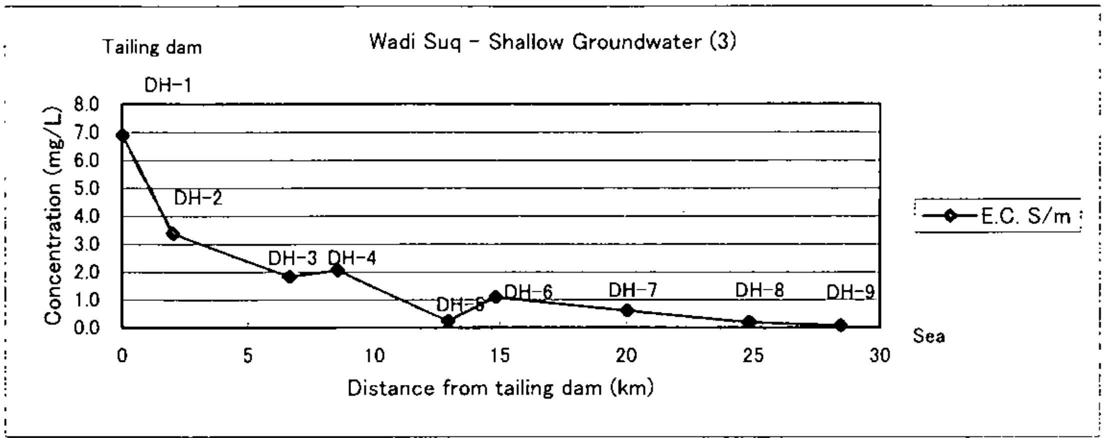
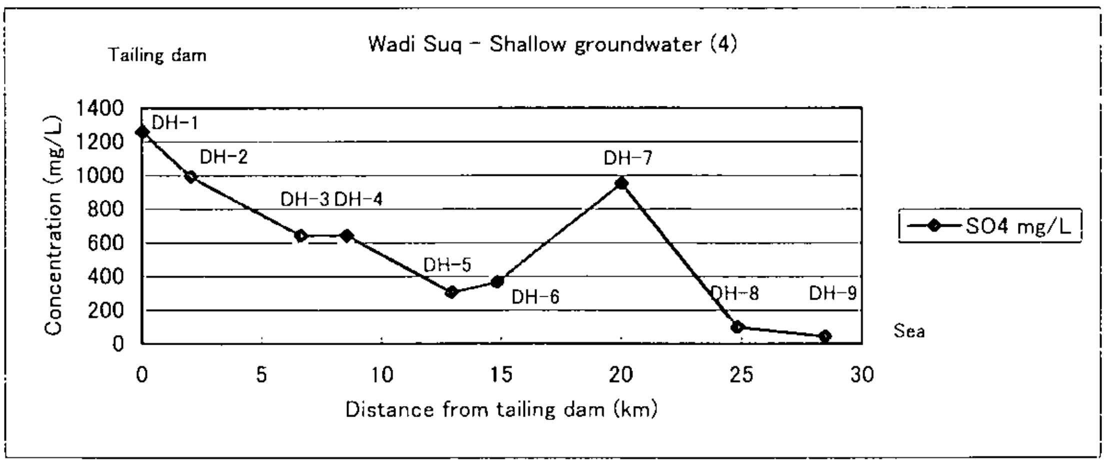




