第４章　調査結果の総合検討

4－1 ドンノイ地区

ドンノイ地区では，地区北西部においての鉱徴状況調査と IP 異常域の余地において追加ボーリング調査が実施された。

ドンノイ地区の地質は，カンブリア珪質砂岩とオルドビス系の泥岩・砂岩と炭酸塩岩およびこれらに貫入した三畳系花崗岩より構成され，第2年次調査で指摘されたように地区のほぼ中央を境として東西で大きく異なっている。すなわち，東側では浅所に花崗岩のストックが貫入しており，この影響で炭酸塩岩の大部分は磁鉄鉱スカルン，角閃石スカルンに交替されているの対し，西側ではドロマイト化や熱水活動でもたらされた石英－方解石脈や方解石脈が多数発達するもののスカルン化は認められない。

地化学探査の結果では，東西の両側で鉛・亜鉛・マンガン・カドミウムの地化学異常が広く分布している。東側の地化学高異常域は，MJTM-2 孔とトレンチ No. 2 によってスカルン化帯上部に網状に発達して纏まりのない角礫化を伴った小断裂に沿って亜鉛・鉛の鉱化作用が形成されたことによるものと結論された。

一方，西側の異常域については MJTM-1 孔及びトレンチ No. 1 においてドロマイト中に方鉛鉱のわずかな鉱染が認められた程度で，異常域をもたらした原因は不明瞭であった。今年度実施した北西部地化学異常域での鉱徴状況調査では，石灰岩層中の節理や断裂または層理に沿って鉱液が上昇し，比較的下位では石英脈と珪化帯を形成していることが明かとなった。これらの石英脈は，数 1,000ppm 程度の亜鉛含有量を示すが，周囲の石灰岩にはドロマイト化や亜鉛・鉛の高異常値は認められない。しかし，酸化鉄やマンガンを多量に含む茶色方解石脈を伴っている場合には区間試料の亜鉛含有量が増加する。

この珪化帯の上方では，石灰岩に広い範囲でドロマイト化帯が形成され，母岩自体も Zn=330ppm～1.6%: Pb=50～970ppm の鉱化作用を受けている。このドロマイト化帯の発達する部分では，珪化小角礫を含む石英脈や珪化帯が節理沿いに分布し，さらにある特定層理を交代して方鉛鉱－閃亜鉛鉱石英脈が認められる。これらの石英脈のうち，最も品位に高い石英脈試料は，80cm 幅で Zn=7.86%, Pb=2.82%で，その周囲の 20m 区間でも Zn=1.60%, Pb=1.43%の高い値を示す。

この鉱化帯の特徴として，脈以外には硫化鉱物がほとんど認められない。

流体包有物試験からみた鉱化状況の特徴は，均質化温度は珪化帯部分とドロマイト化帯でほとんど変わらず 140～250℃を示すが，塩濃度は前者で 6～8%，後者で 1～3%を示している。このことは，亜鉛・鉛の鉱化作用と塩濃度の低下が何らかの関係を示していることを窺わせる。

地化学探査結果で得られた広範囲の鉛・亜鉛の高異常値に対して，露頭での岩石試料は下部の珪化帯ではかなりの低品位，ドロマイト化帯では地化学異常値よりやや低い品位を示す。しかしながら，石英脈や珪化岩試料では，土壌地化学異常値と同程度またはそれ以上の値を示すことがわかった。高濃度の石英脈や珪化帯およびドロマイト化帯の高濃度部の全体に占める分量は少なく，これだけですべての地化学異常の広がりと強度を説明することは難しい。今回の観察結果などから，石灰石中の節理裂罅系の沿って広範に形成された石英脈やドロマイト化帯に含まれていた鉛，亜鉛成分が風化の過程で同様に含有されていたマンガンが酸化物に改変される中でマンガン酸化物に吸着され地表部に残留した可能性が高いものと考えられる。

このドンノイ地区北西部では，実際閃亜鉛鉱と方鉛鉱を含んだ石英脈が抽出されたことから，鉛・亜鉛鉱体が賦損する可能性はドンノイ地区で最も高いと判断される。一方，石英脈の形成機構は，開口節理やある特定層準の層理沿いを交代するものであることから，賦存位置の推定には岩相や地質構造のより詳細な解明が必要である。

IP 異常域の余地で掘削された MJTM-6 孔の結果，この IP 高異常域はスカルンに重複した銅・鉛鉱化帯で

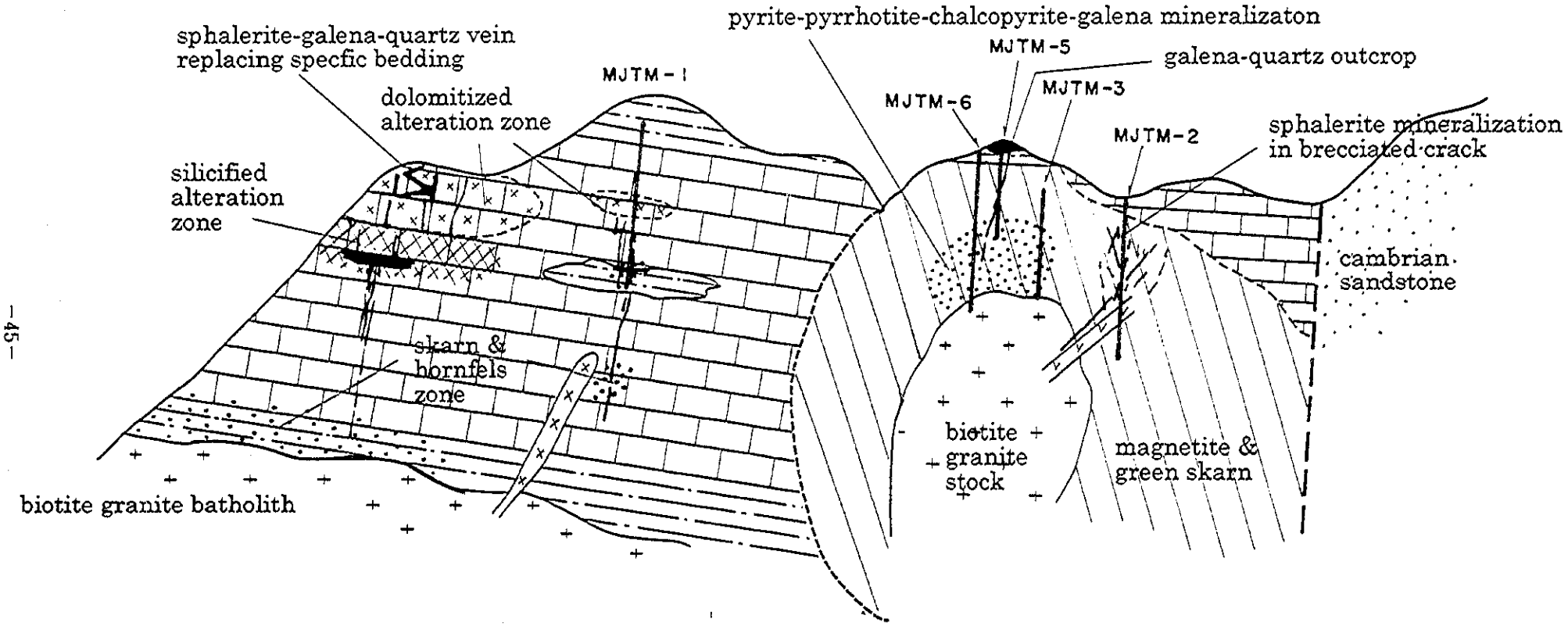


Fig. II-4-1 Schematic mineralization model in the Dong Noi area

ある可能性がより鮮明となった。今回のMJTM-6孔では銅の鉱化作用は深度60m付近に始まり，散点的に下方に連続し，花崗岩との接触部で最も強くなっている。下方に強くなっていることからスカルンの形成時期と密接に関連しているように考えられるが，流体包有物の検討からは均質化温度は149～195℃とスカルンの形成温度よりはきわめて低い。一方，塩濃度は7.8～23%と極めて高く，花崗岩の最終残液から由来した可能性を示している。MJTM-5孔における銅・鉛の鉱化状況からは，スカルンを切って発達する剪断に沿って鉱化が認められることからスカルンの鉱化時期よりは遅れた鉱化作用によるものと判断される。

銅の鉱化状況は，MJTM-3, MJTM-5, MJTM-6孔の3孔においては，現在のところ稼行対象になりうる品位・鉱量は得られていない。しかしながら，スカルン中の銅品位は偏在性が大きいことから，このIP異常域(16 mV・sec/V以上)を示す区域にはまだ探鉱余地は残されている。

3年間にわたるドンノイ地区調査から得られたデータを総合して，ドンノイ地区での鉱化モデルを作成した(Fig. II-4-1)。ドンノイ地区の東部では，オルドビス系石灰岩に貫入したストック状花崗岩体を中心とするスカルン帯が広範囲に形成された。この後花崗岩の最終残液に深く関係した鉱化溶液の上昇に伴って，花崗岩ストック頂部では南北に伸張した黄鉄鉱－磁硫鉄鉱を主体とする管状形の鉱化帯が形成され，同時に銅・鉛を沈殿した。この鉱液の一部は，剪断沿いに上昇し一部の銅・鉛を沈殿するとともに，スカルンと泥岩の境界部で方鉛鉱主体の鉱体を形成した。ストックから離れた場所では，網状に発達した細かい亀裂に沿って鉱液が移動し，一部で閃亜鉛鉱を亀裂沿いに沈殿したが，スカルンに塊状緻密で，多孔質部分が少ないことから大きな鉱体を形成するにいたらなかった。一方，ストック状花崗岩から離れた西部ではスカルン帯の形成は無く，バソリスに直接接する泥岩・砂岩のホルンフェルス化と石灰岩下部にわずかなスカルン化が認められる。ここでも低～中温で塩濃度の高い鉱液が石灰岩の節理や割れ目を通じて上昇し，あるレベルにおいて珪化帯を形成し，その上位で石灰岩を広範囲にドロマイト化するとともに鉛・亜鉛を鉱染した。このドロマイト化帯の中で特定の単層を交代して，閃亜鉛鉱－方鉛鉱石英脈を形成している。

4－2 メーカナイ地区

メーカナイ地区のMJTM-7は，メーカナイ地区で把握された最も強いIP高異常に関連する鉱化状況を確認するために掘削された。MJTM-7孔では，中間部分で著しい黄鉄鉱鉱染と珪化作用が認められ，黄銅鉱鉱徴を伴う。黄銅鉱は，深度129m付近で最も優勢である。MJTM-7孔の近傍で過去にDMRの実施したMK-1, MK-2を参考とすると，MJTM-7孔の黄鉄鉱を伴う珪化帯は，IP異常域の平面的な伸びの方向である北東－南西方向に連続しているものと想定され，この方向の断裂に沿って形成された熱水鉱脈型の鉱化帯と推定される。

第2年次調査の結果では，メーカナイ地区のゴッサン帯は鉛直方向に連続する可能性が推定されゴッサン帯下位の鉱化状況を確認するためMJTM-8孔とMJTM-9孔が掘削された。この2孔の結果を見ると，ゴッサン帯は地表部に10数mの厚さでほぼ地表面に沿って分布していて，その下位にはほとんど目立った鉱徴が無いことが確認された。ゴッサン帯は，粘土化した泥岩ないし砂岩に挟在されて分布し，もともとは黄鉄鉱に富み閃亜鉛鉱を付随する塊状硫化鉱であったものが，風化によって黄鉄鉱が酸化し褐鉄鉱に変化し，閃亜鉛鉱は溶解流出してしまったものと想定される。ゴッサン付近の堆積岩は，特に下盤側で滑石－セリサイト－緑泥石－スメクタイトの粘土化作用を強く受けている。また，MJTM-9孔ではゴッサン帯の上盤には白色粘土化を伴う熱水角礫状の珪化帯及び石英脈が観察される。

現在のゴッサン帯は，メーカナイ地区地表部の尾根沿いから緩い東斜面のみに分布している。また，この地区の層理面が緩い東傾斜であることとボーリング結果をあわせて考えると，ゴッサン帯は石灰岩と一般堆積岩の境

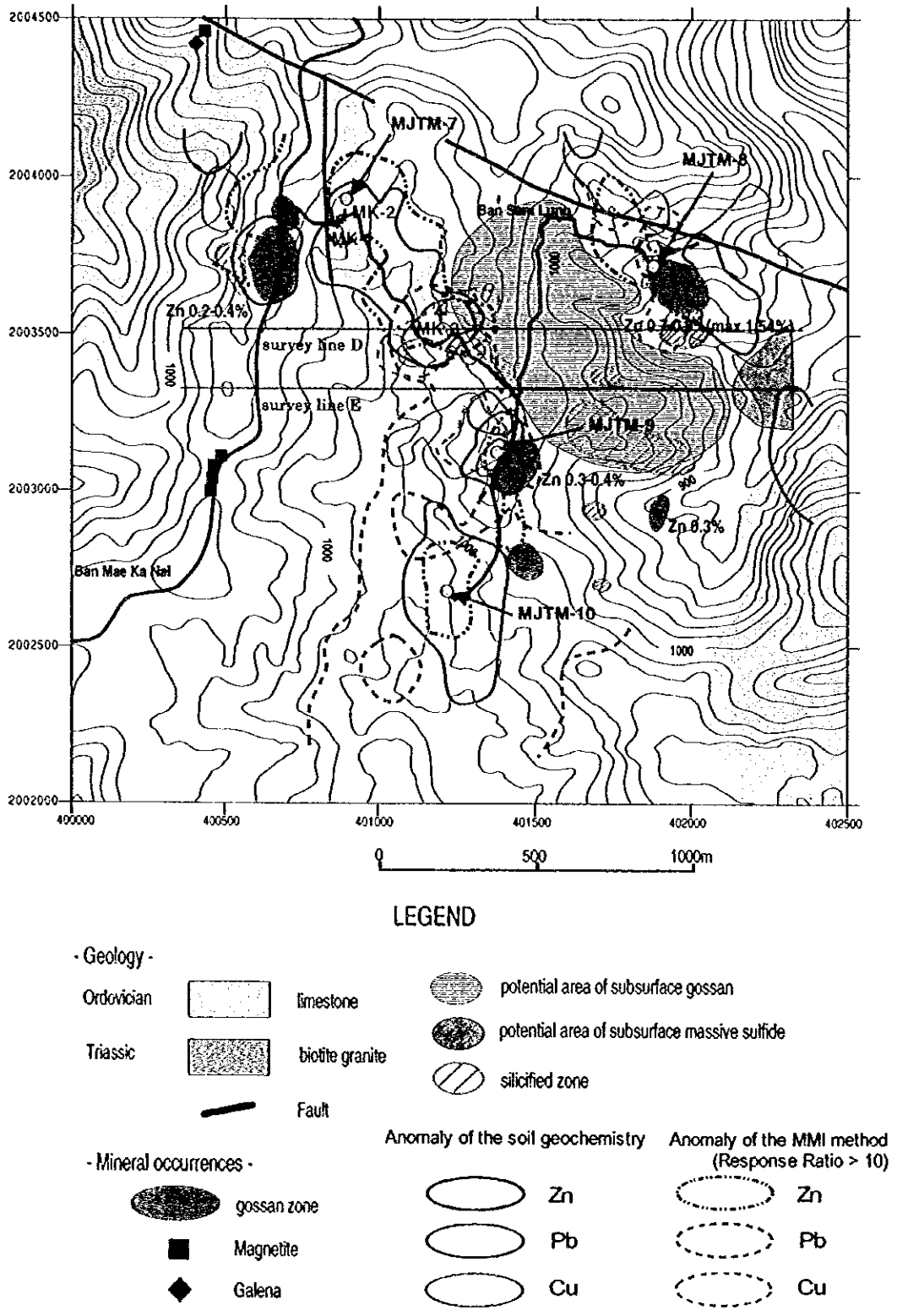
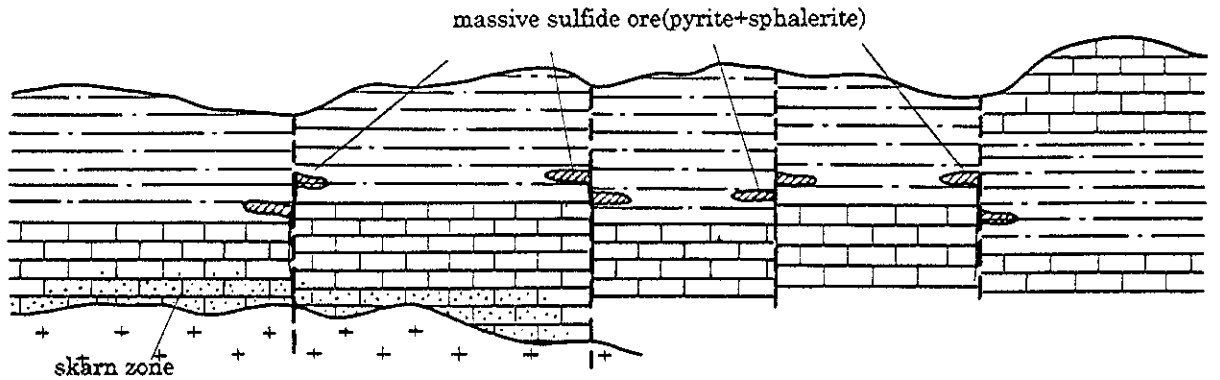


Fig.II-4-2 Potential area for subsurface gossan and massive sulfide ore

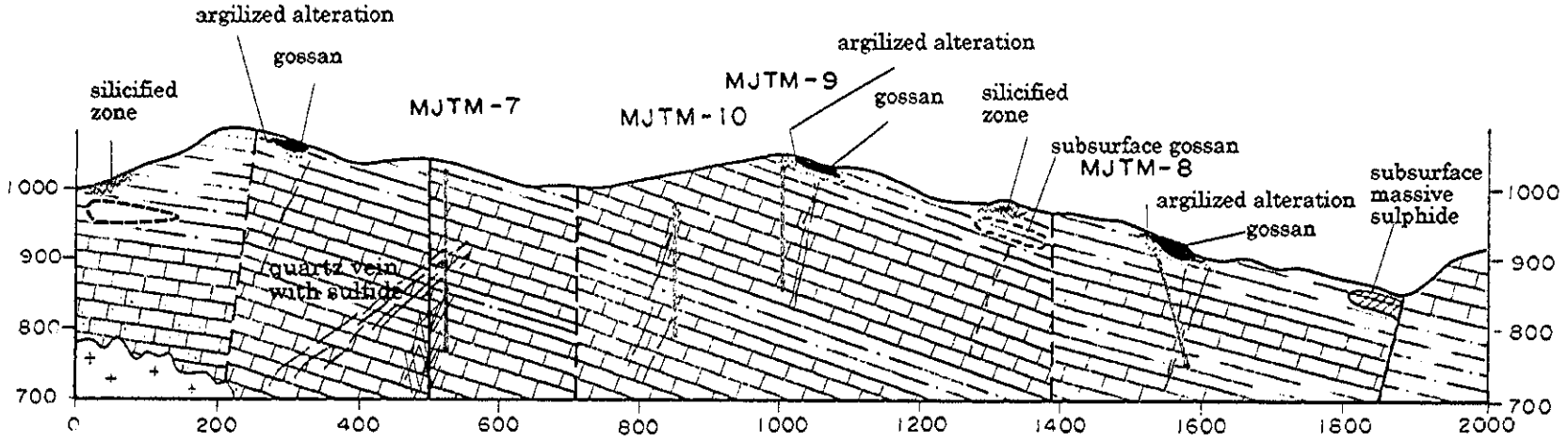
界部から数 m から 15m ほど堆積岩側，時には境界部に形成されていて，現在はその上面がほぼ地表面と一致して分布しているものと考えられる。ゴッサン帯の下部では石英－方解石脈や軽微な黄鉄鉱鉱染が認められるだけで，明瞭な鉱化作用の兆候は認められない。MJTM-9 孔ではドロマイト化の程度もきわめて弱い。ゴッサンの胚胎位置はほぼ同水準であることから，堆積岩中に胚胎するゴッサンは，堆積岩の特定層準に沿って形成されたものと判断される。このことからするとMJTM-8 孔とMJTM-9 孔及びMK-3 孔に挟まれた間の地域は，このゴッサン層準が地表面下にあり，地表下にゴッサン帯が隠されている可能性が高い。特にMJTM-9 孔の東側では，珪化帯が広がっていてこの下にゴッサンが賦存する可能性は高い。ただし，IP 異常は把握されていないことから，硫化鉱である可能性は低い。また，物理探査測線 E および D 測線の東端部には地表直下に IP 異常は東傾斜で分布していて，この区域は MJTM-8 孔に分布するゴッサン帯の延長部にあたり，地表下に塊状硫化鉱の賦存が想定される(Fig. II-4-2)。

