

*Received  
Watson Lake  
April 13/82*



SMD MINING CO. LTD. **091013**  
GEOLOGICAL AND GEOCHEMICAL ASSESSMENT REPORT  
ON THE AM GROUP OF CLAIMS  
WATSON LAKE MINING DISTRICT  
YUKON TERRITORY  
NTS 105 J/3 AND 4  
63°13' LATITUDE; 131°32' LONGITUDE  
PERIOD OF WORK  
JULY 15 TO AUGUST 8, 1981

*AM 1-22  
AM 23-73  
AM 74-93  
YA 66409-  
YA 66430  
YA 67049-  
YA 67099  
YA 67357-  
YA 67376*

February, 1982

*T. Walker*  
T. Walker

**091013**



010190

This report has been examined by the Geological Evaluation Unit under Section 33 of the Yukon Quartz Mining Act and is offered as represented as well as the amount of \$ 10,450.

*R. Watson*

*RW* Regional Manager, Exploration and Geological Services for Commissioner of Yukon Territory.

010190



DEPARTMENT OF INDIAN AFFAIRS AND NORTHERN DEVELOPMENT  
YUKON QUARTZ MINING ACT  
FORM "C" - APPLICATION FOR A CERTIFICATE OF WORK



(This form required in duplicate with sketch showing location of work.)

I (Name) SMD Mining Co. Ltd.	Occupation Mining
(Postal Address) 122 3rd Avenue North, Saskatoon, Sask. S7K 2H6	

OFFICE DATE STAMP

MAKE OATH AND SAY, THAT:

- I am the owner, or agent of the owner, of the mineral claim(s) to which reference is made herein.
- I have done, or caused to be done, work on the following mineral claim(s):

(Here list claims on which work was actually done by number and name)

YA 66409 AM 1 ✓  
YA 66412 AM 4 ✓

situated at Ross River Claim Sheet No. 105-J-3,4

in the Watson Lake Mining District, to the value of at least \$4,075.00

dollars, since the 15th day of July 1981,

to represent the following mineral claims under the authority of Grouping Certificate No. 3183 (applied for)

(Here list claims to be renewed in numerical order, by grant number and claim name, showing renewal period requested).

Please see attached list of Assessment Credit Allocations for Group AM-1.

All claims to be made renewable to a common anniversary date of April 1, 1982 and subsequent years.

- The following is a detailed statement of such work: (Set out full particulars of the work done indicating dates work commenced and ended in the twelve months in which such work is required to be done as shown by Section 53.)

Please see accompanying report entitled:

Geological and Geochemical Assessment Report  
on the AM Group of claims, by T. Walker,  
February 1982.

Sworn before me at Saskatoon, Saskatchewan  
this 6 day of April 1982.

Ralph W. Gilbert  
NOTARY PUBLIC  
My Appointment  
Notary Public  
31, 1985  
SASKATCHEWAN

WMA  
Applicant  
For SMD Mining Co. Ltd.

091012



DEPARTMENT OF INDIAN AFFAIRS AND NORTHERN DEVELOPMENT  
YUKON QUARTZ MINING ACT  
FORM "C" - APPLICATION FOR A CERTIFICATE OF WORK



(This form required in duplicate with sketch showing location of work.)

I (Name)	SMD Mining Co. Ltd.	Occupation	Mining
(Postal Address)	122 3rd Avenue North, Saskatoon, Sask. S7K 2H6		

OFFICE DATE STAMP

MAKE OATH AND SAY, THAT:

- I am the owner, or agent of the owner, of the mineral claim(s) to which reference is made herein.
- I have done, or caused to be done, work on the following mineral claim(s):

(Here list claims on which work was actually done by number and name)

YA 66410 AM 2 ✓  
YA 66411 AM 3 ✓  
YA 66428 AM 20 ✓  
YA 66429 AM 21 ✓  
YA 66430 AM 22 ✓

situated at Ross River Claim Sheet No. 105-J-3,4

in the Watson Lake Mining District, to the value of at least \$4,975.00

dollars, since the 15th day of July 1981,

to represent the following mineral claims under the authority of Grouping Certificate No. 3184 (Applied For)

(Here list claims to be renewed in numerical order, by grant number and claim name, showing renewal period requested).

Please see attached list of Assessment Credit Allocations for Group AM-2.

All claims to be made renewable to a common anniversary date of April 1, 1982 and subsequent years.

- The following is a detailed statement of such work: (Set out full particulars of the work done indicating dates work commenced and ended in the twelve months in which such work is required to be done as shown by Section 53.)

Please see accompanying report entitled:

Geological and Geochemical Assessment Report  
on the AM Group of claims, by T. Walker,  
February 1982.

Sworn before me at Saskatoon, Saskatchewan

this 6 day of April 1982.



[Signature]  
Applicant  
For SMD Mining Co. Ltd.

091013



**DEPARTMENT OF INDIAN AFFAIRS AND NORTHERN DEVELOPMENT**  
**YUKON QUARTZ MINING ACT**  
**FORM "C" - APPLICATION FOR A CERTIFICATE OF WORK**



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I (Name)	SMD Mining Co. Ltd.	Occupation	Mining
(Postal Address)	122 - 3rd Avenue N., Saskatoon, Sask. S7K 2H6		

OFFICE DATE STAMP

**MAKE OATH AND SAY, THAT:**

- I am the owner, or agent of the owner, of the mineral claim(s) to which reference is made herein.
- I have done, or caused to be done, work on the following mineral claim(s):

(Here list claims on which work was actually done by number and name)

- YA 66413 AM 5 ✓
- YA 66416 AM 8 ✓
- YA 67056 AM 30 .
- YA 67058 AM 32 .
- YA 67075 AM 49 .
- YA 67077 AM 51 .

situated at Ross River Claim Sheet No. 105-J-3,4

in the Watson Lake Mining District, to the value of at least \$4,300.00

dollars, since the 15th day of July 1981,

to represent the following mineral claims under the authority of Grouping Certificate No. 3185 (Applied For)

(Here list claims to be renewed in numerical order, by grant number and claim name, showing renewal period requested).

Please see attached list of Assessment Credit Allocations for Group AM-3.

All claims to be made renewable to a common anniversary date of April 1, 1982 and subsequent years.

- The following is a detailed statement of such work: (Set out full particulars of the work done indicating dates work commenced and ended in the twelve months in which such work is required to be done as shown by Section 53.)

Please see accompanying report entitled:

Geological and Geochemical Assessment Report  
on the AM Group of claims, by T. Walker,  
February 1982.

Sworn before me at Saskatoon, Saskatchewan

this 6 day of April 19 82

Ralph W. Gilbert  
Notary Public  
PUBLIC  
My Appointment expires Dec. 31, 1985  
SASKATCHEWAN

W.M. Pumb  
Applicant  
For SMD Mining Co. Ltd.

091013



DEPARTMENT OF INDIAN AFFAIRS AND NORTHERN DEVELOPMENT  
YUKON QUARTZ MINING ACT  
FORM "C" - APPLICATION FOR A CERTIFICATE OF WORK



(This form required in duplicate with sketch showing location of work.)

(Name) SMD Mining Co. Ltd.	Occupation Mining
(Postal Address) 122 - 3rd Avenue North, Saskatoon, Sask. S7K 2H6	

OFFICE DATE STAMP

MAKE OATH AND SAY, THAT:

- I am the owner, or agent of the owner, of the mineral claim(s) to which reference is made herein.
- I have done, or caused to be done, work on the following mineral claim(s):

(Here list claims on which work was actually done by number and name)

YA 66414 AM 6 ✓	YA 66425 AM 17 ✓
YA 66415 AM 7 ✓	YA 66426 AM 18 ✓
YA 66423 AM 15 ✓	YA 66427 AM 19 ✓
YA 66424 AM 16 ✓	

situated at Ross River Claim Sheet No. 105-J-3,4

in the Watson Lake Mining District, to the value of at least \$5,025.00

dollars, since the 15th day of July 19 81,

to represent the following mineral claims under the authority of Grouping Certificate No. 3186 (Applied For)

(Here list claims to be renewed in numerical order, by grant number and claim name, showing renewal period requested).

Please see attached list of Assessment Credit Allocations for Group AM-4.

All claims to be made renewable to a common anniversary date of April 1, 1982 and subsequent years.

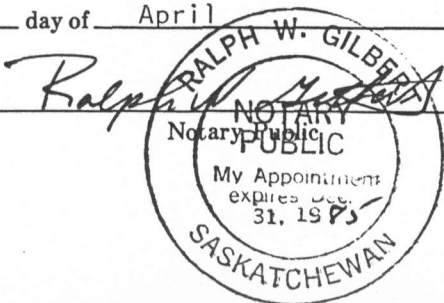
- The following is a detailed statement of such work: (Set out full particulars of the work done indicating dates work commenced and ended in the twelve months in which such work is required to be done as shown by Section 53.)

Please see accompanying report entitled:

Geological and Geochemical Assessment Report  
on the AM Group of claims, by T. Walker,  
February 1982.

Sworn before me at Saskatoon, Saskatchewan

this 6 day of April 19 82



*W.H. Lamb*

Applicant

For SMD Mining Co. Ltd.

09-10-18



**DEPARTMENT OF INDIAN AFFAIRS AND NORTHERN DEVELOPMENT**  
**YUKON QUARTZ MINING ACT**  
**FORM "C" - APPLICATION FOR A CERTIFICATE OF WORK**



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I (Name)	SMD Mining Co. Ltd.	Occupation	Mining
(Postal Address)	122 3rd Avenue North, Saskatoon, Sask. S7K 2H6		

OFFICE DATE STAMP

**MAKE OATH AND SAY, THAT:**

- I am the owner, or agent of the owner, of the mineral claim(s) to which reference is made herein.
- I have done, or caused to be done, work on the following mineral claim(s):

(Here list claims on which work was actually done by number and name)

YA 66417	AM 9 ✓	YA 67061	AM 35
YA 66420	AM 12 ✓	YA 67062	AM 36
YA 67060	AM 34	YA 67094	AM 68

situated at Ross River Claim Sheet No. 105-J-3,4

in the Watson Lake Mining District, to the value of at least \$4,300.00

dollars, since the 15th day of July 19 81,

to represent the following mineral claims under the authority of Grouping Certificate No. 3187 (Applied For)

(Here list claims to be renewed in numerical order, by grant number and claim name, showing renewal period requested).

Please see attached list of Assessment Credit Allocations for Group AM-5.

All claims to be made renewable to a common anniversary date of April 1, 1982 and subsequent years.

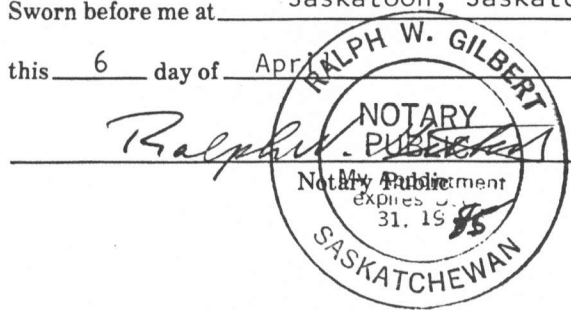
- The following is a detailed statement of such work: (Set out full particulars of the work done indicating dates work commenced and ended in the twelve months in which such work is required to be done as shown by Section 53.)