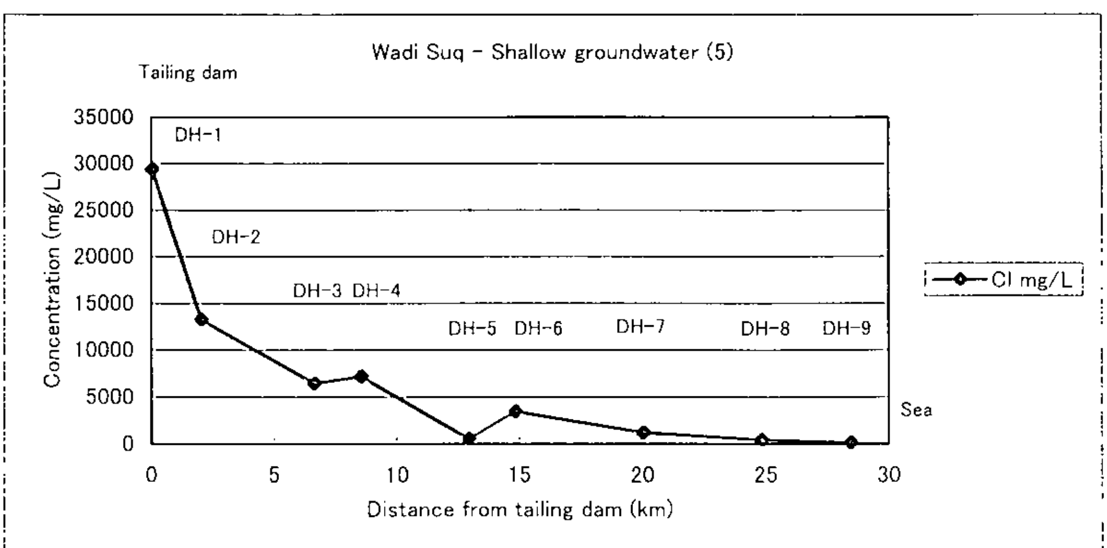
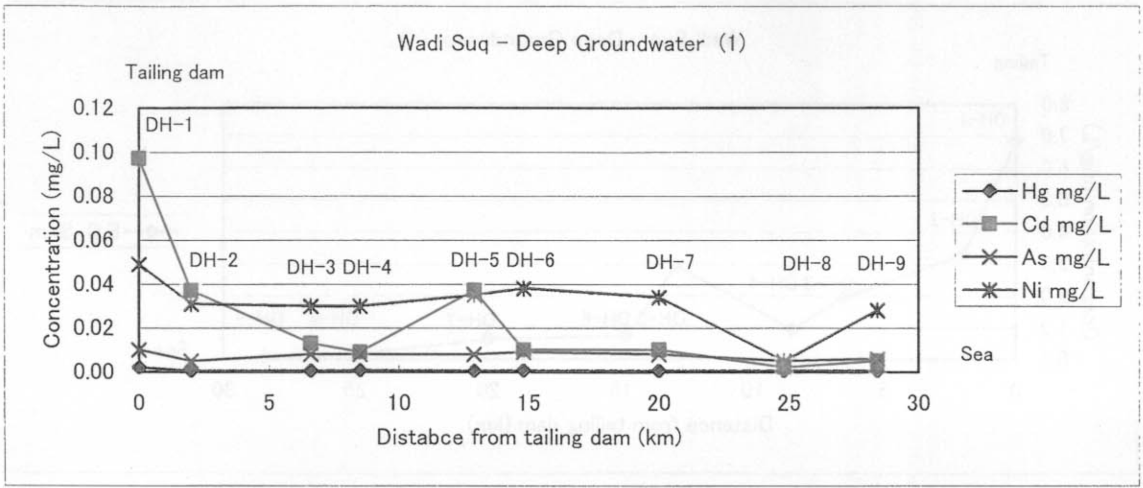
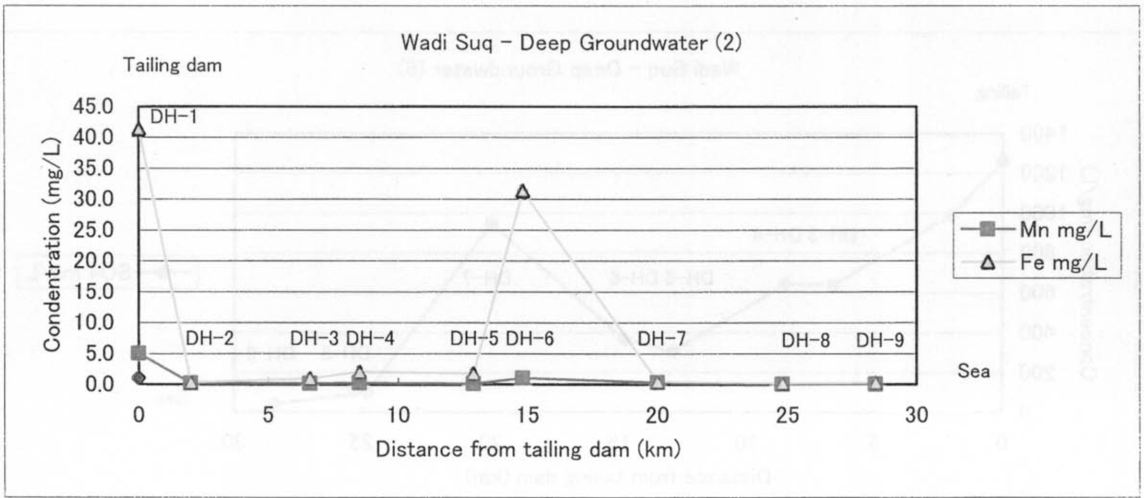


Figure 5.8 Relationship between Distance from Contaminant Source and Water Quality (2)





