1-5 Resource Evaluation

1-5-1 Resource categorisation

Resources were classified here into 'Measured', 'Indicated' and 'Inferred' categories according to the terms and definitions contained within the "JORC Code", i.e. Australasian Code for Reporting of Identified Mineral Resources and Ore Reserves, Report of the Joint Committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia. These categories would indicate the 'confidence' in interpolated grades.

During grade interpolation the two variables of 'number of points' and 'distance' were adopted as parameters indicating 'confidence' level. Number of points would be a whole sample (composite) number computed within the scan distance. Distance would be the scan distance from the centre of the computed block. Subsequently, 'number of points' and 'distance' were combined into a resource category variable for copper and gold. The category values were set from the number and distance values in the following ranges:

Table Ⅲ-1-17 Confidence variable ranges

	Rakah	Hayl As Safil	Al Asghar	Bishara	Al Jadeed
Measured Resources					
Number of points	12≦	12≦	12≦	12≦	12≦
Distance(m)	≦60	≦60	≦80	≦60	≦60
Indicated Resources					
Number of points	12≦	12≦	12≦	12≦	12≦
Distance(m)	60＜x≦90	60＜x≦90	80＜x≦120	60＜x≦90	60＜x≦90
Inferred Resources					
Number of points	3≦	3≦	3≦	3≦	3≦
Distance(m)	≦120	≦120	≦160	≦120	≦120

Distance variables were determined by using ranges in the semi-variograms for each ore body. Roughly, Measured Resources would be set to 2 thirds of average range for each deposit, equal distance to average range for Indicated Resources and 4 thirds of average range for Inferred Resource. Length of composites would be 6 meters for Rakah and 5 meters for other ore bodies.

In the case that there are less than 3 composites within 120 metres or there are more than 3 composites over 120 metres in Rakah, Hayl As Safil, Bishara and Al Jadeed (160 metres for Al Asghar only), there would not be created any ore block neither be classified into any ore category.

For block grade interpolation, it was adopted as much as possible the algorithm Ordinary Kriging. However, Inverse Distance Squared algorithm was applied for some parts of the domains because they could not be represented by proper semi-variograms. The Kriging parameters are summarized in the following tables:

Table Ⅲ-1-18 Kriging parameters for copper

Ore Deposit	Domain	Nugget effect	Sill	Range(m)
Rakah	2	0.22	0.24	90
	3	0.25	0.35	50
Hayl As Safil	2	0.21	0.42	120
	3	0.25	0.60	100
Al Asghar	3	1.0	1.4	120
Al Bishara	4	0.22	0.33	90
Al Jadeed	4	0.2	0.3	115

Table Ⅲ-1-19 Kriging parameters for gold

Ore Deposit	Domain	Nugget effect	Sill	Range(m)
Rakah	2	0.3	1.9	100
	3	1.0	1.5	30
Hayl As Safil	2	0.02	0.24	120
	3	0.10	0.80	80
Al Asghar	3	0.05	1.10	75
Al Bishara	4	0.1	0.24	100

1-5-2 Specific gravity

Defaulted specific gravity values were assigned to each zone indicated as domain numbers. The following table lists the specific gravities described in the OMCO(1994) for use in resource reporting:

Table Ⅲ-1-20 Summary of specific gravity

Ore type	Domain	Rakah	Hayl As Safil	Al Asghar	Al Bishara	Al Jadeed
Stockwork	2	3.18	3.14	-	-	-
Massive	3	3.40	3.18	3.40	-	-
Brecciated	4	3.18	-	-	3.00	3.20

1-5-3 Resource statements

The following table gives the geological ore resources at 0.5%Cu cut-off:

Table Ⅲ-1-21 Geological ore resources at 0.5%COG

	Tonnage (kt)	Copper grade (%Cu)	Contained Cu (t)	Gold grade (g/tAu)	Contained Au (kg)
Rakah					
Total	5,094	0.83	42,643	0.63	3,218
Stockwork	4,886	0.81	39,580	0.50	2,443
Massive	208	1.47	3,063	3.72	775
Hayl As Safil					
Total	5,958	1.13	67,290	0.42	2,473
Stockwork	5,369	1.06	56,917	0.33	1,772
Massive	589	1.76	10,373	1.19	701
Al Asghar					
Massive	932	2.72	25,364	0.99	923
Al Bishara					
Brecciated	3,069	1.09	33,459	0.89	2,731
Al Jadeed					
Brecciated	744	1.34	9,982	0.68	506
Total	15,797	1.13	178,738	0.62	9,851
Stockwork	10,255	0.94	96,497	0.41	4,215
Massive	1,729	2.24	38,800	1.39	2,399
Brecciated	3,813	1.14	43,441	0.85	3,237

Table Ⅲ-1-22 summarises the measured + indicated resources at 0.5%Cu cut-off grade which are basic figures used for pit design. Ratios of total contained copper and gold in the measured + indicated resources of all resources hold 79% and 74%, respectively. Especially for stockwork ores with good metallurgical recovery, ratios of contained copper and gold in the measured + indicated resources hold 93% and 94%, respectively. Therefore, resource categorisation is inferred to be satisfactory. Categorised resources at 0%, 0.2%, 0.4%, 0.5%, 0.6%, 0.7%, 0.8%, 0.9% and 1.0%Cu cut-off grades in each ore body are also presented in the Tables III-1-23 to II-1-27.

Table Ⅲ-1-22 Geological Ore Resources versus Measured + Indicated Resources by ore deposit at 0.5%CuCOG

	Geological Ore Resources(GOR)					Measured+Indicated Resources(MIR)					MIR/GOR	
	Tonnage (kt)	Cu grade (%)	Contained Cu(t)	Au grade (g/t)	Contained Au(kg)	Tonnage (kt)	Cu grade (%)	Contained Cu(t)	Au grade (g/t)	Contained Au(kg)	Contained Cu	Contained Au
Rakah Total	5,094	0.83	42,643	0.63	3,218	4,581	0.81	37,239	0.51	2,351	87%	73%
Stockwork	4,886	0.81	39,580	0.50	2,443	4,563	0.81	36,964	0.50	2,281	93%	93%
Massive	208	1.47	3,063	3.72	775	18	1.52	275	3.88	70	9%	9%
Hayl As Safil Total	5,958	1.13	67,290	0.42	2,473	5,190	1.08	56,090	0.36	1,912	83%	77%
Stockwork	5,369	1.06	56,917	0.33	1,772	4,973	1.07	53,219	0.34	1,691	94%	95%
Massive	589	1.76	10,373	1.19	701	217	1.32	2,871	1.02	221	28%	32%
Al Asghar Massive	932	2.72	25,364	0.99	923	614	2.38	14,668	0.79	490	58%	53%
Bishara Brecciated	3,069	1.09	33,459	0.89	2,731	2,667	1.09	29,195	0.85	2,290	87%	84%
Al Jadeed Brecciated	744	1.34	9,982	0.68	506	244	1.45	3,543	0.86	212	35%	42%
Total	15,797	1.13	178,738	0.62	9,851	13,296	1.06	140,735	0.55	7,255	79%	74%
Stockwork	10,255	0.94	96,497	0.41	4,215	9,536	0.95	90,183	0.42	3,972	93%	94%
Massive	1,729	2.24	38,800	1.39	2,399	849	2.10	17,814	0.92	781	46%	33%
Brecciated	3,813	1.14	43,441	0.85	3,237	2,911	1.12	32,738	0.86	2,502	75%	77%

Table Ⅲ-1-23 Geological Ore Resources by ore type in Rakah at various COG

		COG(%Cu)								
		0.0	0.2	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Measured	Stockwork									
	Tonnage(t)	6,154,082	5,948,570	5,068,181	4,320,891	3,377,663	2,482,768	1,757,984	1,256,458	900,200
	Copper grade(%Cu)	0.67	0.69	0.74	0.81	0.88	0.96	1.05	1.13	1.20
	Gold grade(g/tAu)	0.41	0.42	0.46	0.51	0.58	0.67	0.71	0.75	0.80
	Massive									
	Tonnage(t)	18,155	18,155	18,155	18,155	18,155	18,155	18,155	17,532	16,958
	Copper grade(%Cu)	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.54	1.56
	Gold grade(g/tAu)	3.88	3.88	3.88	3.88	3.88	3.88	3.88	3.96	3.96
Indicated	Stockwork									
	Tonnage(t)	610,089	544,621	333,548	242,680	176,147	121,012	75,485	51,618	36,299
	Copper grade(%Cu)	0.50	0.54	0.69	0.78	0.86	0.96	1.10	1.21	1.32
	Gold grade(g/tAu)	0.25	0.25	0.24	0.27	0.31	0.36	0.45	0.44	0.38
Measured + Indicated	Stockwork									
	Tonnage(t)	6,764,171	6,493,191	5,401,729	4,563,571	3,553,810	2,603,780	1,833,469	1,308,076	936,499
	Copper grade(%Cu)	0.65	0.68	0.74	0.81	0.88	0.96	1.05	1.13	1.20
	Gold grade(g/tAu)	0.40	0.41	0.45	0.50	0.57	0.66	0.70	0.74	0.78
	Massive									
	Tonnage(t)	18,155	18,155	18,155	18,155	18,155	18,155	18,155	17,532	16,958
	Copper grade(%Cu)	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.54	1.56
	Gold grade(g/tAu)	3.88	3.88	3.88	3.88	3.88	3.88	3.88	3.96	3.96
Inferred	Stockwork									
	Tonnage(t)	926,608	747,912	439,710	322,905	258,278	203,435	139,482	81,547	45,170
	Copper grade(%Cu)	0.45	0.53	0.70	0.79	0.85	0.91	0.97	1.07	1.16
	Gold grade(g/tAu)	0.33	0.35	0.45	0.57	0.63	0.62	0.65	0.66	0.67
	Massive									
	Tonnage(t)	190,185	190,185	190,185	190,185	186,806	182,928	175,600	171,764	162,979
	Copper grade(%Cu)	1.46	1.46	1.46	1.46	1.48	1.49	1.52	1.54	1.57
	Gold grade(g/tAu)	3.70	3.70	3.70	3.70	3.67	3.65	3.65	3.65	3.63

Table Ⅲ-1-24 Geological Ore Resources by ore type in Hayl As Safil at various COG

Hayl As Safil		COG(%Cu)								
		0.0	0.2	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Measured	Stockwork: Tonnage(t)	7,977,957	7,162,387	5,704,769	4,656,456	3,807,028	3,238,893	2,807,296	2,426,329	2,071,517
	Copper(%Cu)	0.75	0.82	0.95	1.07	1.18	1.28	1.36	1.44	1.52
	Gold(g/tAu)	0.25	0.27	0.31	0.35	0.36	0.37	0.37	0.37	0.37
	Massive : Tonnage(t)	218,575	214,451	202,477	194,129	183,397	167,149	152,491	139,274	128,939
	Copper(%Cu)	1.20	1.22	1.27	1.30	1.35	1.42	1.48	1.54	1.59
	Gold(g/tAu)	0.92	0.93	0.97	1.00	1.03	1.06	1.07	1.08	1.08
Indicated	Stockwork: Tonnage(t)	617,697	538,363	408,789	317,091	264,790	237,119	213,913	176,527	135,952
	Copper(%Cu)	0.66	0.74	0.88	1.00	1.09	1.14	1.18	1.25	1.34
	Gold(g/tAu)	0.12	0.13	0.16	0.20	0.23	0.25	0.26	0.27	0.27
	Massive : Tonnage(t)	23,403	23,403	23,403	23,403	23,403	23,353	23,204	23,105	22,856
	Copper(%Cu)	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.51	1.51
	Gold(g/tAu)	1.18	1.18	1.18	1.18	1.18	1.19	1.18	1.18	1.19
Measured + Indicated	Stockwork: Tonnage(t)	8,595,654	7,700,750	6,113,558	4,973,547	4,071,818	3,476,012	3,021,209	2,602,856	2,207,469
	Copper(%Cu)	0.74	0.81	0.95	1.07	1.17	1.27	1.35	1.43	1.51
	Gold(g/tAu)	0.24	0.26	0.30	0.34	0.35	0.36	0.36	0.36	0.36
	Massive : Tonnage(t)	241,978	237,854	225,880	217,532	206,800	190,502	175,695	162,379	151,795
	Copper(%Cu)	1.23	1.25	1.29	1.32	1.37	1.43	1.48	1.54	1.58
	Gold(g/tAu)	0.95	0.95	0.99	1.02	1.05	1.08	1.08	1.09	1.10
Inferred	Stockwork: Tonnage(t)	795,058	685,550	459,568	395,983	364,878	325,824	291,922	256,057	201,745
	Copper(%Cu)	0.65	0.74	0.97	1.05	1.09	1.15	1.19	1.24	1.32
	Gold(g/tAu)	0.14	0.16	0.23	0.25	0.27	0.28	0.29	0.30	0.31
	Massive : Tonnage(t)	372,259	372,259	372,060	371,861	368,582	363,514	356,160	346,570	332,062
	Copper(%Cu)	2.01	2.01	2.01	2.01	2.02	2.04	2.07	2.10	2.15
	Gold(g/tAu)	1.29	1.29	1.29	1.29	1.29	1.30	1.30	1.31	1.31