Please see accompanying report entitled:

Geological and Geochemical Assessment Report  
on the AM Group of claims, by T. Walker,  
February 1982

Sworn before me at Saskatoon, Saskatchewan

this 6 day of April 19 82.

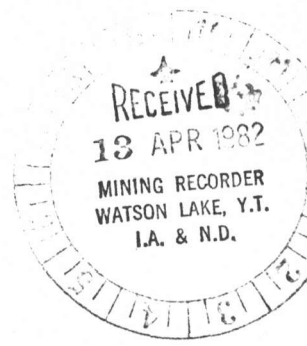


[Signature]  
Applicant  
For SMD Mining Co. Ltd.

091013



DEPARTMENT OF INDIAN AFFAIRS AND NORTHERN DEVELOPMENT  
YUKON QUARTZ MINING ACT  
FORM "C" - APPLICATION FOR A CERTIFICATE OF WORK



(This form required in duplicate with sketch showing location of work.)

I (Name)	SMD Mining Co. Ltd.	Occupation	Mining
(Postal Address)	122 - 3rd Avenue North, Saskatoon, Sask. S7K 2H6		

OFFICE DATE STAMP

MAKE OATH AND SAY, THAT:

- I am the owner, or agent of the owner, of the mineral claim(s) to which reference is made herein.
- I have done, or caused to be done, work on the following mineral claim(s):

(Here list claims on which work was actually done by number and name)

YA 66418	AM 10 ✓	YA 66422	AM 14 ✓
YA 66419	AM 11 ✓	YA 67090	AM 64 ✓
YA 66421	AM 13 ✓	YA 67095	AM 69 ✓

situated at Ross River Claim Sheet No. 105-J-3,4

in the Watson Lake Mining District, to the value of at least \$5,200.00

dollars, since the 15th day of July 19 81,

to represent the following mineral claims under the authority of Grouping Certificate No. 3188 (Applied For)

(Here list claims to be renewed in numerical order, by grant number and claim name, showing renewal period requested).

Please see attached list of Assessment Credit Allocations for Group AM-6.

All claims to be made renewable to a common anniversary date of April 1, 1982 and subsequent years.

- The following is a detailed statement of such work: (Set out full particulars of the work done indicating dates work commenced and ended in the twelve months in which such work is required to be done as shown by Section 53.)

Please see accompanying report entitled:

Geological and Geochemical Assessment Report  
on the AM Group of claims, by T. Walker,  
February 1982.

Sworn before me at Saskatoon, Saskatchewan  
this 6 day of April 19 82.

Ralph W. Gilbert  
Notary Public  
SASKATCHEWAN

W.M. Bunt  
Applicant

For SMD Mining Co. Ltd.

0910-3

SMD MINING CO. LTD.  
 AM PROJECT - YUKON  
 COST STATEMENT - 1981 GEOLOGICAL AND GEOCHEMICAL SURVEYS

Group Name	AM 1	AM 2	AM 3	AM 4	AM 5	AM 6	Totals
Group Number	YA66409+	YA66410+	YA66413+	YA66414+	YA66417+	YA66418+	
Code	600001	600002	600003	600004	600005	600006	
SMDC SALARIES	1295.00	1924.00	1476.00	1925.00	1478.00	2109.00	10207.00
CAMP COSTS	412.00	412.00	413.00	413.00	413.00	413.00	2476.00
SURVEY AIRCRAFT	1407.00	1407.00	1408.00	1408.00	1408.00	1408.00	8446.00
TRAVEL, TRANSPORT, FREIGHT	40.00	40.00	41.00	41.00	41.00	41.00	244.00
GEOCHEMICAL ANALYSIS	614.00	802.00	614.00	802.00	614.00	802.00	4248.00
MISCELLANEOUS OTHER	<u>4.00</u>	<u>4.00</u>	<u>4.00</u>	<u>5.00</u>	<u>5.00</u>	<u>5.00</u>	<u>27.00</u>
TOTAL FIELD COSTS	3772.00	4589.00	3956.00	4594.00	3959.00	4778.00	25648.00
ADMINISTRATION 10%	<u>377.00</u>	<u>459.00</u>	<u>396.00</u>	<u>459.00</u>	<u>396.00</u>	<u>478.00</u>	<u>2565.00</u>
TOTAL ASSESSMENT COSTS	4149.00	5048.00	4352.00	5053.00	4355.00	5256.00	28213.00

CERTIFIED CORRECT:

B. R. Del Frari

B.R. Del Frari  
 Director of Accounting



†  
NNREB WASE

IAND WTLK  
3 MAY 1982  
12:58 PM

PAT WATSON  
GEOLOGY DEPT

AMOUNT REQUIRED FOR RENEWAL OF AM 1-22 IS 10,450.00 DLS

P L MCLEOD  
MINING RECORDER  
WATSON LAKE MINING DISTRICT

†  
NNREB WASE

IAND WTLK

INDIAN AND NORTHERN  
AFFAIRS  
RECEIVED.

82 MAY 3 PI: 10



Government of Canada / Gouvernement du Canada

**ACTION REQUEST / FICHE DE SERVICE**

To — À <i>Pat Watson Geology</i>	File No. — Dossier N°
	Date <i>28 Apr 82</i>

From — De  
*Patti McLeod, Mining Recorder*

<input type="checkbox"/> Please call / Prière d'appeler	Tel. No. — N° de tél.	Ext. — Poste
---------------------------------------------------------	-----------------------	--------------

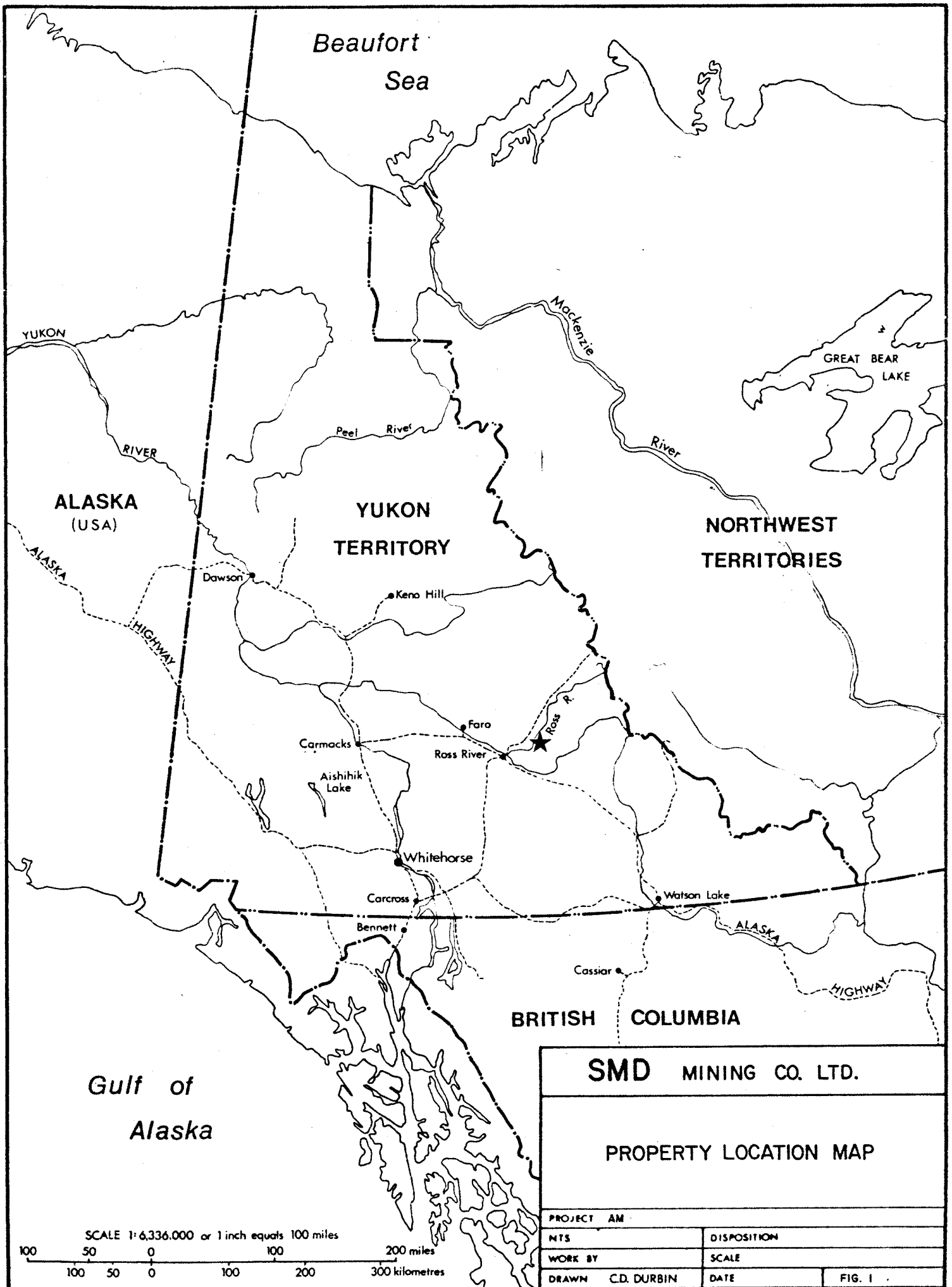
<input type="checkbox"/> Returned your call / Vous a rappelé	<input type="checkbox"/> Will call again / Vous rappellera	<input type="checkbox"/> Wants to see you / Désire vous voir
--------------------------------------------------------------	------------------------------------------------------------	--------------------------------------------------------------

Date	Time — Heure	Message received by / Message reçu par
------	--------------	----------------------------------------

<input type="checkbox"/> Action / Donner suite	<input type="checkbox"/> Approval / Approbation	<input type="checkbox"/> Note & return / Noter et retourner
<input checked="" type="checkbox"/> Comments / Commentaires	<input type="checkbox"/> Draft reply / Projet de réponse	<input type="checkbox"/> Note & forward / Noter et faire suivre
<input type="checkbox"/> As requested / Comme demandé	<input type="checkbox"/> Signature	<input type="checkbox"/> Note & file / Noter et classer

*Will this suffice as a statement of costs for Am report (SMA)?*

*S?*



Beaufort  
Sea

YUKON

RIVER

ALASKA  
(USA)

YUKON  
TERRITORY

NORTHWEST  
TERRITORIES

GREAT BEAR  
LAKE

Peel River

Mackenzie  
River

River

Dawson

Keno Hill

ALASKA  
HIGHWAY

Faro

Carmacks

Ross River

Ross R.

