

NASA CR-144717

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WATER AND LAND RESOURCES
CONSULTANTS AND ENGINEERS

December 18, 1975

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Ref: 581

(NASA-CR-144717) SOIL MOISTURE GROUND TRUTH, LAFAYETTE, INDIANA, SITE; ST. CHARLES MISSOURI, SITE; CENTRALIA, MISSOURI, SITE (Bittinger (M. W.) and Associates, Inc.) 51 p HC \$4.50 :	N76-16598 Unclas 13385
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Mr. T. Schmugge, Code 913
National Aeronautics & Space Administration
Goddard Space Flight Center
Greenbelt Road
Greenbelt, MD 20771

Contract #NAS5-22312

Dear Tom:

Enclosed please find seven copies of our report entitled "Soil Moisture Ground Truth--Lafayette, Indiana, Site; St. Charles, Missouri, Site; Centralia, Missouri, Site" under the above contract. This work covers the most recent portion of our work under this contract.

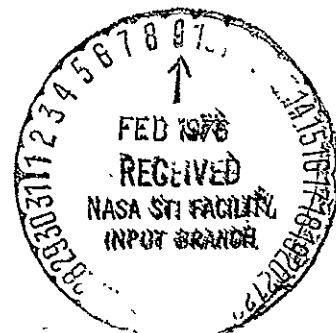
Yours very truly,

M. W. BITTINGER & ASSOCIATES, INC.


E. Bruce Jones, Vice President

EBJ:js
Enc.

cc: Contract Negotiator, J. Conner, Code 286 (w/1 copy of report)
Publication Branch, Code 251 (w/1 copy of report)
Patent Counsel, Code 204 (w/1 copy of report)



SOIL MOISTURE GROUND TRUTH

LAFAYETTE, INDIANA, SITE
ST. CHARLES, MISSOURI, SITE
CENTRALIA, MISSOURI, SITE

November 10, 1975, Mission

E. Bruce Jones
Stephen E. Olt
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December 1975
Mission Report - November 10, 1975, Mission

Prepared for:

GODDARD SPACE FLIGHT CENTER
Greenbelt, Maryland 20771
Contract No. NAS5-22312

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SOIL MOISTURE GROUND TRUTH
LAFAYETTE, INDIANA, SITE
ST. CHARLES, MISSOURI, SITE
CENTRALIA, MISSOURI, SITE
November 10, 1975, Mission

1. INTRODUCTION

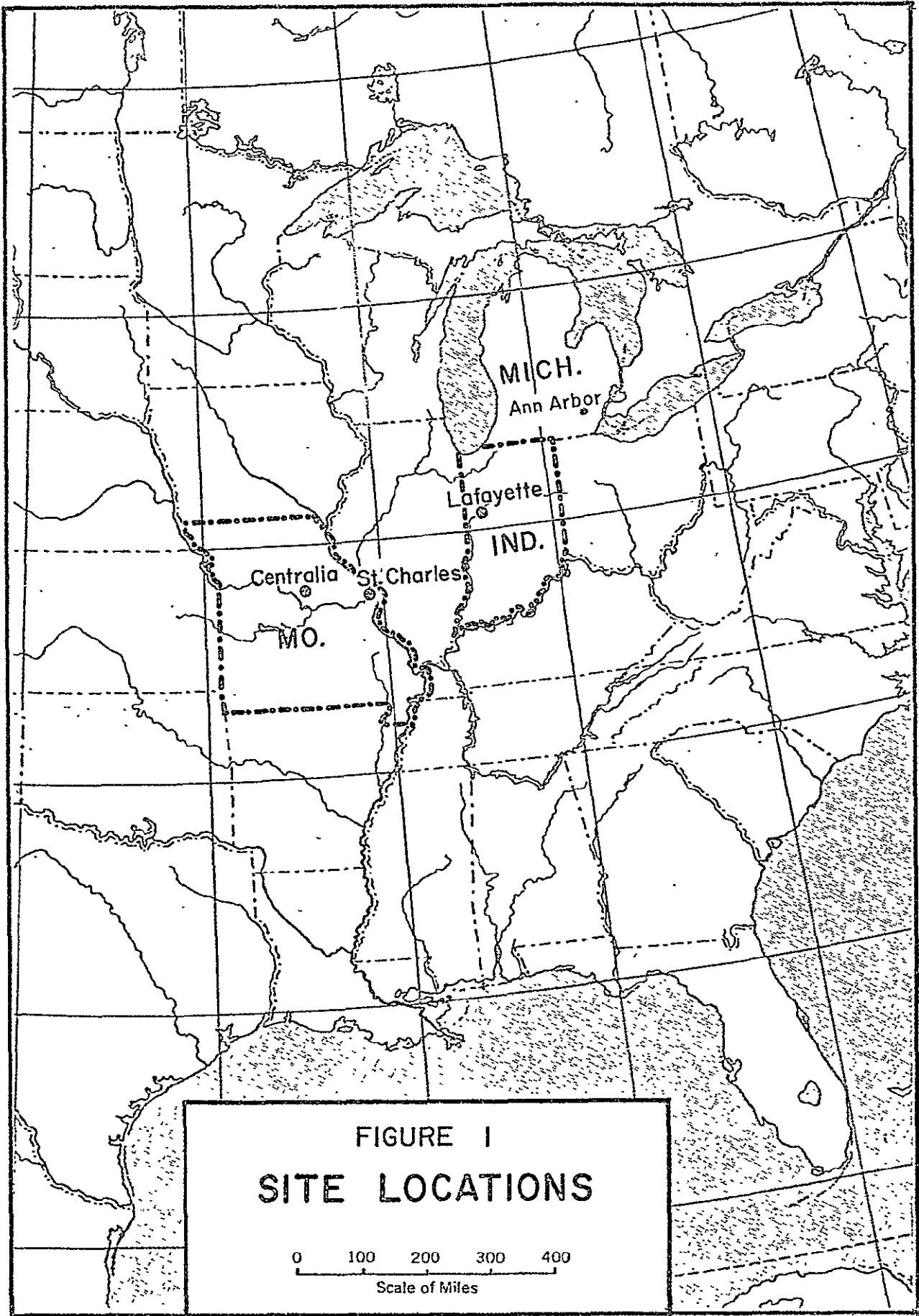
This report contains the soil moisture ground-truth measurements and ground-cover descriptions taken at three soil moisture survey sites located near Lafayette, Indiana; St. Charles, Missouri; and Centralia, Missouri. The data were taken on November 10, 1975, in connection with airborne remote sensing missions being flown by the Environmental Research Institute of Michigan under the auspices of the National Aeronautics and Space Administration.