Table Ⅲ-1-25 Geological Ore Resources by ore type in Al Asghar at various COG

Al Asghar		COG(%Cu)								
		0.0	0.2	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Measured	Massive									
	Tonnage(t)	597,709	597,125	593,566	591,494	587,084	581,188	570,297	557,388	544,213
	Copper grade(%Cu)	2.30	2.30	2.31	2.32	2.33	2.35	2.38	2.42	2.45
	Gold grade(g/tAu)	0.77	0.77	0.78	0.78	0.78	0.78	0.77	0.77	0.76
Indicated	Massive									
	Tonnage(t)	23,163	22,738	22,684	22,684	22,525	22,366	21,728	21,356	21,356
	Copper grade(%Cu)	4.08	4.16	4.17	4.17	4.19	4.22	4.32	4.38	4.38
	Gold grade(g/tAu)	1.22	1.23	1.23	1.23	1.24	1.23	1.23	1.22	1.22
Measured + Indicated	Massive									
	Tonnage(t)	620,872	619,863	616,250	614,178	609,609	603,554	592,025	578,744	565,569
	Copper grade(%Cu)	2.37	2.37	2.38	2.39	2.40	2.42	2.45	2.49	2.52
	Gold grade(g/tAu)	0.79	0.79	0.80	0.80	0.80	0.80	0.79	0.79	0.78
Inferred	Massive									
	Tonnage(t)	322,628	322,363	320,503	318,325	315,616	311,791	306,478	294,525	281,084
	Copper grade(%Cu)	3.32	3.33	3.34	3.36	3.39	3.42	3.47	3.57	3.70
	Gold grade(g/tAu)	1.35	1.35	1.35	1.35	1.36	1.36	1.37	1.38	1.40

Table Ⅲ-1-26 Geological Ore Resources by ore type in Bishara at various COG

Bishara		COG(%Cu)								
		0.0	0.2	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Measured	Brecciated									
	Tonnage(t)	607,734	596,531	588,750	578,906	563,859	543,422	511,031	455,203	375,047
	Copper grade(%Cu)	1.07	1.08	1.10	1.11	1.12	1.14	1.16	1.20	1.25
	Gold grade(g/tAu)	0.89	0.90	0.90	0.89	0.88	0.87	0.86	0.86	0.88
Indicated	Brecciated									
	Tonnage(t)	2,173,221	2,144,673	2,124,236	2,088,984	2,029,406	1,949,484	1,817,625	1,599,844	1,322,156
	Copper grade(%Cu)	1.06	1.08	1.08	1.09	1.11	1.13	1.15	1.20	1.25
	Gold grade(g/tAu)	0.84	0.84	0.85	0.85	0.86	0.87	0.88	0.88	0.89
Measured + Indicated	Brecciated									
	Tonnage(t)	2,780,955	2,741,204	2,712,986	2,667,890	2,593,265	2,492,906	2,328,656	2,055,047	1,697,203
	Copper grade(%Cu)	1.06	1.08	1.08	1.09	1.11	1.13	1.15	1.20	1.25
	Gold grade(g/tAu)	0.85	0.85	0.86	0.86	0.86	0.87	0.88	0.88	0.89
Inferred	Brecciated									
	Tonnage(t)	508,078	451,641	426,141	401,766	371,156	334,219	294,281	247,969	198,563
	Copper grade(%Cu)	0.84	0.94	0.98	1.01	1.05	1.09	1.14	1.19	1.25
	Gold grade(g/tAu)	0.97	1.07	1.11	1.11	1.12	1.09	1.04	0.97	0.96

Table Ⅲ-1-27 Geological Ore Resources by ore type in Al Jadeed at various COG

Al Jadeed		COG(%Cu)								
		0.0	0.2	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Measured	Brecciated									
	Tonnage(t)	213,750	213,750	213,750	213,750	213,750	213,750	212,150	205,100	194,800
	Copper grade(%Cu)	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.47	1.50
	Gold grade(g/tAu)	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.88	0.88
Indicated	Brecciated									
	Tonnage(t)	30,400	30,400	30,400	30,400	29,450	28,400	27,950	26,650	24,750
	Copper grade(%Cu)	1.46	1.46	1.46	1.46	1.49	1.52	1.53	1.57	1.61
	Gold grade(g/tAu)	0.86	0.86	0.86	0.86	0.87	0.88	0.89	0.90	0.92
Measured + Indicated	Brecciated									
	Tonnage(t)	244,150	244,150	244,150	244,150	243,200	242,150	240,100	231,750	219,550
	Copper grade(%Cu)	1.45	1.45	1.45	1.45	1.45	1.46	1.46	1.48	1.51
	Gold grade(g/tAu)	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.88	0.88
Inferred	Brecciated									
	Tonnage(t)	502,900	501,650	501,350	500,800	496,850	484,500	453,700	418,300	385,500
	Copper grade(%Cu)	1.29	1.29	1.29	1.29	1.30	1.31	1.35	1.39	1.43
	Gold grade(g/tAu)	0.59	0.59	0.59	0.59	0.60	0.59	0.59	0.59	0.59

1-5-3 Plotting of block grade maps

The following sections and plans display the representing block grades for copper and gold (Fig.Ⅲ-1-15 to Fig.Ⅲ-1-52). Grades are split into 10 ranges with lowest grades in blue color and the highest grades in red.

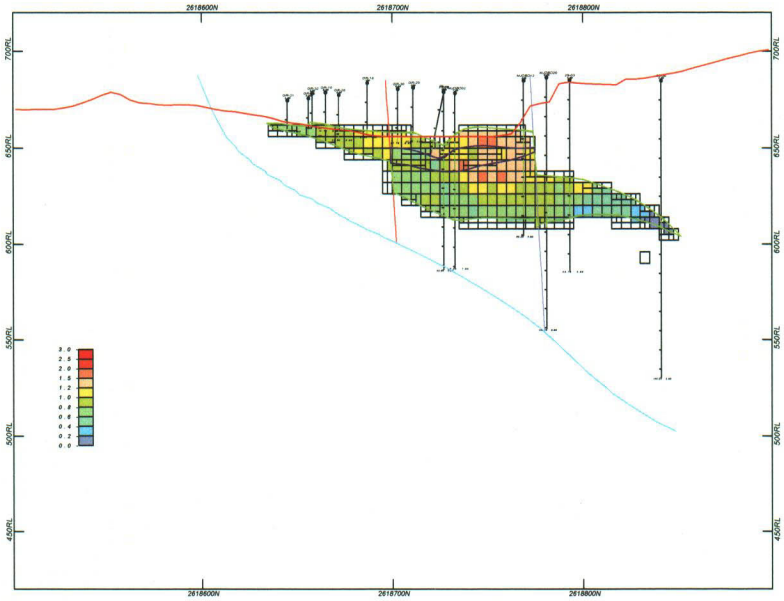

Fig.Ⅲ-1-15　Block Grade Section - Rakah 457290E（%Cu）

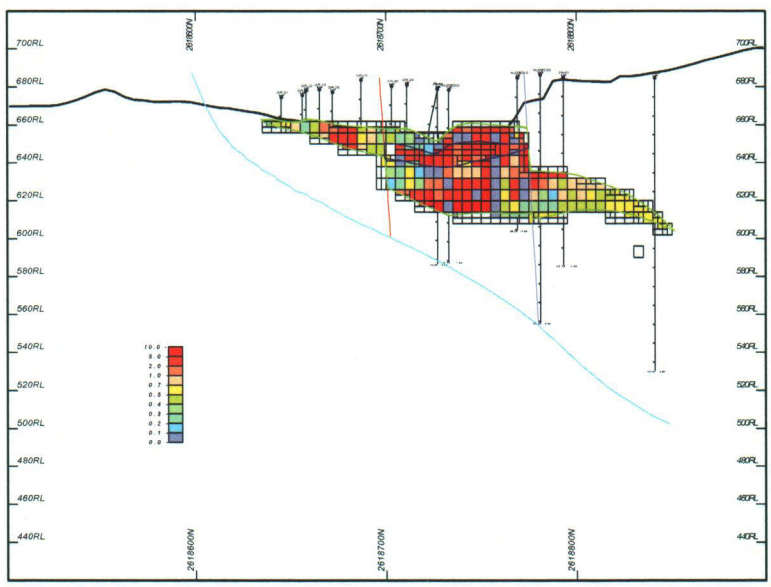

Fig.Ⅲ-1-16　Block Grade Section - Rakah 457290E(g/tAu)

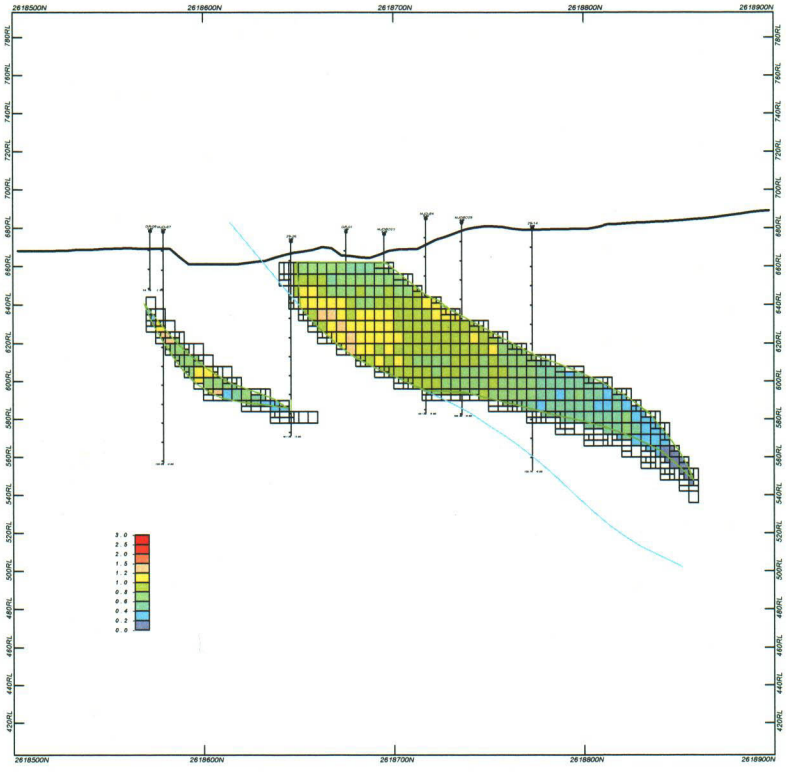

Fig.Ⅲ-1-17　Block Grade Section - Rakah 457350E(%Cu)

