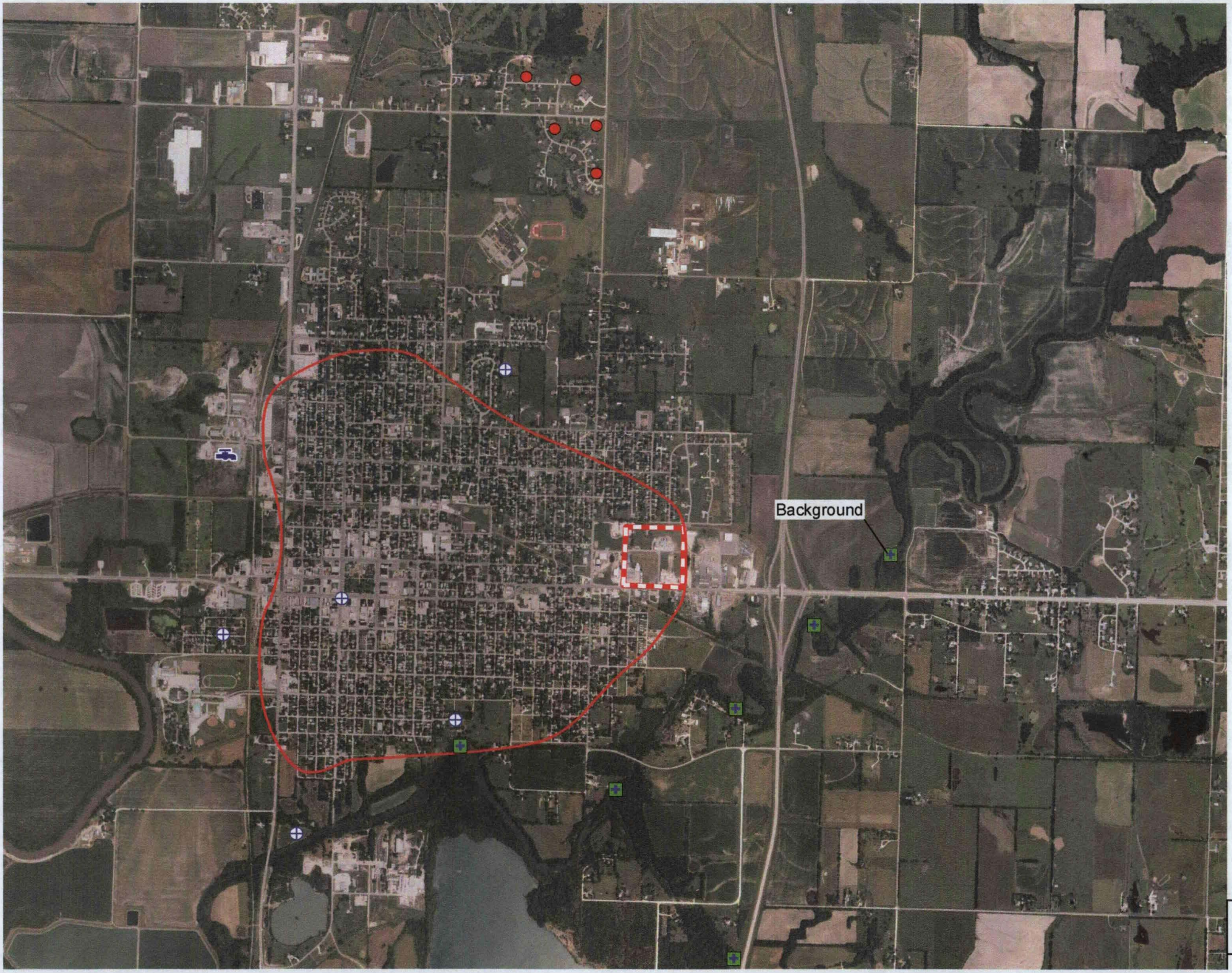
Figure 1
Facility Location Map

Tetra Tech EM Inc.