2. SOIL MOISTURE SURVEY SITES

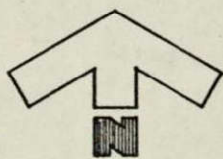
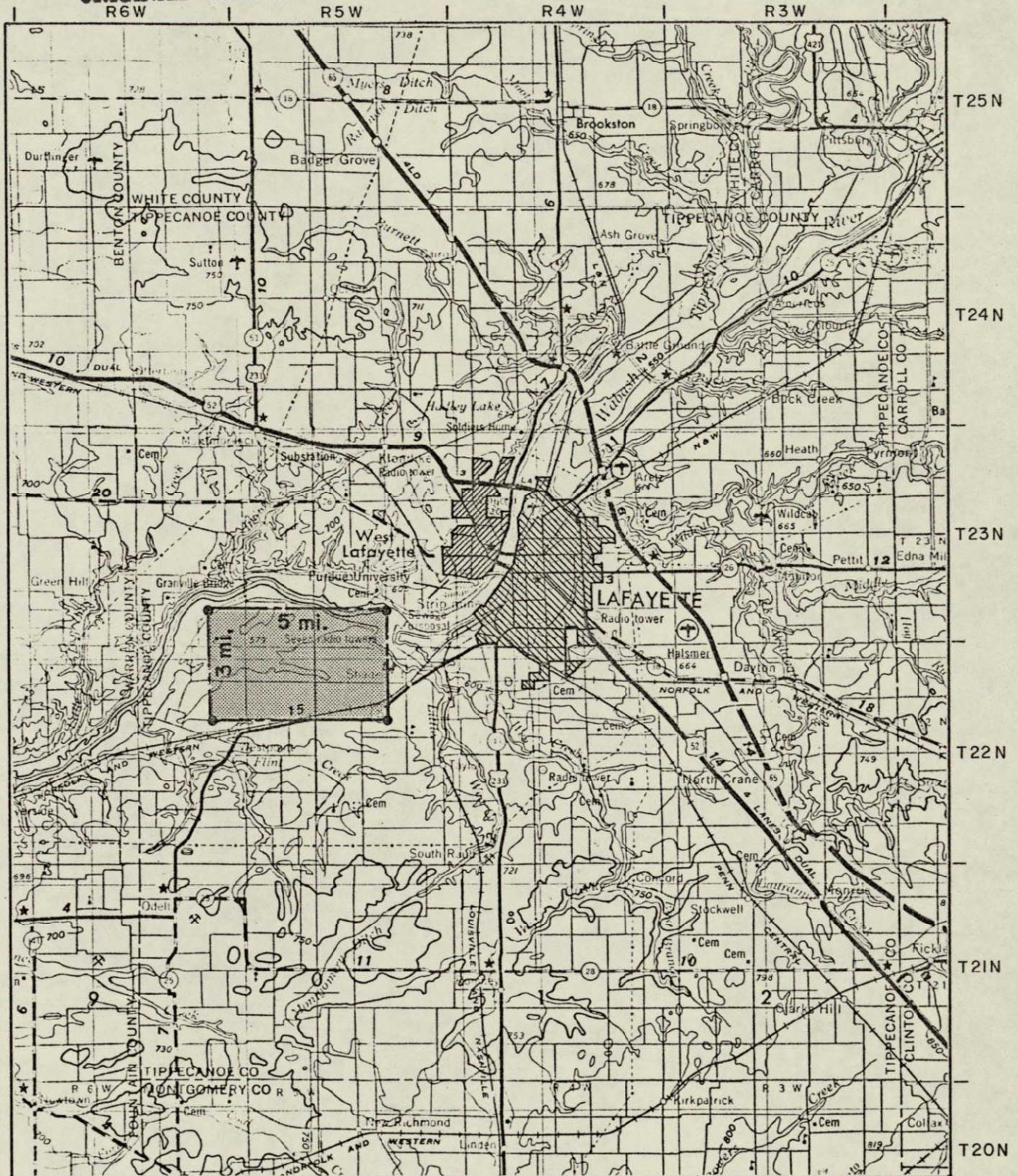
Three sites were selected for use in studying the remote sensing of soil moisture. The three sites were located near Lafayette, Indiana; St. Charles, Missouri; and Centralia, Missouri. The general locations of these sites are shown in Figure 1. The specific locations of the sites are shown in Figures 2 through 4. Each site was selected in an area that was relatively flat and contained a reasonable amount of bare ground. All sites were laid out so that they encompassed 15 square miles (3 miles north to south and 5 miles east to west). On each site corner reflectors were installed. These aluminum target locations are shown in Plate 1 through 3. These were picked up at Ann Arbor, Michigan (ERIM), set, picked up after the flight and returned to ERIM at Ann Arbor by Bittinger personnel.

3. SAMPLING AND ANALYSIS PROCEDURES

Emphasis was placed on the soil moisture in bare fields. At that time of year many of the fields had been rough plowed, and some had progressed to the point where wheat had been planted. Soil moisture was sampled in the top 0 to 1" and 0 to 6" by means of a soil sampling push tube. These samples were then placed in plastic bags and awaited gravimetric analysis.