MJTM-10 孔とDMR のMK-3 孔は亜鉛，鉛，銅の地化学異常域下部の鉱化状況の把握のために掘削された。両孔とも石英脈に伴う方鉛鉱や方鉛鉱鉱染などの鉱徴が認められる。さらに MJTM-9 孔では酸化作用が強く，淡褐色からオレンジ色を呈する多孔質でガザガザした珪化変質帯が数多く認められ，これらは角礫化組織を呈することが多く，優勢な熱水鉱液の通路であった可能性が高い。

Fig. II-4-3 にメーカナイ地区の鉱化モデルを示す。MJTM-7 及び MJTM-8 孔における流体包有物試験の結果から，メーカナイ地域でも鉱化作用に塩濃度の高い鉱液が関与していたことが明らかとなった。均質化温度はMJTM-7の黄銅鉱－石英脈では 300℃とやや高い温度を示すが，その上位の閃亜鉛鉱－石英脈では 190～240℃，MJTM－8孔のゴッサン帯下部では105～185℃と浅～中熱水鉱床ほどの均質化温度を示している。また，もともとの硫化鉱体は，石灰岩と泥岩・砂岩の境界から一般堆積岩側に寄った特定層準を交代して形成されていることから，これらの熱水鉱液がMJTM-7 孔に見られる珪化帯や石英脈やMJTM-10 孔などの多孔質珪化帯など古い断裂系，裂罅に沿って上昇し，特定層準だけを交代して硫化鉱体が形成されたものと推定される。その後，メーカナイ地区では傾動運動や断層の再活動，地表の削剥により現在のような空間配置をとるにいたったものと推定される。



(a) primary mineralization of pyrite-sphalerite ore body



(b) mineral occurrence in the Mae Kanai area at the pesent

Fig.II-4-3 Schematic mineralization model in the Mae Kanai area

第Ⅲ部　結論及び提言

第Ⅲ部　結論及び提言

第1章　結　論

1－1 ドンノイ地区

ドンノイ地区の鉱徴状況調査とボーリング調査の結果から次の結論が得られた。

IP 異常域の余地で掘削された MJTM-6 孔の結果，この IP 高異常域はストック状花崗岩体を中心に形成されたスカルンに重複した銅・鉛鉱化帯である可能性がより鮮明となった。MJTM-6 孔で黄銅鉱の出現する 64m 付近は，IP 探査で把握された異常域（16mV-sec/V 以上）の上限深度とほぼ一致している。黄鉄鉱鉱染を含めて全体的に鉱徴が強くなる 140m以深は 20mV-sec/V 以上の IP 異常域に一致する。16mV-sec/V 以上の異常域は，直径 100m，延長 800mの広がりを持つ。MJTM-5 孔，MJTM-6 孔の結果からは下部すなわち花崗岩との接触部に向かって銅濃度が増加する傾向にあり，富鉱部はこの接触面に近い部分にある可能性が指摘される。しかし，スカルン中の銅鉱徴は偏在する傾向にあり，富鉱体の位置を特定することは難しいものと考えられる。

一方，ドンノイ地区西半部の石灰岩分布域に広がる亜鉛・鉛の地化学異常域は，140～250℃で高塩濃度の熱水鉱液が石灰岩中の節理や裂罅層理面などを通じて上昇し，石灰岩層の比較的上位のある層準で珪化帯を形成し，その直上で広範なドロマイト化と亜鉛・鉛鉱化作用を起こすとともに節理系や特定層準を交代した石英脈を形成し方鉛鉱・閃亜鉛鉱を沈殿させた。

ドロマイト化帯の石英脈では，80cm 幅で Zn=7.86%，Pb=2.82%，この石英脈を含む 20m 区間試料でも Zn=1.60%，Pb=1.43%の高い濃度となっており，亜鉛鉱体の賦存が期待される。しかしながら，石英脈の形成機構は，開口節理やある特定層準の層理沿いを交代するものであることから，賦存位置の推定には岩相や地質構造のより詳細な解明が必要である。

1－2 メーカナイ地域

MJTM-7 孔と過去の DMR のボーリング結果から，メーカナイ地区の IP 高異常域は，北東－南西方向に連続している断裂に沿った珪化帯を伴った鉱化帯に対応し，優勢な黄鉄鉱鉱染と黄銅鉱鉱徴を伴う。黄銅鉱は，深度 129m付近で最も優勢であるが品位は低い。この鉱化帯は，西側尾根部に分布するゴッサン帯を形成した鉱液通路の可能性が指摘される。

第2年次調査の結果では，メーカナイ地区の亜鉛含有量の高いゴッサン帯は鉛直方向に連続すると考えられていた。ボーリング調査の結果，ゴッサン帯は地表部に 10 数 m の厚さでほぼ地表面に沿って分布していて，その下位にはほとんど目立った鉱徴が無いことが確認された。ゴッサン帯は，粘土化した泥岩ないし砂岩に挟在されて分布し，もともとは黄鉄鉱に富み閃亜鉛鉱を付随する塊状硫化鉱であったものが，風化によって黄鉄鉱が酸化し褐鉄鉱に変化し，閃亜鉛鉱は溶解流出してしまったものと想定される。ゴッサン付近の堆積岩は，特に下盤側で滑石－セリサイト－緑泥石－スメクタイトの粘土化作用を強く受けている。また，ゴッサン帯の上盤には白色粘土化を伴う熱水角礫状の珪化帯及び石英脈の発達が観察される。

現在のゴッサン帯は，メーカナイ地区地表部の尾根沿いから緩い東斜面のみに分布し，この地区の層理面が緩い東傾斜であることとボーリング結果をあわせて考えると，ゴッサン帯は石灰岩と一般堆積岩の境界部から数 m から 15m ほど堆積岩側，時には境界部に形成されていて，現在はその上面がほぼ地表面と一致して分布しているものと考えられる。ゴッサンの胚胎位置はほぼ同水準であることから，MJTM-8 孔と MJTM-9 孔及び DMR の MK-3 孔に挟まれた間の地域は，このゴッサン層準が地表面下にあり，地表下にゴッサン帯が隠されている可能性が高い。また，物理探査測線 E および D 測線の東端部には地表直下に IP 異常は東傾斜で分

布していて，地表下に塊状硫化鉱の賦存が想定される。

第２章　将来への提言

２－１ ドンノイ地区

ドンノイ地区北西部の石灰岩中に亜鉛鉱体が賦存する可能性があるが，賦存個所の推定には詳細な地質構造調査とドロマイト化の程度に注目することが肝要である。

ドンノイ地区中央の IP 異常域の 16mV-sec/V 以上の異常域は，銅鉱化作用を伴っている。現在までの３本のボーリング調査では稼行対象となるような品位・鉱量は見つかっていないが，まだ調査余地は残されている。

２－２ メーカナイ地区

潜頭性のゴッサン，塊状硫化鉱体の賦存可能性が高い地区東部での調査が望まれる。

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Appendices

Appendix 1 Microscopic observation of polished thin section of rock and ore sample

No.	Sample No.	Locality	Rock type	Ore minerals											Gang minerals																	Rock fragment
				Sulfide						Oxide		Hydroxide		Sulfate	Carbonate	Silica	Silicate												Oxide					
				Sphalerite	Galena	Chalcopyrite	Pyrite	Pyrrhotite	Arsenopyrite	Magnetite	Hematite	Cryptomelane	Goethite	Barite	Calcite	Quartz	K-feldspar	Plagioclase	Biotite	Muscovite	Chlorite	Clay Mineral	Amphibole	Clinopyroxene	Epidote	Garnet	Cordierite	Tourmaline	Sphene	Zircon			
1	MJTM-6(89.50m～89.70m)	MJTM-6(Dong Noi)	Green Skarnized rock	○	・	・	○								◎	○			◎	△	△	△										
2	MJTM-6(126.6m)	MJTM-6(Dong Noi)	Magnetite skarn			・	○			◎					・	○			◎	△	◎	△										
3	MJTM-6(129.65m)	MJTM-6(Dong Noi)	Magnetite skarn			・	○			◎					○	○			◎		○	△										
4	MJTM-6(154.03m)	MJTM-6(Dong Noi)	Green Skarnized rock	・	△		○	・		○				・	◎				◎				○									
5	MJTM-6(168.40m～168.45m)	MJTM-6(Dong Noi)	Aplite dike													◎	○	○	○	○	△											
6	MJTM-6(178.70m～178.80m)	MJTM-6(Dong Noi)	Green Skarn	△	△	○	○	△							○	○					○	△	◎	△	○							
7	MJTM-7(85.80m～85.95m)	MJTM-7(Mae Kanai)	Magnetite skarn			△	○			◎					○	○					◎	△										
8	MJTM-7(94.70m～94.95m)	MJTM-7(Mae Kanai)	Green Skarnized rock(quartz-calcite vein)	◎		・	・								○	◎						△										
9	MJTM-7(129.10m～129.20m)	MJTM-7(Mae Kanai)	Magnetite skarn			◎	・								◎	◎						△										
10	MJTM-8(21.60m～21.80m)	MJTM-8(Mae Kanai)	altared limestone			・	△								◎					・		・										
11	MJTM-8(139.45m)	MJTM-8(Mae Kanai)	Green Skarnized rock												○	◎			○	○		△										
12	MJTM-10(69.9m)	MJTM-10(Mae Kanai)	dolomitic limestone				○								○	△				○	○											
1	D20-26	Dong Noi	dolomitic limestone(calcite-quartz vein)	◎	◎	・	・	・					○		◎	○				・					○							

Legend ; ◎:Abundant ○:Common △:Minor ・:Rare

Appendix 2 Result of X-ray diffraction analysis

No.	Sample No.	Locality	Rock type	Clay Mineral						Silica	Carbonate			Sulfate	Sulfide	Oxide	Hydroxide	Other silicate			etc.
				Saponite	Smectite	Chlorite/smectite	Chlorite	Sericite	Talc	Quartz	Calcite	Dolomite	Siderite	Barite	Pyrite	Hematite	Goethite	Plageoclase	K-Ferdspar	Albite	
1	MJTM-6(16.10m)	MJTM-6(Dong Noi)	green skarnized rock				・		・		◎	△									
2	MJTM-6(148.00-148.05m)	MJTM-6(Dong Noi)	green skarnized rock								△	・		○							
3	MJTM-6(176.90m)	MJTM-6(Dong Noi)	green argillic rock				・		△		◎										
4	MJTM-7(129.10m)	MJTM-7(Mae Ka Nai)	green argillic rock	・			・	・		○	・				・			・	・		
5	MJTM-7(163.00m)	MJTM-7(Mae Ka Nai)	green argillic rock	・			△	・		○	・							・	・		
6	MJTM-7(252.00m)	MJTM-7(Mae Ka Nai)	green argillic rock	△			・			・	・									○	
7	MJTM-8(8.20-8.30m)	MJTM-8(Mae Ka Nai)	hydrothermal altered clay				・		・	・			・				・				
8	MJTM-8(10.00-10.25m)	MJTM-8(Mae Ka Nai)	reddish brown limonite					・		・							・				
9	MJTM-8(13.50-13.60m)	MJTM-8(Mae Ka Nai)	hydrothermal altered clay				△			・			△								
10	MJTM-9(33.40m)	MJTM-9(Mae Ka Nai)	alteration clay		△		・	・	○												
11	MJTM-9(40.50m)	MJTM-9(Mae Ka Nai)	alteration clay		○		・	・	○	・									・		
12	MJTM-9(138.90m)	MJTM-9(Mae Ka Nai)	orange alteration zone		・		・		・		○	・									
13	MJTM-9(158.60m)	MJTM-9(Mae Ka Nai)	strong argillization zone		・		・	・	・		○	・									
14	MJTM-9(185.25m)	MJTM-9(Mae Ka Nai)	brown alteration zone		・		・				○	△									
15	MJTM-10(76.50-76.60m)	MJTM-10(Mae Ka Nai)	red brown alteration zone				・			・	◎	○									
16	MJTM-10(194.90m)	MJTM-10(Mae Ka Nai)	dolomitic limestone							・	△	◎									
1	D20-03	Dong Noi	brownish carbonate rock				・			・	・	◎									

Legend ; ◎:Abundant ○:Common △:Minor ・:Rare

Appendix 4 Ore assay data of core sample

(1)

SAMPLE	Beginning (m)	END (m)	Au ppb	Ag ppm	Cu ppm	Fe %	Mn ppm	Pb ppm	Zn ppm
6-01	49.85	50.25		<5	14	750	5.36	3120	3440	2220
6-02	69.40	70.30		<5	<1	20	2.84	6210	15	85
6-03	84.70	84.80		<5	38	570	6.74	3850	39100	290
6-04	88.50	89.70		<5	6	625	7.36	5050	925	10830
6-05	106.80	109.60		<5	1	1835	>30.0	6160	25	35
6-06	144.40	144.90		<5	6	4240	5.17	4620	180	375
6-07	147.40	148.05		<5	47	5720	3.62	2610	1615	780
6-08	149.20	150.90		<5	4	735	5.39	3290	660	320
6-09	151.70	151.80		<5	7	145	3.81	4370	3710	125
6-10	152.05	152.35		<5	29	720	4.74	2540	5570	330
6-11	152.35	153.90		<5	3	365	5.18	2900	325	295
6-12	153.90	154.40		<5	21	270	5.93	3180	12210	240
6-13	154.40	155.25		<5	12	70	5.55	3120	6990	220
6-14	155.25	157.70		<5	9	255	5.54	3520	3770	255
6-15	164.00	164.45		<5	1	105	5.54	3850	350	145
6-16	177.10	177.60		<5	4	1715	5.4	4270	55	260
6-17	177.90	178.55		<5	3	1235	6.19	4380	290	360
6-18	178.55	178.85		<5	29	32900	15.25	3060	1680	3170
6-19	178.85	179.10		<5	3	2520	2.51	650	1265	515
6-20	179.10	180.30		<5	1	2080	9.88	5170	15	255
6-21	180.30	181.00		5	2	1975	7.83	1500	10	210
7-01	54.40	54.50		<5	0.4	883	3.7	1870	6	18
7-02	55.20	55.50		<5	1	1115	1.34	1365	68	10
7-03	70.75	70.85		<5	3.8	6100	7.2	4290	16	54
7-04	85.80	85.95		<5	0.6	528	36.5	3140	28	56
7-05	94.70	94.75		10	<.2	191	2.53	580	<2	1.16%
7-06	126.00	127.00		<5	0.2	41	1.61	1645	382	318
7-07	127.00	127.40		15	1.4	103	2.76	1515	1105	1815
7-08	127.40	127.70		<5	<.2	119	1.37	1740	8	60
7-09	127.70	129.10		<5	<.2	110	2.3	645	2	70
7-10	129.10	129.20		80	41.4	18.45%	16.3	585	164	238
7-11	129.20	129.40		20	5.8	1.35%	2.05	325	10	30
7-12	129.40	129.50		10	2.4	6980	1.01	730	<2	16
7-13	129.50	130.70		<5	<.2	186	1.24	1610	16	30
7-14	135.00	136.00		<5	1.4	2560	3.34	1515	<2	76
7-15	136.00	136.70		<5	2	2180	2.01	860	<2	48
7-16	136.70	138.60		<5	<.2	128	2.66	850	<2	56
7-17	138.60	139.70		<5	<.2	37	1.26	865	6	32
7-18	139.70	140.90		<5	<.2	16	1.69	365	<2	40
7-19	177.00	177.10		10	4	3970	6.91	930	80	225
7-20	245.50	248.50		<5	<1	35	3.95	220	5	20
8-01	1.60	3.00		<5	<1	60	>30.0	28000	145	14780
8-02	3.00	5.00		<5	1	140	>30.0	26300	395	13580
8-03	5.00	6.00		<5	3	305	>30.0	29700	255	12920
8-04	10.20	11.95		<5	3	525	>30.0	28700	335	5560
8-05	14.25	14.30		<5	6	350	>30.0	10120	4160	3270
8-06	25.85	25.95		<5	<1	45	5.87	3320	135	150
8-07	27.00	27.20		<5	2	45	5.73	3260	450	145
8-08	31.65	31.85		<5	<1	35	3.61	3270	50	30
8-09	32.80	33.40		<5	<1	95	6.24	3860	40	50
8-10				5	12	8110	5.71	2610	<5	120
9-01	139.75	140.00		<5	<1	10	1.17	450	10	10
9-02	185.30	185.40		<5	<1	5	1.31	1210	70	80
9-03	188.70	188.75		<5	<1	5	0.91	1060	80	25
9X-1	0.00	2.50		<5	1	210	>30.0	>50000	385	3250
9X-2	16.50	16.55		<5	<1	<5	17.95	1590	1635	90
9X-3	24.80	24.90		<5	10	625	22.5	29500	1410	2490
SAMPLE	Beginning	END	Au	Ag	Cu	Fe	Mn	Pb	Zn

Appendix 3 Geochemical data of rock sample in the Northwestern of Dong Noi Area

SAMPLE	Au ppb	Ag ppm	Ca %	Cd ppm	Cu ppm	Fe %	Mg %	Mn ppm	Pb ppm	Zn ppm
D20-1	<5	<1	1.1	<5	<5	0.41	0.17	450	65	65
D20-2	<5	<1	29.4	<5	<5	1.52	1.81	15070	150	995
D20-3	<5	1	23.1	5	5	2.27	9.78	23400	11180	120
D20-4	<5	<1	12.8	<5	<5	0.68	3.37	6540	50	120
D20-5	<5	<1	>30.0	<5	<5	0.38	0.24	1430	100	125
D20-6	<5	<1	>30.0	<5	<5	0.31	0.26	1050	25	90
D20-7	<5	<1	27.9	<5	30	0.37	0.23	1090	35	75
D20-8	<5	<1	>30.0	<5	<5	0.57	0.18	1470	60	110
D20-9	<5	<1	>30.0	<5	5	0.54	0.35	1790	130	190
D20-10	<5	<1	>30.0	<5	<5	0.27	0.15	990	25	45
D20-11	<5	<1	>30.0	<5	<5	0.28	0.26	1160	25	60
D20-12	<5	<1	>30.0	<5	<5	0.42	0.36	1190	5	40
D20-13	<5	<1	0.7	<5	<5	0.42	0.30	190	20	70
D20-14	<5	<1	18.9	<5	<5	0.35	0.23	950	20	45
D20-15	<5	<1	>30.0	<5	<5	0.34	0.25	910	<5	30
D20-16	<5	<1	>30.0	<5	<5	0.34	0.26	750	35	65
D20-17	<5	<1	>30.0	<5	<5	0.46	0.30	1080	50	100
D20-18	<5	<1	>30.0	5	<5	1.67	1.81	8240	95	3180
D20-19	<5	<1	>30.0	<5	<5	0.40	0.37	920	15	150
D20-20	<5	<1	19.8	<5	<5	<.010	0.35	6080	40	765
D20-21	<5	<1	>30.0	<5	<5	0.42	0.82	2180	25	70
D20-22	<5	<1	23.9	<5	<5	0.28	0.17	700	95	25
D20-23	<5	<1	>30.0	<5	<5	0.24	0.21	860	<5	45
D20-24	<5	<1	11.5	<5	<5	0.31	0.19	550	<5	50
D20-25	<5	8	>30.0	75	15	0.62	1.66	4910	14270	16040
D20-26	<5	18	17.9	390	100	2.11	5.65	17180	28200	7.86%
D20-27	<5	<1	22.2	<5	<5	1.47	8.94	12400	180	330
D20-28	<5	<1	13.7	<5	<5	1.01	3.95	7410	215	615
D20-29	<5	<1	28.7	<5	45	0.89	4.14	6370	395	1840
D20-30	<5	<1	>30.0	<5	<5	0.28	0.22	1100	5	80
D20-31	<5	1	27.0	10	15	1.53	3.22	14310	970	2230
D20-32	<5	<1	27.9	<5	<5	0.76	4.96	6970	55	340
D20-33	<5	<1	27.5	5	5	0.96	3.18	6060	50	1860
D20-34	<5	<1	24.6	<5	<5	3.13	4.93	30700	50	820
D20-35	<5	<1	24.6	<5	5	1.42	6.05	10920	65	450
D20-36	<5	<1	0.3	<5	<5	0.36	0.06	1080	95	65
D20-37	<5	<1	10.7	<5	<5	0.31	0.11	960	45	35
D20-38	<5	<1	>30.0	<5	<5	0.26	0.20	1520	<5	80
D20-39	<5	<1	>30.0	<5	<5	0.27	0.26	1880	35	135
D20-40	<5	<1	>30.0	<5	75	1.64	0.27	13220	30	3020
D20-41	<5	1	>30.0	<5	5	0.48	0.31	1810	210	590
D20-42	<5	<1	19.5	<5	<5	0.53	0.80	3170	5	65
D20-43	50	<1	15.1	<5	15	1.04	2.22	3880	535	160
D20-44	<5	<1	27.9	<5	<5	0.33	0.21	1080	20	80
D20-45	<5	<1	13.9	<5	<5	0.51	1.63	2900	15	70
D20-46	<5	<1	>30.0	<5	<5	0.15	0.15	1020	15	75
D20-47	<5	1	28.3	<5	5	0.27	0.17	1650	65	130
D20-48	<5	<1	>30.0	20	5	0.29	0.16	1860	105	675
D20-49	<5	<1	25.8	<5	<5	0.31	0.13	1980	170	380
D20-50	<5	<1	23.7	5	<5	0.21	0.08	1460	125	355
D20-51	<5	<1	19.3	<5	<5	0.39	0.16	1040	85	210
D20-52	<5	<1	29.4	<5	<5	0.75	2.95	5870	15	80
D20-53	<5	<1	>30.0	5	20	0.22	0.15	1890	290	1385
D20-54	<5	<1	21.5	<5	<5	0.33	0.19	1530	25	90
D20-55	<5	<1	14.8	<5	5	0.41	0.10	1370	<5	40
D20-56	<5	1	19.7	<5	<5	0.23	0.12	1480	25	75
D20-57	<5	<1	11.6	<5	5	0.73	0.31	1670	30	115
D20-58	<5	<1	>30.0	<5	<5	0.98	0.54	7270	100	580
D20-59	<5	<1	22.9	5	<5	0.47	0.23	970	5	165
D20-60	<5	<1	29.7	5	<5	0.36	0.29	1350	60	185
D20-61	<5	4	27.3	5	60	4.16	0.20	18890	2680	2750

