# Kansas Geological Survey

Assessment of the Impact of Stormwater Recharge from Unlined Earthen Pits on Ground-Water Quality in the Wichita Area

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Donald O. Whittemore, Lawrence R. Hathaway, Lawrence H. Skelton, Thomas J. McClain, Michael T. Dealy, Brian G. Fisher, and Robert W. Buddemeier

A Cooperative Investigation by the Kansas Geological Survey, Equus Beds Groundwater Management District No. 2, and Wichita-Sedgwick County Department of Community Health

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#### **Executive Summary**

A study was conducted by the Kansas Geological Survey, the Equus Beds Groundwater Management District No. 2, and the Wichita-Sedgwick County Department of Community Health to assess the impact on ground-water quality in the Equus Beds aquifer of stormwater recharge from unlined earthen pits. Two sites were examined, both of which are located at or near the north boundary of Wichita and south of Valley Center. One site, Fox Meadows, drains a new residential area, and the other, Miles Sand, drains a more urban area that includes heavily traveled Meridian Street. The investigation provides background data against which to compare future effects of infiltrating storm runoff in the developing area.

Surface waters in the stormwater retention pits and a drainage ditch to the Miles Sand pit and ground waters underlying the pit areas did not contain volatile organic compounds, triazine herbicides, or heavy metals in concentrations of concern to water supplies. One of the drainage ditch samples contained detectable insecticide chemicals. Agricultural activities occurring before the new housing development in Fox Meadows appear to have caused nitrate contamination of the Equus Beds aquifer there (about 4-8 mg/L nitrate-nitrogen), although the values are less than the drinking-water standard. Nitrate concentrations in all the other surface and ground waters sampled were relatively low (0.3 to less than 3 mg/L nitrate-nitrogen).

The main water-quality problem is saline water (490-580 mg/L chloride concentration) in the pond and ground waters of Miles Sand. Hydrogeochemical data suggest that most but not all of the salinity is natural. An appreciable portion of the salinity is probably saline water from the Arkansas River and adjacent alluvial aquifer that has flowed in the subsurface toward the Little Arkansas River. Upward movement of saltwater from the Permian Wellington aquifer underlying the study area could possibly contribute to the salinity. Contamination by oil-field brine does not appear to be a significant chloride source. Street runoff containing dissolved road salt applied to streets in the watershed would be the most likely anthropogenic salinity source. The lack of samples collected from the drainage ditch near the pit during the winter makes it difficult to assess whether street runoff is a major source of the salinity.

#### Introduction

In 1988 several water users contacted the Equus Beds Groundwater Management District No. 2 (GMD2) regarding a stormwater retention pond being constructed in a proposed housing addition north of Wichita. Their concerns included the potential adverse impact of stormwater infiltration on ground-water quality. To address the concerns, the GMD2 worked with the Kansas Geological Survey (KGS) and the Wichita-Sedgwick County Department of Community Health (WSCDCH) to develop a memorandum of understanding to determine what effect disposing untreated urban stormwater runoff in unlined earthen pits has on the water quality of the Equus Beds aquifer. Accordingly, the KGS, GMD2, and WSCDCH conducted a study involving sampling and analysis of surface and ground waters collected from 1991 to 1992. Two sites were examined, both of which are located at or near the north boundary of Wichita and south of Valley Center between the Arkansas and Little Arkansas rivers. Both sites contain ponds that receive untreated stormwater runoff that either infiltrates to the subsurface or evaporates.

The stormwater retention pond that initiated the ground-water quality concerns is located in a housing development known as Fox Meadows. The housing addition is located in the northern half of NE sec. 13, T. 26 S., R. 1 W. (Figure 1). The area of the housing addition is approximately 60 acres and is subdivided into 60 lots of about 0.5 acre each. Each home requires a domestic well and a septic system.

A stormwater retention pond was constructed in the Fox Meadows development to receive drainage by means of grassed channels and ditches from only the area of the housing development. The retention pond contains a variable amount of water, depending on preceding precipitation, and can be dry after extended periods without substantial precipitation. The retention area is located near the center of the south half of the development and is shown in Figure 1. The pond is about 14 ft (4.3 m) deep and provides about 36 acre-ft of water storage. Sands of the aquifer underlie the soils that were excavated during pond construction, facilitating infiltration of retention water to the underlying aquifer. Water levels measured by the GMD2

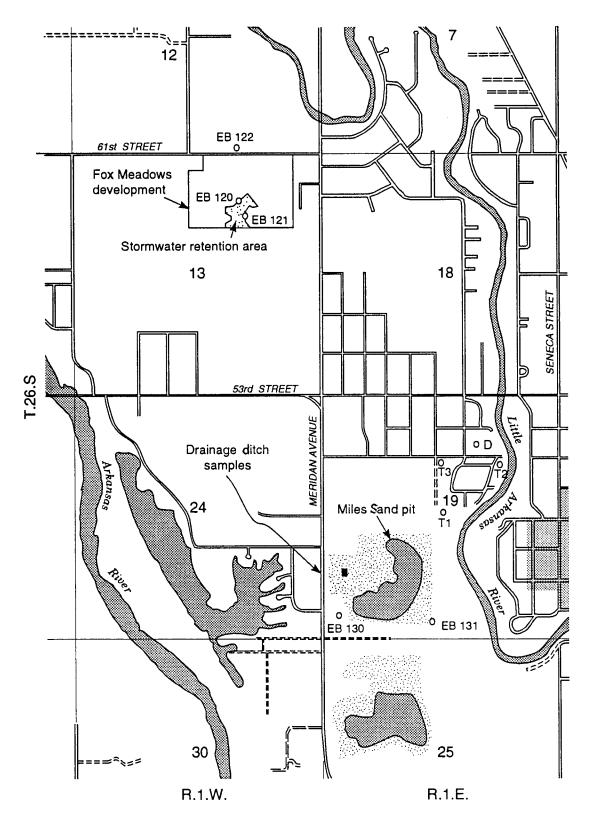


Figure 1. Map of the study area with locations of stormwater retention pits, monitoring and test wells and the drainage ditch sampling point. Small circles indicate monitoring wells (EB), test holes (T), or domestic well (D).

indicate that the depth to the water table ranges from 14 to 20 ft (4.3-6.1 m). The retention pond is about 0.5 mi (0.8 km) to the southwest of a bend in the Little Arkansas River and approximately 1 mi (1.6 km) northeast of the Arkansas River. Two irrigation wells and an estimated 20 domestic wells exist within a 0.5-mi radius and downgradient of the retention pond. Only a few houses had been built at the start of the study, and development was continuing at the time of this report.

The other site is a pond at Miles Sand Co. in the SW sec. 19, T. 26 S., R. 1 W. (Figure 1), where a pit produced from sand and gravel mining receives untreated stormwater runoff from a much larger area than that of Fox Meadows. The sand pit was excavated by suction-pump mining to the bottom of the alluvial sand and gravel [about 49 ft (15 m) as indicated by the shale depth in the EB 130C well log; see Appendix B]. The watershed draining to the Miles Sand pit encompasses a more urbanized area than the Fox Meadows basin and thus receives runoff from more heavily traveled streets. The level of water in the pit about 15 ft (4.6 m) below land surface indicates the shallow depth to the water table. The pit is about 1.5 mi (2.4 km) to the south-southeast of the Fox Meadows pond, 0.2 mi (0.3 km) west of the Little Arkansas River, and 0.8 mi (1.3 km) northeast of the Arkansas River.

In cooperation with the City of Wichita Water Department, the GMD2 installed three monitoring wells in the Equus Beds aquifer around each of the two stormwater disposal pits (Figure 1). All observation wells were augered and constructed using appropriate quality control procedures and materials to prevent contamination or corruption of water samples from well construction or materials. Two of the wells, EB 120C and EB 121A, in the Fox Meadows area are at two sides of the retention pond, and the other well, EB 122A, is to the north across 61st Street from the housing addition. The three wells near the Miles Sand pit are at two sites, EB 130 and EB 131, to the southwest and the southeast of the sand pit, respectively. Two of the wells at each site are shallow, with depths of 28.5-30 ft (8.7-9.1 m) and are labeled "A" after the well site number. The other well at each site is deeper [49.5 ft (15.1 m)] and is labeled "C". The screened interval in the wells is 5 ft (1.5 m) at the bottom of the borehole. The well casing and

continuous-slot screen are PVC. Bentonite was used to grout the well above a gravel pack. Surveyed location and elevation for the wells are listed in Appendix A, and well log and construction information is listed in Appendix B.

Water samples were collected by the WSCDCH according to EPA sampling protocol and sent to the KGS for measurement of dissolved inorganic constituents and to GTEL Environmental Laboratories Inc. in Wichita for determination of volatile organic compounds and selected herbicides. The sampling sites included the six observation wells, the two stormwater recharge pits, a road ditch routing drainage to the Miles Sand pit, and snow melt in a roadside puddle. The road ditch is along the west side of Meridian Avenue and drains through a culvert under the street to the Miles Sand pit. The period of sampling was from August 8, 1991, to July 7, 1992. Sample collection information is summarized in Table 1 and is from sampling logs on file at the WSCDCH and KGS.

#### Results and Discussion

Water collected from the Fox Meadows retention pond was fresh throughout the study, although the major constituent concentrations were much higher in the initial sample collected in August 1991 compared with four later samples (Table 2). The stormwater retention area was constructed to include drainage only from the new housing development and to exclude drainage from other areas. The higher concentration of total dissolved solids (TDS) in the first sample could represent either readily soluble minerals in the soils exposed during construction of the pond and the housing area or remnants of a source from the previously larger drainage area. Water collected from the drainage ditch near the Miles Sand pit on the same day as the first sample from the Fox Meadows pond contained a much lower TDS concentration.

The ground water in the vicinity of the Fox Meadows drainage pond was fresh throughout the study period (Table 2). The range of values for specific conductance and sulfate and chloride concentrations were relatively narrow for all well samples (728-800 uS/cm, 61-72 mg/L, and 68-86 mg/L, respectively) except for the last sample from well EB 121A, which contained somewhat fresher water.

Table 1. Sample Collection Information

Sample site	Sample date	Sample time <sup>a</sup>	Air temp. (°C)	Weather <sup>b</sup>	Chemical analyses <sup>C</sup>
Site 1,	Fox Meadows	area, surface	waters		
Stormwater pond	07/24/91 08/28/91 11/06/91 05/14/92 06/19/92 06/20/92	17:00 8:00-8:20 7:15-7:45 6:40-7:30 19:30-20:00 11:30-12:00	na <sup>d</sup> na 14 19 na na	na r/w r/w l r/w na	0,P I,0 I I,0,P <sup>e</sup> I,0,P I
Site 1,	Fox Meadows	area, ground	waters		
EB 120C	08/09/91 09/12/91 11/19/91 04/23/92 05/29/92 07/07/92	14:15-15:00 16:00-16:56 14:45 13:55 11:00 9:36-10:40	27 33 10 12 na 32	0 w o/w o/w c/w	I I I I
EB 121A		13:30 7:05-8:15 13:47-14:45 9:23-11:00 11:10	27 31 na na 34	o/w 1 o/w 1 w	0,P 0,P I I,0,P I,0,P
EB 122A	08/08/91 09/13/91 11/19/91 05/29/92 07/07/92	7:00-9:00 8:30 15:30 13:00-14.00 14:15-14:45	27 24 na 25 na	0/w 0/1 0/w 0 w	0,P I,0,P I I,0,P I,0,P
Site 2,	Miles Sand	pit area, surf	ace wate	ers	
Roadsite puddle	11/06/91	18:30-19:00	14	r/w	I
Drainage ditch	08/28/91 05/14/92 06/19/92 06/20/92	19:00-20:00 17:45-18:30 18:30-19:30 11:00-11:30	24 19 na na	r/w l w/r na	I,0 I,0,P <sup>e</sup> I,0,P I
Sand pit pond	07/24/91 08/12/91 11/19/91 05/29/92 07/06/92	16:30 16:50-16:05 13:22-13:45 na 16:50-16:00	na 27 10 20 na	na o/w o/w na na	0,P I I I I

Table 1. (Continued)

Sample si	te	Sample date	Sample time <sup>a</sup>	Air temp. deg. C	Weather <sup>b</sup>	Chemical analyses <sup>C</sup>
	Site 2,	Miles Sand	pit area, gr	ound waters		
EB 130A		08/08/91 09/13/91 11/19/91 04/23/92 05/28/92 07/06/92	12:00-17:00 10:00 10:35 9:30-10:45 11:30-13:00 10:30-11:15	25 10 18 ) 12	w o/w o/w o e/w	I,0,P <sup>e</sup> I,0,P I I I,0,P I,0,P
EB 130C		08/09/91 09/13/91 11/19/91 04/23/92 05/28/92 07/06/92	10:00 10:45-11:15 11:45 10:45 13:30 11:40-12:00	10 18 12	0 0/w 0/w 0/w e w	I I I I I
EB 131A		08/09/91 09/13/91 04/23/92 05/28/92 07/06/92	12:00-12:34 11:30-12:15 10:45-11:30 15:00-16:00 16:00-17:00	30 14 18	o o/w l e	0,P I,0,P I I,0,P I,0,P

<sup>a. Time in 24 hour clock; range in time refers to start time to finish time.
b. o = cloudy, w = windy, l = calm, r = rain, e = clear.
c. I = inorganic, O = volatile organic, P = pesticide.
d. Data not available.</sup> 

e. Chain of custody date for organic and pesticide determinations is one day later than recorded on sample log sheet.

Table 2. Chemical Properties and Inorganic Constituent Concentrations

	Sample site	Sample	Sp.C. µS/cm <sup>a</sup>	Lab Pr <sup>b</sup>	Ca mg/L	Mg mg/L	Na mg/L	K mg/L	Sr mg/L	HCO3	SO <sub>4</sub>	ci mg/L	F mg/L	NO3-N mg/L	PO4-P mg/L	As mg/L	Cu mg/L	Mn mg/L	Pb mg/L
							Site	1, Fox	1, Fox Meadows area,	area,	surface waters	waters							
	Stormwater pond	08/28/91	1140	7.10	75.7	16.3	114	29.8	0.48	22	219	183							
		11/06/91	92	7.00	7.7	1.2	2.7	4.5	0.04	34	3.7	2.4	0.12	0.8			,		
		05/14/92	214								7.1	21.2		0.8		0.0010	0.027	0.0003	0.0042
		06/19/92	ĸ	6.80	9.3	1.0	1.0	6.4	0.04	32	1.7	2.7	0.12	7.0	0.147	0.0020	0.020	0.0022	0.0080
		06/20/92	%	9.65	9.3	1.0	4.0	5.4	0.04	33	2.2	7.9	0.12	7.0	0.147	0.0006	0.0070	0.0010	0.0105
							Site	1, Fox	1, Fox Meadows area,	s area,	ground waters	aters							
								•		•	•								
	EB 120C	08/09/91	877	7.45	63.7	12.1	74.5	2.3	0.58	240	9.79	70.9		5.5					
		09/12/91	785	7.45	68.5	12.5	77.1	3.8	0.57	242	71.7	74.4	27.0	5.2	0.033	0.0026	0.018	<0.0010	0.013
		11/19/91	714	7.40	68.0	12.2	73.6	3.4	0.19	239	6.79	73.4	0.48	5.4	0.033	0.0083	0.0034	0.0011	0.011
		04/23/92	<u>%</u>								8.79	77.2		5.5		0.0010	<0.0001	0.0017	0.0030
9		05/29/92	33								69.5	73.7		5.4		0.0018	0.0005	0.0011	0.0048
		07/07/92	785	7.60	6.5	12.1	77.1	3.6	0.57	236	6.07	77.0	0.51	5.9	0.029	0.0018	0.012	0.0005	0.0000
			Í			,	9	,			!	!	í		0			, 200	600
	EB IZIA	11/19/91		07.7	2.5	0.7	0.00	4.0	0.50	177	0.00	, ,,	2.	7.0	0.046	2000.0		7000	3000.0
		76/67/50	900								7.70	(7.3		0		0.0015	0.00	0.000	0.00%
		07/07/92	583	7.55	61.6	10.9	41.1	3.4	0.49	123	35.2	41.2	0.74	3.6	0.033	0.0009	0.0135	0.0023	0.0040
	EB 122A	09/13/91	728	7.20	71.8	13.0	57.3	3.5	0.55	208	63.9	75.4	97.0	5.4	0.020	0.0046	0.0100	0.0310	0.013
		11/19/91	732	7.25	74.2	13.3	9.95	2.7	0.19	212	62.4	74.2	0.48	5.9	0.026	0.0071	0.0024	0.0018	0.0048
		05/29/92	260								64.3	85.5		5.4		0.0019	0.0016	0.0019	0.012
		07/07/92	720	7.25	72.9	13.3	57.0	5.5	0.58	210	61.1	83.1	0.50	5.4	0.023	0.0023	0.0175	0.0022	0.0014
							Site 2,	, Miles		Sand pit area,		surface waters							
	o letter of interest	11,06,01	807	7 40	7 4	,	7 37	•	;	Ş	7,7	7 (7	7	7 6					
	koads ide podie	14/00/11	9	9.	0.12	3	0.0	•	7.10	3	•	0.70	2	;					
	Drainage ditch	08/28/91	138	7.50	10.4	1.4	16.1	6.4	0.05	26	6.5	8.0							
		05/14/92	150								3.2	3.9		1.2		0.0025	0.015	0.0024	0.0065
		06/19/92	88	6.40	3.3	9.0	4.5	12.2	0.02	25	1.9	7.6	<0.10	7.0	0.179	0.0034	0.029	0.0015	0.0077
		06/20/92	93	6.80	6.5	1.2	2.8	11.4	0.04	36	1.7	6.1	0.13	0.5	97.0	0.0030	0.0067	0.0004	0.0075

Table 2. (Continued)

Sample site	Sample date	Sp.C. µS/cm <sup>a</sup>	Lab PH <sup>b</sup>	Ca mg/L	Mg mg/L	Na mg/L	K mg/L	Sr mg/L	нсо <sub>3</sub> mg/L	SO <sub>4</sub>	Cl mg/L	F mg/L	NO3-N mg/L	PO <sub>4</sub> -P mg/L	As mg/L	Cu mg/L	Mn mg/L	Pb mg/L
					Site		s Sand	pit are	a, surf	ace wate	2, Miles Sand pit area, surface waters (continued)	inued)						
Sand pit pond	08/12/91	2220	8.35	61.2	22.2	347.0	5.4	0.79	155	180	206							
	11/19/91	2210	8.10	74.9	22.9	352.0	5.9	0.27	571	177 172	512 512	0.61	0.3	0.003	0.0110	0.0106	0.0430	0.0073
	07/06/92	2120	8.00	67.3	21.8	335.0	7.9	0.76	150	991	495	67.0	0.3	<0.003	0.0027	0.0100	0.0022	0.0058
						Site	?, Mile	s Sand p	oit area	Site 2, Miles Sand pit area, ground waters	1 waters							
EB 130A	08/08/91	2320	8.00	67.5	22.7	360.0	5.7	0.90	170	178	536		0.1					
	09/13/91	2350	7.65	77.4	54.6	373.0	7.2	0.91	174	177	553	0.56	0.5	0.039	0.0032	0.0250	0.0230	0.0088
	11/19/91	2360	7.70	79.7	25.1	371.0	7.7	0.32	177	176	260	0.54	0.3	0.029	0.0092	0.0093	0.0299	0.0038
	04/23/92	2390								158	579		0.3		0.0007	0.0028	0.0220	0.0037
	05/28/92	2400								167	585		0.5		0.0047	0.0075	0.0190	0.0055
	07/06/92	2400	7.75	72.1	23.8	391.0	8.0	0.86	171	170	581	09.0	1.3	0.039	0.0025	0.0210	0.0330	0.0052
EB 130C	08/09/91	2340	7.80	75.3	23.3	354.0	5.4	0.87	175	180	536		0.1					
	09/13/91	2345	7.60	82.5	24.3	360.0	8.9	98.0	175	180	246	0.54	0.3	0.029	0.0048	<0.010	0.0240	0.0084
	11/19/91	2350	7.60	83.5	24.3	361.0	6.9	0.30	181	177	553	0.52	0.2	0.026	0.0115	0.0029	0.0314	0.0027
	04/23/92	2360								991	295		0.1		0.0022	0.0006	0.0170	0.0050
	05/28/92	2380								<b>1</b> 64	268		0.1		0.0026	0.0012	0.0150	0.0088
	07/06/92	2390	7.75	80.0	23.7	377.0	4.1	0.86	173	169	929	0.56	0.3	0.020	0.0035	0.0080	0.0205	0.0036
FB 131A	09/13/91	2150	2.90	1.89	20.7	0.025	11.4	0.73	156	172	267	0.81	0.2	0.049	0.0054	<0.010	0.0010	0,0068
: !	04/23/92	2200							!	175	512		0.2		0,0020	0.0035	0.0002	0.0057
	05/28/92	2210								173	509		0.3		0.0030	0.0034	0.0002	0.0065
	07/06/92	2205	8.00	72.8	24.5	346.0	5.2	0.81	175	176	511	0.62	0.2	0.033	0.0033	0.0070	0.0004	0.0004

a. Specific conductance in microSiemen/cm at 25 °C. b. Recorded to nearest 0.5 unit. Br concentrations in samples collected from EB 130A and EB 130C wells on 11/19/91 are 1.30 mg/L and 0.90 mg/L, respectively.

The nitrate and phosphate concentrations of the study waters were determined to assess nutrient inputs from such sources as fertilizers and septic systems. The maximum contaminant level for nitrate in drinking water is 10 mg/L for nitrate expressed as nitrogen (NO<sub>3</sub>-N) or 45 mg/L if expressed as nitrate (NO<sub>3</sub>). Nitrate concentrations in the Fox Meadows pond were relatively low [0.4-0.8 mg/L as NO<sub>3</sub>-N (1.6-3.6 mg/L as NO<sub>3</sub>)], and were lower during the latter part of the study. In contrast, the nitrate concentrations of the ground water were much higher, [3.6-8.1 mg/L NO<sub>3</sub>-N (16-36 mg/L NO<sub>3</sub>)], although still below the drinking-water standard. The nitrate values remained nearly constant in waters from wells EB 120C and EB 122A [5.2-5.9 mg/L NO<sub>3</sub>-N (23-26 mg/L NO<sub>3</sub>)] but fluctuated between 3.6 and 8.1 mg/L NO<sub>3</sub>-N (16 and 36 mg/L NO<sub>3</sub>) in well EB 121A. Although the housing development is outside the city limits and uses septic tanks and lateral lines for domestic wastewater disposal, the recent and continuing construction of the development and the relatively constant nitrate in the ground water for two wells suggests that most of the nitrate is from past agricultural sources. The area was farmed previous to development.

Phosphate concentrations in all the samples from the Fox Meadows and Mile Sand pit areas were low, less than 0.5 mg/L as phosphate-phosphorus ( $PO_4$ -P). Surface waters in the Fox Meadows retention pond and the Miles Sand drainage ditch contained greater phosphate concentrations (0.15-0.46 mg/L  $PO_4$ -P) than the Miles Sand pit and all ground waters (0.001-0.049 mg/L  $PO_4$ -P), suggesting removal by adsorption on sediment.

Water in the Miles Sand pit was slightly saline during the study, with a relatively constant chloride concentration ranging from 495 to 512 mg/L (Table 2). At least part of the salinity could be derived from street runoff containing dissolved road salt. The stormwater drainage area includes mainly urban but also rural land use. The drainage ditch is along a heavily traveled street on which road salt is spread when conditions warrant. The pit is just to the east of the street. Water collected in the late spring and summer from the drainage ditch routing water to the pit contained dissolved chloride concentrations in the range of only 1.7-6.5 mg/L. In comparison, snowmelt at the beginning of winter (November 6, 1991) collected from a roadside

puddle contained 63 mg/L dissolved chloride, whereas snowmelt collected on the same day from the Fox Meadows drainage pond had only 2.4 mg/L chloride. No ditch samples were collected during the middle or at the end of the winter when runoff dissolving road salt would be expected to be the most saline. However, examination of snowmelt was not included in the original study purpose and funding.

The ground water in the vicinity of the pit was also saline with a total range of chloride concentration of 493-582 mg/L for the three monitoring wells near the pit (Table 2). The chloride concentrations showed a slight increasing trend during the study, and sulfate concentrations either remained nearly constant or decreased slightly.

To examine possible salinity sources by geochemical identification, we also determined the bromide concentration in samples collected from wells EB 130A and 130C on November 11, 1991. The bromide and chloride composition of the waters were compared to plots of bromide/chloride ratio versus chloride concentration for the mixing of freshwaters and various salinity sources. Other possible saltwater sources besides road salt that were considered in the study region are natural salt dissolution in the Permian rocks underlying the alluvial aquifer, saline Arkansas River water (which also receives its salinity from Permian salt dissolution), and oil-field brines (Whittemore, 1982, 1984, 1990). The bromide/chloride mass ratios for the two well waters (0.00232 for EB 130A and 0.00163 for EB 130C) are higher than expected for only Permian salt dissolution (a ratio range of 0.0002-0.0010 at a chloride concentration of 550 mg/L) and lower than expected for oil brine as the primary chloride source (a ratio above 0.003). The ratios might fit a mixture of natural salt dissolution and oil brine as the chloride source. Another possibility is a mixture of salinity from natural salt dissolution and road salt with elevated bromide from combustion products of gasoline additives.

The ground waters in the study region appear to be more saline in locations closer to the Arkansas River and fresher in locations closer to the Little Arkansas River based on data in this report, Lane and Miller (1965), Bevans (1989), and analyses of waters from several test wells drilled to the base of the alluvial aquifer in 1986 (R. Vincent, personal communication, 1993).