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Scale: 1" = 4 miles

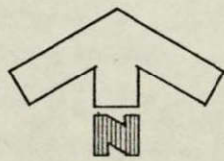
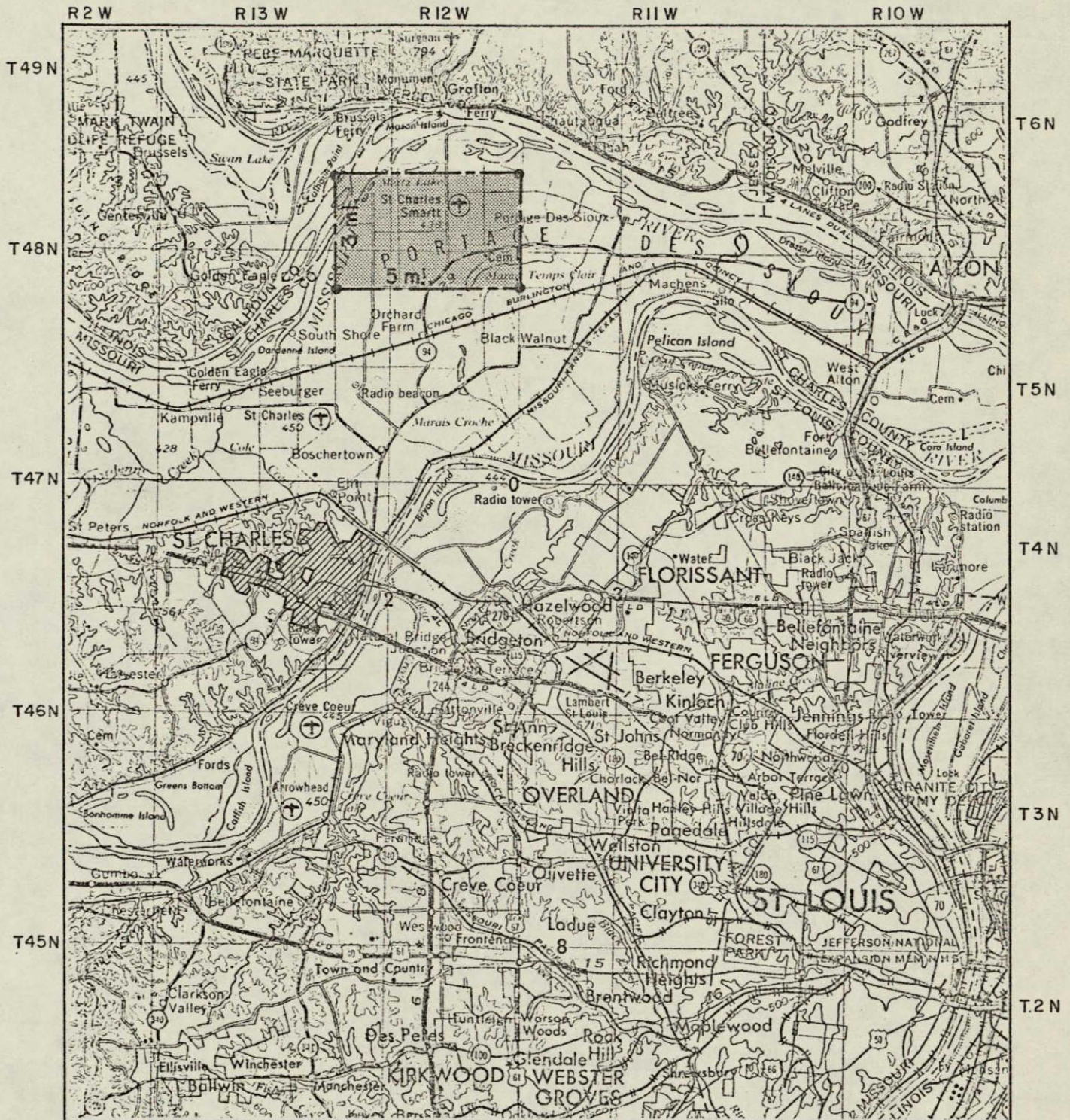
Location Map for:

LAFAYETTE, INDIANA

Prepared by:

M. W. BITTINGER & ASSOCIATES, INC.
FORT COLLINS, COLORADO

FIGURE 2



Scale: 1" = 4 miles

Location Map for :

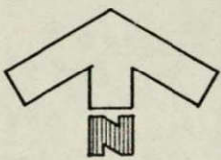
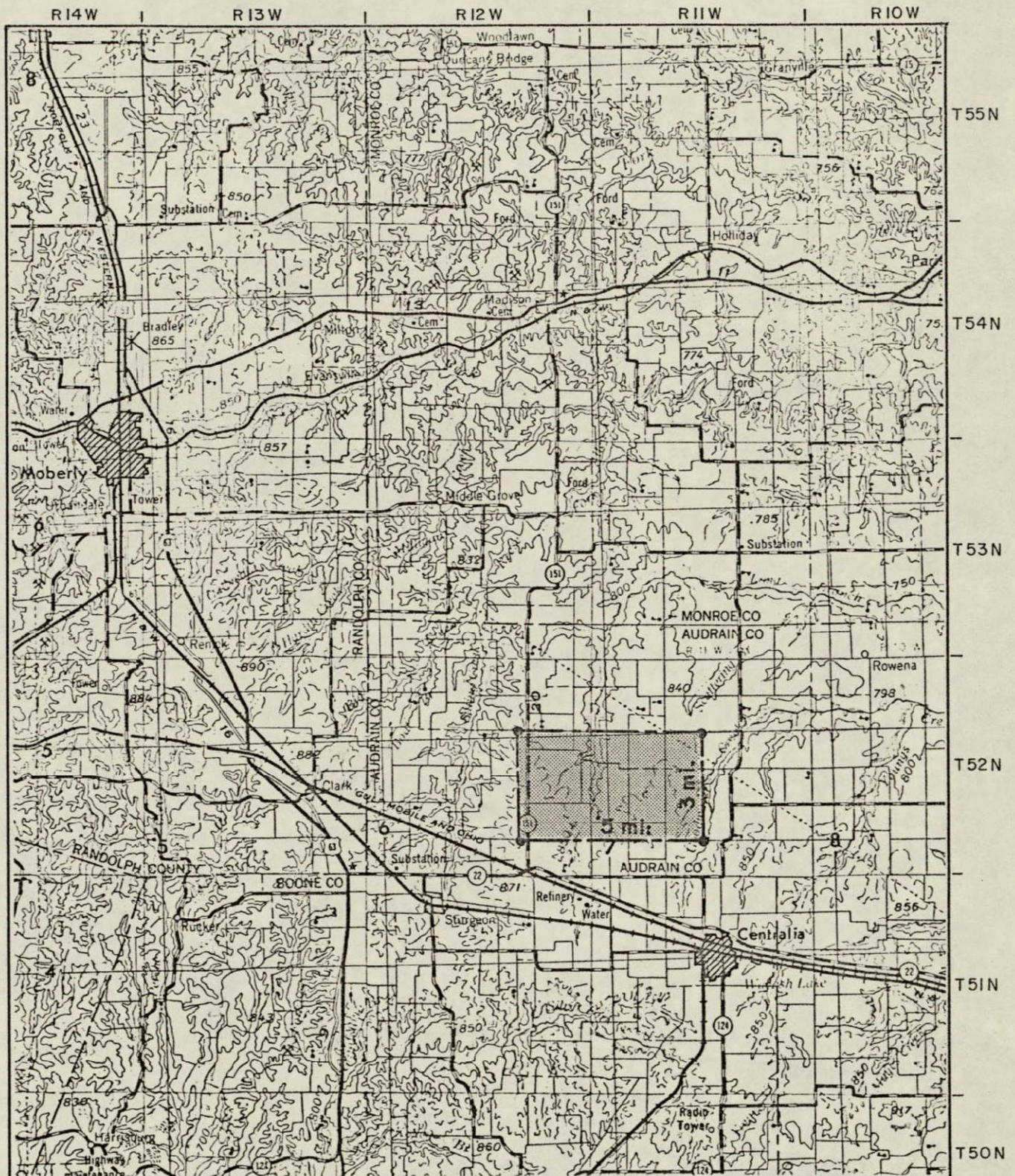
ST. CHARLES, MISSOURI

