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HYDROGEOLOGICAL STUDY OF AREA BETWEEN NAJAF – KARBALAA CITIES

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Abstract

The area which located along the road between the Karbalaa and Najaf cities is one of the important areas in terms of hydrogeological view due to containing the groundwater reservoirs of sandy Debdebba and Dammam limestone formations. The exposed part of the Sandy Debdebba formation helps to renew its water and maintenance of groundwater storage through the infiltration of rainfall and surface floods. The groundwater movement in this reservoir flows from west towards east and south-east direction, while the quality of groundwater in this reservoir is characterized to be highly concentrated with dissolved salts which are generally ranged between (2000) to (4700) PPM.

The Dammam Formation is consider as an aquifer in this area where its western hydraulic boundary characterized to be continuous underground water movement coming from west and south -west direction of the Western Desert. Most of formation thickness considered being saturated thickness of reservoir due to containing wide and expanded caves and cracks as a result of structural and weathering impact. These factors helped to expand cracks on formation exposed surface as well as caves inside it. The Groundwater movement in this aquifer flows from west towards Euphrates River. The salinity of groundwater in this reservoir is varied ranging between (1900) to (3700) PPM with calcium sulfate type.

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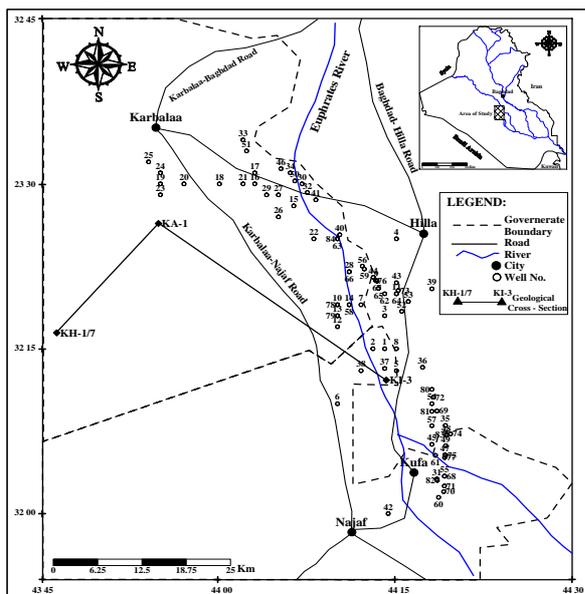
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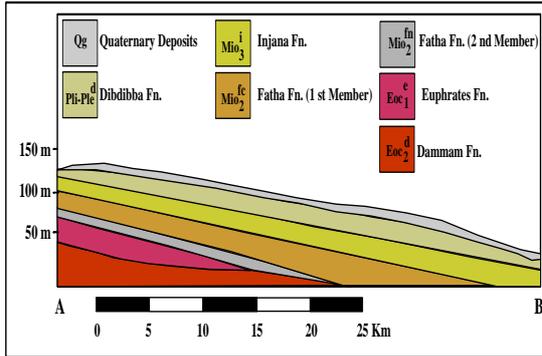
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(Pleistocene- Holocene)

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Era	Period	Epoch	Age	Formation	Lithology	
CENOZOIC	Quaternary	Holocene		Aeolian deposits	[Pattern]	
				Valley fill deposits	[Pattern]	
				Depression deposits	[Pattern]	
	Tertiary	Pleistocene		Gypcrete deposits	[Pattern]	
				Dibdibba	[Pattern]	
		Miocene	Upper		Injana	[Pattern]
					Fatha	[Pattern]
			Lower		Euphrates	[Pattern]

[1]
(Pliocene -)
(Pleistocene)
(Upper Miocene)
(Eocene)
(Middle Miocene)
(Lower Miocene)

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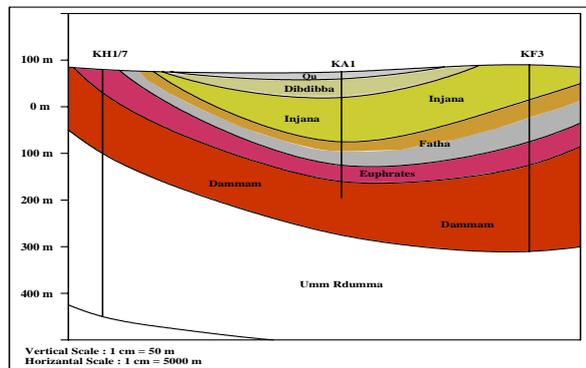
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ت	رقم البئر	سك المكنن (م)	منسوب الماء (م) فوق سطح البحر	معامل التفاتية (م ^٢ /يوم)
١	٢	٢٩,٢	٤٠,٢	٣٦
٢	٣	٢٦	٣٠	١٥,٢٤
٣	٥	٥٦,٣	٦٠,٨	١,٧
٤	٦	٢٩	٥٨	٣٨
٥	٧	٣٥	٥٩	١٦

