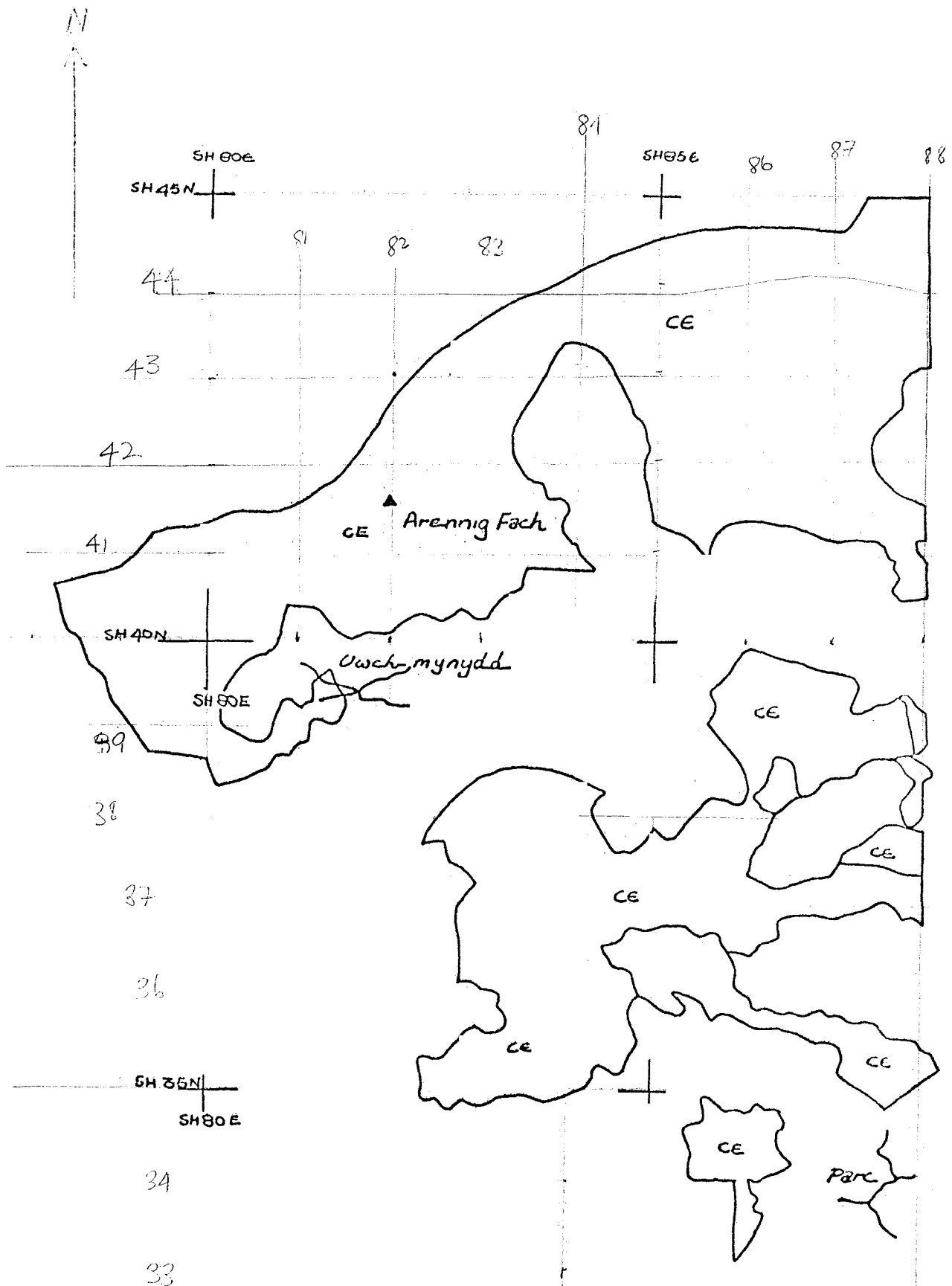


PROJECT NO. 1689 - ARENIG, N. WALES

Application for Financial Assistance : APPENDIX I

Geology of the Area: The area consists largely of Lower Ordovician volcanics. They represent a northerly part of the belt of similar volcanic rocks, of acidic to intermediate composition, which flank the eastern edge of the Harlech Dome. Much of the area has a cover of peat bogs resting on glacial drift, conditions which affect the interpretation of geochemical results. (See map 1689/71/2) and  $\frac{1}{4}$ " index

Three groups of anomalous lead values were found by the regional stream sediment geochemical survey, 1970, with values of 100 to 500 ppm lead, locally high zinc and negligible copper. (See maps 1689/3 to 5)



PROPERTIES  
 (containing) 9636 acres.

