

## 1-5 鉱量計算結果

### 1-5-1 鉱量分類

鉱量を計算するにあたっては、データの信頼度に基づき確定鉱量、推定鉱量、予想鉱量の各基準を設定した。設定基準は、JORC コード (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) に準拠する。

データの信頼度は、求めようとする鉱画の中心部からの距離及びデータ数 (コンポジット数) の組合せにより、Table III-1-17 に示す基準を採用した。距離は地質統計的手法を用い、セミバリオグラムレンジの 2/3 までの距離を確定、レンジと同距離までを推定、レンジの 4/3 までを予想と決定した。コンポジット長は、ラカー鉱床は 6m、他鉱床は 5m である。

Table III-1-17 Confidence variable ranges

	Rakah	Hayl As Safil	Al Asghar	Al Bishara	Al Jadeed
<b>Measured Resources</b>					
Number of points	12 ≤	12 ≤	12 ≤	12 ≤	12 ≤
Distance(m)	≤ 60	≤ 60	≤ 80	≤ 60	≤ 60
<b>Indicated Resources</b>					
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
<b>Inferred Resources</b>					
Number of points	3 ≤	3 ≤	3 ≤	3 ≤	3 ≤
Distance(m)	≤ 120	≤ 120	≤ 160	≤ 120	≤ 120

したがって、例えば、ラカー鉱床で 120m 以内に 2 個以下のデータしか存在しない鉱画あるいは 120m より離れた距離にデータが 3 個以上存在する区域では、鉱画が設定されず鉱量計算の対象から外れることになる。

また、鉱量計算を実行する際の鉱画品位の割付には、極力クリギング(Ordinary Kriging)を採用したが、金の一部については適正なセミバリオグラムが得られなかったため、Inverse Distance Squared により割付けている。以下に、クリギングを採用した鉱床・ドメイン別のクリギングパラメータを示す。

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 比重

鉱量計算上必要となる各鉱種の比重は、OMCO 報告書(1994)に記載されているデータを採用した。

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 鉱量計算結果

各鉱床の 0.5%Cu カットオフ品位における地質鉱量を、Table III-1-21 にまとめた。

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)
<b>Rakah</b>					
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
<b>Hayl As Safil</b>					
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
<b>Al Asghar</b>					
Massive	932	2.72	25,364	0.99	923
<b>Al Bishara</b>					
Brecciated	3,069	1.09	33,459	0.89	2,731
<b>Al Jadeed</b>					
Brecciated	744	1.34	9,982	0.68	506
<b>Total</b>	<b>15,797</b>	<b>1.13</b>	<b>178,738</b>	<b>0.62</b>	<b>9,851</b>
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

ピット設計上の基礎数字となるのは、カットオフ品位 0.5%Cu の確定鉱量+推定鉱量であり、Table III-1-22 に地質鉱量と確定鉱量+推定鉱量の比較表を示した。確定鉱量+推定鉱量中の含銅量及び含金量は、全地質鉱量のそれぞれ 79%、74%を占める。特に、選鉱実収率の高い網状鉱については、それぞれ 93%、94%を占めていることから、今回採用した鉱量分類基準は妥当であるものと評価される。鉱床別の鉱量分類別鉱量の数字を示した (Table III-1-23~Table III-1-27)。カットオフ品位は、0%、0.2%、0.4%、0.5%、0.6%、0.7%、0.8%、0.9%、1.0%Cu の 9 通りである。

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%
Al 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(%Cu)	0.67	0.69	0.74	0.81	0.88	0.96	1.05	1.13	1.20
	Gold(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(%Cu)	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.54	1.56
Gold(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(%Cu)	0.50	0.54	0.69	0.78	0.86	0.96	1.10	1.21	1.32
	Gold(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(%Cu)	0.65	0.68	0.74	0.81	0.88	0.96	1.05	1.13	1.20
	Gold(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(%Cu)	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.54	1.56
Gold(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(%Cu)	0.45	0.53	0.70	0.79	0.85	0.91	0.97	1.07	1.16
	Gold(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(%Cu)	1.46	1.46	1.46	1.46	1.48	1.49	1.52	1.54	1.57
Gold(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(%Cu)	2.30	2.30	2.31	2.32	2.33	2.35	2.38	2.42	2.45
	Gold(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(%Cu)	4.08	4.16	4.17	4.17	4.19	4.22	4.32	4.38	4.38
	Gold(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(%Cu)	2.37	2.37	2.38	2.39	2.40	2.42	2.45	2.49	2.52
	Gold(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(%Cu)	3.32	3.33	3.34	3.36	3.39	3.42	3.47	3.57	3.70
	Gold(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 Al Bishara at various COG

Al 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(%Cu)	1.07	1.08	1.10	1.11	1.12	1.14	1.16	1.20	1.25
	Gold(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(%Cu)	1.06	1.08	1.08	1.09	1.11	1.13	1.15	1.20	1.25
	Gold(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(%Cu)	1.06	1.08	1.08	1.09	1.11	1.13	1.15	1.20	1.25
	Gold(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(%Cu)	0.84	0.94	0.98	1.01	1.05	1.09	1.14	1.19	1.25
	Gold(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(%Cu)	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.47	1.50
	Gold(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(%Cu)	1.46	1.46	1.46	1.46	1.49	1.52	1.53	1.57	1.61
	Gold(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(%Cu)	1.45	1.45	1.45	1.45	1.45	1.46	1.46	1.48	1.51
	Gold(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(%Cu)	1.29	1.29	1.29	1.29	1.30	1.31	1.35	1.39	1.43
	Gold(g/tAu)	0.59	0.59	0.59	0.59	0.60	0.59	0.59	0.59	0.59

### 1-4-3 鉱画品位分布図

鉱床別に代表的な銅及び金の鉱画品位平断面図を以下に示す。

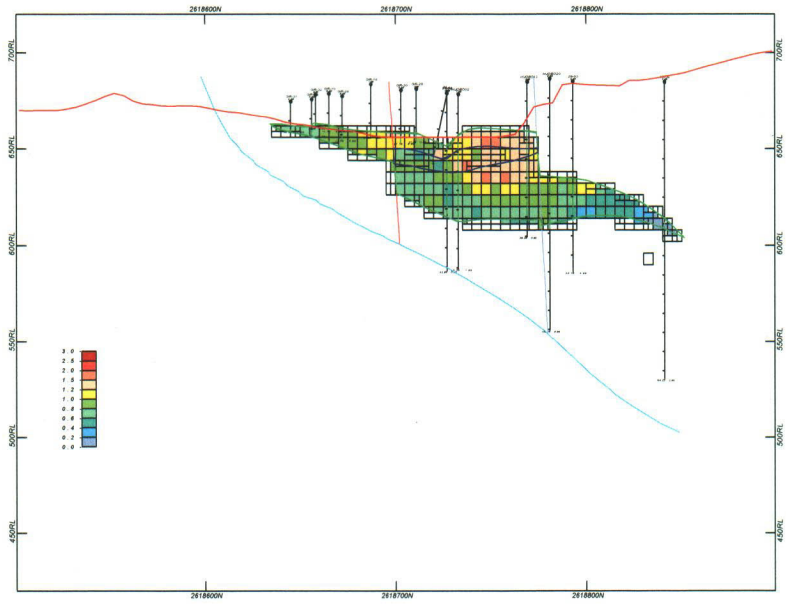


Fig.III-1-15 Block Grade Section - Rakah 457290E (%Cu)

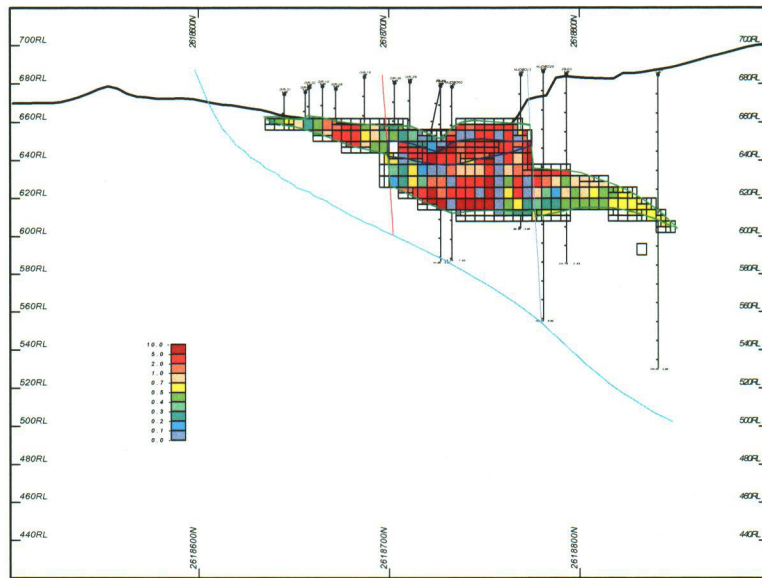


Fig.III-1-16 Block Grade Section - Rakah 457290E(g/tAu)

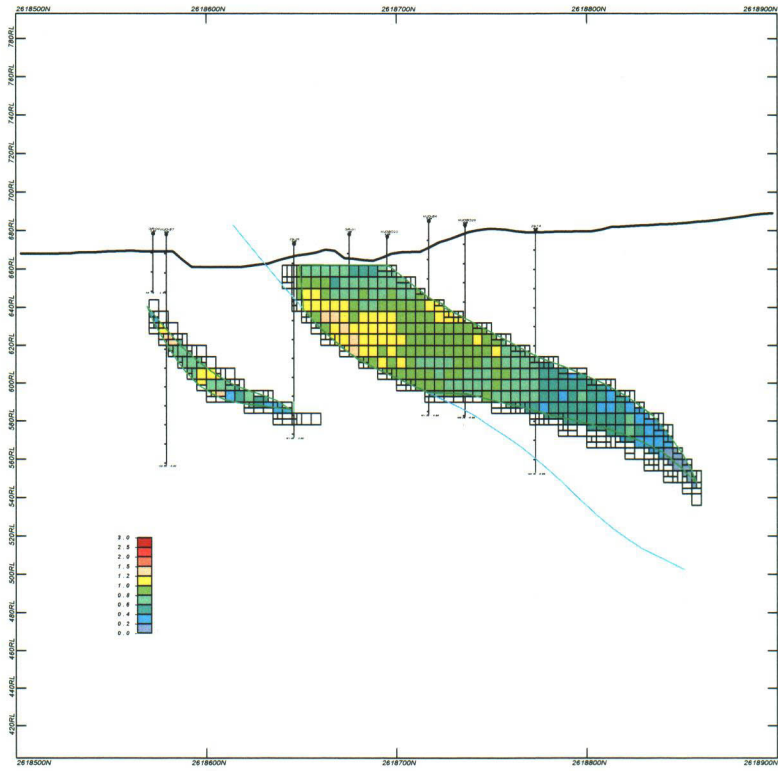


Fig.III-1-17 Block Grade Section - Rakah 457350E(%Cu)