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ت	رقم البئر	الإحداثيات		ارتفاع البئر فوق سطح البحر (م)	عمق البئر (م)	منسوب الماء المستقر (م)	منسوب الماء فوق سطح البحر (م)
		خط العرض	خط الطول				
١	١	32 04	44 03	٣٦	٥٥	٢٠	١٦
٢	٢	32 29	44 01	٥٩	٤٨	١٨,٨	٤٠,٢
٣	٣	32 20	44 10	٥٤	٥٠	٢٤	٣٠
٤	٤	32 30	43 55	٧٣	٦٠	١٧,٥	٥٥,٥
٥	٥	32 30	43 51	٨٤,٤	٨٠	٢٣,٧	٦٠,٨
٦	٦	32 30	43 48	٧٩	٥٠	٢١	٥٨
٧	٧	32 29	43 55	٧٤	٥٠	١٥	٥٩
٨	٨	32 13	44 14	٥٢	٩٠	٢٧	٢٥
٩	٩	32 13	44 12	٦٣	٨٠	٢٥	٣٥

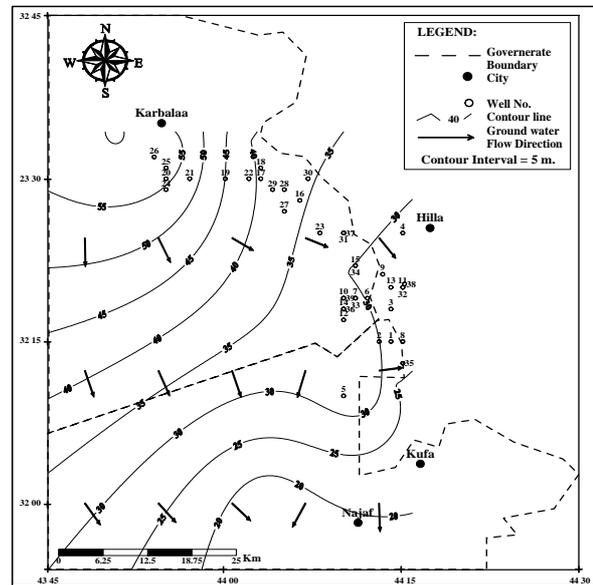
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ت	رقم البئر	الأيونات السالبة				الأيونات الموجبة		
		NO ₃	HCO ₃	SO ₄	Cl	Na	Mg	Ca
١	٤	٠,١٦	١٢٦	٣٤٠	٥٨٠	٢٤٠	١٨٠	٦٢٠
٢	٦	٠,٦	١٩٤	٧٨٢	١٣٣٤	١٤٧	١٤٥	٦٨٠
٣	٧	٠,٦	١٣٤	٤٦٠	٤٢٦	٢٦١	١٢٦	٦٣٢
٤	٨	٢٤,٨	٧٣,٢	٦٧٢	٣٩٧,٦	٢٣٣	٩٠	١٨٦



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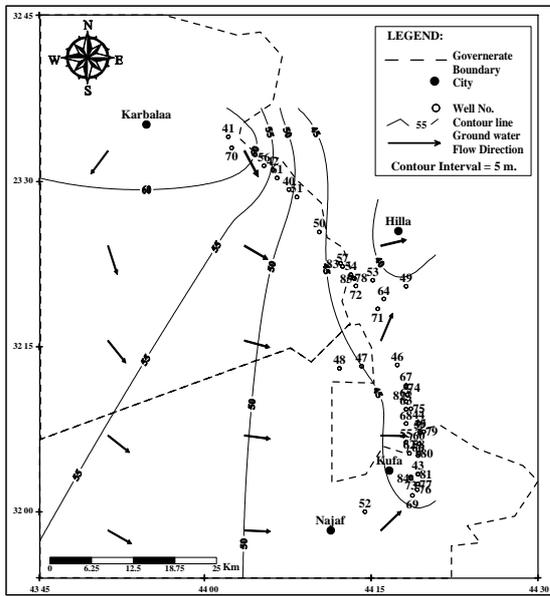
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ت	رقم البئر	الارتفاعات		ارتفاع البئر فوق سطح البحر (م)	منسوب الماء المستقر (م)	منسوب الماء فوق سطح البحر (م)	التفوق الكلي (م)	التأخرية البئر (م)
		خط العرض	خط الطول					
١	40	320315	441843	43.7	0	43.7	298	1308
٢	41	322922	440745	30	0	30	295	518
٣	43	323100	440660	30	0	30	247	3925
٤	44	320340	441907	42	0	42	206	825
٥	45	320802	441914	29.2	0	29.2	258	1056
٦	46	320724	441924	31.9	0	31.9	290	2376
٧	47	321331	441721	34.8	0	34.8	320	528
٨	50	322045	441800	29	0	29	319	1650
٩	51	322537	441019	29.7	0	29.7	317	528
١٠	52	322855	440817	29	0	29	310	389
١١	53	320000	441430	30	0	30	220	660
١٢	54	322100	441500	30	0	30	280	429
١٣	55	322150	441303	31.9	0	31.9	287	605
١٤	56	320630	441800	29	0	29	235	1056
١٥	57	321130	441800	35	0	35	320	726
١٦	58	323138	440521	30	0	30	250	330
١٧	59	322225	441228	33	0	33	300	660
١٨	60	320535	441911	34.3	0	34.3	303	1188
١٩	61	320713	441924	29.2	0	29.2	210	1023
٢٠	62	320618	441917	33.6	0	33.6	300	1023
٢١	63	320148	441857	47.8	0	47.8	283	990
٢٢	64	323027	440639	29	0	29	330	389
٢٣	65	323300	440230	28	0	28	200	330
٢٤	66	320530	441830	7	0	7	315	-
٢٥	67	320930	441800	26	0	26	230	990
٢٦	68	321840	441545	29	0	29	206	330
٢٧	69	321930	441600	29	0	29	314	396
٢٨	70	320934	441843	26	0	26	290	825
٢٩	71	321000	441800	28	0	28	1089	1089
٣٠	72	322048	441348	29.8	0	29.8	206	330
٣١	74	320252	441906	35.9	0	35.9	321	2310
٣٢	75	322121	441323	32	0	32	239	1901
٣٣	76	320725	441958	30.7	0	30.7	235	1023
٣٤	77	321059	441812	27.9	0	27.9	292	792
٣٥	78	320510	441908	39.3	0	39.3	320	2310
٣٦	79	320342	441907	40.5	0	40.5	300	792
٣٧	80	321145	441800	27	0	27	321	5940
٣٨	81	322252	441211	32.8	0	32.8	260	792
٣٩	82	320302	441846	42.4	0	42.4	290	1308
٤٠	83	320800	441800	30	0	30	924	924
٤١	84	322115	441335	357	0	357	267	-
٤٢	85	320526	441915	35.5	0	35.5	284	660