Water collected in 1985 from a 25-ft-deep (7.6-m-deep) domestic well labeled "D" in Figure 1 had chloride and sulfate concentrations of 220 mg/L and 150 mg/L, respectively (Bevans, 1989). Ground waters from three test wells in SW NE sec. 19, T. 26 S., R. 1 E. were slightly saline based on field determinations of chloride concentration (R. Vincent, personal communication, 1993). The locations of the three test wells are shown as T1, T2, and T3 on Figure 1. The chloride contents of waters from test holes T2 [28-38 ft (8.5-11.6 m) depth] and T3 [35-45 ft (10.7-13.7 m) depth] were very similar, 272 and 282 mg/L, respectively. The chloride concentration of water from test hole T1 was more saline, 508 mg/L at a depth of 28-38 ft (8.5-11.6 m) and 460 at a depth of 38-48 ft (11.6-14.6). In 1989 chloride and sulfate concentrations ranged from 355 mg/L and 210 mg/L, respectively, for water from the shallow well to 477 mg/L and 213 mg/L, respectively, for the deep well at site EB 221 in NE NW SW sec. 14, T. 26 S., R. 1 W., 0.2 mi (0.3 km) south of the Arkansas River and about 2.5 mi (4.0 km) to the northwest of Miles Sand pit (Whittemore, 1990). Water collected in 1985 from a 40-ft-deep (12-m-deep) domestic well in NW NW NW sec. 15, T. 26 S., R. 1 W., 0.4 mi (0.6 km) southwest of the Arkansas River and about 4 mi (6 km) to the northwest of Miles Sand pit, had chloride and sulfate contents of 630 mg/L and 250 mg/L, respectively (Bevans, 1989). In contrast, ground waters from four test holes drilled about 0.1 mi (0.16 km) east of the Little Arkansas River in the NE NE sec. 29, T. 26 S. R. 1 E. and at a depth of 38-45 ft (11.6-13.7 m) contained 98-115 mg/L chloride and 174-229 mg/L sulfate (R. Vincent, personal communication, 1993).

Thus ground waters about a mile to the southeast of the Miles Sand pit on the east side of the Little Arkansas River are fresh, whereas ground waters near Miles Sand pit on the west side of the Little Arkansas River and near the Arkansas River are saline. The higher chloride concentration at the shallower depth in test hole T1 and the slightly, but consistently higher chloride in water from shallow well EB 130A than in samples from deep well EB 130C suggest that the main salinity source near Miles Sand pit is not derived from below the alluvial aquifer. The major salinity source must also fit the pattern of increasing chloride concentration toward the south, as indicated by waters from the Fox Meadows monitoring wells, a 30 ft deep well in

SW sec. 18, T. 26 S., R. 1 E. yielding water with a chloride concentration of 61 mg/L (B.G. Fisher residence), well D, test holes T1 to T3, and the monitoring wells near Miles Sand pit.

Much of the ground-water and sand-pit salinity could be derived from saline water in the alluvium of the Arkansas River valley that has flowed in the subsurface as a result of local waterlevel differences. The Miles Sand pit is situated between two rivers, although it is closer to the Little Arkansas River than to the Arkansas River as indicated by Figure 1. The two river channels approach each other near Miles Sand pit and approximately parallel one another until joining about 5 mi (8 km) to the south in the center of Wichita. Once the channels are within 1.5 mi (2.4 km) of one another, as apparent in sections 24 and 19 in Figure 1, the separation distance ranges from 0.5 mi to less than 1.5 mi (0.8-2.4 km) before the confluence. The channel of the Arkansas River appears to be at a higher level than that of the Little Arkansas River in the study area. The relative elevations for the two river levels were estimated using the U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles for Maize and Valley Center. Elevation contours for both quadrangles are based on 1939 planetable surveys revised in 1960 for Maize and 1961 for Valley Center. Features on both maps, including the river channels, were both photorevised in 1982. The river conditions for both maps appear to be lower flows. The elevation contour for 1,325 ft crosses the Arkansas River in SW sec. 24 west of the Miles Sand pit, whereas the estimated elevation is 1,312 ft for the water level in the Little Arkansas River just east of the sand pit in SE sec. 19. In addition, the channel of the Arkansas River is broader and generally shallower than that of the Little Arkansas River. Therefore an average gradient of about 13 ft (4 m) exists between the two rivers, which could cause ground-water to flow through the alluvium from the Arkansas River to the Little Arkansas River. The Little Arkansas River appears to act as a drain relative to the Arkansas River in north Wichita and could induce the flow of saline river water to the Miles Sand pit area. This observation is supported by a modeling study of the Arkansas River valley from Hutchinson to Wichita (Myers et al., 1993).

The source of the natural salinity in the Arkansas River alluvium to the west of the Miles Sand pit is probably derived both from discharge of underlying Permian saltwater to the alluvium

and infiltration of saline Arkansas River water (Whittemore, 1990; Myers et al., 1993). Chloride concentrations in the Arkansas River during lower flows at Maize are in the range of several hundred milligrams per liter, as indicated by values of 140-1,000 mg/L during 1988-1991 (Myers et al., 1993). The sulfate and chloride contents of Arkansas River water collected at Maize in December 1989 were 161 mg/L and 582 mg/L, respectively (Whittemore, 1990). Thus the riverwater sulfate concentration appears to be in a similar concentration range for that in ground waters near the Miles Sand pit, given similar chloride. As indicated earlier, ground waters in Arkansas River alluvium near Maize are also slightly saline and contain higher dissolved solids at deeper depths. The salinity of low Arkansas River flow and alluvial ground waters near the river appears to be sufficiently high to account for most of the chloride content observed in the Miles Sand pit area.

Another possible source of natural saline water could be flow of Permian saltwater from the Permian Wellington aquifer, which underlies the Miles Sand pit according to a map by Gogel (1981). The probability of this source would be greater if a deep unplugged or poorly plugged borehole exists in the vicinity and penetrates the shale underlying the alluvial aquifer. Flow from the underlying Permian would be expected to be greatest when local ground-water levels in the alluvial aquifer were lowest during periods of low river stage and high consumptive use of ground water.

Chloride contents in the Little Arkansas River at Valley Center are lower than those in the Arkansas River near Wichita and are less than 200 mg/L during lower flow (U.S. Geological Survey water data). Chloride concentrations were higher in the Little Arkansas River in the past because surface disposal of oil-field brines contaminated tributaries (Leonard and Kleinschmidt, 1976). Thus part of the salinity in the Miles Sand pit area might be hypothesized as the past infiltration of Little Arkansas River water if the river level was high enough relative to the local ground-water and Arkansas River levels to allow flow into the subsurface and if the salinity of the water was great enough during the higher flows. Such infiltration of oil-brine contaminated waters from the Little Arkansas River could explain the elevated bromide content in the EB 130

samples. However, the combination of conditions needed and the chloride concentration of other ground waters near the river indicate that this is probably not a significant salinity source.

Consumptive use of ground water from wells and evaporation from the sand pit pond during the summer might cause local depressions in the ground-water table relative to the river, but they would also induce additional flow from the Arkansas River. Sustained high flows in the Little Arkansas River with lower flows in the Arkansas River would be necessary for substantial infiltration of Little Arkansas River water. The first flush of surface or near-surface oil brine by a rainstorm in the Little Arkansas River watershed could bring in saline water, but continued high flows would be much too dilute to add appreciable salinity to the alluvial aquifer near Miles Sand pit. As indicated earlier, ground waters are fresh close to the eastern side of the Little Arkansas River southeast of the Miles Sand pit. Infiltration of any oil brine from the river would also be expected to affect this location. If oil brine has contributed to the salinity, the source is not expected to be local because the Miles Sand pit is not near an oil field. In comparison, the Fox Meadows drainage area is relatively near an oil field (the Valley Center Field to the north) but the ground waters in that area are not high in chloride.

The additional bromide in the two ground-water samples above that attributable to natural salt dissolution could also be derived from the bromine-containing additive used in leaded gasoline. Bromide/chloride ratios at given chloride concentrations are generally higher in street runoff from urban areas than for rural areas (Davis and Whittemore, unpublished paper, 1993). The shallower EB 130A well has a higher bromide/chloride ratio, possibly suggesting a greater contribution to the total salinity from urban runoff affected by road salt and gasoline additives, than the ground water from the deeper well EB 130C. Unlike the bromide concentrations, the chloride concentrations at the two depths of site EB 130 are similar, and the slight variations in chloride concentration generally occur in concert. Any explanation based on two or more salinity sources must fit the dissimilar change in bromide and chloride concentrations with depth and the similarity in chloride concentration variations.

Chloride concentrations in samples from well EB 130A were somewhat lower but

consistently less than those in water from well EB 131A. However, well EB 130A is closer to the Arkansas River than well EB 131A. If the main salinity source is from Arkansas River alluvium to the west, variations in local recharge could be the explanation. The Maize topographic quadrangle shows a large, elongated pond in sec. 24 (also drawn in Figure 1) that parallels but is not connected to the Arkansas River during lower river flow. This pond would receive direct atmospheric precipitation and surface drainage in the immediate area during storms. The freshwater could dilute the saline shallow ground water near the pond. Well site EB 130 is only 0.2 mi (0.3 km) east of the easternmost fingers of the pond area known as the Moorings.

Nitrate concentrations in the Miles Sand pit waters were relatively low, 0.3-0.9 mg/L as NO<sub>3</sub>-N (1.2-4.1 mg/L as NO<sub>3</sub>), a range similar to that for the Fox Meadows pond waters. Water in the roadside puddle and drainage ditch samples contained a somewhat greater range in nitrate, [0.4-2.7 mg/L NO<sub>3</sub>-N (1.8-12 mg/L NO<sub>3</sub>)]. Nitrate contents in the ground waters from the three wells in the pit area [0.1-1.3 mg/L NO<sub>3</sub>-N (0.5-5.7 mg/L NO<sub>3</sub>)] were also in the same general range as for the pit waters but were much lower than in the Fox Meadows ground water.

The dissolved concentrations of the metals arsenic, copper, lead, and manganese were all below current values for maximum contaminant levels in drinking waters in all surface waters and ground waters sampled at both the Fox Meadows and Miles Sand pit areas (Table 2). There is no apparent pattern in the metals concentrations from surface- or ground-water collection sites or with time.

The water samples from both sites were analyzed for the volatile organic compounds included in modified method 8240 of the U.S. Environmental Protection Agency (Appendix C). The volatile organic compounds include mainly chlorinated hydrocarbons and simple aromatic hydrocarbons that are of concern for drinking waters. Analyses were not made for saturated petroleum hydrocarbons composing the major part of gasoline and oil. No concentrations of the volatile organic compounds determined were found above the practical quantification limits (listed with the analyses in Appendix C) for the analytical methods used to determine the

compounds. Traces of a few volatile organic compounds were detected in a few samples.

However, the chemicals are also used in the analytical laboratory and might possibly represent contamination by vapors during processing and analysis.

No detectable concentrations of the triazine herbicides atrazine, propazine, simazine, and prometon were found in any of the surface- and ground-water samples (Appendix D). The analytical laboratories determining the herbicides improved their ability to detect lower limits of the compounds during the study period. Detection limits for the four herbicides were  $1 \mu g/L$  for the later samples. Traces of the insecticides malathion and chloropyrifos were found in a sample from the drainage ditch of the Miles Sand pit collected on June 19, 1992. The two compounds were identified in the laboratory using two different analytical columns and conditions and thus appear to be real detections.

#### **Conclusions**

The study indicates that ground-water quality in the Equus Beds aquifer underlying the stormwater retention pits has not been significantly affected by volatile organic compounds, triazine herbicides, and heavy metals. Surface waters in the stormwater retention pits and drainage ditch and ground waters underlying the pit areas did not contain concentrations of these substances at levels of concern to water supplies during the study period. One of the drainage ditch samples contained detectable insecticides. Agricultural activities occurring before the new housing development in Fox Meadows appear to have caused moderate nitrate contamination of the Equus Beds aquifer, although the concentrations are less than the drinking-water standard. Nitrate concentrations in all the other surface and ground waters sampled were relatively low. The investigation provides good background data against which to compare future effects of infiltrating stormwater runoff in the developing Fox Meadows addition.

The main water-quality problem observed is saline water in the Miles Sand pit and ground waters near the pit. Hydrogeochemical data suggest that most but not all of the salinity is natural. An appreciable portion of the chloride concentration is probably from saline water in the Arkansas River and alluvial aquifer next to the river that has flowed in the subsurface toward the

Little Arkansas River. The Miles Sand pit area lies along the ground-water flow path between the two rivers. Upward movement of saltwater from the Permian Wellington aquifer underlying the study area could be another possible natural salinity source. Contamination by oil-field brine does not appear to be a significant chloride source. Street runoff containing dissolved road salt applied to heavily traveled Meridian Street and other streets near the pit would be the most likely anthropogenic contribution to the salinity. The exclusion of drainage from Meridian Street to the Fox Meadows pond might be responsible for the decrease in the salinity of waters in the stormwater retention pond in that area. The lack of samples collected from the drainage ditch near the Miles Sand pit during the middle or end of winter makes it difficult to assess whether street runoff can contain a high enough chloride concentration to be a major source of the salinity in the Miles Sand pond and ground waters. A definitive geochemical identification of the main chloride source(s) based on bromide and chloride relationships for only two ground-water samples was not possible because of the variety of potential salinity sources.

#### **Recommendations for Further Study**

The major unknown revealed by the study is the contribution of winter street runoff to water salinity. Determination of this source would involve sample collection mainly during the winter from the drainage ditch, pond, and wells of the Miles Sand pit and determination of specific conductance, and chloride, sulfate, and bromide concentrations. Some samples from the Fox Meadows area should be included for direct comparison of an area without major street runoff during the same time span. The sampling should focus on drainage ditch waters during periods of snow and ice melt following applications of appreciable amounts of road salt.

Geochemical interpretation of the results will provide a much better assessment of the impact of urban runoff on ground- and surface-water salinity. A few samples could also be analyzed for petroleum hydrocarbons that comprise oil and gasoline used in vehicles, and for volatile organic compounds and pesticides. Determination of petroleum hydrocarbons in the samples will allow assessment of the impact of vehicular organic compounds in street runoff compared with runoff

in a residential area.

The Fox Meadows housing addition was in the process of early development during this study. Any effects on runoff of domestic fertilizer and pesticide use would be expected to increase as development continues toward completion of the 60 housing units. The data presented in this report provide a database against which to compare chemical data from longterm sampling as the drainage areas for both stormwater retention pits continue to develop. Such continued sampling could include major, minor, and trace inorganic constituents, hydrocarbons and volatile organic compounds, and pesticides. Additional trace metals, such as cadmium, chromium, mercury, and selenium, should be included in the analyses of selected samples. Sampling once every two years from the two unlined pits and the six monitoring wells should be sufficient, based on the low impact of trace metals and organic compounds found in the study. Sample collection for tracking salinity effects may need to be more frequent, based on the suggested winter study of street runoff. A continued investigation should be designed to distinguish the ground-water quality effects of below-ground disposal, such as septic systems and infiltration of surface runoff into the stormwater retention ponds. Sampling of runoff at the beginning and end of a few storms after dry periods would provide information on the chemical composition of flush waters in which surface-derived contaminants might be expected to be greatest.

Any future investigations should consider the potential for other sources of ground-water contamination in the area and the direction of ground-water flow. For example, water well records show that seven monitoring wells were drilled in August 1993 in the northeast corner of the section in which the Miles Sand pit is located. The wells are part of a remediation investigation of the Kansas Department of Health and Environment. Records for test wells drilled earlier in the same general area indicate the presence of a gas station, a potential source of hydrocarbons.

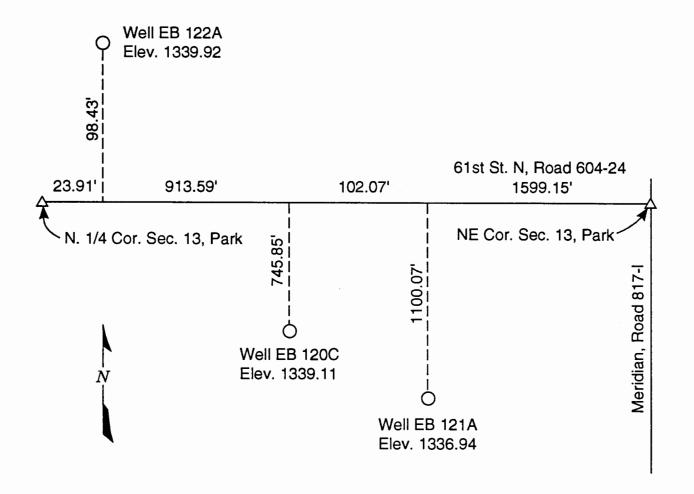
#### Acknowledgments

The information provided by Robert Vincent of Ground Water Associates Inc. on test holes in the study area was valuable for interpreting salinity sources. In addition, the following individuals are acknowledged for their contributions to the study: Trolona Burgir, Don Koci, Jonathan Fisher, Mary Fisher, Shannon Fisher, Kevin Howard, Don Rider, Adrianne Smith, and Marshall Staughter (water sample collection), Karmie Galle and Truman Waugh (determination of inorganic constituents in water samples), S. Ravikumar (data entry for tables), Mark Schoeneweis (production of figure graphics), Mimi Braverman (editing of the final report), Anna Kraxner (production of report copies), Harley Miles (Fox Meadows site access), and George Pearson (Miles Sand Co. site access).

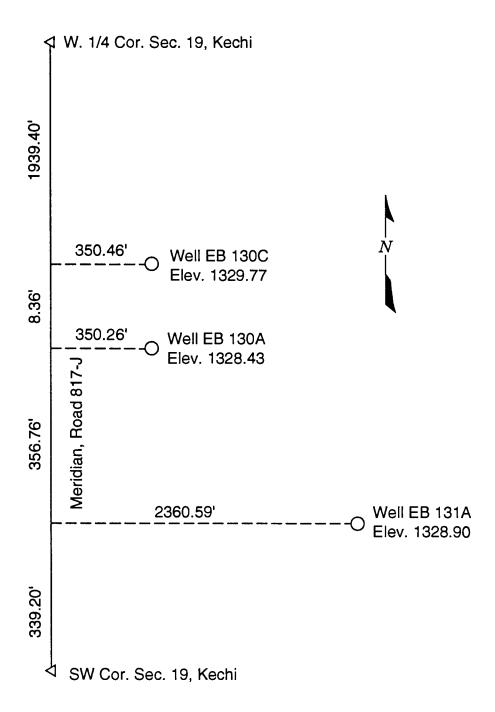
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## Appendix A: Measured Locations and Elevations of Monitoring Wells



Fox Meadows area
NE 1/4 Sec. 13, T. 26 S., R. 1 W.
Park Twp. Sedgwick Co., KS
Well elevations at top of well casing inside box.
Survey by Sedgwick County Bureau of Public Services.



Miles Sand pit area SW 1/4 Sec. 13, T. 26 S., R. 1 E. Kechi Twp. Sedgwick Co., KS Well elevations at top of well casing inside box. Survey by Sedgwick County Bureau of Public Services.

## Appendix B: Monitoring Well Log and Construction Information

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GRAVEL PA GROUT MATERIAL irout Intervals: Froi vhat is the nearest sc 1 Septic tank 2 Sewer lines 3 Watertight sew Direction from well? FROM TO 0 3 3 5 5 10 10 19 19 15 25 30 30 49 3	CK INTERVALS:  1 Neat cerm. Oft. burce of possible core lines 6 Seepage WEST  Topso Fine Coars Fine Fine Coars	From From Prom Prom Prom Prom Prom Prom Prom P	39 2 Cement ground tt., From 7 Pit pin 8 Sewa 9 Feed	it. to	### ### ##############################	From	ome Storm	ft. to ft. to ft. to ft. to  ft. t	ed water as well ecify bel ispos	
GRAVEL PA GROUT MATERIAL irout Intervals: Froi vhat is the nearest sc 1 Septic tank 2 Sewer lines 3 Watertight sew Direction from well? FROM TO 0 3 3 5 5 10 10 19 19 15 25 30 30 49 3	CK INTERVALS:  1 Neat cerm. Oft. burce of possible core lines 6 Seepage WEST  Topso Fine Coars Fine Fine Coars	From From Prom Prom Prom Prom Prom Prom Prom P	39 2 Cement ground tt., From 7 Pit pin 8 Sewa 9 Feed	it. to	### ### ##############################	From	ome Storm	ft. to ft. to ft. to ft. to  ft. t	ed water as well ecify bel ispos	
GRAVEL PA GROUT MATERIAL irout Intervals: Froi vhat is the nearest sc 1 Septic tank 2 Sewer lines 3 Watertight sew Direction from well? FROM TO 0 3 3 5 5 10 10 19 19 15 25 30 30 49 3	CK INTERVALS:  1 Neat cerm. Oft. burce of possible core lines 6 Seepage WEST  Topso Fine Coars Fine Fine Coars	From From Prom Prom Prom Prom Prom Prom Prom P	39 2 Cement ground tt., From 7 Pit pin 8 Sewa 9 Feed	it. to	### ### ##############################	From	ome Storm	ft. to ft. to ft. to ft. to  ft. t	ed water as well ecify bel ispos	
GRAVEL PA GROUT MATERIAL Grout Intervals: From Vhat is the nearest so 1 Septic tank 2 Sewer lines 3 Watertight sew Direction from well? FROM TO 0 3 3 5 5 10 10 19 19 15 25 30 30 49 3	CK INTERVALS:  1 Neat cerm. Oft. burce of possible cor. 5 Cess power lines 6 Seepage WEST  Topso Fine Coars Fine Fine Coars	From From Prom Prom Prom Prom Prom Prom Prom P	39 2 Cement ground tt., From 7 Pit pin 8 Sewa 9 Feed	it. to		From	ome Storm	ft. to	ed water as well ecify bel ispos	
GRAVEL PA GROUT MATERIAL Grout Intervals: From Vhat is the nearest so 1 Septic tank 2 Sewer lines 3 Watertight sew Direction from well? FROM TO 0 3 3 5 5 10 10 19 19 15 25 30 30 49 3	CK INTERVALS:  1 Neat cerm. Oft. burce of possible cor. 5 Cess power lines 6 Seepage WEST  Topso Fine Coars Fine Fine Coars	From From Prom Prom Prom Prom Prom Prom Prom P	39 2 Cement ground tt., From 7 Pit pin 8 Sewa 9 Feed	it. to		From	ome Storm	ft. to	ed water as well ecify bel ispos	
GROUT MATERIAL FOR THE PROPERTY OF THE PROPERT	CK INTERVALS:  1 Neat cerm. Oft. burce of possible cor. 5 Cess power lines 6 Seepage WEST  Topso Fine Coars Fine Fine Coars	From From Prom Prom Prom Prom Prom Prom Prom P	39 2 Cement ground tt., From 7 Pit pin 8 Sewa 9 Feed	it. to		From	ome Storm	ft. to	ed water as well ecify bel ispos	
GRAVEL PA GROUT MATERIAL Grout Intervals: From What is the nearest so 1 Septic tank 2 Sewer lines 3 Watertight sew Direction from well? FROM TO 0 3 3 5 5 10 10 19 19 15 25 30 30 49½ 49½ 555	ED INTERVALS:  CK INTERVALS:  1 Neat cerm  1 Neat cerm  1 O	From From Prom Prom Prom Prom Prom Prom Prom P	39	tt. to	th to to the term of the term	From	e Storm 10 PLUGGII	ft. to	ed water as well ecify bel ispos nd pi	t pond
GRAVEL PA GROUT MATERIAL irout Intervals: Fro Vhat is the nearest sc 1 Septic tank 2 Sewer lines 3 Watertight sew Direction from well? FROM TO 0 3 5 5 10 10 19 19 15 25 30 30 49½ 49½ 55	ED INTERVALS:  I Neat cerm of the content of the co	From From Prom Prom Prom Prom Prom Prom Prom P	39. 2 Cement grounds. From 7 Pit pin 8 Sews 9 Feed OG Coarse Sand	it. to	th to to the total state of the	From	e Storm 10 PLUGGII	ft. to	ed water as well ecify bel ispos nd pi	well  ow) al t pond