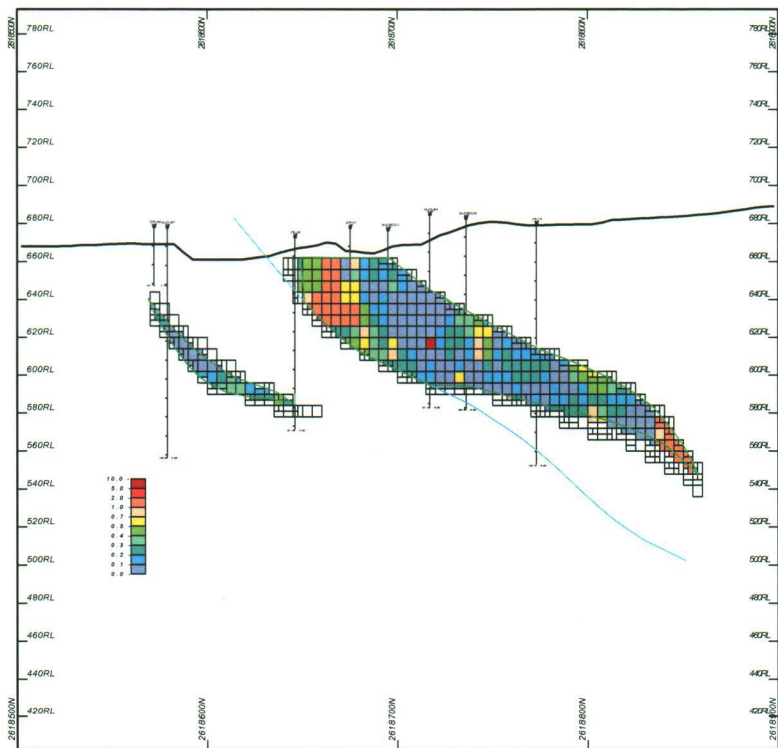


Fig.III-1-18 Block Grade Section - Rakah 457350E(g/tAu)

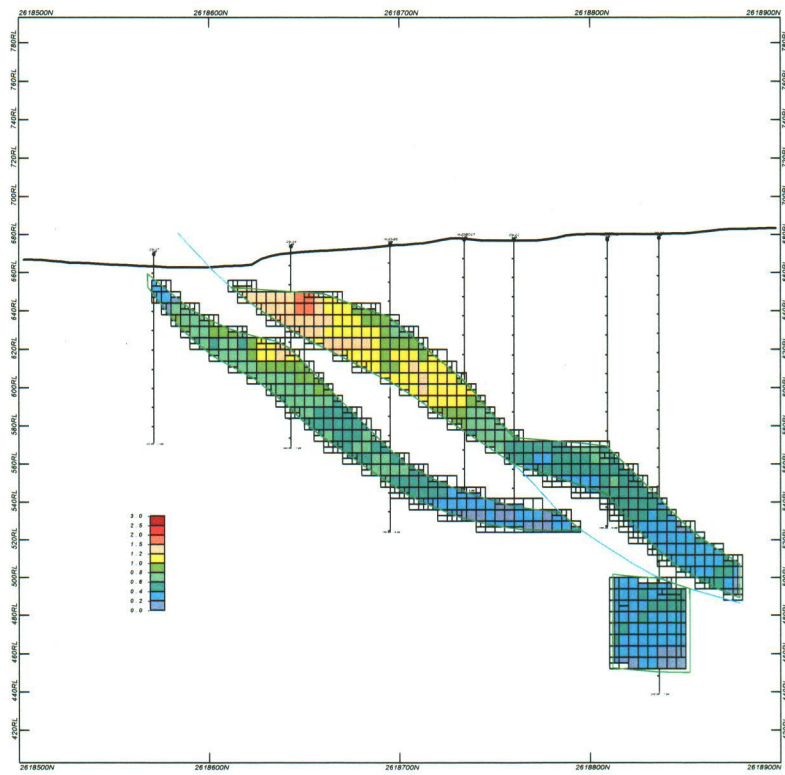


Fig.III-1-19 Block Grade Section - Rakah 457410E(%Cu)

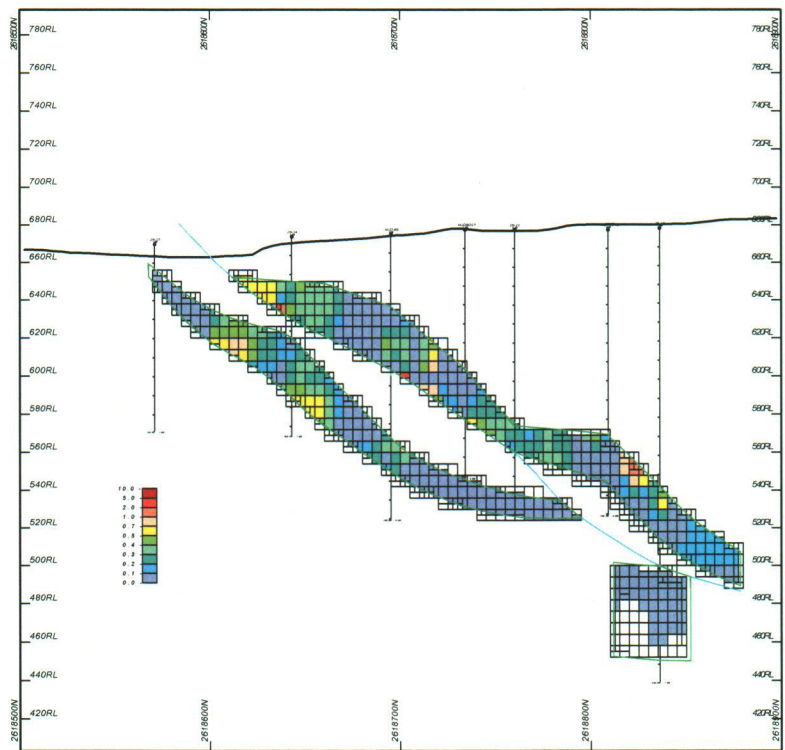


Fig.III-1-20 Block Grade Section - Rakah 457410E(g/tAu)

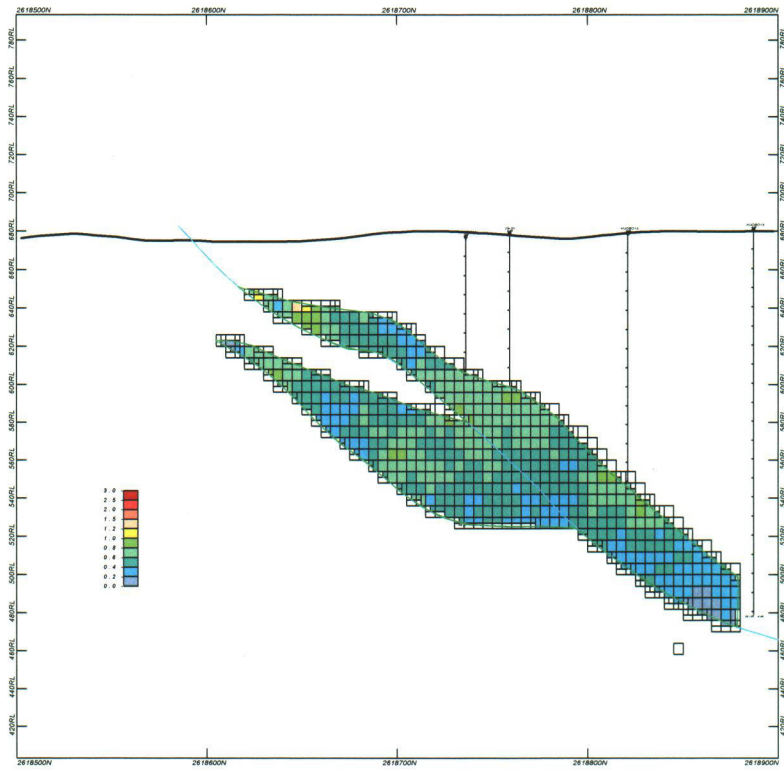


Fig.III-1-21 Block Grade Section - Rakah 457470E(%Cu)

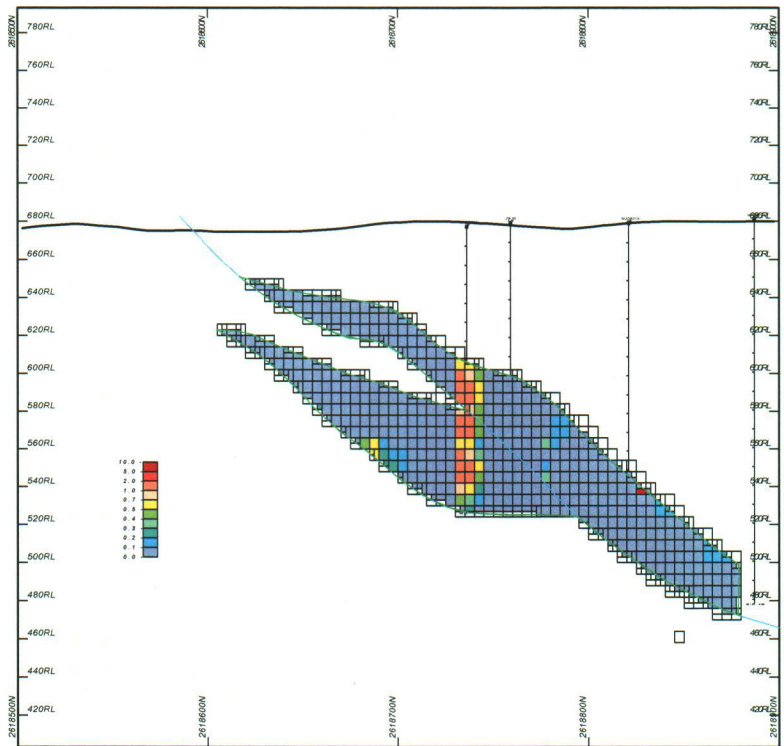


Fig.III-1-22 Block Grade Section - Rakah 457470E(g/tAu)