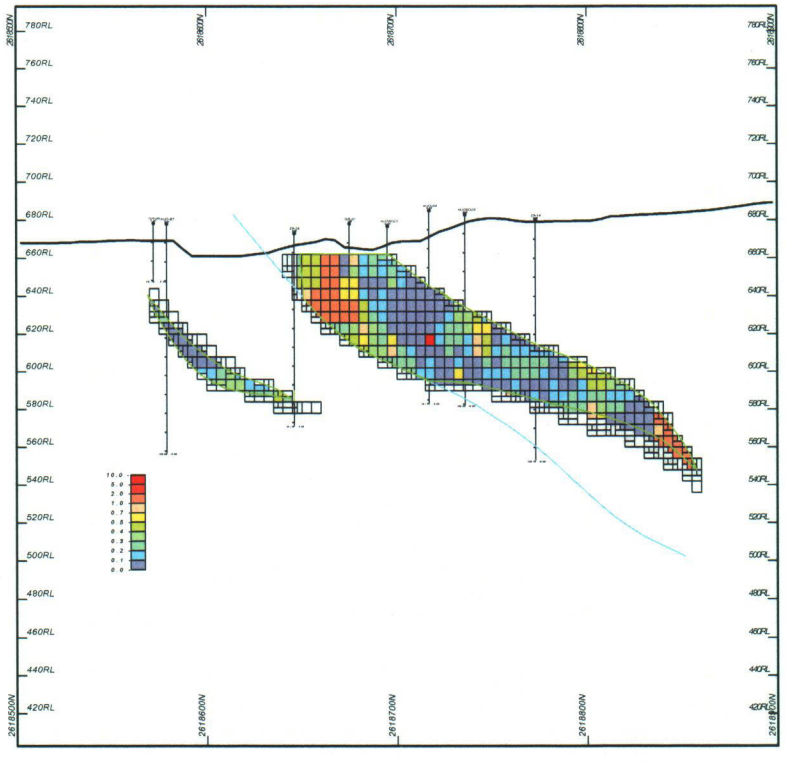

Fig.Ⅲ-1-18　Block Grade Section - Rakah 457350E(g/tAu)

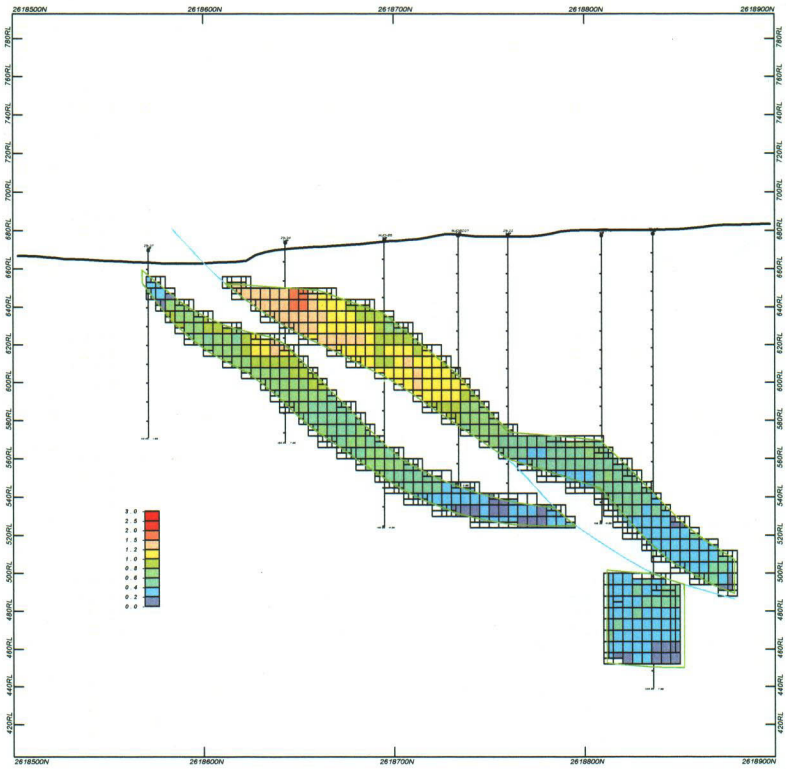

Fig.Ⅲ-1-19　Block Grade Section - Rakah 457410E(%Cu)

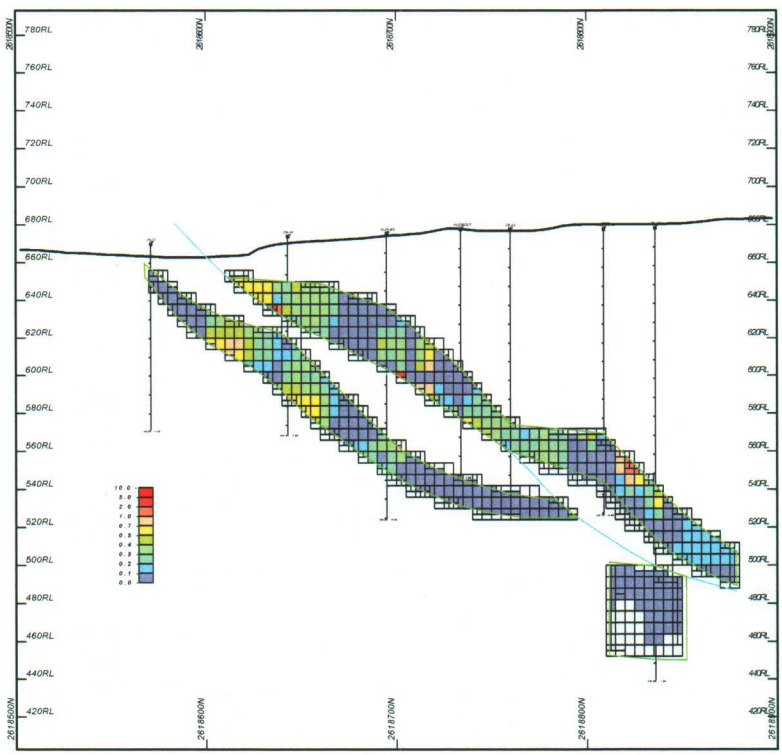

Fig.Ⅲ-1-20　Block Grade Section - Rakah 457410E(g/tAu)

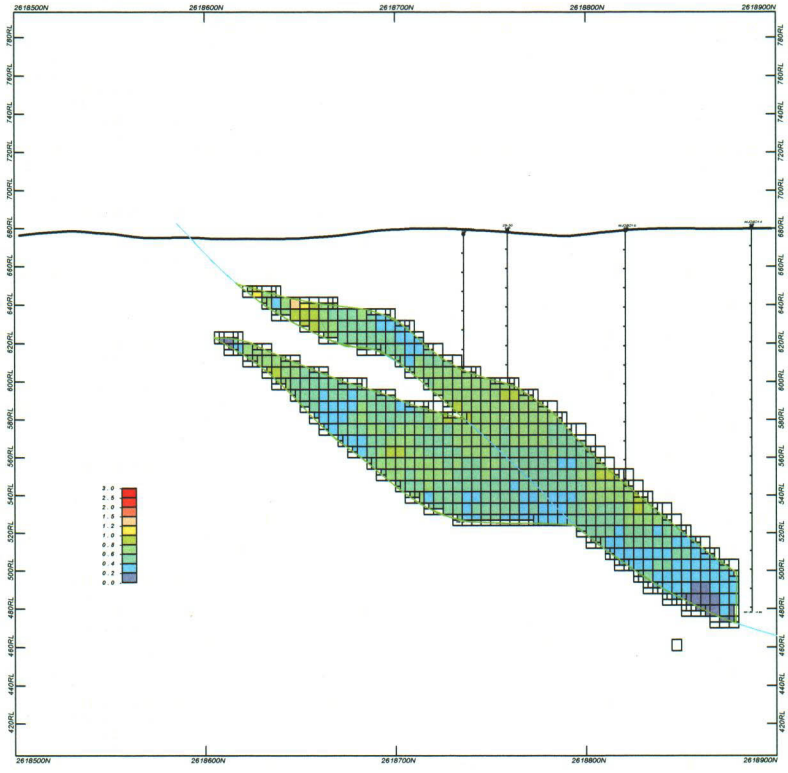

Fig.Ⅲ-1-21　Block Grade Section - Rakah 457470E(%Cu)

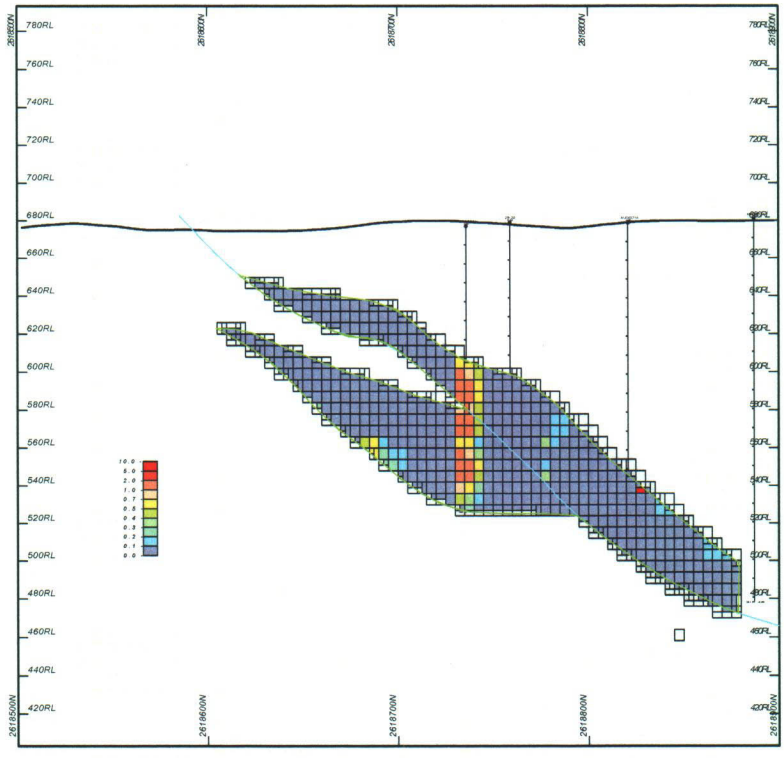

Fig.Ⅲ-1-22　Block Grade Section - Rakah 457470E(g/tAu)

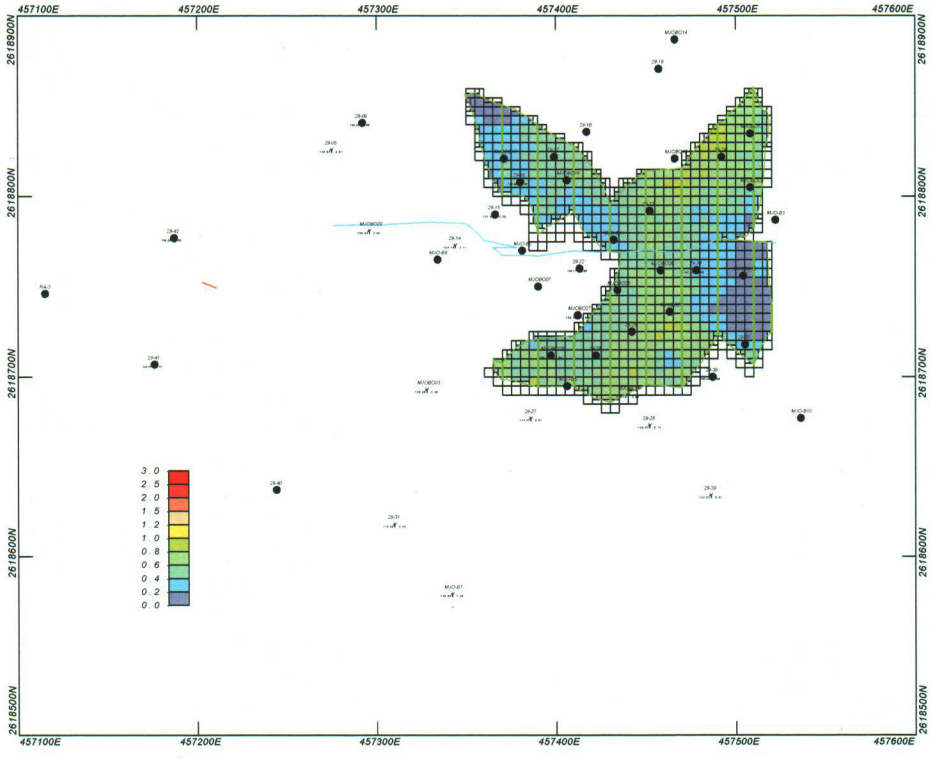

Fig.Ⅲ-1-23　Block Grade Plan - Rakah 550L(%Cu)