WELL # EB-121A	WATE	R WELL RECORD Form W	NC-5 KSA 82a-1		
LOCATION OF WATER WELL:	Fraction	_	Section Number	Township Number	Range Number
funty: SEDGWICK	C E/2 1/4		13	т 26 s	A 1W EW
stance and direction from nearest	town or city street a	address of well if located within o	aty? 2 mai. S	o. of Valley Cen	ter on Meridian,
	o. approx	25 mi., So. on dirt	residential	st. into rox mead	XXX SUDCIVISION,
WATER WELL OWNER:	_			o. end of sub. d	
R#, St. Address, Box # :		nd Water Management		-	Division of Water Resources
ty, State, ZIP Code :		Spruce, Halstead, KS		Application Number:	
LOCATE WELL'S LOCATION WI AN "X" IN SECTION BOX:		COMPLETED WELL29			
		twater Encountered 1			
i   i	1 1	p test data: Well water was .		, ,	
NW NE	1 )	gpm: Well water was .			
		eter 9 . O. Do. 14 BOL			
w	1 2 1	· · · · · · · · · · · · · · · · · · ·			Injection well
	1 Domestic	: 3 Feedlot 6 Oil fiel	d water supply 9	Dewatering 12	Other (Specify below)
SW SE	2 Irrigation	4 Industrial 7 Lawn	and garden only 10	Monitoring well	
	Was a chemical	/bacteriological sample submitted	to Department? Yes		, mo/day/yr sample was sub-
\$	mitted		Wate	r Well Disinfected? Yes	No X
TYPE OF BLANK CASING USE	iD:	5 Wrought iron 8 C	Concrete tile	CASING JOINTS: Glue	d Clamped
1 Steel 3 RMF	, <i>,</i>		Other (specify below)		ied
2 PVC sch 404 ABS	24.5	7 Fiberglass	,		aded. Flush Joint.
ank casing diameter 2					
using height above land surface.			="		
PE OF SCREEN OR PERFORA				40 10 Asbestos-cem	
	nless steel vanized steel	•	8 RMP (SR) 9 ABS	12 None used (o	)
2 Brass 4 Gaiv CREEN OR PERFORATION OPE		5 Gauzed wrapp		8 Saw cut 20 slot	· · · · · · · · · · · · · · · · · · ·
	3 Mill slot	6 Wire wrapped	_	9 Drilled holes	11 None (open noie)
	3 MIII SIOL	o wile wiapped		3 DIMEN HOIS	
7 Louward chuffer	4 Key cunched	7 Torch cut		In Other (specify)	
	4 Key punched	7 Torch cut 24.5 ft to	29.5 <sub>ft From</sub>	10 Other (specify) ft	to ft
2 Louvered shutter CREEN-PERFORATED INTERVA	LS: From	24.5. ft. to	29.5 ft., From	ft.	toft.
CREEN-PERFORATED INTERVA	LS: From	24.5. ft. to	29.5 ft., From	ft.	toft.
	LS: From	7 Torch cut 24.5 ft. to	29.5 ft., From		to
CREEN-PERFORATED INTERVA	From	24.5 ft. to	29.5 ft., From ft., From 29.5 ft., From ft., From		to
GRAVEL PACK INTERVA	From From ALS: From From eat cement	24.5 ft. to	29.5 ft., From 29.5 ft., From ft., From ft., From ft., From ft., From		to
GRAVEL PACK INTERVA  GROUT MATERIAL: 1 No rout Intervals: From. 0	LS: From From From eat cement	24.5 ft. to	29.5 ft., From 29.5 ft., From ft., From ft., From ft., From ft., From		to
GRAVEL PACK INTERVA  GROUT MATERIAL: 1 No rout Intervals: From. 0	LS: From From From eat cement	24.5 ft. to	29.5 ft. From tt. From tt. From tt. From tt. From Bentonite BOLACO	## ft.	to
GRAVEL PACK INTERVA  GROUT MATERIAL: 1 No rout Intervals: From. 0	ALS: From From From eat cement	24,5 ft. to	29.5 ft. From tt. From tt. From tt. From tt. From tt. From Bentonite BOLEC.	ft.   ft.	to
GRAVEL PACK INTERVA  GROUT MATERIAL: 1 No rout Intervals: From. 0	ALS: From From From eat cement	24,5 ft. to	29.5 ft. From tt. From 29.5 ft. From tt. From tt. From tt. From Bentonite BOLEC ft. to. 10 Livesto 11 Fuel st 12 Fertiliz	ft.   ft.	to
GROUT MATERIAL: 1 Note Intervals: From . 0	ALS: From From  ALS: From From eat cement	24.5 ft. to	29.5 ft. From ft. Fro	ft.	to ft. to ft. to ft. to ft. to ft. Abandoned water well Dit well/Gas well Dther (specify below) rater disposal pit
GRAVEL PACK INTERVA  GRAVEL PACK INTERVA  GROUT MATERIAL: 1 No out Intervals: From 0 nat is the nearest source of poss 1 Septic tank 4 L 2 Sewer lines 5 C 3 Waterlight sewer lines 6 Serection from well?	ALS: From From  ALS: From From  eat cement	24.5 ft. to	29.5 ft. From ft. Fro	PLSUG.  ft., From  ck pens 14 / orage 15 ( er storage Storm w	to ft. to ft. to ft. to ft. to ft. Abandoned water well Dit well/Gas well Dther (specify below) rater disposal pit
GRAVEL PACK INTERVA  GRAVEL PACK INTERVA  GROUT MATERIAL: 1 Note of Intervals: From 0	ALS: From From  ALS: From From eat cement	24.5 ft. to	29.5 ft. From ft. Fro	ft.	to ft. to ft. to ft. to ft. to ft. Abandoned water well Dit well/Gas well Dther (specify below) rater disposal pit
GRAVEL PACK INTERVA  GRAVEL PACK INTERVA  GROUT MATERIAL: 1 No out Intervals: From 0 nat is the nearest source of poss 1 Septic tank 4 L 2 Sewer lines 5 C 3 Watertight sewer lines 6 Serection from well?	ALS: From From  ALS: From From  eat cement	24.5 ft. to	29.5 ft. From ft. Fro	ft.	to ft. to ft. to ft. to ft. to ft. Abandoned water well Dit well/Gas well Dther (specify below) rater disposal pit
GRAVEL PACK INTERVA  GRAVEL PACK INTERVA  GROUT MATERIAL: 1 No out Intervals: From 0 nat is the nearest source of poss 1 Septic tank 4 L 2 Sewer lines 5 C 3 Watertight sewer lines 6 Serection from well?	ALS: From From  ALS: From From  eat cement	24.5 ft. to	29.5 ft. From ft. Fro	ft.	to ft. to ft. to ft. to ft. to ft. Abandoned water well Dit well/Gas well Dther (specify below) rater disposal pit
GRAVEL PACK INTERVA  GRAVEL PACK INTERVA  GROUT MATERIAL: 1 No out Intervals: From 0	ALS: From From  ALS: From From  eat cement	24.5 ft. to	29.5 ft. From ft. Fro	ft.	to ft. to ft. to ft. to ft. to ft. Abandoned water well Dit well/Gas well Dther (specify below) rater disposal pit
GRAVEL PACK INTERVA  GRAVEL PACK INTERVA  GROUT MATERIAL: 1 No rout Intervals: From 0	ALS: From From  ALS: From From  eat cement	24.5 ft. to	29.5 ft. From ft. Fro	ft.	to
GRAVEL PACK INTERVA  GRAVEL PACK INTERVA  GROUT MATERIAL: 1 No cout Intervals: From 0	ALS: From From  ALS: From From  eat cement	24.5 ft. to	29.5 ft. From ft. Fro	ft.	to ft. to ft. to ft. to ft. to ft. Abandoned water well Dit well/Gas well Dther (specify below) rater disposal pit
GRAVEL PACK INTERVA  GRAVEL PACK INTERVA  GROUT MATERIAL: 1 No rout Intervals: From 0	ALS: From From  ALS: From From  eat cement	24.5 ft. to	29.5 ft. From ft. Fro	ft.	to ft. to ft. to ft. to ft. to ft. Abandoned water well Dit well/Gas well Dther (specify below) rater disposal pit
GRAVEL PACK INTERVA  GRAVEL PACK INTERVA  GROUT MATERIAL: 1 No rout Intervals: From 0	ALS: From From  ALS: From From  eat cement	24.5 ft. to	29.5 ft. From ft. Fro	ft.	to ft. to ft. to ft. to ft. to ft. Abandoned water well Dit well/Gas well Dther (specify below) rater disposal pit
GRAVEL PACK INTERVA  GRAVEL PACK INTERVA  GROUT MATERIAL: 1 No rout Intervals: From 0	ALS: From From  ALS: From From  eat cement	24.5 ft. to	29.5 ft. From ft. Fro	ft.	to ft. to ft. to ft. to ft. to ft. Abandoned water well Dit well/Gas well Dther (specify below) rater disposal pit
GRAVEL PACK INTERVA  GRAVEL PACK INTERVA  GROUT MATERIAL: 1 No rout Intervals: From 0	ALS: From From  ALS: From From  eat cement	24.5 ft. to	29.5 ft. From ft. Fro	ft.	to ft. to ft. to ft. to ft. to ft. Abandoned water well Dit well/Gas well Dther (specify below) rater disposal pit
GRAVEL PACK INTERVA  GRAVEL PACK INTERVA  GROUT MATERIAL: 1 No cout Intervals: From 0	ALS: From From  ALS: From From  eat cement	24.5 ft. to	29.5 ft. From ft. Fro	ft.	to ft. to ft. to ft. to ft. to ft. Abandoned water well Dit well/Gas well Dther (specify below) rater disposal pit
GRAVEL PACK INTERVA  GRAVEL PACK INTERVA  GROUT MATERIAL: 1 No rout Intervals: From 0	ALS: From From  ALS: From From  eat cement	24.5 ft. to	29.5 ft. From ft. Fro	ft.	to ft. to ft. to ft. to ft. to ft. Abandoned water well Dit well/Gas well Dther (specify below) rater disposal pit
GRAVEL PACK INTERVA  GRAVEL PACK INTERVA  GROUT MATERIAL: 1 No rout Intervals: From 0	ALS: From From  ALS: From From  eat cement	24.5 ft. to	29.5 ft. From ft. Fro	ft.	to ft. to ft. to ft. to ft. to ft. Abandoned water well Dit well/Gas well Dther (specify below) rater disposal pit
GRAVEL PACK INTERVA  GRAVEL PACK INTERVA  GROUT MATERIAL: 1 No rout Intervals: From 0	ALS: From From  ALS: From From  eat cement	24.5 ft. to	29.5 ft. From ft. Fro	ft.	to ft. to ft. to ft. to ft. to ft. Abandoned water well Dit well/Gas well Dther (specify below) rater disposal pit
GRAVEL PACK INTERVA  GRAVEL PACK INTERVA  GROUT MATERIAL: 1 No rout Intervals: From. 0	ALS: From	24,5 ft. to	29.5 ft. From tt. From 29.5 ft. From tt. From tt. From Bentonite BOTAPC ft. to.  10 Livesto 11 Fuel st 12 Fertiliz: 13 Insectic How man)	ft.	to ft. to ft. to ft. to ft. to ft. Abandoned water well Dither (specify below) atter disposal pit INTERVALS
GROUT MATERIAL: 1 No rout Intervals: From. 0 hat is the nearest source of poss 1 Septic tank 4 L 2 Sewer lines 5 G 3 Watertight sewer lines 6 S irection from well? WESTERD TO	ALS: From	24,5 ft. to	29.5 ft. From tt. Fro	ft.	to ft. to ft. to ft. to ft. to ft. Abandoned water well Dither (specify below) rater disposal pit INTERVALS
GROUT MATERIAL: 1 No out Intervals: From . 0	ALS: From	24.5 ft. to	29.5 ft. From tt. From 29.5 ft. From tt. From Bentonite BOTAPC ft. to.  10 Livesto 11 Fuel st 12 Fertiliz: 13 Insecti How man) DM TO	ft.	to ft. to ft. to ft. to ft. to ft. Abandoned water well Dither (specify below) rater disposal pit INTERVALS
GRAVEL PACK INTERVA  GRAVEL PACK INTERVA  GROUT MATERIAL: 1 No out Intervals: From. Q	ALS: From	24.5 ft. to	29.5 ft. From tt. From 29.5 ft. From tt. From Bentonite BOTAPC ft. to.  10 Livesto 11 Fuel st 12 Fertiliz: 13 Insecti How man) DM TO	ft.  ft.  ft.  ft.  ft.  ft.  ft.  ft.	to ft. to ft. to ft. to ft. to ft. Abandoned water well Dither (specify below) rater disposal pit INTERVALS

## EQUUS BEDS GROUNDWATER MANAGEMENT DISTRICT NO. 2

•			DRILLER	R'S LOG AND WE	LL REC	ORD FIELI	SHEET					
Well	No. EB12	1.4										
		ATER WELL:	Fraction			Cartles 11						
County:		qwick	C E/Z	SW 14 NE	. "I	Section Numi	Der To	wnship Nu			ge Numb	
Distance	and direction	on from nearest to	wn or city street	address of well if locate	of within ci	N2 -		26	5	R	1₩	<u>- w</u>
61st	5+. No.	approx. 0.25	mi., south or	n dirt residentia	i st. in	to Fox Mead	l. S. of V	vision.	enter on Last «1	Meridi de of n	an, we:	st on
2 WAT	ER WELL C	WAICD.					en	d of su	b div-	· · · · · · · ·	onu at	SOUTH
RR#, St	L Address, E			anagement Distric					priculture, C	hvision of	Water D	
	ite, ZIP Code	: :		istead, Kansas	67056			pplication		N/A	TTEIST H	esource:
DI LOCA	TE WELL'S	LOCATION WITH	DEPTH OF	COMPLETED WELL.	29.5	It. EI F	VATION:	арргох	1325			
_ ^~ ~×	" IN SECTION	JN BOX:	Depth(s) Groun	dwater Encountered 1	l <i></i>		h. 2		n. 3			
Ī			WELL'S STATK	C WATER LEVEL	1	ft. below land	surface mea	sured on a	mo/day/yr			
	w	NE	Pur	np test data: Well wat	er was		. after		hours our	noina		000
[1		×	Est. Yield,	gpm: Well water	rwas		after		hours our	noina		000
. W	<del></del>		Bore Hole Diam	eterin. to	· • • • • • •		l., and	• • • • • • • • • • • • • • • • • • •	in.	to		h.
1-			WELL WATER	TO BE USED AS:	5 Public v	valer supply	8 Air con	ditioning	11 k	njection w	ell . ·	
	sw	SE	1 Domestic			water supply				Other (Spe		
]]	!		2 Irrigation		/ Lawn ar	nd garden only	C10 Observ	ation well	·		· • • • • • • • • • • • • • • • • • • •	•••••
11	<u> </u>	<del></del>	mitted	/bacteriological sample :	submitted to							was sub-
5 TYPE	OF BLANK	CASING USED:		5 Wrought iron	A Co	ncrate tile	Water Well D			N		
	Steel	3 RMP (S	iR)	6 Asbestos-Cement		ner (specify be		NIOL DAI	TS: Glued			
(2 P	vc	4 ABS	•	7 Fiberolase		· ·						
Blank cas	sing diamete	r	.in. to 0 - 23	ft Dia	in	to .	# Di	2				
Cessily in	eight appare	iano sunace	1. <del></del>	.in., weight			s./h. Wall thi	ckness or	gauge No			π.
TYPE OF	SCREEN (	OR PERFORATIO	N MATERIAL:	•	7	PVC			stos-cemen		· · · · · ·	
1	iteel	3 Stainles:	s steel	5 Fiberglass	8	RMP (SR)			(specify) .			
	rass	4 Galvaniz		6 Concrete tile		ABS			used (oper			
		PATION OPENIN		5 Gauze	ed wrapped	1	8 Saw			11 None	(open ho	ie)
	ontinuous si		lilf slot	6 Wire	wrapped		9 Drilled	i holes				,
	ouvered shu		ey punched	7 Torch			10 Other	(specity)	<i></i> .			
SCHEEN	PEHFORAT	ED INTERVALS:		29.5 It. to		n., F	rom		ft. to.			h
1	GRAVEL PA	CK INTERVALS:	From	ft. to			rom		It to			-
i .	ado SIII		From	29.5 ft. to	19		rom		ft. lo.			tt.
	T MATERIA		From	2 Cement grout		h. F	rom		ft. to			ft
			tt. to .surface	2 Cement grout	<u> 3 Be</u> ₁	ntonite	4 Other	• • • • • • •	• • • • • • • •	• • • • • • •		
What is th	ne nearest so	ource of possible	contamination:	· · · · · · · · · · · · · · · · · · ·	п	. 10	R., F	-rom				
		ردي الم		7 Pit privy			stock pens			Indoned w		!
2 Se	wer lines	5 Cess	pool	6 Sewage lago	on		el storage tilizer storage			well/Gas		
		rer lines 6 Seep		9 Feedyard			mizer storage ecticide stora		16 Oth	er (specity ten disc	/ Delow)	
Direction I	from well?	West					any feet?	25 ft.		or o	orest.	• • • • • •
FROM	10		LITHOLOGIC I		FROM	TO			THOLOGIC	LOG		
0	3	Unconsol. si	it to V. fine	to fine sand,	13	18	Qtz_sand				d. rou	nded
<del></del> -		non-caic., ci	nestnut brown	containing scatt	ered		to angul	ar. Mor	e than c	ne-hali	is O.	5 mm
3	8	qtz. sand gra	ains to 0.5 m	m diam.	·	<del>- </del>	to 1 mm.	intred	went qtz	and ch	ect pe	bbles
	-	mell sorted.	angular to s	ub-rd. clean	·		to 1 cm.	Blk st	alned to	ags. N	оміса	-seen.
		than 1% mica	not exceeding	5 to 0.5 mm. less g 1 mm, scattered	1	-	Brown ±	10% che	rt parti	cles Q.	5-to-1	-0-mm
		qtz frags to	2 mm. Scatter	red unident. dark	18	23		lavey -		ahaa+		
		colored to bl	k fragsor	ss. Fe O or	7— <del></del>		Sandy, c	smooth-	due to	cnert p	ebbles	<u>,                                     </u>
		organic. Lie	int-brown san	d. Si calcareous	1	<del> </del>	rounded, usually				am, bu	<u> </u>
8	13	Same as 3-8 f	t. Incr numb	her of lacon	23	28						
		quartz frags	to 2 mm, les	s mica, scattered		- <del></del>	mm to 2.0	Cm Pa	d bear-	s rangi	ng fro	n 0.5
		rounded chert	frags to 2.0	mm. Light-brown		-	sand mix.	Sand	is quart	z - to	0.5 mm	LAY/_
		Dark particle	s are Fe or M	An stained. Less	28	29.5	Coarse qu	artz sa	nd, sub-	rd to «	ub-and	
		than 1% chert	grains yel	to Crange, Otz			grains to	2 mm d	iam. Ch	ert & a	ranite	
<del></del>	l	grains incr.	in size few	to 4 mm.	l		pebbles 1	o 18 X	9 mm to 15	X 12 m	<u></u>	
力 COMP	LETION:									—— <del>1</del>	···-	
Date	Well Co	moletod:	20 , 6 ,	1991		$\overline{}$	_	, .	1			
Site	Genlagi	mpleted: stLawren	ce H. Skeiton		۵.	$\sim$	$\overline{}$	オー	X(  -	<i></i>		
5760	500 rug r	<b>-</b>	• • • • • • • • • • • • • • • • • • • •		Signa	ture	,	Ŋ.:X	$\mathcal{I}_{\mathcal{L},\mathcal{L}}$	(سربحر		
3-86-2			SE BACK DE	CHEET SOO ADD	TTIONA	J 05445	-		•		•	• •