Appendix 4 Ore assay data of core sample

(2)

	(m)	(m)	ppb	ppm	ppm	%	ppm	ppm	ppm
10-01	25.00		<5	3.2	34	2.4	2170	274	296
10-02	56.25	56.30	<5	5	605	1.2	2170	9260	530
10-03	56.40	56.50	<5	57	100	1.41	680	7.29%	2990
10-04	59.25	59.28	<5	4	20	0.45	1370	13160	180
10-05	69.80	70.20	<5	<1	10	6.61	360	100	65
10-06	76.35	76.60	<5	<1	<5	1.04	2250	250	250
10-07	77.40	77.55	<5	<1	50	1.11	3120	225	190
10-08	79.75	81.00	<5	<1	10	1.08	2550	220	280
10-09	82.00	82.50	15	1	75	2.78	3270	25	45
10-10	55.00	55.10	<5	<1	5	2.17	2900	275	325

Appendix 5 Equipment of driiling survey

Item		Model/Spec.	Quantity	Remarks
Drilling Machine			3	
Rig No.1	Drill Rig	MPR-3(multi purpose)	1	made in Australia on Cat 320 Max HQ400m
	Engine	Detoroit 671	1	Detroit(USA) diesel 250HP
	Mud Pump	Bean Royal 435	1	Rexroth(Australia) 30gal/min
	Mud Mixer		1	hydraulic moter powered by MPR-3
Rig. No.2	Drill Rig	VK-600	1	Longyear Australia
	Engine	Detoroit 471	1	Detroit(USA) diesel 133HP
	Mud Pump	Bean Royal 435	1	Rexroth(Australia) 30gal/min
	Mud Mixer		1	hydraulic moter powered by VK-600
Rig. No.3	Drill Rig	Longyear 44	1	Longyear Australia
	Engine	F5L912	1	Klockner Humbordl Deutz AG, diesel 83HP
	Mud Pump	Bean Royal 435	1	Rexroth(Australia) 30gal/min
	Mud Mixer		1	hydraulic moter powered by LY-44
		LC614	2	FMC corporation(USA)
Drilling Rod		PQ	40	3.05m/rod
		HQ	115	3.05m/rod
		NQ	210	3.05m/rod
Core Barrel Assembly		PQ	4	2.60m(core length 1.60m)
		HQ	4	3.80m(core length 2.80m)
		HQ	4	2.60m(core length 1.60m)
		NQ	4	2.60m(core length 1.60m)
		NQ	4	4.20m(core length 3.50m)

Appendix 6 Articles of consumption during drilling survey

Item	Spec.	Total	MJTM-6	MJTM-7	MJTM-8	MJTM-9	MJTM-10
Metal Crown	5″	0					
Diamond Bit	HQ	15	3	4	2	3	3
	NQ	12	1	2	4	1	4
Reamer	HQ	6	2	1	1	1	1
	NQ	7	1	3	1	1	1
Casing Shoe	HW	5	1	1	1	1	1
	NW	4		1	1	1	1
Aus-Gel(bentonite)	Kg	4,225.0	962.5	425	2,000	387.5	450
MI-Gel(bentonite)	Kg	0					
Quick Trol	Kg	613.5	56.5	187	296	29.5	44.5
Ploymer	Liter	408	107	16	149	62	74
Liqui-Pol	Kg	0					
Aqua-Pac	Liter	0					
Aus-Plug	Kg	0					
LCM	bag	40			40		
Cement	kg	125			125		
Diesel oil	Liter	9,909	1,348	1,991	2,844	1,840	1,886
Core box	Box	217	38	56	43	40	40

Appendix 7 Core logging sheet

MJTM-6
MJTM-7
MJTM-8
MJTM-9
MJTM-10

Mae Sariang, Thailand **MJTM-6** (Scale 1/200) (1/1) (Depth: 0 m - 50 m)

Depth (m)	Geol Column	Core Shape	Structure	Vein	magnetite	galena	sphalerite	chalcopyrite	Fe-sulphide	Skarnization	Silicification	Argillization	Geologic Description: Rock	Geologic Description: Lithology	Results of Laborator: Sample Number	Results of Laborator
1.80													Top Soil	reddish brown soil		
													altered weathered mudstone	1.80-2.70m chocolate color clayey mudstone, strong weathered 2.70-3.10m light brown altered tuff 3.10-4.10m white altered tuffaceous mudstone 4.10-4.70m brown soil filled up open crack with organic material 4.80-5.70m light brown altered tuffaceous mudstone 5.70-8.10m brown soil filled up open crack with organic material 8.10-8.70m light gray clay with white altered tuff gravel		
8.70																
10			∠ 10°										dolomitic limestone	8.70-11.60m light gray & yellowish gray fine banding, dolomitic lime stone and altered tuff alternation 11.60-14.60m light gray to white, massive 12.00-12.40m orange to brown hairline well developed 12.40-12.60m brecciated part, strongly argilized 13.50-14.40m yellowish gray, brecciation & argilization strong		
14.60																
20													green skarn	green to dark green, massive with calcite veinlet network partly orange to brown colored alteration 19.80-20.00m fine grained pyrite dissemination 20.20-21.00m quartz vein network with dark green chlorite alteration 20.20-20.35m pyritization strong 20.35-20.45m chloritization strong 21.00-22.40m weak silicified 22.40-22.90m shear strong with chlorite 22.90-25.00m partly weak silicified with very weak pyritization 24.70m calcite vein w=2cm 25.00-27.80m calcite veinlet network with pyrite some of veinlets oxidized		
				∠ 40°												
27.80																
30													magnetite skarn	gray to dark gray, massive 29.00-30.00m magnetite rare 27.80-30.00m fine grained pyrite dissemination and veinlet remarkable 30.00-30.10m strong sheared with abundant pyrite 30.10-32.00m strong pyrite dissemination and veinlet, partly oxidized 32.00-37.50m pyrite hairline to veinlet network 31.00m quartz-calcite vein(w=2cm) with pyrite 31.70m quartz-calcite vein(w=3cm) with pyrite 35.50-35.70m oxidation remarkable 37.60-37.90m oxidation remarkable 37.90-50.00m dark gray to dark greenish gray, massive fine grained pyrite dissemination and veinlet remarkable 41.20-41.50m banded quartz-calcite vein w=2cm 44.00-45.00m coarse grained idiomorphic pyrite dissemination 48.40-48.90m calcite vein with galena clot, partly orange colored oxidation		
				∠ 20°												
				∠ 70°												
40																
				∠ 65°												
50																

Mae Sariang, Thailand **MJTM-6** (Scale 1/200) (2/1) (Depth: 50 m - 100 m)

Depth (m)	Geol Column	Core Shape	Structure	Vein	magnetite	galena	sphalerite	chalcopyrite	Fe-sulphide	Skarnization	Silicification	Argillization	Geologic Description: Rock	Geologic Description: Lithology	Results of Laborator: Sample Number	Results of Laborator
60			∠70°											dark greenish gray, massive fine grained dissemination and veinlet 50.70-51.60m calcite veinlet network with chlorite alteration, partly oxidized		
														52.80-55.80m calcite veinlet network developing with chlorite alteration, partly oxidation observed		
														59.30-60.00m strong coarse to fine grained pyrite dissemination with chlorite		
			∠60°											63.25-64.20m milky quartz vein developing with pyrite and chalcopyrite		
70			∠80°											65.00-69.30m Quartz veinlet well developing with strong pyritization 65.00m W=7cm milky quartz vein		
			∠70°										magnetite skarn	73.80-74.20m w=1cm milky quartz vein		
80														75.00-76.10m open cracks remarkable with strong oxidation		
						—		•						81.70-81.80m pyrite dissemination with galena and a litte chalcopyrite		
														87.60-88.10m shear zone, brittle core, highly oxidized		
90														88.00-91.70m quartz-calcite veinlet network remarkable strong pyritization with chalcopyrite and sphalerite		
														91.70-91.00m shear zone with dark green chlorite		
														91.00-91.95m strong pyritization 91.95-95.60m strong pyritization with a small amount of chalcopyrite		
														97.30-98.90m quartz-calcite veinlet developing, oxidation remarkable		
100														98.90-99.30m strong shear zone with chlorite alteration and strong pyritization		

Mae Sariang, Thailand **MJTM-6** (Scale 1/200) (3/4) (Depth: 100 m - 150 m)

Depth (m)	Geol Column	Core Shape	Structure	Vein	magnetite	galena	sphalerite	chalcopyrite	Fe-sulphide	Skarnization	Silicification	Argillization	Rock	Lithology	Sample Number	Results of Laborator
110			∠70°											100.10-100.70m calcite veinlet network, oxidation remarkable 102.60-103.00m shear zone with phyllitic texture, dark green chlorite and pyrite abundant 103.00-105.00m pyrite dissemination strong 106.70-107.30m strong pyrite dissemination with a small amount of chalcopyrite 109.00-109.60m strong pyrite dissemination with a small amount of chalcopyrite dark green to dark gray, massive, pyritization strong 111.80m milky quartz vein with pyrite, w=1cm		
120													magnetite skarn	121.70-122.70m chalcopyrite spotted 122.00-125.30m garnet abundant		
130			∠60°											129.00-129.60m brecciated texture remarkable, quartz veinlet abundant 129.60-130.50m calcite-quartz veinlet developing with chalcopyrite and much pyrite 131.60-131.80m milky quartz vein (w=20cm) with abundant pyrite 131.80-135.00m a small amount of chalcopyrite spotted		
140			∠70° ∠60°											138.70-139.50m quartz veinlet network developing 140.10-140.20m quartz-calcite vein w=3cm 140.60-140.80m milky quartz-calcite vein w=5cm 140.80-141.80m shear zone, strong argilic alteration 141.80-142.80m light gray to gray, silicified skarn with pyrite 142.80-143.10m dark green strong chloritization 143.10-144.10m light gray to gray, silicified skarn with pyrite 144.10-144.90m quartz veinlet network with chalcopyrite and pyrite		
150														145.98-146.05m quartz vein w=5cm, strong chlorite alteration around vein 147.00-148.50m quartz veinlet well developing 147.30-148.05m a small amount of chalcopyrite dissemination 148.30m- pyrrhotite dessemination remarkable 149.30-150.00m a small amount of chalcopyrite scattered		

Mae Sariang, Thailand **MJTM-6** (Scale 1/200) (1/1) (Depth: 150 m - 200 m)

Depth (m)	Geol Column	Core Shape	Structure	Vein	magnetite	galena	sphalerite	chalcopyrite	Fe-sulphide	Skarnization	Silicification	Argillization	Geologic Description: Rock	Geologic Description: Lithology	Results of Laborator: Sample Number	Results of Laborator
160													magnetite skarn	150.60-150.80m a small amount of chalcopyrite mineralization 151.70m quartz vein w=1cm with galena 152.05-152.35m pyrrhotite, pyrite, chalcopyrite, galena Ag-mineral? dissemination 153.00-153.10m pyrrhotite, pyrite, chalcopyrite dissemination 153.90-154.10m pyrite, galena pyrrhotite, chalcopyrite, Ag-mineral? dissemination 154.65-154.85m galena scattered 155.00-155.80m galena scattered 155.90-156.00m a small amount of pyrrhotite, chalcopyrite dissemination 157.00-157.80m quartz veinlet network 157.80-165.00m fine grained pyrite dissemination with a small amount of pyrrhotite partly accompanied with galena		
165.00													green skarn	dark grayish green, with magnetite dark green biotite rich partly with pyrrhotite and chalcopyrite 167.70-167.90m light green chlorite alteration		
167.90													aplite	fine grained, massive, idiomorphic biotite rich 188.90-188.95m very fine grained at contact with chloritization		
168.95																
170													magnetite skarn	dark gray to dark green, massive, abundant magnetite with a small amount of pyrrhotite and pyrite 172.20-172.70m a large amount of magnetite 173.10-175.00m a small amount of galena scattering 176.50m milky quartz vein w=3cm 176.50-177.10m milky quartz veinlet network developing silicification and chloritization with strong pyritization and a small amount of chalcopyrite and galena 177.10-177.50m strong silicification with abundant pyrite and a small amount of chalcopyrite 177.50-177.60m milky quartz vein 178.00-178.30m milky quartz veinlet network developing silicification with strong pyritization and a small amount of chalcopyrite and pyrrhotite 178.30-178.55m strong pyritization with a small amount of galena 178.55-178.85m strong chalcopyrite and pyrrhotite mineralization with a small amount of galena 179.10-180.00m strong pyritization with a small amount of galena, pyrrhotite and chalcopyrite 180.30-180.70m pyrrhotite and chalcopyrite mineralization		
180				∠70° ∠20°												
181.05													granite	potash feldspar porphyritic biotite hornblende granite 181.05-181.70m light green alteration (montmorillonite-chlorite) 181.30-181.50m coarse grained pyrite on open fracture		
190																
200																

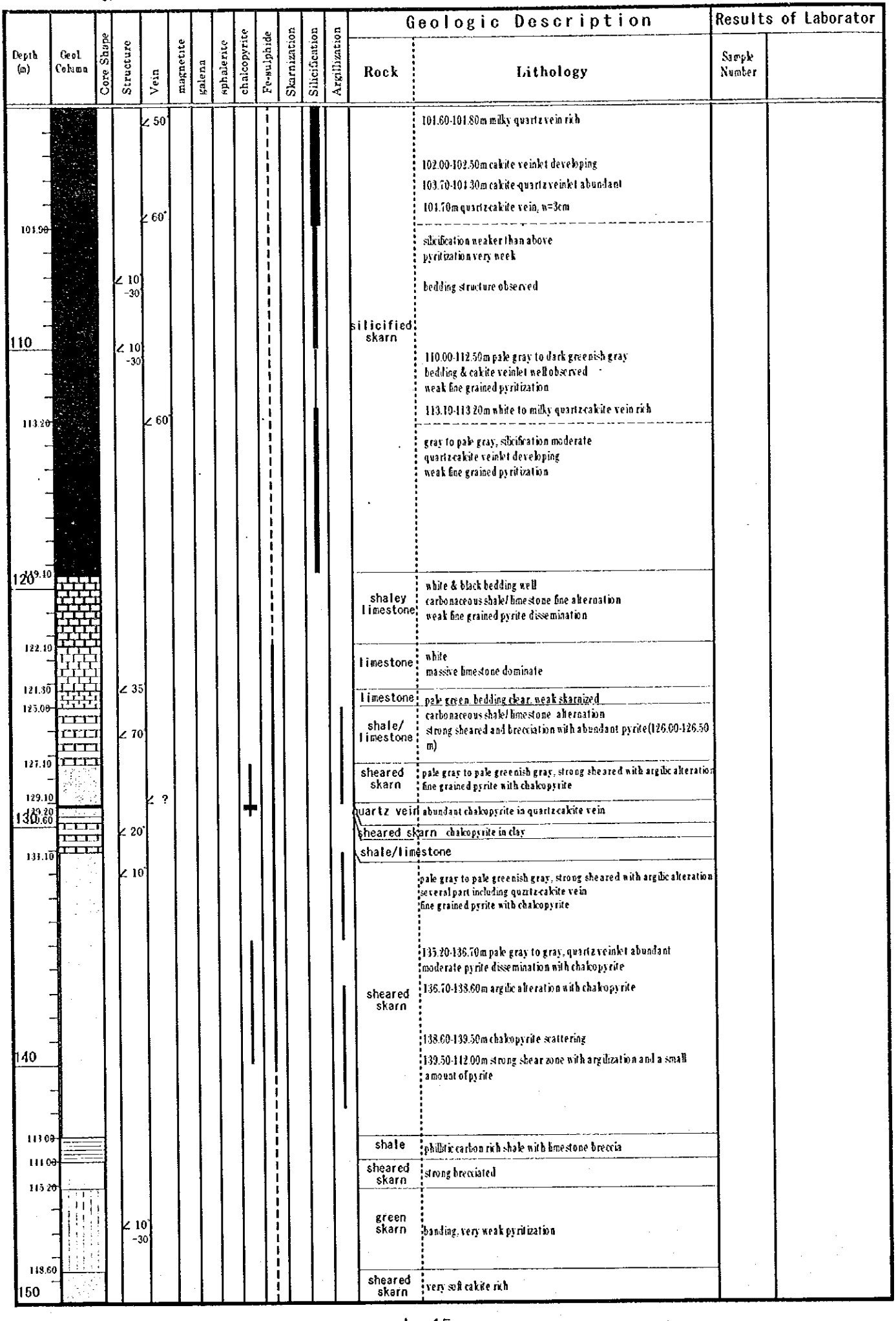
Mae Sariang, Thailand **MJTM-7** (Scale 1/200) (1/6) (Depth: 0 m - 50 m)

Depth (m)	Geol Column	Core Shape	Structure	Vein	magnetite	galena	sphalerite	chalcopyrite	Fe-sulphide	Skarnization	Silicification	Argillization	Geologic Description: Rock	Geologic Description: Lithology	Results of Laborator: Sample Number	Results of Laborator
													Top Soil	brown to reddish brown		
3.70													granule congl.	pale gray rework sediment along stream		
8.60													fine sandstone	yellowish gray to phe brown strong weathered, with Fe oxide mineral		
10 9.90													weathered skarn	pale yellow to pale orange strong weathered		
				∠ 40°									green skarn	dark green massive to banding structure to 18.00m fine to coarse grained pyrite disseminated with a small amount of magnetite at 16.20m chalcopyrite film 18.00-18.20m epidote vein, w=5mm		
20				∠ 60°										19.70-25.00m pyrite dissemination very weak 21.20m calcite(quartz) vein, w=1cm		
				∠ 20°										22.75m calcite(quartz) vein, w=1cm		
			∠ 30°											25.00-25.50m fine grained pyrite dissemination 25.50-26.70m pyrite dissemination weak		
			∠ 10° -30°											26.70-28.20m coarse to fine grained pyrite dissemination 28.20m calcite(quartz) vein, w=1cm 28.20-28.70m pyrite dissemination weak		
				∠ 40°										28.70-30.00m coarse to fine grained pyrite dissemination 30.10m calcite(quartz) vein, w=1cm		
30			∠ 10° -30°	∠ 60°										31.00-33.00m fine to coarse grained pyrite disseminated with a small amount of magnetite		
33.00			∠ 30° -40°										silicified skarn	pale greenish gray to white, massive		
34.40			∠ 60°										green skarn	banding structue remarkable fien to coarse pyrite dissemination with magnetite 38.30-38.40m magnetite rich 40.50-41.00m calcite-quartz vein network 41.90-42.10m argilic alteration 42.30-42.50m calcite veilet abundant 43.70-44.00m calcite veilet abundant 45.00-50.00m banding structue remarkable 45.00-50.00m banding structue remarkable 46.40-47.80m coarse grained pyrite disseminated with a small amount of magnetite		
40				∠ 40° -50°												
			∠ 20° -30°													
50																