Aishihik  
Lake

Whitehorse

Carcross

Watson Lake

Bennett

ALASKA  
HIGHWAY

Cassiar

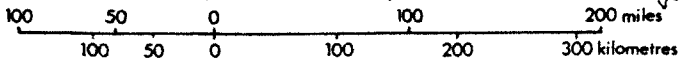
BRITISH COLUMBIA

Gulf of  
Alaska

**SMD MINING CO. LTD.**

**PROPERTY LOCATION MAP**

SCALE 1:6,336,000 or 1 inch equals 100 miles



PROJECT AM

NTS

DISPOSITION

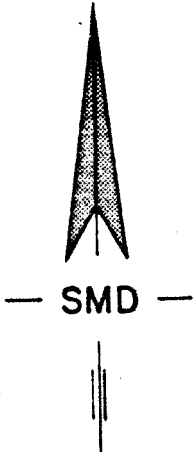
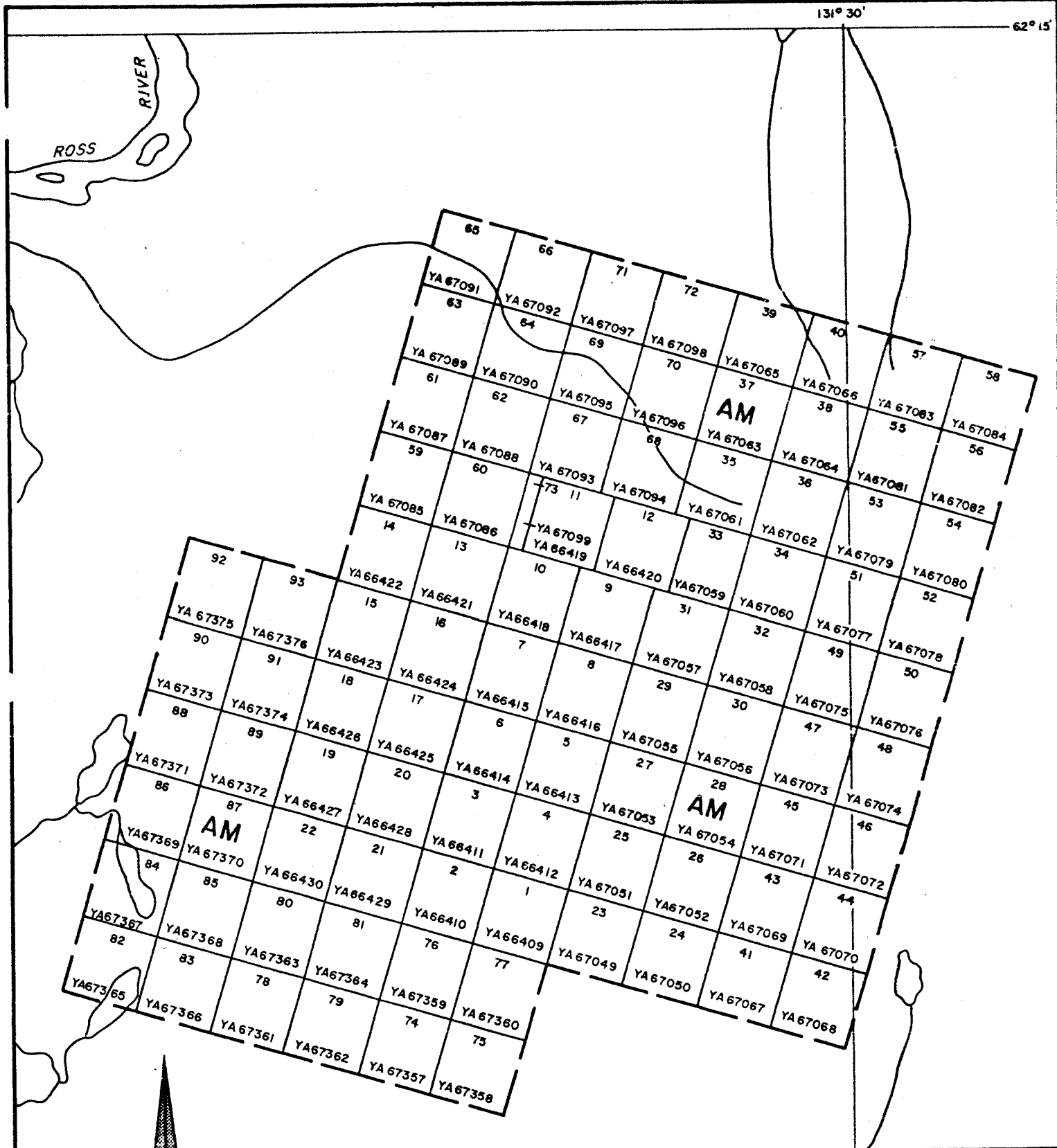
WORK BY

SCALE

DRAWN C.D. DURBIN

DATE

FIG. 1



**SMD MINING CO. LTD.**

**DISPOSITION MAP**

PROJECT		AM PROJECT	
NTS	105-J-3,4	DISPOSITION	CLAIMS 1-93
WORK BY		SCALE	1/2 mile to 1 inch
DRAWN	C.D. DURBIN	DATE	MAP 2

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Map 7	Geochemical Map: Pb conc. in soils, Scale 1:5,000	In Pocket
Map 8	Geochemical Map: Zn conc. in soils, Scale 1:5,000	In Pocket
Map 9	Geochemical Map: Ag conc. in soils, Scale 1:5,000	In Pocket
Map 10	Geochemical Map: Au conc. in soils, Scale 1:5,000	In Pocket
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APPENDICES

Appendix I	Claim List
Appendix II	Personnel List
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## SUMMARY

Prospecting and geological mapping conducted during July 1981 indicated the presence of Cu-Mo porphyry type mineralization developed in a quartz veined hornfelsed red bed unit around the southwest end of a granodiorite to quartz diorite intrusion.

A number of diopsidic skarn outcrops containing Cu, Pb, Zn, Ag mineralization were also discovered in a calcareous unit in contact with the west and southwest flanks of the same intrusion. Two mineralized breccia zones carrying Cu, Pb, Zn, Ag  $\pm$  Mo mineralization were found in the same calcareous unit. The most significant of these is a 75 - 100 m wide zone of intense brecciation 600 m from the southwest end of the intrusion. A grab sample from this zone ran 0.34% Cu, and 0.33% Zn, 0.09% Pb and 0.3 oz. Ag/ton.

A soil geochemical survey conducted concurrently with the geological survey indicated a roughly arcuate Cu, Mo, Pb, Zn, Ag anomaly zone overlying the hornfelsed sediments around the south and west margins of the intrusion. The anomaly varies from 200 - 800 m wide, is open at both ends and contains values up to 1600 ppm Cu, 150 ppm Mo, 650 ppm Pb, 6000 ppm Zn and 9 ppm Ag.

The limited work done to date suggests potential within the project area for several types of mineral deposit, i.e., porphyry Cu-Mo  $\pm$  W, Au and skarn and breccia Cu, Pb, Zn, Ag. Extensive additional ground work will be required to fully evaluate the property.

## INTRODUCTION

The AM group of 93 claims occupies part of the west facing slope and crest of a 1200 - 1500 m high ridge forming the eastern edge of the Ross River valley 51 km northeast of the town of Ross River. The elevation of the property rises in three steps from 790 m on the west side to 1500 + m on the ridge in the east central part of the property. The steps have 20° average side slopes and moderately undulating tops. Vegetation cover is generally 1 - 2 m tall buckbrush and alder with occasional lone black spruce on the tops of the steps and thick, 2 - 3 m buckbrush, alders and isolated stands of mature black spruce on the west facing slopes.

Access to the property was by helicopter from Ross River. The North Canal Road, passes within 7 km of the property but on the opposite (west) side of the Ross River. Winter access could be gained directly from the North Canal Road across the river or from a winter road along Big Timber Creek 10 km south of the property.

A mineralized quartz diorite outcrop, containing molybdenite and chalcopryite, was discovered in the area by A & M Explorations in June 1981 while conducting a reconnaissance silt geochemical survey for SMD Mining Co. Ltd. Subsequent prospecting by SMD personnel uncovered more quartz veined intrusive and metasediment outcrops weakly mineralized with molybdenite, chalcopryite and malachite.

In early July claims AM 1 to 12 were staked by SMD personnel to cover the showings. A base line was cut along the claim location line and a prospecting, mapping and soil geochemical survey was conducted. The prospecting and mapping revealed further Cu-Mo porphyry type mineralization and Pb, Zn sulphide bearing skarn outcrops on the west side of the claim group. This prompted staking of claims AM 13 - 22 and additional prospecting and soil sampling along and close to the new claim location line. Additional prospecting was also conducted along the stream valley draining the northwest corner of the claim group and the ridge top to the east.

The discovery of several mineralized breccias and a second intrusion during this latter prospecting plus the results of the soil survey on AM 1 - 12 resulted in the staking of claims AM 23 - 93.

#### CLAIM STAKING AND LINE CUTTING

AM claims 1 - 22 were staked during July by SMD personnel; claims 23 - 93 were staked during August and September by employees of Ketz Enterprises Ltd., Ross River. All claims were subsequently transferred to SMD Mining Co. Ltd.

Two N15°E lines, totalling 5.03 km, were cut by SMD personnel along the location lines of claims 1 - 22. These lines were chained and flagged every 50 m and used as base lines for the geochemical and geological surveys. The remaining geochemical sample lines were pace and compass lines, normal to and every 200 m along the base lines (Map 3). These lines were also flagged every 50 m.

#### GEOLOGICAL SURVEY

##### 1. Prospecting and Mapping

The bulk of the prospecting and geological mapping was conducted along the cut base lines and flagged geochem. grid lines established on claims 1 - 22. The remainder consisted of ridge and stream traversing on claims 30, 32, 34 - 36, 49, 51, 64, 68 and 69. During the course of the survey seventeen mineralized rock samples were collected and analyzed for Mo, Cu, Ag, Zn, Pb, As, Sb, Sn, W and Au by Rossbacher Laboratories, Vancouver, British Columbia (Appendix III).

The main geological features identified during the geological mapping are two northeast-southwest elongate intrusive plugs (Map 4). They appear to be fairly uniform, medium to coarse grained, pale gray to cream coloured granodiorites. A general grain-size decrease occurs towards the margins of the intrusions and locally hornblende ± feldspar ± biotite porphyry varieties occur (particularly on claims 7, 8 and 9). The north end of the larger intrusion appears

to be more dioritic in composition and contains quartz phenocrysts. Several pale cherty porphyritic dykes were noted at the north and south ends of both plugs. These dykes intrude the main granodiorite masses on claims 34 and 35 and probably represent late stage differentiates.

These and other similar intrusions in the general area were mapped (by Roddick and Green, Reference 1) as equivalents of the Anvil Batholith. They are, however, more akin to the subvolcanic intrusive equivalents of the South Fork Group and are probably of similar age.

The plugs and dykes intrude and hornfels a sequence of non-calcareous to calcareous clastic rocks previously mapped (by Roddick and Green, Reference 1) as Devono-Mississippian black clastics. Although the stratigraphic relationships are obscured by poor outcrop and the intrusions, the sequence appears to start with a vari-coloured siliceous clastic unit (Map 4, Unit 1). This is overlain by a gray green calcareous unit (Unit 2) which is initially capped by black clastics (Unit 3).