OCATION OF WA		Fraction		1	on Number	Township Nur			e Number
	WICK			SE 1/4   12		I T 26	S	<u>R 1</u>	
			address of well if locate	-		So., of Vall			n
		on elst st	. No., About 5	IC. W. OI	rence	& 30 It. NO.	OI 61	st St.	
WATER WELL OV	vner: Grou	nd Water M	anagement Dist	rict II					
, St. Address, Bo	× # : 313	Spruce, Ha	lstead, KS. 6	7056		Board of Ag	riculture, C	Division of \	Vater Resource
State, ZIP Code	<u> </u>					Application I			
CATE WELL'S	OCATION WITH	4 DEPTH OF C	COMPLETED WELL	30.0	. ft. ELEVA	TION:		<u>.</u>	
N "X" IN SECTIO	N BOX:	Depth(s) Ground	dwater Encountered 1		ft. :	2	ft. 3.		
		WELL'S STATIC	WATER LEVEL . 17	ft. bei	low land su	face measured on r	no/day/yr	6-20	<del>-9</del> 1
1		Pum	np test data: Well water	er was	ft. a	fter	hours our	mping :	
\\w	NE		gpm: Weil wate						
1 :	1 ! ! !		eter 9" . O.j.D.jo						
w <del>                                    </del>	F		TO BE USED AS:	5 Public water		8 Air conditioning		Injection we	
l i	1   1	1 Domestic		6 Oil field wate		9 Dewatering			cify below)
SW	SE:					_			
1	. !	2 Irrigation				10 Monitoring well .			
<u> </u>	<u> </u>	1	/bacteriological sample :	submitted to Dep					-
	<u> </u>	mitted				ter Well Disinfected			<u> </u>
YPE OF BLANK			5 Wrought iron	8 Concrete		CASING JOIN	ITS: Glued	ı Ç	amped
1 Steel	3 RMP (S	R)	6 Asbestos-Cement	9 Other (s	specify below	<b>w</b> )	Welde	ed	
2 PVC sch	40 4 ABS		7 Fiberglass				Threa	ded	
k casing diamete	r 2	.in. to 2	5 ft., Dia	in. to .		ft., Dia		in. to	
			in., weight						
	R PERFORATIO		,		sch 4		stos-ceme		<b>54</b> · · · · · ·
1 Steel	3 Stainless		5 Fibergiass	8 RMP					
2 Brass	4 Galvaniz		•	9 ABS	,				• • • • • • • • • •
			6 Concrete tile				used (op	,	
	RATION OPENIN			ed wrapped			) slot	11 None	(open hole)
1 Continuous si	ot 3 M	fill slot	6 Wire	wrapped		9 Drilled holes			
	4 1/	ey punched	7 Toron						
2 Louvered shu	πer 4 K	ey puncheu	7 Torci	cut		10 Other (specify)			
	TED INTERVALS:		25 ft. to	30	ft Fro	10 Other (specify)	ft. te		
		From	25 ft. to	30		m	ft. to	<b>5</b>	
REEN-PERFORAT	ED INTERVALS:	From	25 ft. to ft. to	30	ft., Fro	m	ft. to	o	
EEN-PERFORAT		From	25 ft. to ft. to 19 ft. to	30	ft., Fro	m	ft. to	o	
GRAVEL P	TED INTERVALS:	From	25 ft. to ft. to	30	ft., Fro ft., Fro ft., Fro	m	ft. to	o	
GRAVEL P	TED INTERVALS:  ACK INTERVALS:  IL: 1 Neat (	From From From	25 ft. to	30 3 Benton	ft., Fro	m	ft. to ft. to ft. to	o	
GRAVEL PAROUT MATERIA	TED INTERVALS:  ACK INTERVALS:  IL: 1 Neat (	From From From	25 ft. to ft. to ft. to ft. to	30 3 Benton	ft., Fro	m	ft. to ft. to ft. to	o	
GRAVEL PAROUT MATERIA	TED INTERVALS:  ACK INTERVALS:  IL: 1 Neat (	From. From. From cement ft. to 19	25 ft. to	30 3 Benton	ft., Fro ft., Fro ft., Fro	m	ft. to	o	
GRAVEL PAROUT MATERIA It intervals: Fro	ACK INTERVALS:  1 Neat of possible	FromFromFrom.cement ft. to 19 contamination:	25 ft. to ft. to 19 ft. to ft. to 2 Cement grout ft., From	30 3 Benton	ft., Fro ft., Fro ft. Fro ite HOLE	m m m ft., From tock pens	ft. to ft. to ft. to	o	vater well
GRAVEL PAROUT MATERIA It Intervals: Fro t is the nearest s 1 Septic tank	ACK INTERVALS:  L: 1 Neat in the control of possible 4 Later	From	25 ft. to ft. to ft. to 19 ft. to ft. to 2 Cement grout 7 Pit privy	30 3 Benton	ft., Fro ft., Fro ft. Fro ite HOLE 10 Lives	mm mm mft., Fromtock pens	ft. to ft. t	o	water well
GRAVEL PARAMETERIAN INTERPRETARION OF THE PROPERTY OF THE PROP	ACK INTERVALS:  L: 1 Neat in the course of possible 4 Later 5 Cess	From	25 ft. to 2 Cement grout ft., From 7 Pit privy 8 Sewage lag	30 3 Benton	ft., Froft., Fro ft., Fro ite HOLE  10 Lives 11 Fuel 12 Fertil	m	14 Al	oft. to bandoned v il well/Gas	vater well well y below)
GRAVEL PAROUT MATERIA It Intervals: Fro t is the nearest s 1 Septic tank 2 Sewer lines 3 Watertight ser	ACK INTERVALS:  L: 1 Neat in om 0  Source of possible 4 Later 5 Cess  wer lines 6 Seep	From	25 ft. to ft. to ft. to 19 ft. to ft. to 2 Cement grout 7 Pit privy	30 3 Benton	ft., Fro ft., Fro ft., Fro ite HOLE 10 Lives 11 Fuel 12 Fertil 13 Insec	m	14 Al	oft. to bandoned v il well/Gas	vater well well y below)
GRAVEL PARAMETERIA I Intervals: From the nearest some section from well?	ACK INTERVALS:  L: 1 Neat in the course of possible 4 Later 5 Cess	From	25 ft. to ft. from ft. Ft. From ft. Ft. From ft. Ft. From ft. Ft. Ft. From ft. F	30 3 Benton 7. 10	ft., Fro ft., Fro ft. Fro ite BOLB 10 Lives 11 Fuel 12 Fertil 13 Insec	m	14 Al	ft. to bandoned will well/Gas	vater well well V below)
GRAVEL PARAMETERIA Intervals: From the nearest sometimes as Watertight section from well?	ACK INTERVALS:  L: 1 Neat of possible 4 Later 5 Cess wer lines 6 Seep NW &NNW	From	25 ft. to ft. from ft. Fr	30 3 Benton	ft., Fro ft., Fro ft., Fro ite HOLE 10 Lives 11 Fuel 12 Fertil 13 Insec	m	14 Al	oft. to bandoned v il well/Gas	vater well well V below)
GRAVEL PAROUT MATERIA t Intervals: From the nearest some second of the s	ACK INTERVALS:  L: 1 Neat of possible 4 Later 5 Cess wer lines 6 Seep NW &NNW	From	25 ft. to ft. from ft. Fr	30 3 Benton 7. 10	ft., Fro ft., Fro ft. Fro ite BOLB 10 Lives 11 Fuel 12 Fertil 13 Insec	m	14 Al	ft. to bandoned will well/Gas	vater well well V below)
GRAVEL PARAMETERIA Intervals: From is the nearest of Septic tank 2 Sewer lines 3 Watertight settion from well?	ACK INTERVALS:  L: 1 Neat of possible 4 Later 5 Cess wer lines 6 Seep NW &NNW	From	25 ft. to ft. from ft. Fr	30 3 Benton 7. 10	ft., Fro ft., Fro ft. Fro ite BOLB 10 Lives 11 Fuel 12 Fertil 13 Insec	m	14 Al	ft. to bandoned will well/Gas	vater well well V below)
GRAVEL PARAMETERIA Intervals: From is the nearest of Septic tank 2 Sewer lines 3 Watertight settion from well?	ACK INTERVALS:  L: 1 Neat of possible 4 Later 5 Cess wer lines 6 Seep NW &NNW	From	25 ft. to ft. from ft. Fr	30 3 Benton 7. 10	ft., Fro ft., Fro ft. Fro ite BOLB 10 Lives 11 Fuel 12 Fertil 13 Insec	m	14 Al	ft. to bandoned will well/Gas	vater well well V below)
GRAVEL PARAMETERIA Intervals: From the nearest sometimes as Watertight section from well?	ACK INTERVALS:  L: 1 Neat of possible 4 Later  5 Cess wer lines 6 Seep  NW &NNW	From	25 ft. to ft. from ft. Fr	30 3 Benton 7. 10	ft., Fro ft., Fro ft. Fro ite BOLB 10 Lives 11 Fuel 12 Fertil 13 Insec	m	14 Al	ft. to bandoned will well/Gas	vater well well V below)
GRAVEL PARAMETERIA Intervals: From is the nearest of Septic tank 2 Sewer lines 3 Watertight settion from well?	ACK INTERVALS:  L: 1 Neat of possible 4 Later  5 Cess wer lines 6 Seep  NW &NNW	From	25 ft. to ft. from ft. Fr	30 3 Benton 7. 10	ft., Fro ft., Fro ft. Fro ite BOLB 10 Lives 11 Fuel 12 Fertil 13 Insec	m	14 Al	ft. to bandoned will well/Gas	vater well well V below)
GRAVEL PARAMETERIA Intervals: From is the nearest of Septic tank 2 Sewer lines 3 Watertight settion from well?	ACK INTERVALS:  L: 1 Neat of possible 4 Later  5 Cess wer lines 6 Seep  NW &NNW	From	25 ft. to ft. from ft. Fr	30 3 Benton 7. 10	ft., Fro ft., Fro ft. Fro ite BOLB 10 Lives 11 Fuel 12 Fertil 13 Insec	m	14 Al	ft. to bandoned will well/Gas	vater well well V below)
GRAVEL PARAMETERIA Intervals: From is the nearest of Septic tank 2 Sewer lines 3 Watertight settion from well?	ACK INTERVALS:  L: 1 Neat of possible 4 Later  5 Cess wer lines 6 Seep  NW &NNW	From	25 ft. to ft. from ft. Fr	30 3 Benton 7. 10	ft., Fro ft., Fro ft. Fro ite BOLB 10 Lives 11 Fuel 12 Fertil 13 Insec	m	14 Al	ft. to bandoned will well/Gas	vater well well V below)
GRAVEL PARAMETERIA Intervals: From is the nearest of Septic tank 2 Sewer lines 3 Watertight settion from well?	ACK INTERVALS:  L: 1 Neat of possible 4 Later  5 Cess wer lines 6 Seep  NW &NNW	From	25 ft. to ft. from ft. Fr	30 3 Benton 7. 10	ft., Fro ft., Fro ft. Fro ite BOLB 10 Lives 11 Fuel 12 Fertil 13 Insec	m	14 Al	ft. to bandoned will well/Gas	vater well well V below)
GRAVEL PAROUT MATERIA t Intervals: From the nearest some second of the s	ACK INTERVALS:  L: 1 Neat of possible 4 Later  5 Cess wer lines 6 Seep  NW &NNW	From	25 ft. to ft. from ft. Fr	30 3 Benton 7. 10	ft., Fro ft., Fro ft. Fro ite BOLB 10 Lives 11 Fuel 12 Fertil 13 Insec	m	14 Al	ft. to bandoned will well/Gas	vater well well V below)
GRAVEL PARAMETERIA Intervals: From is the nearest of Septic tank 2 Sewer lines 3 Watertight settion from well?	ACK INTERVALS:  L: 1 Neat of possible 4 Later  5 Cess wer lines 6 Seep  NW &NNW	From	25 ft. to ft. from ft. Fr	30 3 Benton 7. 10	ft., Fro ft., Fro ft. Fro ite BOLB 10 Lives 11 Fuel 12 Fertil 13 Insec	m	14 Al	ft. to bandoned will well/Gas	vater well well V below)
GRAVEL PARAMETERIA Intervals: From the nearest sometimes as Watertight section from well?	ACK INTERVALS:  L: 1 Neat of possible 4 Later  5 Cess wer lines 6 Seep  NW &NNW	From	25 ft. to ft. from ft. Fr	30 3 Benton 7. 10	ft., Fro ft., Fro ft. Fro ite BOLB 10 Lives 11 Fuel 12 Fertil 13 Insec	m	14 Al	ft. to bandoned will well/Gas	vater well well V below)
GRAVEL PARAMETERIA Intervals: From the nearest sometimes as Watertight section from well?	ACK INTERVALS:  L: 1 Neat of possible 4 Later  5 Cess wer lines 6 Seep  NW &NNW	From	25 ft. to ft. from ft. Fr	30 3 Benton 7. 10	ft., Fro ft., Fro ft. Fro ite BOLB 10 Lives 11 Fuel 12 Fertil 13 Insec	m	14 Al	ft. to bandoned will well/Gas	vater well well V below)
GRAVEL PARAMETERIAN INTERPRETARIAN I	ACK INTERVALS:  L: 1 Neat of possible 4 Later  5 Cess wer lines 6 Seep  NW &NNW	From	25 ft. to ft. from ft. Fr	30 3 Benton 7. 10	ft., Fro ft., Fro ft. Fro ite BOLB 10 Lives 11 Fuel 12 Fertil 13 Insec	m	14 Al	ft. to bandoned will well/Gas	vater well well V below)
GRAVEL PARAMETERIA INTERPRETARIA INTERPRETAR	ACK INTERVALS:  L: 1 Neat of possible 4 Later  5 Cess wer lines 6 Seep  NW &NNW	From	25 ft. to ft. from ft. Fr	30 3 Benton 7. 10	ft., Fro ft., Fro ft. Fro ite BOLB 10 Lives 11 Fuel 12 Fertil 13 Insec	m	14 Al	ft. to bandoned will well/Gas	vater well well V below)
GRAVEL PARTON ATTENDANT OF THE PROPERTY OF T	ACK INTERVALS:  L: 1 Neat of possible 4 Later  5 Cess wer lines 6 Seep  NW &NNW	From	25 ft. to ft. from ft. Fr	30 3 Benton 7. 10	ft., Fro ft., Fro ft. Fro ite BOLB 10 Lives 11 Fuel 12 Fertil 13 Insec	m	14 Al	ft. to bandoned will well/Gas	vater well well V below)
GRAVEL PARAMETERIA INTERPRETARIA INTERPRETAR	ACK INTERVALS:  L: 1 Neat of possible 4 Later  5 Cess wer lines 6 Seep  NW &NNW	From	25 ft. to ft. fr. From ft. From ft	30 3 Benton 7. 10	ft., Fro ft., Fro ft. Fro ite BOLB 10 Lives 11 Fuel 12 Fertil 13 Insec	m	14 Al	ft. to bandoned will well/Gas	vater well well V below)
GRAVEL PARAMETERIA INTERPRETARIA INTERPRETAR	ACK INTERVALS:  L: 1 Neat of possible 4 Later  5 Cess wer lines 6 Seep  NW &NNW	From	25 ft. to ft. fr. From ft. From ft	30 3 Benton 7. 10	ft., Fro ft., Fro ft. Fro ite BOLB 10 Lives 11 Fuel 12 Fertil 13 Insec	m	14 Al	ft. to bandoned will well/Gas	vater well well V below)
GRAVEL PAROUT MATERIAL Intervals: From the second of the s	TED INTERVALS:  ACK INTERVALS:  L: 1 Neat of possible source of possible 4 Later 5 Cess wer lines 6 Seep NW SNNW SNNW	From	25 ft. to ft. to ft. to ft. to ft. to 2 Cement grout ft., From 7 Pit privy 8 Sewage lag 9 Feedyard LOG	30 30 30 Senton II. Id	ft., Fro ft.	m m m m m m m m m m m m m m m m m m m	14 Al 15 O Led 15 C T road 3 GGING II	tt. to bandoned villed (Seecification )	vater well well Epsew)
GRAVEL PAROUT MATERIA  ROUT MATERIA  It Intervals: Fro  t is the nearest s  1 Septic tank 2 Sewer lines 3 Watertight ser  ction from well?  OM TO  CONTRACTOR'S	TED INTERVALS:  ACK INTERVALS:  L: 1 Neat of possible source of possib	From	7 Pit privy 8 Sewage lag 9 Feedyard	30 30 30 Senton It. It.	10 Lives 11 Fuel 12 Fertil 13 Insec How ma	m	14 Al 15 O Led Field Food Signing II	tt. to	water well well vell st
GRAVEL PAROUT MATERIA t Intervals: Fro t is the nearest s 1 Septic tank 2 Sewer lines 3 Watertight ser tition from well? OM TO  ONTRACTOR'S Dieted on (mordat	TED INTERVALS:  ACK INTERVALS:  L: 1 Neat of possible 4 Later 5 Cess  Wer lines 6 Seep  NW ENINW  SRB  OR LANDOWNEI  OR LANDOWNE	From	7 Pit privy 8 Sewage lag 9 Feedyard LOG CHEDULE	30 30 30 30 30 30 30 30 30 30 30 30 30 3	10 Lives 11 Fuel 12 Fertil 13 Insec How ma TO	m	14 Al 15 O Led Field Food Signing II	tt. to	water well well vell st
GRAVEL PAROUT MATERIA  I Intervals: From the second	TED INTERVALS:  ACK INTERVALS:  L: 1 Neat of possible 4 Later 5 Cess  Wer lines 6 Seep  NW ENINW  SRB  OR LANDOWNEI  OR LANDOWNE	From	7 Pit privy 8 Sewage lag 9 Feedyard	30 30 30 30 30 30 30 30 30 30 30 30 30 3	10 Lives 11 Fuel 12 Fertil 13 Insec How ma TO	m	14 Al 15 O Led Field Food Signing II	tt. to	water well well vell st

## EQUUS BEDS GROUNDWATER MANAGEMENT DISTRICT NO. 2

DRILLER'S LOG AND WELL RECORD FIELD SHEET

LOCATION OF W County: Sedge		Fraction SW 1/2	SW va	SE v	Section Number			, -	Number
Journiy: 3	on from nearest town				12 N2	<u>  T 26</u>	<u> </u>	I A IV	₩
	iley Center on					5 ft W. of f	ence & 30	o ft. N. n	f 61st St.
WATER WELL O									. 0,3, 0,1
R#, St. Address, I			enagement Distr	_		Sanut at	A	Objection of M	
ty, State, ZIP Cod		Spi uca, nais	stead, Ks. 670	00			n Number:		Vater Resource
	LOCATION WITH	DEPTH OF C	OMPLETED WELL	30.0	h ELEV				
AN "X" IN SECT	ON BOX		water Encountered						
			WATER LEVEL						
1	1 1 1 1		test data: Well v						
	-  NE    <sub>E</sub>	st. Yield	gpm: Well v	vater was		after	hours n	umning	on on
i		ore Hole Diame	iterin.	to		and		n. to	
w	1 1 11		O BE USED AS:		vater supply	8 Air conditionin		Injection we	
sw _	-  se	1 Domestic	3 Feedlot	6 Oil fleid	water supply	9 Dewatering	12	Other (Spec	ify below)
;;; -	7 7 7 7 1	2 Irrigation	4 Industrial	7 Lawn a	nd garden only 🤇	10 Observation w	(llo		
<u> </u>	<u>  X +                                  </u>	Vas a chemical/b	acteriological samp	le submitted	o Department? Y	/esNo	📆; If ye:	s, mo/day/yr s	ample was su
		nitted			w	ater Well Disinfect	ed? Yes	No	
TYPE OF BLANK			5 Wrought iron	8 Cd	ncreta tile	CASING JO	DINTS: Glue	ed Cla	ı beqmı
1 Steel	3 RMP (SR)		6 Asbestos-Ceme	int 9 Ot	her (specify belo	w)	Weld	ded	
2 PVC	4 ABS		7 Fiberglass						
ank casing diamet	er ii	7. 10	h., Dia	in	. to			. in. to	1
asing height above	land surface 39		in., weight			/ft. Wall thickness	or gauge h	۱۰	
1 Steel	OR PERFORATION				PVC)		bestos-cem		
	3 Stainless :		5 Fiberglass		RMP (SR)			-	• • • • • • • • • • •
2 Brass	4 Galvanize DRATION OPENING		6 Concrete tile		ABS		ne used (o		
Continuous s	_			uzed wrappe	đ	8 Saw cut		11 None (	open hole)
C i Conuncous s									
2 Laurena ab				re wrapped		9 Drilled holes			
GRAVEL P	TED INTERVALS:	From	7 To 0	rch cut 25		10 Other (speci	hy) h. h. 	to	
GRAVEL P Colorado SIII GROUT MATERIA	TED INTERVALS:  ACK INTERVALS:  Ca Sand.  AL: 1 Neat cei	From	7 To 1	25		10 Other (speci	/y) ft. ft. ft.	tototo	
GRAVEL P COLORADO SILI GROUT MATERI rout Intervals: Fr	utter 4 Key TED INTERVALS: ACK INTERVALS: Ca Sand	From 30 From 30 From 30 From 30 From 10	7 To 1	25		10 Other (speci	/y)	tototo	
GRAVEL P Colorado SIII GROUT MATERIO out Intervals: Fr	TED INTERVALS:  ACK INTERVALS:  Ca Sand.  AL: 1 Neat cellom. 19	punched From 30 From 30 From 30 From 2 to surface	7 To 1	25		10 Other (speci	hy) h h h h	tototo	
GRAVEL P Colorado SIII GROUT MATERIA TOUT Intervals: Fr hat is the nearest	TED INTERVALS:  ACK INTERVALS:  Ca Sand.  AL: 1 Neat cei om. 19 ht	punched From	7 To	19. 3 Be	t., Fro	10 Other (speci	h) h h	tototo	
GRAVEL P COLORADO SILI GROUT MATERIA out Intervals: Fr hat is the nearest 1 Septic tank 2 Sewer lines	TED INTERVALS:  ACK INTERVALS:  Ca Sand.  AC. 1 Neat cellom. 19 ft.  source of possible course of possible course of possible course.	punched From	7 To	3 Bo	t., Fro	10 Other (speci	h) h h	tototo	finance (in the control of the contr
GRAVEL P Color ado SIII GROUT MATERI out Intervals: Fr nat is the nearest 1 Septic tank 2 Sewer lines 3 Waterlight se rection from well?	TED INTERVALS:  ACK INTERVALS:  Ca Sand.  IL: 1 Neat cei on. 19	punched From	7 To 1	19 3 86	ntonite 4 t. to. 10 Lives 11 Fuel 12 Fertil 13 Insec	10 Other (speci	(y) ft. ft. ft. ft. ft. ft. ft. ft. ft.	tototo	ter well level level level level level level level level
GRAVEL P Colorado SIII GROUT MATERI out Intervals: Fr nat is the nearest 1 Septic tank 2 Sewer lines 3 Watertight se rection from well?	ACK INTERVALS:  Ca Sand.  ACK INTERVALS:  Ca Sand.  AL:  1 Neat ce.  om 19	punched From	7 To 1	3 Bo	nt., Fronts, F	10 Other (speci	14 A 15 C	tototo	ater well rell below) id-6 ft. west
GRAVEL P Color ado SIII GROUT MATERI out Intervals: Fr nat is the nearest 1 Septic tank 2 Sewer lines 3 Waterlight se rection from well?	ACK INTERVALS:  Ca Sand.  AL: 1 Neat cellom	punched From	7 To 1	3 Be	11. Fro tt.,	10 Other (speci	14 A 15 O 16 C O 17 C O	tototottotto	ater well  ater well  below)  id-6 ft. e  ft. west
GRAVEL P Colorado SIII GROUT MATERI out Intervals: Fr nat is the nearest 1 Septic tank 2 Sewer lines 3 Watertight se rection from well?	ACK INTERVALS:  Ca Sand.  ACK INTERVALS:  Ca Sand.  AL:  1 Neat callow  5 Ource of possible co  4 Lateral  5 Cess p  wer lines 6 Seepag  NW & NNW  Loamy, sandy,  qtz grains 90;	punched From	7 To 1	3 Be	11. Fro tt.,	10 Other (specion of the control of	t.	totototototototototo	ater well  ater well  below)  id-6 ft. e  ft. west
GRAVEL P Colorado SIII GROUT MATERI out Intervals: Fr nat is the nearest 1 Septic tank 2 Sewer lines 3 Watertight se rection from well?	ACK INTERVALS:  Ca Sand.  AL: 1 Neat cellom	punched From	7 To 1	3 Bears agoon FROM	tt., Fronts, F	10 Other (special moments)  Other	th.	to to to th. to Abandoned w bit well Gas w Other (specify filled file froad-10 Gic LOG poss auth grains ar on-caic.	ater well rell below) id-6 ft. e ft. west
GRAVEL P Colorado SIII GROUT MATERI out Intervals: Fr nat is the nearest 1 Septic tank 2 Sewer lines 3 Watertight se rection from well?	A Key TED INTERVALS: Ca Sand.  ACK INTERVALS: Ca Sand.  AL: 1 Neat cel on	punched From	7 To 1	3 Bears agoon FROM	tt., Fronts, F	10 Other (special moments)  Other	14 A 15 O 16 O 16 O 17 O 17 O 17 O 17 O 17 O 17	to	ater well  below) id-6 ft. e ft. west igenic qual e lightly
GRAVEL P Colonado SIII GROUT MATERU rout Intervals: Fr hat is the nearest 1 Septic tank 2 Sewer lines 3 Watertight se rection from well? FROM TO 0 3	A Key TED INTERVALS: Ca Sand.  ACK INTERVALS: Ca Sand.  AL: 1 Neat cel om. 19 to source of possible or 4 Lateral 5 Cess p wer lines 6 Seepag NW & NNW  Loamy, sandy, qtz grains 90; A few, less ti Organic debricalo.	punched From	7 To 1	agoon FRON	11. From the	10 Other (special momentum) Other	14 A 15 O 16 O 16 O 17 O 17 O 17 O 17 O 17 O 17	to	ater well  below) id-6 ft. e  ft. west  igenic qual re lightly  mm. Pert
GRAVEL P COLORADO SILI GROUT MATERIA OUT Intervals: Fr hat is the nearest 1 Septic tank 2 Sewer lines 3 Watertight se rection from well?	A Key TED INTERVALS: Ca Sand. ACK INTERVALS: Ca Sand. AL: 1 Neat cel on	punched From	7 To 1	agoon FROM	11. From the	10 Other (special or many control or many cont	e dir LITHOLOG o grains, f of qtz e 0, N	to to to tto th. to Abandoned w. Dither (specify filled file rt road-10 GIC LOG poss auth grains ar on-caic. mm to 1.00 d, water-w axis. Sc	ater well  below) id-6 ft. e  ft. west  igenic qual e lightly  omm. Perforn qtz
GRAVEL P Colonado SIII GROUT MATERU rout Intervals: Fr hat is the nearest 1 Septic tank 2 Sewer lines 3 Watertight se rection from well? FROM TO 0 3	A Key TED INTERVALS: Ca Sand. AL: 1 Neat ce. om. 19	punched From	7 To 1	agcon FROM	tt., Fro	10 Other (special management)  Other	e dir LITHOLOG grains, f of qtz e 0, N 90% 0.5 , rounde	to  to  to  tto  tto	ater well  below)  id-6 ft. e  ft. west  igenic quai  e lightly  omn. Perf  orn qtz  ome chert  chalf iron
GRAVEL P COLORADO SILI GROUT MATERU out Intervals: Fr hat is the nearest 1 Septic tank 2 Sewer lines 3 Watertight se rection from well? FROM TO 0 3	A Key TED INTERVALS: Ca Sand. AL: 1 Neat ce. com. 19	punched From	7 To 1	agoon FROM am. 18	tt., Fro	10 Other (special or many control or many cont	th.  th.  th.  th.  th.  th.  th.  th.	to to to th. to  Chandoned w.  Chinel/Gas w.  Cherroad-10  GIC LOG  poss auth grains ar  on-caic.  mm to 1.00 d, water-w.  axis. Sc  About one-acser than	ater well  below)  id-6 ft. e  ft. west  igenic quai  e lightly  omn. Perf  orn qtz  ome chert  chalf iron
GRAVEL P Colorado SIII GROUT MATERU out Intervals: Fr hat is the nearest 1 Septic tank 2 Sewer lines 3 Watertight se rection from well? FROM TO 0 3	A Key TED INTERVALS: Ca Sand. AL: 1 Neat ce. com. 19	punched From	7 To 1	agoon FROM 18 18 18 18 18 18 18 18 18 18 18 18 18	11. Fro. 11. Fuel 12 Feriii 13 Insec. How ma	10 Other (special moments)  Other	th.  th.  th.  th.  th.  th.  th.  th.	toto  tot. to  Abandoned w  Dither (specify filled file froad=10  GIC LOG  poss auth grains ar on=caic. mm to 1.00 d, water-w axis. So  About one- acser than	ater well  vell  below) id-5 ft. e  ft. west  igenic qual  re lightly  orn qtz  me chert  half iron  above.
GRAVEL P COLORAGO SILI GROUT MATERU out Intervals: Fr hat is the nearest 1 Septic tank 2 Sewer lines 3 Watertight se rection from well? FROM TO 0 3	A Key TED INTERVALS: Ca Sand.  ACK INTERVALS: Ca Sand.  AL: 1 Neat cero Source of possible or 4 Lateral 5 Cess p wer lines 6 Seepag NW & NNW  Loamy, sandy, qtz grains 90; A few, less fi Organic debri- calc. Fine qtz sand diam: angular water-worn qui to 10 mm; some Mn stain. No; Same as 3-8,	punched From	7 To 1	agoon FRON 18	11. From the	10 Other (special moments)  Other	e dir LITHOLOG  o grains, f of qtz  o no	to  to  to  to  to  to  Abandoned w.  Diker (specify tilled file troad-10 Gilc LOG poss auth grains ar on-calc. mm to 1.00 d, water-waxis. Sc About one-acce than one-calc. § ig rock	ater well  below) id-6 ft. e  ft. west  igenic qual e lightly  mm. Perh orn qtz me chert half iron above.  pebbles
GRAVEL P COLORADO SITI GROUT MATERIA OUT Intervals: Fr hat is the nearest 1 Septic tank 2 Sewer lines 3 Watertight se rection from well? FROM TO 0 3	A Key TED INTERVALS: Ca Sand.  ACK INTERVALS: Ca Sand.  AL: 1 Neat cero Source of possible or 4 Lateral 5 Cess p wer lines 6 Seepag NW & NNW  Loamy, sandy, qtz grains 90; A few, less fi Organic debri- calc. Fine qtz sand diam: angular water-worn qui to 10 mm; some Mn stain. No; Same as 3-8,	punched From	7 To 1	agoon FRON 18	11. From the	10 Other (special monomorphism)  Other	e dir LITHOLOG grains, f of qtz e 0. N 90% 0.5 , rounde mm long 10 mm.	to	ater well  below) id-6 ft. e  ft. west  igenic qual e lightly  mm. Perf yorn qtz me chert half iron above.  pebbles  0 1.0 mm
GRAVEL P Colorado SIII GROUT MATERI out Intervals: Fr nat is the nearest 1 Septic tank 2 Sewer lines 3 Watertight se rection from well? ROM TO 0 3	A Key TED INTERVALS: Ca Sand.  ACK INTERVALS: Ca Sand.  AL: 1 Neat cero	punched From	7 To 1	agoon FRON 18	11. From the	10 Other (special moments)  Other	e dir LITHOLOG grains, f of qtz e 0. N 90% 0.5 , rounde mm long 10 mm.	to	ater well  below) id-6 ft. e  ft. west  igenic qual e lightly  mm. Perf yorn qtz me chert half iron above.  pebbles  0 1.0 mm
GRAVEL P COLORADO SITI GROUT MATERIA Out Intervals: Fr hat is the nearest 1 Septic tank 2 Sewer lines 3 Watertight se rection from well? FROM TO 0 3	A Key TED INTERVALS: Ca Sand.  ACK INTERVALS: Ca Sand.  AL: 1 Neat cero	punched From	7 To 1	agoon FRON 18	tt., Fro	10 Other (special or comments)  The comments of the comments o	e dir LITHOLOG o grains, f of qtz e_0. N 90% 0.5 , rounde mm long 10 mm. rall. co b-rd. N Chert	to	ater well below) Id-6 ft. e ft. west igenic qual re lightly onm. Perf corn qtz ome chert half iron above. pebbles.
GRAVEL P Color ado SIII GROUT MATERI out Intervals: Fr hat is the nearest 1 Septic tank 2 Sewer lines 3 Waterlight se rection from well? FROM TO 0 3 3 8 8 13	A Key TED INTERVALS:  Ca Sand.  ACK INTERVALS:  Ca Sand.  AL:  1 Neat cell  Om.  19  A Lateral  5 Cess p  wer lines 6 Seepag  NW & NNW  Loamy, sandy,  qtz grains 90;  A few, less ti  Organic debrii  calc.  Fine qtz sand  diam, angular  water-worn qui  to 10 mm; somm  Mn stain Non  Same as 3-8,  13 mm, Vol. c  .25 mm) lesser  Non-caic.  Same as 8-13	punched From	7 To 1	agoon FRON 18	11. From the	10 Other (special moments)  Other	e dir LITHOLOG grains, f of qtz e 0. N 90% 0.5 , rounde mm long 10 mm. crail co	to	ater well below) id-6 ft. e ft. west igenic qual e lightly mm. Perf yorn qtz me chert half iron above. pebbles:
CREEN-PERFORA  GRAVEL P Color ado SIII  GROUT MATERU rout Intervals: That is the nearest 1 Septic tank 2 Sewer lines 3 Watertight se irsction from well? FROM TO 0 3 3 R 8 13	A Key TED INTERVALS:  Ca Sand.  ACK INTERVALS:  Ca Sand.  AL:  1 Neat cell  Om.  19  A Lateral  5 Cess p  wer lines 6 Seepag  NW & NNW  Loamy, sandy,  qtz grains 90;  A few, less ti  Organic debrii  calc.  Fine qtz sand  diam, angular  water-worn qui  to 10 mm; somm  Mn stain Non  Same as 3-8,  13 mm, Vol. c  .25 mm) lesser  Non-caic.  Same as 8-13	punched From	7 To 1	agoon FRON 18	11. From the	10 Other (special or comments)  The comments of the comments o	e dir LITHOLOG grains, f of qtz e 0. N 90% 0.5 , rounde mm long 10 mm. crail co	to	dater well  below) id-6 ft. e  ft. west  igenic qual e lightly  mm. Pert yorn qtz me chert half iron above.  pebbles:  cebbles:
GRAVEL P Colorado SIII GROUT MATERU rout intervals: Fhat is the nearest 1 Septic tank 2 Sewer lines 3 Watertight se rection from well? FROM TO 0 3 3 8 8 13 13 18 COMPLETION	A Key TED INTERVALS: Ca Sand.  ACK INTERVALS: Ca Sand.  AL: 1 Neat cero 19 nt Source of possible or 4 Lateral 5 Cess p wer lines 6 Seepag NW & NNW  Loamy, sandy, gtz grains 90; A few, less ft Organic debri- calc. Fine gtz sand diam: angular water-worn qui to 10 mm: some Mn stain. Noi Same as 3-8, 13 mm. Voi .25 mm) lesser Non-calc. Same as 8-13 :	punched From	7 To 1	agoon FRON 18	11. From the	10 Other (special moments)  Other	e dir LITHOLOG grains, f of qtz e 0. N 90% 0.5 , rounde mm long 10 mm. crail co	to	ater well  below) id-6 ft. e  ft. west  igenic qual e lightly  mm. Perf yorn qtz me chert half iron above.  pebbles:
GRAVEL P Colorado SIII GROUT MATERU Out Intervais: The nearest 1 Septic tank 2 Sewer lines 3 Waterlight se ection from well? ROM TO 0 3 3 8 8 13 13 18 COMPLETION Date Well CO	A Key TED INTERVALS: Ca Sand.  ACK INTERVALS: Ca Sand.  AL: 1 Neat cero Source of possible or 4 Lateral 5 Cess p wer lines 6 Seepag NW & NNW  Loamy, sandy, gtz grains 90; A few, less fi Organic debri: calc. Fine gtz sand diam: angular water-worn gu: to 10 mm; some Mn stain. Noi Same as 3-8, 13 mm. Voi . 25 mm) lesser Non-calc. Same as 8-13 : ompleted: 20.	punched From	7 To 1	agoon FRON 18	11. From the	10 Other (special moments)  The stock pens storage fizer storage sticide storage sticide storage sticide storage fizer f	e dir LITHOLOG grains, f of qtz e 0. N 90% 0.5 , rounde mm long 10 mm. crail co	to	pebbles.
GRAVEL P Colorado SIII GROUT MATERU DOUT Intervais: The nearest 1 Septic tank 2 Sewer lines 3 Waterlight se ection from well? ROM TO 0 3 3 8 8 13 13 18 COMPLETION Date Well CO	A Key TED INTERVALS: Ca Sand.  ACK INTERVALS: Ca Sand.  AL: 1 Neat cero 19	punched From	7 To 1	agoon FRON 18	11. From the	10 Other (special of the content of	e dir LITHOLOG grains, f of qtz e 0. N 90% 0.5 , rounde mm long 10 mm. crail co	to	pebbles.