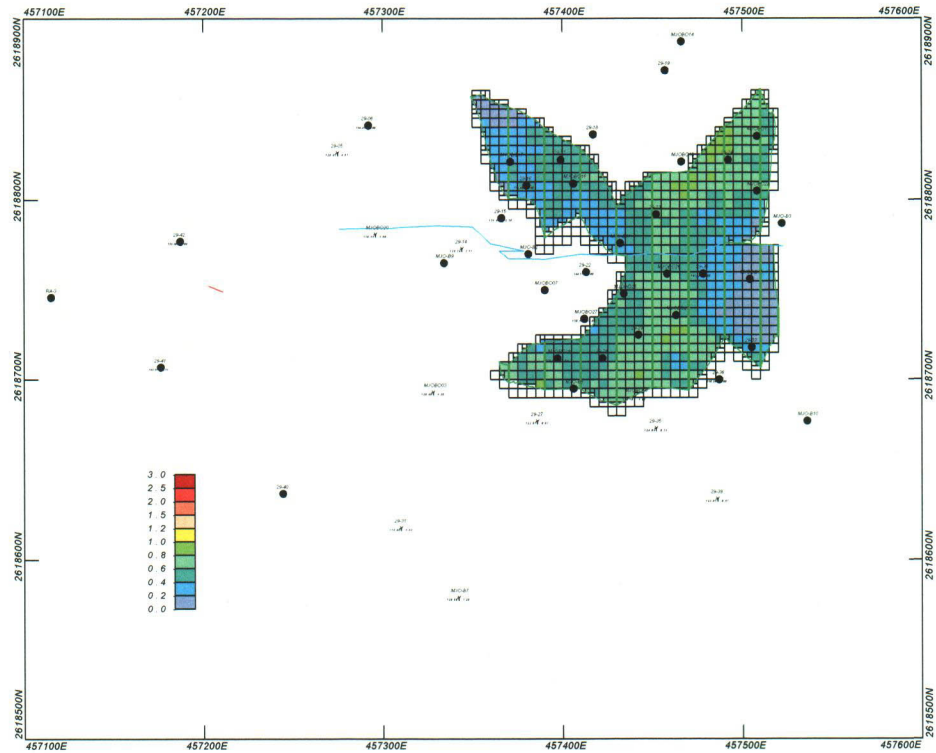


Fig. III-1-23 Block Grade Plan - Rakah 550L(%Cu)

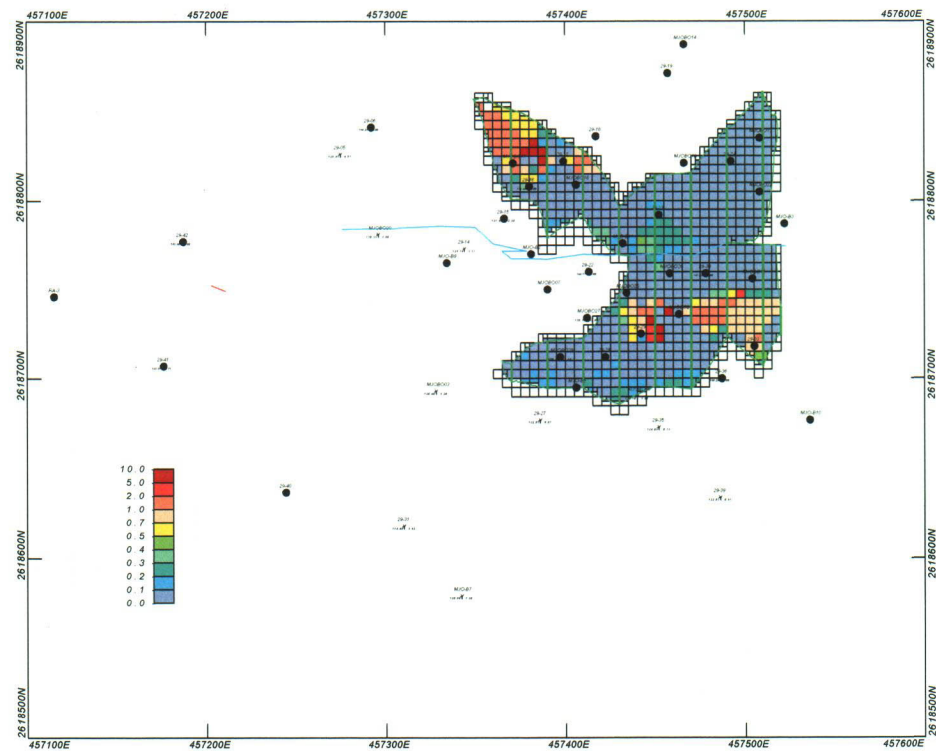


Fig. III-1-24 Block Grade Plan - Rakah 550L(g/tAu)

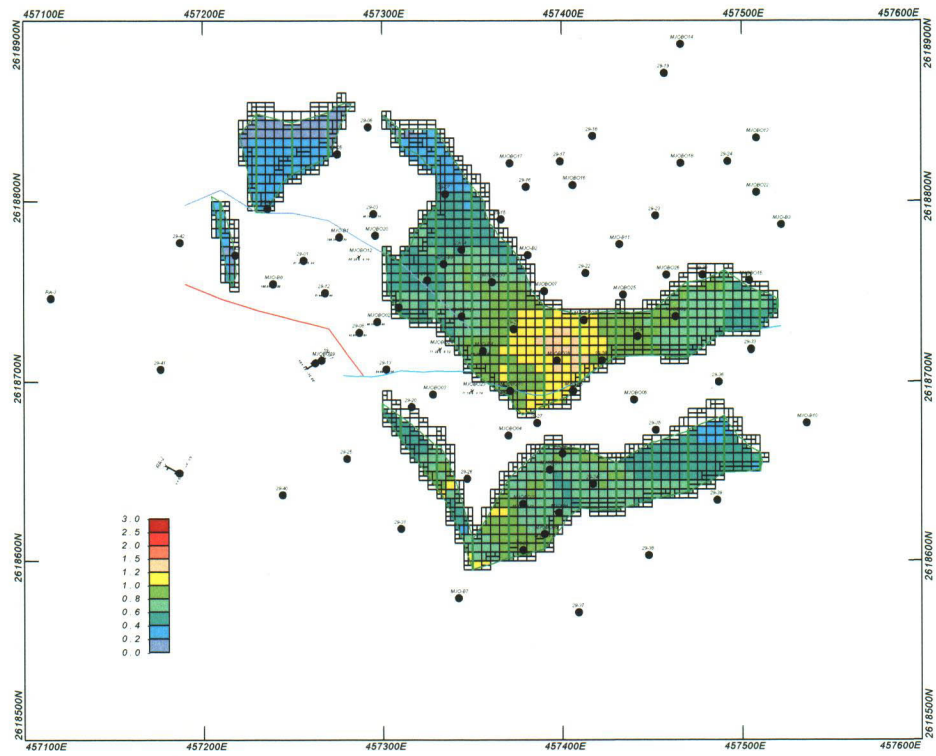


Fig.III-1-25 Block Grade Plan - Rakah 600L(%Cu)

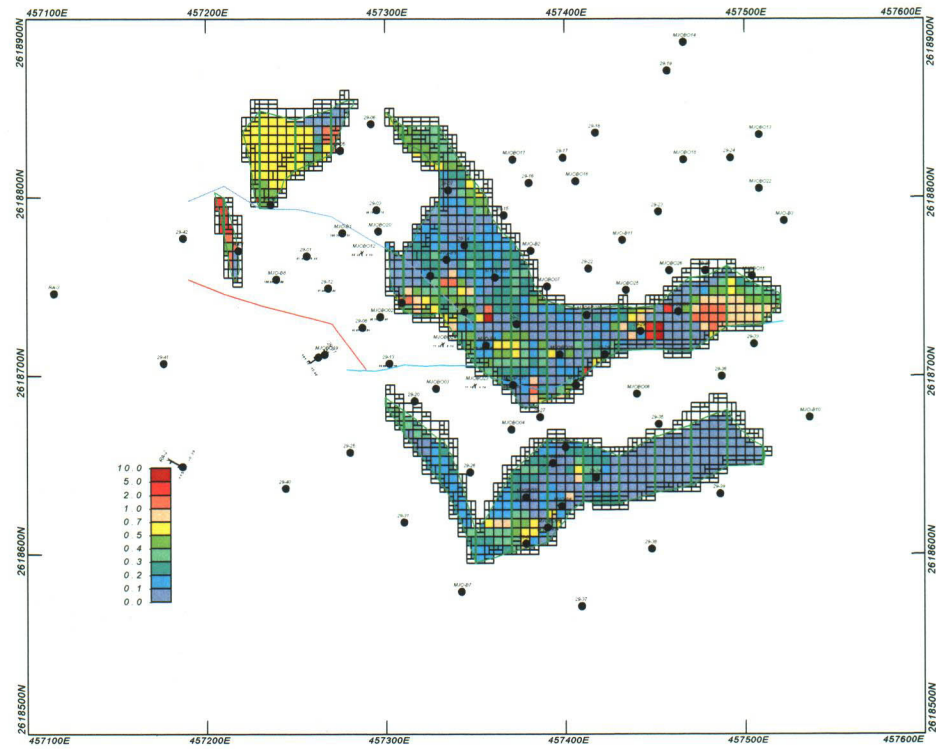


Fig.III-1-26 Block Grade Plan - Rakah 600L(g/tAu)