Date: 01/17/07 | Drawn By: Bill Spiking | Project No: I9004.L06.0038.000

Iola Preschool
Concrete Plant
Super Flea
Flea Market
ior High School
Iola Middle School
Coberly Site
East Iola Site
Flea Market
MFA
Brentags
Mckinley Elementary
Colborn
Oak
Elm
Lincoln
Breckenridge
Tennessee
Peach
Douglas
Ohio
Vermont
Kansas
Briarwood
Kennedy
Eisenhower
Willow
Monroe
East
Madison
2nd
Broadway
Neosho
Spruce
Vine
Clarence
54
169
269

Source



Source

Home > Kansas > Allen County > Iola Public Schools

Iola Public Schools

Quick Links:

- Tools:
  Search schools by zip, Compare schools side-by-side
- Schools:
  Blue Ribbon, Magnet, Charter, Special education, Vocational
- Online:
  Tuition-free online public schools for Kansas residents
- List:
  Private schools in Kansas, Boarding schools in Kansas
- View:
  Kansas Dept. of Education website, Kansas public school jobs

Browse Public schools in Iola, Kansas below:

Iola, Kansas Public High Schools

Town	School	# Students	T:S
Iola	Iola Senior High School	419	1:16

Iola, Kansas Public Middle Schools

Town	School	# Students	T:S
Iola	Iola Middle School	288	1:11

Iola, Kansas Public Elementary Schools

Town	School	# Students	T:S
Iola	Jefferson Elementary School	253	1:15
Iola	Lincoln Elementary School	250	1:14
Iola	Mckinley Elementary School	124	1:17

Overview

About This Town (Iola)	(Iola)	(KS) State Statistics
# of Schools	5 School(s) (0.4% of state total)	*1,413 School(s)*
# of Students	1,334 students (0.3% of state total)	*469,369 students*
# of Teachers	93 Teacher(s) (0.3% of state total)	*33,336 Teacher(s)*
Student / Teachers Ratio	14:1 Teacher	*14:1 Teacher*
# of Male Students	695 students	*231,692 students*

% Male Students	52.1%	*49.4%*
# of Female Students	639 students	*237,677 students*
% Female Students	47.9%	*50.6%*
Students by Ethnicity:		
# of American Indian Students	11 students	*5,849 students*
% American Indian Students	0.8%	*1.2%*
# of Asian Students	10 students	*11,230 students*
% Asian Students	0.7%	*2.4%*
# of Hispanic Students	44 students	*73,519 students*
% Hispanic Students	3.3%	*15.7%*
# of Black Students	31 students	*35,485 students*
% Black Students	2.3%	*7.6%*
# of White Students	1,186 students	*324,018 students*
% White Students	89%	*69%*
# of Other Students	52 students	*19,268 students*
% of Other Students	4%	*4%*
Students by Grade:		
# of Students in Pre-Kindergarten:	28 students	*8,631 students*
# of Students in Kindergarten:	106 students	
# of Students in 1st Grade:	107 students	*36,425 students*
# of Students in 2nd Grade:	105 students	*35,522 students*
# of Students in 3rd Grade:	100 students	*35,743 students*
# of Students in 4rd Grade:	91 students	*35,652 students*
# of Students in 5th Grade:	90 students	*35,202 students*
# of Students in 6th Grade:	113 students	*34,874 students*
# of Students in 7th Grade:	89 students	*34,092 students*
# of Students in 8th Grade:	86 students	*34,510 students*
# of Students in 9th Grade:	118 students	*37,311 students*
# of Students in 10th Grade:	101 students	*35,523 students*
# of Students in 11th Grade:	90 students	*33,467 students*
# of Students in 12th Grade:	110 students	*32,540 students*
# of Ungraded Students:	n/a	*3,446 students*

Town Statistics:

About This Town (Iola)	(Iola) Stats	(KS) State Statistics
Population (Approximate)	8,572 people	*2,687,946 people*
% (age 25+) w/College Degree	28%	*24%*
Median Household Income	31607	*$42,665*

View housing listings in Kansas

Median Value of Housing Unit
State (KS)

Provided by Zillow.com.