grains. Larger pebbles to 10-15 mm, sub-ang. to sub-rd. Non-calc.

MW #EB-130C		R WELL RECORD F		82a-1212	labaa	Barra Murahas
OCATION OF WATER WELL:	Fraction	Ott OTA	Section Nur	1 .		Range Number
unty: SEDGWICK		SW 1/4 SW			<u>6 s</u>	A 1E EW
stance and direction from nearest From Meridian and				ox Meadow/s East side of 1	Road V	Michita, KS.
WATER WELL OWNER:		d Water Manage				
#, St. Address, Box # :		pruce, Halstea			Agriculture (	Division of Water Resource
	272 2	bruce, paraces	a, ka. 07030		n Number:	SIVISION OF THE GOLD
y, State, ZIP Code			401			
LOCATE WELL'S LOCATION WI AN "X" IN SECTION BOX:						
N						6 <del></del> 21 <del>. 9</del> 1ft.
	1 1					
NW NE	Pump	test data: Well water	was	ft. after	. hours pu	mping gpi
	Est. Yield	gpm: Well water	was	ft. after	. hours pu	mping gp
i	Bore Hole Diame	ter 4 3 in . to .		.ft., and	in.	. to
w	WELL WATER TO	O BE USED AS: 5	Public water supply	8 Air conditionin	g 11	Injection well
	1 Domestic	3 Feedlot 6	Oil field water supp	ly 9 Dewatering	12	Other (Specify below)
SW SE	2 Irrigation					,
						mo/day/yr sample was si
<u> </u>	4	acteriological sample st	Dirintod to Departine	Water Well Disinfect		No X
	mitted	5 14/	0.00			Clamped
YPE OF BLANK CASING USE		5 Wrought iron	8 Concrete tile			
1 Steel 3 RMF	<b>,</b> - ,	6 Asbestos-Cement		,		ed
2 PVC sch 40 4 ABS		7 Fiberglass				aded. Flush Joint.
nk casing diameter						
ing height above land surface.		.in., weight	•703	lbs./ft. Wall thickness	or gauge N	o <b>-154</b>
E OF SCREEN OR PERFORA	TION MATERIAL:		7 PVC <b>sch</b>	40 10 As	bestos-ceme	ent
1 Steel 3 Stair	niess steel	5 Fiberglass	8 RMP (SR)	11 Ot	her (specify)	
	vanized steel	6 Concrete tile	9 ABS		one used (or	
REEN OR PERFORATION OPE			d wrapped	8 Saw cut 20		11 None (open hole)
	3 Mill slot	6 Wire w		9 Drilled holes		Ti Hona (opon hole)
			rapped	a Diffied Holes		
				40 015 4		
	4 Key punched	7 Torch			• -	• • • • • • • • • • • • • • • • • • • •
	LS: From 39.	, . ,	. <b>44</b>	, From	ft. t	o
2 Louvered shutter REEN-PERFORATED INTERVA	LS: From 39.		.44	, From	ft. t	o
	LS: From39.		.44	, From	ft. t	o
REEN-PERFORATED INTERVA	LS: From39.		.44	, From	ft. t	o
GRAVEL PACK INTERVA	From	ft. to	.44	, From , From , From , From	ft. f	o
GRAVEL PACK INTERVA	From	ft. to	.44	, From , From , From , From	ft. f	o
GRAVEL PACK INTERVA	ALS: From 39. From 34. From leat cement ft. to 34. From	ft. to	44 ft 45 ft 3 Bentonite ft to.	, From , From , From , From	ft. 1	o
GRAVEL PACK INTERVA	ALS: From 39. From 34. From leat cement ft. to 34. From	ft. to ft. to ft. to ft. to ft. to ft. to 2 Cement grout ft., From		. From	ft. 1	o
GRAVEL PACK INTERVA	From	ft. to 7 Pit privy	44	. From	ft. 1 ft. 1 ft. 1 ft. 1	oo.  ft. to  bandoned water well  bil well/Gas well
GRAVEL PACK INTERVAL  GRAVEL PACK INTERVAL  GROUT MATERIAL: 1 N  ut Intervals: From () at is the nearest source of poss  1 Septic tank 4 L  2 Sewer lines 5 0	ALS: From	ft. to ft. to ft. to ft. to ft. to ft. to 7 Pit privy 8 Sewage lago		From From From From From From From This From Livestock pens Fuel storage Fertilizer storage	14 A 15 C	o
GRAVEL PACK INTERVA  GRAVEL PACK INTERVA  GROUT MATERIAL: 1 N  ut Intervals: From ()  at is the nearest source of poss 1 Septic tank 4 L 2 Sewer lines 5 ( 3 Watertight sewer lines 6 §	ALS: From	ft. to 7 Pit privy		From From From From From From Fom Fin. From Livestock pens Full storage Fertilizer storage Insecticide storage	14 A 15 C Storm	o
GRAVEL PACK INTERVA GRAVEL PACK INTERVA GROUT MATERIAL: 1 N ut Intervals: FromQ at is the nearest source of poss 1 Septic tank 4 L 2 Sewer lines 5 G 3 Watertight sewer lines 6 S ection from well?	From	ft. to ft. to ft. to ft. to ft. to ft. to  2 Cement grout ft., From 7 Pit privy 8 Sewage lago 9 Feedyard	44	From From From From From From Fom Fin. From Livestock pens Full storage Fertilizer storage Insecticide storage	14 A 15 C Storm	o
GRAVEL PACK INTERVA GRAVEL PACK INTERVA GROUT MATERIAL: 1 N ut Intervals: From() at is the nearest source of poss 1 Septic tank 4 L 2 Sewer lines 5 C 3 Watertight sewer lines 6 S ction from well? West	From	ft. to ft. to ft. to ft. to ft. to ft. to  2 Cement grout ft., From 7 Pit privy 8 Sewage lago 9 Feedyard		From From From From From From From Fin. From Livestock pens Fuel storage Fertilizer storage Insecticide storage	14 A 15 C Storm	o
GRAVEL PACK INTERVAL GRAVEL PACK INTERVAL GROUT MATERIAL: 1 N at Intervals: FromQ at is the nearest source of poss 1 Septic tank 4 L 2 Sewer lines 5 C 3 Watertight sewer lines 6 S action from well? West	ALS: From	ft. to ft. to ft. to ft. to ft. to ft. to  2 Cement grout ft., From 7 Pit privy 8 Sewage lago 9 Feedyard	44	From From From From From From From Fin. From Livestock pens Fuel storage Fertilizer storage Insecticide storage	14 A 15 C Storm	o
GRAVEL PACK INTERVAL  GRAVEL PACK INTERVAL  GROUT MATERIAL: 1 N  ut Intervals: From	ALS: From	ft. to ft. to ft. to ft. to ft. to ft. to  2 Cement grout ft., From 7 Pit privy 8 Sewage lago 9 Feedyard	44	From From From From From From From Fin. From Livestock pens Fuel storage Fertilizer storage Insecticide storage	14 A 15 C Storm	o
GRAVEL PACK INTERVAL  INTE	ALS: From	ft. to 7 Pit privy 8 Sewage lago 9 Feedyard	44	From From From From From From From Fin. From Livestock pens Fuel storage Fertilizer storage Insecticide storage	14 A 15 C Storm	o
GRAVEL PACK INTERVAL GRAVEL PACK INTERVAL GROUT MATERIAL: 1 N ut Intervals: FromQ at is the nearest source of poss 1 Septic tank 4 L 2 Sewer lines 5 C 3 Watertight sewer lines 6 S ction from well? West COM TO 0 4 5 4 10 5 10 20 6 20 30 6	From	ft. to 7 Pit privy 8 Sewage lago 9 Feedyard	44	From From From From From From From Fin. From Livestock pens Fuel storage Fertilizer storage Insecticide storage	14 A 15 C Storm	o
GRAVEL PACK INTERVAL INTERV	From	ft. to 2 Cement grout ft., From 7 Pit privy 8 Sewage lago 9 Feedyard LOG	44	From From From From From From From Fin. From Livestock pens Fuel storage Fertilizer storage Insecticide storage	14 A 15 C Storm	o
GRAVEL PACK INTERVAL  GRAVEL PACK INTERVAL  GRAVEL PACK INTERVAL  GROUT MATERIAL: 1 N  ut Intervals: From 0  at is the nearest source of poss 1 Septic tank 4 L 2 Sewer lines 5 0 3 Watertight sewer lines 6 5  cotion from well? West  A 10 1 10 20 0 20 30 1 30 40 1	From	ft. to 7 Pit privy 8 Sewage lago 9 Feedyard	44	From From From From From From From Fin. From Livestock pens Fuel storage Fertilizer storage Insecticide storage	14 A 15 C Storm	o
GRAVEL PACK INTERVAL  Intervals: FromQ	From	ft. to ft. exists a second secon	44	From From From From From From From Fin. From Livestock pens Fuel storage Fertilizer storage Insecticide storage	14 A 15 C Storm	o
GRAVEL PACK INTERVAL  Intervals: FromQ	From	ft. to ft. exists a second secon	44	From From From From From From From Fin. From Livestock pens Fuel storage Fertilizer storage Insecticide storage	14 A 15 C Storm	o
GRAVEL PACK INTERVAL GRAVEL PACK INTERVAL GROUT MATERIAL: 1 N ut Intervals: From	From	ft. to ft. exists a second secon	44	From From From From From From From Fin. From Livestock pens Fuel storage Fertilizer storage Insecticide storage	14 A 15 C Storm	o
GRAVEL PACK INTERVAL GRAVEL PACK INTERVAL GROUT MATERIAL: 1 N ut Intervals: From	From	ft. to ft. exists a second secon	44	From From From From From From From Fin. From Livestock pens Fuel storage Fertilizer storage Insecticide storage	14 A 15 C Storm	o
GRAVEL PACK INTERVAL  Intervals: FromQ	From	ft. to ft. exists a second secon	44	From From From From From From From Fin. From Livestock pens Fuel storage Fertilizer storage Insecticide storage	14 A 15 C Storm	o
GRAVEL PACK INTERVAL GRAVEL PACK INTERVAL GROUT MATERIAL: 1 N ut Intervals: From	From	ft. to ft. exists a second secon	44	From From From From From From From Fin. From Livestock pens Fuel storage Fertilizer storage Insecticide storage	14 A 15 C Storm	o
GRAVEL PACK INTERVAL GRAVEL PACK INTERVAL GROUT MATERIAL: 1 N ut Intervals: From	From	ft. to ft. exists a second secon	44	From From From From From From From Fin. From Livestock pens Fuel storage Fertilizer storage Insecticide storage	14 A 15 C Storm	o
GRAVEL PACK INTERVAL GRAVEL PACK INTERVAL GROUT MATERIAL: 1 N ut Intervals: From. 0 at is the nearest source of poss 1 Septic tank 4 L 2 Sewer lines 5 0 3 Watertight sewer lines 6 5 ection from well? West A 10 1 10 20 0 20 30 1 30 40 1 40 44	From	ft. to ft. exists a second secon	44	From From From From From From From Fin. From Livestock pens Fuel storage Fertilizer storage Insecticide storage	14 A 15 C Storm	o
GRAVEL PACK INTERVAL GRAVEL PACK INTERVAL GROUT MATERIAL: 1 N ut Intervals: From. 0 at is the nearest source of poss 1 Septic tank 4 L 2 Sewer lines 5 0 3 Watertight sewer lines 6 5 ection from well? West A 10 1 10 20 0 20 30 1 30 40 1 40 44	From	ft. to ft. exists a second secon	44	From From From From From From From Fill From Livestock pens Fuel storage Fertilizer storage Insecticide storage	14 A 15 C Storm	o
GRAVEL PACK INTERVAL GRAVEL PA	From	ft. to ft. exists a second secon	44	From From From From From From From Fill From Livestock pens Fuel storage Fertilizer storage Insecticide storage	14 A 15 C Storm	o
GRAVEL PACK INTERVAL  I Nut Intervals: From. 0  at is the nearest source of poss  1 Septic tank 4 L  2 Sewer lines 5 C  3 Watertight sewer lines 6 S  action from well? West  GOM TO  0 4 5  4 10 1  10 20 0  20 30 1  30 40 1  40 44 49 0  10 1  10 44 10 1  10 20 0  10 20 0  10 20 0  10 30 40 1  10 44 49 0	ALS: From	tt. to	.44	From From From From From GOI4PO PAGUG  tt. From Livestock pens Fuel storage Fertilizer storage Insecticide storage w many feet? 20	14 A 15 C 16 C Storm pond/s	oo.  th. to bandoned water well bit well/Gas weil bther (specify below) water-disposal and pit pond NTERVALS
GRAVEL PACK INTERVAL	ALS: From	tt. to	.44	From From From GOIAPO PAGIUG From Livestock pens Fuel storage Insecticide storage w many feet? 20	14 A 15 C Storm Dond/s	o
GRAVEL PACK INTERVAL	ALS: From	ft. to	.44	From From From From From From From From	14 A 15 C Storm Dond/s	oo.  th. to bandoned water well bit well/Gas weil bther (specify below) water-disposal and pit pond NTERVALS
GRAVEL PACK INTERVAL  INTERVAL  GRAVEL PACK INTERVAL  GRAVEL PACK INTERVAL  TO 0  TO 0  GRAVEL PACK INTERVAL  TO 0  TO 0  GRAVEL PACK INTERVAL  TO 0  TO 0  GRAVEL PACK INTERVAL  TO 0  GRAVEL PACK INTERVAL  TO 0  TO 0  GRAVEL PACK INTERVAL  TO 0  GRAV	ALS: From	tt. to	.44	From From From From From From From From	14 A 15 C Storm Dond/s	o

