ESE ALCOHOL, INC.
PO BOX 848
LEOTI, KS 67861
SWD

MONITORING REPORT
KDHE - DIVISION OF ENVIRONMENT
BUREAU OF WATER - TECHNICAL SERVICES SECTION
FORBES FIELD, BUILDING 283
TOPEKA, KS 66620-0001
ATTN: PERMITS & COMPLIANCE

SAMPLED AND ANALYZED PRIOR TO IRRIGATION SEASON WHEN UTILIZED FOR IRRIGATION REPORTED ANNUALLY

ISSUE DATE: 10/01/2010
EXPIRATION DATE: 09/30/2015

KANSAS PERMIT # I-UA26-NP01
ISSUE DATE: 06/01/2004
EXPIRATION DATE: 09/30/2015

TELEPHONE NUMBER: (620) 375-4904

MASH WATER IRRIGATION

KANSAS PERMIT # I-UA26-NP01

KANSAS PERMIT # I-UA26-NP01

	CHLORDIE	SODIUM	SULPHATE	AMMONIUM NH3-N	NITRATE NO3	TOTAL PHOSPHOROUS	TKN	POTASSIUM	pH	TOTAL CALCIUM	TOTAL MAGNESIUM	HARDNESS	ALKALINITY	ELECTRICAL CONDUCTIVITY	TDS	SAR ABSORPTION	DISSOLVED ORGANIC CARBON
TESTED BY PACE ANALYTICAL SERVICES, INC.										REPORTING PERIOD 10/28/2020			TESTED BY PACE ANALYTICAL SERVICES, INC.				
quantitative level	50.0 mg/L	2500 ug/L	20.0 mg/L	3.0 mg/L	.1 mg/L	25.0 mg/L	25.0 mg/L	2,500 ug/L	0.10 s.u	1,000 ug/L	2,500 ug/L	2,500 mg/L	20.0 mg/L	1.0 umhos/cm	143.0 mg/L	meq/L	1,000.0 mg/L
9/2/2020	395	349,000	154	236	0.75	882	706	1,330,000	4.6	353,000	422,000	2,620,000	548	8,460	10,500	3	9,480.0

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: ESE ALCOHOL IRRIGATION WATER
Pace Project No.: 60347602

Sample: IRRIGATION WATER **Lab ID: 60347602001** Collected: 09/02/20 17:55 Received: 09/04/20 16:00 Matrix: Water

Comments: • FLIP TO COMMENT:
The sample volume received for dissolved organic carbon was laboratory filtered prior to sample analysis.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
	Pace Analytical Services - Kansas City							
Calcium	**353000**	ug/L	1000	5	09/12/20 08:32	09/14/20 16:58	7440-70-2	
Magnesium	**422000**	ug/L	250	5	09/12/20 08:32	09/14/20 16:58	7439-95-4	
Potassium	**1330000**	ug/L	2500	5	09/12/20 08:32	09/14/20 16:58	7440-09-7	
Sodium	**349000**	ug/L	2500	5	09/12/20 08:32	09/14/20 16:58	7440-23-5	
Hardness, Total(SM 2340B)	**2620000**	ug/L	2500	5	09/12/20 08:32	09/14/20 16:58		
Sodium Adsorption Ratio, SAR	Analytical Method: EPA 6010							
	Pace Analytical Services - Kansas City							
Sodium Adsorption Ratio	**3.0**			1		09/14/20 16:58		
2320B Alkalinity	Analytical Method: SM 2320B							
	Pace Analytical Services - Kansas City							
Alkalinity, Total as CaCO3	**548**	mg/L	20.0	1		09/14/20 17:34		
2510B Specific Conductance	Analytical Method: SM 2510B							
	Pace Analytical Services - Kansas City							
Specific Conductance	**8460**	umhos/cm	1.0	1		09/15/20 16:26		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
	Pace Analytical Services - Kansas City							
Total Dissolved Solids	**10500**	mg/L	143	1		09/09/20 15:46		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
	Pace Analytical Services - Kansas City							
pH at 25 Degrees C	**4.6**	Std. Units	0.10	1		09/10/20 13:37		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
	Pace Analytical Services - Kansas City							
Chloride	**395**	mg/L	50.0	50		09/15/20 14:58	16887-00-6	
Sulfate	**154**	mg/L	20.0	20		09/11/20 19:17	14808-79-8	
350.1 Ammonia	Analytical Method: EPA 350.1							
	Pace Analytical Services - Kansas City							
Nitrogen, Ammonia	**236**	mg/L	3.0	30		09/10/20 16:03	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2 Preparation Method: EPA 351.2							
	Pace Analytical Services - Kansas City							
Nitrogen, Kjeldahl, Total	**706**	mg/L	25.0	10	09/14/20 08:27	09/14/20 15:13	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
	Pace Analytical Services - Kansas City							
Nitrogen, NO2 plus NO3	**0.75**	mg/L	0.10	1		09/09/20 11:18		

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ANALYTICAL RESULTS

Project: ESE ALCOHOL IRRIGATION WATER
Pace Project No.: 60347602

Sample: IRRIGATION WATER **Lab ID: 60347602001** Collected: 09/02/20 17:55 Received: 09/04/20 16:00 Matrix: Water

Comments: • FLIP TO COMMENT:
The sample volume received for dissolved organic carbon was laboratory filtered prior to sample analysis.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
365.4 Total Phosphorus	Analytical Method: EPA 365.4 Preparation Method: EPA 365.4 Pace Analytical Services - Kansas City							
Phosphorus	**882**	mg/L	25.0	250	09/11/20 11:43	09/15/20 12:09	7723-14-0	
5310C Diss. Organic Carbon LF	Analytical Method: SM 5310C Pace Analytical Services - Kansas City							
Dissolved Organic Carbon	**9480**	mg/L	1000	1000		09/15/20 13:02		

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American Agricultural Laboratory, Inc.

700 West D St. / P.O. Box 370 / McCook, Nebraska 69001
Office: 308-345-3670 / FAX: 308-345-7880 / www.AmAgLab.com

"Analysis You Can Grow With"®

DATE	12/03/2019
Submitted By	SKYLER JAMES
Address	1202 COLLEGE
City, State, Zip	SCOTT CITY KS 67871

Re: Nutrient availability from manure application the first crop year after application

Name:	ESE ALCOHOL
Sample ID:	LAGOON
Lab Number:	30045

Nutrient	% Availability 1st Year	Lbs/acre inch (as received basis)
Organic N	30%	25.32
Ammonium-N	95%	53.83
Nitrate-N	100%	0.05
Phosphorus (as P_2O_5)	70%	262.88
Potassium (as K_2O)	90%	293.01
Calcium (as Ca)	55%	21.40
Magnesium (as Mg)	55%	47.05
Sodium (as Na)	90%	59.32
Chloride (as Cl)	100%	111.76
Sulfur (as S)	40%	9.12
Zinc (as Zn)	40%	0.27
Iron (as Fe)	40%	0.67
Manganese (as Mn)	40%	0.34
Copper (as Cu)	40%	0.00
Boron (as B)	40%	0.07

% Availability 1st year is an estimation of nutrient availability based on published information for feedlot manure.
Lbs/ton (as received basis) assumes the manure is broadcast and incorporated into the soil immediately after application.

Please contact us if you have any questions. Thanks.

Sincerely,

Kevin Grooms

Supplemental Condition No. D-3 Land Irrigation Water Monitoring Requirements

There are three documents that address irrigation water. The first is the volume irrigated from the west irrigation cell on a weekly basis. The second is titled "Irrigation water gallons" which consists of three pages and provides the date, location, the volume of water being applied, and the cropping practice. The third "Mash water irrigation" is an historical summary to provide an historical norm for ESE. Over the past 20 years the average amount of mash water irrigated has been 4,149,605 gallons/year. The most recent five year average has been 4,320,960 gallons/year. Agronomic calculations for the mash water land application have been prepared and are being submitted.

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MONITORING REPORT
KDHE - DIVISION OF ENVIRONMENT
BUREAU OF WATER - TECHICAL SERVICES SECTION
FORBES FIELD, BUILDING 283
TOPEKA, KS 66620-001

QUANITY MONITORED AND RECORDED

WEEKLY : REPORTED ANNUALLY

ATT:PERMITS & COMI _____ _____
SIGNATURE OF AUTTHORIZED PERSONAL

ISSUE DATE___ 10/1/2010 EXPIRATION DATE _____
PACE ANALYTICAL E= 10116
CERTIFIED LAB & NUMBER

___(620)_-375-4904
TELEPHONE NUMBER

START	END	DUE DATE	IRRIGATION WATER GALLONS
1/1/2019	12/31/2019	4/28/2019	

KANSAS PERMIT # I-UA26-NP01

DATE	COOLING WATER BASIN	MASH WATER POND #1	TOTAL GALLONS	APPLICATION SITE TRACT #
1/1/2019	0		0	
1/7/2019	0		0	
1/14/2019	0		0	
1/21/2019	0		0	
1/28/2019	0		0	
2/4/2019	0		0	
2/11/2019	0		0	
2/18/2019	0		0	
2/25/2019	0		0	
3/4/2019	0		0	
3/11/2019	0		0	
2/18/2019	0		0	
3/25/2019	0		0	
4/1/2019	0		0	
4/8/2019	0		0	
4/15/2019	0		0	
4/22/2019	0		0	
4/29/2019	0		0	
5/6/2019	0		0	
5/13/2019	0		0	
5/20/2019	877,100		877,100	S. Tract# 88
5/27/2019	0		0	
6/3/2019	0		0	
6/10/2019	0		0	
6/17/2019	0		0	
2/24/2019	0		0	
7/1/2019	0		0	
7/8/2019	0		0	
7/15/2019	2,597,600		2,597,600	N. Tract# 87
7/22/2019	0		0	
7/29/2019	0		0	
8/5/2019	0		0	
8/12/2019	0		0	
8/19/2019	1,366,400		1,366,400	N. Tract# 87
8/26/2019	0		0	
9/2/2019	0		0	
9/9/2019	0		0	
9/16/2019	0		0	
9/23/2019	0		0	
9/30/2019	0		0	
10/7/2019	0		0	
10/14/2019	0		0	
10/21/2019	0		0	
10/28/2019	0		0	
11/4/2019	0		0	
11/11/2019	0		0	
11/18/2019	0		0	
11/25/2019	0		0	
12/2/2019	0		0	
12/9/2019	0		0	
12/16/2019	0		0	
12/23/2019	0		0	
12/30/2019	0		0	
	0		0	

TOTAL GALLONS 2019 4,841,100 TOTAL GALLONS

Nutrient Balance for Nitrogen: Mash Water

Field	Crop & year	Yield goal	Soil N available	Recommended N	Effluent water applied	Lbs N from water	Additional N needed	Net soil change
			lbs/a	lbs/a	Acre inch/a	lbs/a	lbs/a	Lbs/a
NW20-18-36	Wheat 2017	100 bu/a	53.9	116	1.27	128	0	-42
SW20-18-36	Wheat 2016	100 bu/a	47	123	0.46	46	76	-6
NW20-18-36	Wheat 2019	100 bu/a	11.95	158	1.42	120	38	19
SW20-18-36	Wheat 2018	100 bu/a	41	129	1.22	123	6	13
SW20-18-36	Wheat 2020	100 bu/a	29	142	1.15	97	45	
NW20-18-36	Wheat 2021	100 bu/a	31.35	139	1.42	120	19	

Analysis Date		Effulent Analysis			
		Nitrate	Ammonium	Organic N	Total
	% available	100%	95%	30%	
2/17/2017	Lbs/acre-inch	0.5	79.8	82	162.3
2/17/2017	/acre-inch to cr	0.5	75.81	24.6	100.91
3/16/2018	Lbs/acre-inch	0.1	75.7	41.1	116.9
3/17/2018	/acre-inch to cr	0.1	71.915	12.33	84.345

Comments:

The winter of 2018/2019 was charactictized by lots of snow that helped wheat get an excellent start, followed by a cool spring to finish out good yields. Irrigation was not needed to reach 100+ bushels/acre of wheat. Soil tests showed NW20-18-37 has some, though not a lot of carryover indicating an efficient use of Nitrogen. SW20-18-37 is planted to wheat and off to a good start for a 2020 harvest.