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FORT COLLINS, COLORADO

F I G U R E
3

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR



Scale: 1" = 4 miles

Location Map for :

CENTRALIA, MISSOURI

Prepared by :

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FORT COLLINS, COLORADO

FIGURE
4

The initial weighing of the soil samples was completed within approximately 36 hours after the initial sample was taken.

4. SAMPLING POINTS

The sampling points were selected in the field at the time of the sampling since it was difficult to anticipate which fields would be bare and which would have either the previous year's crop still standing or would already be green with the new wheat crop. Every effort was made by the sampling teams to collect representative samples as well as those in areas where there were apparent soil moisture changes.

Difficulties with land access were encountered at the Centralia, Missouri, site, and therefore intensive sampling was done on only 1.0 square mile which was under agreement for research purposes by the Agricultural Research Service, USDA. No such problems were encountered at the other sites.

Specific sample points are shown on Plates 1 through 3.

5. GROUND COVER

In addition to obtaining gravimetric soil moisture samples, the field crews noted insofar as possible the actual ground cover on the day of the flight. This was often difficult to ascertain due to the limited access. The information on Plates 4 through 6 represents a "best estimate" and should not be used in any other manner.

6. DATA

Tables 1 through 3 contain the data collected at each site and are keyed to the sample points on Plates 1 through 3. Soil moisture analyses by Empire Laboratories are appended as Appendix A.

Table 1. Soil Moisture Sample Points Data
Lafayette, Indiana, Site

<u>Point</u>	<u>Sample number</u>	<u>Sample description</u>	<u>% Soil moisture</u>	<u>Field description</u>	<u>Approximate sample time (CST)</u>	<u>Remarks</u>
L-1	27 24	0-1" surface 0-6"	15.0 14.6	Plowed field	10:40 a.m.	
L-2	11 36	0-1" surface 0-6"	21.8 21.4	Plowed field--some stubble	10:55 a.m.	
L-3	2 4	0-1" surface 0-6"	18.0 15.0	Plowed cornfield some stubble	11:05 a.m.	
L-4	30 7	0-1" surface 0-6"	20.7 14.8	Stubble	11:20 a.m.	
L-5	14 29	0-1" surface 0-6"	28.0 23.2	Stubble field--covered with dead vegetation	11:45 a.m.	
L-6	26 22	0-1" surface 0-6"	18.8 16.8	Stubble field--covered with dead vegetation	11:55 a.m.	
L-7	32 28	0-1" surface 0-6"	18.1 16.4	Stubble	12:05 p.m.	
L-8	10 19	0-1" surface 0-6"	16.6 16.8	Stubble with new growth coming up	12:30 p.m.	
L-9	35 6	0-1" surface 0-6"	17.7 16.7	Stubble with new growth	12:35 p.m.	
L-10	21 8	0-1" surface 0-6"	16.4 16.2	Stubble--covered with dead material	1:45 p.m.	

Table 1. (continued)

<u>Point</u>	<u>Sample number</u>	<u>Sample description</u>	<u>% Soil moisture</u>	<u>Field description</u>	<u>Approximate sample time (CST)</u>	<u>Remarks</u>
L-11	20 18	0-1" surface 0-6"	27.8 28.4	Stubble--covered with dead plant material	2:10 p.m.	
L-12	5 33	0-1" surface 0-6"	31.1 30.5	Plowed field	2:15 p.m.	
L-13	12 13	0-1" surface 0-6"	18.0 17.6	Plowed field	2:45 p.m.	
L-14	9 16	0-1" surface 0-6"	20.3 17.6	Plowed field	3:00 p.m.	
L-15	31 3	0-1" surface 0-6"	18.9 19.6	Stubble field	4:05 p.m.	
L-16	15 1	0-1" surface 0-6"	19.9 18.7	Plowed field	4:15 p.m.	
L-17	17 25	0-1" surface 0-6"	15.8 15.7	Stubble field	4:30 p.m.	
L-18	34 23	0-1" surface 0-6"	16.7 14.9	Stubble field	4:40 p.m.	