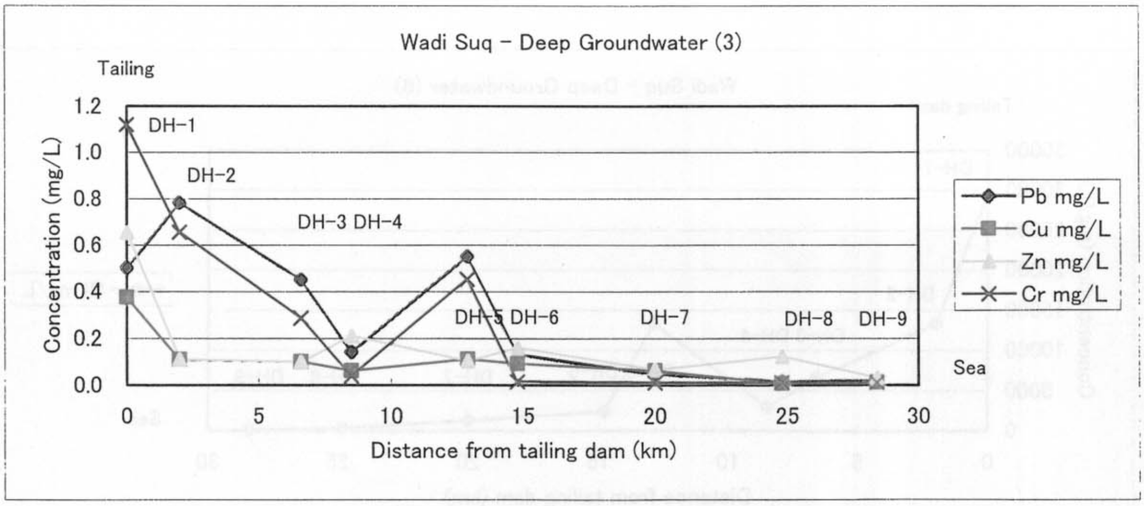
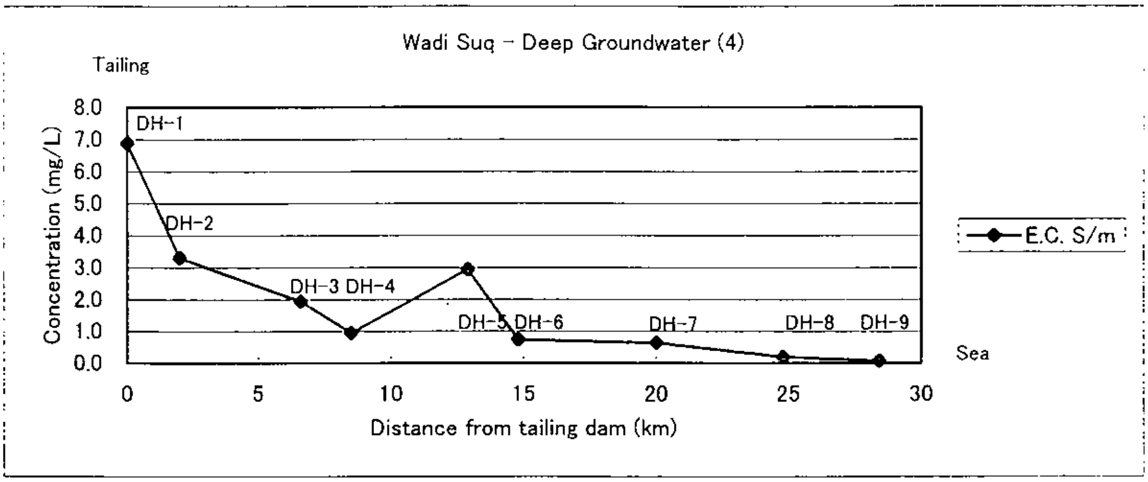
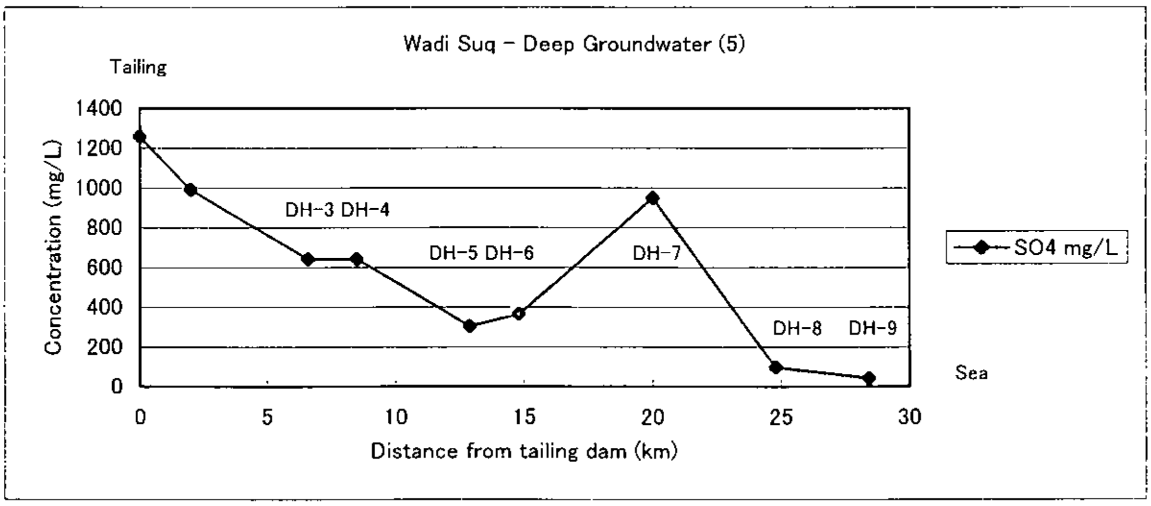


Figure 5.8 Relationship between Distance from Contaminant Source and Water Quality (3)





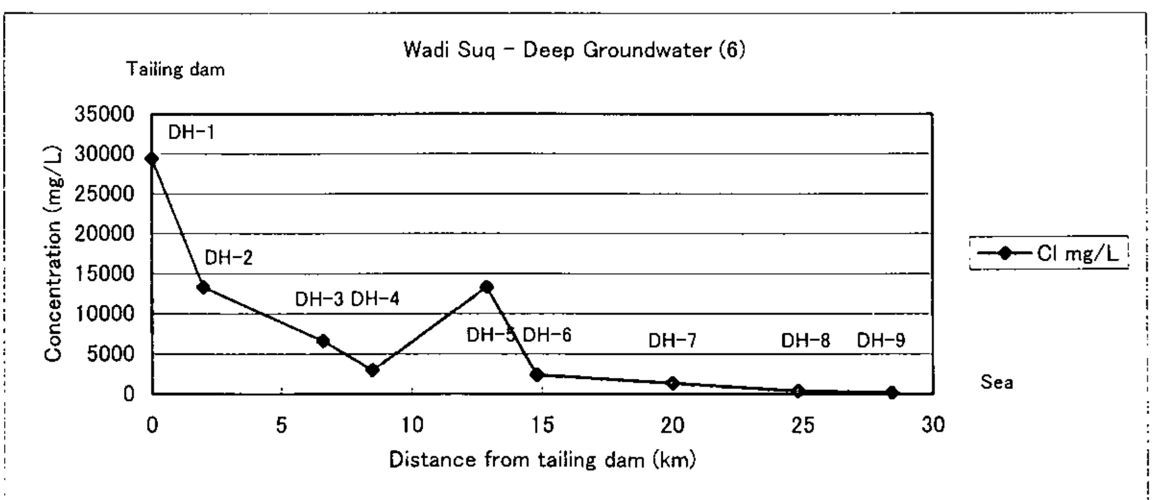


Figure 5.8 Relationship between Distance from Contaminant Source and Water Quality (4)

5.4.4 Correlation of Water Quality

The correlation of water quality among the first sampling, second sampling, deep groundwater, and shallow groundwater is shown in Table 5.8 and Figure 5.9. Correlations among the different sampling events are characterized, as follows:

- Seasonal differences in water quality are hardly recognized.
- Groundwater quality in the Study area is divided into three groups, namely G-1 to G-3.
- Group G-1, which is found from the lower part of the tailing dam to Sagha Village (KM14) and northwest part of the tailing dam, is directly affected by the seepage water from the tailing dam.
- Groundwater quality at drill holes DH-5, DH-6 and DH-12 is weakly correlated with Group G-1 indicating it is only partly affected by the seepage of the tailing dam.
- Group G-2, which is found in the middle and lower parts of Wadi Suq, is thought to present the Wadi Suq's original water quality. However, the correlation at Drill hole DH-7 is weak because the concentration of SO_4 is too high.
- Group G-3 presents the water quality of Wadi al Jizi. Groundwater in the lower part of Wadi Suq has a good correlation with Wadi al Jizi.