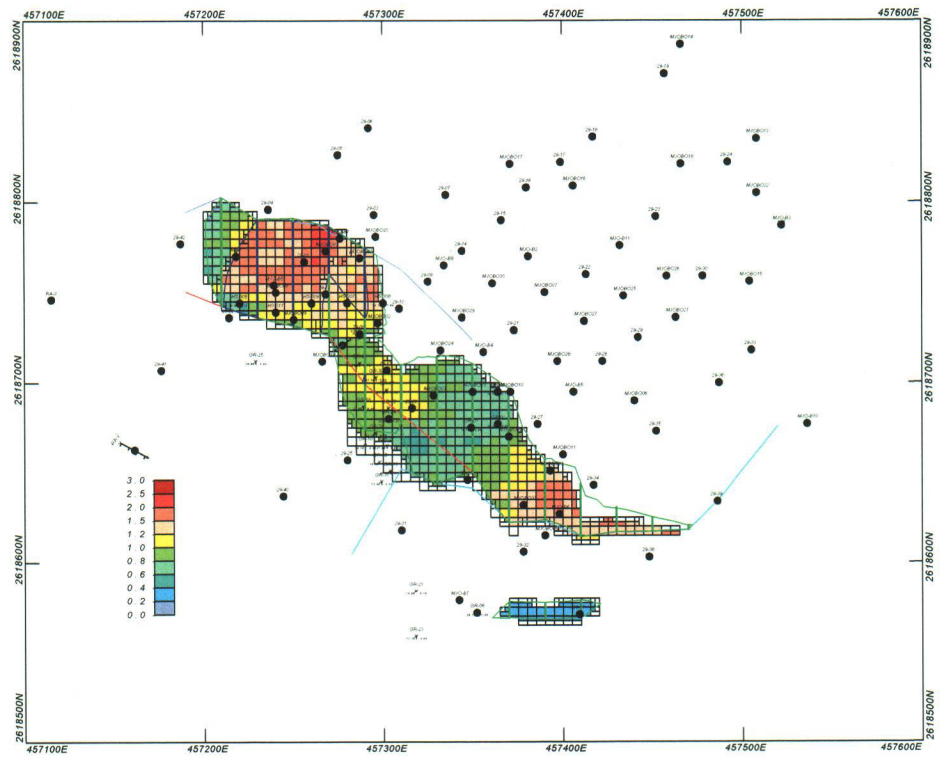


Fig.III-1-27 Block Grade Plan - Rakah 650L(%Cu)

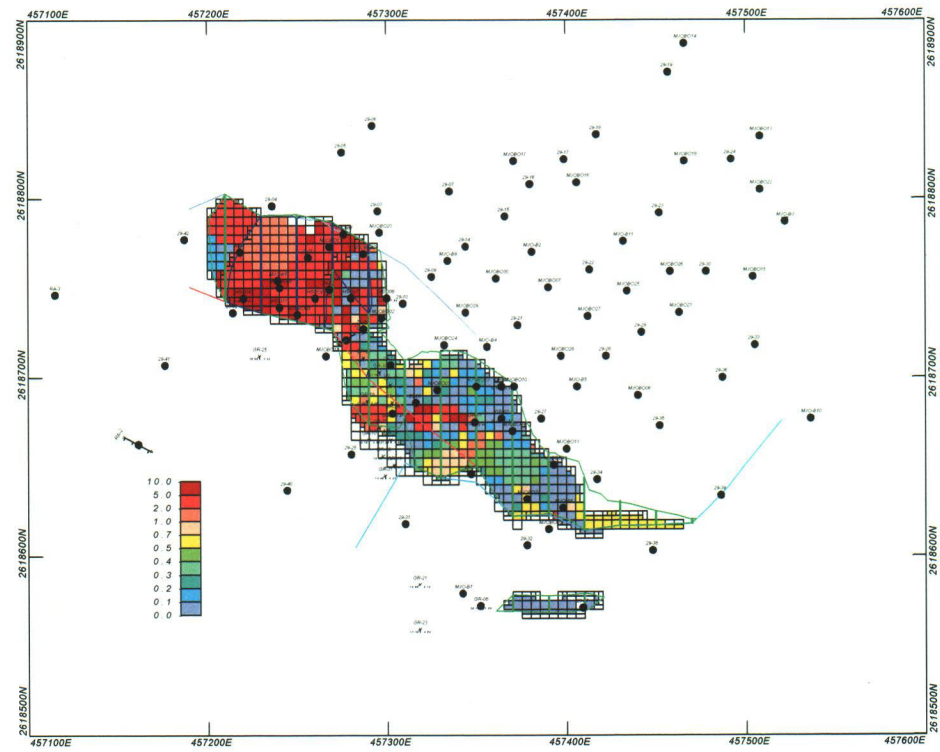


Fig.III-1-28 Block Grade Plan - Rakah 650L(g/tAu)

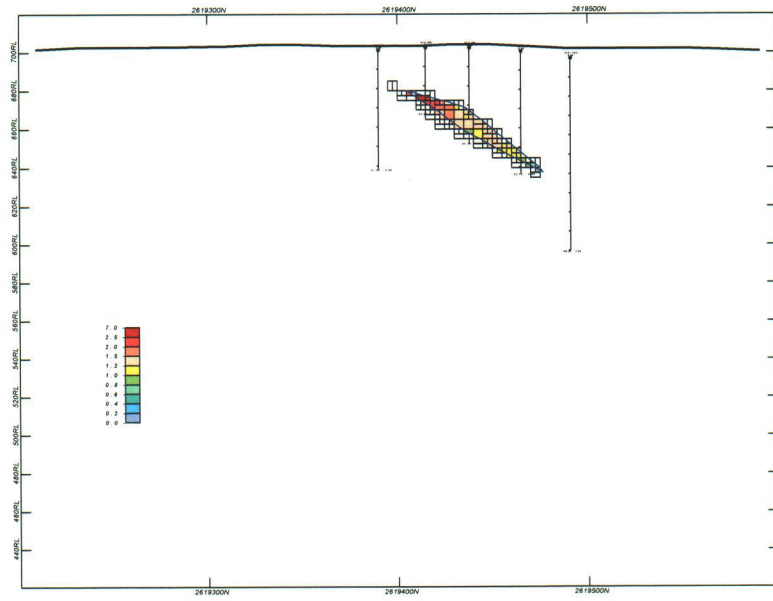


Fig.III-1-29 Block Grade Section – Al Asghar 452900E(%Cu)

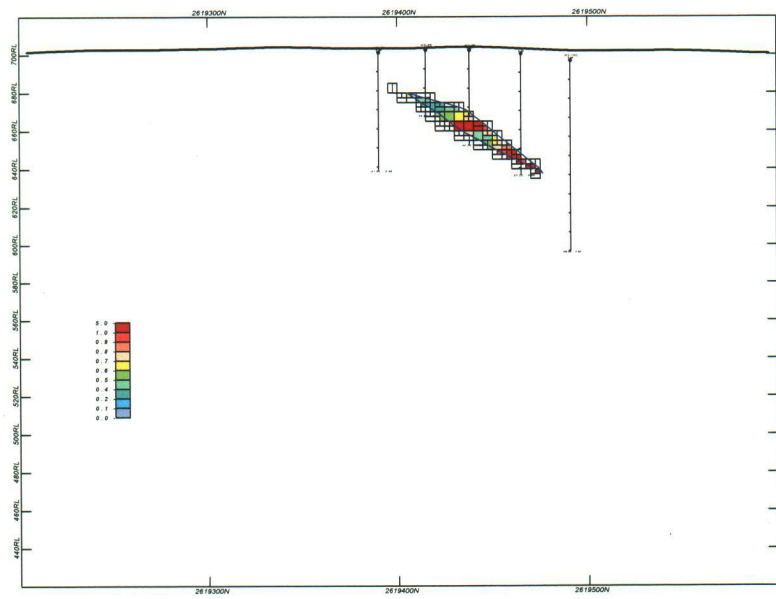


Fig.III-1-30 Block Grade Section – Al Asghar 452900E(g/tAu)

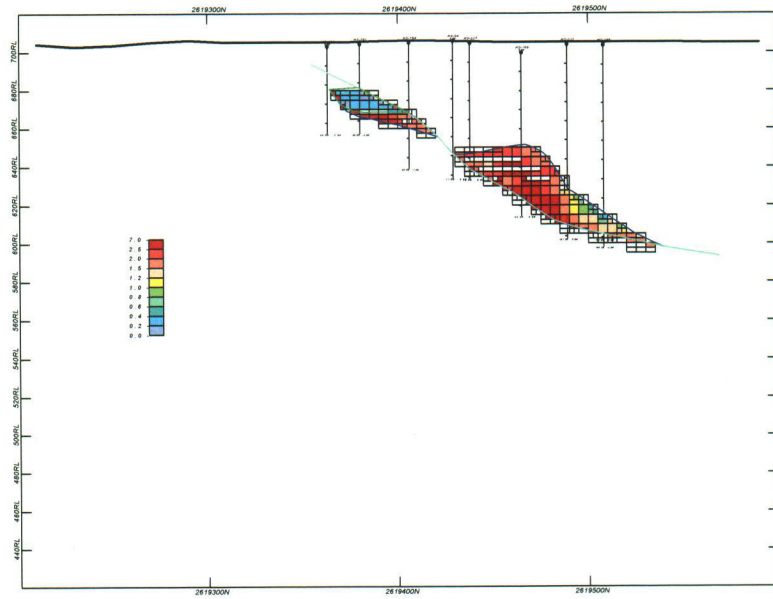


Fig.III-1-31 Block Grade Section – Al Asghar 453000E(%Cu)

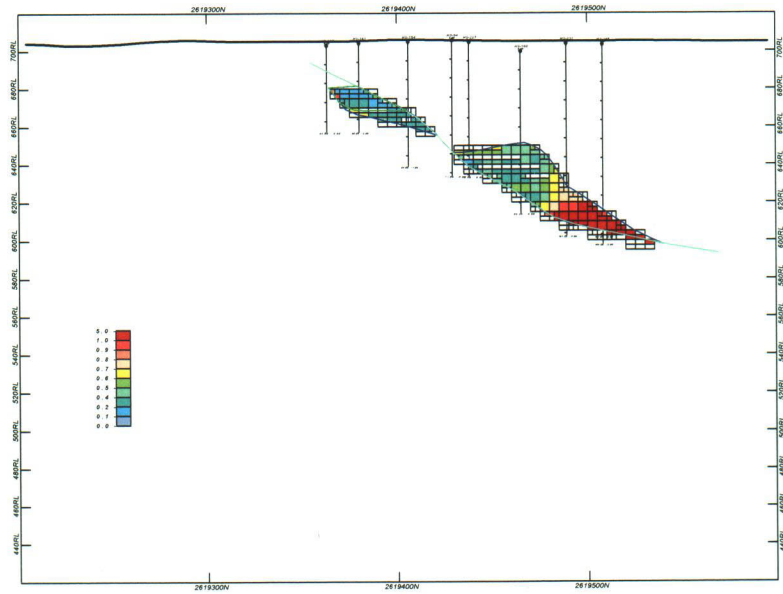


Fig.III-1-32 Block Grade Section – Al Asghar 453000E(g/tAu)