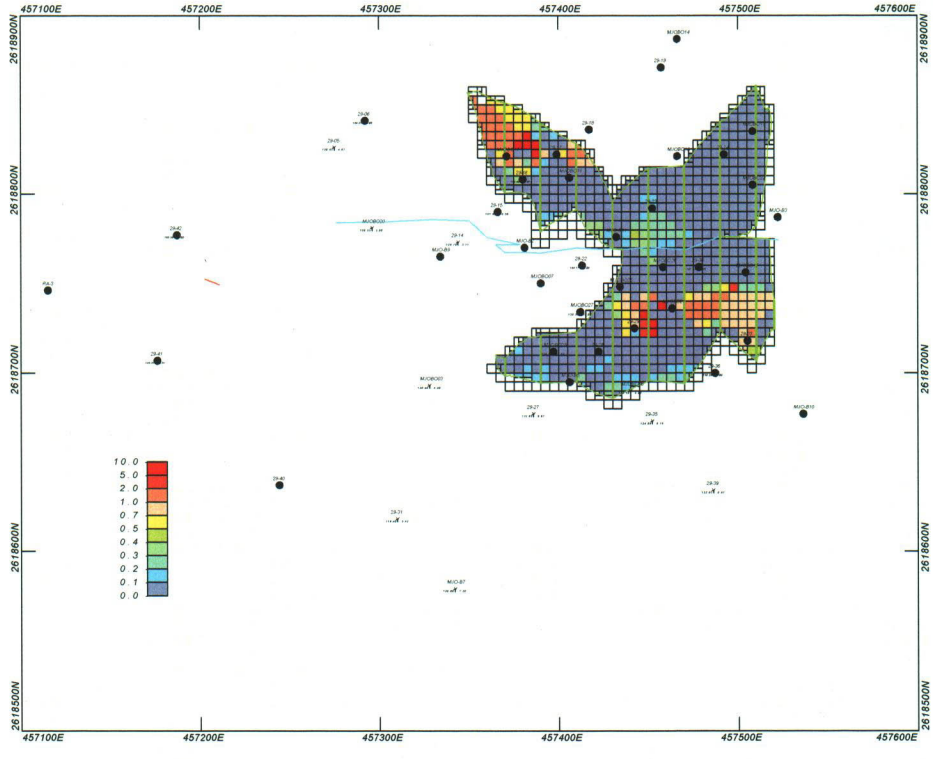

Fig.Ⅲ-1-24　Block Grade Plan - Rakah 550L(g/tAu)

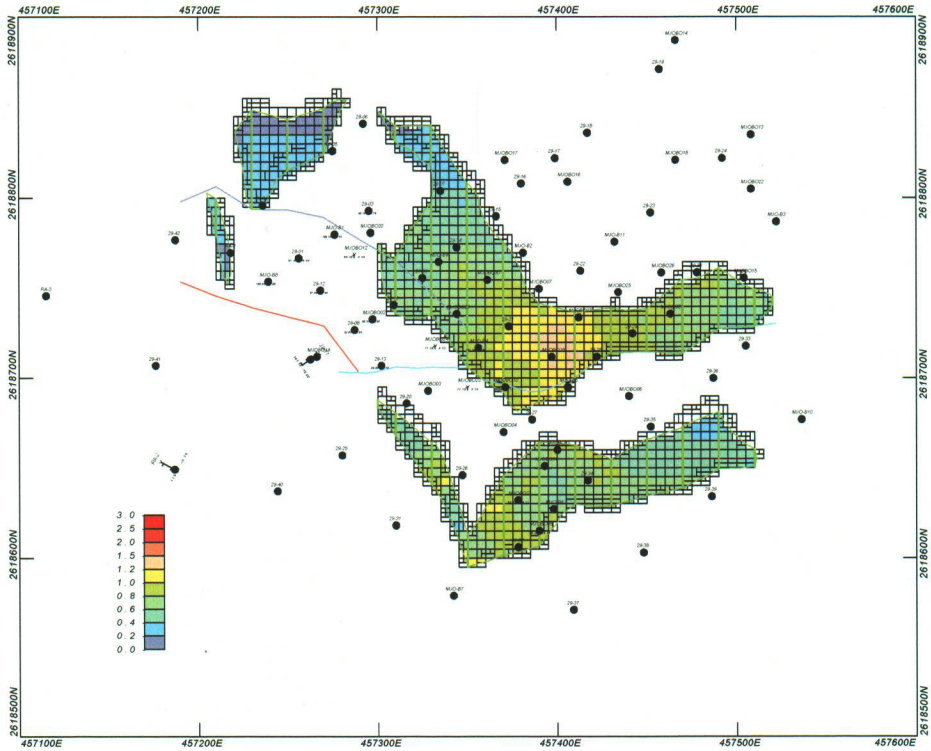

Fig.Ⅲ-1-25　Block Grade Plan - Rakah 600L(%Cu)

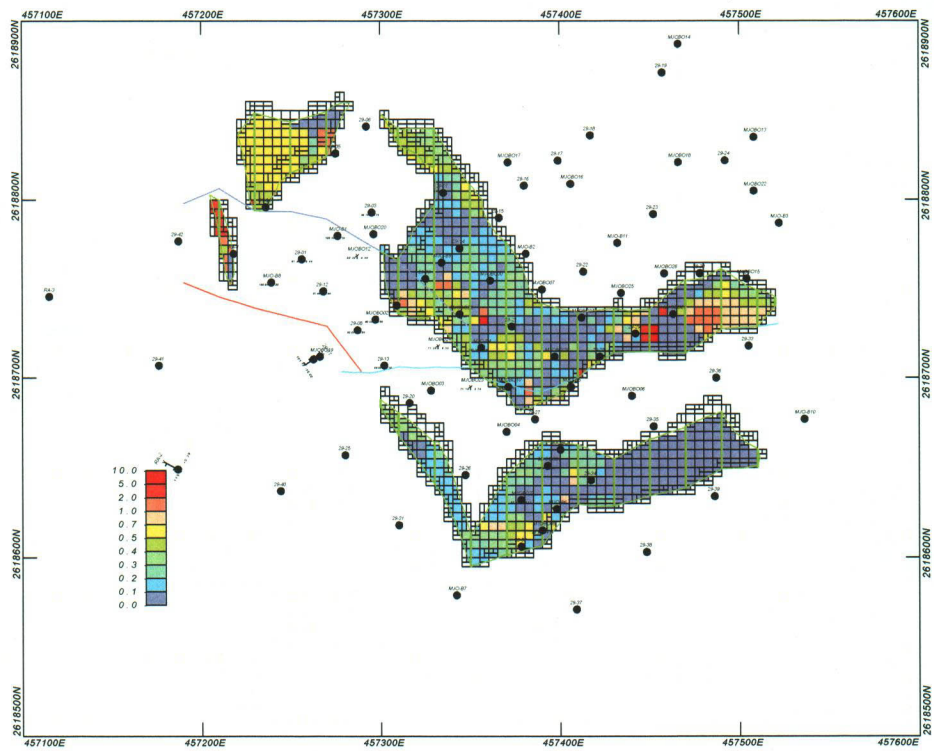

Fig.Ⅲ-1-26　Block Grade Plan - Rakah 600L(g/tAu)

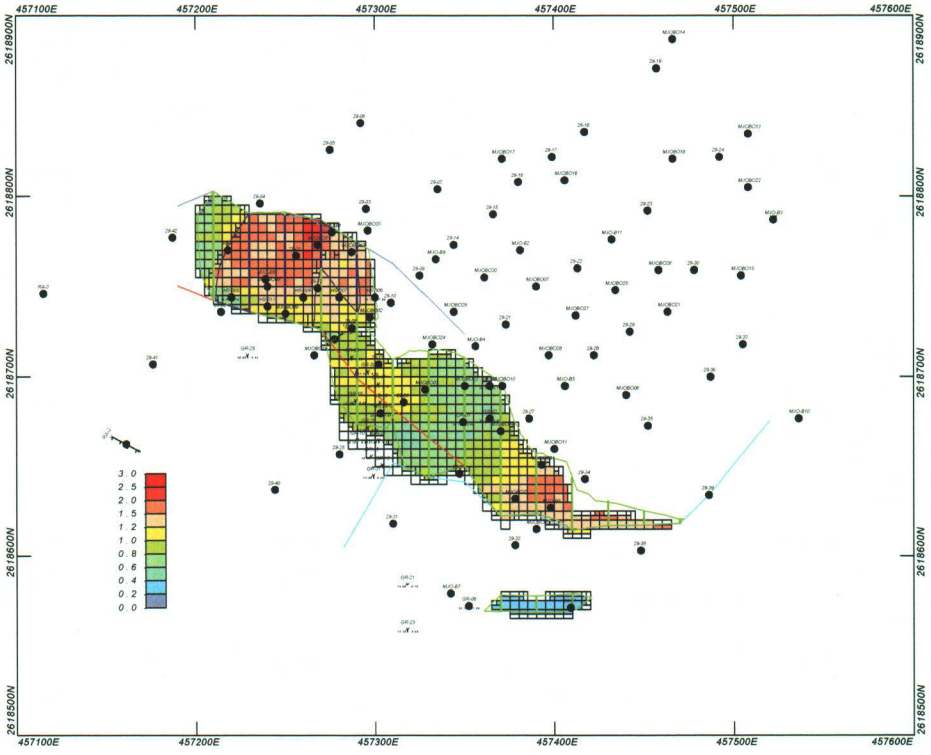

Fig.Ⅲ-1-27　Block Grade Plan - Rakah 650L(%Cu)

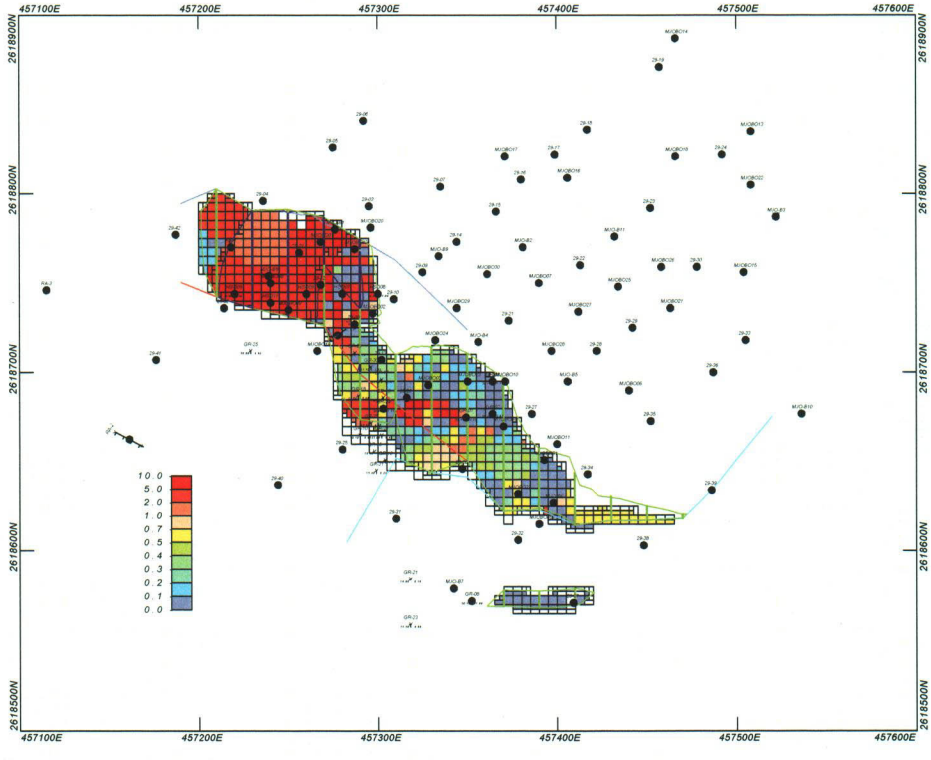

Fig.Ⅲ-1-28　Block Grade Plan - Rakah 650L(g/tAu)