Table 2. Soil Moisture Sample Points Data
St. Charles, Missouri, Site

<u>Point</u>	<u>Sample number</u>	<u>Sample description</u>	<u>% Soil moisture</u>	<u>Field description</u>	<u>Approximate sample time (CST)</u>	<u>Remarks</u>
SC-1	26	0-1" Bottom	32.6	Rough plowed with approximately 12 inches vertical difference	9:55 a.m.	Due to extremely rough plowing, two samples--top and bottom--were taken.
	36	0-6" Bottom	37.2			
	25	0-1" Top	27.2			
	6	0-6" Top	30.5			
SC-2	47	0-1" Bottom	28.2	" " " " "	10:10 a.m.	" " " "
	13	0-6" Bottom	25.9			
	49	0-1" Top	19.0			
	42	0-6" Top	20.8			
SC-3	63	0-1" Bottom	39.2	" " " " "	10:38 a.m.	" " " "
	46	0-6" Bottom	37.3			
	66	0-1" Top	30.5			
	17	0-6" Top	28.3			
SC-4	48	0-1" Bottom	36.4	" " " " "	11:15 a.m.	" " " "
	40	0-6" Bottom	38.2			
	31	0-1" Top	32.7			
	28	0-6" Top	37.3			
SC-5	55	0-1" Bottom	38.8	" " " " "	---	" " " "
	41	0-6" Bottom	36.1			
	70	0-1" Top	40.7			
	44	0-6" Top	48.4			
SC-6	4	0-1" Bottom	39.3	" " " " "	11:50 a.m.	" " " "
	54	0-6" Bottom	32.0			
	27	0-1" Top	29.2			
	18	0-6" Top	31.1			

Table 2. (continued)

<u>Point</u>	<u>Sample number</u>	<u>Sample description</u>	<u>% Soil moisture</u>	<u>Field description</u>	<u>Approximate sample time (CST)</u>	<u>Remarks</u>
SC-7	51	0-1" Stubble	37.1	Stubble	--	
	69	0-6" Stubble	32.7			
SC-8	43	0-1" Top	18.3	Trashy stubble plowed with approximately 12 inches vertical difference	12:05 p.m.	Due to extremely rough plowing, two samples--top and bottom--were taken.
	32	0-6" Top	24.1			
	53	0-1" Bottom	31.1			
	34	0-6" Bottom	30.4			
SC-9	30	0-1"	32.2	Plowed field--relief lost due to weathering	12:30 p.m.	
	39	0-6"	29.1			
SC-10	65	0-1"	42.8	Plowed field with stubble showing	1:25 p.m.	
	24	0-6"	40.8			
SC-11	59	0-1"	30.9	Plowed, disced	2:00 p.m.	
	45	0-6"	34.7			
SC-12	38	0-1"	37.2	Corn stubble with emerging vegetation	2:10 p.m.	
	9	0-6"	43.7			
SC-13	67	0-1"	25.2	Plowed and slightly disced field	2:20 p.m.	
	64	0-6"	30.9			
SC-14	68	0-1"	32.3	Plowed and disced--some slight new emergent growth	2:30 p.m.	
	16	0-6"	35.0			
SC-15	50	0-1"	27.2	Plowed and disced field --well prepared	2:40 p.m.	
	29	0-6"	31.0			

Table 2. (continued)

<u>Point</u>	<u>Sample number</u>	<u>Sample description</u>	<u>% Soil moisture</u>	<u>Field description</u>	<u>Approximate sample time (CST)</u>	<u>Remarks</u>
SC-16	8	0-1" Bottom	34.6	Rough plowed with approximately 12 inches vertical difference	--	Due to extremely rough plowing, two samples--top and bottom--were taken.
	56	0-6" Bottom	30.3			
	35	0-1" Top	29.0			
	33	0-6" Top	28.3			
SC-17	20	0-1"	26.6	Disced--some standing stubble	3:15 p.m.	
	52	0-6"	37.1			
SC-18	22	0-1" Bottom	27.9	Rough plowed with approximately 12 inches vertical difference	3:25 p.m.	Due to extremely rough plowing, two samples--top and bottom--were taken.
	23	0-6" Top	30.9			
	21	0-1" Top	26.3			
	14	0-6" Bottom	35.4			
SC-19	2	0-1"	25.6	Disced field	--	
	12	0-6"	27.7			
SC-20	5	0-1"	19.9	Smoothly disced field	--	
	3	0-6"	23.1			
SC-21	7	0-1" Bottom	29.7	Rough plowed	--	
	6i	0-6" Bottom	30.1			
SC-22	62	0-1"	25.5	Plowed and disced	--	
	11	0-6"	29.8			
SC-23	19	0-1"	13.1	Plowed and disced	4:55 p.m.	
	15	0-6"	16.5			
SC-24	58	0-1"	21.1	Plowed and disced	--	
	60	0-6"	23.7			
SC-25	57	0-1"	27.8	Plowed and disced	5:15 p.m.	
	10	0-6"	29.9			

Table 3. Soil Moisture Sample Points Data
Centralia, Missouri, Site

<u>Point</u>	<u>Sample number</u>	<u>Sample description</u>	<u>% Soil moisture</u>	<u>Field description</u>	<u>Approximate sample time (CST)</u>	<u>Remarks</u>
C-1	8	0-1"	26.9	Bare ground with small corn stubble, some debris	11:00 a.m.	
	44	0-6"	26.8			
C-2	18	0-1"	25.3	Same as C-1	11:08 a.m.	
	61	0-6"	24.2			
C-3	53	0-1"	24.8	" " "	11:15 a.m.	
	26	0-6"	25.2			
C-4	31	0-1"	28.4	" " "	11:25 a.m.	
	59	0-6"	26.3			
C-5	11	0-1"	29.4	" " "	11:30 a.m.	
	49	0-6"	28.7			
C-6	58	0-1"	25.2	" " "	11:40 a.m.	
	47	0-6"	26.9			
C-7	38	0-1"	25.9	" " "	11:45 a.m.	
	1	0-6"	23.8			
C-8	50	0-1"	29.2	Same as C-1, somewhat sandy	11:52 a.m.	
	51	0-6"	24.3			
C-9	32	0-1"	24.8	Same as C-1	12:00 p.m.	
	20	0-6"	24.8			
C-10	34	0-1"	26.1	" " "	12:08 p.m.	
	42	0-6"	25.2			

Table 3. (continued)