OCATION OF WATER WE	LL: Fraction				Section Nu	mber	OWNSH	ip Numb	er			ımber
unty: Sedgwick	NEC			SW 1/4			T	26	S	l A	lΕ	E/W
ance and direction from ne	earest town or city stre	et address	of well if lo	cated within	city? Mile	s Sand	Co.,	4852	No.	Merid	lian,	Wichit
KS. 67204, appr	ож75 mi So,	of 53	rd St.	No. & .	5 mi. E.	of Mer	dian	on E	side	of J	lake.	
WATER WELL OWNER:	Ground Water											
#, St. Address, Box # :	313 Spruce,						Board	of Agric	ulture,	Division	of Wate	r Resource
, State, ZIP Code :								ation Nu				
OCATE WELL'S LOCATIO	N WITH 4 DEPTH C	F COMPLE	ETED WELI	L28	.5 ft. E	LEVATION	, Aj	PPROX	•	1.	328	
IN "X" IN SECTION BOX:	Depth(s) Gro	oundwater E	Encountered	1 1		ft. 2			ft. 3			
	WELL'S STA	ATIC WATE	R LEVEL .	17	ft. below lar	nd surface	measure	d on mo	/day/yr	6-	20 <del>-9</del> 1	·
	p											
NW NI	Est. Yield	<i>.</i>	pm: Well	water was		ft, after .		he	ours pu	. pnigmu		
					LOW STEM							
W	WELL WATE				ic water supply		conditio			Injection		
	1 Dome	stic	3 Feedlot	6 Oil fl	eld water supp		watering	-		Other (		pelow)
SW SE	2 Irrigati	ion	4 Industrial		n and garden o	-	•	•				
	1 1				ed to Departme	-			_			
<del> </del>	mitted					Water W			•	,,	•	X
YPE OF BLANK CASING		5 Wr	ought iron	8	Concrete tile					<u></u>		ed
	RMP (SR)		bestos-Cem	-	Other (specify		O/IOII 10	John				
2 PVC sch 40 4	* *		ergiass		· · · · · · · · · · · · · · · · · · ·						_	h Join
k casing diameter			-									
ing height above land surf												
E OF SCREEN OR PERF			eignt		7 PVC <b>sci</b>			•	•		<i>□</i>	
				_			-	Asbesto				
	Stainless steel		perglass		8 RMP (SR)							
	Galvanized steel	6 Co	ncrete tile		9 ABS			None u	_ ` `			
REEN OR PERFORATION			5 (	Gauzed wrap	oped	8 9	saw cut	20	STOF	11 No	ne (ope	n hole)
1 Continuous slot	3 Mill stot				1							
				Vire wrappe	d	9 (	Onlied h	oles				
2 Louvered shutter REEN-PERFORATED INTE	4 Key punched ERVALS: From From ERVALS: From		7 T 23.5 ft. ft. 15. ft.	Forch cut to to	28•5 fi	10 ( ., From ., From	Other (sp	pecify)	ft. ft. ft.	to to to		
GRAVEL PACK INTE	4 Key punched ERVALS: From From ERVALS: From From  1 Neat cement	2 Cerr	7 1 23.5. ft. ft. .15. ft. ft.	Forch cut to to to  3	28.5 fr 28.5 fr 28.5 fr	10 ( ., From	Other (sp	pacify)	ft. ft. ft. ft.	to to to		
GRAVEL PACK INTO	4 Key punched ERVALS: From From ERVALS: From From  1 Neat cement Q. ft. to	2 Cerr 12.3 fr	7 1 23.5. ft. ft. .15. ft. ft.	Forch cut to to to  3	28.5 ft 28.5 ft 8 Bentonite B	10 ( i., From i., From i., From i., From	Other (sp	pacify)	ft. ft. ft.	to		
GRAVEL PACK INTO GROUT MATERIAL: ut Intervals: From	4 Key punched ERVALS: From From ERVALS: From From  1 Neat cement Qft. to possible contamination	2 Cerr 12.3 fr	7 T 23.5. ft	to to	28.5 ff 28.5 ff 3 Bentonite B	., From From From From	G. Fro	pacify)	ft. ft. ft. 	totototototototto	oed wate	
GRAVEL PACK INTO GROUT MATERIAL: ut Intervals: From at is the nearest source of 1 Septic tank	4 Key punched ERVALS: From From ERVALS: From From  1 Neat cement Qft. to possible contamination 4 Lateral lines	2 Cerr 12.3 fr	7 T 23.5 ft ft ft	Forch cut to to to to y	28.5 ff 28.5 ff	., From From From From From DLR Pibe	Other (sp	pacify)	ft.	tototototoft. toft. toft. toft. toft. to	ed wate	fi fi
GRAVEL PACK INTI GRAVEL PACK INTI GROUT MATERIAL: ut Intervals: From at is the nearest source of 1 Septic tank 2 Sewer lines	4 Key punched ERVALS: From From ERVALS: From From  1 Neat cement Qft. to possible contamination 4 Lateral lines 5 Cess pool	2 Cerr 12.3 fr	7 T 23.5 ft. ft. ft. ft. hent grout tt. From 7 Pit privy 8 Sewage	Forch cut to to to to  y y a lagoon	28.5.fi	From From From From Livestock   Fuel storac Fertilizer s	G ft., Fro	m	ft.	totototototto	ed wate	fi fi
GRAVEL PACK INTO GRAVEL PACK INTO GROUT MATERIAL: ut Intervals: From at is the nearest source of 1 Septic tank 2 Sewer lines 3 Watertight sewer lines	4 Key punched ERVALS: From From ERVALS: From From  1 Neat cement Qft. to possible contamination 4 Lateral lines 5 Cess pool 6 Seepage pit	2 Cerr 12.3 fr	7 T 23.5 ft ft ft	Forch cut to to to to  y y a lagoon	28-5.ft 28-5.ft 3 Bentonite E6 10 11 12 13	From From From From Livestock   Fuel storar Fertilizer s Insecticide	Gft Fro	m	ft.	tototototoft. toft. toft. toft. toft. to	ed wate	fi fi
GRAVEL PACK INTI GROUT MATERIAL: at Intervals: From it is the nearest source of 1 Septic tank 2 Sewer lines 3 Watertight sewer lines ction from well?	4 Key punched ERVALS: From From ERVALS: From From  1 Neat cement Q ft. to possible contamination 4 Lateral lines 5 Cess pool 6 Seepage pit WEST	2 Cerr . <b>12.3</b> . fr	7 T 23.5 ft. ft. ft. ft. hent grout tt. From 7 Pit privy 8 Sewage	rorch cut to to to  y a lagoon rd	28•5 fr fr 28•5 fr	From From From From Livestock   Fuel storac Fertilizer s	Gft Fro	m	14 / 15 ( 16 ( 2 ( )	tototoft. toft. tof	ed wate Gas well Decify be	
GRAVEL PACK INTI GRAVEL PACK INTI GROUT MATERIAL: at Intervals: From	4 Key punched ERVALS: From From  1 Neat cement 0 ft. to possible contamination 4 Lateral lines 5 Cess pool 6 Seepage pit WEST LITHOLOGO	2 Cerr . 12.3 h	23.5. ft	rorch cut to to to  y a lagoon rd	28-5.ft 28-5.ft 3 Bentonite E6 10 11 12 13	From From From From Livestock   Fuel storar Fertilizer s Insecticide	Gft Fro	m	14 / 15 ( 16 ( 2 ( )	totototototto	ed wate Gas well Decify be	f
GRAVEL PACK INTI  GRAVEL PACK INTI  ROUT MATERIAL:  It Intervals: From	4 Key punched ERVALS: From From ERVALS: From From  1 Neat cement Q ft. to possible contamination 4 Lateral lines 5 Cess pool 6 Seepage pit WEST	2 Cerr . 12.3 h	23.5. ft	rorch cut to to to  y a lagoon rd	28•5 fr fr 28•5 fr	From From From From Livestock   Fuel storar Fertilizer s Insecticide	Gft Fro	m	14 / 15 ( 16 ( 2 ( )	tototoft. toft. tof	ed wate Gas well Decify be	
GRAVEL PACK INTI  ROUT MATERIAL: It Intervals: From t is the nearest source of 1 Septic tank 2 Sewer lines 3 Watertight sewer lines ction from well?	4 Key punched ERVALS: From From  1 Neat cement 0 ft. to possible contamination 4 Lateral lines 5 Cess pool 6 Seepage pit WEST LITHOLOGO	2 Cerr . 12.3 h	23.5. ft	rorch cut to to to  y a lagoon rd	28•5 fr fr 28•5 fr	From From From From Livestock   Fuel storar Fertilizer s Insecticide	Gft Fro	m	14 / 15 ( 16 ( 2 ( )	tototoft. toft. tof	ed wate Gas well Decify be	
GRAVEL PACK INTI GROUT MATERIAL: at Intervals: From it is the nearest source of 1 Septic tank 2 Sewer lines 3 Watertight sewer lines ction from well?	4 Key punched ERVALS: From From  1 Neat cement 0 ft. to possible contamination 4 Lateral lines 5 Cess pool 6 Seepage pit WEST LITHOLOGO	2 Cerr . 12.3 h	23.5. ft	rorch cut to to to  y a lagoon rd	28•5 fr fr 28•5 fr	From From From From Livestock   Fuel storar Fertilizer s Insecticide	Gft Fro	m	14 / 15 ( 16 ( 2 ( )	tototoft. toft. tof	ed wate Gas well Decify be	fi fi
GRAVEL PACK INTI  ROUT MATERIAL: It Intervals: From t is the nearest source of 1 Septic tank 2 Sewer lines 3 Watertight sewer lines ction from well?	4 Key punched ERVALS: From From  1 Neat cement 0 ft. to possible contamination 4 Lateral lines 5 Cess pool 6 Seepage pit WEST LITHOLOGO	2 Cerr . 12.3 h	23.5. ft	rorch cut to to to  y a lagoon rd	28•5 fr fr 28•5 fr	From From From From Livestock   Fuel storar Fertilizer s Insecticide	Gft Fro	m	14 / 15 ( 16 ( 2 ( )	tototoft. toft. tof	ed wate Gas well Decify be	
GRAVEL PACK INTI  ROUT MATERIAL: It Intervals: From t is the nearest source of 1 Septic tank 2 Sewer lines 3 Watertight sewer lines ction from well?	4 Key punched ERVALS: From From  1 Neat cement 0 ft. to possible contamination 4 Lateral lines 5 Cess pool 6 Seepage pit WEST LITHOLOGO	2 Cerr . 12.3 h	23.5. ft	rorch cut to to to  y a lagoon rd	28•5 fr fr 28•5 fr	From From From From Livestock   Fuel storar Fertilizer s Insecticide	Gft Fro	m	14 / 15 ( 16 ( 2 ( )	tototoft. toft. tof	ed wate Gas well Decify be	
GRAVEL PACK INTI  ROUT MATERIAL: It Intervals: From t is the nearest source of 1 Septic tank 2 Sewer lines 3 Watertight sewer lines ction from well?	4 Key punched ERVALS: From From  1 Neat cement 0 ft. to possible contamination 4 Lateral lines 5 Cess pool 6 Seepage pit WEST LITHOLOGO	2 Cerr . 12.3 h	23.5. ft	rorch cut to to to  y a lagoon rd	28•5 fr fr 28•5 fr	From From From From Livestock   Fuel storar Fertilizer s Insecticide	Gft Fro	m	14 / 15 ( 16 ( 2 ( )	tototoft. toft. tof	ed wate Gas well Decify be	
GRAVEL PACK INTI  GRAVEL PACK INTI  ROUT MATERIAL:  It Intervals: From	4 Key punched ERVALS: From From  1 Neat cement 0 ft. to possible contamination 4 Lateral lines 5 Cess pool 6 Seepage pit WEST LITHOLOGO	2 Cerr . 12.3 h	23.5. ft	rorch cut to to to  y a lagoon rd	28•5 fr fr 28•5 fr	From From From From Livestock   Fuel storar Fertilizer s Insecticide	Gft Fro	m	14 / 15 ( 16 ( 2 ( )	tototoft. toft. tof	ed wate Gas well Decify be	
GRAVEL PACK INTI  GRAVEL PACK INTI  ROUT MATERIAL:  It Intervals: From	4 Key punched ERVALS: From From  1 Neat cement 0 ft. to possible contamination 4 Lateral lines 5 Cess pool 6 Seepage pit WEST LITHOLOGO	2 Cerr . 12.3 h	23.5. ft	rorch cut to to to  y a lagoon rd	28•5 fr fr 28•5 fr	From From From From Livestock   Fuel storar Fertilizer s Insecticide	Gft Fro	m	14 / 15 ( 16 ( 2 ( )	tototoft. toft. tof	ed wate Gas well Decify be	
GRAVEL PACK INTI GROUT MATERIAL: at Intervals: From it is the nearest source of 1 Septic tank 2 Sewer lines 3 Watertight sewer lines ction from well?	4 Key punched ERVALS: From From  1 Neat cement 0 ft. to possible contamination 4 Lateral lines 5 Cess pool 6 Seepage pit WEST LITHOLOGO	2 Cerr . 12.3 h	23.5. ft	rorch cut to to to  y a lagoon rd	28•5 fr fr 28•5 fr	From From From From Livestock   Fuel storar Fertilizer s Insecticide	Gft Fro	m	14 / 15 ( 16 ( 2 ( )	tototoft. toft. tof	ed wate Gas well Decify be	fi fi
GRAVEL PACK INTI GRAVEL PACK INTI GROUT MATERIAL: at Intervals: From	4 Key punched ERVALS: From From  1 Neat cement 0 ft. to possible contamination 4 Lateral lines 5 Cess pool 6 Seepage pit WEST LITHOLOGO	2 Cerr . 12.3 h	23.5. ft	rorch cut to to to  y a lagoon rd	28•5 fr fr 28•5 fr	From From From From Livestock   Fuel storar Fertilizer s Insecticide	Gft Fro	m	14 / 15 ( 16 ( 2 ( )	tototoft. toft. tof	ed wate Gas well Decify be	f
GRAVEL PACK INTI GRAVEL PACK INTI GROUT MATERIAL: at Intervals: From	4 Key punched ERVALS: From From  1 Neat cement 0 ft. to possible contamination 4 Lateral lines 5 Cess pool 6 Seepage pit WEST LITHOLOGO	2 Cerr . 12.3 h	23.5. ft	rorch cut to to to  y a lagoon rd	28•5 fr fr 28•5 fr	From From From From Livestock   Fuel storar Fertilizer s Insecticide	Gft Fro	m	14 / 15 ( 16 ( 2 ( )	tototoft. toft. tof	ed wate Gas well Decify be	f
GRAVEL PACK INTI GRAVEL PACK INTI GROUT MATERIAL: at Intervals: From	4 Key punched ERVALS: From From  1 Neat cement 0 ft. to possible contamination 4 Lateral lines 5 Cess pool 6 Seepage pit WEST LITHOLOGO	2 Cerr . 12.3 h	23.5. ft	rorch cut to to to  y a lagoon rd	28•5 fr fr 28•5 fr	From From From From Livestock   Fuel storar Fertilizer s Insecticide	Gft Fro	m	14 / 15 ( 16 ( 2 ( )	tototoft. toft. tof	ed wate Gas well Decify be	f
GRAVEL PACK INTI GROUT MATERIAL: ut Intervals: From at is the nearest source of 1 Septic tank 2 Sewer lines 3 Watertight sewer lines action from well?	4 Key punched ERVALS: From From  1 Neat cement 0 ft. to possible contamination 4 Lateral lines 5 Cess pool 6 Seepage pit WEST LITHOLOGO	2 Cerr . 12.3 h	23.5. ft	rorch cut to to to  y a lagoon rd	28•5 fr fr 28•5 fr	From From From From Livestock   Fuel storar Fertilizer s Insecticide	Gft Fro	m	14 / 15 ( 16 ( 2 ( )	tototoft. toft. tof	ed wate Gas well Decify be	fi fi
GRAVEL PACK INTI GROUT MATERIAL: at Intervals: From it is the nearest source of 1 Septic tank 2 Sewer lines 3 Watertight sewer lines ction from well?	4 Key punched ERVALS: From From  1 Neat cement 0 ft. to possible contamination 4 Lateral lines 5 Cess pool 6 Seepage pit WEST LITHOLOGO	2 Cerr . 12.3 h	23.5. ft	rorch cut to to to  y a lagoon rd	28•5 fr fr 28•5 fr	From From From From Livestock   Fuel storar Fertilizer s Insecticide	Gft Fro	m	14 / 15 ( 16 ( 2 ( )	tototoft. toft. tof	ed wate Gas well Decify be	fi fi
GRAVEL PACK INTO GRAVEL INTO	4 Key punched ERVALS: From From ERVALS: From From  1 Neat cement Q ft. to possible contamination 4 Lateral lines 5 Cess pool 6 Seepage pit WEST LITHOLOG SEE SCHEDUIL	2 Cerr. 12.3. fin:	23.5 ft	rorch cut to to to g a lagoon ird  FF	28.5 h 28.5 h 18 Bentonite Et 10 11 12 13 HO ROM TO	10 (c. From	G	30 <sup>S</sup>	14 / ft. 15 (1.16) 16 (1.16) 17 (1.16) 18 (1.16) 18 (1.16) 18 (1.16) 18 (1.16) 18 (1.16)	tototototototototototototd.	ed water says well becity be ONID.	
GRAVEL PACK INTI GRAVEL PACK INTI GROUT MATERIAL: ut Intervals: From at is the nearest source of 1 Septic tank 2 Sewer lines 3 Watertight sewer lines ection from well?	4 Key punched ERVALS: From From ERVALS: From From  1 Neat cement Q ft. to possible contamination 4 Lateral lines 5 Cess pool 6 Seepage pit WEST LITHOLOG SEE SCHEDUIL	2 Cerr. 12.3. ff n: n: GIC LOG E ATTAC	23.5. ft	reil was (1)	28.5 ft f	10 (c., From, From	G ft Fro pens ge torage storage ent?	30 <sup>S</sup> PLUG	14 / 15 (16 ) 15 (16 ) 15 (16 ) 16 (16	tototototototototo	o water as well becity be OND	
GRAVEL PACK INTO GRAVEL PACK INTO GROUT MATERIAL: ut Intervals: From at is the nearest source of 1 Septic tank 2 Sewer lines 3 Watertight sewer lines iction from well? IOM TO  CONTRACTOR'S OR LAN pleted on (mo/day-year)	4 Key punched ERVALS: From From ERVALS: From From  1 Neat cement Q ft. to possible contamination 4 Lateral lines 5 Cess pool 6 Seepage pit WEST LITHOLO SEE SCHEDUL	2 Cerr. 12.3 m	23.5. ft	reil was (1)	28.5 h 28.5 h 3 Bentonite E6 10 11 12 13 Ho AOM TO	Livestock Fuel storac Fertilizer s Insecticide w many fee	G Fro pens ge torage storage et?	30 <sup>S</sup> PLUG  (3) plug ne best c	14 / 15 (16 ) 15 (16 ) 15 (16 ) 16 (16	tototototototototo	o water as well becity be OND	on and wa
GRAVEL PACK INTI GROUT MATERIAL: It Intervals: From It is the nearest source of 1 Septic tank 2 Sewer lines 3 Watertight sewer lines ction from well? OM TO  CONTRACTOR'S OR LAN	4 Key punched ERVALS: From From ERVALS: From From  1 Neat cement Q ft. to possible contamination 4 Lateral lines 5 Cess pool 6 Seepage pit WEST LITHOLO SEE SCHEDUL  DOWNER'S CERTIFIC 6-20-91 se No.	2 Cerr 12.3 m	23.5. ft	reil was (1)	28.5 ft  28.5 ft  3 Bentonite Etc  10  11  12  13  Ho  AOM TO  constructed, (2  and thi	Livestock Fuel storac Fertilizer s Insecticide w many fee	G Fro pens ge torage storage et?	30 <sup>S</sup> PLUG  (3) plug ne best c	14 / 15 (16 ) 15 (16 ) 15 (16 ) 16 (16	tototototototototo	o water as well becity be OND	on and wa

### EQUUS BEDS GROUNDWATER MANAGEMENT DISTRICT NO. 2

DRILLER'S LOG AND WELL RECORD FIELD SHEET

Well No. E							· · · · · · · · · · · · · · · · · · ·	
LOCATION OF	WATER WELL:	Fraction	SE v	SW V	ection Numbe	T 26	1 -	Number
	ction from nearest town					And Co. 4852 No.	S A 1E	E 6720
	5 mi. 5. of 53rd						inimerician, Wi	CHITA 6/204
2 WATER WEL					5.1 C 310E	o. iave.		
RR#, St. Address		Ground Wate	r Management (	listrict II		Board of Agri	culture, Division of Wa	Nor Bosons
City, State, ZIP (		313 Spruce,	Halstead, Ka	isas 6	7056	Application N	N/A	
LOCATE WEL	'S LOCATION WITH	DEPTH OF CO	MPLETED WELL	28.5	t. FLEV	ATION: Approx.		
AN "X" IN SE						2		
ī —						urlace measured on m		
						after		
\\	NE E	st. Yield	gpm: Well w	ater was	h.	alter	Yours pumping	gpm
	i l B	ore Hole Diame	er in.	to		and	in. to	
* w	1   w		BE USED AS:	5 Public wa		8 Air conditioning		
sw	SE	1 Domestic	3 Feedlot	6 Oil field w	ater supply	9 Dewatering	12 Other (Specif	y below)
;;		2 Irrigation	4 industrial	7 Lawn and	l garden only€	10 Observation well		
<u>i</u>	<u> </u>	/as a chemical/b	acteriological samp	e submitted to	Department? \	resNoX		
		bettii				ater Well Disinfected?		
TYPE OF BU	NK CASING USED:		5 Wrought iron	8 Cond	crete tile	CASING JOINT	S: Glued Clar	mped
1 Steel	3 AMP (SA)		6 Asbestos-Came	nt 9 Othe	r (specify being	w)	Welded	
2 PVC	4 ABS		7 Fiberglass				Threaded.)	
Nank casing diar	seter in	្ to	, . ft., Dia	in. 1	lo	tt Dia	in to	
Casing height ab	we land surface3	6 • • • • • • • • • • • • • • • • • • •	n., weight		lbs	/ft. Wall thickness or	gauge No	
YPE OF SCREE	N OR PERFORATION	MATERIAL:		TP			os-cement	
1 Steel	3 Stainless st	teei	5 Fiberglass	8 A	MP (SR)		(specify)	
2 Brass	4 Galvanized	steel	6 Concrete tile	9 A			used (open hole)	
CREEN OR PE	AFORATION OPENINGS			uzed wrapped		8 Saw cut	11 None (or	oen hole)
1 Continuos	s slot 3 Mill s	slot		e wrapped		9 Drilled holes		, , , , , ,
2 Louvered	shutter 4 Key	punched		ch cut				
CREEN-PERFO	RATED INTERVALS.	From 28			t Fro	m	t 10	
		From			t. Fro	nm	ft in	
GRAVE	PACK INTERVALS:	From 28	.5 t. to	15-0	th Fro	ım	t to	
Colorado S	lica Sand	From	ft. to		ft., Fro		fi to	
GROUT MATE			Cement grout	(3 Ben	tonite 4	Other		
cout intervals:	From 123 tt.	tosur.f.ace	t., From	h.	to	ft From	h. to	
Vhat is the neare	st source of possible con	ntamination:				stock pens	14 Abandoned wat	
1 Septic tan	4 Lateral li	ines	7 Pit privy		11 Fuel		15 Oil well/Gas we	
2 Sewer line	s 5 Cass po	noi los	8 Sewage la	igcon		izer storage	16 Other (specify t	
3 Watertight	sewer lines 6 Seepage	pit pit	9 Feedyard			-	and pit pond	
direction from we	17 West		•			ny feet? 30 ft.		
FROM TO		LITHOLOGIC L	OG	FROM	TO		HOLOGIC LOG	
0 3	Dark-brn, sand	y, silt. Qt	z grains range	8	13	Tan qtz sand ran		0.5 to
	from 0.1 & sma	ller to 0.2	mm. Lightly	stalned		2.0 mm dlam. An		
	with Fe O . G	rains angula	r to rounded.			to transparant,		
	Non-calc. Les					granite, qtz. ss		
	lightens below			few		comprise perhaps	15-20% by vol	of sample
	± 1%, gtz grai			1	-1	Non-calc. Some	mica.	و بين الله و الله
3 8	Tellow to tan,			13	18	Tan qtz sand pre	dom, 0.25 to 1.5	mm dlam.
	mixture. Pred	ominately qt	z, less 1% ea			Cherts atz pebbl		
	mica and felds	par. Smalle	r grains andu	ar		than 5% by vol.	One	
	to subangular.	Larger rou	nd to sub-rd			shows etched XI	tage non Size 0	ITA BEGIVE
	frosted. Pebb							
	sandstone. Av	a eiza nana-	of case o			Less than 1% ang either Mn or Fe	-Dlack-coated_g	rains,
	0.5 mm, pebble	s from 5 to	10-15 mm. Cor	tains	-	foldense !- *	Sidine Some San	0-51Ze
	unmeasured amou	unt of cilt-	size silien	18		feldspar, ig. &		
	particles.	9111 31 3111	3116	1.0		Similar to 13-18		
COMPLETI					L		(Over)	
							7	
Date Well	Completed: . 20	÷ , '	1991		. `	1.	in /	
							- 11 1	
Site Genl	ngist			8	_	r -716	-11	
Site Geol	ogist				ture	7.6.6.	一人はた	
Site Geol -86-2	ogist	i Sightoge	SHEET FOR	Signa AMOITIONA		?t.c	134.5T	

- 23 28 Similar to 18-23. Fewer pebbles, sand-size fraction increasing.
- 28 33 Well-sorted, light-tan, angular to rounded quartz sand, avg. 0-25 to 1-0 mm dlam. Fewer pebbies. A few 0-2 mm diam mica flakes

Appendix C:	Analytical Da	ta for Volatile	Organic	Compounds in	า Water	Samples
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Project Number: EQB01.EQB01 Storm Water Dis-

Work Order Number: X1-07-948
Date Reported: 08-09-91

Table 1 ANALYTICAL RESULTS

GTEL Sam	ple Number	01	02	
Client I	Client Identification		Miles Sand #2	
Da	te Sampled	07-24-91	07-24-91	
Da	te Analyzed	08-01-91	08-01-91	
Analyte	PQL, ug/L <sup>B</sup>		Concentrati	ion, ug/L <sup>c</sup>
Chloromethane	10	<10	< 10	
Bromomethane	10	<10	< 10	
Vinyl Chloride	10	<10	< 10	
Chloroethane	10	<10	<10	
Methylene Chloride	5	<5	<5	
Acetone	100	<100	< 100	
Carbon Disulfide	5	<5	<5	
1,1-Dichloroethene	5	<5	<5	
1,1-Dichloroethane	5	<5	<5	
1,2-Dichloroethene (total)	5	<5	<5	
Chloroform	5	<5	<5	
1,2-Dichloroethane	5	<5	<5	
2-Butanone	100	<100	<100	
1,1,1-Trichloroethane	5	<5	<5	
Carbon Tetrachloride	5	<5	<5	
Vinyl Acetate	50	< 50	< 50	
Bromodichloromethane	5	<5	<5	
1,2-Dichloropropane	5	<5	<5	
cis-1,3-Dichloropropene	5	<5	<5	
Trichloroethene	5	<5	<5	
Dibromochloromethane	5	<5	<5	

Table 1 continued on next page, footnotes at end of table



Project Number: EQB01.EQB01 Storm Water Dis-

Work Order Number: X1-07-948
Date Reported: 08-09-91

### Table 1 (continued)

### ANALYTICAL RESULTS

GTEL Sam	ole Number	01	02		
Client Io	Client Identification		Miles Sand #2		
Da	te Sampled	07-24-91	07-24-91		
Da	te Analyzed	08-01-91	08-01-91		
Analyte	PQL, ug/Lb		Concentrati	on, ug/L <sup>c</sup>	
1,1,2-Trichloroethane	5	<5	<5		
Benzene	5	<5	<5		
2-Chloroethylvinyl Ether	10	< 10	< 10		
trans-1,3-Dichloropropene	5	<5	<5		
Bromoform	5	<5	<5		
4-Methyl-2-Pentanone	50	<50	< 50		
2-Hexanone	50	<50	< 50		
Tetrachloroethene	5	<5	<5		
1,1,2,2-Tetrachloroethane	5	<5	<5		
Toluene	5	<5	1 J		
Chlorobenzene	5	<5	<5		
Ethylbenzene	5	<5	<5		
Styrene	5	<5	<5		
Xylenes (total)	5	<5	<5		
1,2-Dichlorobenzene	5	<5	<5		
1,3-Dichlorobenzene	5	<5	<5		
1,4-Dichlorobenzene	5	<5	<5		
PQL Multiplier <sup>e</sup>		1	1		

Table 1 continued on next page, footnotes at end of table



Storm Water Dis-

posal Study

Work Order Number: X1-07-948

Date Reported: 08-09-91

#### Footnotes to Table 1

#### ANALYTICAL RESULTS

- Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, Table 2, US EPA November 1986; sample preparation per EPA Method 5030.
- b Practical quantitation limit.
- Data Flag Definitions С
  - Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the quantitation limit, but greater than zero, or when reporting an estimated concentration for a tentatively identified compound. J
  - Indicates that the analyte was found in the blank as well as a sample. It indicates possi-В ble/probable blank contamination and warns the data user to take appropriate action.
- Indicates the adjustments made for sample dilution.