Lab Date	Field	Exchangeable NH4-N 0-6		Exchangeable NH4-N 6-24		Nitrate-N 0-6		Nitrate-N 6-24		Total available
		ppm	lbs/A	ppm	lbs/a	ppm	Lbs/A	ppm	Lbs/A	lbs/A
7/13/2017	NW 20 18 36	0.4	0.7	1.2	6.5	1.6	3	1.8	10	11.95
7/17/2019	NW20-18-36	1.5	2.7	1.9	10.3	2.8	5	6.8	37	31.35
7/14/2016	SW 20 18 36	2.2	4	3.1	16.7	10.5	19	3.7	20	41.35
7/16/2018	SW20 18 36	1.5	2.7	1.6	8.6	3.3	6	5.7	31	28.5
7/14/2015	NW 20 18 36	4.3	7.7	3.9	21.4	8.4	15	7.5	41	53.9
7/13/2017	NW 20 18 36	0.4	0.7	1.2	6.5	1.6	3	1.8	10	11.95
7/23/2014	SW 20 18 36	5.1	9.2	3.5	18.9	5.1	9	7.3	39	47.15
7/14/2016	NW 20 18 36	2.2	4	3.1	16.7	10.5	19	3.7	20	41.35
7/16/2018	SW20 18 36	1.5	2.7	1.6	8.6	3.3	6	5.7	31	28.5
2020 sample	NW 20 18 36									
7/17/2019	NW20-18-36	1.5	2.7	1.9	10.3	2.8	5	6.8	37	31.35
2021 sample	NW 20 18 36									

*100% credit givent to Nitrogen in 0-6 inch range and 50% credit to 6-24 inch nitrogen

Nutrient Balance for Phosphorous: Mash Water

Field	Crop	Yield goal	p1 phos available	Lbs P available	Lbs p205 Available	Recommended P2O5	Mash water applied	Lbs p2o5 from water	Fertilizer p205 needed	Net soil change	Net soil change P	Net Soil Change P2O5
			ppm	lbs/a	lbs/a	lbs/a	Acre inch/a	lbs/a	lbs/a	ppm	lbs/a	lbs/a
NW20-18-36	Wheat 2017	100 bu	89	163.76	375.25604	0	1.27	375.5136	0	-1	-1.84	-4.2
SW20-18-36	Wheat 2016	100 bu	31	57.04	130.70716	20	0.46	136.0128	0	28	51.52	118.1
NW20-18-36	Wheat 2019	100 bu	88	161.92	371.03968	0	1.42	373.4458	0	52	95.68	219.3
SW20-18-36	Wheat 2018	100 bu	82	150.88	345.74152	0	1.22	360.7296	0	15	27.6	63.2
SW20-18-36	Wheat 2020	100 bu	97	178.48	408.98692	0	1 15	302.4385	0	na	#VALUE!	#VALUE!
NW20-18-36	Wheat 2021	100 bu	140	257.6	590.2904	0	1.216505587	319.9288043	0	na	#VALUE!	#VALUE!

Water Analysis	2/17/2017		
	Lbs/acre inch	% available	lbs/acre inch to credit
Phos as P	184.4		
Phos as p2o5	422.4	70%	295.68
Total	**422.4**		**295.68**

Water Analysis	3/16/2018		
	Lbs/acre inch	% available	lbs/acre inch to credit
Phos as P	164.1		
Phos as p2o5	375.7	70%	262.99
Total	**375.7**		**262.99**

Lab Date	Field	Bray p1 ppm	Bray p1 Lbs/a P
		ppm	Lbs/a
7/14/2015	NW 20 18 36	89	163.76
7/13/2017	NW 20 18 36	88	161.92
7/23/2014	SW 20 18 36	54	99.36
7/14/2016	SW 20 18 36	82	150.88
7/13/2017	NW 20 18 36	88	161.92
7/17/2019	NW 20 18 36	140	257.6
7/14/2016	SW 20 18 36	82	150.88
7/16/2018	SW 20 18 36	97	178.48
7/16/2018	SW 20 18 36	97	178.48
	SW 20 18 36		
7/17/2019	NW 20 18 36	140	257.6
	NW 20 18 36		

Comments:

While effluent is applied at a rate to provide Nitrogen for the crops Phosphorous fertilization is another benefit of the application. Phosphorous has increased to a productive level, and we continue to monitor levels to ensure that the soil remains in a benefical range. The smaller change in soil test phos compared to the applied phos is not suprising since the soil tests are an index indicating what will become available to the plant rather than total soil phosphorous. Much of the phosphorous in these soils is tied up with calcium with only a small portion is in soil solution at any given time.

Nutrient Balance for Potasium: Mash Water

Field	Crop	Yield goal	Soil K available	Recommended K2O	Mash water applied	Lbs K2O from water	Fertilizer K2O needed	Net soil change
			ppm	lbs/a	Acre inch/a	lbs/a	lbs/a	ppm
NW20-18-36	Wheat 2017	100 bu/a	667.5	0	1.27	426.6819	0	15
SW20-18-36	Wheat 2016	100 bu/a	677	0	0.45	151.1865	0	5
NW20-18-36	Wheat 2019	100 bu/a	682.5	0	1.42	418.6728	0	74
SW20-18-36	Wheat 2018	100 bu/a	682	0	1.22	409.8834	0	44.5
SW20-18-36	Wheat 2020	100 bu/a	726.5	0	1.15	339.066	0	
NW20-18-36	Wheat 2021	100 bu/a	756.5	0	1.42	418.6728	0	

Mash analysis	2/17/2017			
	Lbs/acre-inch	% available		lbs/acre-inch to credit
Potassium as K	311			0
Potassium as K20	**373.3**		**90%**	**335.97**

Mash analysis	3/16/2018			
	Lbs/acre-inch	% available		lbs/acre-inch to credit
Potassium as K	273			0
Potassium as K20	**327.6**		**90%**	**294.84**

Lab Date	Field	K PPM 0-6 inch	K PPM 6-24 inch	Average
		ppm	ppm	ppm
7/14/2015	NW 20 18 36	821	514	667.5
7/13/2017	NW 20 18 36	854	511	682.5
7/23/2014	NW 20 18 36	870	484	677
7/14/2016	NW 20 18 36	874	490	682
7/13/2017	NW 20 18 36	854	511	682.5
7/17/2019	NW 20 18 36	974	539	756.5
7/14/2016	NW 20 18 36	874	490	682
7/16/2018	NW 20 18 36	889	564	726.5
7/16/2018	NW 20 18 36	889	564	726.5
	NW 20 18 36			
7/17/2019	NW 20 18 36	974	539	756.5
	NW 20 18 36			

en in 0-6 inch range and 50% credit to 6-24 inch nitrogen

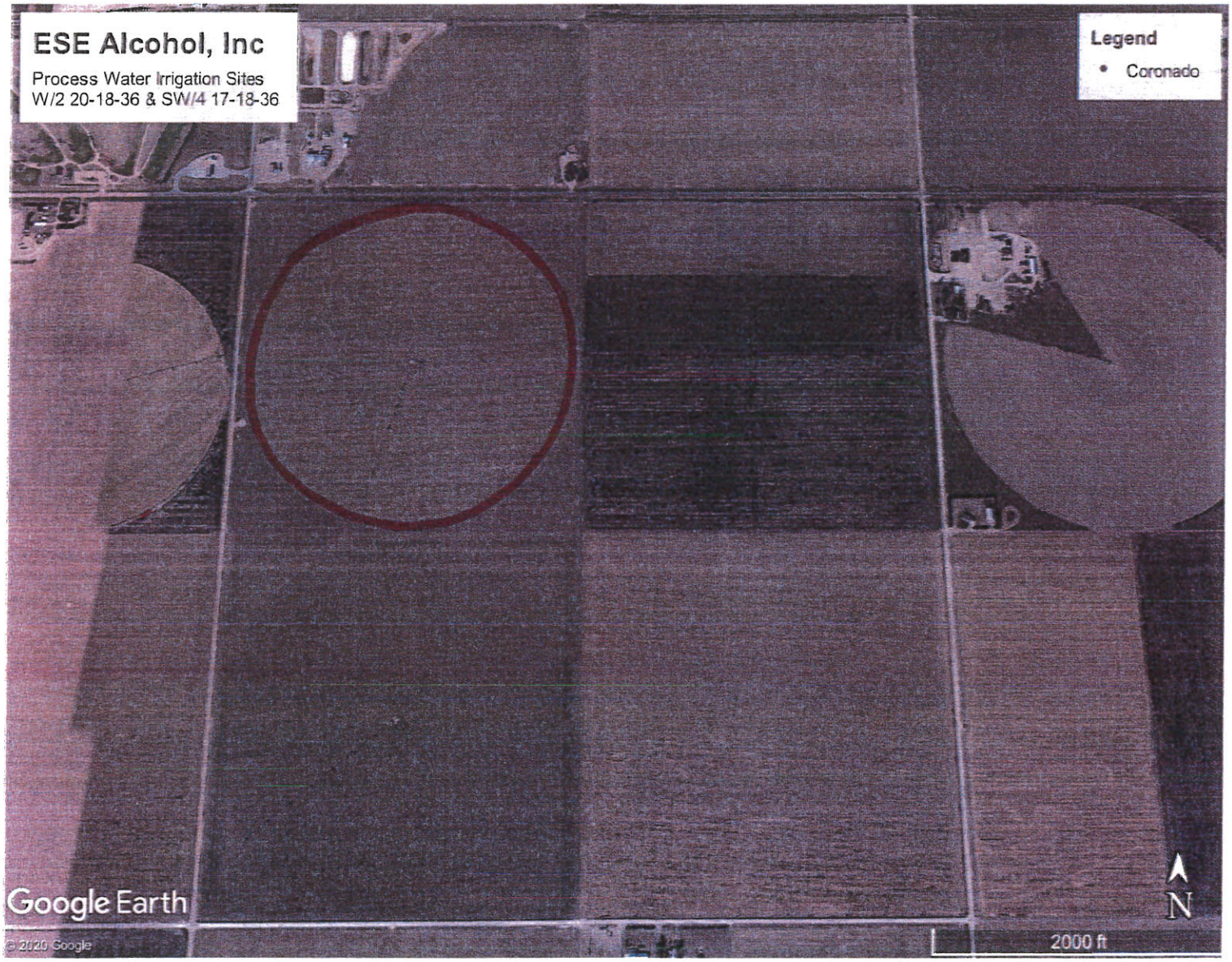
Comments:

Potasium is a nutrient rarely needed in Wichita county due to the naturally high level of potasium in the soils and these fields are no exeption. Soil tests tend to vary up and down overtime as seen on the trends pages for both NW20 and SW20. As with phosphorous, much of the potasium is tied up in the soils making it not sprising that although more is applied than removed, soil tests and overall levels change very little.