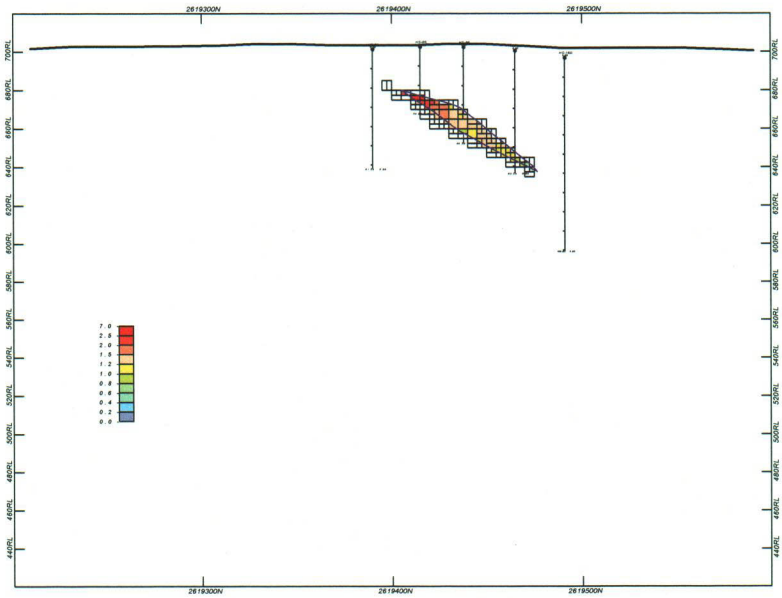

Fig.Ⅲ-1-29　Block Grade Section – Al Asghar 452900E(%Cu)

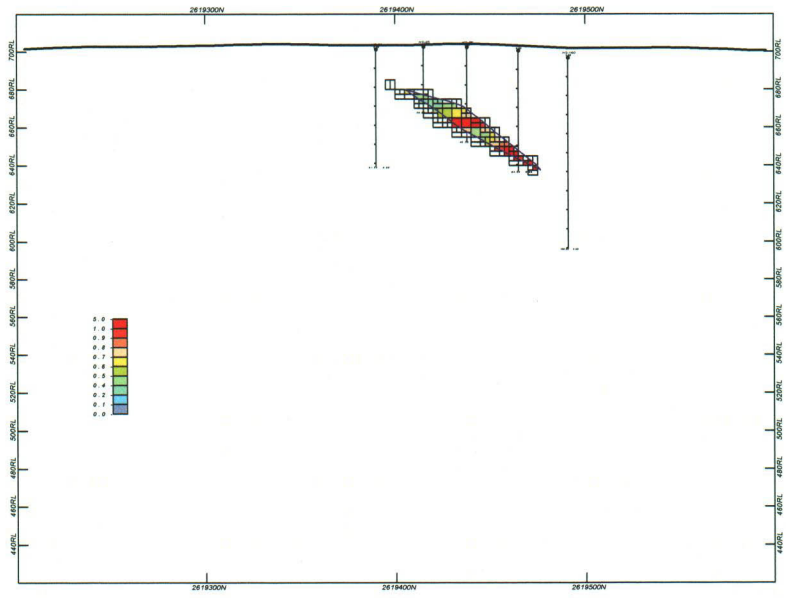

Fig.Ⅲ-1-30　Block Grade Section – Al Asghar 452900E(g/tAu)

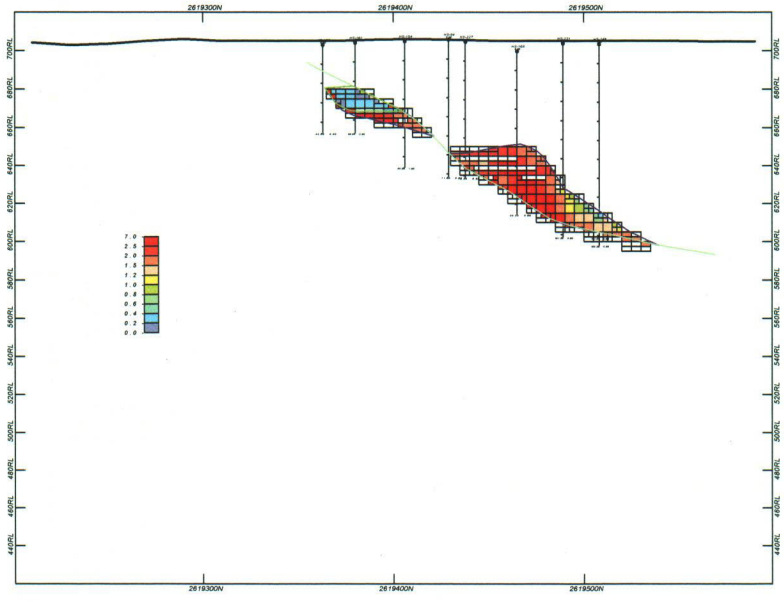

Fig.Ⅲ-1-31　Block Grade Section – Al Asghar 453000E(%Cu)

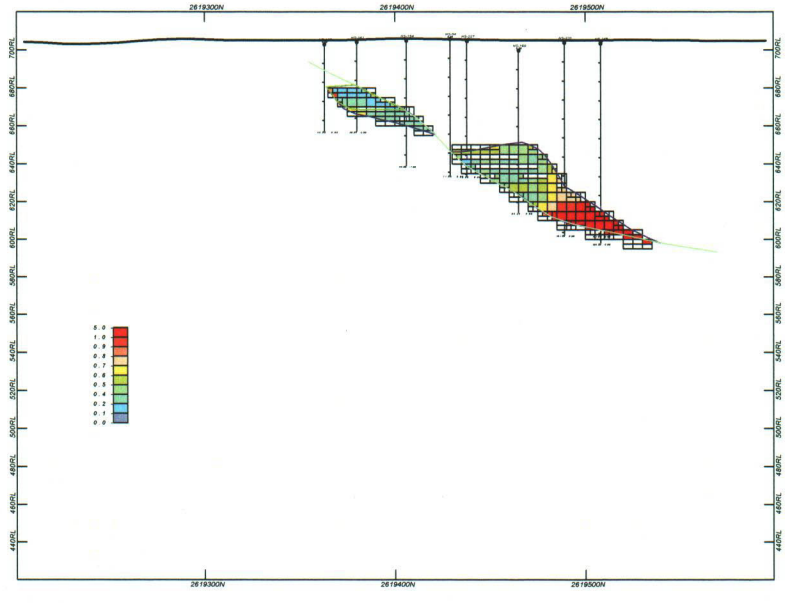

Fig.Ⅲ-1-32　Block Grade Section – Al Asghar 453000E(g/tAu)

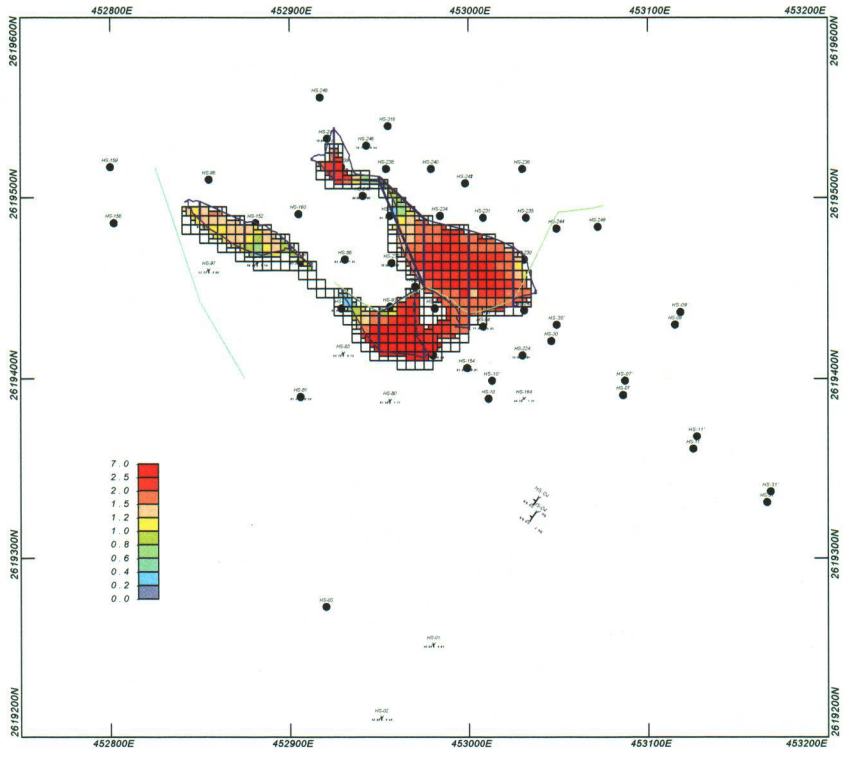

Fig.Ⅲ-1-33 Block Grade Plan – Al Asghar 640L(%Cu)

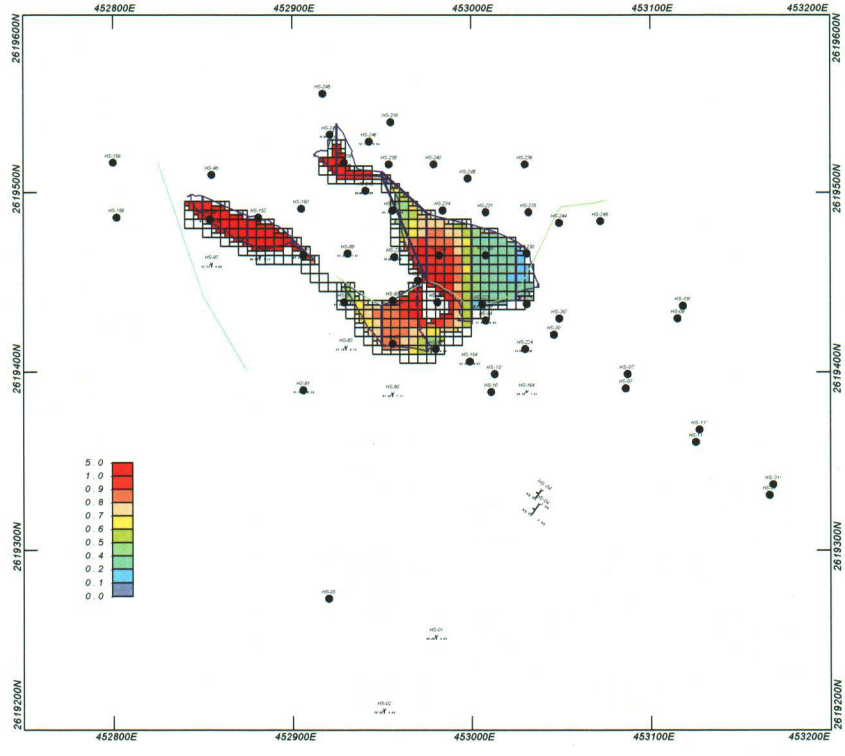

Fig.Ⅲ-1-34 Block Grade Plan – Al Asghar 640L(g/tAu)

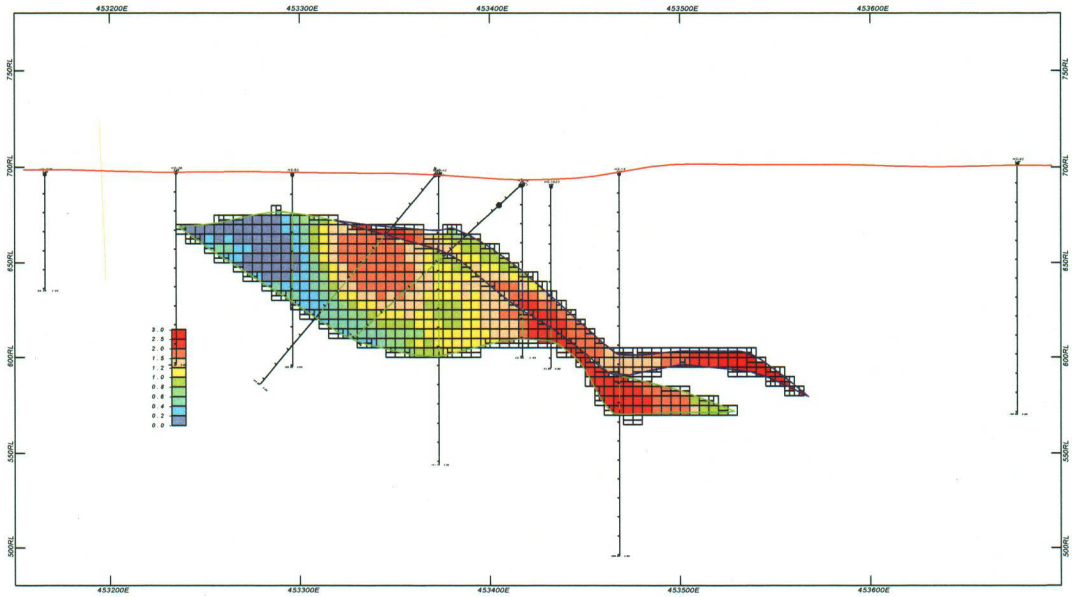

Fig.Ⅲ-1-35　Block Grade Section – Hayl as Safil 2618700E(%Cu)