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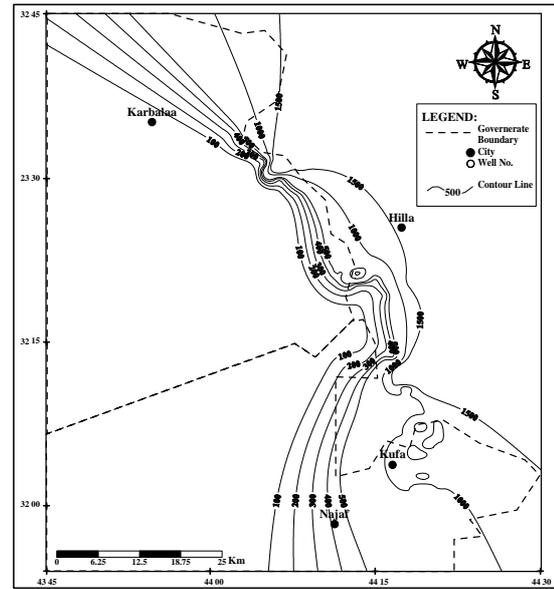
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TDS (ppm)	الأيونات السالبة				الأيونات الموجبة			رقم البئر	ت
	NO ₃	HCO ₃	SO ₄	Cl	Na	Mg	Ca		
4638	38	104	2726	430	414	231	660	41	١
2231	-	150	1162	320	138	88	448	48	٢
1885	-	104	960	284	207	59	320	49	٣
4156	-	146	1766	954	566	255	500	51	٤
2840	10	146	998	749	448	73	384	52	٥
5357	53	275	2582	883	483	353	700	53	٦
4199	5285	98	1920	923	515	195	520	54	٧
4929	-	92	2534	852	400	328	700	58	٨
2896	-	162	760	1092	552	127	284	60	٩
3584	8	119	700	1544	771	142	348	63	١٠
3611	14	79	1440	959	400	209	472	64	١١
4875	-	183	2414	852	427	364	600	65	١٢
4479	-	58	1985	1065	518	239	608	69	١٣
3995	-	174	900	1278	557	154	324	70	١٤
3772	-	98	1345	1131	521	194	533	73	15
4606	3	138	2160	923	460	281	588	77	16

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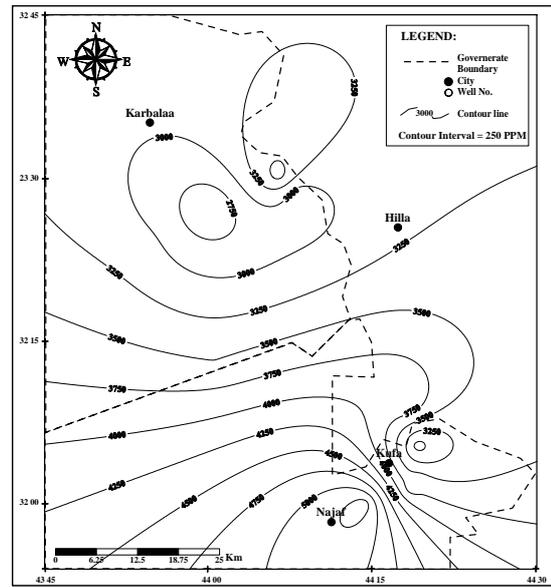
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