The basal vari-coloured unit dominates the outcrop and consists of gray, green, purple, brown and blue-gray finely banded to massive phyllitic and slaty argillites, siltstones and pale gray to white quartzites. Delicate colour banding and relict ripple cross bedding occur in some outcrops. This unit may be a marginal marine tidal flat to deltaic red bed sequence very similar to the Spokane and St. Regis Formations of the Belt Supergroup in Idaho and Montana. This unit may also contain some thin calcareous beds which are seen in outcrop only as diopside bearing skarns.

The overlying calcareous unit appears to be much thinner and was identified with certainty in two areas only, i.e., in the northeast quarter of AM 19 and the northeast quarter of AM 34. At both localities it consists of thinly bedded gray to gray-green calcareous siltstones, mudstones, calc-silicate schists and 2 - 30 cm lenses and beds of gray crystalline limestone. The calcareous unit appears to conformably overlie the red bed unit which suggests

a change to more open marine carbonate shelf sedimentation with time. Lithologically these units are correlatable with Roddick and Greens Middle and Upper Cambrian (?) 1a, b and c units.

The youngest (?) unit exposed on the claim group consists of a thick sequence of black shales and phyllites with interbedded black chert, siltstone and sandstone. These rocks are best exposed in a narrow gorge on claims 64, 66 and 69. The eastern half of this outcrop has been invaded by numerous irregular, 1 - 5 m thick quartz porphyry dykes and has been hornfelsed to flinty black slate and flagstone. Lithologically this unit correlates with Roddick and Greens Upper Devonian - Lower Mississippian (?) unit 5c.

## 2. Structure

Poor outcrop density and distribution precludes any detailed structural interpretations, however, a few general features are evident.

An east-northeast regional foliation is present throughout the claim and tight east-northeast trending isoclinal folding is evident in the southwest corner. In contrast the apparent elongation of the main intrusions and dykes is northeast-southwest. The southeast margin of the main intrusion is bounded by a remarkably linear strip of low swampy ground, also trending northeast-southwest, which may be the surface trace of a fault.

Both these trends are strongly discordant with the regional northwest-southeast grain of this part of the Selwyn Basin.

## 3. Mineralization

Porphyry type Cu-Mo mineralization was found in two areas of quartz stockwork veining on claims 2 - 7 and 34. The quartz veining occurs mainly in the hornfelsed argillites and siltstones of the red bed unit and (to a lesser extent) in the finer grained marginal facies of the plugs and dykes. The Cu-Mo mineralization occurs as weak disseminations of chalcopyrite, molybdenite and

malachite in the quartz veins, dry fractures and (to a lesser extent) the host sediment. Grab samples collected mainly from outcrops on claims 2 - 7 range from 38 to 600 ppm Cu, 3 to 190 ppm Mo, 3.0 - 9.4 ppm Ag and 20 - 200 ppb Au. The better grade mineralization tends to occur in and close to the porphyry dykes.

No systematic variations in Cu to Mo ratio appears from the samples collected to date and no significant alteration patterns were observed either. Secondary biotite, epidote and chlorite do occur in places and traces of pyrite occur throughout the intrusives and hornfelsed sediment.

In addition to the Cu-Mo mineralization, a number of mineralized diopside bearing skarn outcrops were found on claims 2 and 6. The skarn on AM 6 is a massive green diopsidic marble in contact with the main plug which contains disseminated chalcopyrite, bornite, sphalerite and molybdenite. The other outcrop appears to be within the calcareous unit, is quartz/carbonate veined and carries chalcopyrite, bornite and malachite. A grab sample from this outcrop ran 0.5 oz. Ag/ton.

Two mineralized breccia zones were also discovered on claims 19 - 20 and 34. The former is a 75 - 100 m wide zone of intense brecciation in sediments of units 1a and 2. The breccia consists of a chaotic assemblage of angular sediment clasts 5 cm to 3 m diameter cemented by calcite and minor quartz. Mineralization consists of disseminations, blebs and stringers of chalcopyrite, bornite, galena, sphalerite and minor pyrite in the cement and (to a lesser extent) the breccia fragments. A composite sample, consisting of 3 - 5 cm diameter pieces of low grade rock taken approximately every 10 - 15 m across the breccia zone, ran 0.34% Cu, 0.33% Zn, 0.09% Pb and 0.3 oz. Ag/ton. The other zone on claim 34 is in the same host rocks but is much weaker and consists essentially of a network of thin carbonate veinlets which carry galena and sphalerite. The carbonate veinlets extend upwards into the black shales and are peripheral to an extensive quartz vein network in hornfelsed green argillite which is intruded by quartz porphyry dykes.

Finally a zone of sulphide mineralization was found in the black shales exposed on claims 64 and 66. Mineralization consists of lenses, stringers and disseminations of pyrite parallel to bedding in a 5 m thick shale unit. Specks of sphalerite and hydrozincite coatings on some bedding plains and joints were tentatively identified in the field. A grab sample taken from the 'show' ran 260 ppm Pb and 940 ppm Zn.

#### GEOCHEMICAL SURVEY

A total of 343 soil samples were collected at 50 m intervals along the cut "north-south" base lines and flagged "east-west" grid lines (Map 3). All the samples were analyzed for Cu, Mo, Pb, Zn, Ag and Au by Rossbacher Laboratory Ltd., Vancouver (Appendix III). The samples were dried, hand crushed and sieved to -80 mesh in the lab prior to digestion using a perchloric/nitric acid leach and analysis by A.A.

The soil type developed in the sampled area is a very immature orange brown mineral soil with virtually no soil profile. It varies in thickness from less than 5 cm to 1 m and is usually capped by a 1 - 5 cm white ash layer and a very variable thickness of humus, peat and moss. The sample horizon chosen for the survey was the orange brown 'C' horizon and at most sites this was collected. In several areas, particularly in the linear swampy belt on the east side of the grid and the west half of claim 11, the 'C' horizon could not be sampled due to permafrost development within 10 cm of surface. In these areas the soils collected were predominantly organic rich clays.

The analysis results have been plotted as a series of contoured geochemical maps for each individual element (Maps 5 - 10). The contour intervals selected were the background value and geometric multiples thereof. Background values were picked from uniform interval contour plots of the individual element data.

The results indicate a roughly arcuate "anomalous" base and precious metal soil zone overlying the western and southern margins of the main intrusive plug and its hornfelsed aureole (Map 11). This

zone varies in width from 800 m in the south to 200 m in the north, where it is apparently entirely within the intrusive.

As may be expected from the distribution of the known mineralized outcrops, the main Cu-Mo soil anomaly occurs at the south end of the main plug in the hornfelsed red beds. Values of up to 1610 ppm Cu and 142 ppm Mo were recorded in this zone (Maps 5 and 6). A north-south trending narrow (100 m) linear zone of anomalous Pb, Ag and Zn values cuts across this Cu-Mo zone on claims 3 and 6. This appears to coincide with a diopside skarn band containing chalcopyrite, bornite and sphalerite. Ag values of up to 8.4 ppm were recorded in this zone. A second Pb, Ag, Zn zone occurs along the west ledge of claims 2 and 3, again mineralized skarn outcrops were noted in this area.

The northern half of the soil anomaly zone on claims 9 - 12 is essentially a Pb, Zn, Ag zone (Maps 7, 8 and 9). The strongest and widest part of the anomaly occurs on claim 10 and in part overlies an area of diopside skarn outcrops. Values up to 640 ppm Pb, 6000 ppm Zn and 4 ppm Ag were recorded in this area. Several two-sample copper anomalies (up to 560 ppm) were detected in this area (Map 6), the strongest lying well within the intrusive.

Virtually all the soil samples had Au values of 10 ppb (the detection limit). The six samples greater than this (20 - 90 ppb) are scattered and show no obvious correlation with the other elements or the known geology.

The soil sampling along the locations line for claims 13 - 22 indicated two anomalous areas. One is a four sample Cu, Pb, Zn, Ag  $\pm$  Mo anomaly in part overlying the mineralized breccia zone on claim 19. The other is 250 m further south and is a four sample Cu, Mo, Ag  $\pm$  Pb, Zn anomaly. These two zones could indicate extension of the main Cu-Mo anomaly across claims 17, 20 and 21.

## CONCLUSIONS

The examination to date of approximately 15% of the property has revealed significant Cu, Mo, Pb, Zn and Ag mineralization and an extensive polymetallic soil anomaly zone associated with one (possibly two?) Late Cretaceous to Tertiary granodiorite plugs.

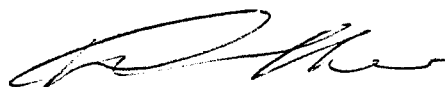
The composition and mode of occurrence of the mineralization found suggests the possibility of at least three types of mineral deposit occurring on the property, i.e.:

1. Porphyry type Cu-Mo; in the quartz vein networks developed in hornfelsed red beds close to the intrusive plugs and dykes.
2. Skarn type Ag, Pb, Zn; in the carbonate rich unit close to the intrusives.
3. Ag, Cu, Pb, Zn breccia? pipes; in the carbonate rich rocks more distal from the intrusions but probably related to them.

## RECOMMENDATIONS

The following program is suggested for the further evaluation in 1982 of AM claims 1 - 93:

1. An air photo survey and photo geological study.
2. Extension of the soil geochemical and geological surveys to cover the whole property.
3. A ground EM and Magnetometer survey of the property to identify structure and help interpret the geological observations.
4. Detailed IP/resistivity surveys in the most favourable areas for porphyry Cu-Mo mineralization identified during steps 1 - 3.