ESE MASH WATER IRRIGATION

Year	Total Usage
1998	3,428,300
1999	6,954,500
2000	4,131,700
2001	2,614,600
2002	3,425,100
2003	4,347,400
2004	4,923,600
2005	6,613,499
2006	3,673,500
2007	7,645,300
2008	4,868,300
2009	4,159,000
2010	4,029,600
2011	572,900
2012	0
2013	4,149,000
2014	3,196,500
2015	5,627,900
2016	3,988,500
2017	4,642,900
2018	2,866,100
2019	4,841,100

2019


ESE Alcohol, Inc
Process Water Irrigation Sites
W/2 20-18-36 & SW/4 17-18-36
Legend
Coronado
Google Earth
© 2020 Google
N
2000 ft

Supplemental Condition No. D-4 Mash Solids Land Application Requirements

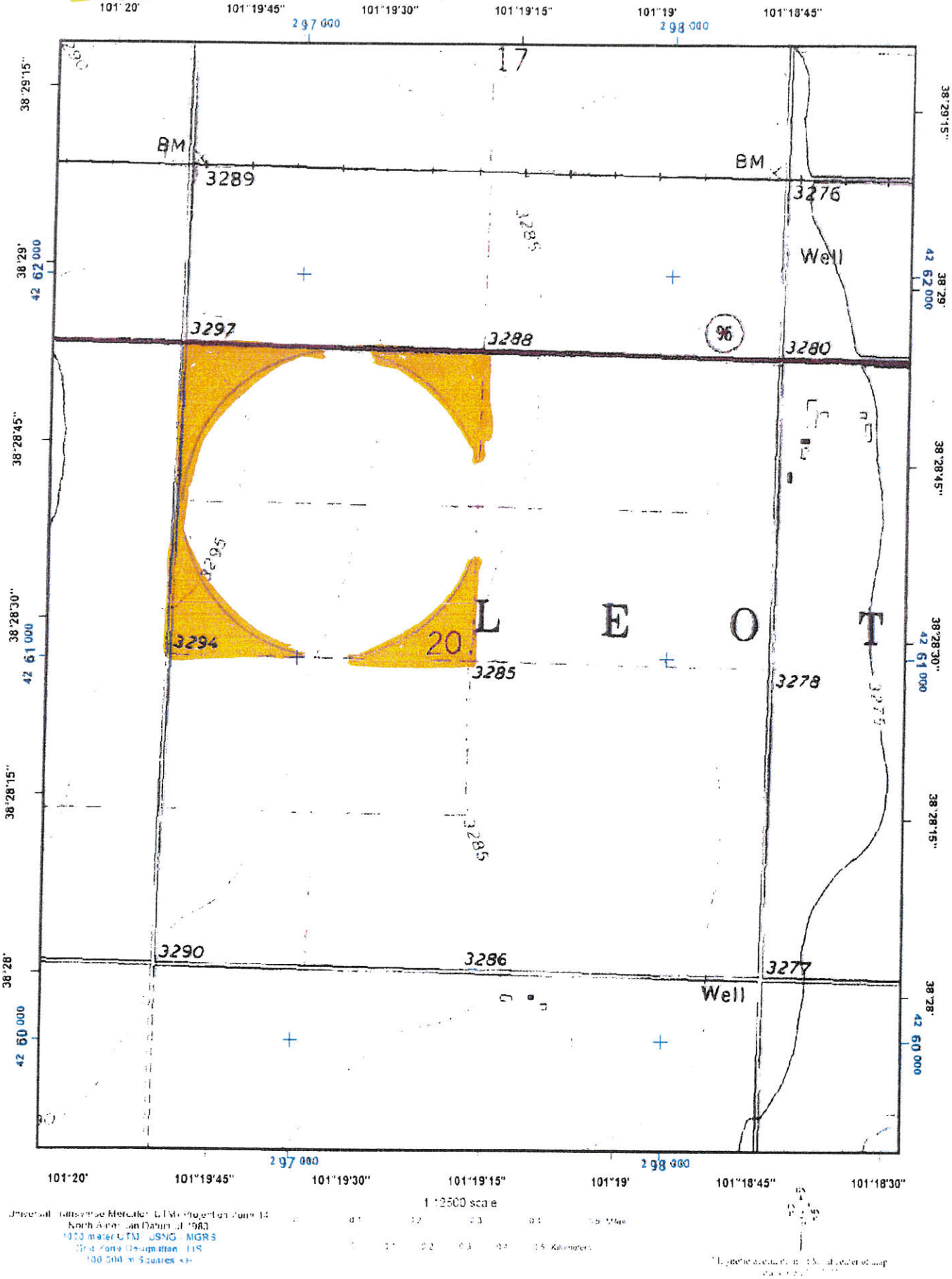
a. Mash solids are stored at a single central stockpile location in a manner consistent with our current permit.
b. Mash solids are not stockpiled at any land application site.
c. Mash solids are incorporated within 24 hours after land application unless no-till methods of farming are being utilized.
d. We do not farm saturated, frozen, or snow covered ground and thus do not apply mash solids during these periods of time.
e. Mash solids are applied utilizing hi-tech manure spreader equipment that is GPS equipped.
f. The off-site stockpile location has not changed and meets the permit requirements.

ESE Alcohol, Inc
ESE Alcohol Inc Map to Stock Pile
SE/4 5-18-36
Legend
Feature 1
Coronado
96
Google Earth
© 2018 Google
N
1 mi

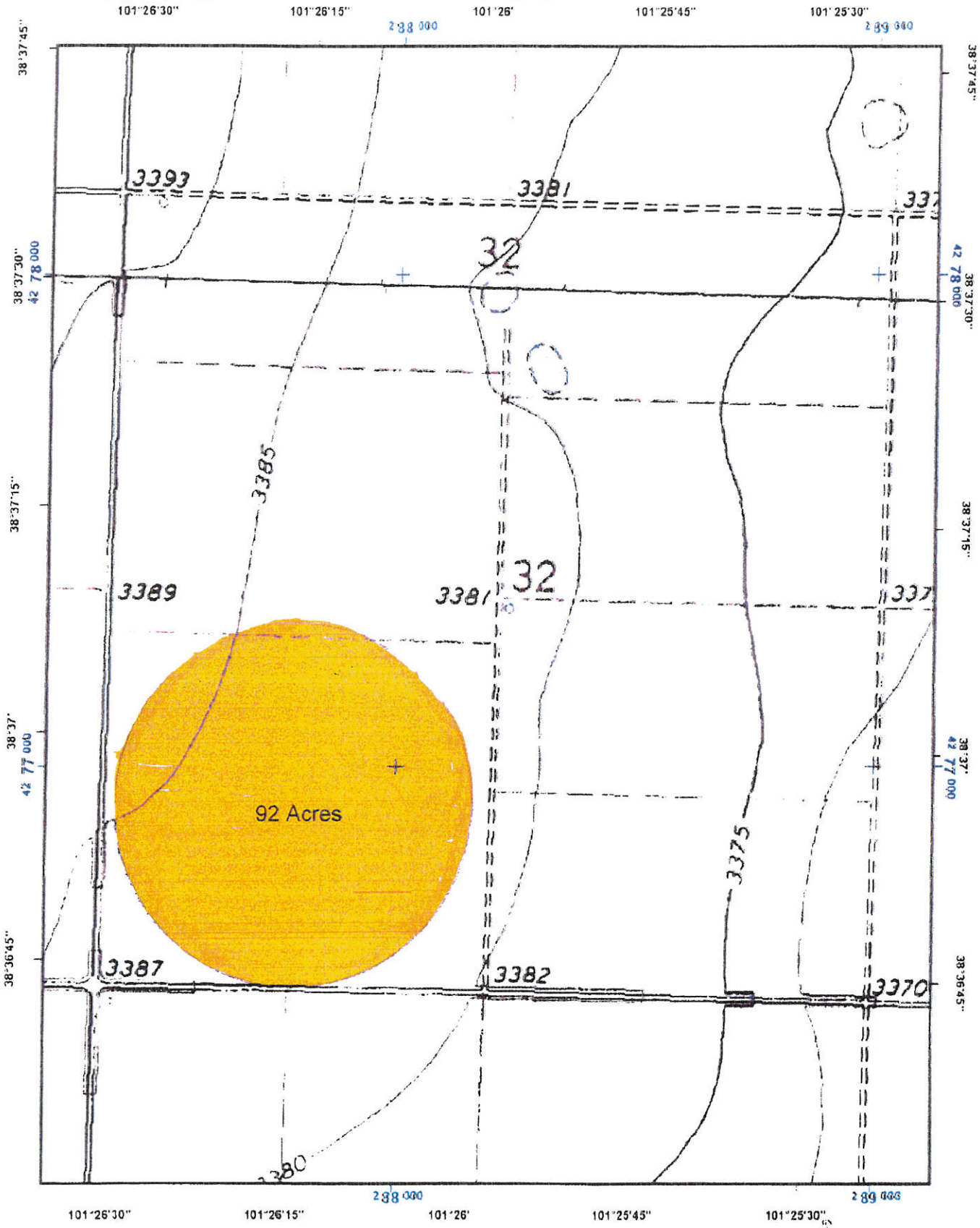
CALENDAR YEAR --------- 2019
BIO-SOLIDS APPLIED

DATE		TRACT	LEGAL DESCRIPTION	ACRES	TONS APPLIED	TONS/ACRE	PHYSICAL LOCATION	CROP & HARVEST YEAR
Aug 2019	Gary	7	SE/4 05-18-36	120	1280	10.67	Circle-Tailwater Pit/GGma	2020 Corn
"	Gary	75	NE/4 33-17-36	92	920	10.00	Circle-Farm	2020 Corn
	Gary	20	SW/4 32-16-37	92	960	10.43	Circle-Krenzel's	2020 Corn
"	ESE	87	NW/4 20-18-36	70	200	2.86	ESE-Perry Ground	2021 Wheat
Aug 2019	Gary	9 & 76	S/2 33-17-36	100	413	4.13	7 Corners-Farm	2020 Wheat
"	Gary	98 & 99	N/2-N/2 36-17-37	105	314	3.00	Lindbergh	2020 Wheat
Sept 2019	Gary	21	NW/4 05-17-37	70	330	4.71	4 Corners-Krenzel's	2020 Corn
"	Gary	20	SW/4 32-16-37	70	330	4.71	4 Corners-Krenzel's	2020 Corn
"	Gary	19	NW/4 32-16-37	70	330	4.71	4 Corners-Krenzel's	2020 Corn
"	Gary	17 & 18	E/2 36-16-37	140	660	4.71	8 Corners-Parks Church	2020 Corn
Sept 2019	Gary	8	NW/4 33-17-36	30	160	5.33	3 Corners-Farm	2020 Corn
"	Gary	6 & 7	E/2 05-18-36	60	320	5.33	6 Corners-Tailwater Pit/GGma	2020 Corn
"	Gary	98 & 99	S 105 A of NW 36-17-37	105	540	5.14	Lindbergh	2020 Corn
Dec 2019	Gary	76	SE/4 33-17-36	92	660	7.17	Circle	
TOTALS				**1216**	**7,417**	**5.92**		

Tract(s) #87, #88 NW/2 & SW/2 20-18-36 Leoti, Wichita Co.