5.4.5 Dating of Groundwater

A sample of groundwater collected at a depth of 50m at DH-7 was date by analyzing Tritium (^3H). This groundwater sample indicated the age of the groundwater at this location was 27 years (1973), which is before the start of the mine development at Sohar was begun.

5.4.6 Evaluation Standards for Water Contamination

The environmental standards for drinking water and wastewater discharges as stipulated by Oman's environmental regulations are shown in Table 5.9 (1) and (2). The evaluation standards for water contamination in this Study consist of the standards for wastewater discharges in Oman.

5.4.7 Extent of Water Contamination

Contaminated seepage from the tailing dam, including salt and heavy metals, is dispersed downstream in Wadi Suq and Wadi Bani Umar al Gharbi to the northwestward of the tailing dam, as shown in Figure 5.10. The Study revealed that heavy metals, including Hg, Cd, Cr, Ni, Mn, Pb, Cu, Fe, and Zn, as well as SO_4 and Cl are seeping from the tailing dam and are dispersed into downstream areas. The dispersion of contaminants exhibits a uniform attenuation pattern with distance downstream from the tailing dam, with near background levels occurring around borehole DH-5.

Table 5.8 Correlation Table of Groundwater Quality of Drill Holes along Wadi Suq (1)

No.	DH No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
1	DH-1-July	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	DH-2-S-July	0.166	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	DH-3-S-July	0.151	**0.902**	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	DH-4S-July	0.329	**0.647**	0.402	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	DH-5S-July	0.050	-0.640	-0.589	-0.101	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	DH-6S-July	0.080	0.291	0.443	0.340	-0.052	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	DH-7S-July	0.099	-0.062	-0.124	0.292	0.257	-0.253	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	DH-8S-July	-0.079	-0.300	-0.098	-0.478	0.149	**0.508**	-0.645	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	DH-9-S-July	0.020	-0.533	-0.542	-0.052	**0.825**	0.143	-0.253	0.422	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	DH-1A-Nov.	**0.974**	0.192	0.223	0.231	0.044	0.081	-0.023	0.017	0.053	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	DH-2-S-Nov.	0.128	**0.952**	**0.958**	0.426	-0.748	0.362	-0.186	-0.110	-0.630	0.182	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	DH-3-S-Nov.	0.235	**0.889**	**0.988**	0.391	-0.611	0.450	-0.153	-0.064	-0.560	0.295	**0.959**	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	DH-4S-Nov.	0.298	**0.878**	**0.776**	0.859	-0.459	**0.529**	0.148	-0.323	-0.399	0.250	**0.790**	**0.772**	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	DH-5-S-Nov.	0.060	-0.492	-0.584	0.151	0.910	-0.205	0.312	-0.166	**0.790**	0.028	-0.699	-0.625	-0.313	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	DH-6S-Nov.	0.051	0.070	0.304	0.093	0.086	**0.949**	-0.293	**0.670**	0.258	0.088	0.190	0.305	0.295	-0.145	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	DH-7S-Nov.	0.051	-0.009	0.031	0.116	0.095	-0.175	**0.941**	-0.499	-0.441	-0.038	-0.039	0.007	0.140	0.049	-0.179	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	DH-8S-Nov.	-0.034	-0.503	-0.441	-0.266	**0.509**	0.409	-0.508	**0.846**	**0.797**	0.009	-0.452	-0.418	-0.396	0.313	**0.543**	-0.543	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	DH-9-S-Nov.	-0.001	-0.485	-0.355	-0.323	**0.598**	0.346	-0.574	**0.799**	**0.861**	0.082	-0.435	-0.340	-0.443	0.403	**0.504**	-0.612	**0.934**	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	DH-1A-July	-0.387	-0.279	-0.293	-0.204	0.023	-0.172	-0.065	0.005	-0.010	-0.463	-0.249	-0.241	-0.263	0.001	-0.155	-0.090	0.025	0.018	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	DH-2-D-july	-0.344	-0.016	-0.010	-0.513	-0.595	-0.323	-0.226	0.057	-0.528	-0.302	0.134	-0.017	-0.280	-0.618	-0.300	-0.056	-0.215	-0.312	-0.140	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	DH-3-D-July	-0.384	-0.297	-0.477	-0.053	0.137	-0.470	0.216	-0.411	0.117	-0.415	-0.426	-0.558	-0.314	0.356	-0.493	0.062	-0.134	-0.184	-0.225	0.404	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	DH-4D-2-July	-0.019	-0.605	-0.605	0.024	**0.755**	-0.139	0.337	-0.236	**0.576**	-0.106	-0.744	-0.620	-0.357	**0.812**	-0.114	0.114	0.174	0.268	0.111	-0.418	0.446	1	-	-	-	-	-	-	-	-	-	-	-	-	-