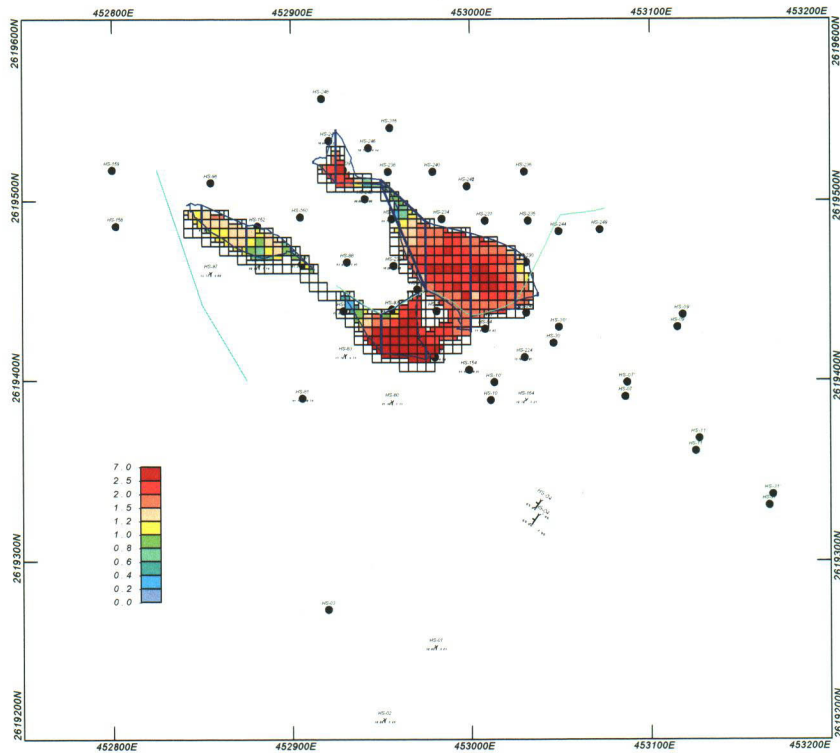


Fig. III-1-33 Block Grade Plan – Al Asghar 640L(%Cu)

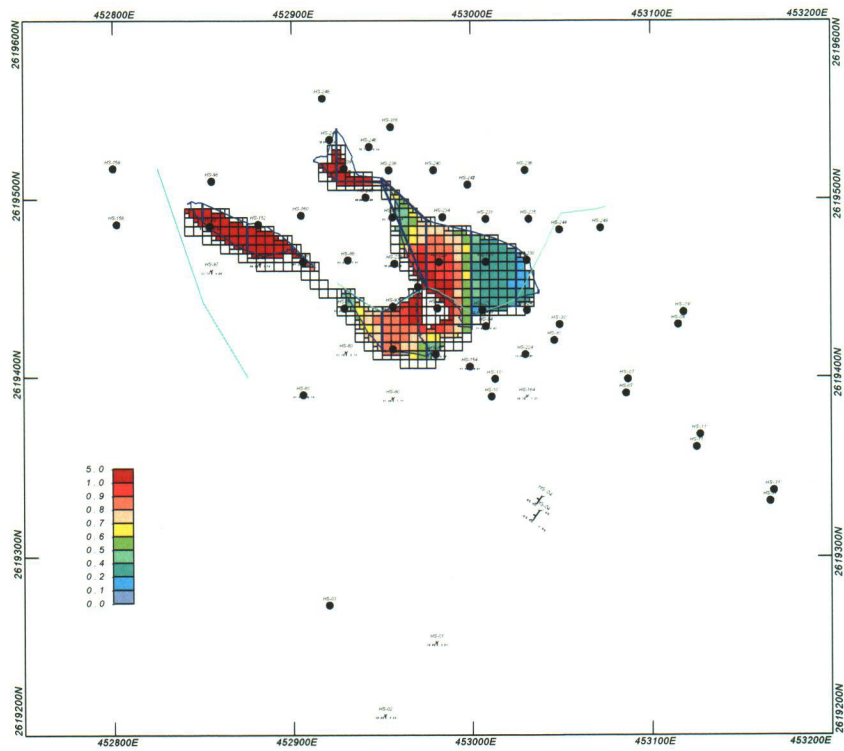


Fig. III-1-34 Block Grade Plan – Al Asghar 640L(g/tAu)

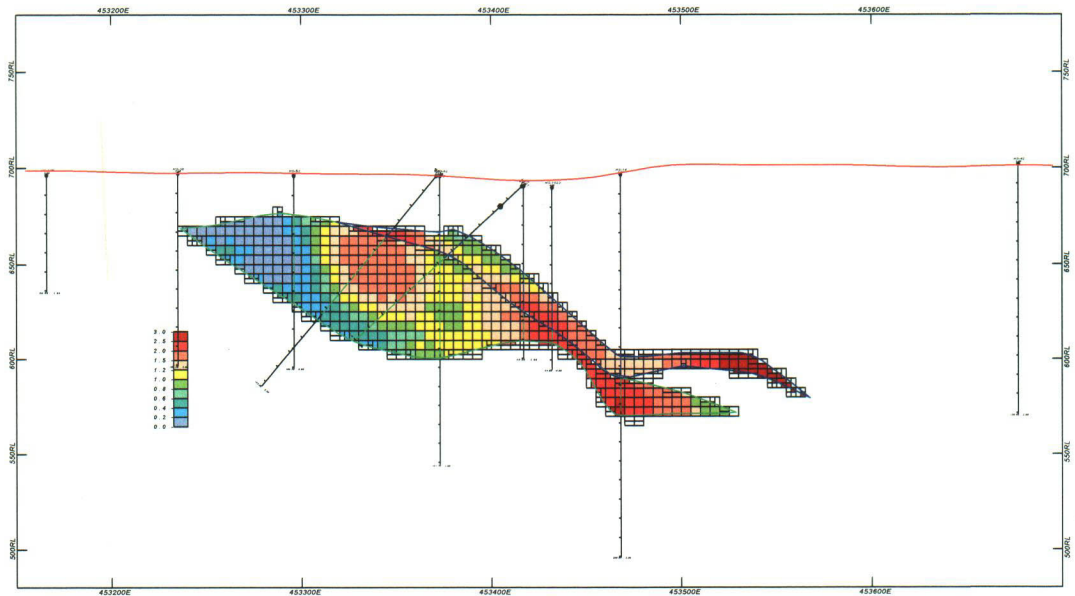


Fig.III-1-35 Block Grade Section – Hayl as Safil 2618700E(%Cu)

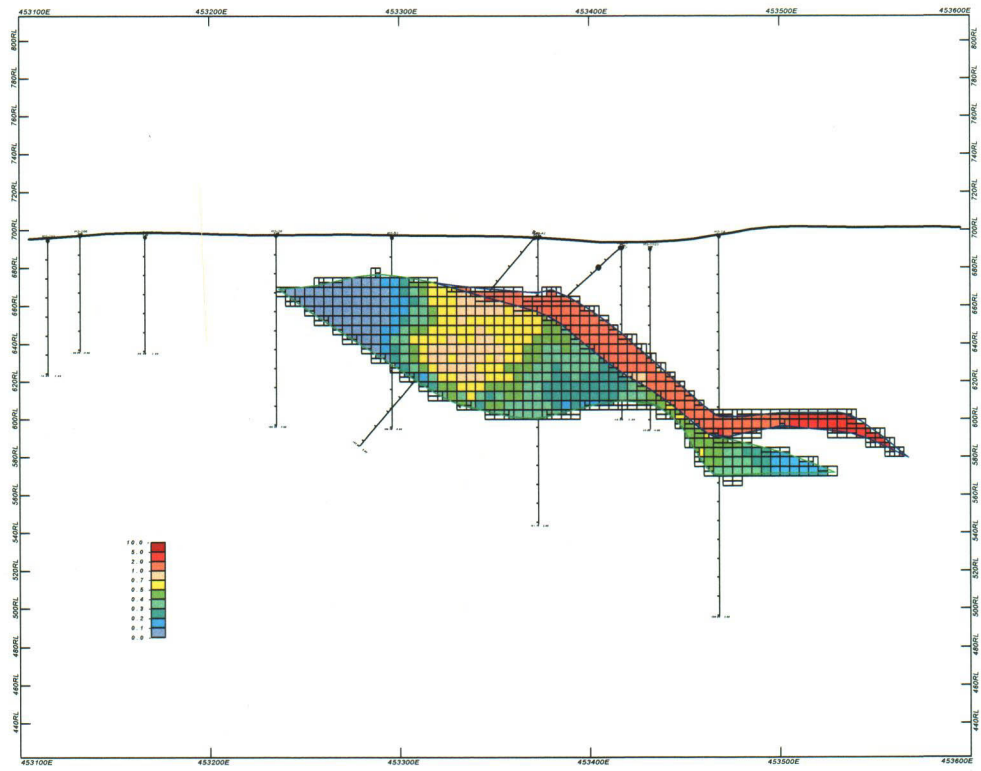


Fig.III-1-36 Block Grade Section – Hayl as Safil 2618700E(g/tAu)

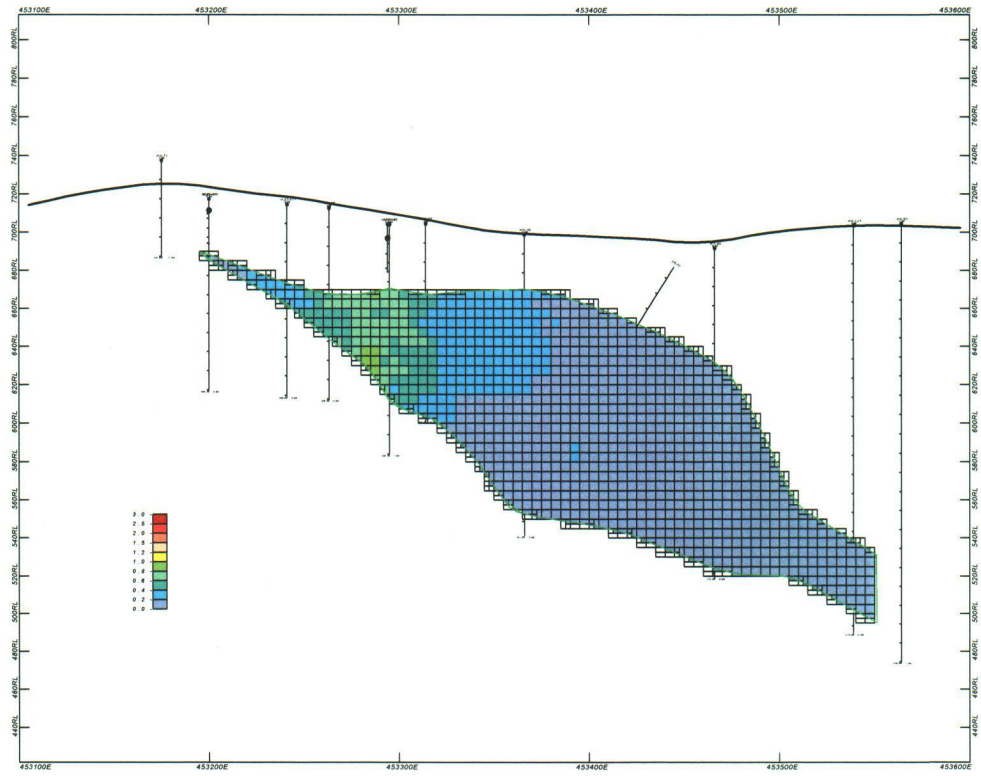


Fig.III-1-37 Block Grade Section – Hayl as Safil 2618800E(%Cu)