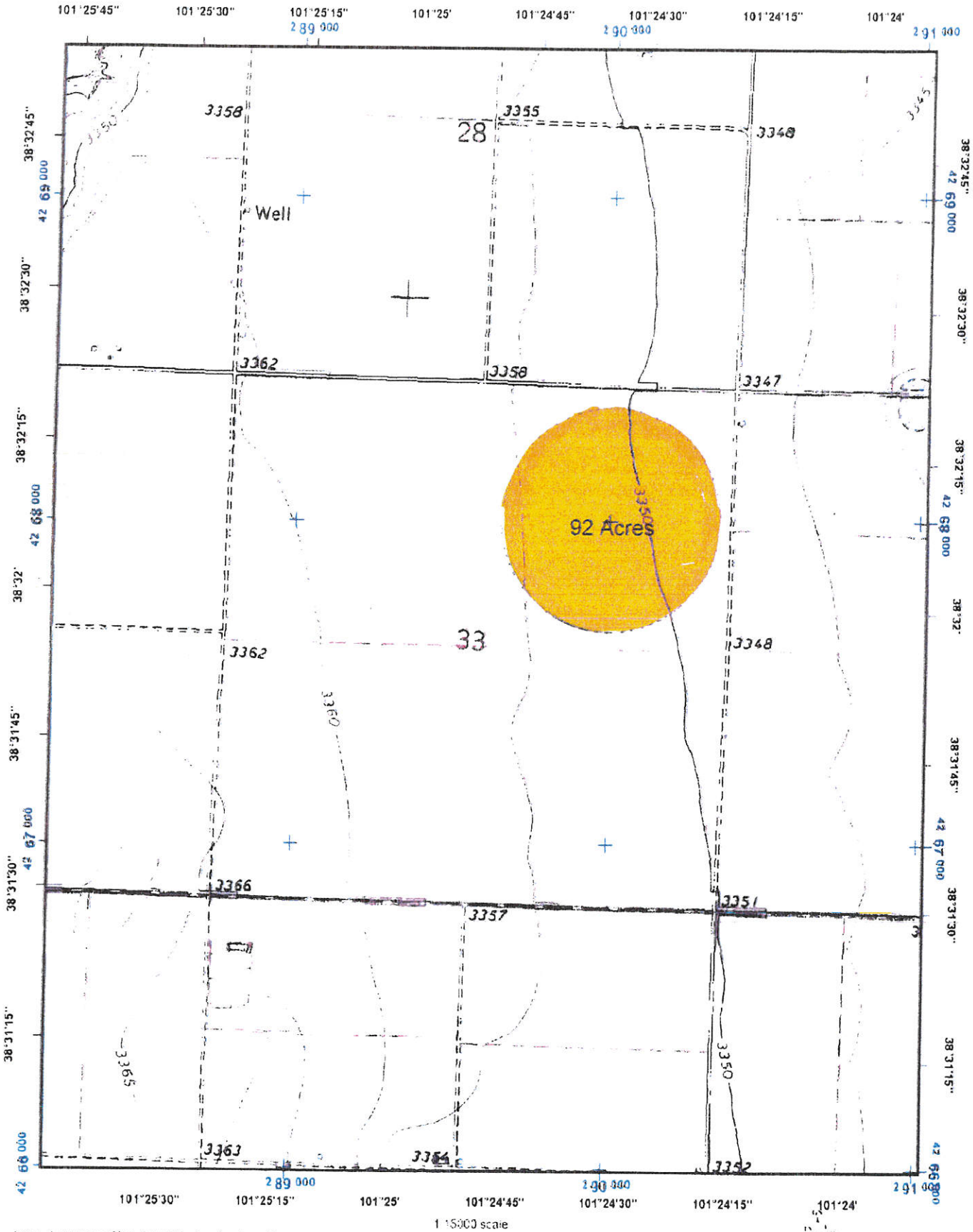
Tract(s) #19; #20 NW/4 & SW/4 32-16-37 Russell Springs 3, Wichita Co.



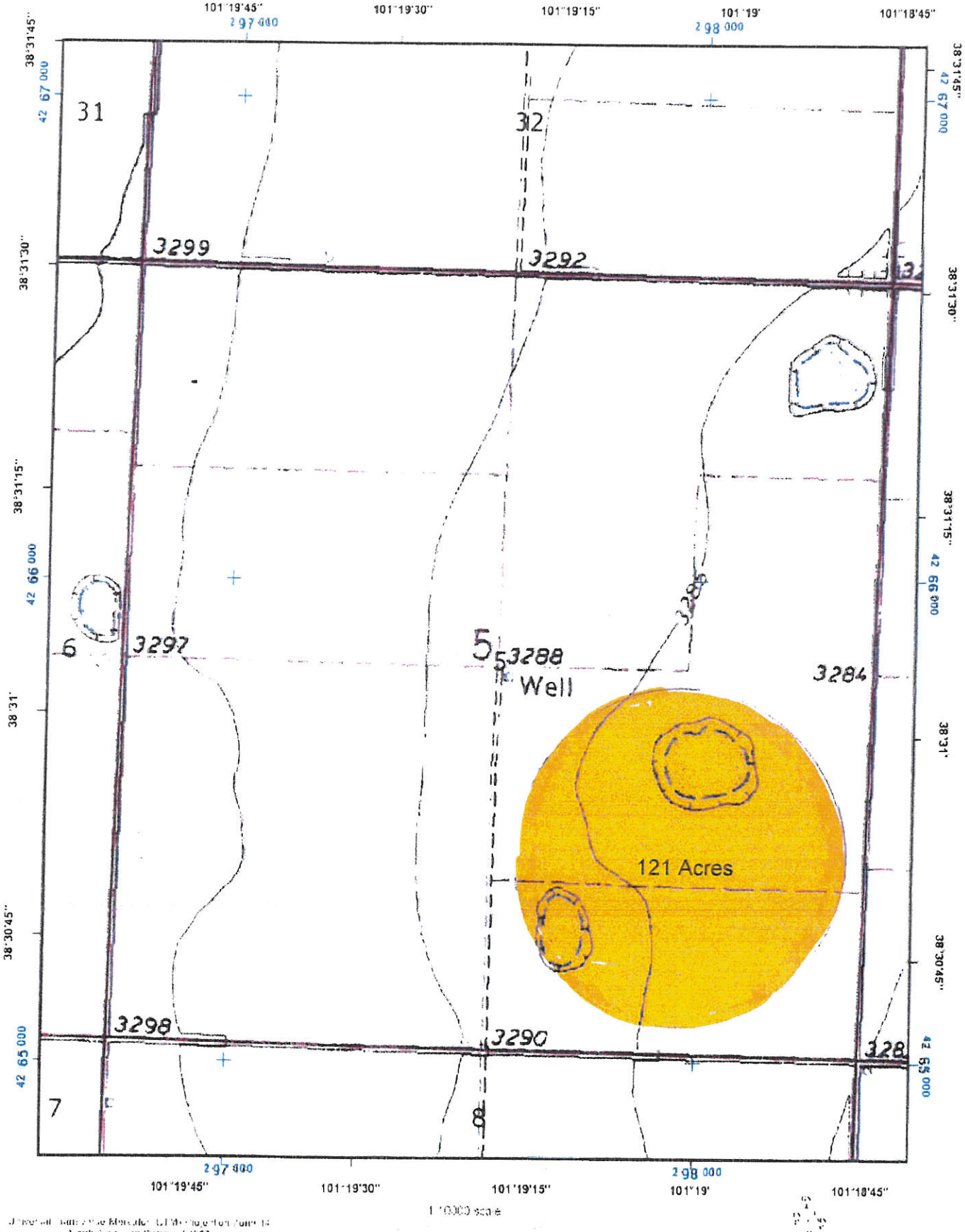
1:10000 scale

Universal Transverse Mercator UTM Projection Zone 14
North American Datum of 1983
1000 meter UTM USNG MGRS
Grid Zone Designation 14S
100 000 m Squares KH

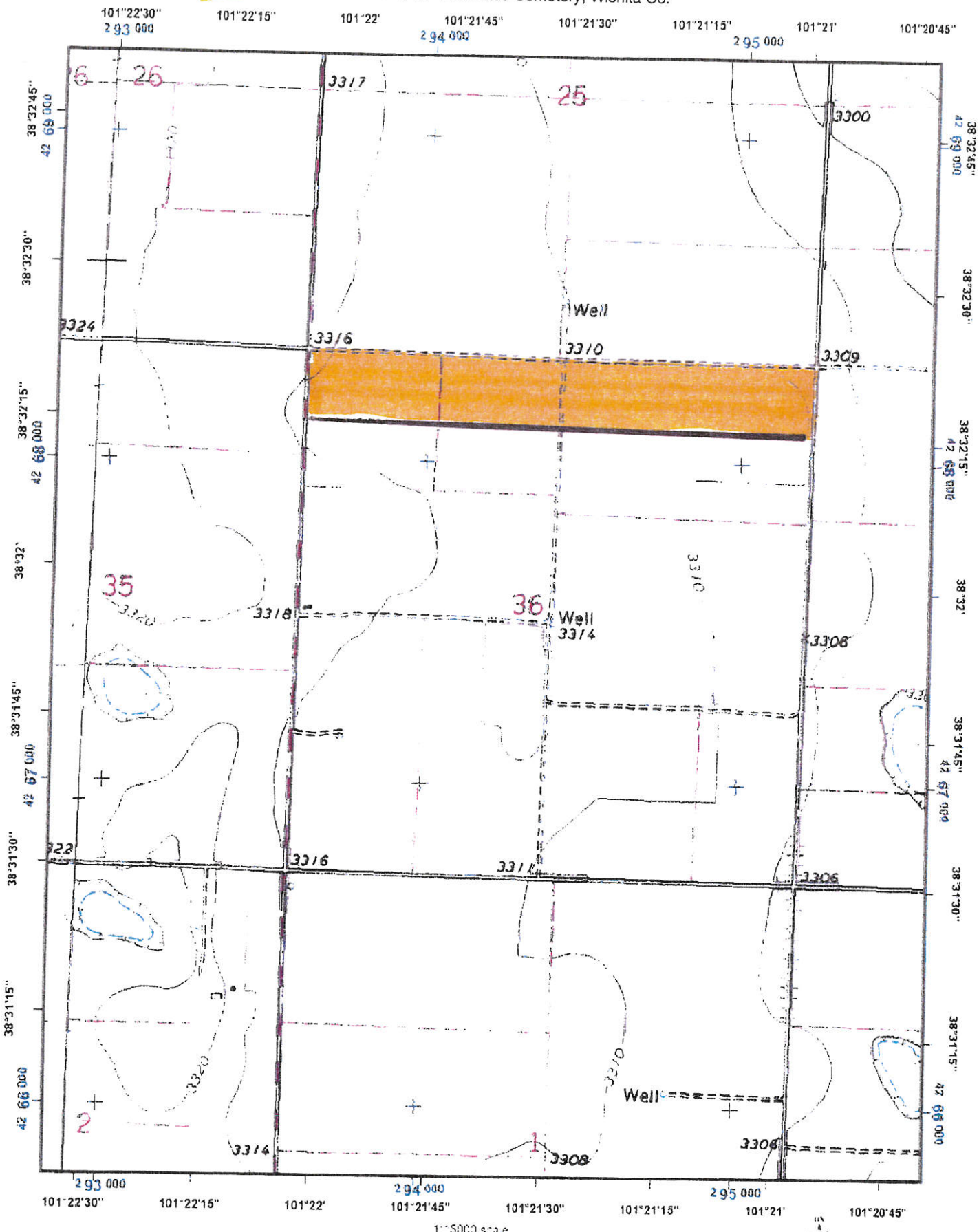
Tract(s)#8; #9; #75; #76 Sec 33-17-36 Coronado Cemetery, Wichita Co.



Tract #6; #7 NE/4 & SE4 05-18-36 Coronado Cemetery, Wichita Co.