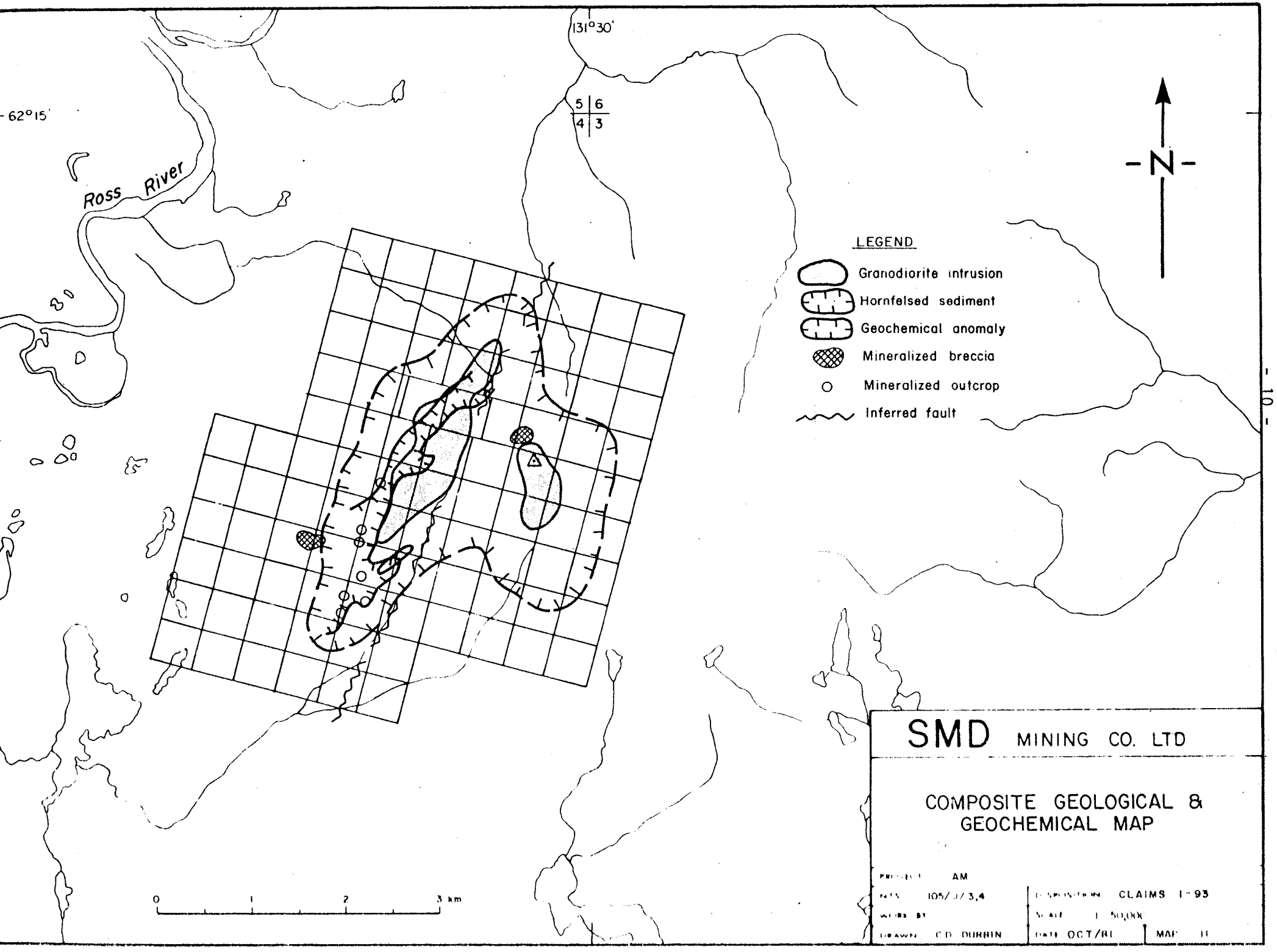


Terry Walker  
Senior Project Geologist







REFERENCES

Roddick, J. A. and Green, L. H., 1961 - Map 12-1961, Sheldon Lake,  
GSC Preliminary Series.

Roddick, J. A. and Green, L. H., 1961 - Map 13-1961, Tay River, GSC  
Preliminary Series.



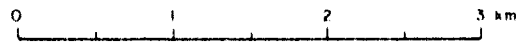
**LEGEND**

-  Granodiorite intrusion
-  Hornfelsed sediment
-  Geochemical anomaly
-  Mineralized breccia
-  Mineralized outcrop
-  Inferred fault

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**COMPOSITE GEOLOGICAL & GEOCHEMICAL MAP**

PROJECT	AM	DISPOSITION	CLAIMS 1-93
DATE	105/12/3,4	SCALE	1:50,000
WORKS BY		DATE	OCT/81
DRAWN	C.D. DURRIN	MAP	11



APPENDIX I  
PERSONNEL LIST - AM PROJECT

<u>Name and Title</u>	<u>Activity</u>	<u>Time Charged (Days)</u>
T. Walker	Line Cutting	3
Senior Project Geologist 122-3rd Avenue North Saskatoon, Saskatchewan	Geological Mapping and Prospecting	8
	Map Preparation and Report Writing	15
Garth Drever	Line Cutting	
Geologist 122-3rd Avenue North Saskatoon, Saskatchewan	Soil Sampling	7
	Geological Mapping	2
Mori Goodz	Line Cutting	3
Geological Assistant Carleton University Ottawa, Ontario	Soil Sampling	7
	Prospecting	2

APPENDIX II

CLAIM LIST, AM GROUP

<u>Claim Names</u>	<u>Grant Numbers</u>	<u>Owner</u>
AM 1 - 22	YA 66409 - YA 66430	SMD Mining Co. Ltd.
AM 23 - 73	YA 67049 - YA 67099	SMD Mining Co. Ltd.
AM 74 - 93	YA 67357 - YA 67376	SMD Mining Co. Ltd.

NB: The work described in the report was done on behalf of the owners.

STATEMENT OF QUALIFICATIONS

I, Terence Walker, of the City of Saskatoon in the Province of Saskatchewan, do hereby certify:

That I am a District Geologist employed by Saskatchewan Mining Development Corporation, with offices located at 122-3rd Avenue North, Saskatoon, Saskatchewan.

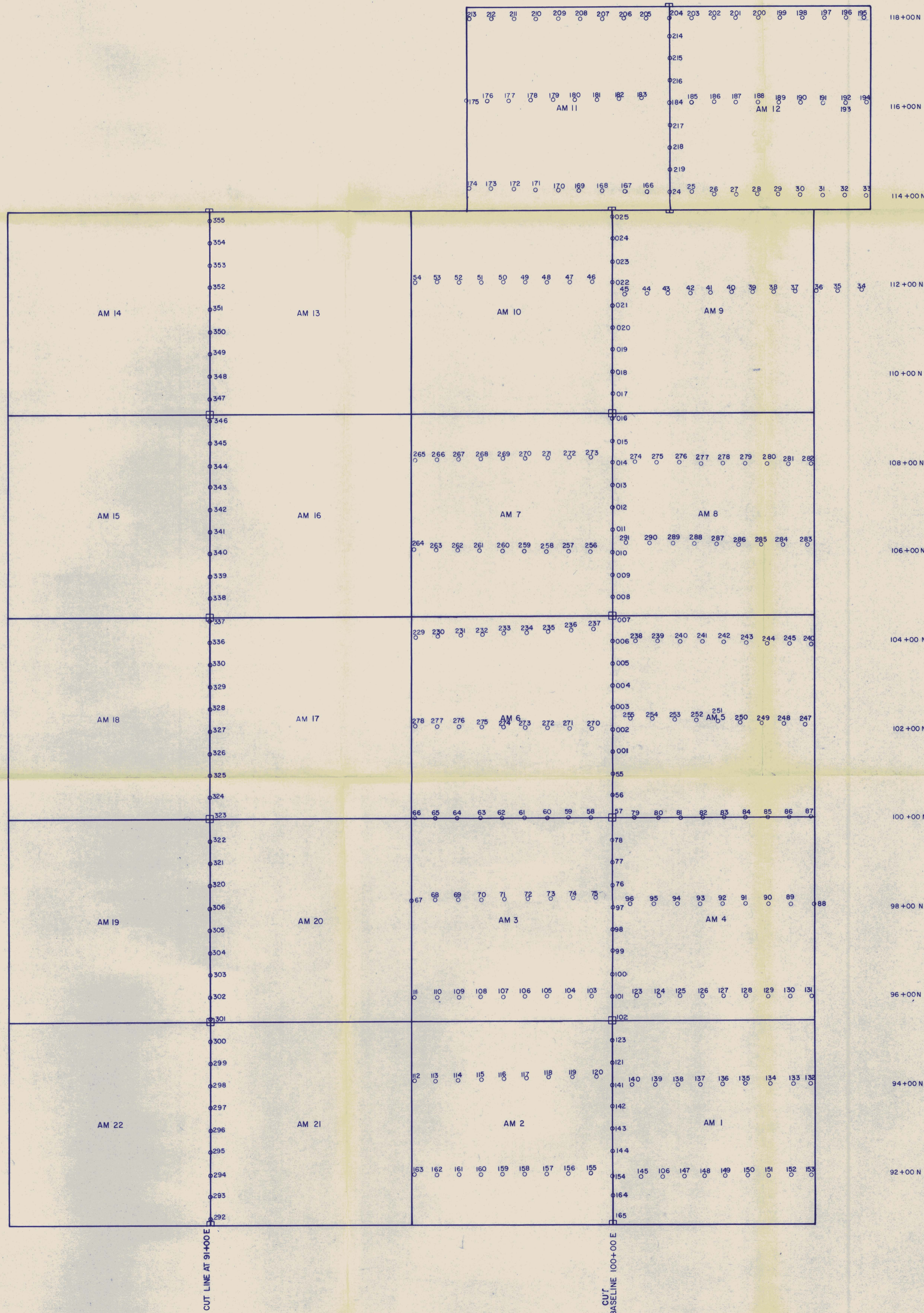
I further certify that:

1. I am a graduate of the University of London (UK) with the degree of Bachelor of Science (1968) and the University of McGill with the degree of M. Sc. (1978).
2. I have been practising my profession continuously for the past thirteen years.
3. I am a member of the Canadian Institute of Mining and Metallurgy and the associate member of the Institute of Mining and Metallurgy (UK).
4. The information for this report was obtained from personal examinations of the property during July 15 to August 8, 1981 and from government publications.

Dated at Saskatoon, Saskatchewan, 15th day of February, 1982.



T. Walker, M. Sc.  
District Geologist



SAMPLE LOCATION SAMPLE NUMBER  
(PREPARED BY SPIN)