23	DH-5D-2-July	-0.343	-0.110	-0.273	-0.280	-0.343	-0.571	-0.116	-0.254	-0.229	-0.323	-0.125	-0.326	-0.322	-0.158	-0.564	-0.134	-0.242	-0.300	-0.193	**0.792**	**0.774**	-0.091	1	-	-	-	-	-	-	-	-	-	-	-	-
24	DH-6D-2-July	-0.447	-0.460	-0.497	-0.050	**0.620**	-0.061	0.118	0.056	**0.608**	-0.464	-0.567	-0.556	-0.350	**0.642**	0.008	-0.032	0.352	0.384	0.327	-0.496	0.162	**0.527**	-0.194	1	-	-	-	-	-	-	-	-	-	-	-
25	DH-7D-2-July	-0.019	-0.036	0.038	0.070	0.108	-0.142	**0.920**	-0.470	-0.437	-0.104	-0.049	0.011	0.115	0.041	-0.133	**0.992**	-0.533	-0.586	-0.030	-0.053	0.049	0.139	-0.153	-0.015	1	-	-	-	-	-	-	-	-	-	-
26	DH-8D-3-July	-0.038	-0.186	0.174	-0.655	-0.064	0.379	-0.480	**0.798**	-0.010	0.073	0.095	0.222	-0.296	-0.445	**0.551**	-0.210	0.415	0.471	0.062	0.202	-0.576	-0.326	-0.309	-0.191	-0.155	1	-	-	-	-	-	-	-	-	-
27	DH-9-D-July	-0.068	-0.479	-0.435	-0.259	**0.537**	0.346	-0.502	**0.822**	**0.825**	-0.009	-0.446	-0.426	-0.405	0.360	0.498	-0.543	**0.980**	**0.934**	0.047	-0.268	-0.156	0.130	-0.236	0.432	-0.535	0.374	1	-	-	-	-	-	-	-	-
28	DH-1A-Nov.	-0.483	-0.253	-0.213	-0.336	0.008	-0.179	-0.217	0.117	0.022	-0.497	-0.188	-0.179	-0.334	-0.043	-0.121	-0.202	0.069	0.111	**0.961**	-0.076	-0.248	0.008	-0.156	0.330	-0.131	0.192	0.114	1	-	-	-	-	-	-	-
29	DH-2-D-Nov.	-0.350	-0.017	0.005	-0.514	-0.596	-0.301	-0.222	0.051	-0.532	-0.306	0.138	-0.005	-0.272	-0.620	-0.278	-0.050	-0.224	-0.316	-0.149	**0.998**	0.414	-0.400	**0.783**	-0.496	-0.044	0.209	-0.283	-0.082	1	-	-	-	-	-	-
30	DH-3-D-Nov.	-0.442	-0.270	-0.388	-0.202	-0.048	-0.451	0.204	-0.344	-0.100	-0.464	-0.323	-0.462	-0.331	0.105	-0.461	0.143	-0.209	-0.288	-0.241	**0.630**	**0.954**	0.278	**0.843**	-0.005	0.138	-0.399	-0.253	-0.252	**0.642**	1	-	-	-	-	-
31	DH-4D-2-Nov.	0.005	-0.617	-0.621	-0.013	**0.773**	-0.152	0.209	-0.160	**0.651**	-0.069	-0.753	-0.629	-0.405	**0.825**	-0.116	-0.021	0.252	0.373	0.140	-0.430	0.398	**0.984**	-0.090	0.531	0.005	-0.278	0.218	0.052	-0.419	0.214	1	-	-	-	-
32	DH-5D-2-Nov.	-0.346	-0.134	-0.303	-0.275	-0.316	-0.571	-0.122	-0.246	-0.188	-0.325	-0.154	-0.358	-0.335	-0.124	-0.559	-0.153	-0.211	-0.275	-0.187	**0.768**	**0.790**	-0.073	**0.998**	-0.160	-0.173	-0.329	-0.203	-0.149	**0.761**	**0.847**	-0.073	1	-	-	-
33	DH-6D-2-Nov.	-0.480	-0.466	-0.457	-0.133	**0.575**	0.013	0.032	0.178	**0.588**	-0.484	-0.530	-0.509	-0.372	**0.547**	0.098	-0.076	0.411	0.441	0.355	-0.460	0.069	0.454	-0.239	**0.988**	-0.052	-0.047	0.485	0.376	-0.459	-0.069	0.463	-0.207	1	-	-
34	DH-7D-2-Nov.	-0.006	-0.117	-0.144	0.219	0.323	-0.262	**0.984**	-0.617	-0.199	-0.110	-0.233	-0.190	0.077	0.363	-0.269	**0.933**	-0.486	-0.520	-0.032	-0.229	0.246	0.376	-0.100	0.184	**0.928**	-0.443	-0.463	-0.155	-0.223	0.230	0.253	-0.106	0.101	1	-
35	DH-8D-3-Nov.	0.010	-0.393	-0.085	-0.596	0.266	0.403	-0.600	**0.894**	0.421	0.112	-0.183	-0.034	-0.431	-0.079	**0.588**	-0.453	**0.721**	**0.804**	0.112	-0.051	-0.488	-0.023	-0.386	0.063	-0.400	**0.892**	**0.683**	0.230	-0.046	-0.429	0.063	-0.387	0.186	-0.554	1
36	DH-9-D-Nov.	-0.065	-0.468	-0.423	-0.257	**0.532**	0.347	-0.525	0.823	**0.830**	-0.003	-0.436	-0.414	-0.402	0.359	0.496	-0.568	**0.980**	**0.943**	0.040	-0.266	-0.153	0.133	-0.231	0.428	-0.560	0.376	**0.999**	0.110	-0.281	-0.253	0.225	-0.199	0.481	-0.486	**0.689**

Table 5.8 Correlation Table of Groundwater Quality of Drill Holes along Wadi Suq (2)