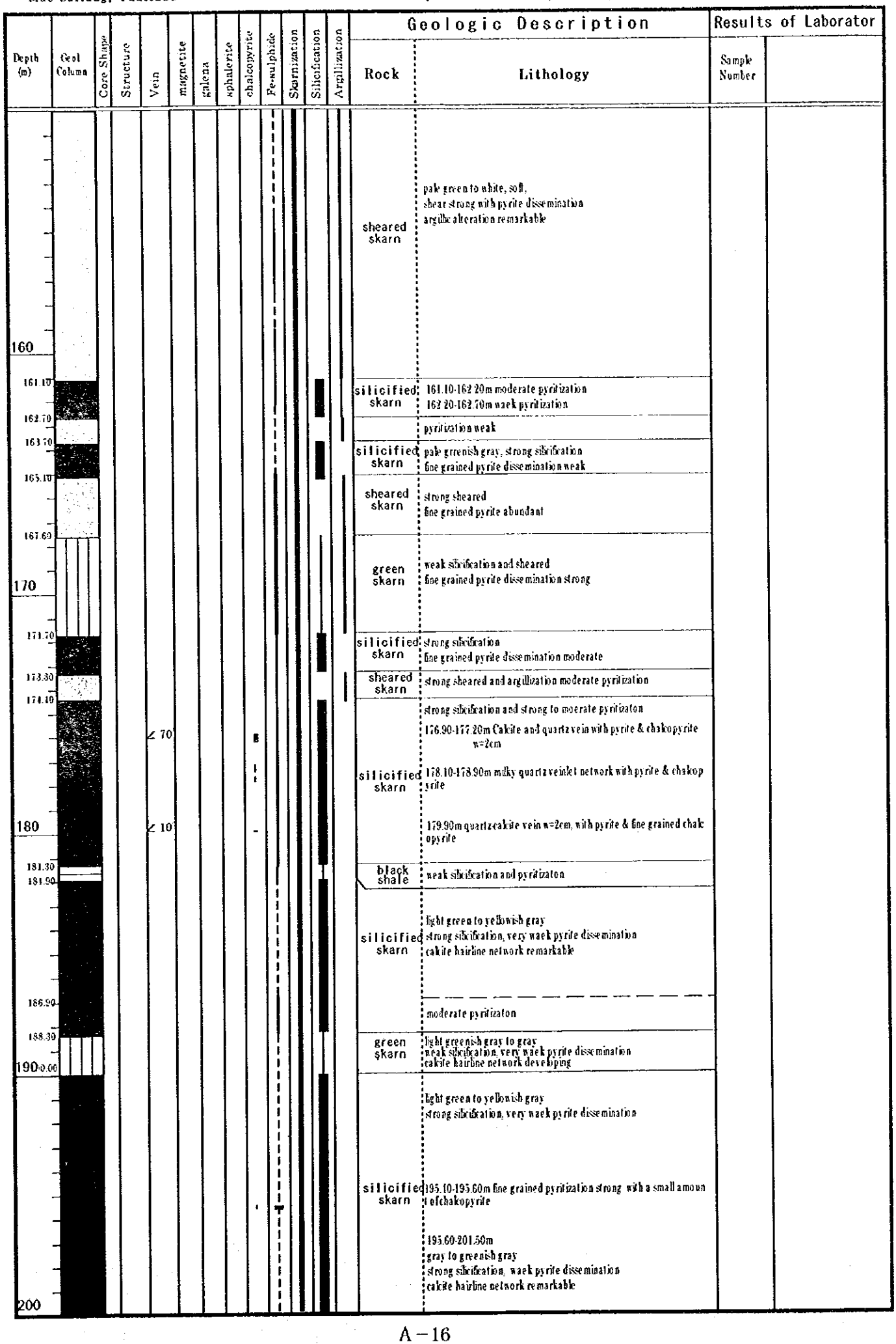
Mae Sariang, Thailand **MJTM-7** (Scale 1/200) (2/6) (Depth: 50 m - 100 m)

Depth (m)	Geol Column	Core Shape	Structure	Vein	magnetite	galena	sphalerite	chalcopyrite	Fe-sulphide	Skarnization	Silicification	Argillization	Rock	Lithology	Sample Number
			∠10°											50.20-50.60m dark green, magnetite rich	
			∠20°-30°											51.00-53.00m banding structure remarkable	
														53.60-54.10m calcite veinlet developing	
														54.20-54.60m dark green part with chalcopyrite film	
														55.0-55.80m calcite-quartz vein network with chalcopyrite film	
				∠40°										56.80m calcite vein, w=1cm	
60															
				∠50° ∠60°										60.10m calcite-quartz vein, w=3cm 60.50m calcite-quartz vein, w=1cm	
														60.20-61.80m brecciated zone	
														63.10-64.00m calcite veinlet developing	
			∠5°-15°										green skarn	64.00-65.70m banding structure developing, pyritization weak	
			∠5°-10°											66.90-85.50m banding and brecciated zone	
70														fine grained pyritization and calcite veinlet remarkable	
														70.75m chalcopyrite dissemination	
			∠40°-60°												
80															
				∠80°										81.30-81.80m calcite-quartz vein, w=3cm	
														85.50-86.30m dark green to dark gray, magnetite rich zone with very fine chalcopyrite	
														87.20m- coarse grained pyritization strong with magnetite	
90															
91.30															
				∠60°		-	-	-					silicified skarn	pale gray to gray strong silicification fine grained pyrite dissemination weak	
														91.75m w=2cm, quartz-calcite vein with chalcopyrite, sphalerite, galena, pyrite	
100															

Mae Sariang, Thailand **MJTM-7** (Scale 1/200) (3/6) (Depth: 100 m - 150 m)



Mae Sariang, Thailand **MJTM-7** (Scale 1/200) (4/6) (Depth: 150 m - 200 m)



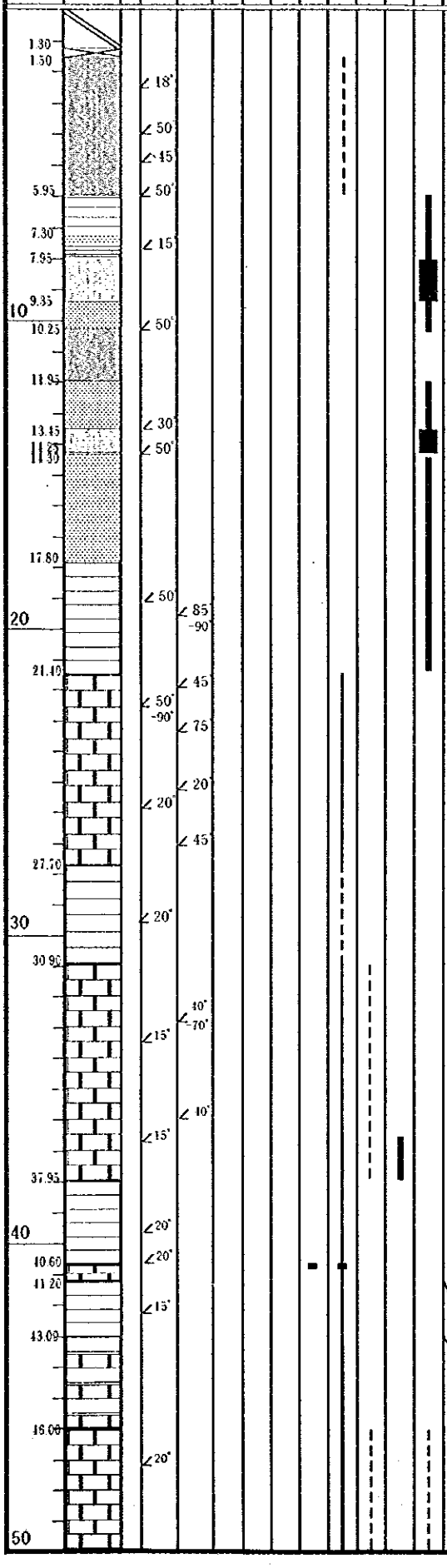
Mae Sariang, Thailand **MJTM-7** (Scale 1/200) (5/6) (Depth: 200 m - 250 m)

Depth (m)	Geol. Column	Core Shape	Structure	Vein	magnetite	galena	sphalerite	chalcopyrite	Fe-sulphide	Skarnization	Silicification	Argillization	Rock	Lithology	Sample Number	Results of Laborator
201.50													sheared skarn	pale green to white, soft, shear strong with pyrite dissemination argilic alteration remarkable, weak silicification		
203.00																
				∠ 10°				-						greenish gray, strong silicification pyrite dissemination moderate		
														203.00-210.00m calcite hairline abundant developing		
														205.20m quartz-calcite vein, w=1cm, with pyrite & chalcopyrite		
210													silicified skarn	212.70-213.50m shear zone, argillic alteration and strong pyritizatio n		
														216.30-216.50m weak shear with argilic alteration		
219.00																
220													sheared skarn	strong shear zone on silicified skarn pyritization moderate		
220.70																
														greenish gray to gray strong silicification and moerate pyritizaton partly with shear zone calcite hairline remarkable		
				∠ 60°									silicified skarn	226.60m quartz-calcite vein, max 10cm		
														226.70-227.20m strong sheared with argillization		
230																
														231.00-235.50m strong shear zone on silicified skarn weak argillization		
														237.0-238.00m strong shear zone on silicified skarn weak argillization		
239.00																
240														dark greenish gray to light gray strong shear on silicified skarn with weak argillization(chlorite-smecti te-kaolinite?) fine to coarse grained pyritization strong		
													sheared skarn	245.00-248.50m coarse to fine grained pyrite dissemination very str ong		
248.50																
250														light green to white, strong shear on green skarn strong argillization, partly with silicification fine to coarse grained pyritization strong		

Mae Sariang, Thailand **MJTM-7** (Scale 1/200) (6/6) (Depth: 250 m - 270 m)

Depth (m)	Geol Column	Core Shape	Structure	Vein	magnetite	galena	sphalerite	chalcopyrite	Fe-sulphide	Skarnization	Silicification	Argillization	Geologic Description: Rock	Geologic Description: Lithology	Results of Laborator: Sample Number	Results of Laborator
251.20													sheared skarn	light green to white strong shear, strong argilization(chlorite-smectite-kaolinite?) with silicification fine to coarse grained pyritization very strong		
260														green to light green strong shear, strong argillization(chlorite-smectite-kaolinite?) with weak silicification fine to coarse grained pyritization very strong		
														green to light green strong shear, with silicification fine to coarse grained pyritization very strong		
261.00														strong silicification fine to coarse grained pyritization very strong		
261.60													green skarn	dark green to green massive, weak pyritization		
267.80														white to light green brecciation remarkable, moderate pyritization		
269.20														dark green, massive, idiomorphic pyrite dissemination moderate		
270																

Mae Sariang, Thailand **MJTM-8** (Scale 1/200) (1/5) (Depth: 0 m - 50 m)



Geologic Description

Rock	Lithology
Fill up Soil	soil & gravel
Top Soil	dark reddish brown soil with gossan gravel
gossan	dark reddish brown to light yellowish brown wavy banded texture, almost turn into limonite, partly remaining pyrite 1.25-1.30m white clay 1.80m w=3cm white clay
shale	yellow/pink mixed colored argillic alteration strong
shale/ sandstone	fine alternation argillic alteration strong
clay	light bluish gray, hydrothermal altered clay
sandstone	light yellow, fine-grained, argillic alteration strong
gossan	reddish brown to yellow, limonite rich, mixed with abundant clay
sandstone	11.95-12.15 light bluish gray clay light yellow, fine-grained, argillic alteration strong
clay	light bluish gray, hydrothermal altered clay
gossan	dark reddish brown, pyrite remaining
sandstone	light yellow, fine-grained, argillic alteration strong 16.00-16.30m altered shale interbedded
shale	yellow, fine banded highly hydrothermal altered vertical hairline crack abundant developing with manganese oxide film
dolomite	purple to light gray quartz-calcite-chlorite hairline and veins well developing with a small amount of pyrite partly brecciated texture remarkable 21.60m galena in clacite vein 21.70m calcite vein w=3cm with breccia 23.05-23.25m quartz-calcite vein w=1cm network 25.85-25.90m calcite-quartz vein with abundant pyrite 25.90-25.95m gossan below 26.30m chloritization stronger 26.95-27.10m light brown mineral vein with calcite-quartz vein
shale	yellowish brown to orange, fine bedding highly hydrothermal altered with abundant limonite
dolomite	dark greenish gray, weak skarnized 31.45-31.90m light brown carbonate mineral replacing along bedding 32.80-33.00m quartz-calcite vein network with hematite and brown mineral 33.05-33.25m brown mineral in quartz-calcite veinlet 35.10-35.60m calcite-quatz pool 35.80-36.00m calcite quartz vein 36.50-37.95m well bedded structure, silicification strong, pyrite vein along bedding
siliceous shale	dark gray, carbonaceous, well banding brecciated texture remarkable with calcite-quartz veinlet pyrite weak disseminated
dolomite	40.60-40.80m green brecciation strong with chalcopyrite-pyrite dissemination dark gray brecciated texture with calcite-quartz veinlet
siliceous shale	dark gray, carbonaceous, well banding pyrite weak disseminated
dolomite/ siliceous shale	green skarnized dolomite and shale alternation pyritization moderate
dolomite	light green weak skarnized, chloritization pyritization moderate

Results of Laborator	
Sample Number	

Mae Sariang, Thailand **MJTM-8** (Scale 1/200) (2/5) (Depth: 50 m - 100 m)

Depth (m)	Geol Column	Core Shape	Structure	Vein	magnetite	galena	sphalerite	chalcopyrite	Fe-sulphide	Skarnization	Silicification	Argillization	Rock	Lithology	Sample Number
			∠60°	∠15°									dolomite	50.50 calcite-quartz vein w=1cm 51.10-51.20m pyrite abundant 51.65m calcite vein with pyrite 52.50m pyrite abundant along crack 52.80-57.10m pyrite dissemination weak 53.90m calcite-quartz vein w=5cm 54.10-54.70m shear strong 56.00m calcite-quartz vein w=1cm 56.80-57.10m shear zone, brittle core	
57.10			∠80°	∠80°											
			∠65°	∠60°											
60			∠80°										muddy dolomite	light gray to gray, well banded pyrite dissemination weak 61.10-61.30m calcite-quartz vein w=1cm 61.30m-vertical calcite vein, w=5mm 61.60m open crack with idiomorphic calcite	
			∠45°	∠75°											
				∠90°											
67.50															
68.50													dolomite	dark green, skarnized, fine-grained pyrite dissemmination	
70													siliceous shale	gray, fine bedded abundant shear cracks with calcite hairline pyrite dissemination weak	
76.30													chert	light brown, weak pyritization crashed brittle core	
80 79.70													sheared limestone/ shale	black to gray shale and limestone alternation w=10-100cm each strong sheared, almost turn into clayey limestone clastic pebble in carbon rich clay partly remaining limestone core with pyrite	
90															
			∠50°											98.60m slickenside in clayey shale	
100			∠50°											99.30m slickenside in clayey shale	

Mae Sariang, Thailand **MJTM-8** (Scale 1/200) (3/5) (Depth: 100 m - 150 m)

Depth (m)	Geol. Column	Core Shape	Structure	Vein	magnetite	galena	sphalerite	chalcopyrite	Fe-sulphide	Skarnization	Silicification	Argillization	Rock	Lithology	Sample Number	Results of Laborator
			∠60° ∠60°											100.30m slickensisle in clayey shale 100.60m slickensisle in clayey shale		
102.20													siliceous shale	light gray, fine banding brittle core of pebble sized a small amount of pyritization		
104.20													sheared limestone/ shale	black to gray shale and limestone alternation w=10-100cm each strong sheared, almost turn into clayey limestone clastic pebble in carbon rich clay partly remaining limestone core with pyrite		
110	109.40												skarnized dolomite	green, dolomitic part remaining in lenticular shear strong, brittle to pulverizing 110.80-111.30m light bown cherty shale seam interbedding		
115.30			∠35°										sheared limestone/ shale/ green skarn	black, green, white alternative 20-50cm width strong sheared, almost turn into clayey and breccia 117.10m slickensisle 117.90-120.30m pyrite dissemination remarkable		
120			∠50°													
125.60			∠50°										sheared green skarn	dark green to green, storng sheared, core brittle to pulverized 128.60m slickensisle 130.30-132.00m core shape remained 131.40-132.00m silicfied skarn, very fine pyrite dissminated		
130			∠75°													
133.90			∠35°										green skarn	dark green, banded structure remarkable light gray chert seam interbedding 131.20m pyrite dissminated along crack 131.70-135.90m hardly crash and pulverized bby shear zone 136.00-138.20m idiomorphic pyrite dissemination along bedding		
138.20													silicified skarn	light green to green, banded structure remarkable quartz-calsite veinlet network developing, fine pyrite dissemination		
139.40			∠45°										sandostone	dark gray, massive, calcareous hornfelsic with little large porphyroblast pyrite dissemination moderate		
140	140.10		∠50°													
			∠40°											green, banded structure remarkable fine grained pyrite dissemonation weak to moderate 142.10-143.30m quartz segregation seam along beding with chlorite		
				∠50°										143.60m calsite quartz vein w=3cm		
				∠15°									silicified skarn	145.15-145.20m brecciated quartz vein		
				∠10°										147.40m quartz vein w=6mm		
			∠50°											148.00-148.80m quartz-calsite vein w=1-5cm network with chlorite 149.00-150.90m remarkably platy bedded		
150																

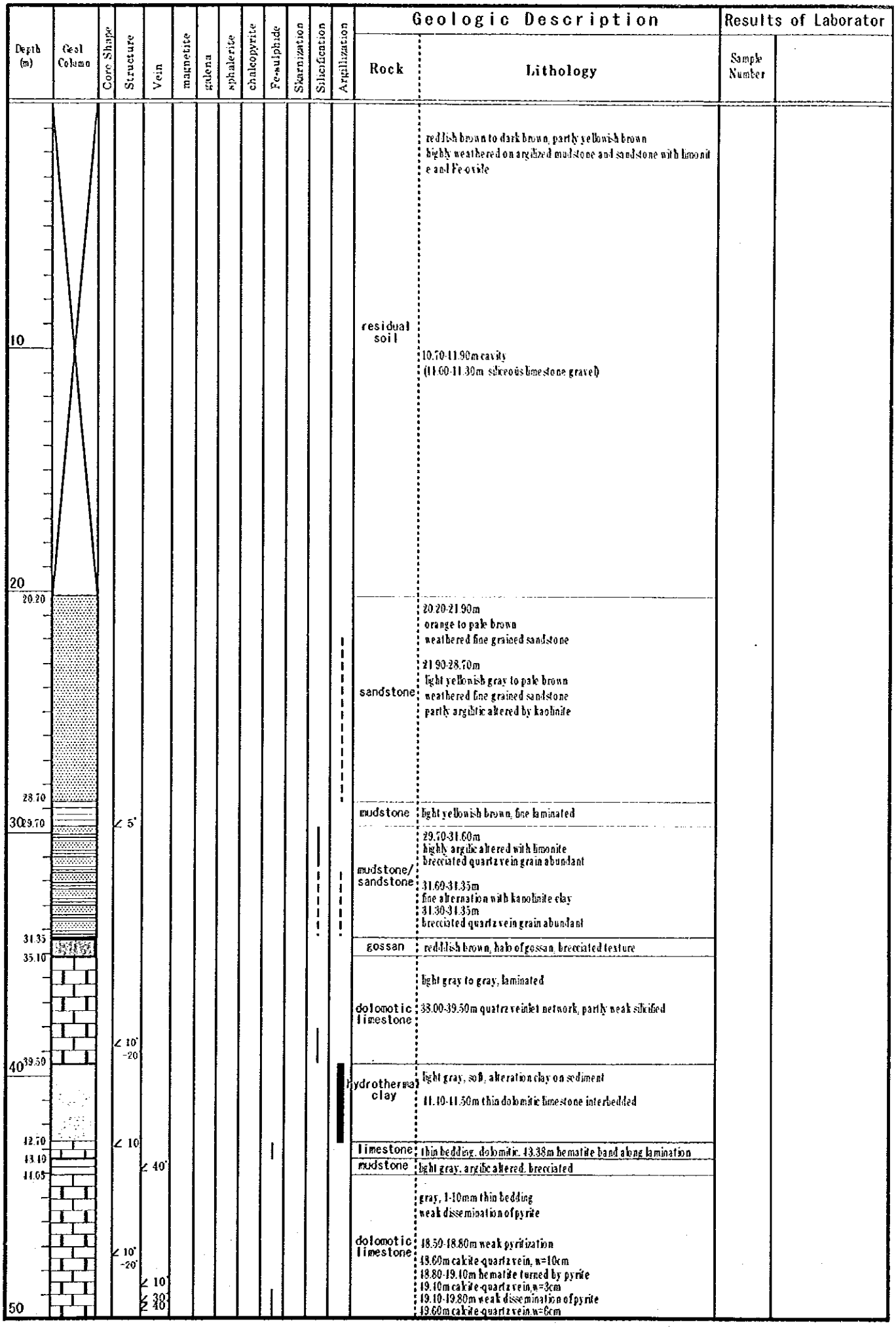
Mae Sariang, Thailand **MJTM-8** (Scale 1/200) (1/5) (Depth: 150 m - 200 m)