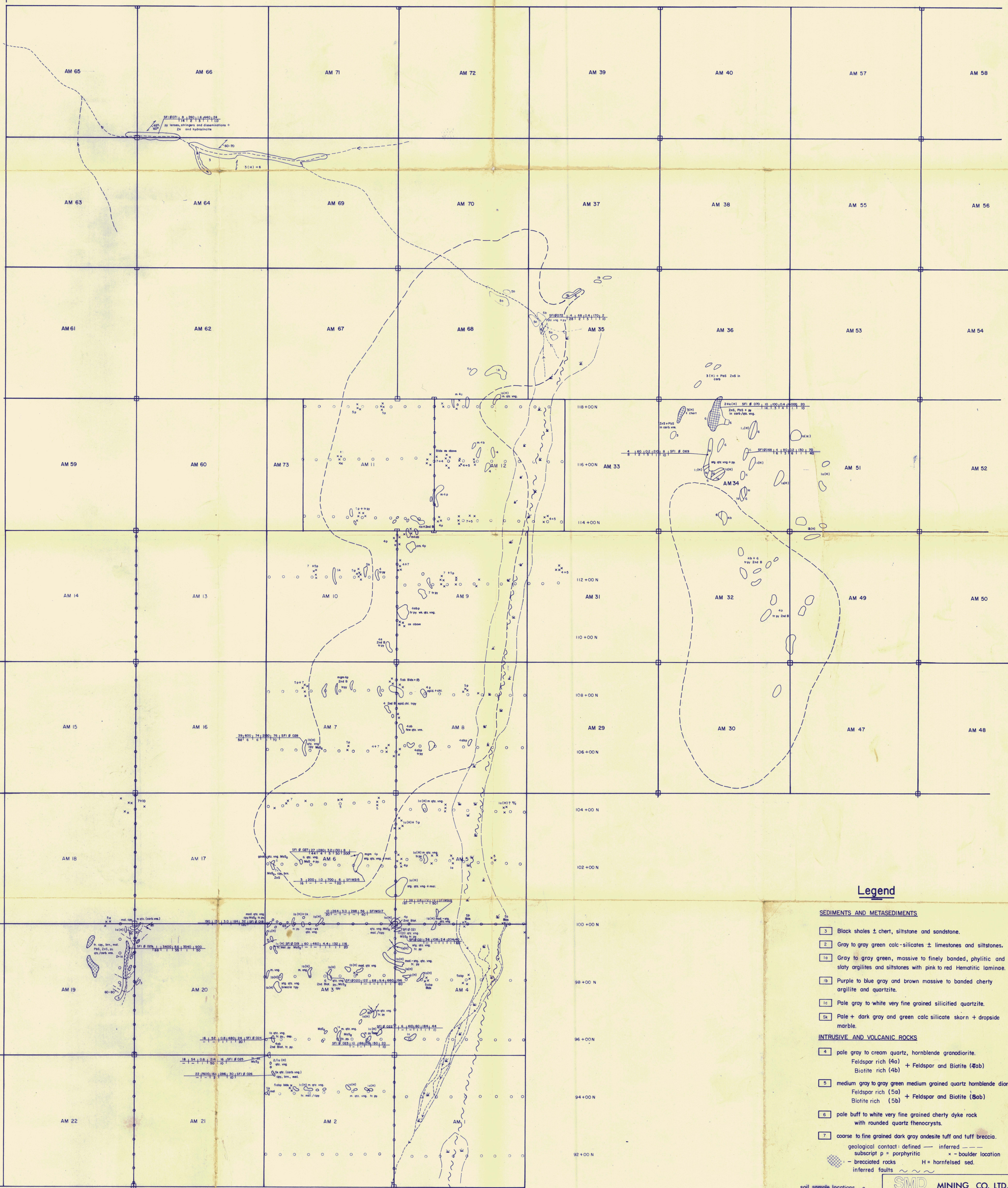
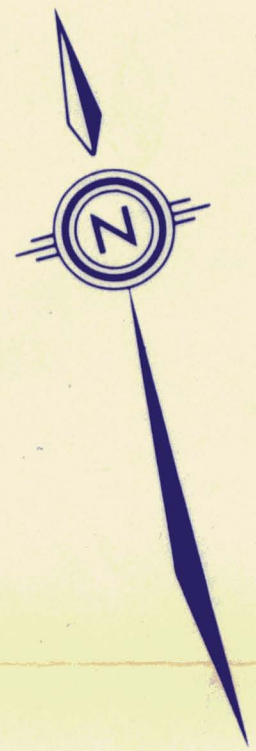
CLAIM LOCATION LINES



**SMD MINING CO. LTD.**

Survey Grid and  
Soil Sample Location Map  
**091013**

PROJECT	AM	DISPOSITION	CLAIMS 1-93
DATE	05/11/94	SCALE	1:5,000
WORK BY		DATE	DEC/91
DRAWN	C.D. DURBIN	MAP	3



### Legend

#### SEDIMENTS AND METASEDIMENTS

- 3 Black shales ± chert, siltstone and sandstone.
- 2 Gray to gray green calc-silicates ± limestones and siltstones.
- 1a Gray to gray green, massive to finely banded, phyllitic and slaty argillites and siltstones with pink to red Hematitic laminae.
- 1b Purple to blue gray and brown massive to banded cherty argillite and quartzite.
- 1c Pale gray to white very fine grained silicified quartzite.
- 5a Pale + dark gray and green calc silicate skarn + dropside marble.

#### INTRUSIVE AND VOLCANIC ROCKS

- 4 pale gray to cream quartz, hornblende granodiorite.  
Feldspar rich (4a) + Feldspar and Biotite (4ab)
- 5 medium gray to gray green medium grained quartz hornblende diorite.  
Feldspar rich (5a) + Feldspar and Biotite (5ab)
- 6 pale buff to white very fine grained cherty dyke rock with rounded quartz phenocrysts.
- 7 coarse to fine grained dark gray andesite tuff and tuff breccia.

geological contact: defined — inferred —  
subscript p = porphyritic x = boulder location  
- brecciated rocks H = hornfelsed sed.  
inferred faults

soil sample locations ○  
rock sample locations ○  
SP180001 to SP180010  
in ppm (except Au in ppb)

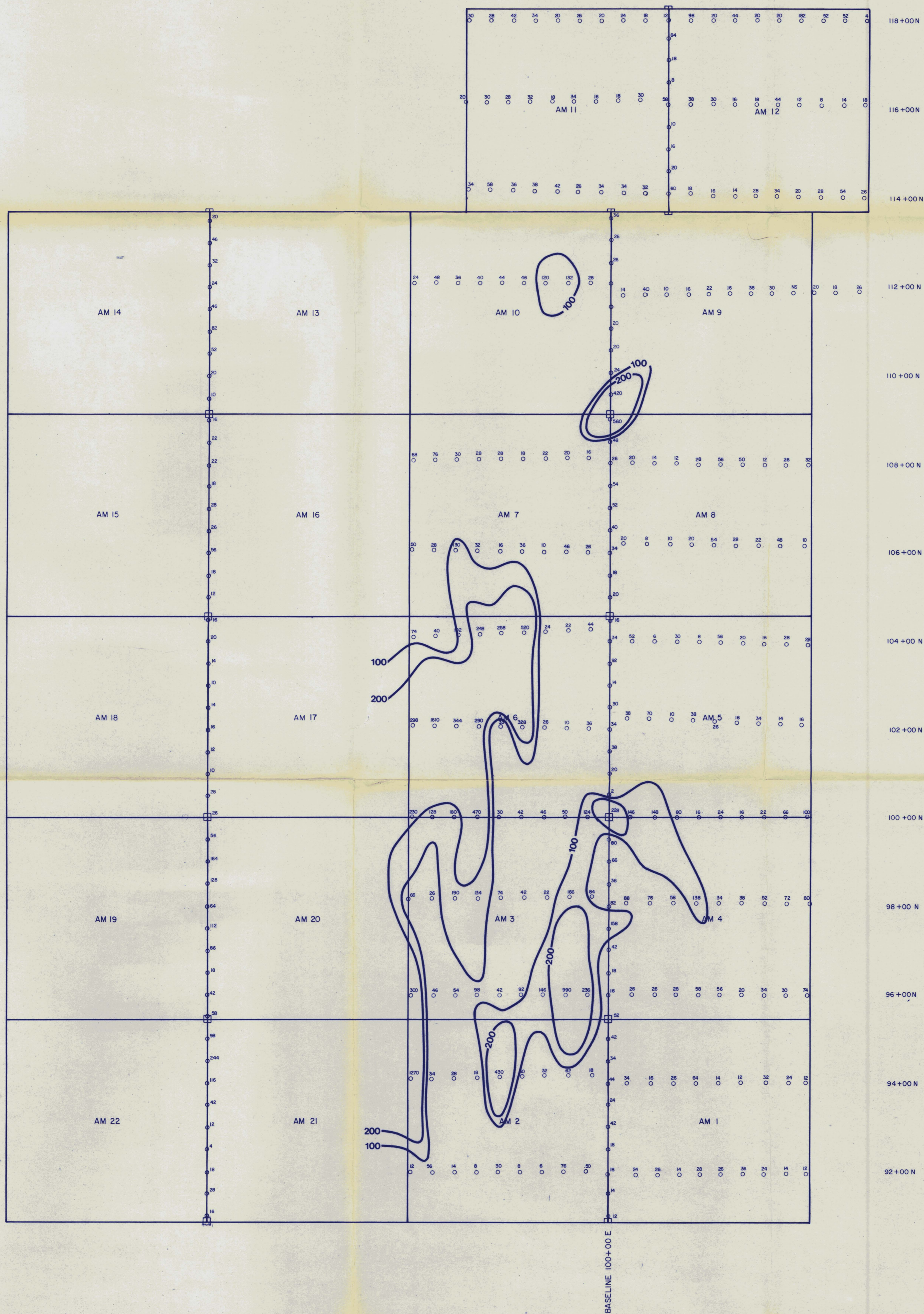
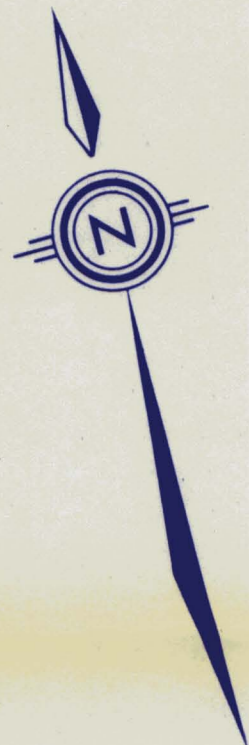
SMD MINING CO. LTD.

### GEOLOGY MAP

091013



PROJECT	AMOUTH FORK	AM GROUP	
DATE	05/27/88	DISPOSITION	CLAIMS 1-99
DRAWN BY	CO. DURBIN	SCALE	1:5000
DATE	JULY/88	MAP #	4