Project Number: EQB01.EQB01 Storm Water Disposal Pond Study Work Order Number: X1-08-409 Date Reported: 08-19-91

### Table 1 ANALYTICAL RESULTS

GTEL Sam	ple Number	01	02	
Client Identification		EB121-A	EB131-A	
Da	te Sampled	08-09-91	08-09-91	
Da	te Analyzed	08-14-91	08-14-91	
Analyte	POL ug/L <sup>B</sup>		Concentrati	on, ug/L <sup>c</sup>
Chloromethane	10	< 10	<10	
Bromomethane	10	< 10	<10	
Vinyl Chloride	10	<10	<10	
Chloroethane	10	< 10	<10	
Methylene Chloride	5	<5	<5	
Acetone	100	< 100	<100	
Carbon Disulfide	5	<5	<5	
1,1-Dichloroethene	5	<5	<5	
1,1-Dichloroethane	5	<5	<5	
1,2-Dichloroethene (total)	5	<5	<5	
Chloroform	5	<5	<5	
1,2-Dichloroethane	5	<5	<5	
2-Butanone	100	< 100	< 100	
1,1,1-Trichloroethane	5	<5	<5	
Carbon Tetrachloride	5	<5	<5	
Vinyl Acetate	50	< 50	<50	
Bromodichloromethane	5	<5	<5	
1,2-Dichloropropane	5	<5	<5	
cis-1,3-Dichloropropene	5	<5	<5	
Trichloroethene	5	<5	<5	
Dibromochloromethane	5	<5	<5	

Table 1 continued on next page, footnotes at end of table



Project Number: EQB01.EQB01
Storm Water Disposal
Pond Study
Work Order Number: X1-08-409
Date Reported: 08-19-91

### Table 1 (continued)

### ANALYTICAL RESULTS

GTEL Sam	ple Number	01	02	
Client I	Client Identification		EB131-A	
Da	te Sampled	08-09-91	08-09-91	
Da	te Analyzed	08-14-91	08-14-91	
Analyte	POL. ug/L <sup>6</sup>		Concentrati	on, ug/L <sup>c</sup>
1,1,2-Trichloroethane	5	<5	<5	
Benzene	5	<5	<5	
2-Chloroethylvinyl Ether	10	<10	<10	
trans-1,3-Dichloropropene	5	<5	<5	
Bromoform	5	<5	<5	
4-Methyl-2-Pentanone	50	< 50	< 50	
2-Hexanone	50	< 50	< 50	
Tetrachloroethene	5	<5	<5	
1,1,2,2-Tetrachloroethane	5	<5	<5	
Toluene	5	<5	<5	
Chlorobenzene	5	<5	<5	
Ethylbenzene	5	<5	<5	
Styrene	5	<5	<5	
Xylenes (total)	5	<5	< 5	
1,2-Dichlorobenzene	5	<5	<5	
1,3-Dichlorobenzene	5	<5	<5	
1,4-Dichlorobenzene	5	<5	<5	
PQL Multiplier <sup>e</sup>		1	1	

Table 1 continued on next page, footnotes at end of table



Storm Water Disposal

Pond Study

Work Order Number: X1-08-409

Date Reported: 08-19-91

### Footnotes to Table 1

#### ANALYTICAL RESULTS

- Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, Table 2, US EPA November 1986; sample preparation per EPA Method 5030.
- Ъ Practical quantitation limit.
- Data Flag Definitions c
  - Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the quantitation limit, but greater than zero, or when reporting an estimated con-J centration for a tentatively identified compound.
  - В Indicates that the analyte was found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.
- Indicates the adjustments made for sample dilution. е



Project Number: EQB01.EQB01 Storm Water Disposal Pond Study Work Order Number: X1-08-274 Date Reported: 08-19-91

### Table 1 ANALYTICAL RESULTS

GTEL Sam	ole Number	01		
Client Id	Client Identification			
Da	te Sampled	08-08-91	·	
Da	te Analyzed	08-15-91		
Analyte	POL, ug/L <sup>B</sup>		Concentration, ug/L <sup>c</sup>	
Chloromethane	10	< 10		
Bromomethane	10	< 10		
Vinyl Chloride	10	< 10		
Chloroethane	10	< 10		
Methylene Chloride	5	<5		
Acetone	100	< 100		
Carbon Disulfide	5	< 5		
1,1-Dichloroethene	5	< 5		
1,1-Dichloroethane	5	< 5		
1,2-Dichloroethene (total)	5	<5		
Chloroform	5	<5		
1,2-Dichloroethane	5	<5		
2-Butanone	100	< 100		
1,1,1-Trichloroethane	5	<5		
Carbon Tetrachloride	5	< 5		
Vinyl Acetate	50	< 50		
Bromodichloromethane	5	<5		
1,2-Dichloropropane	5	<5		
cis-1,3-Dichloropropene	5	<5		
Trichloroethene	5	<5		
Dibromochloromethane	5	<5		

Table 1 continued on next page, footnotes at end of table



Project Number: EQB01.EQB01
Storm Water Disposal
Pond Study
Work Order Number: X1-08-274
Date Reported: 08-19-91

### Table 1 (continued)

### ANALYTICAL RESULTS

GTFL Sam	ole Number	01	
	GTEL Sample Number  Client Identification		
	te Sampled	EB122A 08-08-91	
		08-08-91	
Da	te Analyzed	08-13-91	
Analyte	POL, ug/Lb		Concentration, ug/L <sup>c</sup>
1,1,2-Trichloroethane	5	<5	
Benzene	5	<5	
2-Chloroethylvinyl Ether	10	< 10	
trans-1,3-Dichloropropene	5	<5	
Bromoform	5	<5	
4-Methyl-2-Pentanone	50	< 50	
2-Hexanone	50	<50	
Tetrachloroethene	5	<5	
1,1,2,2-Tetrachloroethane	5	<5	
Toluene	5	<5	
Chlorobenzene	5	<5	
Ethylbenzene	5	<5	
Styrene	5	<5	
Xylenes (total)	5	<5	
1,2-Dichlorobenzene	5	<5	
1,3-Dichlorobenzene	5	<5	
1,4-Dichlorobenzene	5	<5	
PQL Multiplier <sup>e</sup>		11	

Table 1 continued on next page, footnotes at end of table



Storm Water Disposal

Pond Study

Work Order Number: X1-08-274

Date Reported: 08-19-91

### Footnotes to Table 1

#### ANALYTICAL RESULTS

- Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, Table 2, US EPA November 1986; sample preparation per EPA Method 5030.
- b Practical quantitation limit.
- Data Flag Definitions ¢
  - Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the quantitation limit, but greater than zero, or when reporting an estimated concentration for a tentatively identified compound. J
  - Indicates that the analyte was found in the blank as well as a sample. It indicates possi-В ble/probable blank contamination and warns the data user to take appropriate action.
- Indicates the adjustments made for sample dilution. е



Project Number: EQB01.EQB01 Storm Water Disposal Pond Study

Work Order Number: X1-08-276 Date Reported: 08-19-91

### Table 1 ANALYTICAL RESULTS

GTEL Sam	ole Number	01			
Client Id	Client Identification				
Da	te Sampled	08-09-91			
Da	te Analyzed	08-15-91			
Analyte	POL, ug/LB		Concentration	on, ug/L <sup>c</sup>	
Chloromethane	10	<10			
Bromomethane	10	<10			_
Vinyl Chloride	10	< 10			
Chloroethane	10	< 10			
Methylene Chloride	5	<5			
Acetone	100	<100			
Carbon Disulfide	5	<5			
1,1-Dichloroethene	5	<5			
1,1-Dichloroethane	5	<5			
1,2-Dichloroethene (total)	5	<5			
Chloroform	5	<5			
1,2-Dichloroethane	5	<5			
2-Butanone	100	<100			
1,1,1-Trichloroethane	5	<5			
Carbon Tetrachloride	5	<5			
Vinyl Acetate	50	< 50			
Bromodichloromethane	5	<5			
1,2-Dichloropropane	5	<5			
cis-1,3-Dichloropropene	5	<5			
Trichloroethene	5	<5			
Dibromochloromethane	5	<5			

Table 1 continued on next page, footnotes at end of table



Work Order Number: X1-08-276
Date Reported: 08-19-91
Date Reissued: 08-30-91

### Table 1 (continued)

### ANALYTICAL RESULTS

GTEL Sam	GTEL Sample Number		
Client Identification		EB130A	
Da	te Sampled	08-09-91	
Da	te Analyzed	08-15-91	
Analyte	PQL, ug/LB		Concentration, ug/L <sup>c</sup>
1,1,2-Trichloroethane	5	<5	
Benzene	5	<5	
2-Chloroethylvinyl Ether	10	< 10	
trans-1,3-Dichloropropene	5	<5	
Bromoform	5	<5	
4-Methyl-2-Pentanone	50	< 50	
2-Hexanone	50	< 50	
Tetrachloroethene	5	<5	
1,1,2,2-Tetrachloroethane	5	<5	
Toluene	5	<5	
Chlorobenzene	5	<5	
Ethylbenzene	5	<5	
Styrene	5	<5	
Xylenes (total)	5	<5	
1,2-Dichlorobenzene	5	<5	
1,3-Dichlorobenzene	5	<5	
1,4-Dichlorobenzene	5	<5	
PQL Multiplier <sup>e</sup>		1	

Table 1 continued on next page, footnotes at end of table



Storm Water Disposal

Pond Study

Work Order Number: X1-08-276

Date Reported: 08-19-91

### Footnotes to Table 1

#### ANALYTICAL RESULTS

- Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, Table 2, US EPA November 1986; sample preparation per EPA Method 5030.
- Practical quantitation limit. b
- **Data Flag Definitions** С
  - Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the quantitation limit, but greater than zero, or when reporting an estimated concentration for a tentatively identified compound. J
  - Indicates that the analyte was found in the blank as well as a sample. It indicates possi-В ble/probable blank contamination and warns the data user to take appropriate action.
- Indicates the adjustments made for sample dilution. е



Project Number: EQB01.EQB01 Storm Water Disposal Pond Study

Work Order Number: X1-08-A05 Date Reported: 09-18-91

Table 1 ANALYTICAL RESULTS

GTFI Sam	ple Number	01	02	T T
	Client Identification		Miles Ditch #1	
D	ate Sampled	08-28-91	08-28-91	
Da	te Analyzed	09-10-91	09-10-91	
Analyte	PQL, ug/Lb		Concentrati	ion, ug/L <sup>c</sup>
Chloromethane	10	<10	< 10	
Bromomethane	10	<10	< 10	
Vinyl Chloride	10	<10	<10	
Chloroethane	10	<10	<10	
Methylene Chloride	5	<5	<5	
Acetone	100	<100	<100	
Carbon Disulfide	5	<5	<5	
1,1-Dichloroethene	5	<5	<5	
1,1-Dichloroethane	5	<5	<5	
1,2-Dichloroethene (total)	5	<5	<5	
Chloroform	5	<5	< 5	
1,2-Dichloroethane	5	<5	<5	
2-Butanone	100	<100	< 100	
1,1,1-Trichloroethane	5	<5	<5	
Carbon Tetrachloride	5	<5	<5	
Vinyl Acetate	50	<50	<50	
Bromodichloromethane	5	<5	<5	
1,2-Dichloropropane	5	<5	< 5	
cis-1,3-Dichloropropene	5	<5	<5	
Trichloroethene	5	<5	<5	
Dibromochloromethane	5	<5	<5	

Table 1 continued on next page, footnotes at end of table



Project Number: EQB01.EQB01 Storm Water Disposal Pond Study Work Order Number: X1-08-A05 Date Reported: 09-18-91

### Table 1 (continued)

### ANALYTICAL RESULTS

GTEL Sam	01	02			
Client I	Client Identification		Miles Ditch #1		
Da	te Sampled	08-28-91	08-28-91		
Da	te Analyzed	09-10-91	09-10-91		
Analyte	PQL, ug/Lb		Concentrati	on, ug/L <sup>c</sup>	
1,1,2-Trichloroethane	5	<5	<5		
Benzene	5	<5	< 5		
2-Chloroethylvinyl Ether	10	< 10	< 10		
trans-1,3-Dichloropropene	5	<5	<5		·
Bromoform	5	<5	<5		
4-Methyl-2-Pentanone	50	<50	< 50		
2-Hexanone	50	<50	< 50		
Tetrachloroethene	5	<5	<5		
1,1,2,2-Tetrachloroethane	5	<5	<5		
Toluene	5	<5	<5		
Chlorobenzene	5	<5	<5		
Ethylbenzene	5	<5	<5		
Styrene	5	<5	<5		
Xylenes (total)	5	<5	<5		
1,2-Dichlorobenzene	5	<5	< 5		
1,3-Dichlorobenzene	5	<5	<5		
1,4-Dichlorobenzene	5	<5	<5		
PQL Multiplier <sup>e</sup>		1	1		

Table 1 continued on next page, footnotes at end of table



Storm Water Disposal

Pond Study

Work Order Number: X1-08-A05

Date Reported: 09-18-91

### Footnotes to Table 1

#### **ANALYTICAL RESULTS**

- a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, Table 2, US EPA November 1986; sample preparation per EPA Method 5030.
- b Practical quantitation limit.
- c Data Flag Definitions
  - Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the quantitation limit, but greater than zero, or when reporting an estimated concentration for a tentatively identified compound.
  - B Indicates that the analyte was found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.
- e Indicates the adjustments made for sample dilution.



Project Number: EQB01.EQB01 Storm Water Disposal Pond Study

Work Order Number: X1-09-406 Date Reported: 09-26-91

Table 1 ANALYTICAL RESULTS

GTEL San	ple Number	01	02	03	04
	Client Identification		EB 130-A	EB 122-A	EB 121-A
D	ate Sampled	09-13-91	09-13-91	09-13-91	09-12-91
D	ate Analyzed	09-18-91	09-18-91	09-18-91	09-19-91
Analyte	POL, ug/L <sup>6</sup>		Concentrati	on, ug/L <sup>c</sup>	
Chloromethane	10	< 10	<10	< 10	<10
Bromomethane	10	< 10	<10	<10	<10
Vinyl Chloride	10	< 10	<10	< 10	<10
Chloroethane	10	< 10	< 10	<10	<10
Methylene Chloride	5	4 JX	<5	<5	<5
Acetone	100	< 100	<100	< 100	< 100
Carbon Disulfide	5	<5	<5	<5	<5
1,1-Dichloroethene	5	<5	<5	<5	<5
1,1-Dichloroethane	5	<5	<5	<5	<5
1,2-Dichloroethene (total)	5	<5	<5	<5	<5
Chloroform	5	<5	<5	<5	<5
1,2-Dichloroethane	5	<5	<5	<5	<5
2-Butanone	100	< 100	< 100	< 100	< 100
1,1,1-Trichloroethane	5	<5	<5	<5	<5
Carbon Tetrachloride	5	<5	<5	<5	<5
Vinyl Acetate	50	< 50	< 50	< 50	<50
Bromodichloromethane	5	<5	<5	<5	<5
1,2-Dichloropropane	5	<5	<5	<5	<5
cis-1,3-Dichloropropene	5	<5	<5	<5	<5
Trichloroethene	5	<5	<5	<5	<5
Dibromochloromethane	5	<5	<5	<5	<5

Table 1 continued on next page, footnotes at end of table



Project Number: EQB01.EQB01 Storm Water Disposal Pond

Work Order Number: X1-09-406
Date Reported: 09-26-91

### Table 1 (continued)

### ANALYTICAL RESULTS

GTEL Sam	nle Number	01	02	03	04
	GTEL Sample Number Client Identification		EB 130-A	EB 122-A	EB 121-A
	te Sampled	EB 131-A 09-13-91	09-13-91	09-13-91	09-12-91
	te Analyzed	09-13-91	09-13-91	09-13-91	09-12-91
Da		09-10-91	09-18-91	09-18-91	09-19-91
Analyte	POL. ug/L <sup>b</sup>		Concentrati	on, ug/L <sup>c</sup>	
1,1,2-Trichloroethane	5	<5	<5	<5	<5
Benzene	5	<5	<5	<5	<5
2-Chloroethylvinyl Ether	10	<10	<10	<10	< 10
trans-1,3-Dichloropropene	5	<5	<5	<5	<5
Bromoform	5	<5	<5	<5	<5
4-Methyl-2-Pentanone	50	< 50	< 50	<50	< 50
2-Hexanone	50	<50	< 50	<50	<50
Tetrachloroethene	5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	5	<5	<5	<5	<5
Toluene	5	<5	<5	<5	<5
Chlorobenzene	5	<5	<5	<5	<5
Ethylbenzene	5	<5	<5	<5	<5
Styrene	5	<5	<5	<5	<5
Xylenes (total)	5	<5	<5	<5	<5
1,2-Dichlorobenzene	5	<5	<5	<5	<5
1,3-Dichlorobenzene	5	<5	<5	<5	<5
1,4-Dichlorobenzene	5	<5	<5	<5	<5
PQL Multiplier <sup>e</sup>		1	1	1	1

Table 1 continued on next page, footnotes at end of table



Project Number: EQB01.EQB01 Storm Water Disposal Pond

Study

Work Order Number: X1-09-406 Date Reported: 09-26-91

### Footnotes to Table 1

#### ANALYTICAL RESULTS

- Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, Table 2, US EPA November 1986; sample preparation per EPA Method 5030.
- b Practical quantitation limit.
- **Data Flag Definitions** c
  - Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the quantitation limit, but greater than zero, or when reporting an estimated concentration for a tentatively identified compound. J
  - Indicates that the analyte was found in the blank as well as a sample. It indicates possi-В ble/probable blank contamination and warns the data user to take appropriate action.
  - Indicates compound was not found in the blank, but it is a common laboratory contaminant and warns the data user to take appropriate action. X
- Indicates the adjustments made for sample dilution. е



Project Number: EQB01.EQB01 Storm Water Pond

Work Order Number: X2-05-726
Date Reported: 06-02-92

### Table 1 **ANALYTICAL RESULTS**

GTEL Sam	ple Number	01	02	
Client lo	dentification	Miles Sandpit Drainage Ditch	Fox Meadow Drainage Pond	
Da	te Sampled	05-15-92	05-15-92	
Da	te Analyzed	05-27-92	05-27-92	
Analyte	PQL ug/Lb		Concentrat	tion, ug/L <sup>C</sup>
Chloromethane	10	<10	<10	
Bromomethane	10	<10	<10	
Vinyl Chloride	10	<10	<10	
Chloroethane	10	<10	<10	
Methylene Chloride	5	<5	<5	
Acetone	100	10 J	6 J	
Carbon Disulfide	5	<5	<5	
1,1-Dichloroethene	5	<5	<5	
1,1-Dichloroethane	5	<5	<5	
1,2-Dichloroethene (total)	5	<5	<5	
Chloroform	5	<5	<5	
1,2-Dichloroethane	5	<5	<5	
2-Butanone	100	<100	< 100	
1,1,1-Trichloroethane	5	<5	<5	
Carbon Tetrachloride	5	<5	<5	
Vinyl Acetate	50	<50	<50	
Bromodichloromethane	5	<5	<5	
1,2-Dichloropropane	5	<5	<5	
cis-1,3-Dichloropropene	5	<5	<5	
Trichloroethene	5	<5	<5	
Dibromochloromethane	5	<5	<5	

Table 1 continued on next page, footnotes at end of table



Project Number: EQB01.EQB01 Storm Water Pond Disposal Study Work Order Number: X2-05-726 Date Reported: 06-02-92

### Table 1 (continued)

### **ANALYTICAL RESULTS**

GTEL Sample Number		01	02	
Client lo	Client Identification		Fox Meadow Drainage Pond	
Da	te Sampled	05-15-92	05-15-92	
Da	te Analyzed	05-27-92	05-27-92	
Analyte	PQL ug/Lb		Concentra	tion, ug/L <sup>C</sup>
1,1,2-Trichloroethane	5	<5	<5	
Benzene	5	<5	<5	
2-Chloroethylvinyl Ether	10	<10	<10	
trans-1,3-Dichloropropene	5	<5	<5	
Bromoform	5	<5	<5	
4-Methyl-2-Pentanone	50	<50	<50	
2-Hexanone	50	<50	<50	
Tetrachloroethene	5	<5	<5	
1,1,2,2-Tetrachloroethane	5	<5	<5	
Toluene	5	<5	<5	
Chlorobenzene	5	<5	<5	
Ethylbenzene	5	<5	<5	
Styrene	5	<5	<5	
Xylenes (total)	5	<5	<5	
1,2-Dichlorobenzene	5	<5	<5	
1,3-Dichlorobenzene	5	<5	<5	
1,4-Dichlorobenzene	5	<5	<5	
PQL Multiplier <sup>e</sup>		1	1	

Table 1 continued on next page, footnotes at end of table



Storm Water Pond

Disposal Study

Work Order Number: X2-05-726 Date Reported: 06-02-92

### Footnotes to Table 1

#### ANALYTICAL RESULTS

Volatile Organics in Water EPA Method 8240<sup>a</sup>

- a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, Table 2, US EPA November 1986; sample preparation per EPA Method 5030.
- b Practical quantitation limit.
- c Data Flag Definitions
  - Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the quantitation limit, but greater than zero, or when reporting an estimated concentration for a tentatively identified compound.
  - B Indicates that the analyte was found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.
- e Indicates the adjustments made for sample dilution.

NOTE: Sample temperature when received at the laboratory was 5 °C.



Project Number: EQB01.EQB01 Storm Water Disposal Study Work Order Number: X2-05-C97 Date Reported: 06-04-92

Table 1 **ANALYTICAL RESULTS** 

GTEL Sam	ple Number	01	02	03	04
Client Identification		EB-130-A	EB-131-A	EB-121-A	EB-122-A
Da	te Sampled	05-28-92	05-28-92	05-29-92	05-29-92
Da	te Analyzed	06-02-92	06-02-92	06-02-92	06-02-92
Analyte	PQL ug/Lb		Concentra	tion, ug/L <sup>c</sup>	
Chloromethane	10	<10	<10	<10	<10
Bromomethane	10	<10	< 10	<10	<10
Vinyl Chloride	10	<10	<10	<10	<10
Chloroethane	10	<10	<10	<10	<10
Methylene Chloride	5	<5	<5	<5	<5
Acetone	100	<100	< 100	<100	<100
Carbon Disulfide	5	<5	<5	<5	<5
1,1-Dichloroethene	5	<5	<5	<5	<5
1,1-Dichloroethane	5	<5	<5	<5	<5
1,2-Dichloroethene (total)	5	<5	<5	<5	<5
Chloroform	5	<5	<5	<5	<5
1,2-Dichloroethane	5	<5	<5	<5	<5
2-Butanone	100	<100	< 100	<100	< 100
1,1,1-Trichloroethane	5	<5	<5	<5	<5
Carbon Tetrachloride	5	<5	<5	<5	<5
Vinyl Acetate	50	<50	<50	<50	<50
Bromodichloromethane	5	<5	<5	<5	<5
1,2-Dichloropropane	5	<5	<5	<5	<5
cis-1,3-Dichloropropene	5	<5	<5	<5	<5
Trichloroethene	5	<5	<5	<5	<5
Dibromochloromethane	5	<5	<5	<5	<5

Table 1 continued on next page, footnotes at end of table



Project Number: EQB01.EQB01 Storm Water Disposal Study Work Order Number: X2-05-C97 Date Reported: 06-04-92

### Table 1 (continued)

### **ANALYTICAL RESULTS**

GTEL Sam	ple Number	01	02	03	04
Client lo	dentification	EB-130-A	EB-131-A	EB-121-A	EB-122-A
Da	te Sampled	05-28-92	05-28-92	05-29-92	05-29-92
Da	te Analyzed	06-02-92	06-02-92	06-02-92	06-02-92
Analyte	PQL ug/Lb		Concentra	tion, ug/L <sup>C</sup>	
1,1,2-Trichloroethane	5	<5	<5	<5	<5
Benzene	5	<5	<5	<5	<5
2-Chloroethylvinyl Ether	10	<10	<10	<10	<10
trans-1,3-Dichloropropene	5	<5	<5	<5	<5
Bromoform	5	<5	<5	<5	<5
4-Methyl-2-Pentanone	50	<50	<50	<50	< 50
2-Hexanone	50	<50	<50	<50	<50
Tetrachloroethene	5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	5	<5	<5	<5	<5
Toluene	5	<5	<5	<5	<5
Chlorobenzene	5	<5	<5	<5	<5
Ethylbenzene	5	<5	<5	<5	<5
Styrene	5	<5	<5	<5	<5
Xylenes (total)	5	<5	<5	<5	<5
1,2-Dichlorobenzene	5	<5	<5	<5	<5
1,3-Dichlorobenzene	5	<5	<5	<5	<5
1,4-Dichlorobenzene	5	<5	<5	<5	<5
PQL Multiplier <sup>e</sup>		1	1	1	1

Table 1 continued on next page, footnotes at end of table



Storm Water Disposal

Study

Work Order Number: X2-05-C97 Date Reported: 06-04-92

### Footnotes to Table 1

### ANALYTICAL RESULTS

Volatile Organics in Water EPA Method 8240<sup>a</sup>

- a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, Table 2, US EPA November 1986; sample preparation per EPA Method 5030.
- b Practical quantitation limit.
- c Data Flag Definitions
  - J Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the quantitation limit, but greater than zero, or when reporting an estimated concentration for a tentatively identified compound.
  - B Indicates that the analyte was found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.
- e Indicates the adjustments made for sample dilution.

NOTE: Sample temperature when received at the laboratory was 10 °C.



Project Number: EQB01.EQB01 Storm Water Pond Disposal Study Work Order Number: X2-06-439 Date Reported: 07-06-92

### Table 1 ANALYTICAL RESULTS

GTEL Sample Number		01	02	
Client lo	dentification	Miles Sand Pit	Fox Meadows Drain Pond	
Da	te Sampled	06-19-92	06-19-92	
Da	te Analyzed	06-26-92	06-26-92	
Analyte	PQL ug/Lb		Concentrat	tion, ug/L <sup>C</sup>
Chloromethane	10	<10	<10	
Bromomethane	10	<10	<10	
Vinyl Chloride	10	<10	<10	
Chloroethane	10	<10	<10	
Methylene Chloride	5	<5	<5	
Acetone	100	<100	< 100	
Carbon Disulfide	5	<5	<5	
1,1-Dichloroethene	5	<5	<5	
1,1-Dichloroethane	5	<5	<5	
1,2-Dichloroethene (total)	5	<5	<5	
Chloroform	5	<5	<5	
1,2-Dichloroethane	5	<5	<5	
2-Butanone	100	<100	<100	
1,1,1-Trichloroethane	5	<5	<5	
Carbon Tetrachloride	5	<5	<5	
Vinyl Acetate	50	<50	<50	
Bromodichloromethane	5	<5	<5	
1,2-Dichloropropane	5	<5	<5	
cis-1,3-Dichloropropene	5	<5	<5	
Trichloroethene	5	<5	<5	
Dibromochloromethane	5	<5	<5	

Table 1 continued on next page, footnotes at end of table



Project Number: EQB01.EQB01 Storm Water

Pond Disposal

Work Order Number: X2-06-439
Date Reported: 07-06-92

### Table 1 (continued)

### **ANALYTICAL RESULTS**

GTEL Sam	ole Number	01	02		
Client lo	Client Identification		Fox Meadows Drain Pond		
Da	te Sampled	06-19-92	06-19-92		
Da	te Analyzed	06-26-92	06-26-92		
Analyte	PQL ug/Lb		Concentrat	tion, ug/L <sup>c</sup>	
1,1,2-Trichloroethane	5	<5	<5		
Benzene	5	<5	<5		
2-Chloroethylvinyl Ether	10	<10	<10		
trans-1,3-Dichloropropene	5	<5	<5		
Bromoform	5	<5	<5		
4-Methyl-2-Pentanone	50	<50	<50		
2-Hexanone	50	<50	<50		
Tetrachloroethene	5	<5	<5		
1,1,2,2-Tetrachloroethane	5	<5	<5		
Toluene	5	<5	<5		
Chlorobenzene	5	<5	<5		
Ethylbenzene	5	<5	<5		
Styrene	5	<5	<5		
Xylenes (total)	5	<5	<5		
1,2-Dichlorobenzene	5	<5	<5		
1,3-Dichlorobenzene	5	<5	<5		
1,4-Dichlorobenzene	5	<5	<5		
PQL Multiplier <sup>e</sup>		1	11	L	

Table 1 continued on next page, footnotes at end of table



Storm Water Pond Disposal

Study

Work Order Number: X2-06-439

Date Reported: 07-06-92

### Footnotes to Table 1

### **ANALYTICAL RESULTS**

Volatile Organics in Water EPA Method 8240<sup>a</sup>

- a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, Table 2, US EPA November 1986; sample preparation per EPA Method 5030.
- b Practical quantitation limit.
- c Data Flag Definitions
  - Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the quantitation limit, but greater than zero, or when reporting an estimated concentration for a tentatively identified compound.
  - B Indicates that the analyte was found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.
- e Indicates the adjustments made for sample dilution.

NOTE: Sample temperature when received at the laboratory was 4 °C.