Depth (m)	Geol Column	Core Shape	Structure	Vein	magnetite	galena	sphalerite	chalcopyrite	Fe-sulphide	Skarnization	Silicification	Argillization	Geologic Description: Rock	Geologic Description: Lithology	Results of Laborator: Sample Number	Results of Laborator
160			∠40°										siliciefied skarn	151.20m quartz seggrigtion seam w=1-1mm		
160.90			∠40°													
			∠40°	∠50°												
														156.20-157.00m quartz-calcite hairline network remarkable		
														158.00-159.00m quartz-calcite hairline network remarkable 158.80-158.90m pyrite-chalcopyrite spot in quartz-calcite vein		
			∠40°													
			∠35°										chert/ green skarn	light brown & green fine alternation quartz hirline well developing pyrite dissemination along chlorite veinlet		
														163.10-163.50m calcite-quartz vein w=5-10mm irregular form		
165.70				∠20°										165.20m pyrite abundant disseminated along chlorite vein		
			∠40°										green skarn	dark green to green, well banding structure pyrite dissemination not so much 166.20-166.25m quartz seggrigation seam 166.30-166.80m remarkable dissemination of pyrite		
170				∠40°										167.30m quartz seggrigtion seam w=1-1mm 168.40m quartz-chlorite vein		
				∠30°										170.50-173.70m pyrite moderate disseminated along bedding		
			∠30°											171.15-171.30m quartz vein with chlorite		
173.70																
													chert/ green skarn	light brown & green fine alternation pyrite dissemination along bedding		
180														179.80m-181.50m quartz-calcite vein network w=1-10mm		
			∠35°											182.30-186.90m brittle core by shaer zone 185.10-185.70m water rush out 200L/minute 185.10-187.10m sandstone hornfels seam interbedded		
			∠30°													
			∠5°													
			-15°													
188.00			∠40°											light purplish gray with light green seam by chlorite-epidote pyrite dissemination weak		
190																
			∠35°													
			∠40°										sandstone hornfels	191.60-191.80m pyrite dissemination moderate along bedding		
														195.70-197.60m quartz-calcite vein abondant w=3-5mm		
				∠15°												
				-90°												
197.60													green skarn	dark green to green, massive		
199.00																
200																

Mae Sariang, Thailand **MJTM-8** (Scale 1/200) (3/3) (Depth: 200 m - 250 m)

Depth (m)	Geol. Column	Core Shape	Structure	Vein	magnetite	galena	sphalerite	chalcopyrite	Fe-sulphide	Skarnization	Silicification	Argillization	Geologic Description: Rock	Geologic Description: Lithology	Results of Laborator: Sample Number	Results of Laborator
201.00													sandstone hornfels	light purplish gray with light green seam by chlorite-epidote pyrite dissemination weak		
209.20													green skarn	dark green to green, massive pyrite dissemination weak		
210			∠ 60° -85°											white, strong silicified, partly remain green skarn patch brecciated texture remarkable with chlorite hairline crack well developing with abundant pyrite		
			∠ 70° -85°											211.15-211.80m dark green massive skarn interbedding		
													silicified skarn	211.80-222.90m silicification weaker than above, chlorite rich brittle core pebble size		
220			∠ 70° -85°													
222.90																
23																
24																
25																

Mae Sariang, Thailand **MJTM-9** (Scale 1/200) (1/1) (Depth: 0 m - 50 m)



Mae Sariang, Thailand **MJTM-9** (Scale 1/200) (3/1) (Depth: 50 m - 100 m)

Depth (m)	Geol Column	Core Shape	Structure	Vein	magnetite	galena	sphalerite	chalcopyrite	Fe-sulphide	Skarnization	Silicification	Argillization	Geologic Description: Rock	Geologic Description: Lithology	Results of Laborator: Sample Number	Results of Laborator
														dark gray to light gray 1-10mm thin parallel bedded hematite band developing several part 51.60-52.00m oxidization remarkable 52.00m- weak pyrite dissemination		
				∠ 10°									muddy dolomite	55.60m calcite vein, w=3cm		
				∠ 70°										58.80-59.20m calcite vein, w=1cm		
60														60.60-60.70m calcite vein abundant		
61.00														dark gray to light gray 1-10mm thin parallel bedded weak pyritization with hematite		
			∠ 10° -20°											67.90-68.10m calcite vein abundant		
70 70.00				∠ 20°										69.90m calcite vein, w=1cm		
														71.00-73.00m oxidation remarkable		
				∠ 20°										72.50m calcite vein, w=6cm		
														72.50-73.00m hematite rich		
				∠ 60°										76.20m calcite vein, w=2cm		
				∠ 60°										77.00m calcite vein, w=1cm		
														76.20-78.00m hematite rich		
80 80.00														79.00-79.20m oxidation remarkable		
													tuffceous to muddy dolomite	light yellow to orange wavy bedding		
82.00													dolomite	gray to dark gray, thin prallel bedding weak fine grained pyrite dissemination		
83.70													tuffceous to muddy dolomite	light yellow to orange wavy bedding very weak pyritization		
90 89.10			∠ 10° -20°										dolomite	gray to dark gray, thin prallel bedding weak fine grained pyrite dissemination		
92.90													tuffceous to muddy dolomite	light yellow to orange wavy prallel bedding, partly lenticular shape very weak pyritization		
98.70													dolomite			
100																

Mae Sariang, Thailand **MJTM-9** (Scale 1/200) (3/4) (Depth: 100 m - 150 m)

Depth (m)	Geol Column	Core Shape	Structure	Vein	magnetite	galena	sphalerite	chalcopyrite	Fe-sulphide	Skarnization	Silicification	Argillization	Geologic Description: Rock	Geologic Description: Lithology	Results of Laborator: Sample Number
110			∠ 10° -30°										dolomite	gray to dark gray, 1-10mm thin prallel bedding weak fine grained pyrite dissemination partly turned in orange to light brown alteration	
														107.60-107.80m coarse recrystalcakite vein	
														107.60-109.30m light brown to orange alteration(oxidation)	
														108.60-109.30m cakite veinlet abundant	
			∠ 10° -20°											110.70-111.30m orange to light brown alteration strong oxidation of hematite and lomonite	
														112.30-112.70m strong oxidation of hematite and lomonite	
120														120.30-121.20m cakite veinlet abundant	
														121.20-121.80m orange to light brown alteration strong oxidation of hematite and limonite	
			∠ 10° -20°	∠ 10°										123.60m cakite vein w=2cm	
130			∠ 5° -10°											around 135m bedding texture weaker than above	
														137.50-138.20m brecciated texture remarkable with argilic alterati on and pyritization	
														138.55-139.10m orange to light brown alteration strong oxidation of hematite and limonite	
				∠ 60°										138.60m cakite vein, w=2cm	
				∠ 30°										139.10m quartz-cakite vein, w=1cm	
140				∠ 40°										139.80-139.90m cakite-quartz vein, w=10cm with strong pyritization	
														140.00-140.10m oxidation zone	
														140.80-141.50m orange to light brown alteration strong oxidation	
			∠ 5° -10°											145.10-148.20m partly oxidized band occured along bedding	
														147.90-148.20m cakite veinlet abundant	
150				∠ 5° -10°										149.45-149.55m cakite-quartz vein abundant	

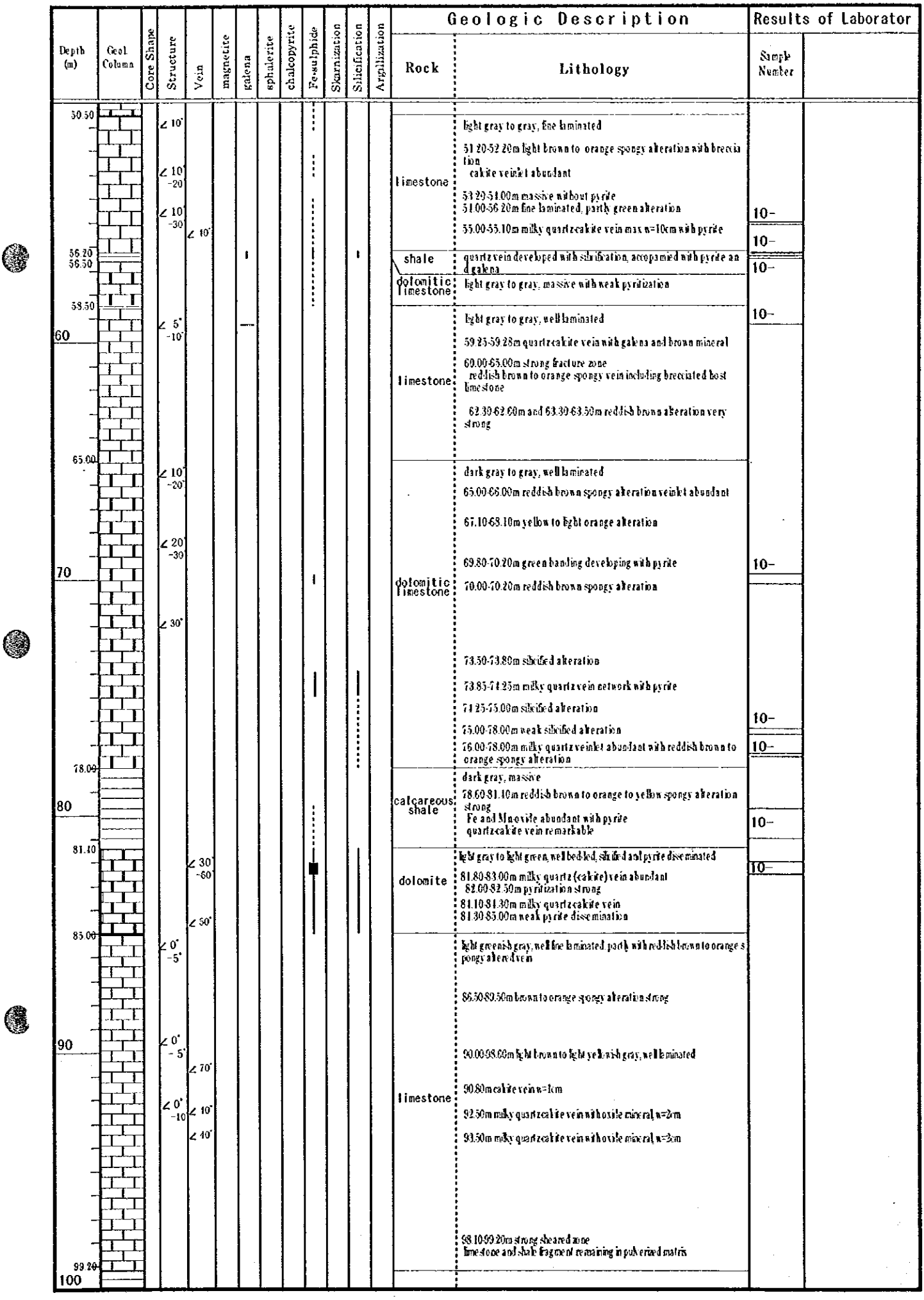
Mae Sariang, Thailand **MJTM-9** (Scale 1/200) (1/1) (Depth: 150 m - 200 m)

Depth (m)	Geol Column	Core Shape	Structure	Vein	magnetite	galena	sphalerite	chalcopyrite	Fe-sulphide	Skarnization	Silicification	Argillization	Geologic Description: Rock	Geologic Description: Lithology	Results of Laborator: Sample Number	Results of Laborator
150			∠ 5° -10°	∠ 40°										gray to dark gray, 1-10mm thin parallel bedding weak fine grained pyrite dissemination		
				∠ 60°												
			∠ 10° -30°													
157.00														light greenish gray weak argillic altered and weak pyrite dissemination		
														158.30-158.50m, 159.20-159.30m strong argillization 159.50m calcite-quartz vein, w=3cm		
160.00				∠ 50°										gray, brecciated calcite veinlet abundant		
														161.20-162.00m strong oxidation		
														162.60-165.60m weak silicification		
165.60														light gray to gray, massive compact moderate pyritization		
166.80													dolomite	dark gray to gray, 1-10mm thin bedded weak pyrite dissemination		
														167.50-168.80m light gray tuffaceous to muddy layer interbedded		
170														168.80-169.70m light orange alteration		
171.20														light gray to gray, massive compact moderate pyritization		
173.30																
														178.30-178.60m calcite veinlet abundant, orange to light brown alteration		
178.99																
180														light gray to gray, massive compact weak fine grained pyritization		
														178.90-183.90m weakly silicified		
				∠ 60°										183.90-184.10m calcite vein with abundant fine grained pyrite		
														185.10m quartz-calcite vein, w=2cm		
				∠ 50°										181.50-183.50m light brown alteration 187.50-188.70m light brown to light orange alteration		
														188.70-188.85m calcite vein abundant with fine grained pyrite		
				∠ 70°										189.70m calcite vein, w=1cm		
190.80				∠ 5°												
			∠ 10° -20°											dark gray to gray, 1-10mm thin bedded texture weak pyrite dissemination		
														195.90-196.00m calcite vein abundant		
														199.00-199.20m calcite vein abundant with oxidation		
			∠ 20° -30°											199.40-199.70m calcite vein abundant with oxidation		
200																

Mae Sariang, Thailand **MJTM-10** (Scale 1/200) (1/1) (Depth: 0 m - 50 m)

Depth (m)	Geol Column	Core Shape	Structure	Vein	magnetite	galena	sphalerite	chalcopyrite	Fe-sulphide	Skarnization	Silicification	Argillization	Geologic Description: Rock	Geologic Description: Lithology	Results of Laborator: Sample Number	Results of Laborator
													Top Soil	light brown to orange soil		
														white, strong silicified, partly remain green skarn patch brecciated texture remarkable with chlorite hairline crack well developing with abundant pyrite		
8.20													weathered altered rock	brecciated texture ramrkable matrix: yellow weathered sediment? brecciated part: orange to brown carbonate mineral		
10 10.00													sandstone	light brown to yellowish white strong weathered		
11.40													limestone	light gray to gray, brecciated texture breccia part light brown to orange alteration calcite-(quartz) veinlet well development		
														15.00-15.60m brown strong weathered and argillic alteration		
														15.60-17.00m yellow to pale orange strong alteration brecciated texture remarkable calcite-quartz veinlet abundant		
														17.00-20.70m light gray to gray, massive calcite-(quartz) veinlet network partly brown to orange alteration		
20																
			∠ 10 -30											20.70m- light gray to gray, bedded well		
														23.70-24.00m light greenish gray, silicified alteration		
														24.00-25.00m brown alteration		
			∠ 10 -20											25.00-25.70m fine grained pyrite weak dissemination		
27.50				∠ 60												
													dolomitic limestone	brown to light orange alteration calcite-quartz veinlet abundant 27.80m calcite-quartz vein w=5cm		
30																
30.50			∠ 30 -40										limestone	light green, bedded well, slightly chloritized calcite-quartz veinlet abundant		
35.00																
													dolomitic limestone to dolomite	light green, thin bedded well (w=1-10mm)		
														35.00-36.50m partly brown to orange, silicified alteration with a s mall amount of pyrite		
														35.00-36.50m partly brown to orange, silicified alteration with a s mall amount of pyrite		
40																
														40.00-45.00m light gray to gray, fine bedded(1-5mm) partly brown alteration band developing with pyrite		
			∠ 10 -20	∠ 40										42.50m calcite vein, w=2cm		
														43.40-44.80m brown carbonate mineral bands with pyrite		
45.00																
			∠ 20 -30										limestone	light gray to gray, fine beded with weak fine-grained pyritization		
49.00													dolomitic limestone	light gray to gray, massive calcite-quartz hairline well developing with weak pyritization		
50																

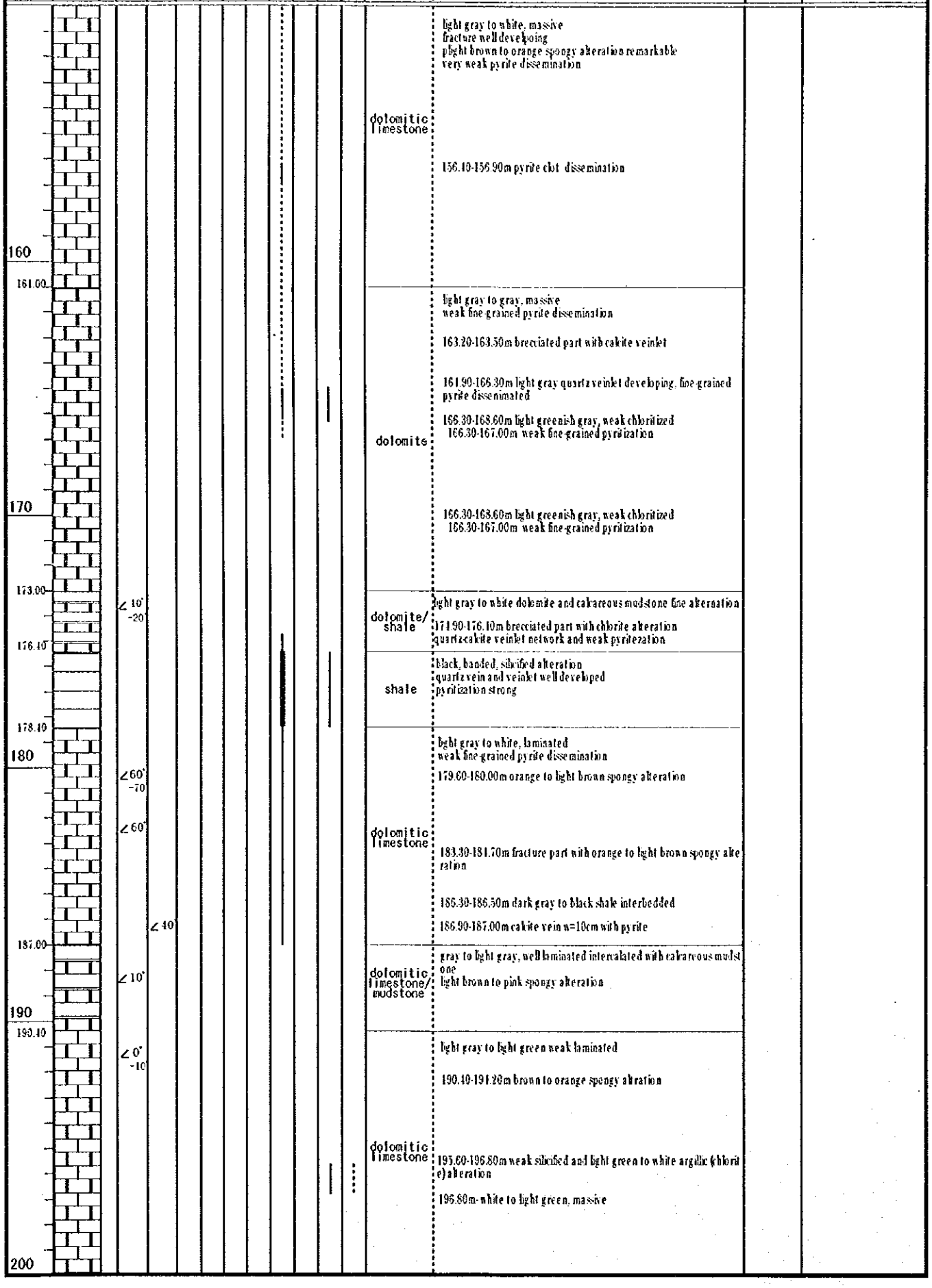
Mae Sariang, Thailand **MJTM-10** (Scale 1/200) (2/1) (Depth: 50 m - 100 m)