No.	DH No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
1	DH-1A	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	DH-1B	0.125	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	DH-2-S	0.029	-0.401	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	DH-2-D	0.041	-0.385	**0.991**	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	DH-3-S	0.030	-0.360	**0.950**	**0.920**	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	DH-3-D	-0.348	-0.676	**0.592**	**0.626**	**0.522**	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	DH-4S	-0.177	-0.462	**0.614**	**0.564**	**0.728**	**0.599**	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	DH-4D-1	-0.155	0.326	-0.607	-0.606	-0.529	-0.531	-0.480	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	DH-4D-2	-0.330	-0.022	-0.743	-0.733	-0.667	-0.064	-0.094	**0.563**	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	DH-5-S	-0.306	-0.027	-0.748	-0.787	-0.674	-0.168	-0.105	0.238	**0.741**	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	DH-5D-1	-0.272	-0.702	**0.761**	**0.761**	**0.629**	**0.781**	**0.563**	-0.558	-0.390	-0.326	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	DH-5D-2	-0.084	-0.556	**0.752**	**0.748**	**0.633**	**0.732**	**0.622**	-0.677	-0.398	-0.301	**0.790**	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	DH-6S	-0.148	0.033	0.014	-0.048	0.229	-0.110	**0.554**	-0.078	0.068	0.238	-0.022	-0.054	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	DH-6D-1	0.141	-0.136	-0.596	-0.545	-0.657	-0.152	-0.286	0.215	**0.587**	0.464	-0.200	-0.294	0.030	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	DH-6D-2	0.002	0.108	-0.688	-0.685	-0.675	-0.339	-0.328	0.041	0.451	**0.608**	-0.383	-0.430	0.220	**0.589**	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	DH-7S	-0.102	-0.159	0.119	0.080	0.314	0.295	0.444	-0.267	0.107	0.128	-0.095	-0.032	0.189	-0.332	-0.090	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	DH-7D-1	-0.077	-0.255	-0.092	-0.104	0.062	0.345	0.262	-0.174	0.321	0.304	-0.147	-0.095	-0.001	-0.080	0.050	**0.928**	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	DH-7D-2	-0.098	-0.238	-0.098	-0.134	0.092	0.265	0.357	-0.182	0.325	0.370	-0.175	-0.091	0.169	-0.103	0.087	**0.954**	**0.975**	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	DH-8S	-0.012	0.036	-0.278	-0.358	-0.146	-0.412	0.237	0.075	0.179	0.482	-0.104	-0.197	**0.805**	0.281	0.468	-0.145	-0.247	-0.068	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	DH-8D-1	0.349	**0.610**	-0.119	-0.032	-0.249	-0.372	-0.661	0.314	-0.201	-0.512	-0.347	-0.354	-0.543	0.042	-0.133	-0.472	-0.429	-0.556	-0.491	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	DH-8D-2	0.350	**0.568**	-0.056	0.038	-0.201	-0.273	-0.609	0.222	-0.232	-0.543	-0.265	-0.284	-0.554	0.040	-0.147	-0.454	-0.406	-0.545	-0.529	**0.992**	1	-	-	-	-	-	-	-	-	-	-	-	-	-
22	DH-8D-3	0.309	**0.536**	-0.089	0.009	-0.231	-0.236	-0.662	0.249	-0.197	-0.511	-0.298	-0.293	-0.622	0.019	-0.143	-0.400	-0.321	-0.476	-0.621	**0.980**	**0.985**	1	-	-	-	-	-	-	-	-	-	-	-	-
23	DH-9-S	0.204	**0.517**	-0.600	-0.571	-0.675	-0.684	-0.616	0.421	0.177	0.218	-0.424	-0.498	0.070	**0.543**	**0.528**	-0.768	-0.683	-0.670	0.428	0.471	0.430	0.369	1	-	-	-	-	-	-	-	-	-	-	-
24	DH-9-D	0.198	0.370	-0.498	-0.512	-0.513	-0.614	-0.265	0.163	0.147	0.379	-0.291	-0.335	0.421	**0.535**	**0.598**	-0.590	-0.580	-0.485	**0.765**	0.076	0.045	-0.052	**0.879**	1	-	-	-	-	-	-	-	-	-	-
25	DH-10-S	-0.135	-0.022	-0.085	-0.184	0.126	-0.263	0.356	-0.124	-0.017	0.404	-0.111	-0.173	**0.823**	-0.080	0.276	0.364	0.186	0.369	**0.788**	-0.679	-0.715	-0.751	-0.046	0.335	1	-	-	-	-	-	-	-	-	-
26	DH-10-D	-0.098	0.130	-0.100	-0.182	0.172	-0.223	0.412	-0.036	0.102	0.294	-0.274	-0.341	**0.765**	-0.167	0.180	**0.654**	0.461	**0.610**	**0.577**	-0.528	-0.555	-0.586	-0.215	0.102	**0.872**	1	-	-	-	-	-	-	-	-
27	DH-11-S	-0.362	-0.311	-0.501	-0.489	-0.560	0.244	-0.156	0.250	**0.743**	**0.694**	-0.064	0.044	-0.364	0.381	0.260	0.050	0.335	0.285	-0.167	-0.286	-0.293	-0.204	-0.078	-0.143	-0.259	-0.303	1	-	-	-	-	-	-	-
28	DH-11-D	-0.165	-0.465	-0.301	-0.327	-0.285	0.356	0.265	-0.177	**0.570**	**0.771**	0.100	0.247	0.034	0.352	0.294	0.305	**0.504**	**0.527**	0.169	-0.674	-0.650	-0.609	-0.244	-0.023	0.157	0.073	**0.790**	1	-	-	-	-	-	-
29	DH-12S	0.099	0.235	0.122	0.057	0.298	-0.368	0.226	-0.142	-0.395	-0.053	-0.092	-0.218	**0.793**	-0.224	0.123	0.104	-0.144	-0.004	**0.675**	-0.244	-0.265	-0.332	0.159	0.417	**0.813**	**0.719**	-0.722	-0.356	1	-	-	-	-	-
30	DH-12D-1	-0.297	-0.371	0.039	0.017	-0.139	0.231	0.136	-0.307	0.048	0.357	**0.558**	0.418	-0.008	0.298	0.177	-0.396	-0.338	-0.301	0.339	-0.365	-0.332	-0.394	0.179	0.372	0.079	-0.250	0.321	0.452	-0.140	1	-	-	-	-
31	DH-12D-2	-0.343	-0.499	0.484	0.393	0.531	0.316	**0.654**	-0.458	-0.229	0.050	**0.547**	0.427	0.366	-0.312	-0.188	0.396	0.198	0.323	0.330	-0.741	-0.730	-0.773	-0.545	-0.184	**0.585**	0.464	-0.112	0.234	0.309	0.449	1	-	-	-
32	DH-13-S	-0.365	0.108	-0.769	-0.783	-0.754	-0.385	-0.599	**0.697**	**0.614**	**0.675**	-0.477	-0.515	-0.192	0.287	0.361	-0.160	0.041	0.037	0.088	-0.047	-0.128	-0.037	0.327	0.160	0.037	-0.081	**0.662**	0.302	-0.251	0.057	-0.266	1	-	-
33	DH-13-D	-0.418	-0.011	-0.704	-0.749	-0.630	-0.397	-0.390	**0.654**	**0.606**	**0.722**	-0.399	-0.480	0.108	0.284	0.436	-0.111	0.022	0.080	0.367	-0.288	-0.376	-0.308	0.304	0.265	0.318	0.147	**0.552**	0.317	-0.010	0.111	-0.046	**0.936**	1	-
34	DH-14-S	0.120	0.439	-0.300	-0.220	-0.443	-0.344	-0.837	**0.515**	0.008	-0.282	-0.392	-0.391	-0.717	0.082	-0.072	-0.467	-0.326	-0.467	-0.591	**0.870**	**0.834**	**0.890**	0.405	-0.065	-0.717	-0.646	0.085	-0.475	-0.463	-0.320	-0.747	0.374	0.107	1
35	DH-14-D	-0.048	0.318	-0.186	-0.172	-0.209	-0.307	-0.634	**0.722**	-0.050	-0.306	-0.367	-0.469	-0.345	-0.126	-0.183	-0.387	-0.393	-0.434	-0.253	**0.577**	0.490	**0.535**	0.307	-0.058	-0.284	-0.281	-0.122	-0.639	-0.079	-0.403	-0.392	0.459	0.376	**0.767**