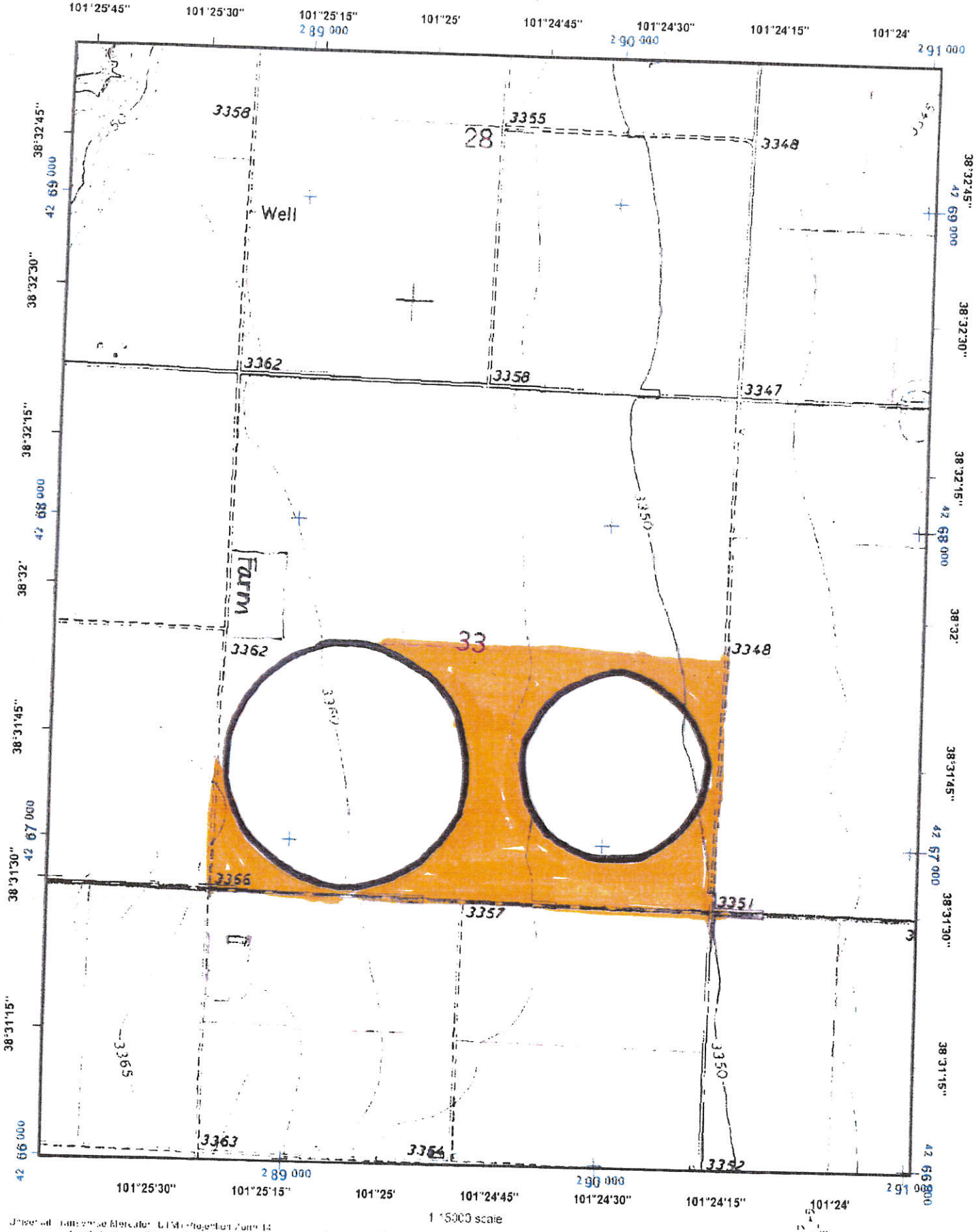
Tract(s) #85; #86; #98; #99 SW/4 & SE4 36-17-37 Coronado Cemetery, Wichita Co.



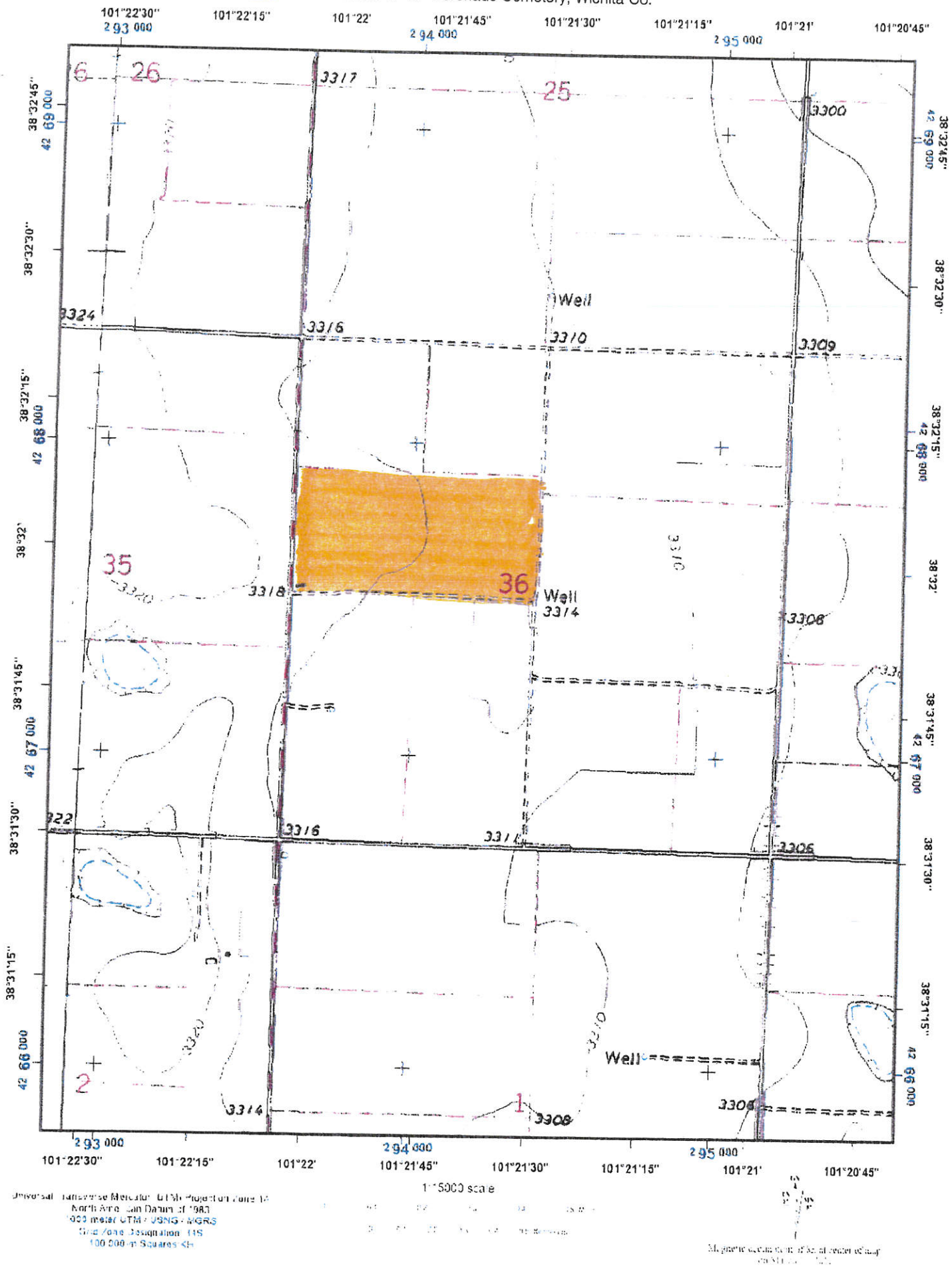
Universal Transverse Mercator UTM Projection Zone 14
North American Datum of 1983
1000 meter UTM - USNG - MGRS
Grid Zone Designation 14S
100 000 m Squares KH

Magnetic declination at center of map

Tract(s)#8; #9; #75; #76 Sec 33-17-36 Coronado Cemetery, Wichita Co.

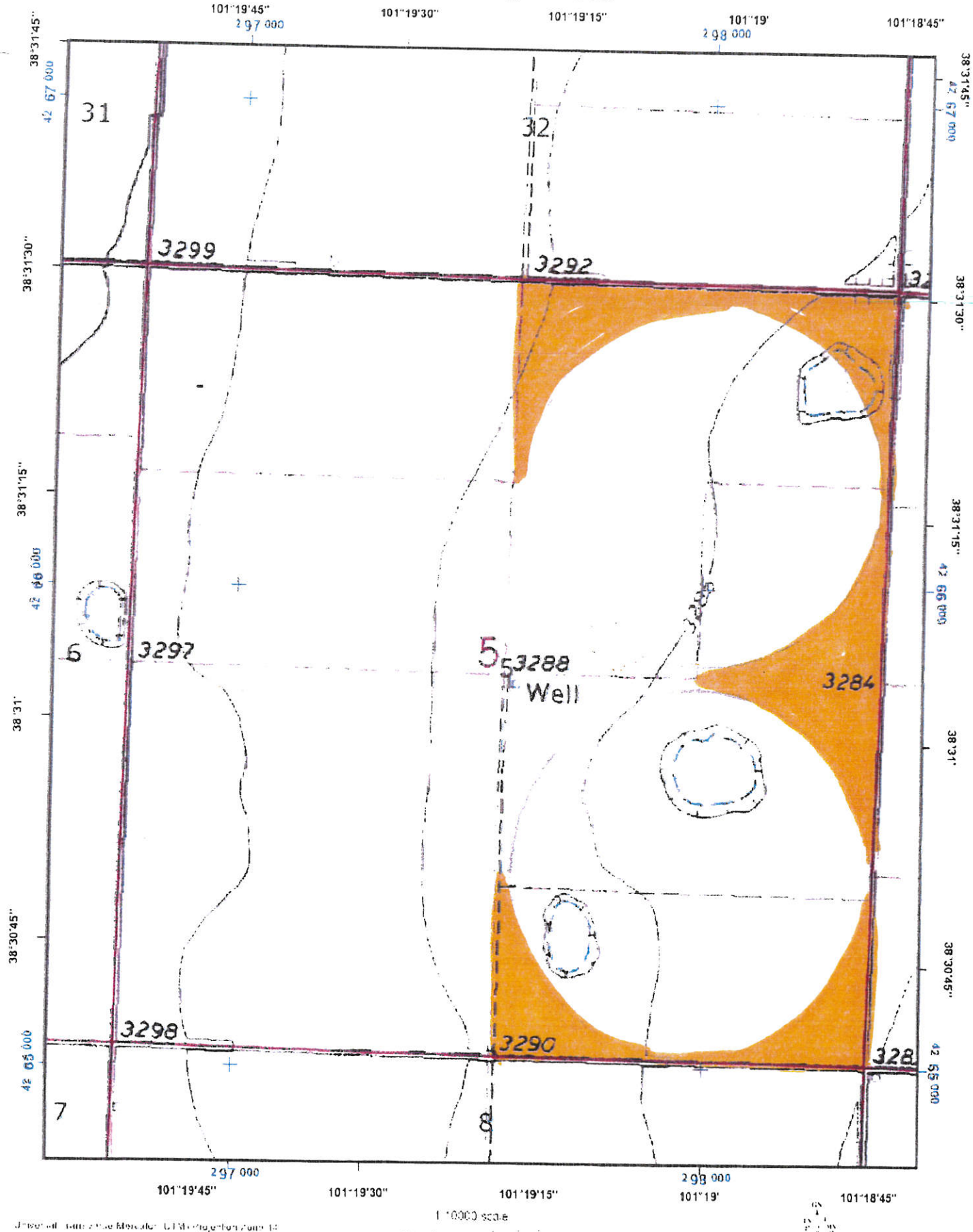


Tract(s) #85; #86; #98; #99 SW/4 & SE4 36-17-37 Coronado Cemetery, Wichita Co.