Mae Sariang, Thailand **MJTM-10** (Scale 1/200) (3/1) (Depth: 100 m - 150 m)

Depth (m)	Geol. Column	Core Shape	Structure	Vein	magnetite	galena	sphalerite	chalcopyrite	Fe-sulphide	Skarnization	Silicification	Argillization	Geologic Description: Rock	Geologic Description: Lithology	Results of Laborator: Sample Number	Results of Laborator
110			∠10°										shale	dark gray to black, well banded		
														100.00-100.70m milky quartz(calcite)veinlet remarkable max. w=2cm		
														102.00-103.70m milky quartz(calcite)veinlet remarkable max. w=2cm		
														105.00-110.00m fractured part		
														109.50-109.70m quartz hairline network		
			∠30°	∠3°										111.90m quartz vein w=6cm		
			∠10°-20°											112.00m quartz vein w=5cm		
														112.00-112.50m fracture developing		
														112.50-120.00m partly fine-grained pyrite disseminated and partly fractured with orange to brown Fe-oxide		
120			∠5°-10°											120.00-125.00m well bedding, partly pyrite dissemination		
			∠10°											122.50-121.10m quartz(calcite) hairline well developed and partly fractured with Fe-oxidation		
			∠30°	∠60°										125.20m milky quartz vein (w=2cm) with pyrite		
														125.20-126.30m quartz veinlet partly observed		
130				∠30°										128.20m pyrite vein w=1cm		
														128.20-129.00m pyrite mineralization along fine bedding		
														129.00-130.00m fine-grained pyrite dissemination		
				∠40°										130.10-130.70m hematite vein replaced pyrie in quartz vein		
														131.50-131.60m hematite-quartz vein		
				∠40°										133.15-133.20m quartz vein w=3cm		
														135.60-137.80m massive texture with weak pyritization		
														136.10-136.30m and 137.15-137.30m chrolitoid porphyroblast abundant		
														137.80m- fine bedded well with strong pyritization along bedding		
140				∠45°										139.00-139.10m quartz vein filled up fracture		
														111.60-112.10m quartz vein network dominate		
				∠30°-80°										113.50-113.60m steined pyrite vein in quartz vein		
				∠30°												
118.60																
150			∠65°-90°													

Mae Sariang, Thailand **MJTM-10** (Scale 1/200) (3/1) (Depth: 150 m - 200 m)



Mae Sariang, Thailand **MJTM-9x** (Scale 1/200) (1/1) (Depth: 0 m - 30 m)

Depth (m)	Geol Column	Core Shape	Structure	Vein	magnetite	galena	sphalerite	chalcopyrite	Fe-sulphide	Skarnization	Silicification	Argillization	Geologic Description: Rock	Geologic Description: Lithology	Results of Laborator: Sample Number	Results of Laborator
2.50													gossan	red brown to dark brown cobble bed of gossan with Fe-oxide		
			∠ 3°										mudstone/ sandstone	yellowish white to light gray completely turned into hydrothermal alteration clay		
			∠ 5°											5.90-5.95m dark brown clay with so much limonite		
			∠ 5°											7.10m gossan seam w=1cm along bedding		
10			∠ 10°											8.10-8.50m hydrothermal brecciated silicified zone along bedding with weak limonite		
			∠ 5° -10°											11.10-11.50m gossan vein along bedding		
														11.90-11.95m gossan seam		
			∠ 0° 50°											16.50-16.55m hematite vein W=5cm 16.55m fracture with slicken-side		
20																
20.10													mudstone	light gray, thin bedding hydrothermal argillization moderate vertical hair-racks well developing with manganese oxide film		
			∠ 5°											20.10-28.90m hydrothermal brecciated texture with weak silicification		
														21.50m quart vein breccia w=1cm 21.85-21.90m gossan vein 21.90m idiomorphic quartz growth in open crack along bedding		
30			∠ 10°													
40																
50																

Appendix 8 Homogenized temperature and salinity of fluid inclusion

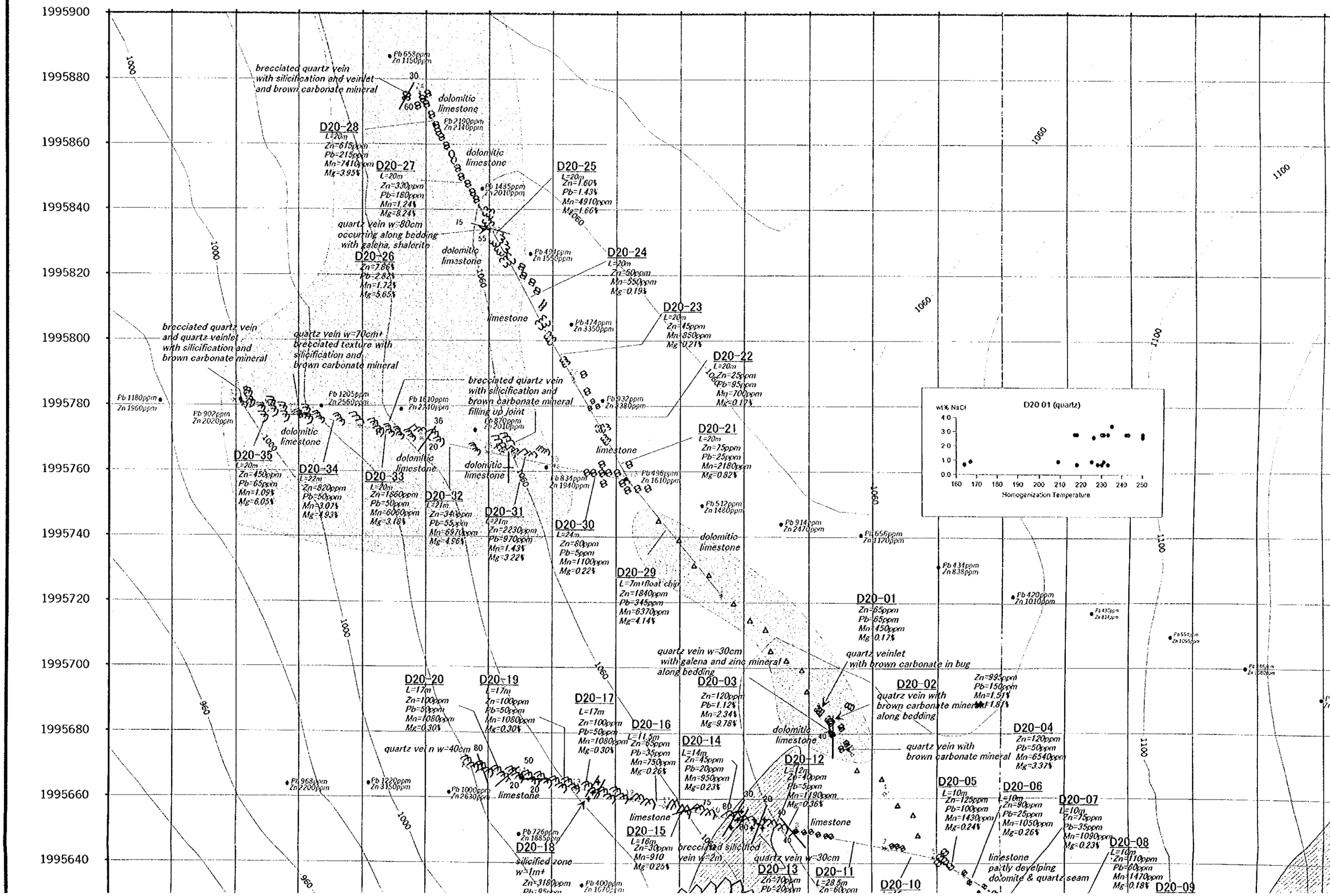
No	Sample No.	Locality	Description	Mineral	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	MJTM-6 63.50-63.60m	Dong Noi area		Calcite	288	291	289	288	332	285	262	292	291	262	262	268	331	291	292	292	291	292	285	282	278	274	274	275
					4.7	4.7	4.6	4.7	4.7	4.7	4.6	4.4	4.7	4.9	5.1	4.7	5.2	4.7	4.9	4.6	4.6	4.4	4.6	4.9	4.7	4.4	4.3	4.7
2	MJTM-6 129.6m	Dong Noi area	secondary inclusion partly liquid CO_2 rich	Quartz	176	177	174	155	156	156	149	167	215	216	214	240	239	238	236	218	224	335#	334#	333#	309#	308#	312#	
					1.6	1.6	1.4	1.6	1.6	1.4	1.4	1.7	1.4	1.60	1.4	1.7	1.4	1.2	1.6	1.4	1.6	-	-	-	-	-	-	
3	MJTM-6 178.7-178.8m	Dong Noi area	secondary inclusion partly multiphase	Quartz	186	195	149	189	174	178	177	179	164	180	169	161	186	170	190	173	174	164	167	187	169	97*	107*	
					19.3	3.4	15.9	13.7	11.7	10.9	10.7	10.3	9.1	23.3	20.6	23.1	8.4	21.4	7.8	21.7	10.8	-	-	-	21.3	27.9	28.2	
4	MJTM-7 94.90-94.95m	Mae Kanai area	secondary inclusion	Sphalerit	222	186	196	224	218	239	208	209	208	217														
					6.8	7.9	7.8	7.1	6.9	6.9	6.6	6.8	6.6	6.6														
5	MJTM-7 129.1-129.2m	Mae Kanai area	secondary inclusion	Quartz	308	302	305	301	306	305	302	303	301	299	300	300	301											
					8.4	8.5	8.4	7.4	7.2	7.4	7.5	8.2	7.4	7.7	8.4	8.4	8.2											
6	MJTM-7 245.7m	Mae Kanai area	secondary inclusion	Quartz	197	199	194																					
					7.2	7.1	6.9																					
7	MJTM-8 32.80-32.85m	Mae Kanai area	secondary inclusion	Quartz	148	184	168	124	123	183	117	122	127	106														
					1.9	2.3	2.1	2.3	2.1	2.3	8.3	8.1	2.1	1.9														
1	D20-01	Dong Noi area	secondary inclusion	Quartz	209	230	231	233	230	226	231	225	243	250	242	250	231	230	233	235	217	218	164	167	228	218		
					0.9	2.8	0.9	0.7	0.7	2.6	2.8	0.9	2.8	2.6	2.8	2.8	0.9	0.7	2.8	3.4	2.8	2.8	0.7	0.9	0.7	0.7		
2	D20-56	Dong Noi area	secondary inclusion	Quartz	204	207	206	205	218	224	204	201	242	230	242	220	218	230	321	374	373							
					7.7	7.5	7.7	7.8	7.4	7.5	7.4	7.7	4.4	4.7	7.7	7.5	7.4	7.5	7.4	7.5	7.4							

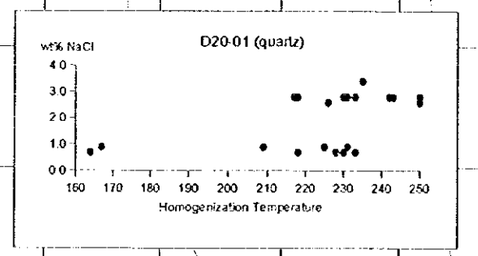
Upper: homogenized temperature unit:°C

: liquid CO_2 rich

* : solid dissolution

Lower: salinity unit: wt% NaCl equivalent


1995900
1995880
1995860
1995840
1995820
1995800
1995780
1995760
1995740
1995720
1995700
1995680
1995660
1995640
1000
1060
1100
960
brecciated quartz vein with silicification and veinlet and brown carbonate mineral
Pb 658ppm Zn 1150ppm
30
60
dolomitic limestone
D20-28
L=20m
Zn=615ppm
Pb=215ppm
Mn=7410ppm
Mg=3.95%
Pb 2190ppm Zn 2140ppm
D20-27
L=20m
Zn=330ppm
Pb=180ppm
Mn=1.24%
Mg=8.24%
quartz vein w=80cm occurring along bedding with galena, shalerite
Pb 1435ppm Zn 2010ppm
D20-25
L=20m
Zn=1.60%
Pb=1.43%
Mn=4910ppm
Mg=1.66%
15
55
D20-26
Zn=7.86%
Pb=2.82%
Mn=1.72%
Mg=5.65%
Pb 494ppm Zn 1550ppm
D20-24
L=20m
Zn=50ppm
Mn=550ppm
Mg=0.19%
limestone
Pb 474ppm Zn 3350ppm
D20-23
L=20m
Zn=45ppm
Mn=850ppm
Mg=0.21%
brecciated quartz vein and quartz veinlet with silicification and brown carbonate mineral
quartz vein w=70cm+ brecciated texture with silicification and brown carbonate mineral
brecciated quartz vein with silicification and brown carbonate mineral filling up joint
D20-22
L=20m
Zn=25ppm
Pb=95ppm
Mn=700ppm
Mg=0.17%
Pb 1180ppm Zn 1960ppm
Pb 902ppm Zn 2020ppm
Pb 1205ppm Zn 2560ppm
Pb 1610ppm Zn 2240ppm
Pb 870ppm Zn 2010ppm
Pb 932ppm Zn 3380ppm
36
20
dolomitic limestone
D20-35
L=20m
Zn=450ppm
Pb=65ppm
Mn=1.09%
Mg=6.05%
D20-34
L=22m
Zn=820ppm
Pb=50ppm
Mn=3.07%
Mg=4.93%
D20-33
L=20m
Zn=1860ppm
Pb=50ppm
Mn=6060ppm
Mg=3.18%
D20-32
L=21m
Zn=340ppm
Pb=55ppm
Mn=6970ppm
Mg=4.56%
D20-31
L=21m
Zn=2230ppm
Pb=970ppm
Mn=1.43%
Mg=3.22%
D20-30
L=24m
Zn=80ppm
Pb=5ppm
Mn=1100ppm
Mg=0.22%
Pb 834ppm Zn 1940ppm
limestone
D20-21
L=20m
Zn=75ppm
Pb=25ppm
Mn=2180ppm
Mg=0.82%
Pb 496ppm Zn 1610ppm
Pb 512ppm Zn 1480ppm
Pb 914ppm Zn 2470ppm
Pb 656ppm Zn 1120ppm
Pb 434ppm Zn 838ppm
Pb 420ppm Zn 1010ppm
Pb 430ppm Zn 834ppm
Pb 554ppm Zn 1095ppm
Pb 356ppm Zn 1260ppm
dolomitic limestone
D20-29
L=7m+float chip
Zn=1840ppm
Pb=345ppm
Mn=6370ppm
Mg=4.14%
D20-01
Zn=65ppm
Pb=65ppm
Mn=450ppm
Mg=0.17%
quartz vein w=30cm with galena and zinc mineral along bedding
quartz veinlet with brown carbonate in bug
D20-03
Zn=120ppm
Pb=1.12%
Mn=2.34%
Mg=9.78%
D20-02
quatrz vein with brown carbonate mineral along bedding
Zn=995ppm
Pb=150ppm
Mn=1.51%
Mg=1.81%
D20-20
L=17m
Zn=100ppm
Pb=50ppm
Mn=1080ppm
Mg=0.30%
D20-19
L=17m
Zn=100ppm
Pb=50ppm
Mn=1080ppm
Mg=0.30%
D20-17
L=17m
Zn=100ppm
Pb=50ppm
Mn=1080ppm
Mg=0.30%
D20-16
L=11.5m
Zn=65ppm
Pb=35ppm
Mn=750ppm
Mg=0.26%
D20-14
L=14m
Zn=45ppm
Pb=20ppm
Mn=950ppm
Mg=0.23%
dolomitic limestone
D20-12
L=12m
Zn=40ppm
Pb=5ppm
Mn=1190ppm
Mg=0.36%
D20-04
Zn=120ppm
Pb=50ppm
Mn=6540ppm
Mg=3.37%
quartz vein with brown carbonate mineral
quartz vein w=40cm
80
50
20
20
Pb 968ppm Zn 2200ppm
Pb 1220ppm Zn 3150ppm
Pb 1000ppm Zn 2630ppm
limestone
D20-18
silicified zone w=1m+
Zn=3180ppm
Pb 726ppm Zn 1885ppm
Pb 400ppm Zn 1670ppm
D20-15
L=16m
Zn=30ppm
Mn=910
Mg=0.25%
limestone
brecciated silicified vein w=2m
quartz vein w=30cm
D20-13
Zn=10ppm
Pb=20ppm
D20-11
L=28.5m
Zn=60ppm
D20-10
D20-05
L=10m
Zn=125ppm
Pb=100ppm
Mn=1430ppm
Mg=0.24%
D20-06
L=10m
Zn=90ppm
Pb=25ppm
Mn=1050ppm
Mg=0.26%
D20-07
L=10m
Zn=75ppm
Pb=35ppm
Mn=1090ppm
Mg=0.23%
D20-08
L=10m
Zn=110ppm
Pb=60ppm
Mn=1470ppm
Mg=0.18%
D20-09
limestone partly developing dolomite & quartz seam
D20 01 (quartz)
wt% NaCl
40
30
20
10
0.0
160
170
180
190
200
210
220
230
240
250
Homogenization Temperature



D20-23
L=20m
Zn=45ppm
Mn=860ppm
Mg=0.21%

D20-22
L=20m
Zn=25ppm
Pb=95ppm
Mn=700ppm
Mg=0.17%

D20-21
L=20m
Zn=75ppm
Pb=25ppm
Mn=2180ppm
Mg=0.82%

Pb 496ppm
Zn 1610ppm

Pb 512ppm
Zn 1480ppm

Pb 914ppm
Zn 2470ppm

Pb 656ppm
Zn 1120ppm

Pb 434ppm
Zn 838ppm

Pb 420ppm
Zn 1010ppm

dolomitic limestone

D20-01
Zn=65ppm
Pb=65ppm
Mn=450ppm
Mg=0.17%

quartz vein w=30cm with galena and zinc mineral along bedding

quartz veinlet with brown carbonate in bug

D20-03
Zn=120ppm
Pb=1.12%
Mn=2.34%
Mg=9.78%

D20-02
quatrz vein with brown carbonate mineral along bedding
Zn=995ppm
Pb=150ppm
Mn=1.51%
Mg=1.81%