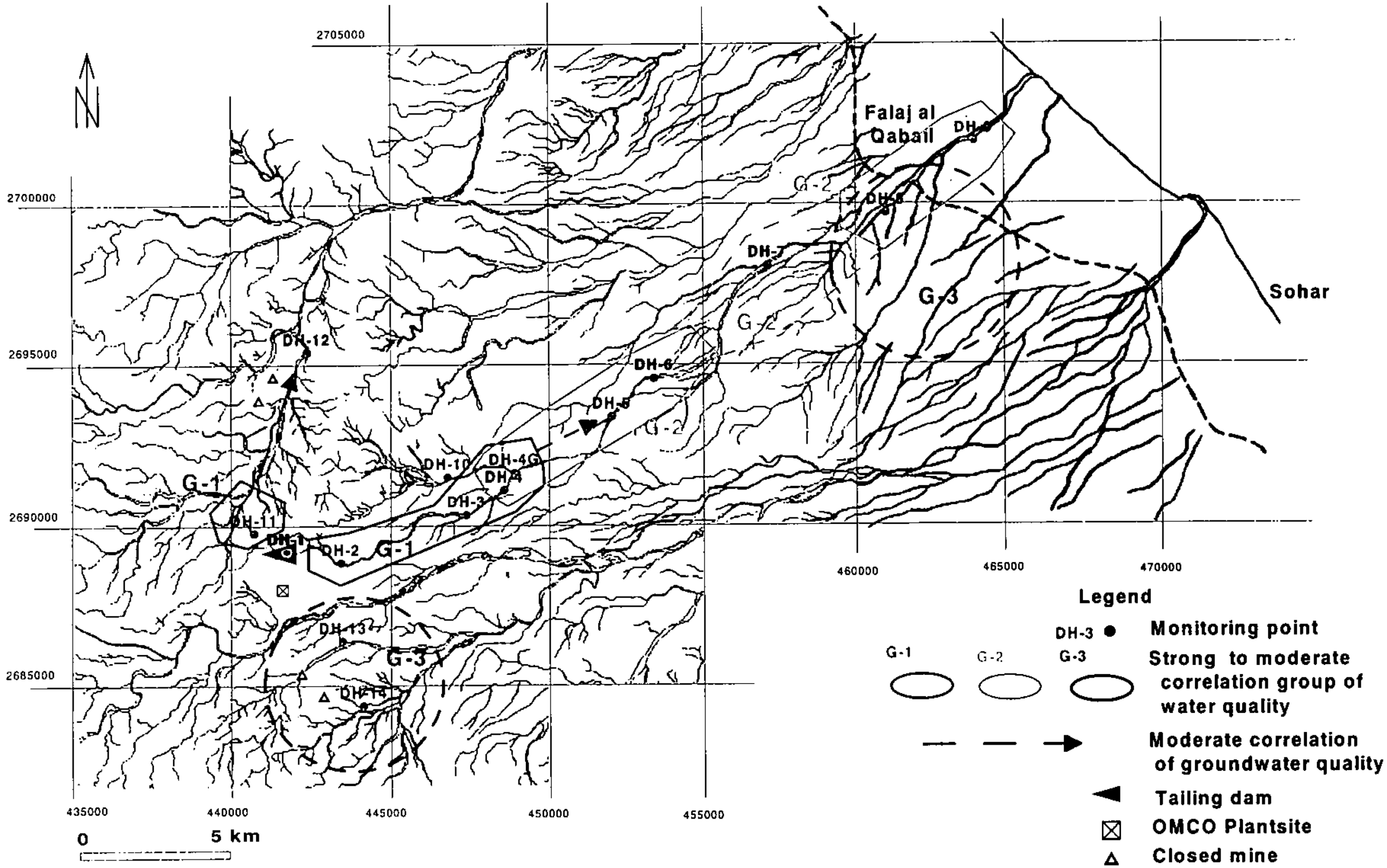


Figure 5.9 Correlation Map of Water Quality in Drill Holes

Table 5.9 Water Quality Standards in Oman

(1) Environmental Standard for Drinking Water (Extracts)