<u>Point</u>	<u>Sample number</u>	<u>Sample description</u>	<u>% Soil moisture</u>	<u>Field description</u>	<u>Approximate sample time (CST)</u>	<u>Remarks</u>																																																																																																
C-11	48	0-1"	28.8	Bare ground with small corn stubble, some debris	12:15 p.m.																																																																																																	
	27	0-6"	26.9				C-12	60	0-1"	28.6	Same as C-11	12:20 p.m.		43	0-6"	26.3	C-13	25	0-1"	22.2	Somewhat rough plowed field	12:25 p.m.		3	0-6"	22.3	C-14	2	0-1"	23.5	Same as C-13	12:32 p.m.		24	0-6"	24.5	C-15	45	0-1"	23.2	" " "	12:40 p.m.		4	0-6"	23.5	C-16	10	0-1"	26.4	Bare ground, small stubble, some debris	12:50 p.m.	ERIM aircraft overhead 12:55 p.m.	63	0-6"	23.2	C-17	33	0-1"	26.2	Same as C-16	1:00 p.m.		5	0-6"	25.4	C-18	28	0-1"	22.2	Same as C-13	1:08 p.m.		13	0-6"	21.4	C-19	64	0-1"	22.1	Same as C-13	1:15 p.m.		12	0-6"	22.7	C-20	62	0-1"	13.5	Same as C-13, somewhat sandy	1:20 p.m.		17	0-6"	13.3	C-21	15	0-1"	29.4	Same as C-16	1:30 p.m.
C-12	60	0-1"	28.6	Same as C-11	12:20 p.m.																																																																																																	
	43	0-6"	26.3				C-13	25	0-1"	22.2	Somewhat rough plowed field	12:25 p.m.		3	0-6"	22.3	C-14	2	0-1"	23.5	Same as C-13	12:32 p.m.		24	0-6"	24.5	C-15	45	0-1"	23.2	" " "	12:40 p.m.		4	0-6"	23.5	C-16	10	0-1"	26.4	Bare ground, small stubble, some debris	12:50 p.m.	ERIM aircraft overhead 12:55 p.m.	63	0-6"	23.2	C-17	33	0-1"	26.2	Same as C-16	1:00 p.m.		5	0-6"	25.4	C-18	28	0-1"	22.2	Same as C-13	1:08 p.m.		13	0-6"	21.4	C-19	64	0-1"	22.1	Same as C-13	1:15 p.m.		12	0-6"	22.7	C-20	62	0-1"	13.5	Same as C-13, somewhat sandy	1:20 p.m.		17	0-6"	13.3	C-21	15	0-1"	29.4	Same as C-16	1:30 p.m.		35	0-6"	29.1						
C-13	25	0-1"	22.2	Somewhat rough plowed field	12:25 p.m.																																																																																																	
	3	0-6"	22.3				C-14	2	0-1"	23.5	Same as C-13	12:32 p.m.		24	0-6"	24.5	C-15	45	0-1"	23.2	" " "	12:40 p.m.		4	0-6"	23.5	C-16	10	0-1"	26.4	Bare ground, small stubble, some debris	12:50 p.m.	ERIM aircraft overhead 12:55 p.m.	63	0-6"	23.2	C-17	33	0-1"	26.2	Same as C-16	1:00 p.m.		5	0-6"	25.4	C-18	28	0-1"	22.2	Same as C-13	1:08 p.m.		13	0-6"	21.4	C-19	64	0-1"	22.1	Same as C-13	1:15 p.m.		12	0-6"	22.7	C-20	62	0-1"	13.5	Same as C-13, somewhat sandy	1:20 p.m.		17	0-6"	13.3	C-21	15	0-1"	29.4	Same as C-16	1:30 p.m.		35	0-6"	29.1																
C-14	2	0-1"	23.5	Same as C-13	12:32 p.m.																																																																																																	
	24	0-6"	24.5				C-15	45	0-1"	23.2	" " "	12:40 p.m.		4	0-6"	23.5	C-16	10	0-1"	26.4	Bare ground, small stubble, some debris	12:50 p.m.	ERIM aircraft overhead 12:55 p.m.	63	0-6"	23.2	C-17	33	0-1"	26.2	Same as C-16	1:00 p.m.		5	0-6"	25.4	C-18	28	0-1"	22.2	Same as C-13	1:08 p.m.		13	0-6"	21.4	C-19	64	0-1"	22.1	Same as C-13	1:15 p.m.		12	0-6"	22.7	C-20	62	0-1"	13.5	Same as C-13, somewhat sandy	1:20 p.m.		17	0-6"	13.3	C-21	15	0-1"	29.4	Same as C-16	1:30 p.m.		35	0-6"	29.1																										
C-15	45	0-1"	23.2	" " "	12:40 p.m.																																																																																																	
	4	0-6"	23.5				C-16	10	0-1"	26.4	Bare ground, small stubble, some debris	12:50 p.m.	ERIM aircraft overhead 12:55 p.m.	63	0-6"	23.2	C-17	33	0-1"	26.2	Same as C-16	1:00 p.m.		5	0-6"	25.4	C-18	28	0-1"	22.2	Same as C-13	1:08 p.m.		13	0-6"	21.4	C-19	64	0-1"	22.1	Same as C-13	1:15 p.m.		12	0-6"	22.7	C-20	62	0-1"	13.5	Same as C-13, somewhat sandy	1:20 p.m.		17	0-6"	13.3	C-21	15	0-1"	29.4	Same as C-16	1:30 p.m.		35	0-6"	29.1																																				
C-16	10	0-1"	26.4	Bare ground, small stubble, some debris	12:50 p.m.	ERIM aircraft overhead 12:55 p.m.																																																																																																
	63	0-6"	23.2				C-17	33	0-1"	26.2	Same as C-16	1:00 p.m.		5	0-6"	25.4	C-18	28	0-1"	22.2	Same as C-13	1:08 p.m.		13	0-6"	21.4	C-19	64	0-1"	22.1	Same as C-13	1:15 p.m.		12	0-6"	22.7	C-20	62	0-1"	13.5	Same as C-13, somewhat sandy	1:20 p.m.		17	0-6"	13.3	C-21	15	0-1"	29.4	Same as C-16	1:30 p.m.		35	0-6"	29.1																																														
C-17	33	0-1"	26.2	Same as C-16	1:00 p.m.																																																																																																	
	5	0-6"	25.4				C-18	28	0-1"	22.2	Same as C-13	1:08 p.m.		13	0-6"	21.4	C-19	64	0-1"	22.1	Same as C-13	1:15 p.m.		12	0-6"	22.7	C-20	62	0-1"	13.5	Same as C-13, somewhat sandy	1:20 p.m.		17	0-6"	13.3	C-21	15	0-1"	29.4	Same as C-16	1:30 p.m.		35	0-6"	29.1																																																								
C-18	28	0-1"	22.2	Same as C-13	1:08 p.m.																																																																																																	
	13	0-6"	21.4				C-19	64	0-1"	22.1	Same as C-13	1:15 p.m.		12	0-6"	22.7	C-20	62	0-1"	13.5	Same as C-13, somewhat sandy	1:20 p.m.		17	0-6"	13.3	C-21	15	0-1"	29.4	Same as C-16	1:30 p.m.		35	0-6"	29.1																																																																		
C-19	64	0-1"	22.1	Same as C-13	1:15 p.m.																																																																																																	
	12	0-6"	22.7				C-20	62	0-1"	13.5	Same as C-13, somewhat sandy	1:20 p.m.		17	0-6"	13.3	C-21	15	0-1"	29.4	Same as C-16	1:30 p.m.		35	0-6"	29.1																																																																												
C-20	62	0-1"	13.5	Same as C-13, somewhat sandy	1:20 p.m.																																																																																																	
	17	0-6"	13.3				C-21	15	0-1"	29.4	Same as C-16	1:30 p.m.		35	0-6"	29.1																																																																																						
C-21	15	0-1"	29.4	Same as C-16	1:30 p.m.																																																																																																	
	35	0-6"	29.1																																																																																																			