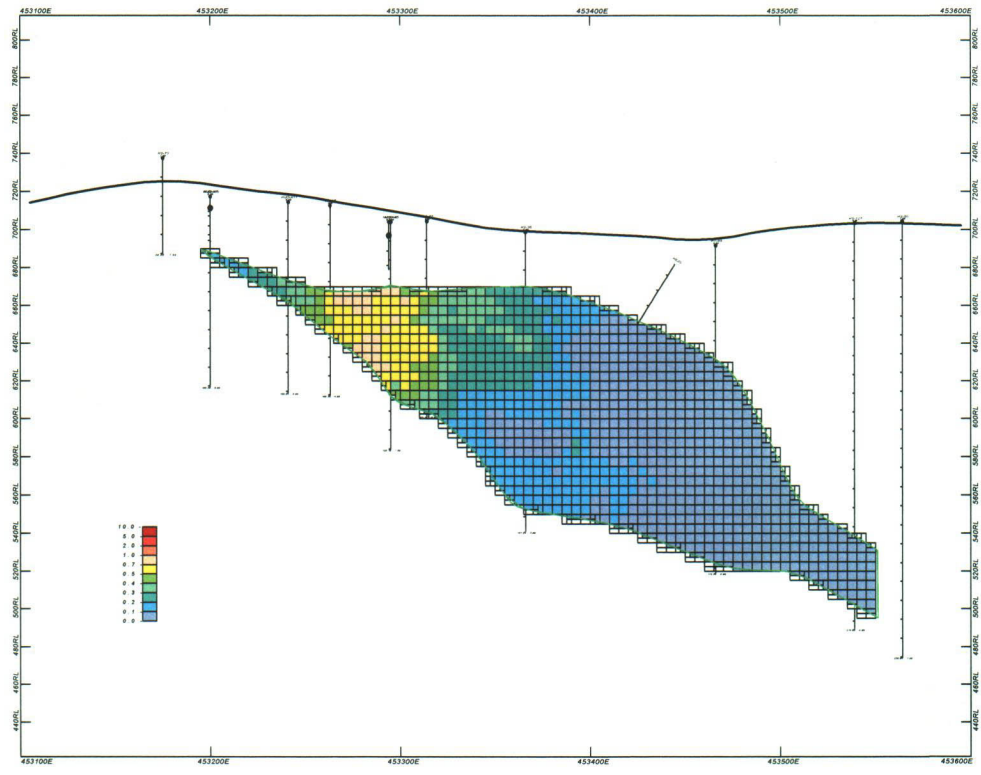


Fig.III-1-38 Block Grade Section – Hayl as Safil 2618800E(g/tAu)

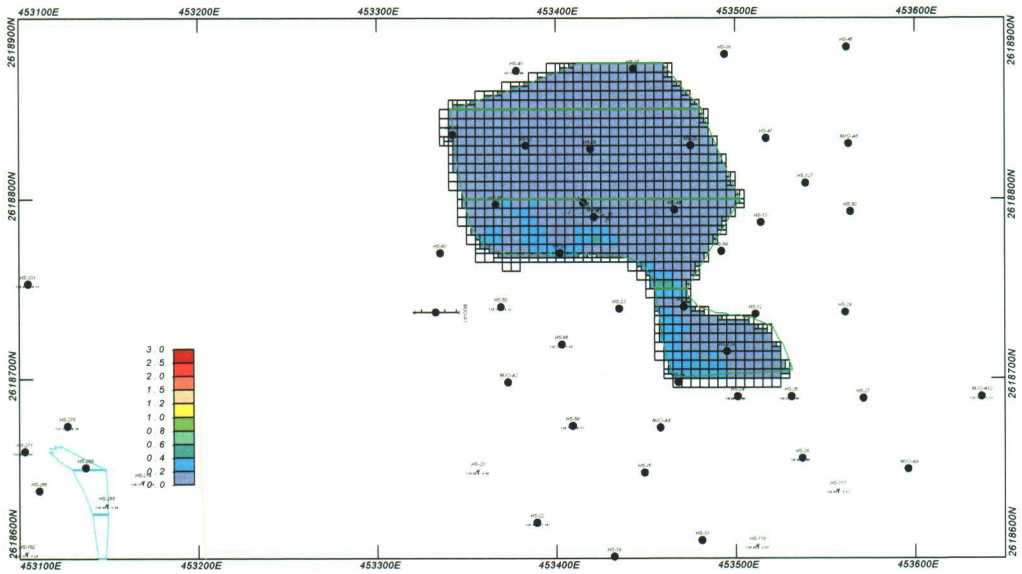


Fig.III-1-39 Block Grade Plan – Hayl as Safil 570L(%Cu)

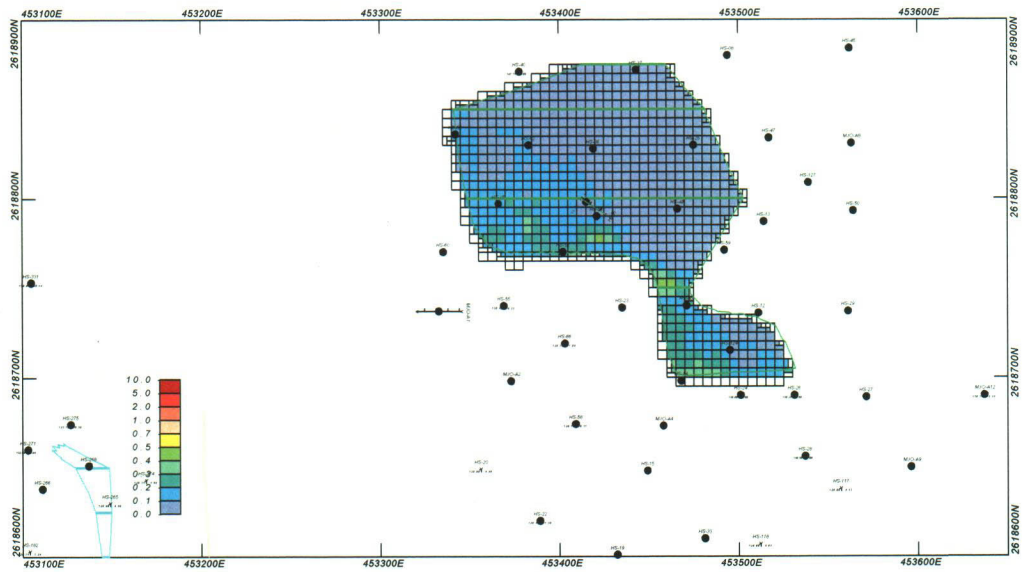


Fig.III-1-40 Block Grade Plan – Hayl as Safil 570L(g/tAu)

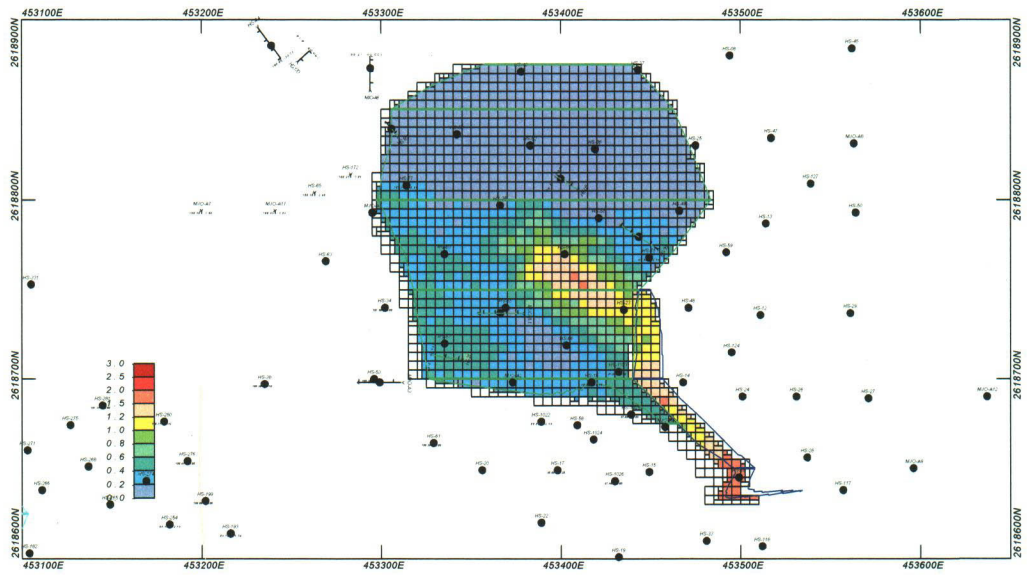


Fig.III-1-41 Block Grade Plan – Hayl as Safil 610L(%Cu)