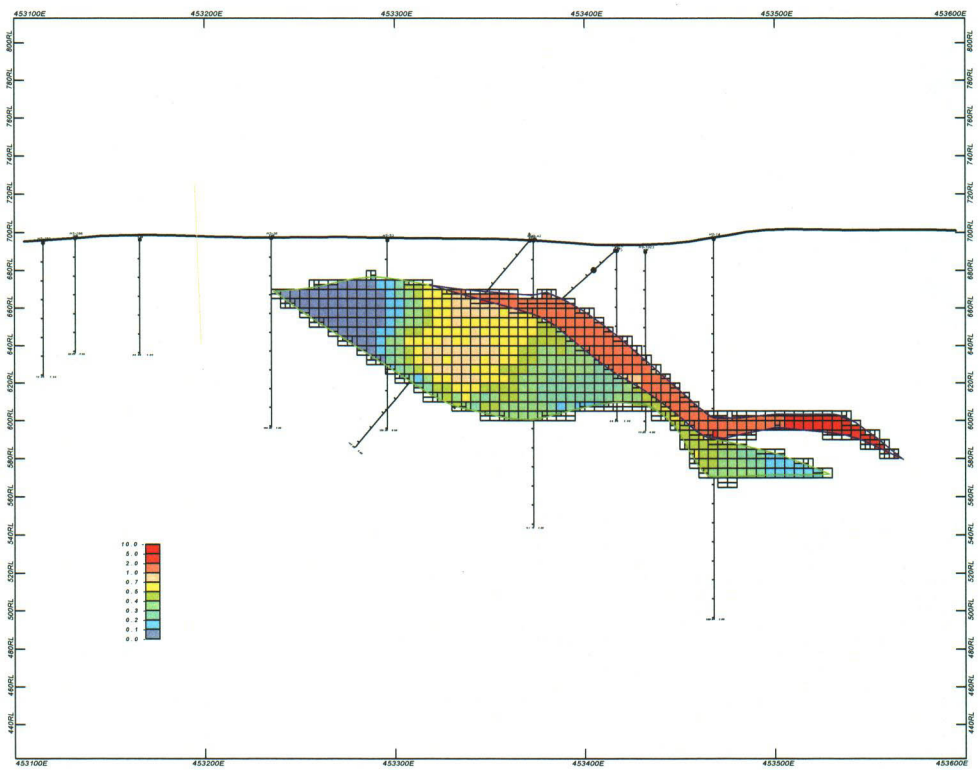

Fig.Ⅲ-1-36　Block Grade Section – Hayl as Safil 2618700E(g/tAu)

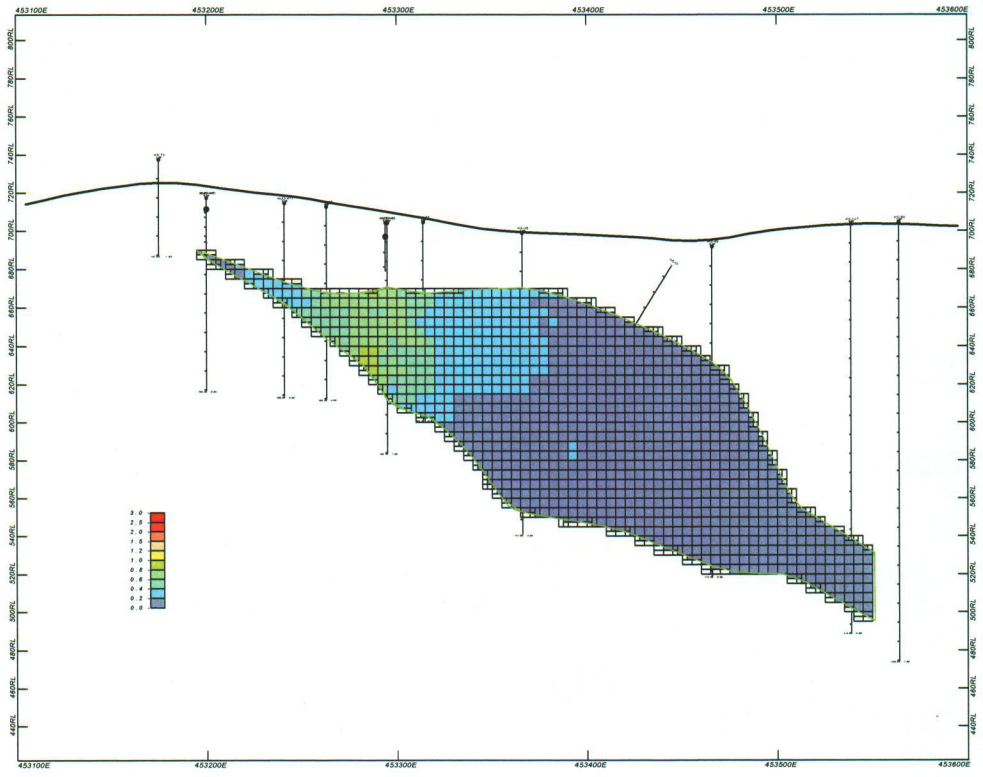

Fig.Ⅲ-1-37　Block Grade Section – Hayl as Safil 2618800E(%Cu)

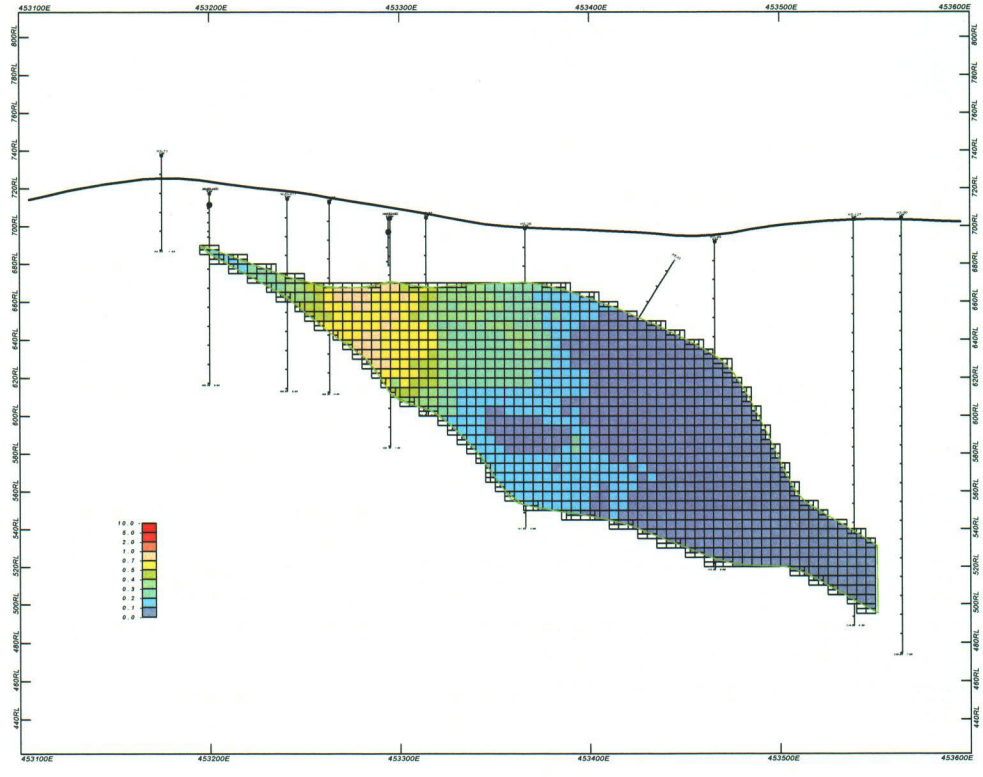

Fig.Ⅲ-1-38　Block Grade Section – Hayl as Safil 2618800E(g/tAu)

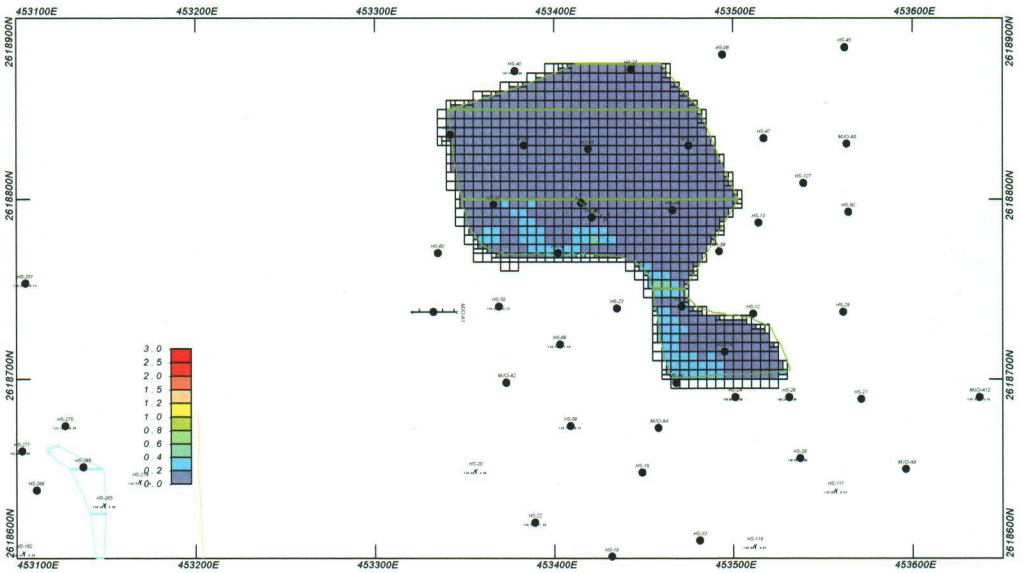

Fig.Ⅲ-1-39 Block Grade Plan – Hayl as Safil 570L(%Cu)

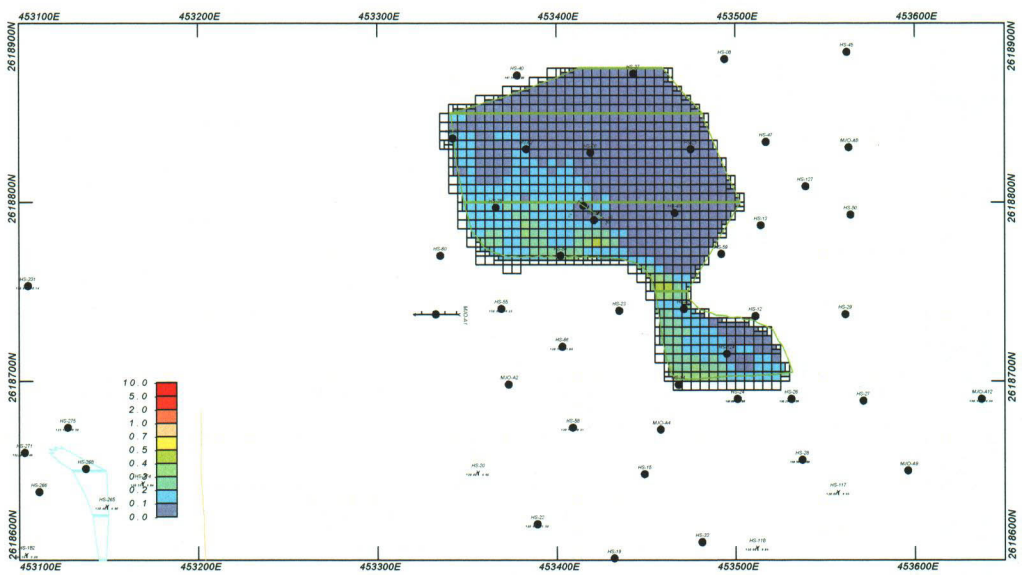

Fig.Ⅲ-1-40 Block Grade Plan – Hayl as Safil 570L(g/tAu)