Items	Hg	Pb	As	Cd	Se	CN
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Permissive Concentration	0.001	0.10	0.05	0.01	0.01	0.05

(2) Environmental Standard for Discharge (Extracts)

Items	TDS	EC	pH	As	Cd	Cl	Cr	Cu
	mg/L	μ S/cm		mg/L	mg/L	mg/L	mg/L	mg/L
Permissive Concentration	1500	2000	6-9	0.1	0.01	650	0.05	0.5

Items	Fe	Pb	Mn	Hg	Ni	SO4	Zn
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Permissive Concentration	1	0.10	0.1	0.001	0.1	400	5

The extent of water contamination designated by the evaluation standards of water quality, as shown in Table 5.7 and Figure 5.10, is confirmed at two areas, namely from the tailing dam to Sagha Village (KM14) and from northwestward of the tailing dam to Wadi Bani Umar al Gharbi. Also, a part of the contamination is dispersed all the way to the drill holes of DH-5 and DH-12. However, the relatively high concentrations of SO_4 and Cl at drill holes DH-6 and DH-7 are thought to occur due to natural causes that occur locally.

Concentrations of Cd, Pb, SO_4 and Cl at the drill holes of DH-5, DH-6 and DH-7 exceed the evaluation standards. These exceedances of the standards are thought to occur by overlapping the dispersion of man-made and naturally occurring contamination. Particularly, the Cl contamination of deep groundwater in the lower part of Wadi Suq strongly indicates a natural source of Cl, because the age of deep groundwater predates the mine development.

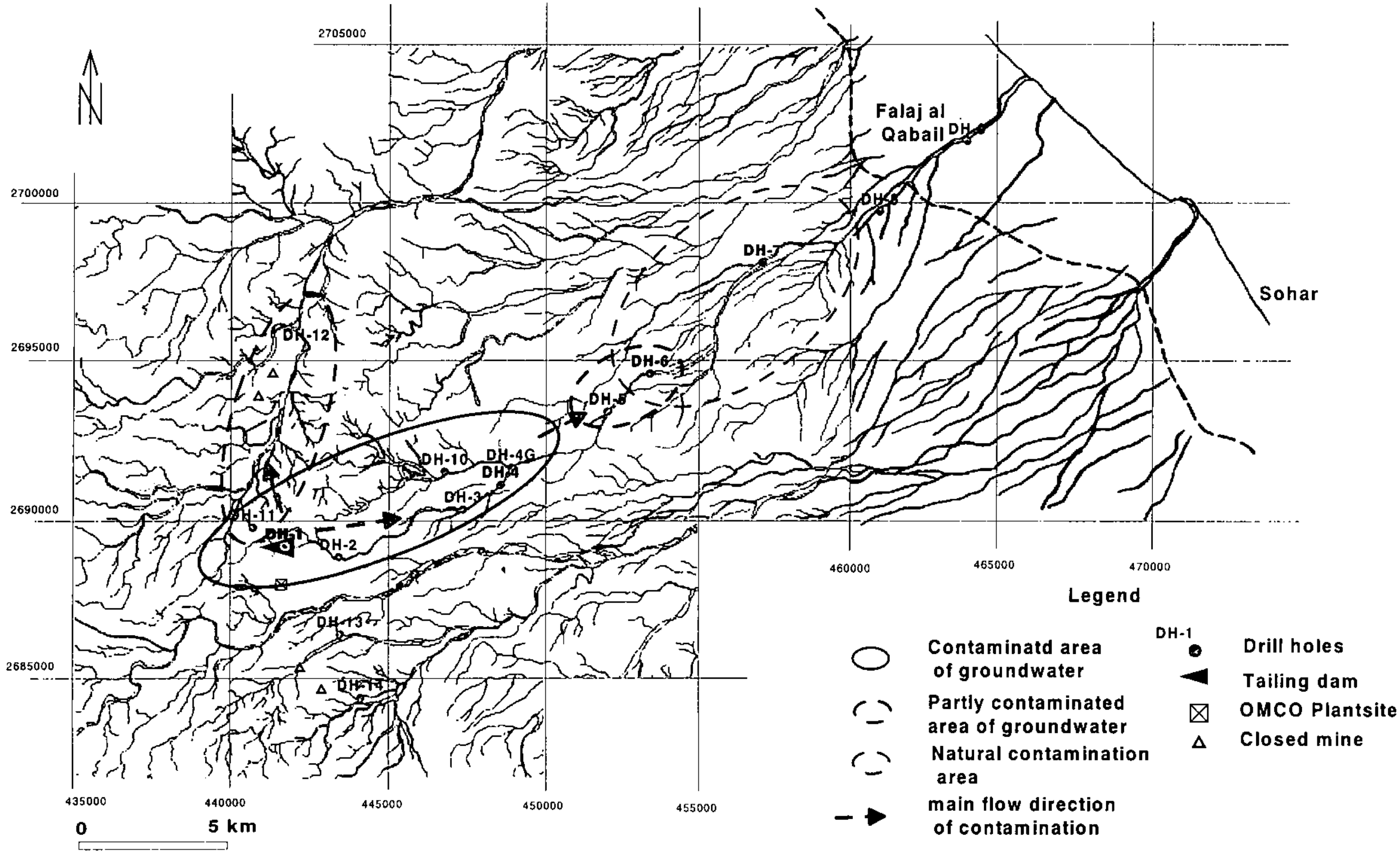


Figure 5.10 Extent of Groundwater Contamination