Table 3. (continued)

<u>Point</u>	<u>Sample number</u>	<u>Sample description</u>	<u>% Soil moisture</u>	<u>Field description</u>	<u>Approximate sample time (CST)</u>	<u>Remarks</u>
C-22	52	0-1"	24.3	Bare ground, small stubble, some vegetative debris	1:40 p.m.	
	6	0-6"	24.2			
C-23	57	0-1"	24.7	Same as C-22	1:45 p.m.	
	55	0-6"	22.8			
C-24	14	0-1"	25.0	Same as C-22	1:55 p.m.	
	37	0-6"	26.3			
C-25	7	0-1"	23.8	Bare ground, somewhat rough plowed field	2:00 p.m.	
	36	0-6"	26.6			
C-26	56	0-1"	21.7	Same as C-25	2:10 p.m.	
	9	0-6"	22.7			
C-27	16	0-1"	24.0	" " "	2:18 p.m.	
	40	0-6"	24.1			
C-28	21	0-1"	24.9	" " "	2:30 p.m.	
	39	0-6"	25.9			
C-29	29	0-1"	20.7	Bare ground, plowed with spring wheat just starting	2:40 p.m.	
	19	0-6"	22.5			
C-30	46	0-1"	23.9	Same as C-25	2:50 p.m.	
	41	0-6"	25.9			
C-31	22	0-1"	19.2	Bare ground, plowed, some stubble	3:00 p.m.	
	54	0-6"	23.2			
C-32	30	0-1"	23.1	Same as C-31	3:15 p.m.	
	23	0-6"	25.0			

APPENDIX A

Laboratory results on soil moisture

Empire Laboratories, Inc.

P.O. Box 429 • 214 North Bowen
Fort Collins, Colorado 80522 • Telephone 303 494 0159

November 17, 1975

Bittinger & Associates
105 South Meldrum
Fort Collins, CO 80521

Attention: Mr. Bruce Jones

Gentlemen:

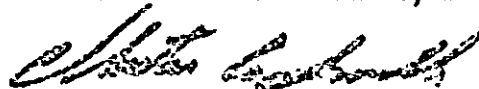
Re: Soil Samples - St. Charles, Missouri; Centralia, Missouri; and
Lafayette, Indiana

Please find enclosed moisture contents from soil samples
delivered to our laboratory on November 11, 1975, from the
above-referenced projects.

If you have any questions regarding these moisture contents
or if we can be of additional help to you on this project, please
feel free to contact us.

Very truly yours,

EMPIRE LABORATORIES, INC.



Chester C. Smith, P. E.
Vice President

pa!

Enclosure



SUMMARY OF TEST RESULTS

St. Charles, Missouri

<u>Sample No.</u>	<u>Location</u>	<u>% Moisture</u>
1	SC 5.05 C. 10 0"-6" Top	25.8
2	SC 5.95 B. 40 0"-1"	25.6
3	SC 5.7 B. 7 0"-6"	23.1
4	SC 2.8 B. 4 1"-0" Bottom	39.3
5	SC 5.7 B. 7 0" 1"	19.9
6	SC 1.1 A. 05 0"-6" Top	30.5
7	SC 5.05 C. 10 0"-1" Bottom	29.7
8	SC 4.7 C. 45 0"-1" Bottom	34.6
9	SC 4.05 C. 8 0"-6"	43.7
10	SC 5.95 A. 05 0"-6"	29.9
11	SC 4.95 B. 45 0"-6"	29.8
12	SC 5.95 B. 40 0"-6"	27.7
13	SC 1.6 A. 05 0"-6" Bottom	25.9
14	SC 5.75 C. 45 0"-6" Bottom	35.4
15	SC 5.95 A. 35 0"-6"	16.5
16	SC 2.8 C6 0"-6"	35.0
17	SC 1.95 A. 6 0"-6" Top	28.3
18	SC 2.8 B. 4 0"-6" Top	31.1
19	SC 5.95 A. 35 0"-1"	13.1
20	SC 4.7 C. 55 0"-1"	26.6
21	SC 5.75 C. 45 0"-1" Top	26.3
22	SC 5.75 C. 45 0"-1" Bottom	27.9
23	SC 5.75 C. 45 0"-6" Bottom	30.9
24	SC 4.2 C. 55 0"-6"	40.8
25	SC 1.1 A. 05 0"-1" Top	27.2
26	SC 1.1 A. 05 0"-1" Bottom	32.6
27	SC 2.8 B. 4 1"-0" Top	29.2
28	SC 2.25 B. 45 0"-6" Top	37.3
29	SC 2.70 C. 9 0"-6"	31.0
30	SC 3.9 B. 45 0"-1"	32.2