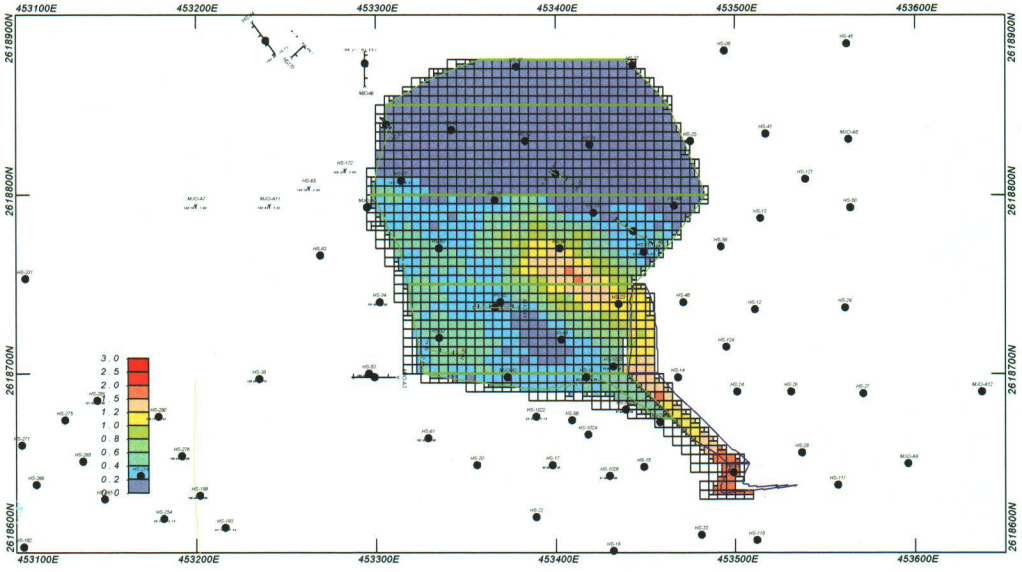

Fig.Ⅲ-1-41　Block Grade Plan – Hayl as Safil 610L(%Cu)

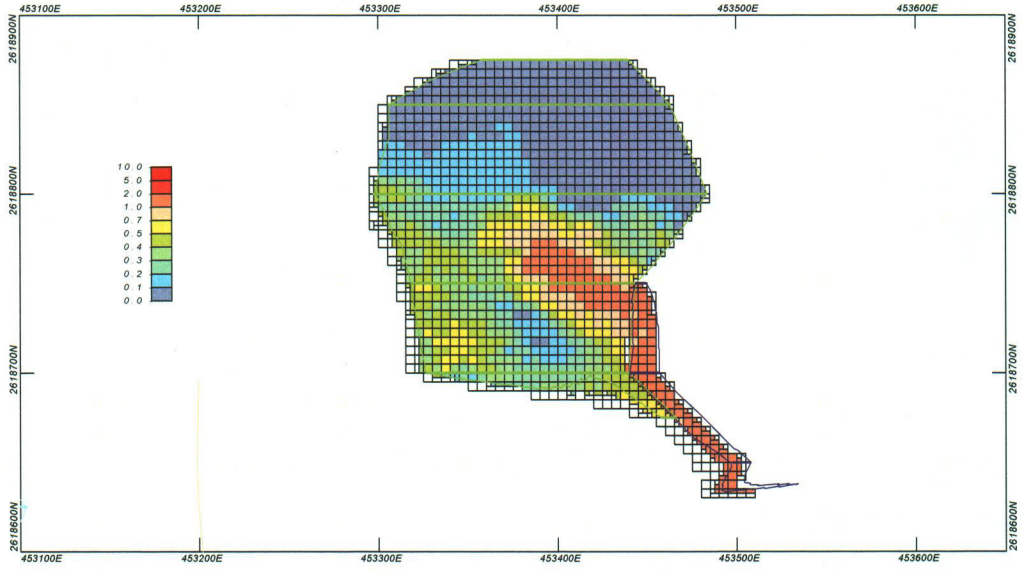

Fig.Ⅲ-1-42　Block Grade Plan – Hayl as Safil 610L(g/tAu)

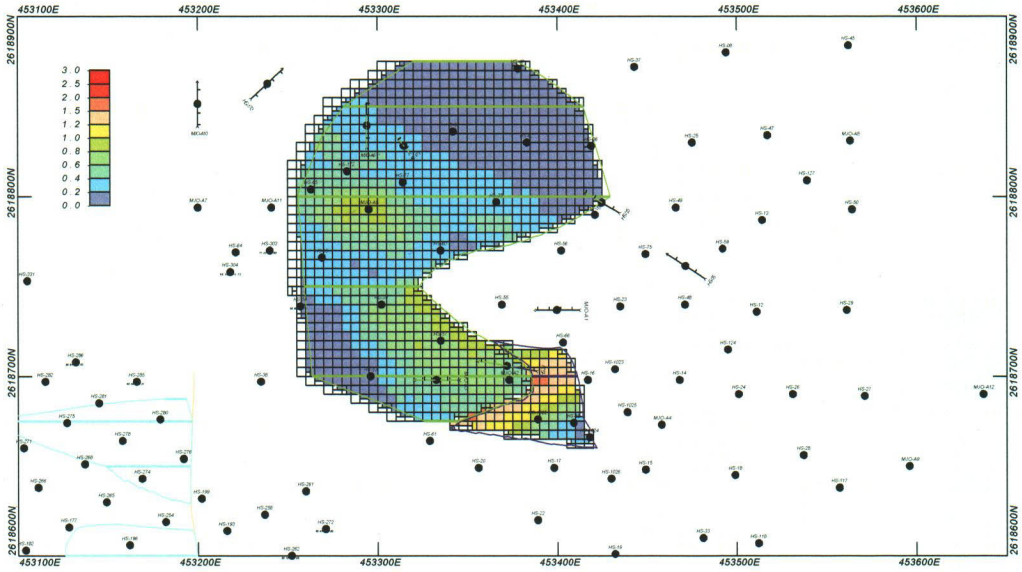

Fig.Ⅲ-1-43 Block Grade Plan – Hayl As Safil 650L(%Cu)

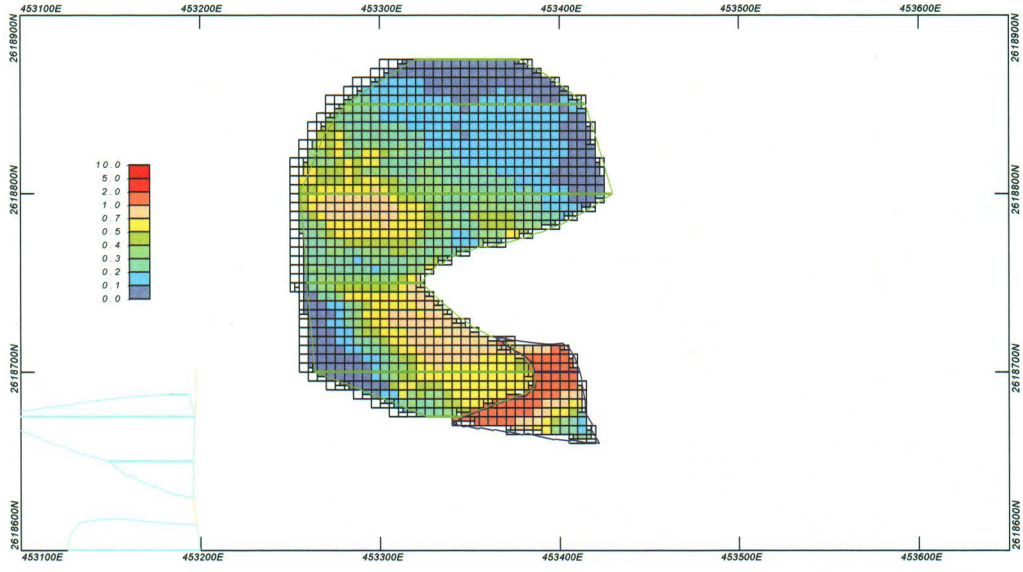

Fig.Ⅲ-1-44 Block Grade Plan – Hayl As Safil 650L(g/tAu)

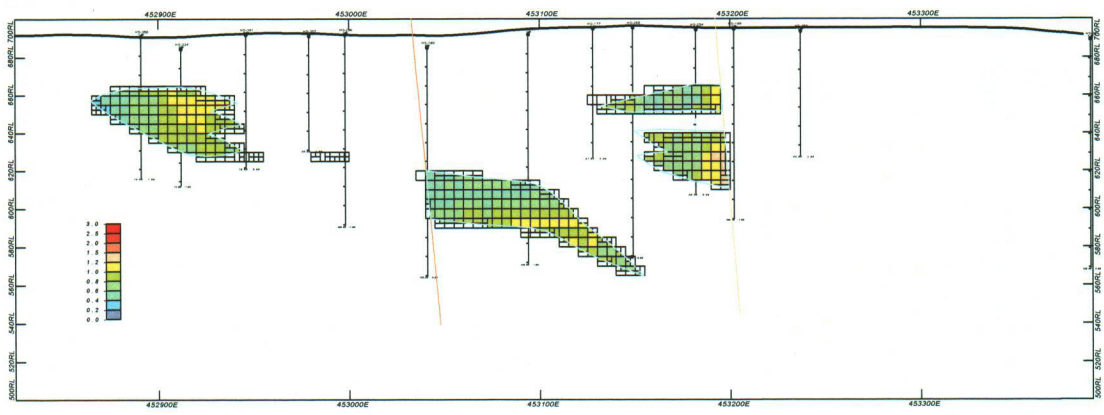

Fig.Ⅲ-1-45　Block Grade Section – Al Bishara 2618625E(%Cu)

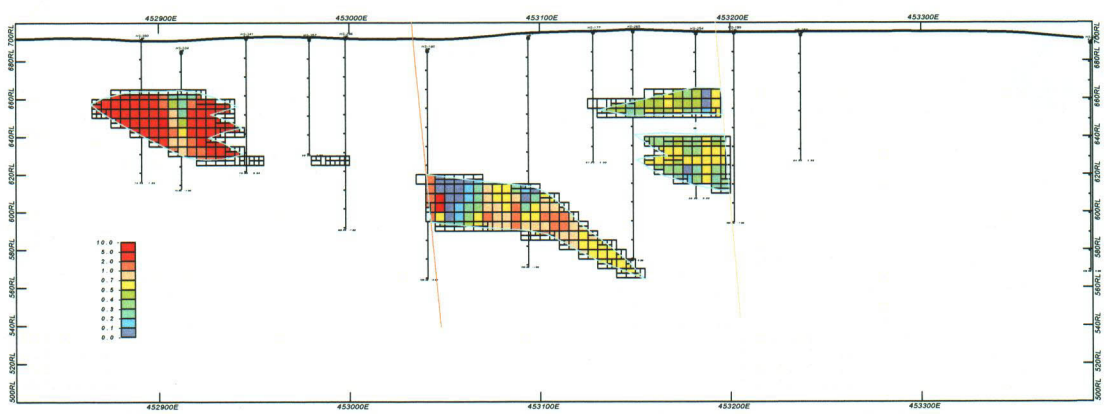

Fig.Ⅲ-1-46　Block Grade Section – Al Bishara 2618625E(g/tAu)