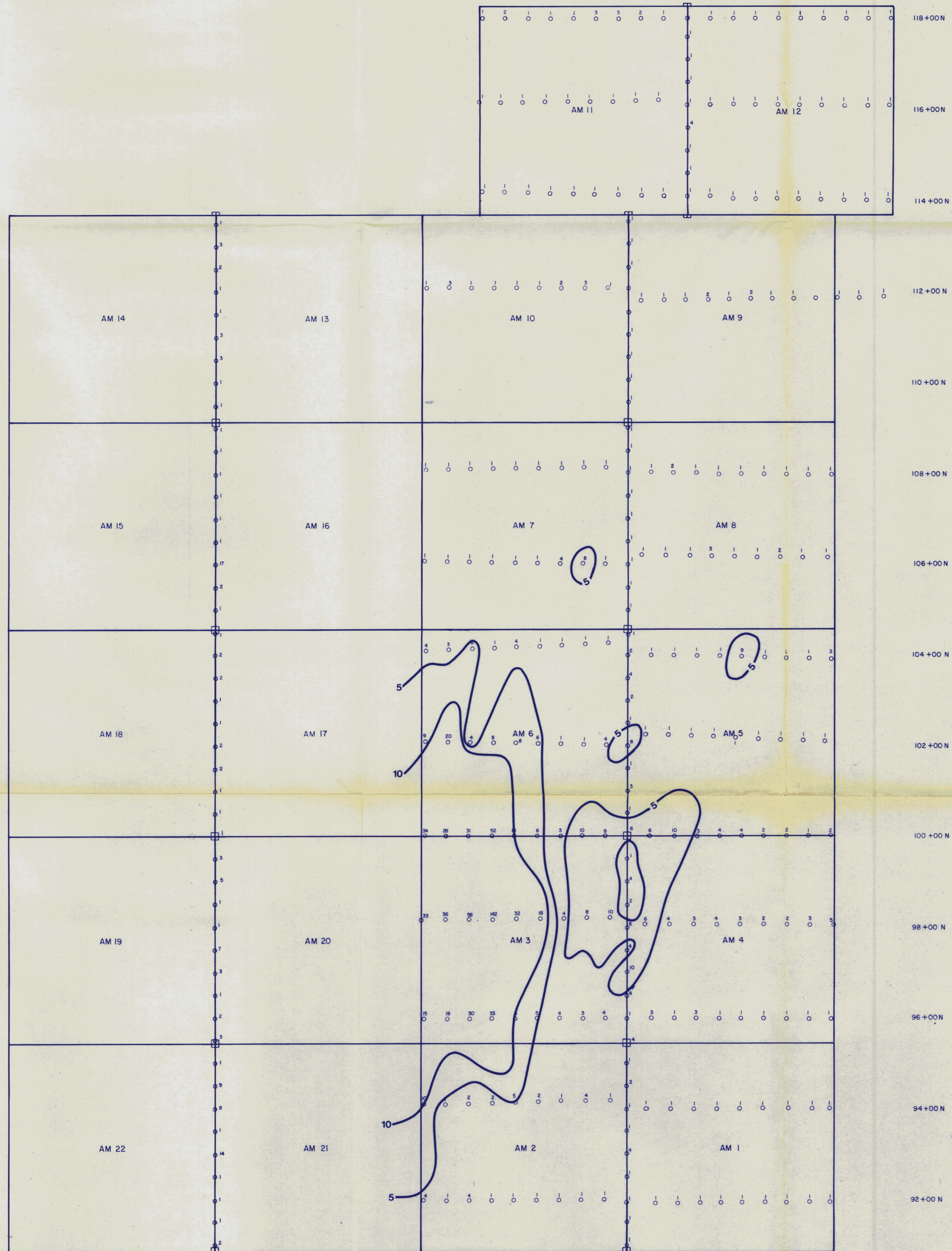
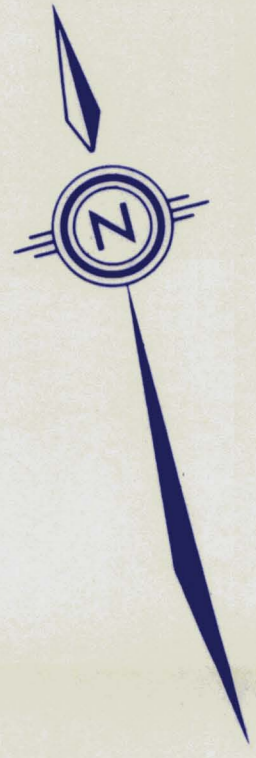
PROJECT AM  
SITE 105/A/A  
WORK BY  
DRAWN C.D. DURBIN

DISPOSITION CLAIMS 1-25  
SCALE 1:5000  
DATE DEC/81 MAP 5

SMD MINING CO. LTD.

Soil Geochemistry Map  
091013 Copper (ppm)





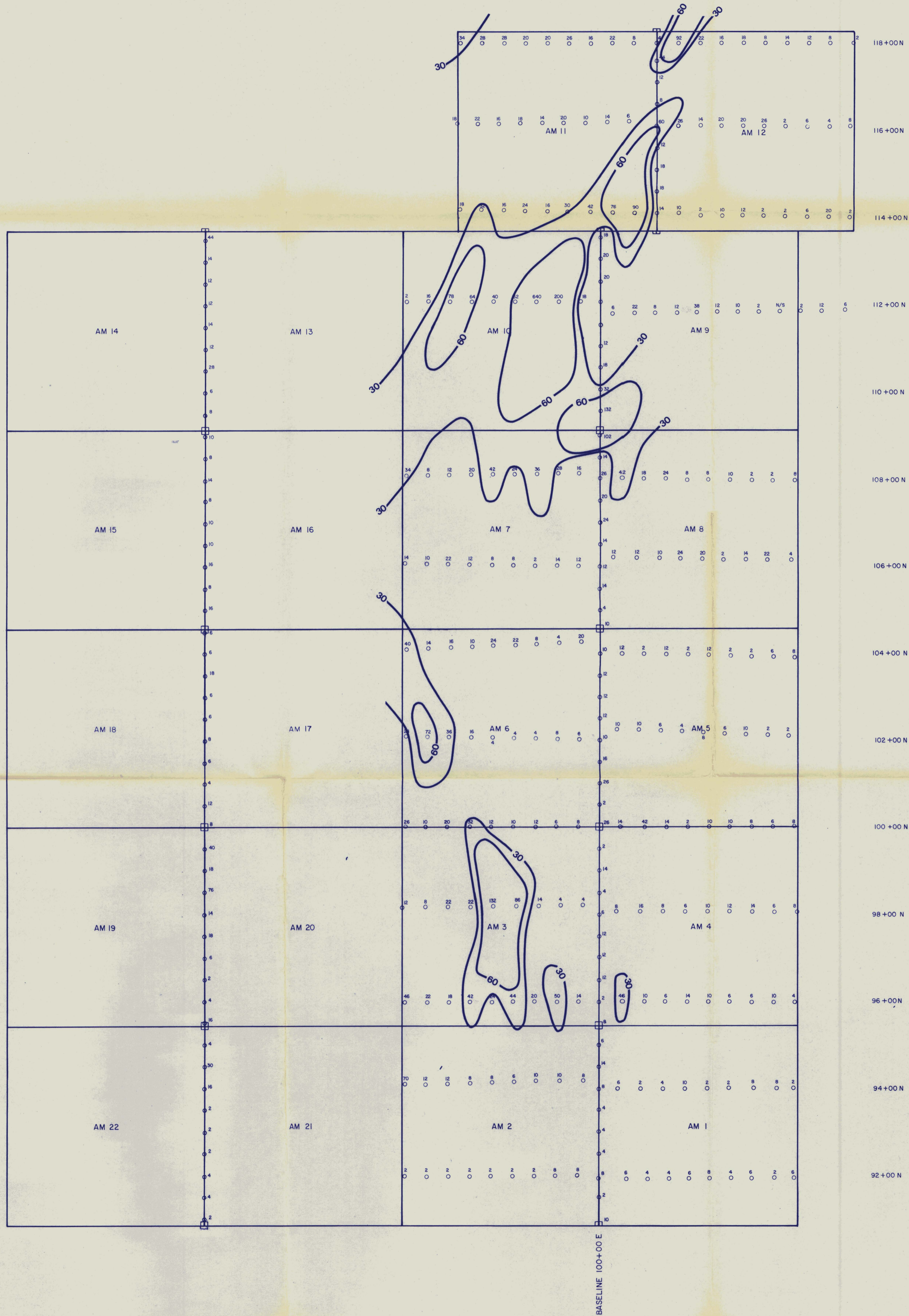
SAMPLE LOCATION MOLYBDENUM (ppm)  
THRESHOLD = 5 ppm  
CLAIM LOCATION LINES



**SMD MINING CO. LTD.**

Soil Geochemistry Map  
**Molybdenum (ppm)**  
**091013**

PROJECT	AM	DISPOSITION	CLAIMS	1-03
NTS	100//4	SCALE	1:5,000	
WORK BY		DATE	DEC/81	MAP 6
DRAWN	C.D. DURBIN			



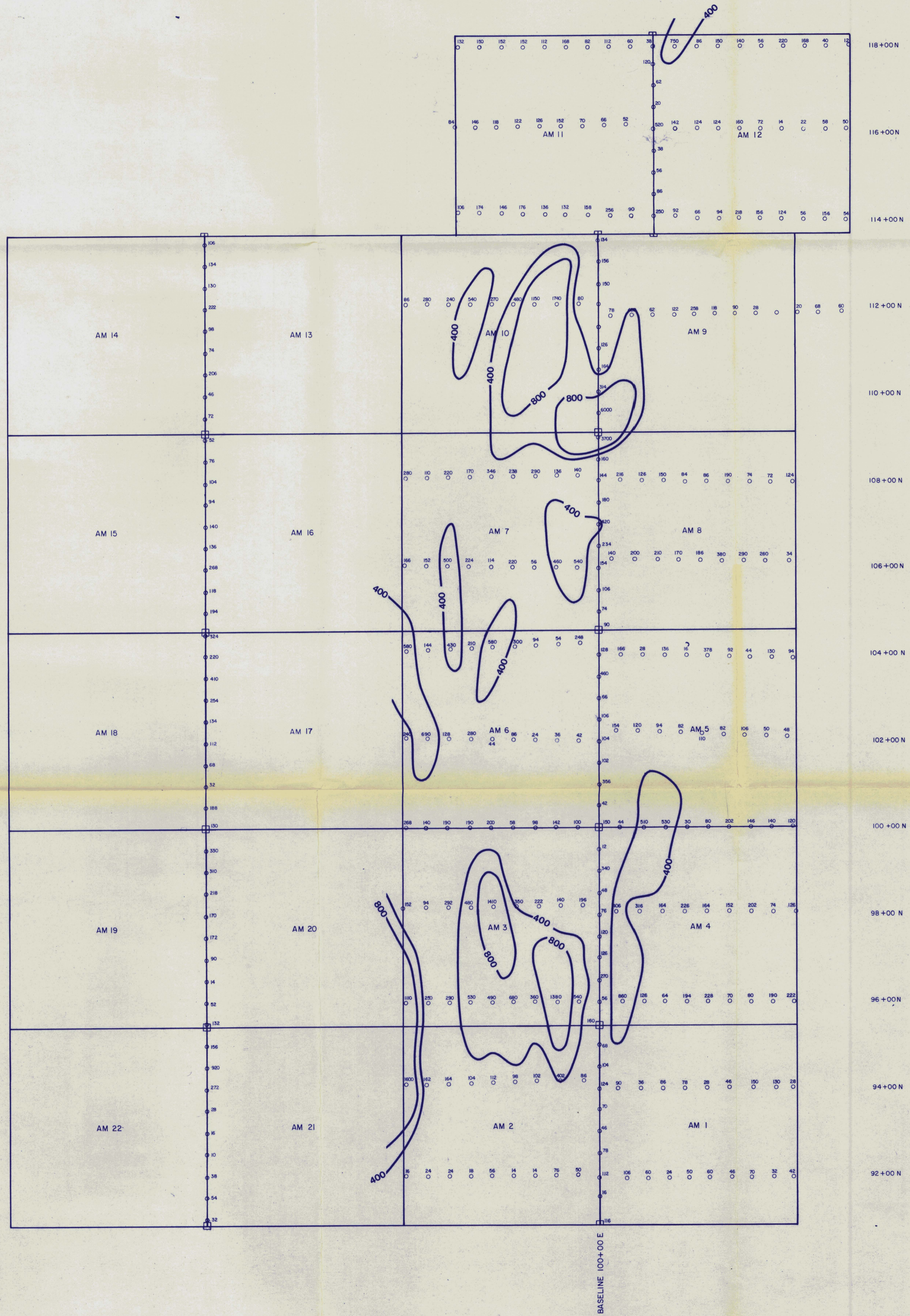
SAMPLE LOCATION LEAD (ppm)  
THRESHOLD = 30 ppm  
SECTION LINES

SMD MINING CO. LTD.