SUMMARY OF TEST RESULTS

St. Charles, Missouri

<u>Sample No.</u>	<u>Location</u>	<u>% Moisture</u>
31	SC 2. 25 B. 45 0"-1" Top	32. 7
32	SC 2. 95 A. 05 0"-6" Top	24. 1
33	SC 4. 7 C. 45 0"-6" Top	28. 3
34	SC 2. 95 A. 05 0"-6" Bottom	30. 4
35	SC 4. 7 C. 45 0"-1" Top	29. 0
36	SC 1. 1 A. 05 0"-6" Bottom	37. 2
37	SC 5. 05 C. 10 0"-1" Top	28. 9
38	SC 4. 05 C. 8 0"-1"	37. 2
39	SC 3. 9 B. 45 0"-6"	29. 1
40	SC 2. 25 B. 45 6"-6" Bottom	38. 2
41	SC 2. 25 B. 55 0"-6" Bottom	36. 1
42	SC 1. 6 A. 05 0"-6" Top	20. 8
43	SC 2. 95 A. 05 0"-1" Top	18. 3
44	SC 2. 25 B. 55 0"-6" Top	48. 4
45	SC 3. 95 C. 8 0"-6"	34. 7
46	SC 1. 95 A. 6 0"-6" Bottom	37. 3
47	SC 1. 6 A. 05 0"-1" Bottom	28. 2
48	SC 2. 25 B. 45 0"-1" Bottom	38. 4
49	SC 1. 6 A. 05 0"-1" Top	19. 0
50	SC 2. 70 C. 9 0"-1"	27. 2
51	SC 2. 8 8. 65 0"-1" Stubble	37. 1
52	SC 4. 7 C. 55 0"-6"	37. 1
53	SC 2. 95 A. 05 0"-1" Bottom	31. 1
54	SC 2. 8 B. 4 0"-6" Bottom	32. 0
55	SC 2. 25 B. 55 0"-1" Bottom	38. 8
56	SC 4. 7 C. 45 0"-6" Bottom	30. 3
57	SC 5. 95 A. 05 0"-1"	27. 8
58	SC 5. 90 A. 35 0"-1"	21. 1
59	SC 3. 95 C. 8 0"-1"	30. 9
60	SC 5. 90 A. 35 0"-6"	23. 7

SUMMARY OF TEST RESULTS

St. Charles, Missouri

<u>Sample No.</u>	<u>Location</u>	<u>% Moisture</u>
61	SC 5. 05 C. 10 0"-6" Bottom	30.1
62	SC 4. 95 B. 45 0"-1" SC	25.5
63	SC 1. 95 A. 6 0"-1" Bottom	39.2
64	SC 3. 5 B. 45 0"-6"	30.9
65	SC 4. 2 C. 55 0"-1"	42.8
66	SC 1. 95 A. 6 0"-1" Top	30.5
67	SC 3. 5 B. 45 0"-1"	25.2
68	SC 2. 8 C6 0"-1"	32.3
69	SC 2. 8 8. 65 soy bean stubble 0"-6"	32.7
70	SC 2. 25 B. 55 0"-1" Top	40.7

SUMMARY OF TEST RESULTS

Centralia, Missouri

<u>Sample No.</u>	<u>Location.</u>	<u>% Moisture</u>
1	7-6	23.8
2	14-1	23.5
3	13-6	22.3
4	15-6	23.5
5	17-6	25.4
6	22-6	24.2
7	25-1	23.8
8	1-1	26.9
9	26-6	22.7
10	16-1	26.4
11	5-1	29.4
12	19-6	22.7
13	18-6	21.4
14	24-1	25.0
15	21-1	29.4
16	27-1	24.0
17	20-6	13.3
18	2-1	25.3
19	26-6	22.5
20	9-6	24.8
21	28-1	24.9
22	31-1	19.2
23	32-6	25.0
24	14-6	24.5
25	13-1	22.2
26	3-6	25.2
27	11-6	26.9
28	18-1	22.2

SUMMARY OF TEST RESULTS (continued)

Centralia, Missouri

<u>Sample No.</u>	<u>Location</u>	<u>% Moisture</u>
29	29-1	20.7
30	32-1	23.1
31	4-1	28.4
32	9-1	24.8
33	17-1	26.2
34	10-1	26.1
35	21-6	29.1
36	25-6	26.6
37	24-6	26.3
38	7-1	25.9
39	28-6	25.9
40	27-6	24.1
41	30-6	25.9
42	10-6	25.2
43	12-6	26.3
44	1-6	26.8
45	15-1	23.2
46	30-1	23.9
47	6-6	26.9
48	11-1	28.8
49	5-6	28.7
50	8-1	20.2
51	8-6	24.3
52	22-1	24.3
53	3-1	24.8
54	31-6	23.2
55	23-6	22.8
56	26-1	21.7

SUMMARY OF TEST RESULTS (continued)

Centralia, Missouri

<u>Sample No.</u>	<u>Location</u>	<u>% Moisture</u>
57	23-1	24.7
58	6-1	25.2
59	4-6	26.3
60	12-1	28.6
61	2-6	24.2
62	20-1	13.5
63	16-6	23.2
64	19-1	22.1

SUMMARY OF TEST RESULTS

Lafayette, Indiana

<u>Sample No.</u>	<u>Location</u>	<u>% Moisture</u>
1	L-31	18.7
2	L-5	18.0
3	L-30	19.6
4	L-6	15.0
5	L-23	31.1
6	L-18	16.7
7	L-8	14.8
8	L-20	16.2
9	L-27	20.3
10	L-15	16.6
11	L-3	21.8
12	L-25	18.0
13	L-26	17.6
14	L-9	28.0
15	L-31	19.9
16	L-28	17.6
17	L-33	15.8
18	L-22	28.4
19	L-16	16.8
20	L-21	27.8
21	L-19	16.4
22	L-12	16.8
23	L-36	14.9
24	L-2	14.6
25	L-34	15.7
26	L-11	18.8

SUMMARY OF TEST RESULTS (continued)

Lafayette, Indiana

<u>Sample No.</u>	<u>Location</u>	<u>% Moisture</u>
27	L-1	15.0
28	L-14	16.4
29	L-10	23.2
30	L-7	29.7
31	L-29	18.9
32	L-13	18.1
33	L-24	30.5
34	L-35	16.7
35	L-17	17.7
36	L-4	21.4