D20-16

D20-14
L=14m
Zn=45ppm
Pb=20ppm
Mn=950ppm
Mg=0.23%

dolomitic limestone

quartz vein with brown carbonate mineral

D20-04
Zn=120ppm
Pb=50ppm
Mn=6540ppm
Mg=3.37%

D20-12
L=12m
Zn=40ppm
Pb=5ppm
Mn=1190ppm
Mg=0.36%

D20-05
L=10m
Zn=125ppm
Pb=100ppm
Mn=1430ppm
Mg=0.24%

D20-06
L=10m
Zn=90ppm
Pb=25ppm
Mn=1050ppm
Mg=0.26%

D20-07
L=10m
Zn=75ppm
Pb=35ppm
Mn=1090ppm
Mg=0.23%

D20-08
L=10m
Zn=110ppm
Pb=60ppm
Mn=1470ppm
Mg=0.18%

limestone

D20-15
Zn=30ppm
Mn=910
Mg=0.25%

brecciated silicified vein w=2m

quartz vein w=30cm

limestone partly develping dolomite & quartz seam

D20-13
Zn=70ppm

D20-11
L=28.5m

D20-10

D20-09

Pb 924ppm
Zn 1615ppm

dolomitic limestone

Pb 464ppm

1060
1100
1160

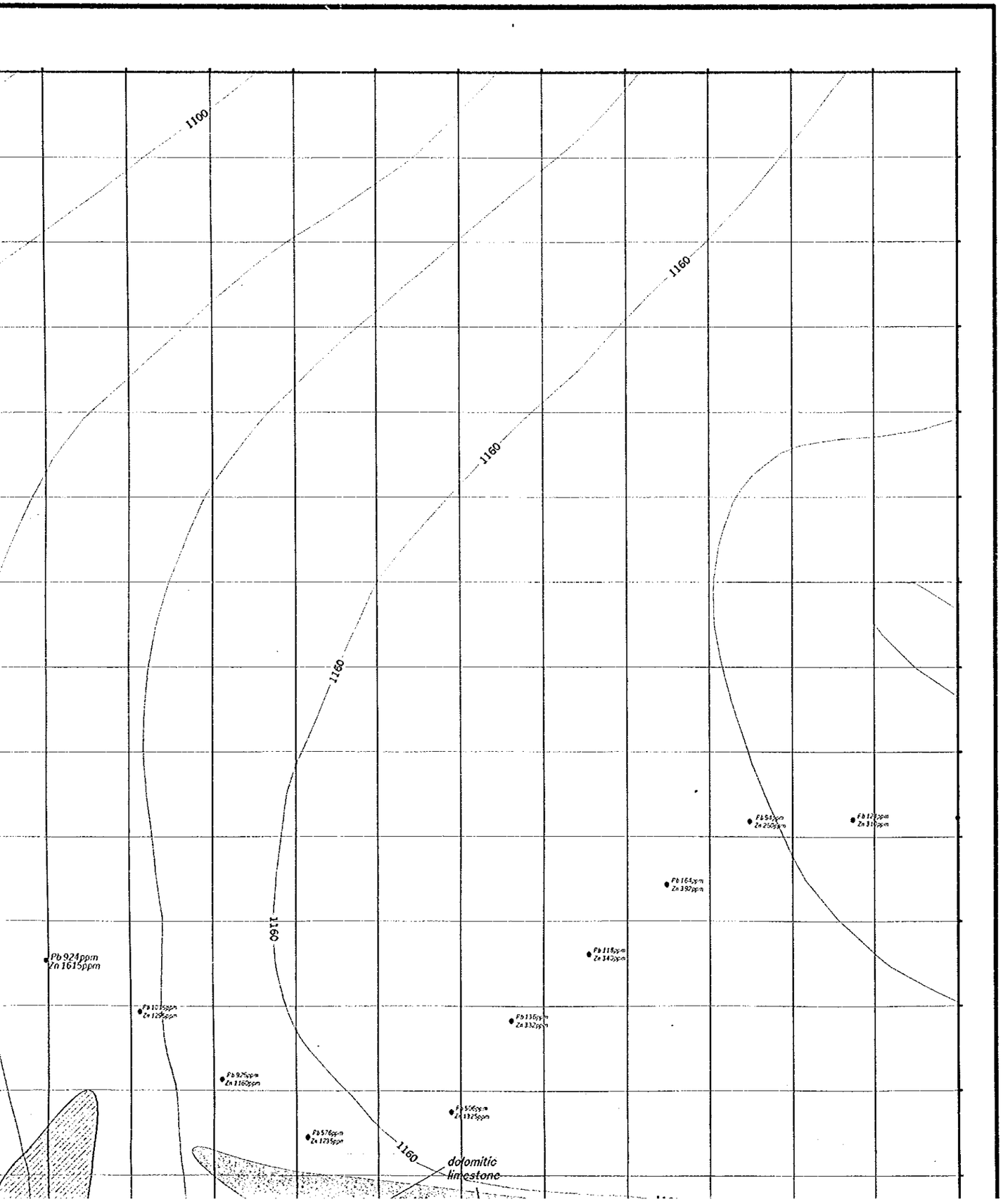
PLATE-1

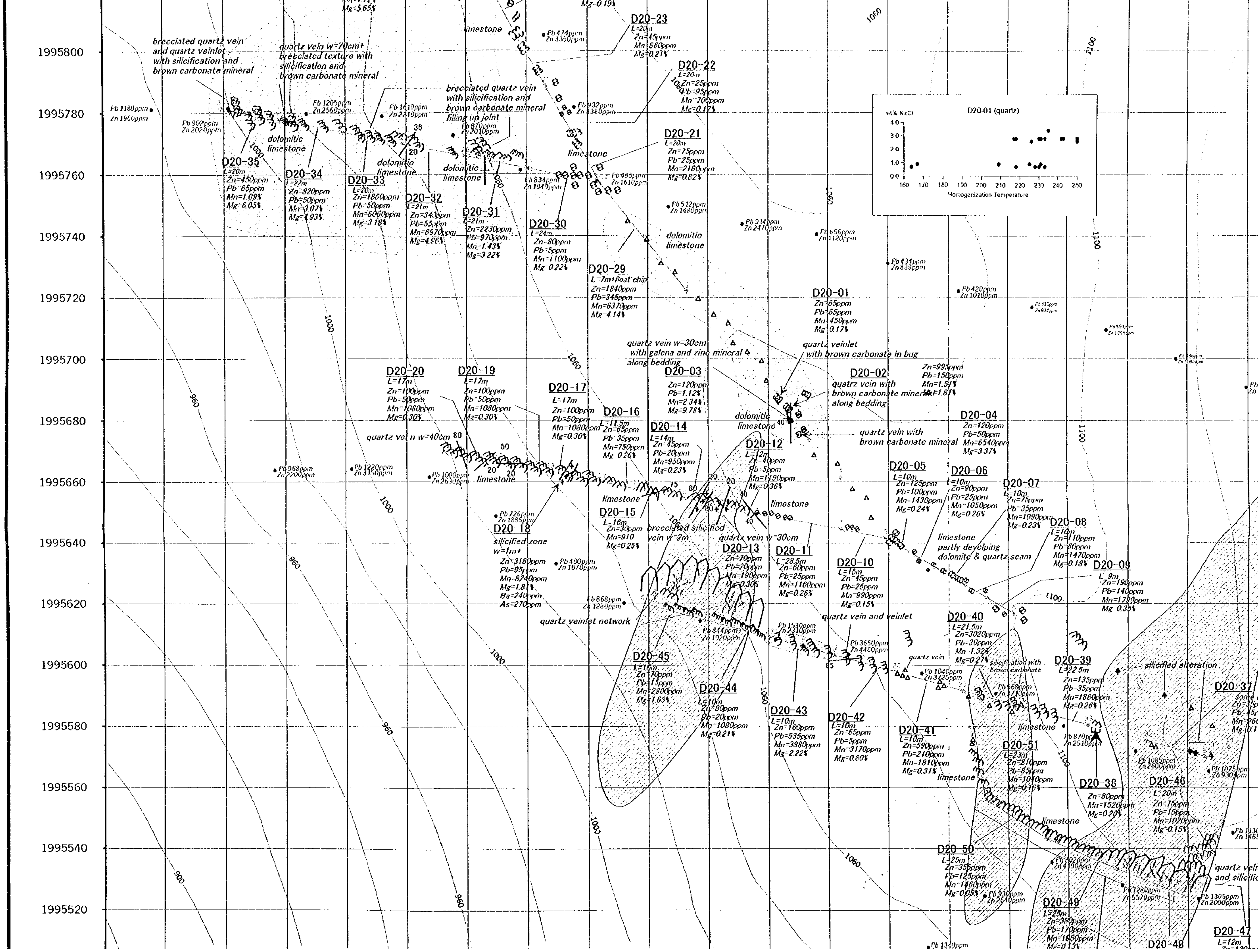
COOPERATIVE MINERAL EXPLORATION IN THE MAE SARIANG AREA, THAILAND

PHASE III

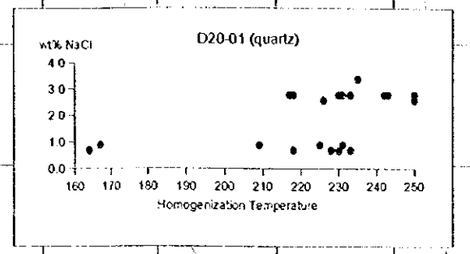
MARCH, 2000

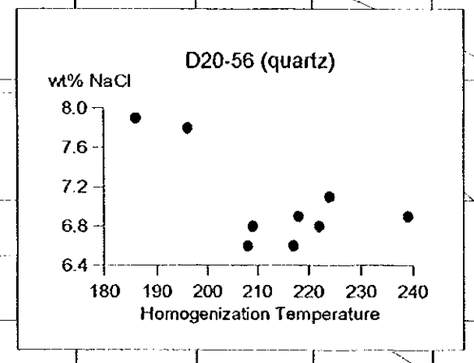
MINERAL OCCURRENCE SURVEY RESULT AT THE NORTHWESTERN PART OF THE DONG NOI AREA





1995800
1995780
1995760
1995740
1995720
1995700
1995680
1995660
1995640
1995620
1995600
1995580
1995560
1995540
1995520
brecciated quartz vein and quartz veinlet with silicification and brown carbonate mineral
quartz vein w=70cm+ brecciated texture with silicification and brown carbonate mineral
brecciated quartz vein with silicification and brown carbonate mineral filling up joint
limestone
dolomitic limestone
D20-23
D20-22
D20-21
D20-35
L=20m
Zn=450ppm
Pb=65ppm
Mn=1.09%
Mg=6.05%
D20-34
L=22m
Zn=820ppm
Pb=50ppm
Mn=3.07%
Mg=4.93%
D20-33
L=20m
Zn=1860ppm
Pb=50ppm
Mn=6060ppm
Mg=3.18%
D20-32
L=21m
Zn=340ppm
Pb=55ppm
Mn=6970ppm
Mg=4.86%
D20-31
L=21m
Zn=2230ppm
Pb=970ppm
Mn=1.43%
Mg=3.22%
D20-30
L=24m
Zn=80ppm
Pb=5ppm
Mn=1100ppm
Mg=0.22%
D20-29
L=7m+float chip
Zn=1840ppm
Pb=345ppm
Mn=6370ppm
Mg=4.14%
D20-01 (quartz)
wt% NaCl
Homogenization Temperature
D20-01
Zn=65ppm
Pb=65ppm
Mn=450ppm
Mg=0.17%
quartz vein w=30cm with galena and zinc mineral along bedding
quartz veinlet with brown carbonate in bug
D20-03
Zn=120ppm
Pb=1.12%
Mn=2.34%
Mg=9.78%
D20-02
quatrz vein with brown carbonate mineral along bedding
Zn=995ppm
Pb=150ppm
Mn=1.51%
Mg=1.81%
D20-04
Zn=120ppm
Pb=50ppm
Mn=6540ppm
Mg=3.37%
quartz vein with brown carbonate mineral
D20-20
L=17m
Zn=100ppm
Pb=50ppm
Mn=1080ppm
Mg=0.30%
D20-19
L=17m
Zn=100ppm
Pb=50ppm
Mn=1080ppm
Mg=0.30%
D20-17
L=17m
Zn=100ppm
Pb=50ppm
Mn=1080ppm
Mg=0.30%
D20-16
L=11.5m
Zn=65ppm
Pb=35ppm
Mn=750ppm
Mg=0.26%
D20-14
L=14m
Zn=45ppm
Pb=20ppm
Mn=950ppm
Mg=0.23%
D20-12
L=12m
Zn=40ppm
Pb=5ppm
Mn=1190ppm
Mg=0.36%
quartz vein w=40cm
D20-05
L=10m
Zn=125ppm
Pb=100ppm
Mn=1430ppm
Mg=0.24%
D20-06
L=10m
Zn=90ppm
Pb=25ppm
Mn=1050ppm
Mg=0.26%
D20-07
L=10m
Zn=75ppm
Pb=35ppm
Mn=1090ppm
Mg=0.23%
D20-08
L=10m
Zn=110ppm
Pb=60ppm
Mn=1470ppm
Mg=0.18%
D20-09
L=9m
Zn=190ppm
Pb=140ppm
Mn=1790ppm
Mg=0.35%
limestone partly develping dolomite & quartz seam
D20-18
silicified zone w=1m+
Zn=3180ppm
Pb=95ppm
Mn=8240ppm
Mg=1.81%
Ba=240ppm
As=270ppm
D20-15
L=16m
Zn=30ppm
Mn=910
Mg=0.25%
brecciated silicified vein w=2m
quartz vein w=30cm
D20-13
Zn=70ppm
Pb=20ppm
Mn=190ppm
Mg=0.30%
D20-11
L=28.5m
Zn=60ppm
Pb=25ppm
Mn=1160ppm
Mg=0.26%
D20-10
L=15m
Zn=45ppm
Pb=25ppm
Mn=990ppm
Mg=0.15%
quartz veinlet network
quartz vein and veinlet
D20-40
L=21.5m
Zn=3020ppm
Pb=30ppm
Mn=1.32%
Mg=0.27%
silicified alteration
D20-45
L=10m
Zn=70ppm
Pb=15ppm
Mn=2900ppm
Mg=1.63%
D20-44
L=10m
Zn=80ppm
Pb=20ppm
Mn=1080ppm
Mg=0.21%
D20-43
L=10m
Zn=160ppm
Pb=535ppm
Mn=3880ppm
Mg=2.22%
D20-42
L=10m
Zn=65ppm
Pb=5ppm
Mn=3170ppm
Mg=0.80%
D20-41
L=10m
Zn=590ppm
Pb=210ppm
Mn=1810ppm
Mg=0.31%
D20-51
L=23m
Zn=210ppm
Pb=85ppm
Mn=1040ppm
Mg=0.16%
D20-39
L=22.5m
Zn=135ppm
Pb=35ppm
Mn=1880ppm
Mg=0.26%
D20-38
Zn=80ppm
Mn=1520ppm
Mg=0.20%
D20-46
L=20m
Zn=75ppm
Pb=15ppm
Mn=1020ppm
Mg=0.15%
D20-37
D20-50
L=25m
Zn=355ppm
Pb=125ppm
Mn=1460ppm
Mg=0.05%
D20-49
L=25m
Zn=380ppm
Pb=170ppm
Mn=1850ppm
Mg=0.13%
D20-48
D20-47
L=12m
quartz vein and silicific





D20-23
L=20m
Zn=145ppm
Mn=860ppm
Mg=0.27%

D20-22
L=20m
Zn=25ppm
Pb=95ppm
Mn=700ppm
Mg=0.17%

D20-21
L=20m
Zn=75ppm
Pb=25ppm
Mn=2180ppm
Mg=0.82%

Pb 512ppm
Zn 1480ppm

Pb 914ppm
Zn 2470ppm

Pb 656ppm
Zn 1120ppm

dolomitic limestone

Pb 431ppm
Zn 838ppm

Pb 420ppm
Zn 1010ppm

D20-01
Zn=65ppm
Pb=65ppm
Mn=450ppm
Mg=0.17%

quartz vein w=30cm with galena and zinc mineral along bedding

quartz veinlet with brown carbonate in bug

D20-02
quatrz vein with brown carbonate mineral along bedding
Zn=995ppm
Pb=150ppm
Mn=1.51%
Mg=1.81%

D20-03
Zn=120ppm
Pb=1.12%
Mn=2.34%
Mg=9.78%

D20-16
=11.5m
Zn=65ppm
Pb=35ppm
Mn=750ppm
Mg=0.26%

D20-14
L=14m
Zn=45ppm
Pb=20ppm
Mn=950ppm
Mg=0.23%

dolomitic limestone

D20-12
L=12m
Zn=40ppm
Pb=5ppm
Mn=1190ppm
Mg=0.36%

quartz vein with brown carbonate mineral

D20-04
Zn=120ppm
Pb=50ppm
Mn=6540ppm
Mg=3.37%

D20-05
L=10m
Zn=125ppm
Pb=100ppm
Mn=1430ppm
Mg=0.24%

D20-06
L=10m
Zn=90ppm
Pb=25ppm
Mn=1050ppm
Mg=0.26%

D20-07
L=10m
Zn=75ppm
Pb=35ppm
Mn=1090ppm
Mg=0.23%

D20-08
L=10m
Zn=110ppm
Pb=60ppm
Mn=1470ppm
Mg=0.18%

D20-09
L=9m
Zn=190ppm
Pb=140ppm
Mn=1790ppm
Mg=0.35%

limestone

D20-15
=16m
Zn=30ppm
Mn=910
Mg=0.25%

brecciated silicified vein w=2m

quartz vein w=30cm

limestone partly develping dolomite & quartz seam

D20-13
Zn=70ppm
Pb=20ppm
Mn=1890ppm
Mg=0.30%

D20-11
L=28.5m
Zn=60ppm
Pb=25ppm
Mn=1160ppm
Mg=0.26%

D20-10
L=15m
Zn=45ppm
Pb=25ppm
Mn=990ppm
Mg=0.15%

Pb 1530ppm
Zn 2310ppm

Pb 814ppm
Zn 1920ppm

Pb 3650ppm
Zn 1460ppm

quartz vein and veinlet

D20-40
L=21.5m
Zn=3020ppm
Pb=30ppm
Mn=1.32%
Mg=0.27%

quartz vein

Pb 1040ppm
Zn 3220ppm

silicification with brown carbonate

D20-39
L=22.5m
Zn=135ppm
Pb=35ppm
Mn=1880ppm
Mg=0.26%

silicified alteration

D20-37
some floats
Zn=35ppm
Pb=15ppm
Mn=860ppm
Mg=0.11%

D20-45
L=10m
Zn=70ppm
Pb=15ppm
Mn=2900ppm
Mg=1.63%

D20-44
L=10m
Zn=80ppm
Pb=20ppm
Mn=1080ppm
Mg=0.21%

D20-43
L=10m
Zn=160ppm
Pb=535ppm
Mn=3880ppm
Mg=2.22%

D20-42
L=10m
Zn=65ppm
Pb=5ppm
Mn=3170ppm
Mg=0.80%

D20-41
L=10m
Zn=590ppm
Pb=210ppm
Mn=1810ppm
Mg=0.31%

limestone

D20-51
L=23m
Zn=210ppm
Pb=85ppm
Mn=1040ppm
Mg=0.16%

Pb 870ppm
Zn 2510ppm

D20-38
Zn=80ppm
Mn=1520ppm
Mg=0.20%

D20-46
L=20m
Zn=75ppm
Pb=15ppm
Mn=1020ppm
Mg=0.15%

Pb 1085ppm
Zn 2600ppm

Pb 1075ppm
Zn 930ppm

Pb 924ppm
Zn 1615ppm

Pb 240ppm
Zn 1015ppm

Pb 1130ppm
Zn 1965ppm

D20-50
L=25m
Zn=355ppm
Pb=125ppm
Mn=1460ppm
Mg=0.08%

Pb 930ppm
Zn 2640ppm

Pb 1230ppm
Zn 5570ppm

Pb 1305ppm
Zn 2000ppm

quartz vein along joint and silicified alteration

limestone

D20-49
L=25m
Zn=380ppm
Pb=170ppm
Mn=1880ppm
Mg=0.12%

D20-47
L=12m

D20-48

D20-56
L=19m
Zn=75ppm
Pb=25ppm
Mn=1480ppm
Mg=0.12%

D20-55
L=22m
Zn=40ppm
Mn=1370ppm
Mg=0.10%

D20-62
L=26m
Zn=80ppm
Pb=15ppm
Mn=5870ppm
Mn=2.95%

Pb 666ppm
Zn 1500ppm

Pb 468ppm
Zn 1125ppm

Pb 254ppm
Zn 1640ppm

dolomitic limestone

Pb 464ppm
Zn 1225ppm

quartz vein
W=20cm
W=50cm
W=10cm

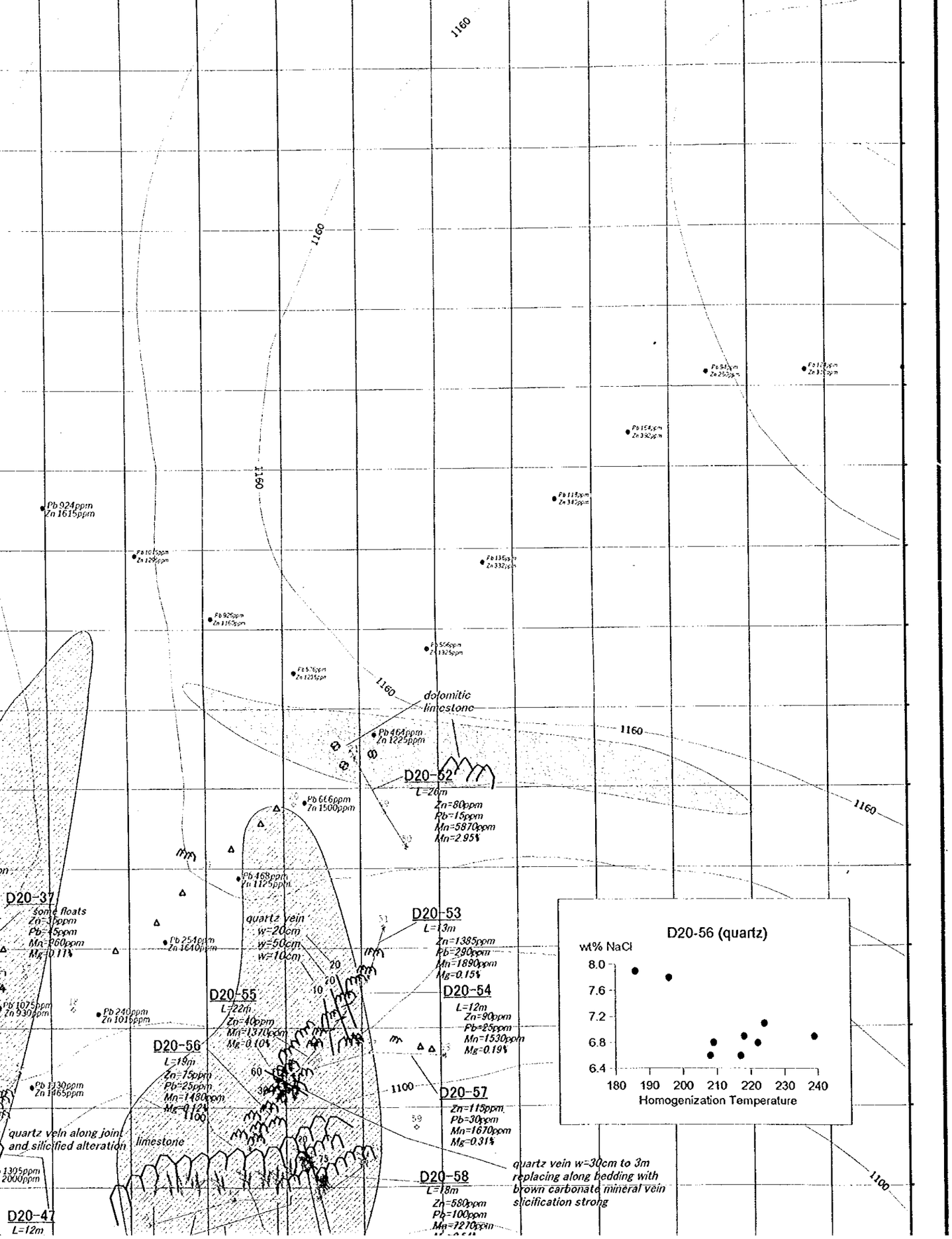
D20-53
L=13m
Zn=1385ppm
Pb=290ppm
Mn=1890ppm
Mg=0.15%