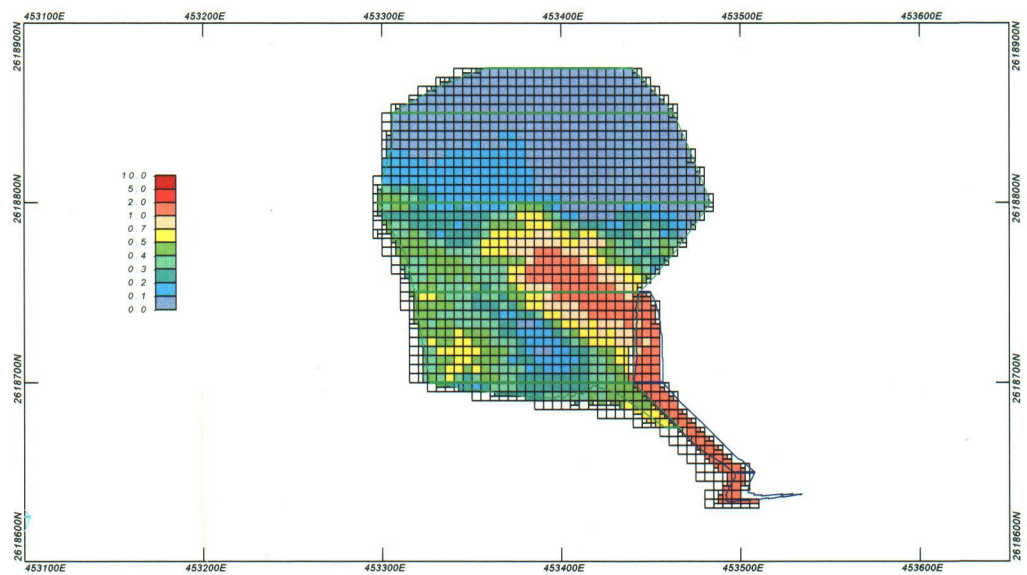


Fig.III-1-42 Block Grade Plan – Hayl as Safil 610L(g/tAu)



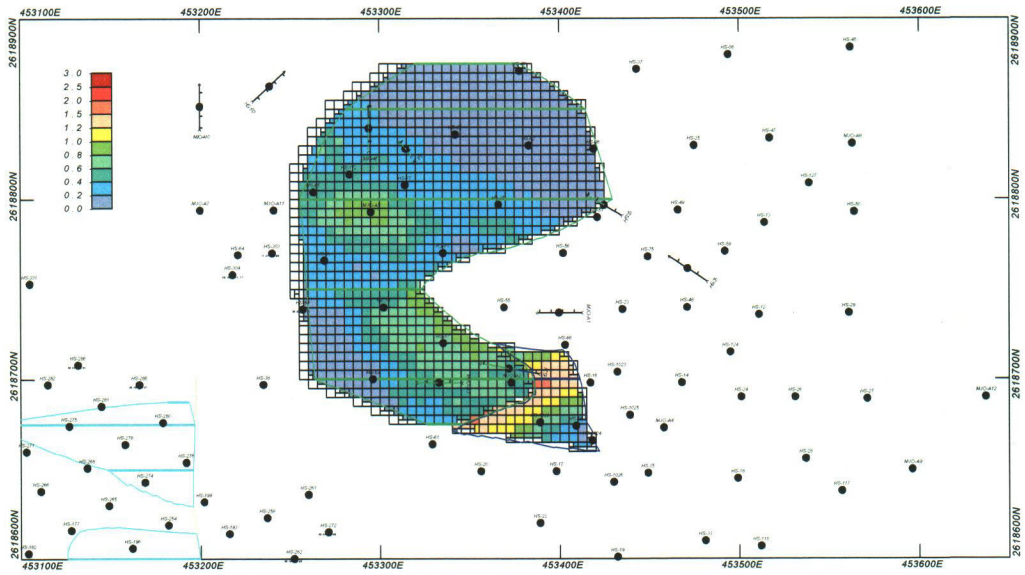


Fig.III-1-43 Block Grade Plan – Hayl As Safil 650L(%Cu)

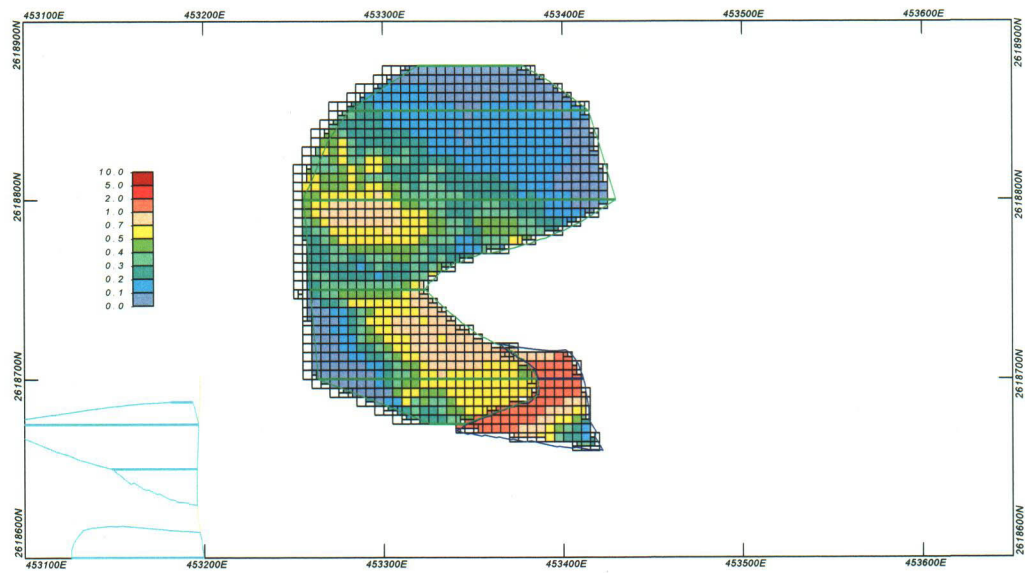


Fig.III-1-44 Block Grade Plan – Hayl As Safil 650L(g/tAu)

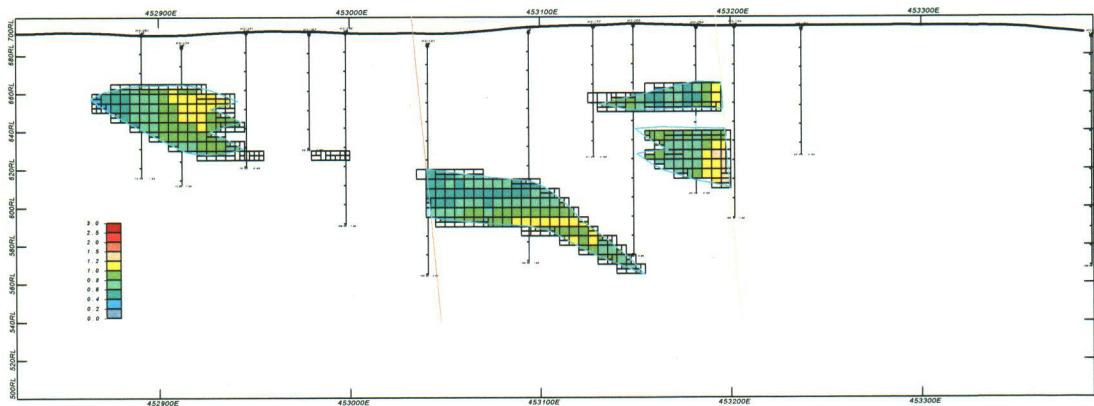


Fig.III-1-45 Block Grade Section – Al Bishara 2618625E(%Cu)

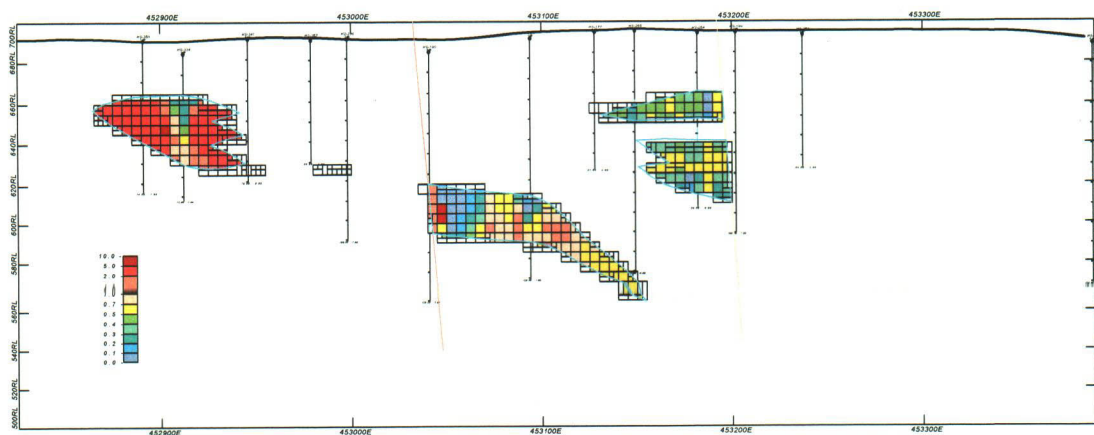


Fig.III-1-46 Block Grade Section – Al Bishara 2618625E(g/tAu)

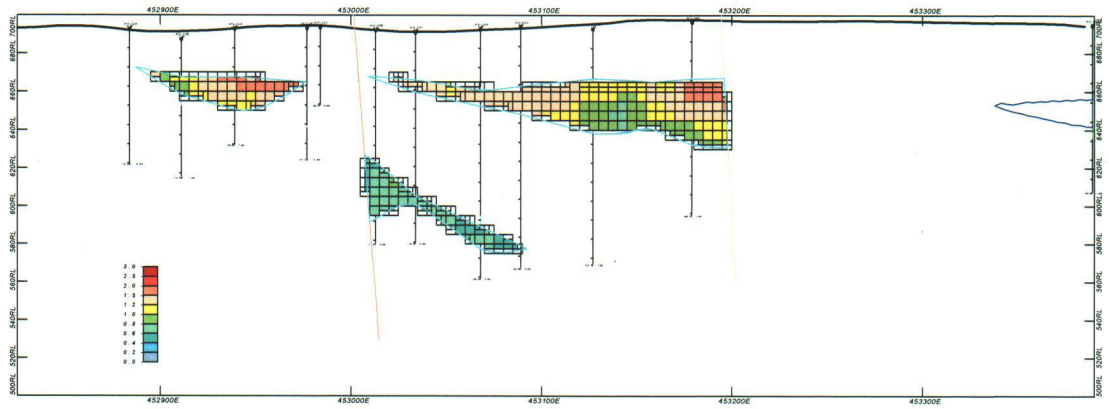


Fig.III-1-47 Block Grade Section – Al Bishara 2618675E(%Cu)