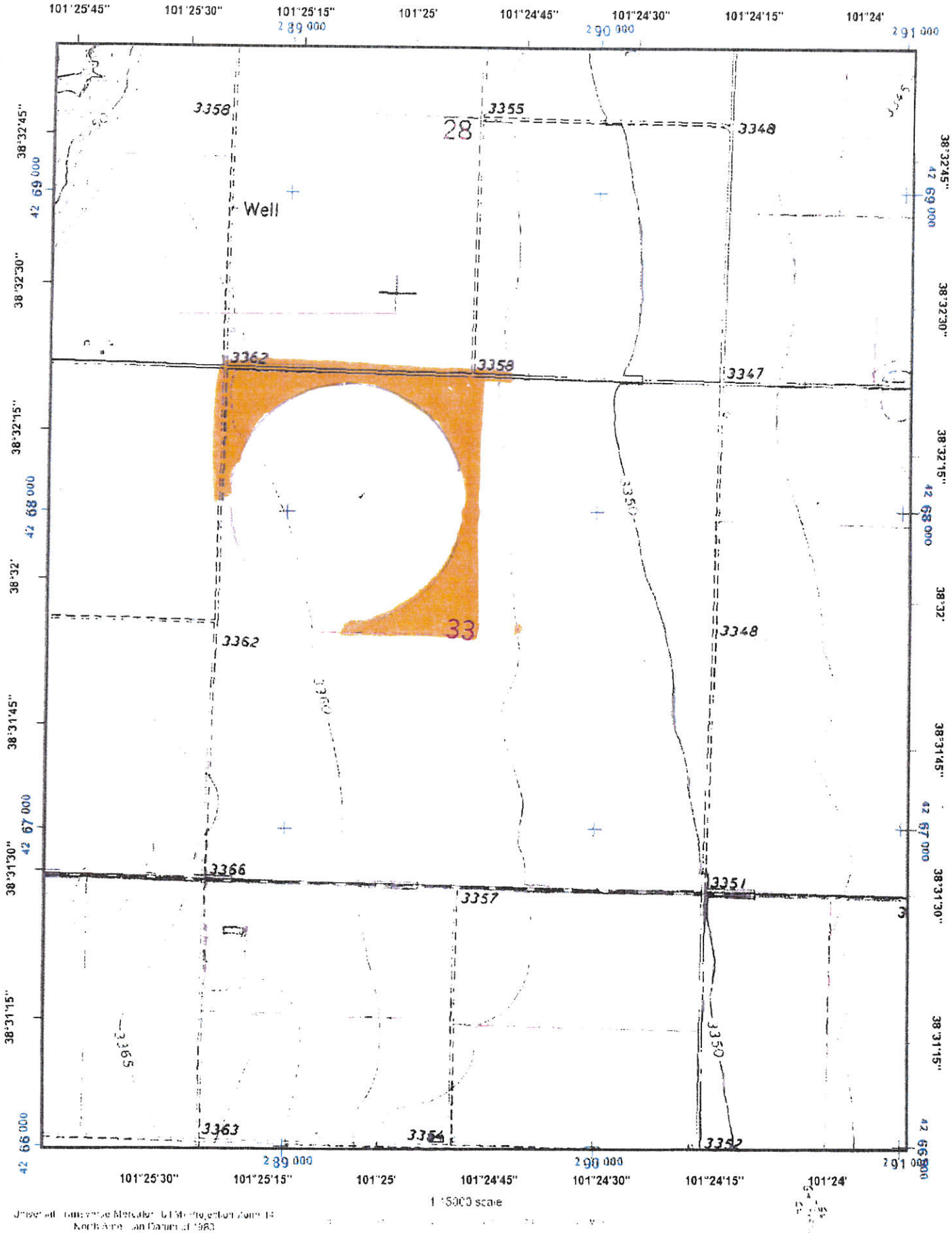


Universal Transverse Mercator (UTM) Projection Zone 14
North American Datum of 1983
000 meter UTM / USNG / MGRS
Grid Zone Designation 14S
100,000-m Squares <H>

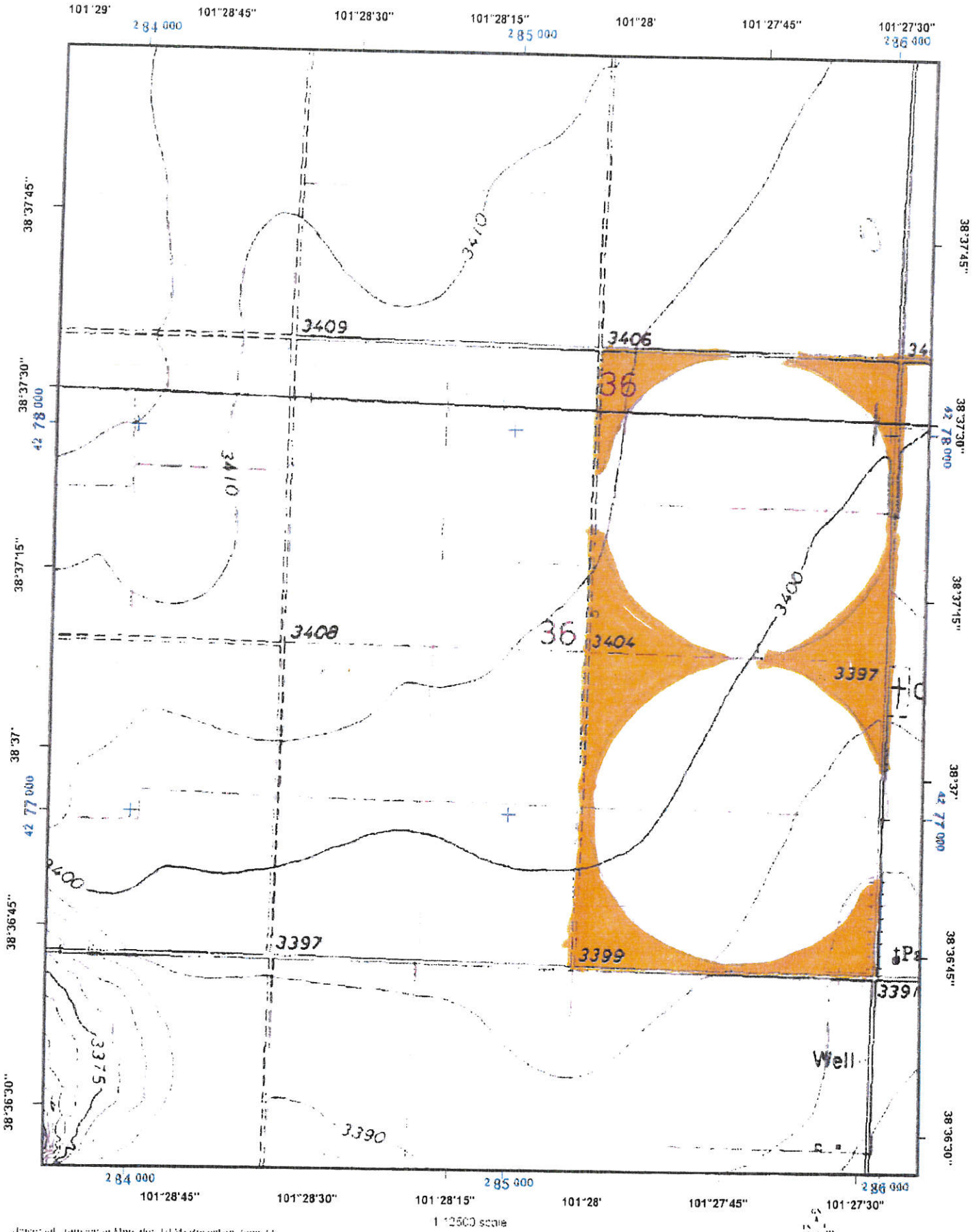
Tract #6, #7 NE/4 & SE4 05-18-36 Coronado Cemetery, Wichita Co.



Tract(s)#8; #9; #75; #76 Sec 33-17-36 Coronado Cemetery, Wichita Co.



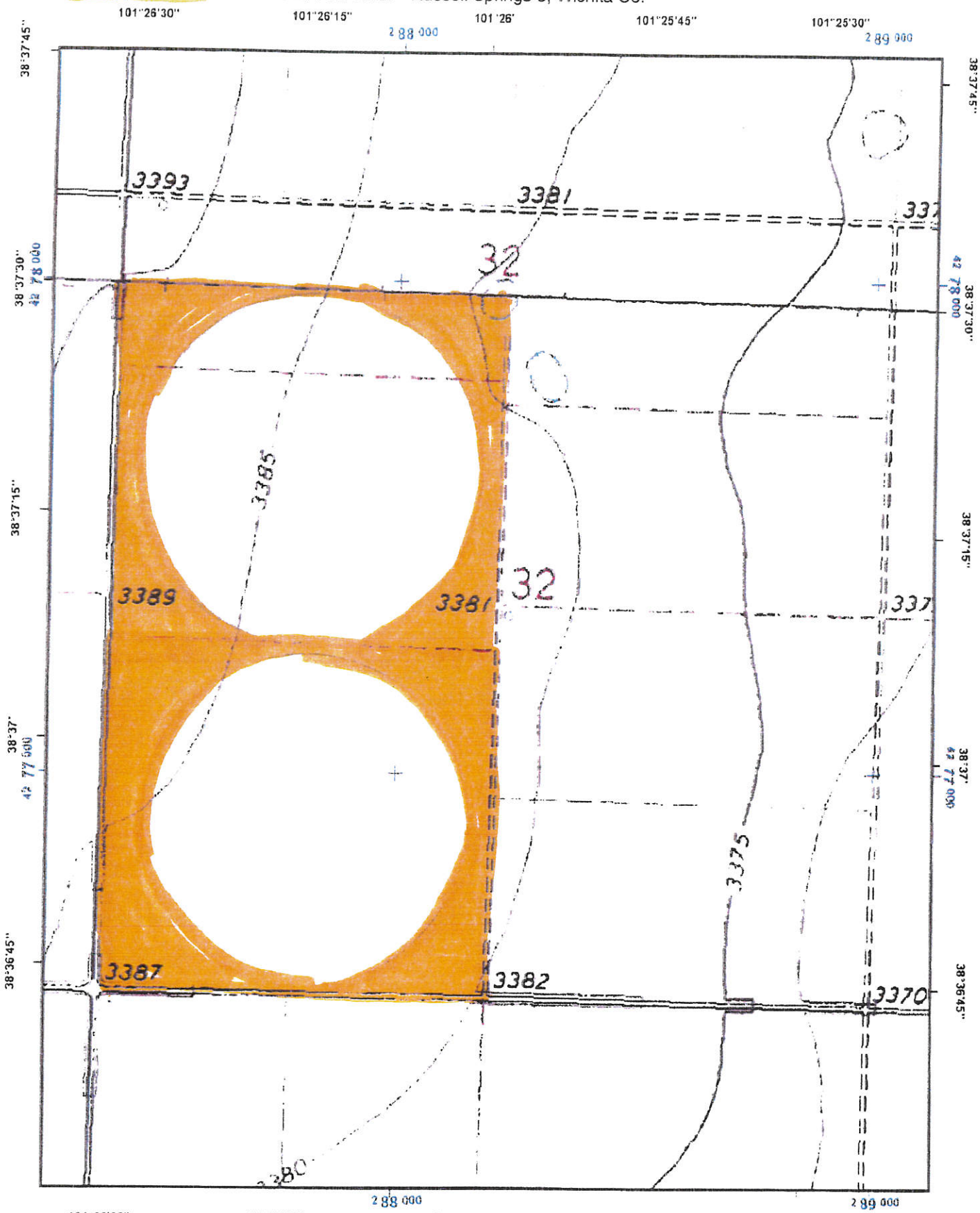
Tract(s) #17, #18 NE/4 & SE/4 36-16-38 Russell Springs 3, Wichita Co.