D20-54
L=12m
Zn=90ppm
Pb=25ppm
Mn=1530ppm
Mg=0.19%

D20-57
Zn=115ppm
Pb=30ppm
Mn=1610ppm
Mg=0.31%

quartz vein w=30cm to 3m replacing along bedding with brown carbonate mineral vein silicification strong

D20-58
L=18m
Zn=580ppm
Pb=100ppm
Mn=7270ppm



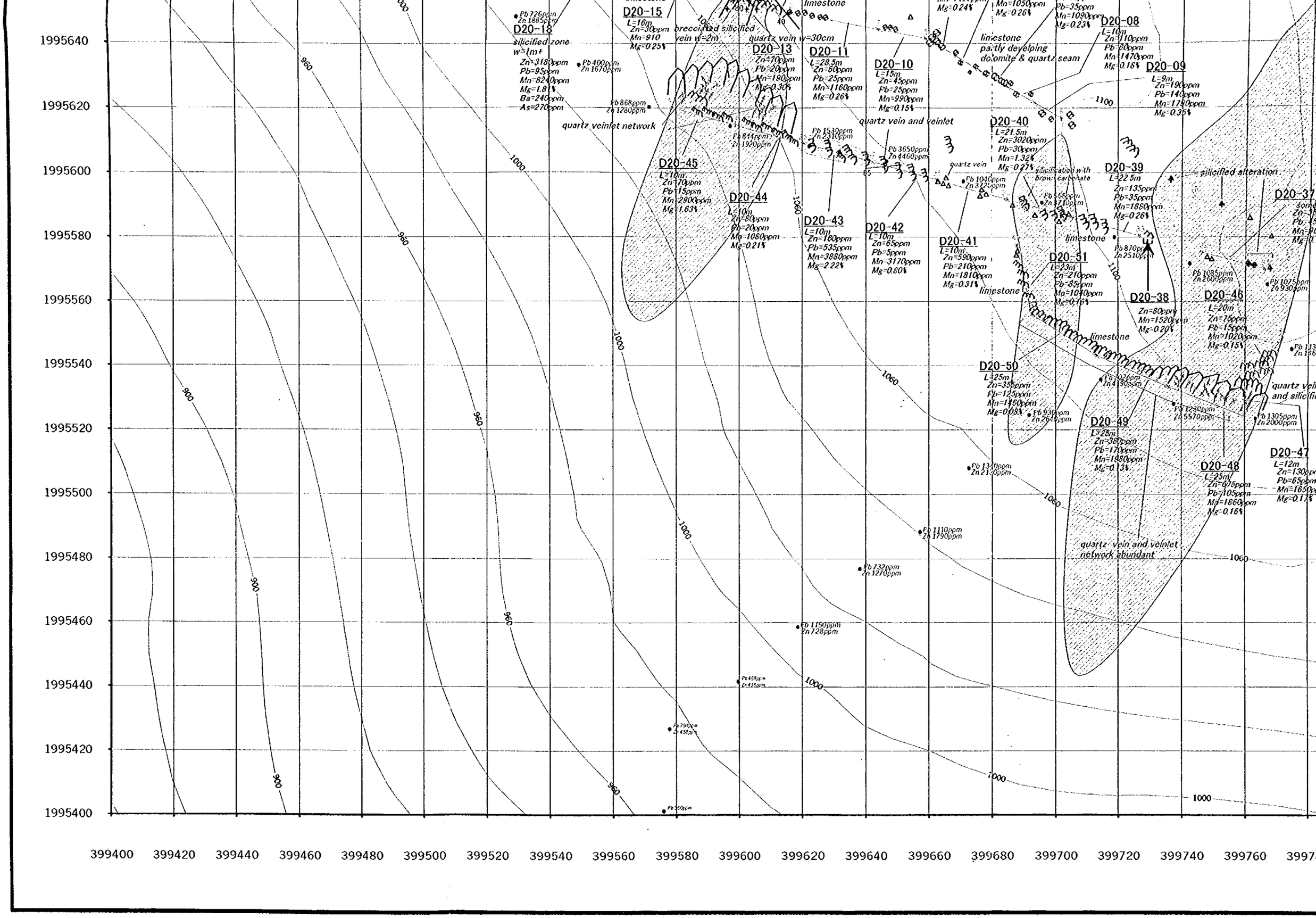
LEGEND

325ppm
1558ppm — Soil sample location in Second phase

D20-20 — Rock sample section along survey line

D20-26 — Rock sample of vein and spot

Silicified alteration with brecciated texture and brown carbonate minerals


D20-18
silicified zone w=1m+
Zn=3180ppm
Pb=95ppm
Mn=8240ppm
Mg=1.8%
Ba=240ppm
As=270ppm
Pb 726ppm Zn 1885ppm
Pb 400ppm Zn 1670ppm
Pb 868ppm Zn 1280ppm
D20-15
L=16m
Zn=300ppm
Mn=910
Mg=0.25%
brecciated silicified vein w=2m
quartz veinlet network
limestone
quartz vein w=30cm
D20-13
Zn=700ppm
Pb=20ppm
Mn=1805ppm
Mg=0.30%
D20-11
L=28.5m
Zn=60ppm
Pb=25ppm
Mn=1160ppm
Mg=0.26%
D20-10
L=15m
Zn=45ppm
Pb=25ppm
Mn=990ppm
Mg=0.15%
Pb 1530ppm Zn 2310ppm
Pb 814ppm Zn 1920ppm
Pb 3650ppm Zn 4460ppm
quartz vein and veinlet
D20-45
L=10m
Zn=70ppm
Pb=15ppm
Mn=2900ppm
Mg=1.63%
D20-44
L=10m
Zn=80ppm
Pb=20ppm
Mg=1080ppm
Mg=0.21%
D20-43
L=10m
Zn=180ppm
Pb=535ppm
Mn=3880ppm
Mg=2.22%
D20-42
L=10m
Zn=65ppm
Pb=5ppm
Mn=3170ppm
Mg=0.80%
D20-41
L=10m
Zn=590ppm
Pb=210ppm
Mn=1810ppm
Mg=0.31%
limestone
Pb 1046ppm Zn 3720ppm
Pb 1565ppm Zn 3710ppm
D20-40
L=21.5m
Zn=3020ppm
Pb=30ppm
Mn=1.32%
Mg=0.27%
silicification with brown carbonate
quartz vein
D20-39
L=22.5m
Zn=135ppm
Pb=35ppm
Mn=1880ppm
Mg=0.26%
silicified alteration
limestone
Pb 870ppm Zn 2510ppm
D20-51
L=23m
Zn=210ppm
Pb=85ppm
Mn=1040ppm
Mg=0.16%
D20-38
Zn=80ppm
Mn=1520ppm
Mg=0.20%
Pb 1085ppm Zn 2600ppm
D20-46
L=20m
Zn=75ppm
Pb=15ppm
Mn=1020ppm
Mg=0.15%
Pb 1075ppm Zn 930ppm
D20-50
L=25m
Zn=355ppm
Pb=125ppm
Mn=1460ppm
Mg=0.08%
Pb 936ppm Zn 2640ppm
Pb 1230ppm Zn 5570ppm
Pb 1305ppm Zn 2000ppm
D20-49
L=28m
Zn=380ppm
Pb=170ppm
Mn=1980ppm
Mg=0.13%
D20-48
L=25m
Zn=675ppm
Pb=105ppm
Mn=1860ppm
Mg=0.16%
D20-47
L=12m
Zn=130ppm
Pb=65ppm
Mn=1650ppm
Mg=0.17%
quartz vein and veinlet network abundant
Pb 1110ppm Zn 1790ppm
Pb 732ppm Zn 1270ppm
Pb 1150ppm Zn 728ppm
Pb 453ppm Zn 418ppm
Pb 794ppm Zn 438ppm
Pb 560ppm
D20-08
L=10m
Zn=110ppm
Pb=60ppm
Mn=1470ppm
Mg=0.18%
D20-09
L=9m
Zn=190ppm
Pb=140ppm
Mn=1750ppm
Mg=0.35%
limestone partly develping dolomite & quartz seam
D20-37
Zn=1
Pb=
Mn=
Mg=0
1995640
1995620
1995600
1995580
1995560
1995540
1995520
1995500
1995480
1995460
1995440
1995420
1995400
399400
399420
399440
399460
399480
399500
399520
399540
399560
399580
399600
399620
399640
399660
399680
399700
399720
399740
399760
900
960
1000
1060
1100

D20-15
Zn=30ppm
Mn=910
Mg=0.25%

breccia-ted silicified vein w=2m

quartz vein w=30cm

limestone

D20-13
Zn=70ppm
Pb=20ppm
Mn=180ppm
Mg=0.30%

D20-11
L=28.5m
Zn=60ppm
Pb=25ppm
Mn=1160ppm
Mg=0.26%

D20-10
L=15m
Zn=45ppm
Pb=25ppm
Mn=990ppm
Mg=0.15%

Mn=1050ppm
Mg=0.26%

Mg=0.24%

Pb=35ppm
Mn=1090ppm
Mg=0.23%

D20-08
L=10m
Zn=110ppm
Pb=60ppm
Mn=1470ppm
Mg=0.18%

limestone
partly develping dolomite & quartz seam

D20-09
L=9m
Zn=190ppm
Pb=140ppm
Mn=1790ppm
Mg=0.35%

1100

quartz vein and veinlet

D20-40
L=21.5m
Zn=3020ppm
Pb=30ppm
Mn=1.32%
Mg=0.27%

silicification with brown carbonate

quartz vein

Pb 1030ppm
Zn 3720ppm

Pb 844ppm
Zn 1920ppm

Pb 1530ppm
Zn 2310ppm

Pb 3650ppm
Zn 4460ppm

D20-45
L=10m
Zn=70ppm
Pb=15ppm
Mn=2900ppm
Mg=1.63%

D20-44
L=10m
Zn=80ppm
Pb=20ppm
Mn=1080ppm
Mg=0.21%

D20-43
L=10m
Zn=160ppm
Pb=535ppm
Mn=3880ppm
Mg=2.22%

D20-42
L=10m
Zn=65ppm
Pb=5ppm
Mn=3170ppm
Mg=0.80%

D20-41
L=10m
Zn=590ppm
Pb=210ppm
Mn=1810ppm
Mg=0.31%

1060

D20-39
L=22.5m
Zn=135ppm
Pb=35ppm
Mn=1880ppm
Mg=0.26%

silicified alteration

Pb 1665ppm
Zn 3710ppm

limestone

Pb 870ppm
Zn 2510ppm

D20-51
L=23m
Zn=210ppm
Pb=85ppm
Mn=1040ppm
Mg=0.16%

D20-38
Zn=80ppm
Mn=1520ppm
Mg=0.20%

limestone

D20-37
some floats
Zn=35ppm
Pb=15ppm
Mn=860ppm
Mg=0.11%

Pb 1085ppm
Zn 2600ppm

Pb 1075ppm
Zn 930ppm

D20-46
L=20m
Zn=75ppm
Pb=15ppm
Mn=1020ppm
Mg=0.15%

Pb 240ppm
Zn 1010ppm

Pb 1130ppm
Zn 1465ppm

D20-50
L=25m
Zn=355ppm
Pb=125ppm
Mn=1460ppm
Mg=0.08%

Pb 902ppm
Zn 1190ppm

Pb 936ppm
Zn 2640ppm

quartz vein along joint and silicified alteration

limestone

Pb 1280ppm
Zn 5570ppm

Pb 1305ppm
Zn 2000ppm

D20-49
L=25m
Zn=380ppm
Pb=170ppm
Mn=1980ppm
Mg=0.13%

D20-48
L=25m
Zn=675ppm
Pb=105ppm
Mn=1860ppm
Mg=0.16%

D20-47
L=12m
Zn=1300ppm
Pb=65ppm
Mn=1650ppm
Mg=0.13%

Pb 1340ppm
Zn 2120ppm

1080

1000

Pb 1110ppm
Zn 1790ppm

Pb 132ppm
Zn 1270ppm

Pb 1150ppm
Zn 1728ppm

Pb 458ppm
Zn 418ppm

Pb 754ppm
Zn 488ppm

Pb 360ppm

quartz vein and veinlet network abundant

1060

1160

dolomitic limestone

Pb 464ppm
Zn 1225ppm

D20-52
L=26m
Zn=80ppm
Pb=15ppm
Mn=5870ppm
Mn=2.95%

Pb 666ppm
Zn 1500ppm

Pb 168ppm
Zn 1125ppm

quartz vein
w=20cm
w=50cm
w=10cm

Pb 254ppm
Zn 1640ppm

D20-53
L=13m
Zn=1385ppm
Pb=290ppm
Mn=1890ppm
Mg=0.15%

D20-54
L=12m
Zn=90ppm
Pb=25ppm
Mn=1530ppm
Mg=0.19%

D20-55
L=22m
Zn=40ppm
Mn=1370ppm
Mg=0.10%

D20-56
L=19m
Zn=75ppm
Pb=25ppm
Mn=1480ppm
Mg=0.12%

D20-57
Zn=115ppm
Pb=30ppm
Mn=1670ppm
Mg=0.31%

limestone

quartz vein w=30cm to 3m replacing along bedding with brown carbonate mineral vein silicification strong

D20-58
L=18m
Zn=580ppm
Pb=100ppm
Mn=7270ppm
Mg=0.54%

brown carbonate vein w=7m

D20-60
L=23m
Zn=185ppm
Pb=65ppm
Mn=1350ppm
Mg=0.29%

D20-59
L=22m
Zn=165ppm
Pb=5ppm
Mn=970ppm
Mg=0.23%

quartz vein with hematite film on center crack, w=15cm

D20-61
Zn=2750ppm
Pb=2680ppm
Mn=1.89%

quartz veinlet network remarkable

Pb 518ppm
Zn 430ppm

Pb 106ppm
Zn 480ppm

Pb 216ppm
Zn 536ppm

Pb 408ppm
Zn 814ppm

Pb 180ppm
Zn 1545ppm

Pb 177ppm
Zn 674ppm

D20-56 (quartz)

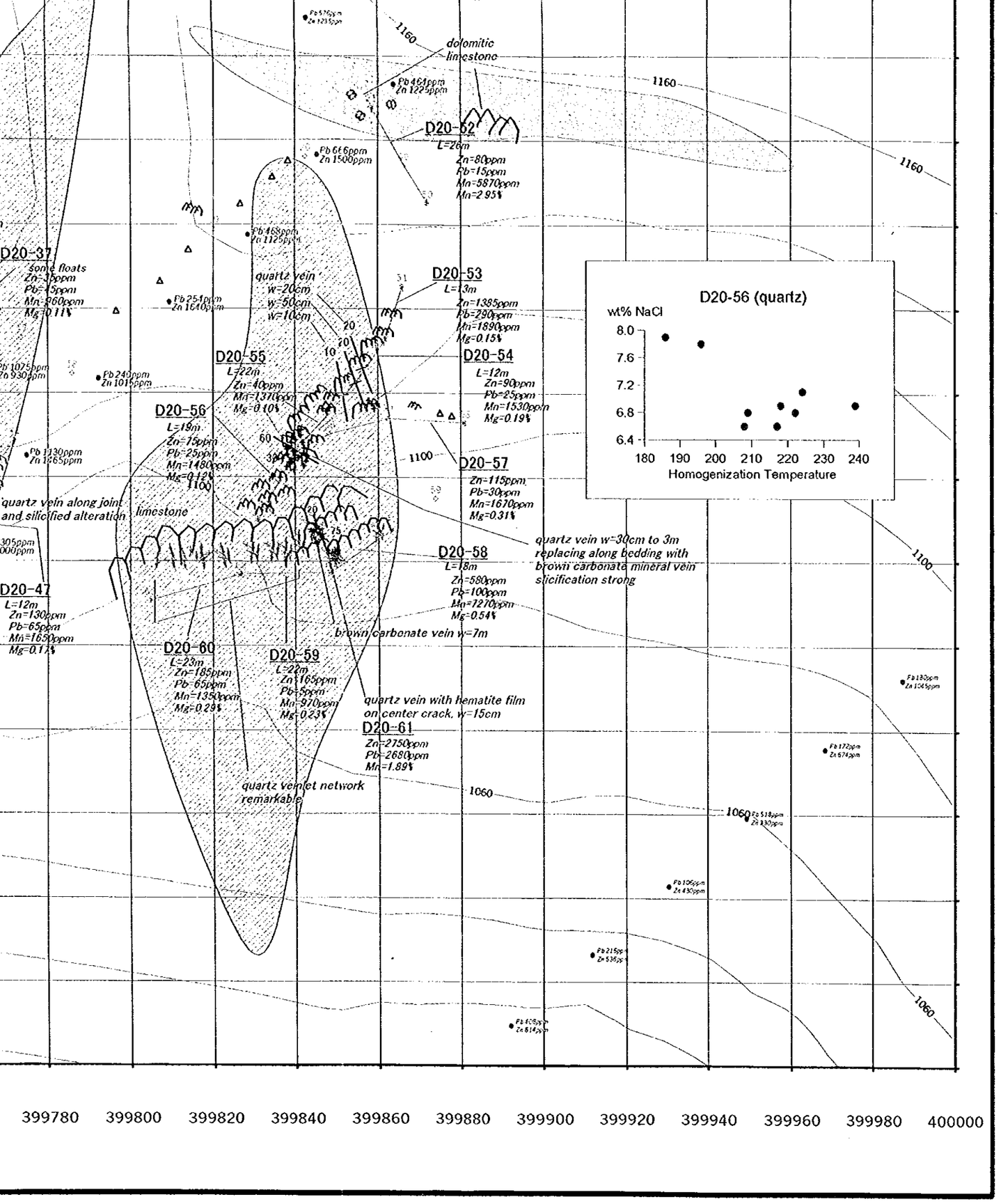
wt% NaCl

8.0
7.6
7.2
6.8
6.4

180 190 200 210 220 230 240

Homogenization Temperature

399580 399600 399620 399640 399660 399680 399700 399720 399740 399760 399780 399800 399820 399840 399860 399880 399900 399920 399940 399960 399980 40000



LEGEND

325ppm
1558ppm — Soil sample location in Second phase

D20-20 — Rock sample section along survey line

D20-26 — Rock sample of vein and spot

Silicified alteration with brecciated texture and brown carbonate minerals

Quartz vein and veinlet network with silicified alteration

Silicified alteration

20 / 75 — Quartz vein, strike and dipping

40 / 40 — Bedding, strike and dipping

Silicified alteration zone

Dolomitized alteration zone

JICA