MAP NO.  
 1689/71/1

Northampton 1871  
17500 of 1689  
1/1689/71  
 N 101000

SH85E

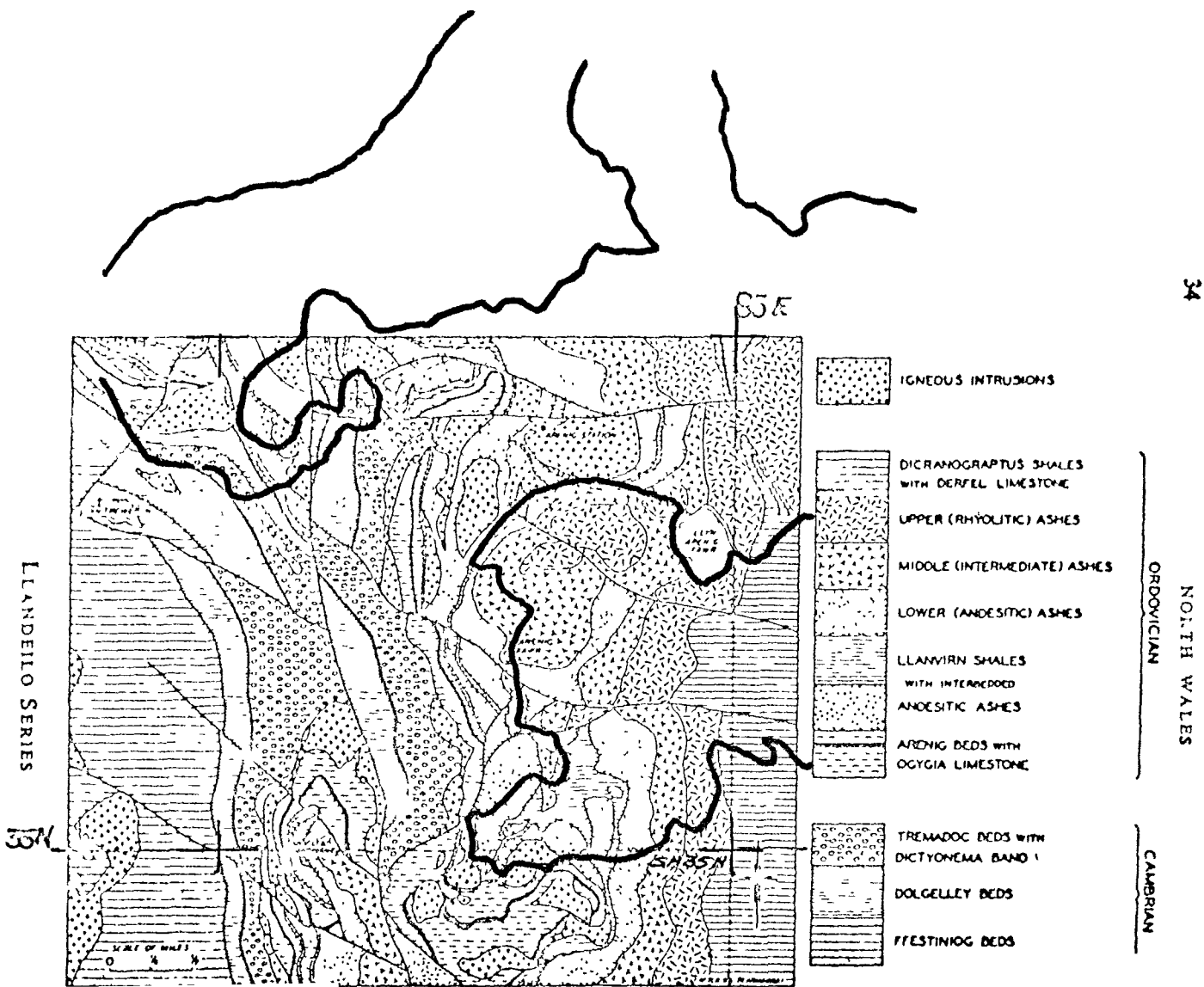
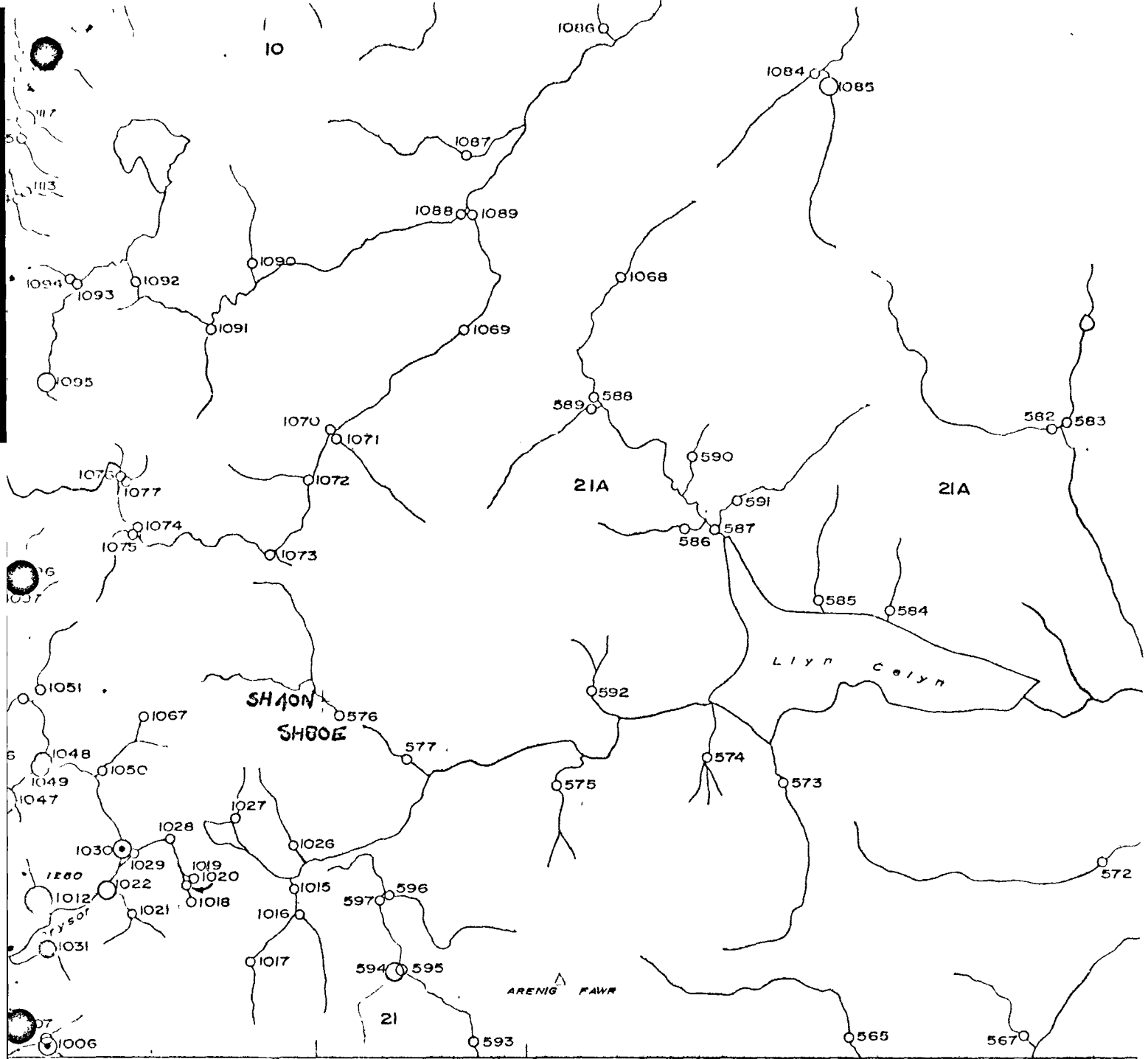