1 : 2500 scale

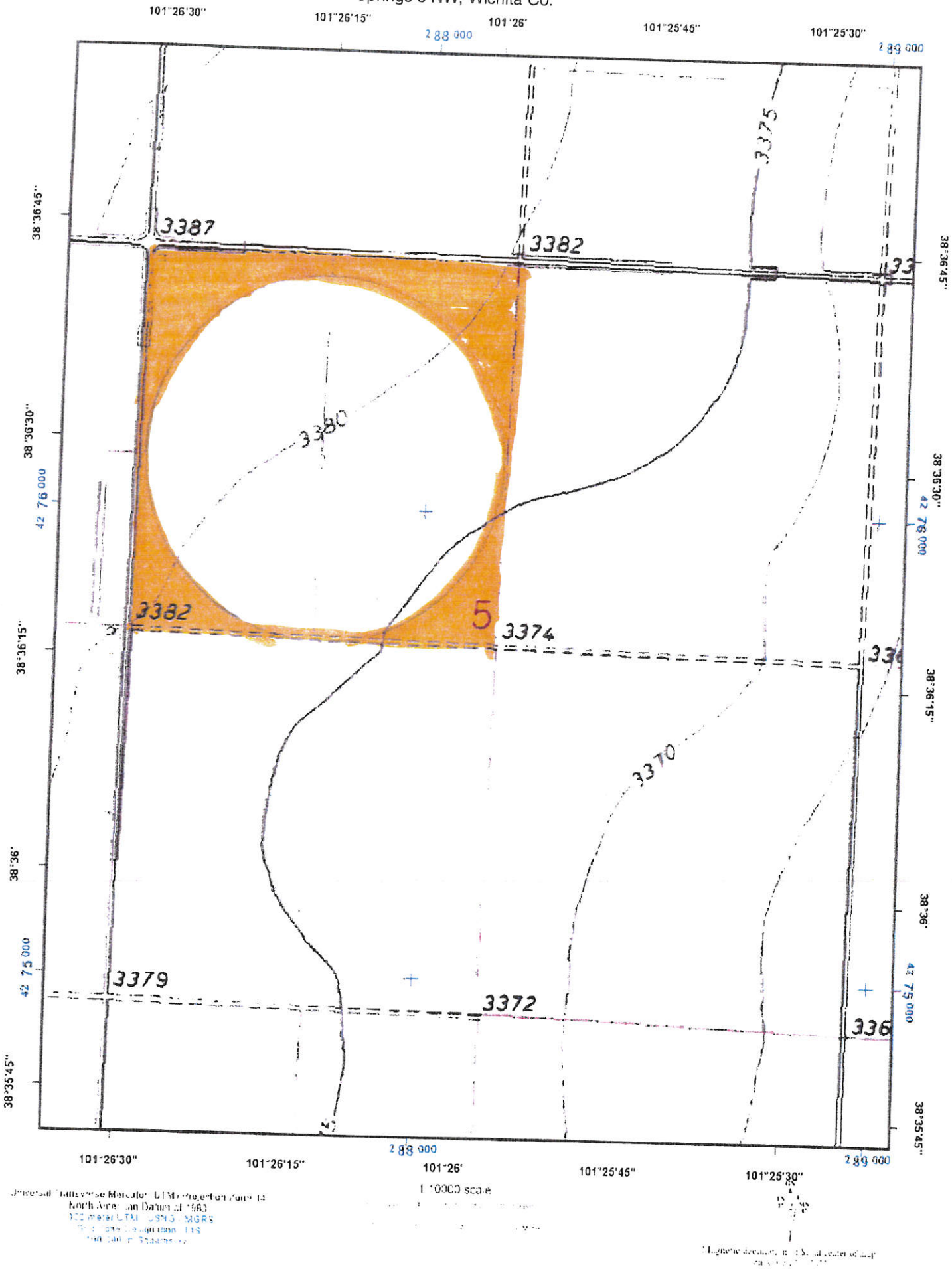
Universal Transverse Mercator Grid Zone 14
North American Datum of 1983
1000 meter UTM USNG MGRS
Grid Zone Designation 14S
100,000 m Square ID
0.1 0.2 0.3 0.4 0.5 Miles
0.1 0.2 0.3 0.4 0.5 Kilometers

Tract(s) #19; #20 NW/4 & SW/4 32-16-37 Russell Springs 3, Wichita Co.

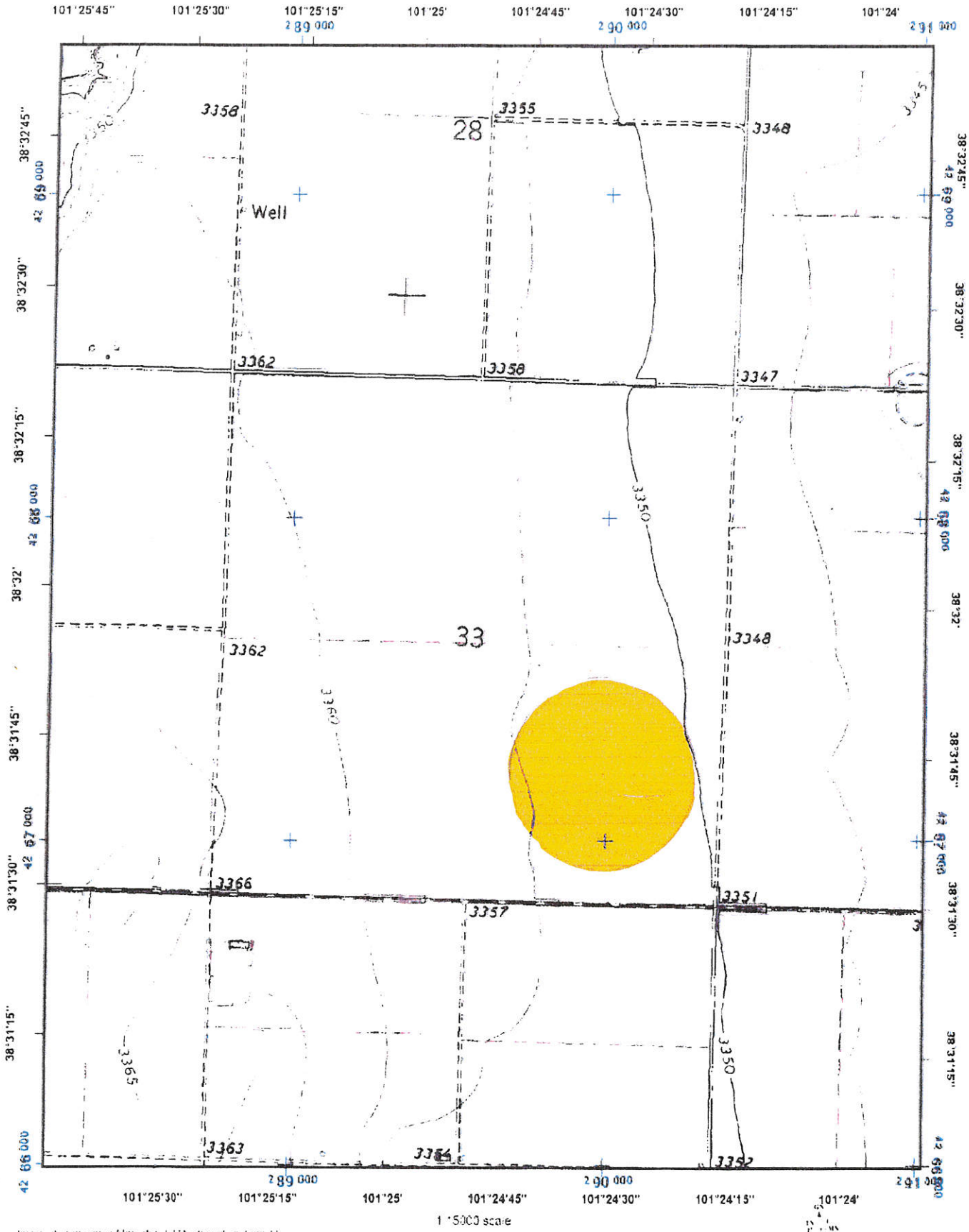


1 : 10000 scale

Tract #21 NW/4 05-17-37 Russell Springs 3 NW, Wichita Co.



Tract(s)#8; #9; #75; #76 Sec 33-17-36 Coronado Cemetery, Wichita Co.



1:15000 scale

American Agricultural Laboratory, Inc.

210 East 1st / PO Box 370 / McCook, Nebraska 69001
Office: 308-345-3670 / FAX: 308-345-7880
www.AmAgLab.com

SOLID MANURE NUTRIENT REPORT

SKYLER JAMES
CROP QUEST
1202 COLLEGE
SCOTT CITY KS 67871

Account Number: 38042

Date Sampled:
Date Received: 04/26/2019
Date Reported: 05/02/2019

Lab Number: 29608

Name: ESE ALCOHOL
Sample ID: MASH

Constituent Analyzed	Results	lbs per ton (as received basis)	Method
Moisture	66.20 %		105 C 5HR
Solids	33.80 %		105 C 5HR
Ash	19.03 %		AOAC 942.05
pH	6.17 s.u.		SM 4500 B
Electrical Conductivity	13.69 mmhos/cm		SM 4500 B
Soluble Salts	0.59 %	11.8	SM 4500 B
Total Nitrogen (N)	2.02 %	40.4	AOAC 984.13
Organic Nitrogen (N)	1.98 %	39.6	TN-NH4-NO3
Ammonium-N (N)	0.04 %	0.9	SM 4500 H
Nitrate-N (N)	0.0008 %	0.0	EPA 353.2
Phosphorus (P)	0.15 %	3.0	AOAC 985.01
Phosphorus (P2O5)		6.9	
Potassium (K)	0.15 %	3.0	AOAC 985.01
Potassium (K2O)		3.6	
Calcium (Ca)	0.10 %	2.0	AOAC 985.01
Magnesium (Mg)	0.08 %	1.6	AOAC 985.01
Sodium (Na)	0.01 %	0.2	AOAC 985.01
Chloride (Cl)	0.05 %	1.0	LACHAT12117071A
Sulfur (S)	0.12 %	2.4	AOAC 985.01
Zinc (Zn)	57.1 mg/kg	0.11	AOAC 985.01
Iron (Fe)	1190.5 mg/kg	2.38	AOAC 985.01
Mangenese (Mn)	27.6 mg/kg	0.06	AOAC 985.01
Copper (Cu)	16.5 mg/kg	0.03	AOAC 985.01
Boron (B)	6.3 mg/kg	0.01	AOAC 985.01

Analysis by Olsen's Agricultural Laboratory, Inc.

American Agricultural Laboratory, Inc.

700 West D St. / P.O. Box 370 / McCook, Nebraska 69001

Office: 308-345-3670 / FAX: 308-345-7880 / www.AmAgLab.com

"Analysis You Can Grow With"®

DATE	12/03/2019
Submitted By	SKYLER JAMES
Address	1202 COLLEGE
City, State, Zip	SCOTT CITY KS 67871

Re: Nutrient availability from manure application the first crop year after application

Name:	ESE ALCOHOL
Sample ID:	MASH SOLIDS
Lab Number:	30064

Nutrient	% Availability 1st Year	Lbs/ton (as received basis)
Organic N	25%	5.73
Ammonium-N	95%	4.07
Nitrate-N	100%	0.00
Phosphorus (as P_2O_5)	70%	4.17
Potassium (as K_2O)	90%	4.34
Calcium (as Ca)	55%	4.73
Magnesium (as Mg)	55%	1.98
Sodium (as Na)	90%	0.18
Chloride (as Cl)	100%	0.20
Sulfur (as S)	40%	0.80
Zinc (as Zn)	40%	0.04
Iron (as Fe)	40%	2.88
Manganese (as Mn)	40%	0.06
Copper (as Cu)	40%	0.01
Boron (as B)	40%	0.01

% Availability 1st year is an estimation of nutrient availability based on published information for feedlot manure.
Lbs/ton (as received basis) assumes the manure is broadcast and incorporated into the soil immediately after application.