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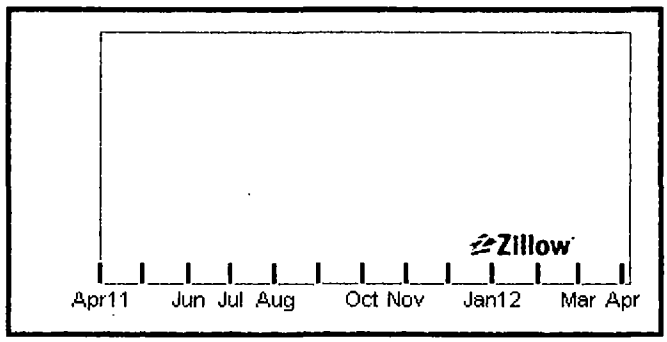
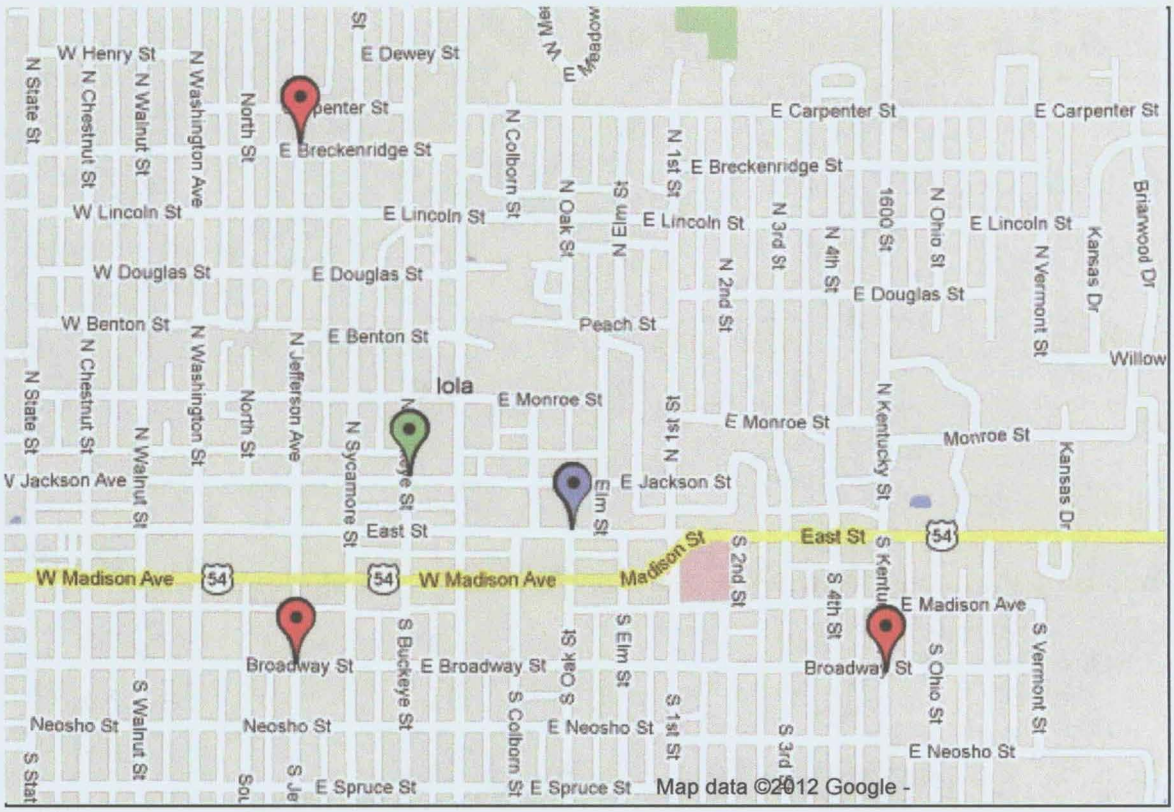


% Owning / % Renting	72% / 28%	*69% / 31%*

Town Map:

Show me location of:

Tip: Zoom in/out using the slider below. View aerial photos using the Satellite or Hybrid buttons.



- High school
- Middle school
- Elementary school

Note: Data has been gathered from the Dept. of Education, schools, and commercial data sources.

Recent Public School Articles:

- How the NY DOE is Handling a Rash of Sex Abuse Cases
  In light of many charges of sexual abuse between staff and students in New York schools, the Department of Education is taking steps that range from firing those involved to initiating new policies in hopes of protecting students in the future.
- No More "Pink Slime" on the Menus of Many Public Schools
  ("Pink slime," a beef byproduct that has been getting plenty of attention in the media of late, is now leaving many public schools nationwide in light of all the negative publicity. We'll take a look at a few of the school districts saying goodbye to the product.
- As Louisiana Governor Jindal Fights to Reform Louisiana Schools, Teachers Push Back
  Learn about the education reform that is currently making its way through the Louisiana state legislature and the teacher protests that have arisen as a result.
- More articles: Most Popular, Evaluating Public Schools, Types of Public Schools, Improving Learning, Attending Public School, High School Issues, Public School Policies, Public School Jobs

Featured Public Schools:

Lincoln Elementary School
(Iola, KS)

Iola Middle School
(Iola, KS)

Iola Senior High School
(Iola, KS)

Mckinley Elementary School
(Iola, KS)

Jefferson Elementary School
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