Soil Geochemistry Map  
091013 Lead (ppm)



PROJECT	AM	DISPOSITION	CLAIMS 1-95
NTS	100/2/4	SCALE	1:5,000
WORK BY		DATE	DEC/81
DRAWN	C.D. DURBIN	MAP	7

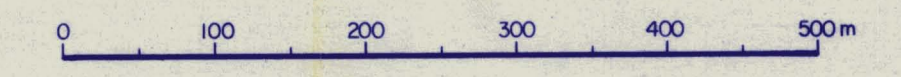


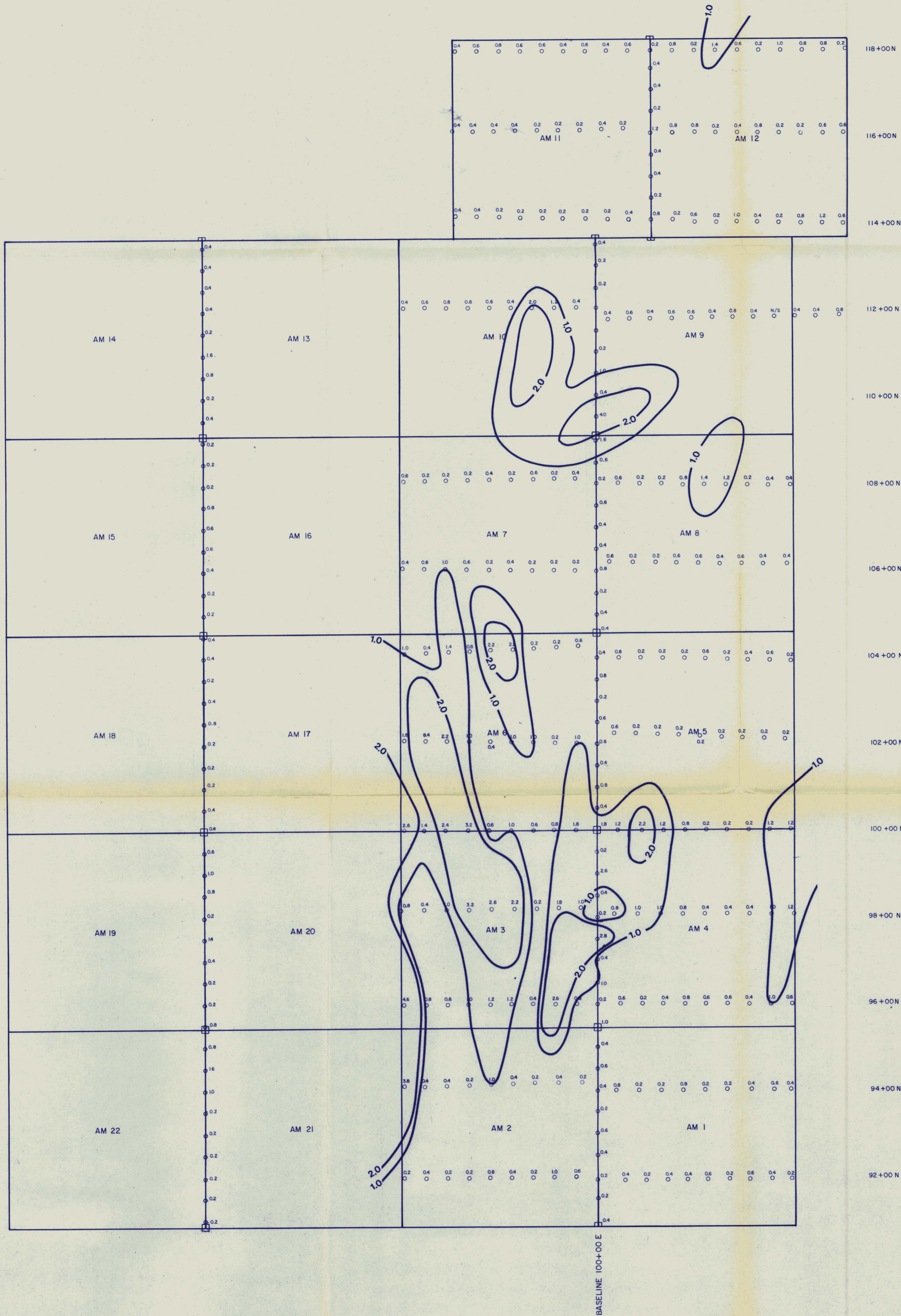
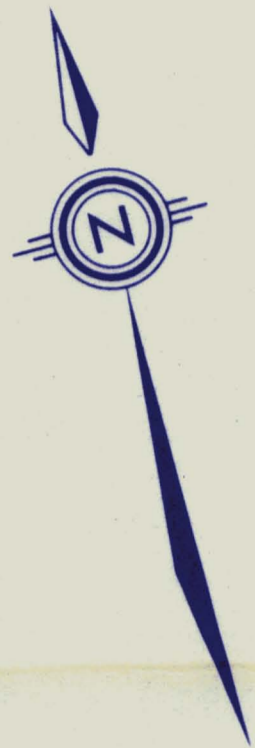
90  
SAMPLE LOCATION ○ ZINC (ppm)  
THRESHOLD = 400 ppm  
CLAIM LOCATION LINES

**SMD MINING CO. LTD.**

**Soil Geochemistry Map**  
**091013 Zinc (ppm)**

PROJECT	AM	DISPOSITION	CLAIMS 1-95
NTS	105/1/4	SCALE	1:5,000
WORK BY		DATE	DEC 78
DRAWN	C.D. DURBIN	MAP	8





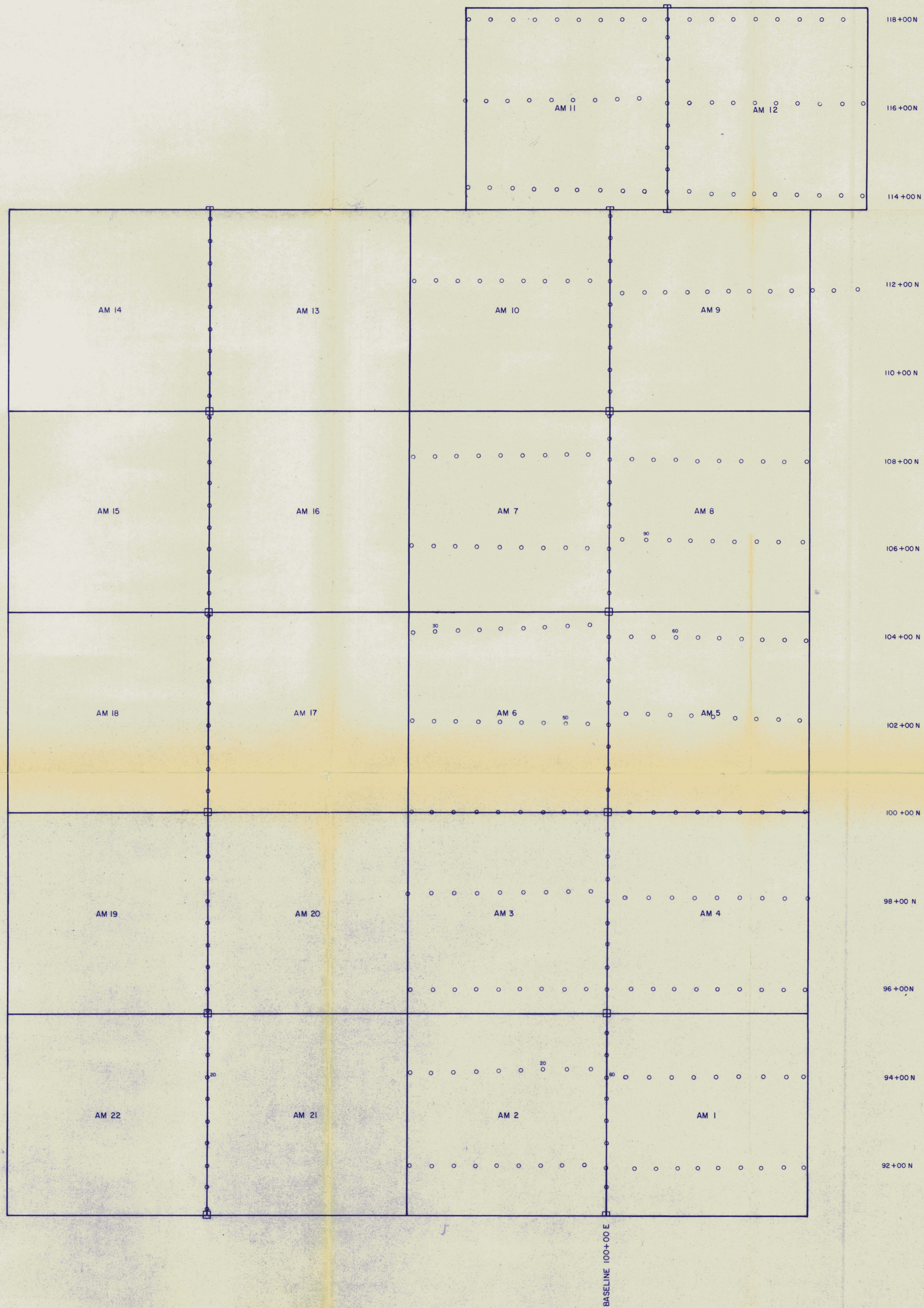
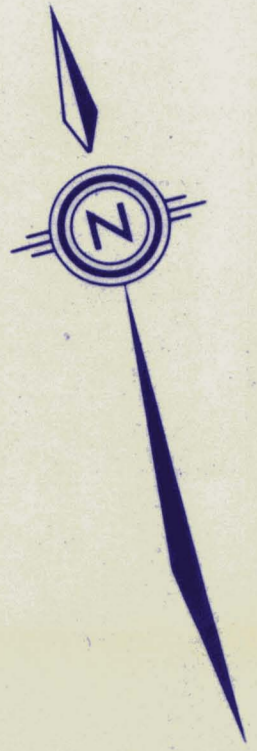
SAMPLE LOCATION  $\odot$  SILVER (ppm)  
THRESHOLD = 1.0 ppm  
CLAIM LOCATION LINES  $\square$

SMD MINING CO. LTD.

Soil Geochemistry Map  
091013 Silver (ppm)

PROJECT	AM	DISPOSITION	CLAIMS	1-93
NTS	108/2/4	SCALE	1:5,000	
WORK BY		DATE	DEC/81	MAP 9
DRAWN	C.D. DURBIN			





SAMPLE LOCATION GOLD (ppb)

CLAIM LOCATION LINES

**NOTE:** All sample locations to have an assigned value of  $\leq 10$  ppb, unless otherwise indicated.

**SMD MINING CO. LTD.**

**Soil Geochemistry Map**  
Gold (ppb)

PROJECT AM  
N15 105/2/4 DISPOSITION CLAIMS 1-22  
WORK BY SCALE 1:5000  
DRAWN C.D. DURBIN DATE JULY/81 MAP 10