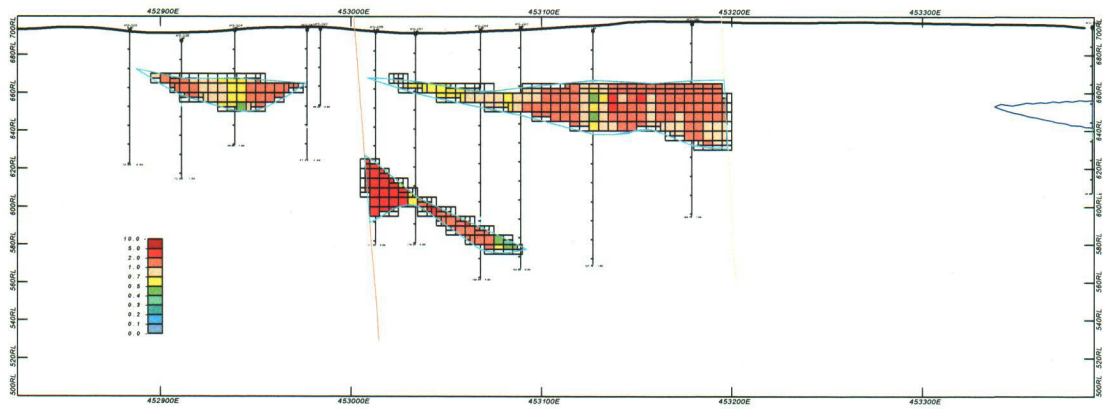


Fig.III-1-48 Block Grade Section – Al Bishara 2618675E(g/tAu)

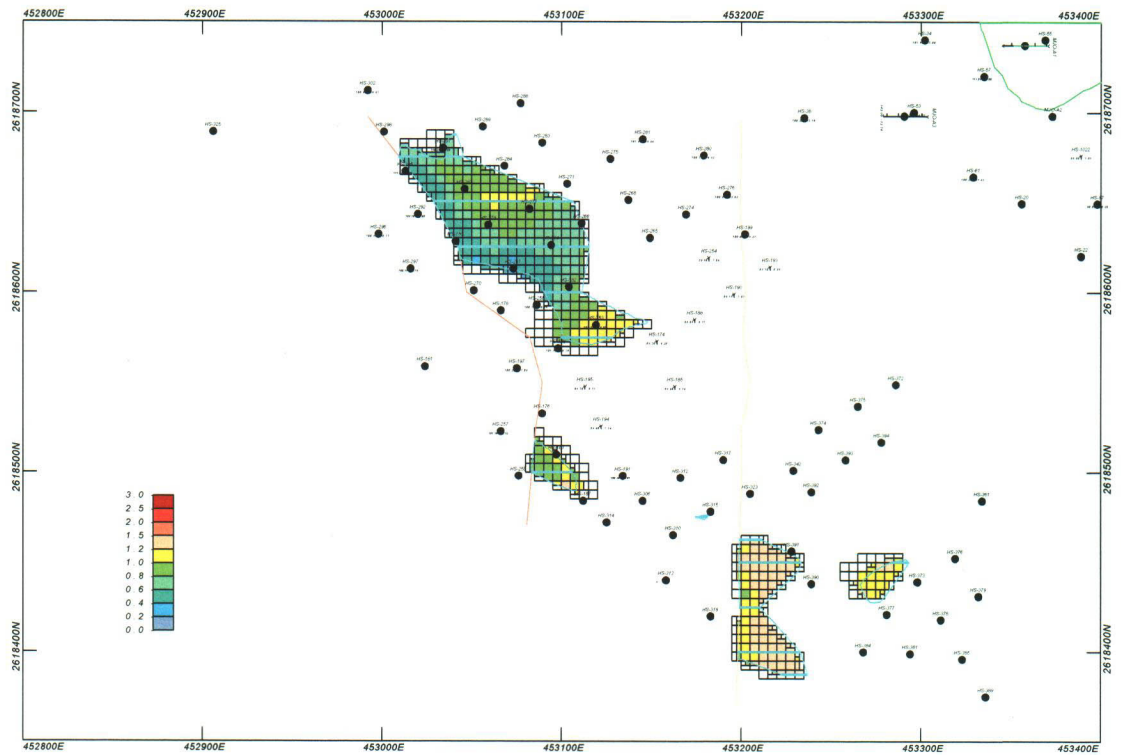


Fig.III-1-49 Block Grade Plan – Al Bishara 600L(%Cu)

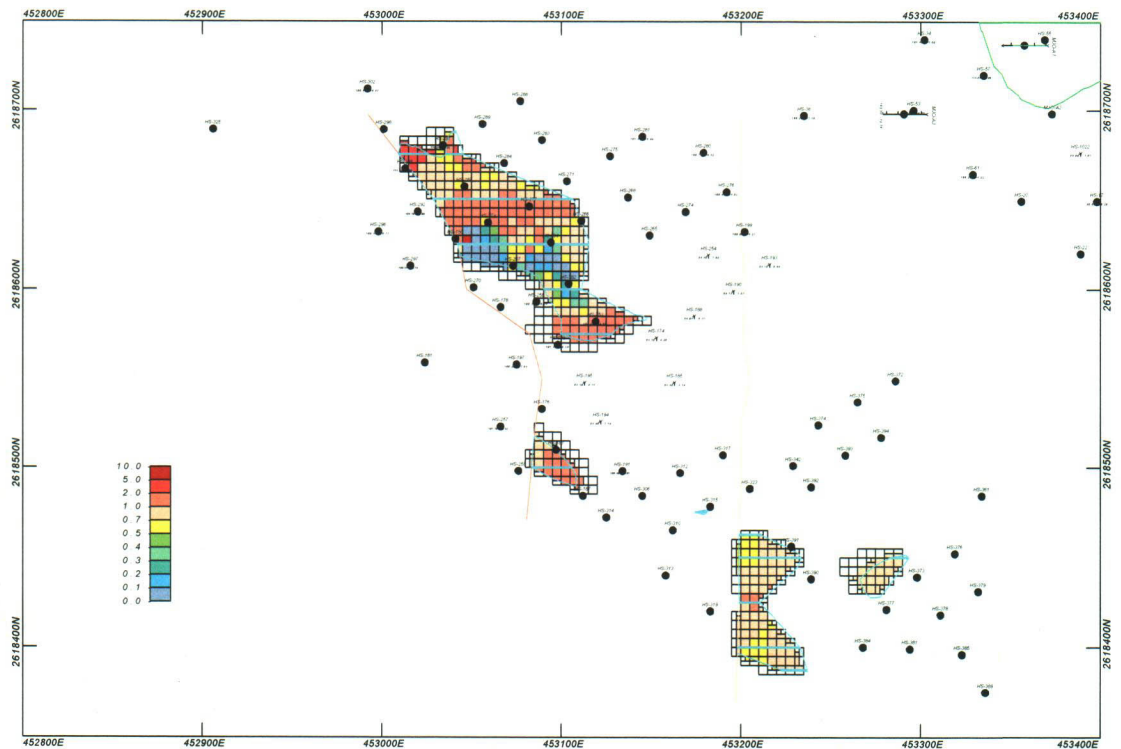


Fig.III-1-50 Block Grade Plan – Al Bishara 600L(g/tAu)

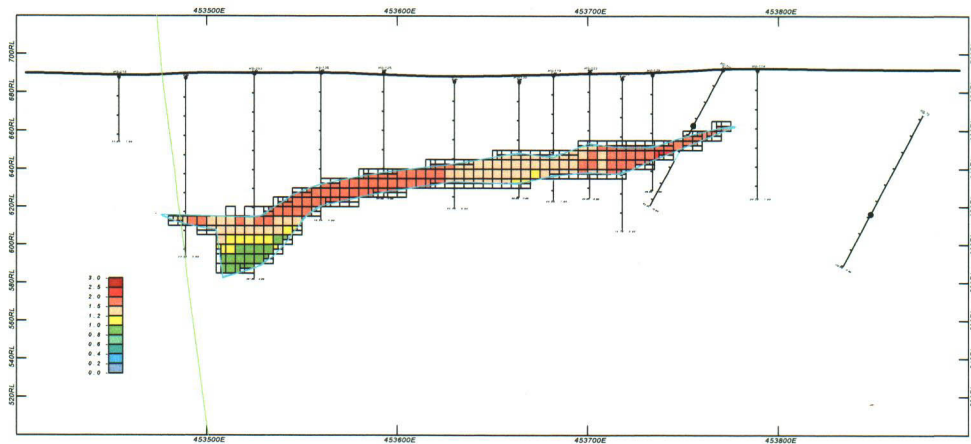


Fig.III-1-51 Block Grade Section – Al Jadeed 2618240N(%Cu)

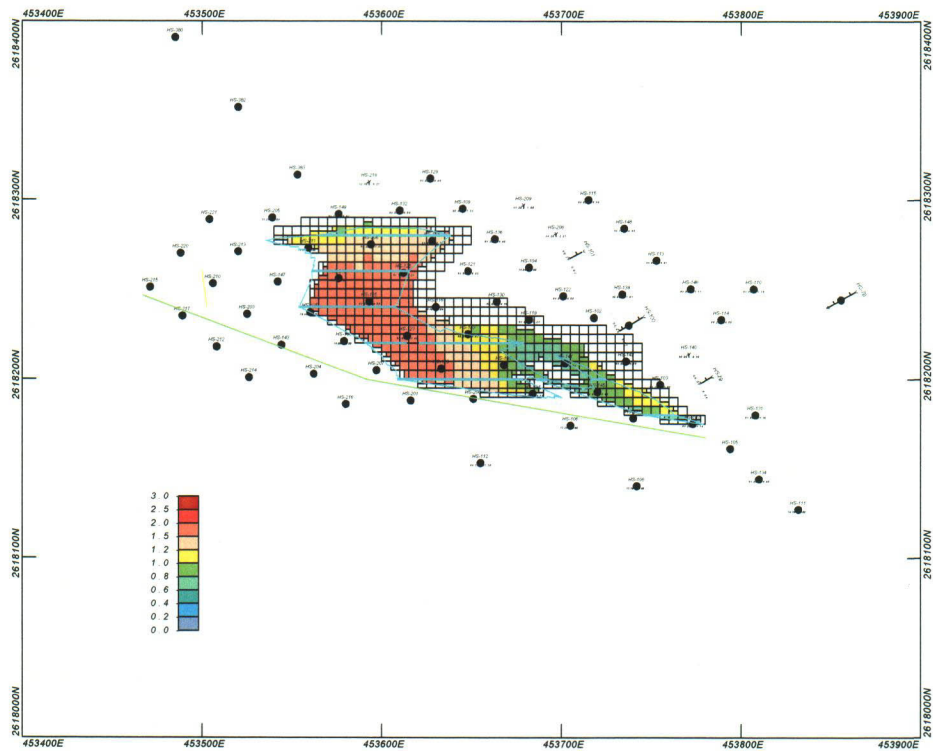


Fig.III-1-52 Block Grade Plan – Al Jadeed 630L(%Cu)