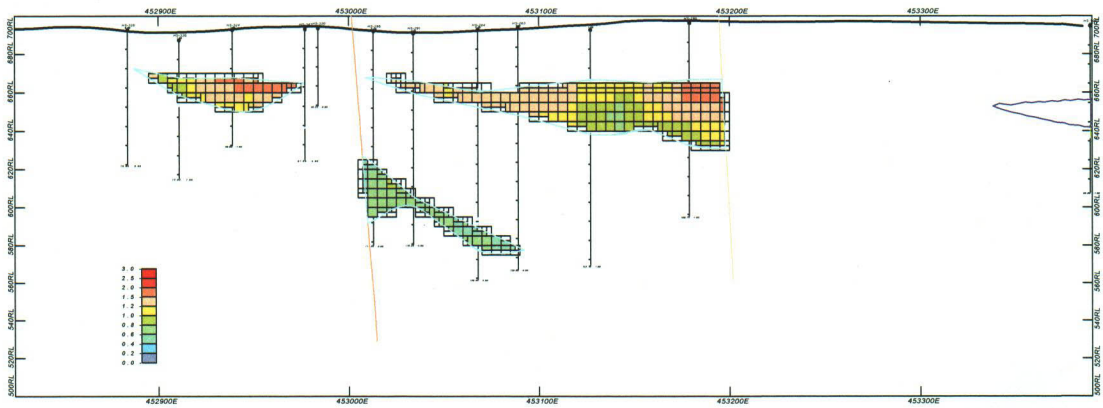

Fig.Ⅲ-1-47　Block Grade Section – Al Bishara 2618675E(%Cu)

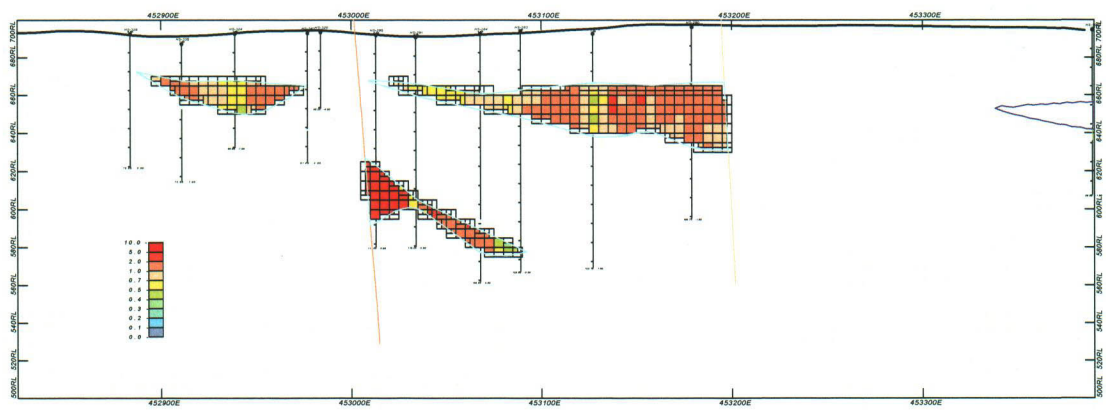

Fig.Ⅲ-1-48　Block Grade Section – Al Bishara 2618675E(g/tAu)

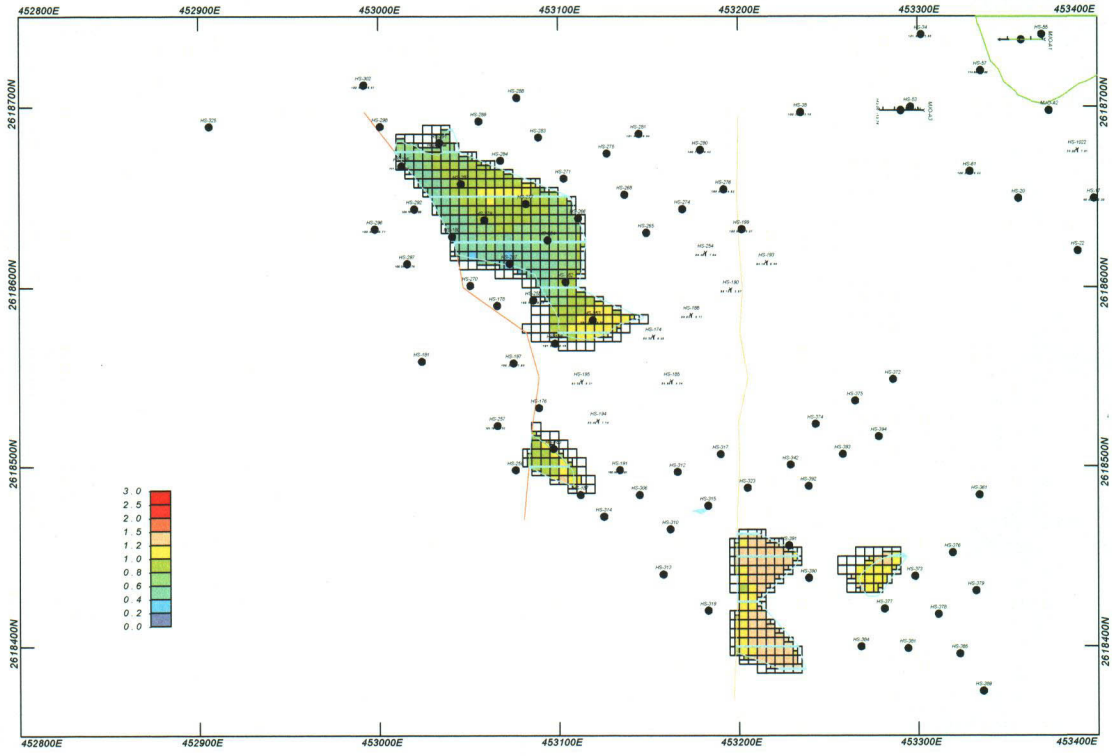

Fig.Ⅲ-1-49 Block Grade Plan – Al Bishara 600L(%Cu)

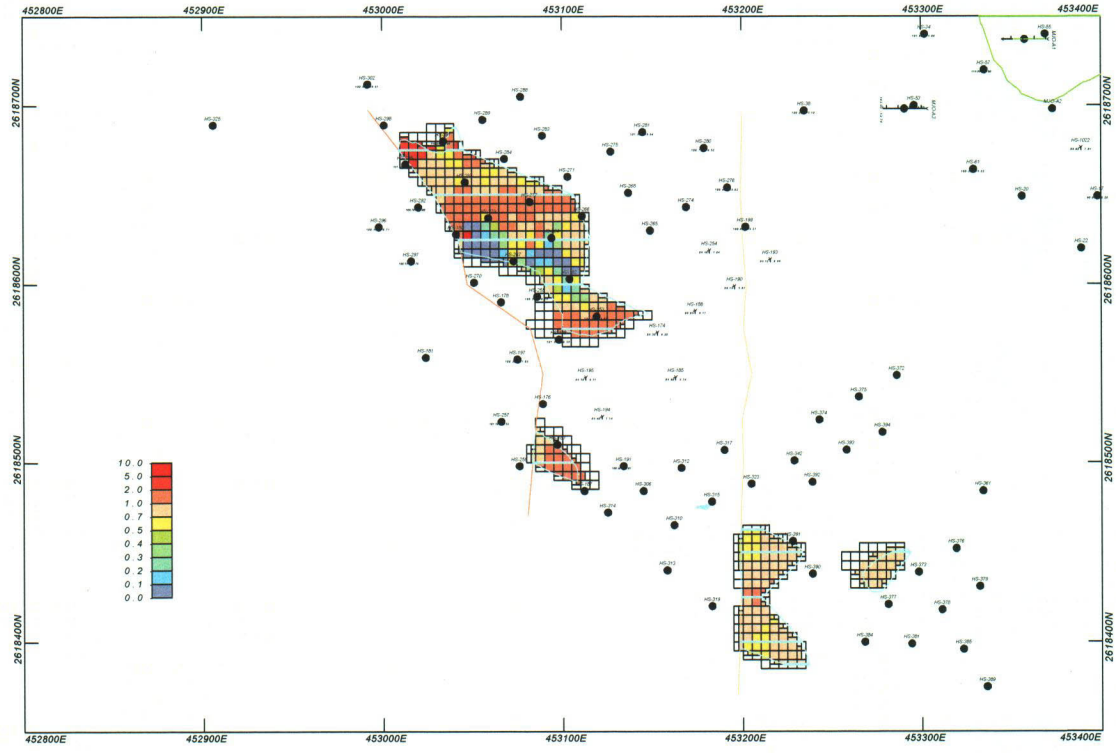

Fig.Ⅲ-1-50 Block Grade Plan – Al Bishara 600L(g/tAu)

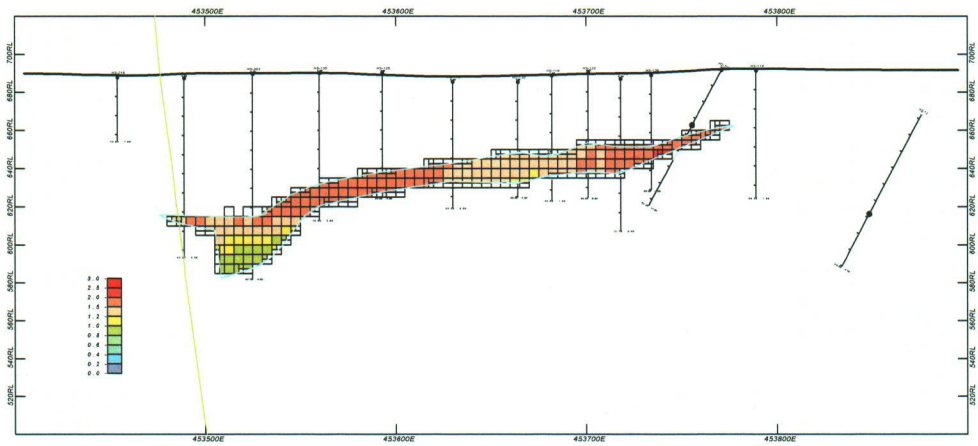

Fig.Ⅲ-1-51　Block Grade Section – Al Jadeed 2618240N(%Cu)

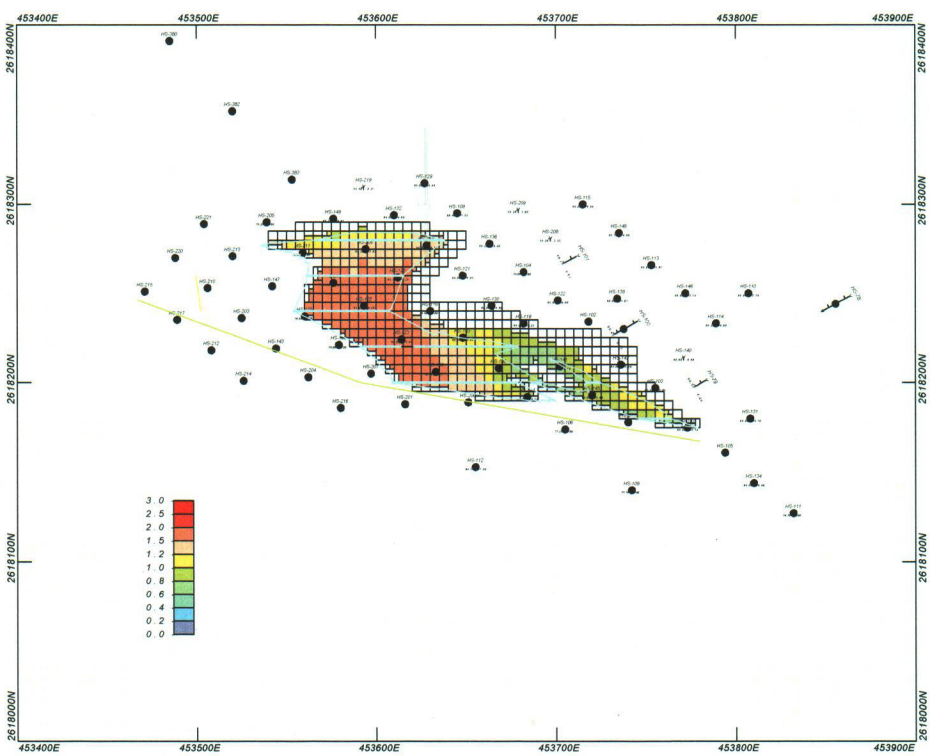

Fig.Ⅲ-1-52　Block Grade Plan – Al Jadeed 630L(%Cu)