Project Number: EQB01.EQB01 Work Order Number: X2-07-103 Date Reported: 07-17-92

### Table 1 **ANALYTICAL RESULTS**

GTEL Sam	ple Number	01	02	03	04
Client lo	Client Identification		EB-131A	EB-121A	EB-122A
Da	te Sampled	07-06-92	07-06-92	07-07-92	07-07-92
Da	te Analyzed	07-08-92	07-08-92	07-08-92	07-08-92
Analyte	PQL ug/Lb		Concentra	tion, ug/L <sup>C</sup>	
Chloromethane	10	<10	< 10	<10	<10
Bromomethane	10	<10	< 10	<10	<10
Vinyl Chloride	10	<10	<10	<10	<10
Chloroethane	10	<10	<10	<10	<10
Methylene Chloride	5	<5	<5	<5	<5
Acetone	100	<100	<100	<100	<100
Carbon Disulfide	5	<5	<5	<5	<5
1,1-Dichloroethene	5	<5	<5	<5	<5
1,1-Dichloroethane	5	<5	<5	<5	<5
1,2-Dichloroethene (total)	5	<5	<5	<5	<5
Chloroform	5	<5	<5	<5	<5
1,2-Dichloroethane	5	<5	<5	<5	<5
2-Butanone	100	<100	< 100	<100	<100
1,1,1-Trichloroethane	5	<5	<5	<5	<5
Carbon Tetrachloride	5	<5	<5	<5	<5
Vinyl Acetate	50	<50	<50	<50	<50
Bromodichloromethane	5	<5	<5	<5	<5
1,2-Dichloropropane	5	<5	<5	<5	<5
cis-1,3-Dichloropropene	5	<5	<5	<5	<5
Trichloroethene	5	<5	<5	<5	<5
Dibromochloromethane	5	<5	<5	<5	<5

Table 1 continued on next page, footnotes at end of table



Project Number: EQB01.EQB01 Work Order Number: X2-07-103 Date Reported: 07-17-92

### Table 1 (continued)

### ANALYTICAL RESULTS

GTEL Sam	GTEL Sample Number		02	03	04
Client lo	Client Identification		EB-131A	EB-121A	EB-122A
Da	ate Sampled	07-06-92	07-06-92	07-07-92	07-07-92
Da	te Analyzed	07-08-92	07-08-92	07-08-92	07-08-92
Analyte	PQL ug/Lb		Concentra	tion, ug/L <sup>C</sup>	
1,1,2-Trichloroethane	5	<5	<5	<5	<5
Benzene	5	<5	<5	<5	<5
2-Chloroethylvinyl Ether	10	<10	<10	<10	<10
trans-1,3-Dichloropropene	5	<5	<5	<5	<5
Bromoform	5	<5	<5	<5	<5
4-Methyl-2-Pentanone	50	<50	<50	<50	<50
2-Hexanone	50	<50	<50	<50	<50
Tetrachloroethene	5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	5	<5	<5	<5	<5
Toluene	5	<5	<5	<5	<5
Chlorobenzene	5	<5	<5	<5	<5
Ethylbenzene	5	<5	<5	<5	<5
Styrene	5	<5	<5	<5	<5
Xylenes (total)	5	<5	<5	<5	<5
1,2-Dichlorobenzene	5	<5	<5	<5	<5
1,3-Dichlorobenzene	5	<5	<5	<5	<5
1,4-Dichlorobenzene	5	<5	<5	<5	<5
PQL Multiplier <sup>e</sup>		1	11	1	1

Table 1 continued on next page, footnotes at end of table



Project Number: EQB01.EQB01 Work Order Number: X2-07-103 Date Reported: 07-17-92

### Footnotes to Table 1

#### **ANALYTICAL RESULTS**

### Volatile Organics in Water EPA Method 8240<sup>a</sup>

- a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, Table 2, US EPA November 1986; sample preparation per EPA Method 5030.
- b Practical quantitation limit.
- c Data Flag Definitions
  - J Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the quantitation limit, but greater than zero, or when reporting an estimated concentration for a tentatively identified compound.
  - B Indicates that the analyte was found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.
- e Indicates the adjustments made for sample dilution.

NOTE: Sample temperature when received at the laboratory was 8 °C.



### Appendix D: Analytical Data for Pesticides in Water Samples

Project Number: EQB01.EQB01 Storm Water

Work Order Number: X1-08-275
Date Reported: 08-27-91

### Table 1

# ANALYTICAL RESULTS Triazine Herbicides in Water EPA Method 507a

GTEL Sam	GTEL Sample Number				
Client 1	dentification	EB122A			
D	ate Sampled	08-08-91			
Da	te Received	08-09-91			
Da	te Extracted	08-16-91			
Da	Date Analyzed				
Analyte	QL* ug/L		Concentrat	ion, ug/L	
Propazine	5.0	< 5.0			
Simazine	5.0	< 5.0			
Atrazine	5.0	< 5.0			
*QL Multiplier		1			

EPA-600/4-88/039 Methods for the Determination of Organic Compounds in Drinking Water, EMSLORD, US EPA, Dec., 1988.

QL = Quantitation Limit.



Project Number: EQB01.EQB01 Storm Water Disposal

Work Order Number: X1-08-943
Date Reported: 08-28-91

### Table 1

### ANALYTICAL RESULTS Triazine Herbicides in Water EPA Method 507a

GTEL	GTEL Sample Number		02	
Clie	nt Identification	EB121-A	EB131-A	
	Date Sampled	08-09-91	08-09-91	
	Date Received	08-09-91	08-09-91	
	Date Analyzed	08-18-91	08-18-91	
Analyte	QL* ug/L	Concentration, ug/L		
Propazine	5.0	<5.0	<5.0	
Simazine	5.0	< 5.0	<5.0	
Atrazine	5.0	<5.0	<5.0	
*QL Multiplier		1	1	

EPA-600/4-88/039 Methods for the Determination of Organic Compounds in Drinking Water, EMSLORD, US EPA, Dec., 1988.

QL = Quantitation Limit.



Project Number: EQB01.EQB01 Storm Water

Work Order Number: X1-08-277
Date Reported: 08-26-91

#### Table 1

# ANALYTICAL RESULTS Triazine Herbicides in Water EPA Method 507a

GTEL San	ple Number	01			
Client	Identification	EB130A			
D	ate Sampled	08-09-91			
D	ate Received	08-09-91			
Da	ate Extracted	08-16-91			
D	ate Analyzed	08-18-91			
Analyte	QL* ug/L		Concentra	tion, ug/L	
Propazine	5.0	<5.0			
Simazine	5.0	<5.0			
Atrazine	5.0	< 5.0			
*QL Multiplier	:	1			

EPA-600/4-88/039 Methods for the Determination of Organic Compounds in Drinking Water, EMSLORD, US EPA, Dec., 1988.

QL = Quantitation Limit.



Project Number: EQB01.EQB01 Storm Water Disposal Study Work Order Number: X1-07-926 Date Reported: 08-21-91

Table 1

#### **ANALYTICAL RESULTS** Triazine Herbicides in Water EPA Method 507a

GTEL San	ple Number	01	02		
Client 1	Client Identification		Miles Sand #2		
D	Date Sampled		07-24-91		
Da	ate Received	07-26-91	07-26-91		
Da	Date Analyzed		08-05-91		
Analyte	QL* ug/L	Concentration, ug/L			
Propazine	20	<20	<20		
Simazine	20	<20	<20		
Atrazine	20	<20	<20		
*QL Multiplier		1	11		

EPA-600/4-88/039 Methods for the Determination of Organic Compounds in Drinking Water, EMSLORD, US EPA, Dec., 1988.

QL = Quantitation Limit.



Project Number: EQB01.EQB01 Storm Water Disposal Pond Study Work Order Number: X1-09-407

Date Reported: 10-17-91

Table 1 ANALYTICAL RESULTS Triazine Herbicides in Water EPA Method 507a

GTEL Sar	nple Number	01 02 03 0				
Client	Identification	EB 131-A EB 130-A EB 122-A EB121				
Γ	ate Sampled	09-13-91 09-13-91 09-13-91 09-12-				
Date Analyzed		09-24-91	-24-91 09-24-91 09-24-91 09-24-9			
Analyte	QL* ug/L	Concentration, ug/L				
Propazine	5.0	<5.0	< 5.0	< 5.0	<5.0	
Simazine	5.0	< 5.0	<5.0	<5.0	< 5.0	
Atrazine	5.0	< 5.0	<5.0	<5.0	<5.0	
*QL Multiplier		1 1 1 1				

EPA-600/4-88/039 Methods for the Determination of Organic Compounds in Drinking Water, EMSLORD, US EPA, Dec., 1988.

QL = Quantitation Limit.





GTEL Environmental Laboratories, Inc.

4211 May Ave.

Wichita, KS 67209

June 02, 1992

PACE Project Number: 520520508

GTEL Work Order Number: X2-05-72

Attn: Ms. Kathleen Kremer

Client Reference: Storm Water Pond Disposal Study

PACE Sample Number: 60 0067287
Date Collected: 05/15/92
Date Received: 05/20/92
Client Sample ID: Miles

Sand

Parameter Units MDL Pit DATE ANALYZED

ORGANIC ANALYSIS

TRIAZINES IN WATERS Atrazine ug/L 1.0 ND 05/27/92 1.0 ND 05/27/92 Propazine ug/L Simazine ug/L ND 05/27/92 1.0 05/27/92 Prometon ND ug/L 1.0 05/27/92 Triphenyl phosphate (Surrogate) 28

Organophosphorus Pesticide Prep - Waters 05/21/92

MDL Method Detection Limit

ND Not detected at or above the MDL.



Ms. Kathleen Kremer

Page

June 02, 1992

PACE Project Number: 520520508

GTEL Work Order Number: X2-05-72

Client Reference: Storm Water Pond Disposal Study

PACE Sample Number: Date Collected:

Date Received:

Client Sample ID:

60 0067295 05/15/92 05/20/92 Fox

Meadows

Parameter Units MDL Pond DATE ANALYZED

ORGANIC ANALYSIS

TRIAZINES IN WATERS 05/27/92 Atrazine ug/L 1.0 ND Propazine ug/L 1.0 ND 05/27/92 Simazine ug/L 1.0 ND 05/27/92 ND 05/27/92 1.0 Prometon ug/L Triphenyl phosphate (Surrogate) 22 05/27/92

05/21/92 Organophosphorus Pesticide Prep - Waters

MDL ND

Method Detection Limit

Not detected at or above the MDL.

These data have been reviewed and are approved for release.

Neal R. Hudson

natel

Manager, Organic Chemistry

Kansas City, Missouri



Ms. Kathleen Kremer

QUALITY CONTROL DATA

June 02, 1992

Page

PACE Project Number: 520520508

GTEL Work Order Number: X2-05-71

Client Reference: Storm Water Pond Disposal Study

METHOD 8140 PLUS Batch: 60 13822

Samples: 60 0067287, 60 0067295

#### METHOD BLANK:

The throat services			Method
Parameter	Units	MDL	Blank_
Atrazine	ug/L	$\overline{1.0}$	ND
Propazine	ug/L	1.0	ND
Simazine	ug/L	1.0	ND
Prometon	ug/L	1.0	ND
Triphenyl phosphate (Surrogate)	%		38

### LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

			Reference		Dupl	
Parameter	Units	MDL	Value F	Recv	Recv F	RPD
Malathion	ug/L	$\overline{1.0}$	4.06	92%	88%	4%
Parathion-ethyl	ug/L	1.0	4.10	115%	112%	2%

Method Detection Limit MDL RPD Relative Percent Difference



GTEL Environmental Laboratories, Inc.

Midwest Region

4211 May Ave. Wichita, KS 67209

June 17, 1992

PACE Project Number: 520602501

GTEL Wichita Work Order #X2-05-0

Attn: Ms. Nancy Kerchen

Client Reference: Fox Meadows + Rules Pit

PACE Sample Number: Date Collected: Date Received: Client Sample ID: Parameter	<u>Units</u>	_MDL_	60 0073767 05/28/92 06/02/92 EB-130A	DATE ANALYZED
ORGANIC ANALYSIS				
TRIAZINES IN WATERS Atrazine Propazine Simazine Prometon Triphenyl phosphate (Surrogate) Organophosphorus Pesticide Prep - Waters	ug/L ug/L ug/L ug/L %	1.0 1.0 1.0 1.0	ND ND ND ND 76 06/03/92	06/15/92 06/15/92 06/15/92 06/15/92 06/15/92
PACE Sample Number: Date Collected: Date Received: Client Sample ID: Parameter	<u>Units</u>	MDL_	60 0073775 05/28/92 06/02/92 EB-131A	DATE ANALYZED
ORGANIC ANALYSIS				
TRIAZINES IN WATERS Atrazine Propazine Simazine Prometon Triphenyl phosphate (Surrogate) Organophosphorus Pesticide Prep - Waters	ug/L ug/L ug/L ug/L %	1.0 1.0 1.0 1.0	ND ND ND ND 73 06/03/92	06/16/92 06/16/92 06/16/92 06/16/92 06/16/92

MDL

Method Detection Limit

ND

Not detected at or above the MDL.



June 17, 1992 Ms. Nancy Kerchen PACE Project Number: 520602501 Page GTEL Wichita Work Order #X2-05-C98 Client Reference: Fox Meadows + Rules Pit PACE Sample Number: 60 0073783 Date Collected: 05/29/92 Date Received: 06/02/92 Client Sample ID: EB-121A Parameter Units MDL DATE ANALYZED ORGANIC ANALYSIS TRIAZINES IN WATERS ND Atrazine ug/L 1.0 06/16/92 Propazine ug/L 1.0 ND 06/16/92 Simazine ug/L 1.0 ND 06/16/92 Prometon 1.0 ND 06/16/92 ug/L Triphenyl phosphate (Surrogate) % 57 06/16/92 Organophosphorus Pesticide Prep - Waters 06/03/92 PACE Sample Number: 60 0073791 Date Collected: 05/29/92 Date Received: 06/02/92 Client Sample ID: EB-122A MDL Parameter Units DATE ANALYZED ORGANIC ANALYSIS TRIAZINES IN WATERS Atrazine ug/L 1.0 ND 06/16/92 1.0 Propazine ND 06/16/92 ug/L Simazine ug/L 1.0 ND 06/16/92 1.0 ND Prometon ug/L 06/16/92 Triphenyl phosphate (Surrogate) 70 06/16/92 Organophosphorus Pesticide Prep - Waters 06/03/92

MDL

Method Detection Limit

ND

Not detected at or above the MDL.



Ms. Nancy Kerchen Page

Client Reference: Fox Meadows + Rules Pit

June 17, 1992 PACE Project Number: 520602501

GTEL Wichita Work Order #2-05-C98

These data have been reviewed and are approved for release.

Neal R. Hudson

malet

Manager, Organic Chemistry



Ms. Nancy Kerchen

QUALITY CONTROL DATA

Pafaranca

Page

June 17, 1992 PACE Project Number: 520602501

GTEL Wichita Work Order #X2-05-C9

Spike

Client Reference: Fox Meadows + Rules Pit

TRIAZINES IN WATERS Batch: 60 14172

Samples: 60 0073767, 60 0073775, 60 0073783, 60 0073791

METHOD BLANK:

THE THOSE SEPTIME.			Method
Parameter	Units	MDL	Blank
Atrazine	ug/L	$\overline{1.0}$	ND
Propazine	ug/L	1.0	ND
Simazine	ug/L	1.0	ND
Prometon	ug/L	1.0	ND
Triphenyl phosphate (Surrogate)	%		102

SPIKE AND SPIKE DUPLICATE:

						Op I ICO	
			60 00737	67	Spike	Dupl	
Parameter	Units	MDL	EB-130A	Spike	Recv	Recv	RPD
Atrazine	ug/L	$\overline{1.0}$	ND	D 7.0	96%	66%	37%

LABORATORY CONTROL SAMPLE:

			Well el clicc	
Parameter	Units	MDL	Value	<u>Recv</u>
Atrazine	<del>ug/L</del>	$\overline{1.0}$	7.0	85%

MDL Method Detection Limit

Concentration found on diluted sample. D

Relative Percent Difference RPD



GTEL Environmental Laboratories, Inc.

4211 May Ave.

Wichita, KS 67209

June 30, 1992

PACE Project Number: 520623505

GTEL Wichita Work Order #X2-06-40

Attn: Ms. Kathleen Kremer

Client Reference: Fox Meadows & Miles

PACE Sample Number: 60 0085129 Date Collected: 06/19/92 06/23/92 Date Received: Client Sample ID: Miles Sand Pit Drain

MDL Parameter Units Ditch DATE ANALYZED

ORGANIC ANALYSIS

TRIAZINES IN WATERS 1.0 06/26/92 Atrazine uq/L ND Propazine ug/L 1.0 ND 06/26/92 Simazine 1.0 ND 06/26/92 ug/L Prometon 1.0 06/26/92 ug/L ND 06/26/92 % Triphenyl phosphate (Surrogate) 116 Decachlorobiphenyl Surrogate % 42 06/26/92 Tetrachloro-meta-xylene Surrogate 65 06/26/92

Organophosphorus Pesticide Prep - Waters 06/25/92

MDL Method Detection Limit

ND Not detected at or above the MDL.



Ms. Kathleen Kremer

Page

Parameter

June 30, 1992

PACE Project Number: 520623505

GTEL Wichita Work Order #X2-06-4

Client Reference: Fox Meadows & Miles

PACE Sample Number: Date Collected: Date Received: Client Sample ID:

60 0085137 06/19/92 06/23/92 Fox Meadow

> Drainage Pond DATE ANALYZED

ORGANIC ANALYSIS

TRIAZINES IN WATERS Atrazine Propazine Simazine Prometon Triphenyl phosphate (Surrogate) Decachlorobiphenyl Surrogate	ug/L ug/L ug/L ug/L %	1.0 1.0 1.0 1.0	ND ND ND ND 109 57	06/26/92 06/26/92 06/26/92 06/26/92 06/26/92
Tetrachloro-meta-xylene Surrogate Organophosphorus Pesticide Prep - Waters	%		69 06/25/92	06/26/92

Units

MDL

MDL

Method Detection Limit

ND

Not detected at or above the MDL.

These data have been reviewed and are approved for release.

avler & Linger
Neal R. Hudson for

Manager, Organic Chemistry



Ms. Kathleen Kremer Page 3 QUALITY CONTROL DATA

June 30, 1992

PACE Project Number: 520623505

GTEL Wichita Work Order #X2-06-43

Client Reference: Fox Meadows & Miles

TRIAZINES IN WATERS Batch: 60 14409

Samples: 60 0085129, 60 0085137

METHOD BLANK:

Parameter Atrazine Propazine Simazine Prometon Triphenyl phosphate (Surrogate) Decachlorobiphenyl Surrogate	Units ug/L ug/L ug/L ug/L %	MDL 1.0 1.0 1.0	Method Blank ND ND ND ND 150 89
Tetrachloro-meta-xylene Surrogate	%		84

SPIKE AND SPIKE DUPLICATE:

					Spike	
				Spike	Dupl	
Parameter	<u>Units</u>	MDL	<u>60 0073767 Spike</u>	Recv	Recv	RPD
Atrazine	ug/L	$\overline{1.0}$	ND 7.0	96%	66%	37%

LABORATORY CONTROL SAMPLE:

			Reference
Parameter	<u>Units</u>	MDL	<u>Value</u> <u>Recv</u>
Atrazine	ug/L	1.0	7.0 85%

MDL Method Detection Limit
RPD Relative Percent Difference



GTEL Environmental Laboratories Inc. PACE Project No. 520623505 Client Reference: Fox Meadows & Miles GTEL Wichita Work Order #X2-06-439

### Project Narrative

Fraction: Triazine Herbicides (507)

Sample 60 008512.9 (Miles Sandpit Drain Ditch) contained traces of Malathion and Chlorpyrifos less than 10 ug/L. These compounds were identified utilizing two different analytical columns and conditions.

Charles E. Girgin
GC Semivolatiles Supervisor

June 30, 1992

KLG3/kcz



GTEL Environmental Laboratories, Inc.

4211 May Ave.

Wichita, KS 67209

July 22, 1992 PACE Project Number: 520708506 GTEL Wichita Work Order #X2-07-1

Attn: Ms. Kathleen Kremer

Client Reference: Fox Meadows & Miles Sand Pit

60 0092508 PACE Sample Number: Date Collected: 07/06/92 07/08/92 Date Received:

			EB 130A	
<u>Parameter</u>	<u>Units</u>	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
TRIAZINES IN WATERS Atrazine Propazine Simazine Prometon Triphenyl phosphate (Surrogate) Decachlorobiphenyl Surrogate	ug/L ug/L ug/L ug/L %	1.0 1.0 1.0 1.0	ND ND ND ND 72 95	07/21/92 07/21/92 07/21/92 07/21/92 07/21/92 07/21/92
Tetrachloro-meta-xylene Surrogate Organophosphorus Pesticide Prep - Waters	%		103 07/10/92	07/21/92



Ms. Kathleen Kremer

Page 2

July 22, 1992
PACE Project Number: 520708506
GTEL Wichita Work Order #X2-07-10

Client Reference: Fox Meadows & Miles Sand Pit

PACE Sample Number:	60 0092516
Date Collected:	07/06/92
Date Received:	07/08/92
Client Sample ID:	FR 131A

Date Received: Client Sample ID: <u>Parameter</u>	<u>Units</u>	<u>MDL</u>	07/08/92 EB 131A	DATE ANALYZED
ORGANIC ANALYSIS				
TRIAZINES IN WATERS Atrazine Propazine Simazine Prometon Triphenyl phosphate (Surrogate) Decachlorobiphenyl Surrogate	ug/L ug/L ug/L ug/L %	1.0 1.0 1.0 1.0	ND ND ND ND 60 86	07/21/92 07/21/92 07/21/92 07/21/92 07/21/92 07/21/92
Totrachloro mota vylono Surrogato	0/		103	07/21/92



Ms. Kathleen Kremer

Page

July 22, 1992 PACE Project Number: 520708506 GTEL Wichita Work Order #X2-07-103

DATE ANALYZED

Client Reference: Fox Meadows & Miles Sand Pit

PACE Sample Number: Date Collected:			60 0092524 07/07/92
Date Received:			07/08/92 FB 121A
Client Sample ID: Parameter	Units	MDL	LB 121A

ORGANIC	ANALYSIS

TRIAZINES IN WATERS Atrazine Propazine Simazine Prometon Triphenyl phosphate (Surrogate) Decachlorobiphenyl Surrogate	ug/L ug/L ug/L ug/L %	1.0 1.0 1.0 1.0	ND ND ND ND 41 32	07/21/92 07/21/92 07/21/92 07/21/92 07/21/92 07/21/92
Tetrachloro-meta-xylene Surrogate	%		125	07/21/92



Ms. Kathleen Kremer

Page

July 22, 1992

PACE Project Number: 520708506

GTEL Wichita Work Order #X2-07-103

Client Reference: Fox Meadows & Miles Sand Pit

PACE Sample Number: Date Collected: Date Received: Client Sample ID:

Parameter

60 0092532 07/07/92 07/08/92 EB 122A

Units MDL DATE ANALYZED

ORGANIC ANALYSIS

TRIAZINES IN WATERS Atrazine ug/L 1.0 ND 07/21/92 Propazine ug/L 1.0 ND 07/21/92 Simazine 1.0 ND 07/21/92 ug/L Prometon 1.0 ND 07/21/92 ug/L Triphenyl phosphate (Surrogate) 07/21/92 109 Decachlorobiphenyl Surrogate % 68 07/21/92 Tetrachloro-meta-xylene Surrogate 97 07/21/92 Organophosphorus Pesticide Prep - Waters 07/10/92

These data have been reviewed and are approved for release.

Neal R. Hudson

nelly

Manager, Organic Chemistry



Ms. Kathleen Kremer Page 5

**FOOTNOTES** for pages 1 through

July 22, 1992 PACE Project Number: 520708506

GTEL Wichita Work Order #X2-07-103

Client Reference: Fox Meadows & Miles Sand Pit

MDL ND

Method Detection Limit

Not detected at or above the MDL.



Ms. Kathleen Kremer

QUALITY CONTROL DATA

July 22, 1992

Page 6 PACE Project Number: 520708506

Client Reference: Fox Meadows & Miles Sand Pit

GTEL Wichita Work Order #X2-07-101

TRIAZINES IN WATERS

Batch: 60 14907

Samples: 60 0092508, 60 0092516, 60 0092524, 60 0092532

### **METHOD BLANK:**

Parameter Atrazine Propazine Simazine Prometon Triphenyl phosphate (Surrogate) Decachlorobiphenyl Surrogate	Units ug/L ug/L ug/L ug/L %	MDL 1.0 1.0 1.0	Method Blank ND ND ND ND 184 107
Tetrachloro-meta-xylene Surrogate	%		107

#### SPIKE AND SPIKE DUPLICATE:

						Spike	
			600092532		Spike	Dupl	
Parameter	Units	MDL	EB 122A S	pike	Recv	Recv	RPD
Atrazine	ug/L	1.0	$\overline{ND}$ $\overline{1}$	0.0	88%	119%	29%

#### LABORATORY CONTROL SAMPLE:

			Reference
Parameter	Units	MDL	Value Recv
Atrazine	<del>ug/L</del>	$\overline{1.0}$	5.0 95%



Ms. Kathleen Kremer

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**FOOTNOTES** 

for page

July 22, 1992 PACE Project Number: 520708506 GTEL Wichita Work Order #X2-07-103

Client Reference: Fox Meadows & Miles Sand Pit

DS

Concentration found on diluted sample.

MDL

Method Detection Limit

ND

Not detected at or above the MDL.

**RPD** 

Relative Percent Difference