Please contact us if you have any questions. Thanks.

Sincerely,

Kevin Grooms

Supplemental Condition No. 6 Soil Monitoring Requirements

The Farm Summary document identifies 116 tracts of farm ground that could be utilized for application purposes. All irrigation sites utilized are tested. The Bio-Solids Applied document lists 11 tracts that were utilized in 2018. Twenty percent of the 19 solids sites would mean 4 solid sites need to be tested; however our permit requires a minimum of 5 solid sites be tested. We therefore tested 5 solid sites along with the irrigation sites utilized.

Before and After Soil Test Results

Lab Date	Field		pH	Exchangeable NH4-N ppm	Exchangeable NH4-N lbs/A	Nitrate-N 0-6 ppm	Nitrate-N 0-6 Lbs/A	Nitrate-N 6-24 ppm	Nitrate-N 6-24 Lbs/A	Bray P1 ppm	M3 P ppm	Extractable K ppm	Extractable Na % of Cations	Extractable Na ppm	EC mmhos
11/21/2019	03 NW32-1-37	N	6.8	3.4	6.1	16.1	29	8.1	44	71	74	761	1	30	1.34
8/10/2018	03 NW32-16-37	N	6.8	4.9	8.8	10	18	2.7	15	43	52	914	1	28	0.78
8/10/2018	03 NW32-16-37	S	7.2	2.9	5.2	11.4	21	3	16	47	53	966	0	21	1.2
11/21/2019	03 NW32-1-37	S	6.8	3	5.4	13.2	24	4.8	26	80	85	819	1	28	0.96
8/21/2018	N36-17-37	SE	6.5	1.1	2	14.4	26	5.8	31	66	98	922	0	17	0.7
11/21/2019	N36-17-37	SE	6.5	3.4	6.1	16	29	3.7	20	94	98	858	0	8	0.8
11/20/2017	N 13-16-37	N	7.1	1.2	2.2	7.3	13	2.9	16	46	59	759	0	10	0.46
11/21/2019	N 13-16-37	N	6.6	4.5	8.1	25.3	46	7.8	42	97	111	851	0	13	0.92
8/21/2018	S36-17-37	CORNERS	7.9	0.9	1.6	27.5	50	13.4	72	na	84	1108	0	23	1.02
11/21/2019	S36-17-37	CORNERS	7.4	2.1	3.8	18.5	33	9.9	53	79	80	894	0	9	1.16

03 NW32-1-37
03 NW32-16-37

Nutrient Balance for Nitrogen: Mash Solid

Field		Crop	Yield goal	Units	Available N	Recommended additional N	Mash applied	Lbs N from mash	Fertilizer N needed	Net soil change	Crop use
						lbs/a	Tons/a	lbs/a	lbs/a	lbs/a	lbs/a
03 NW32-1-37	N	Corn	220	bu	79.1	184.9	11.41	195.9097	-11	-37.3	222.2
03 NW32-16-37	S	Corn	220	bu	42.2	221.8	11.41	195.9097	26	13.2	208.6
N36-17-37	SE	Corn	120	bu	59	85	6.86	117.7862	0	-3.9	121.6862
N 13-16-37	N	Corn	120	bu	31.2	112.8	9.94	170.6698	0	64.9	105.7698
S36-17-37	Corners	Corn	120	bu	123.6	20.4	8	137.36	-117	-33.8	54.2

Mash analysis	3/21/2018		
	Lbs/ton	% available	lbs/ton to credit
Nitrate	0	100%	0
Ammonium	9.3	90%	8.37
Organic N	35.2	25%	8.8
Total	**44.5**		**17.17**

Lab Date	Field		xchangeable NH4-N		Nitrate-N 0-6		Nitrate-N 6-24		Total available
			ppm	lbs/A	ppm	Lbs/A	ppm	Lbs/A	
11/21/2019	03 NW32-1-37	N	3.4	6.1	16.1	29	8.1	44	79.1
8/10/2018	03 NW32-16-37	N	4.9	8.8	10	18	2.7	15	41.8
8/10/2018	03 NW32-16-37	S	2.9	5.2	11.4	21	3	16	42.2
11/21/2019	03 NW32-1-37	S	3	5.4	13.2	24	4.8	26	55.4
8/21/2018	N36-17-37	SE	1.1	2	14.4	26	5.8	31	59
11/21/2019	N36-17-37	SE	3.4	6.1	16	29	3.7	20	55.1
11/20/2017	N 13-16-37	N	1.2	2.2	7.3	13	2.9	16	31.2
11/21/2019	N 13-16-37	N	4.5	8.1	25.3	46	7.8	42	96.1
8/21/2018	S36-17-37	CORNERS	0.9	1.6	27.5	50	13.4	72	123.6
11/21/2019	S36-17-37	CORNERS	2.1	3.8	18.5	33	9.9	53	89.8

Nutrient Balance for Phosphorous: Mash Solid

Field		Crop	Yield goal	Units	PPM phos	Recommended p2o5	Mash applied	Lbs p2o5 from mash	Fertilizer p2o5 needed	Net soil change	Net soil change
						lbs/a	Tons/a	lbs/a	lbs/a	ppm	lbs/a
03 NW32-1-37	N	Corn	220	bu	71	0	11.41	62.2986	0	-28	-51.52
03 NW32-16-37	S	Corn	220	bu	47	10	11.41	62.2986	0	33	60.72
N36-17-37	SE	Corn	120	bu	66	0	6.86	37.4556	0	28	51.52
N 13-16-37	N	Corn	120	bu	46	10	9.94	54.2724	0	51	93.84
S36-17-37	CORNERS	Corn	120	bu	84	0	8	43.68	0	-4	-7.36

Mash analysis	2/17/2017			
	Lbs/ton	% available		lbs/ton to credit
p2o5	7.8	70%		5.46
P	3.4			
Total	**7.8**			**5.46**

Lab Date	Field		Bray P1 ppm
11/21/2019	03 NW32-1-37	N	71
8/10/2018	03 NW32-16-37	N	43
8/10/2018	03 NW32-16-37	S	47
11/21/2019	03 NW32-1-37	S	80
8/21/2018	N36-17-37	SE	66
11/21/2019	N36-17-37	SE	94
11/20/2017	N 13-16-37	N	46
11/21/2019	N 13-16-37	N	97
8/21/2018	S36-17-37	CORNERS	84 (m3 test)
11/21/2019	S36-17-37	CORNERS	80 (m3 test)

Mash Applications and Sample Dates

Location	Legal	Acres	Tons applied	Crop	Sample date	Mash date	Sample date	Notes
Krenzels	N/2 NW/4 32-16-37	46	11.41	2019 Corn	8/10/2018	9/18/2018	11/18/2019	
Krenzels	S/2 NW/4 32-16-37	46	11.41	2019 Corn	8/10/2018	9/18/2018	11/18/2019	
Townsend	SE/3 N/2 36-17-37	105	6.86	2019 Corn	8/15/2018	9/18/2018	11/19/2019	
Dean Wiegers	N/2 N/2 13-16-37	160	3 & 6.94	2019 Corn	11/20/2017	6/18/2018 & 9/18/2018	11/19/2019	2 mash application dates
Townsend	S/2 S36-17-37	155?	8	2019 Corn	8/21/2018	9/18/2018	11/21/2019	Missing Bray p1 test

Soil Test Trends NW20-18-36

Date	Field_ID	ph	nh4 ppm	nh4 lbs	NO3 ppm	NO3lbs	Bray_P1_ppm	K_ppm	Na_ppm	Na_Sat_pct	Soluble_Salts	
6/20/2011	NW 20 18 36	7.3	5.9	10.6	16.7	30	8	704	17	0	1.12	
4/29/2013	NW 20 18 36	7	3.3	5.9	7.1	13	13	786	22	0	0.74	
7/9/2013	NW 20 18 36	7.8	4.7	8.5	3.6	6	7	523	32	1	0.62	0-6 in
8/23/2013	NW 20 18 36	7	5	9	27.1	49	57	891	49	1	1.54	
9/18/2014	NW 20 18 36	7.35	3.7	6.65	40.05	72	82	790	69	1	1.64	
7/14/2015	NW 20 18 36	7.4	4.3	7.7	8.4	15	89	821	46	1	0.96	
7/13/2017	NW 20 18 36	7.5	0.4	0.7	1.6	3	88	854	32	1	0.82	
7/17/2019	NW20-18-36	7.2	1.5	2.7	2.8	5	140	974	49	1	1.08	

6/20/2011	NW 20 18 36	7.8	5.2	28.1	3.8	21	2	586	25	1	1.12	
4/29/2013	NW 20 18 36	7.9	3.1	16.7	7.4	40	1	568	22	0	0.9	
7/9/2013	NW 20 18 36	6.7	4.4	23.8	12.8	69	13	701	24	1	0.9	6-24 in
8/23/2013	NW 20 18 36	7.7	5.3	28.6	14.3	77	15	597	34	1	1.36	
9/18/2014	NW 20 18 36	7.9	3	16.2	31.2	168.5	7	493.5	52.5	1	1.38	
7/14/2015	NW 20 18 36	8	3.9	21.1	7.5	41	2	514	41	1	0.96	
7/13/2017	NW 20 18 36	8.2	1.2	6.5	1.8	10	3	511	48	1	0.76	
7/17/2019	NW20-18-36	8.1	1.9	10.3	6.8	37	1	539	57	1	0.96	

Soil Test Trends SW20-18-36

date	Field_ID	ph	NH4 ppm	NH4 lb	no3 ppm	no3 lb	Bray_P1_ppm	K ppm	Na ppm	NA sat %	Salt	
6/20/2011	SW 20 18 36	7.2	4.6	8.3	10.3	19	7	746	19	0	1.06	**0-6 inch**
4/29/2013	SW 20 18 36	6.8	3.7	6.7	21.8	39	16	821	13	0	1.18	
9/17/2013	SW 20 18 36	7.4	1.7	3.1	7	13	31	761	44	1	1.12	
7/23/2014	SW 20 18 36	7.5	5.1	9.2	5.1	9	54	870	61	1	1.12	
7/14/2016	SW 20 18 36	7.2	2.2	4	10.5	19	82	874	32	1	1.4	
7/16/2018	SW20 18 36	6.9	1.5	2.7	3.3	6	97	889	64	1	1.34	

6/20/2011	SW 20 18 36	7.9	3.6	19.4	3.8	21	4	598	26	1	0.96	**6-24 inch**
4/29/2013	SW 20 18 36	7.8	3.8	20.5	7.9	43	1	559	21	0	1	
9/17/2013	SW 20 18 36	8	1	5.4	6.8	37	1	580	28	0	1.24	
7/23/2014	SW 20 18 36	8.1	3.5	18.9	7.3	39	1	484	37	1	1.08	
7/14/2016	SW 20 18 36	8.1	3.1	16.7	3.7	20	1	490	29	1	1.14	
7/16/2018	SW20 18 36	7.8	1.6	8.6	5.7	31	24	564	56	1	1.44	