FIG. 14: Geological map of the Areniz country . Scale 1" ~ 1 mile



**Cu LEGEND**

Element content of minus 80 mesh fraction of stream sediments in p.p.m

- 0 - 20
- 20 - 40
- ⊙ 40 - 80
- 80 - 150
- 150 - 350
- Value 350 and over

2961 ..... Sample number

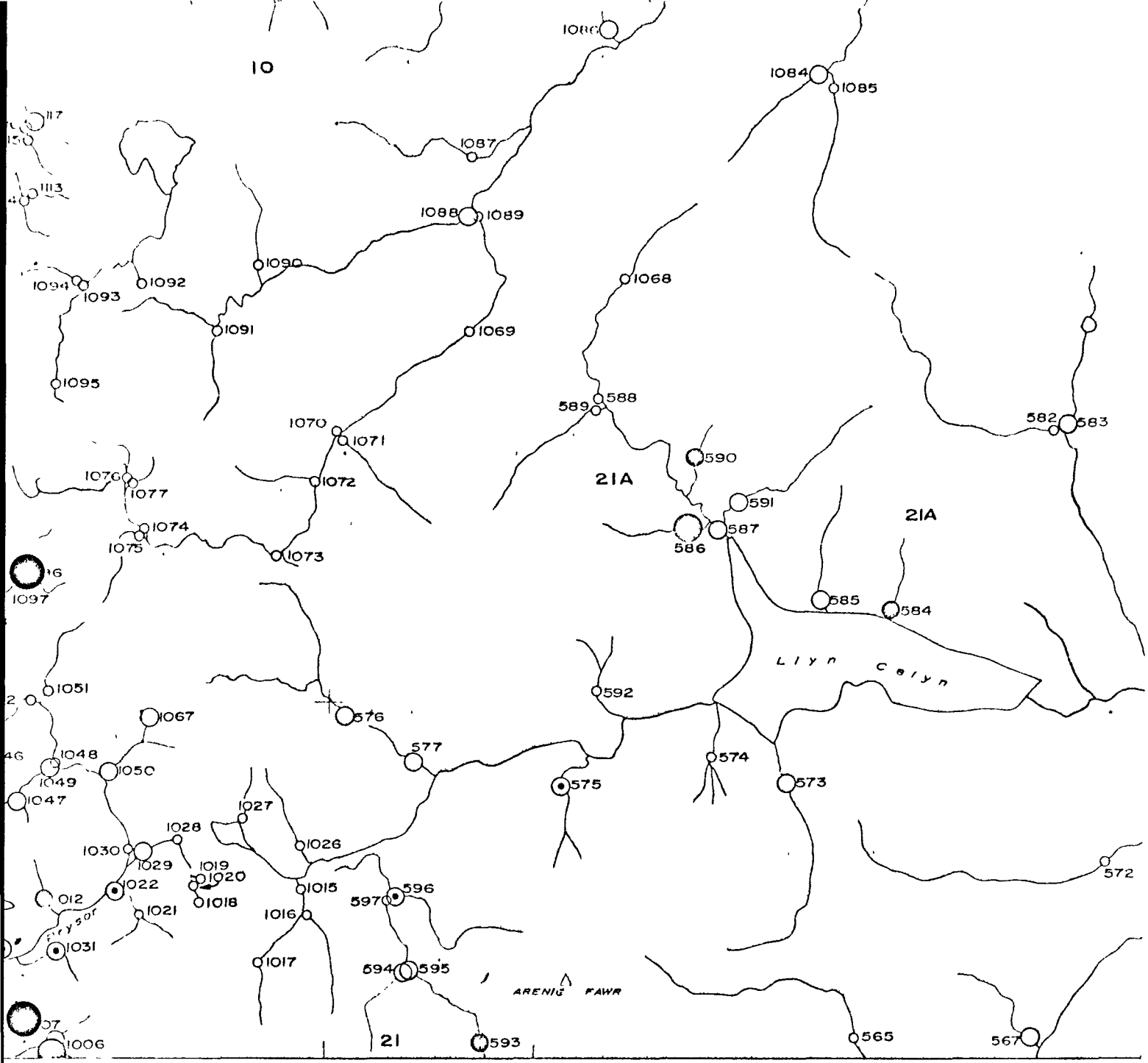
2 ..... Anomalies of interest (See text)

NORANDA-KERR, LTD.

MAP 1689/71/3

Stream Sed. Cu.

Scale: 1" = 1 mile



**Zn LEGEND**

Content of minus 80 mesh  
stream sediments in p.p.m.

- — 150
- — 150 — 300
- — 300 — 500
- — 500 — 1000
- — 1000 — 2000
- — 2000 and over

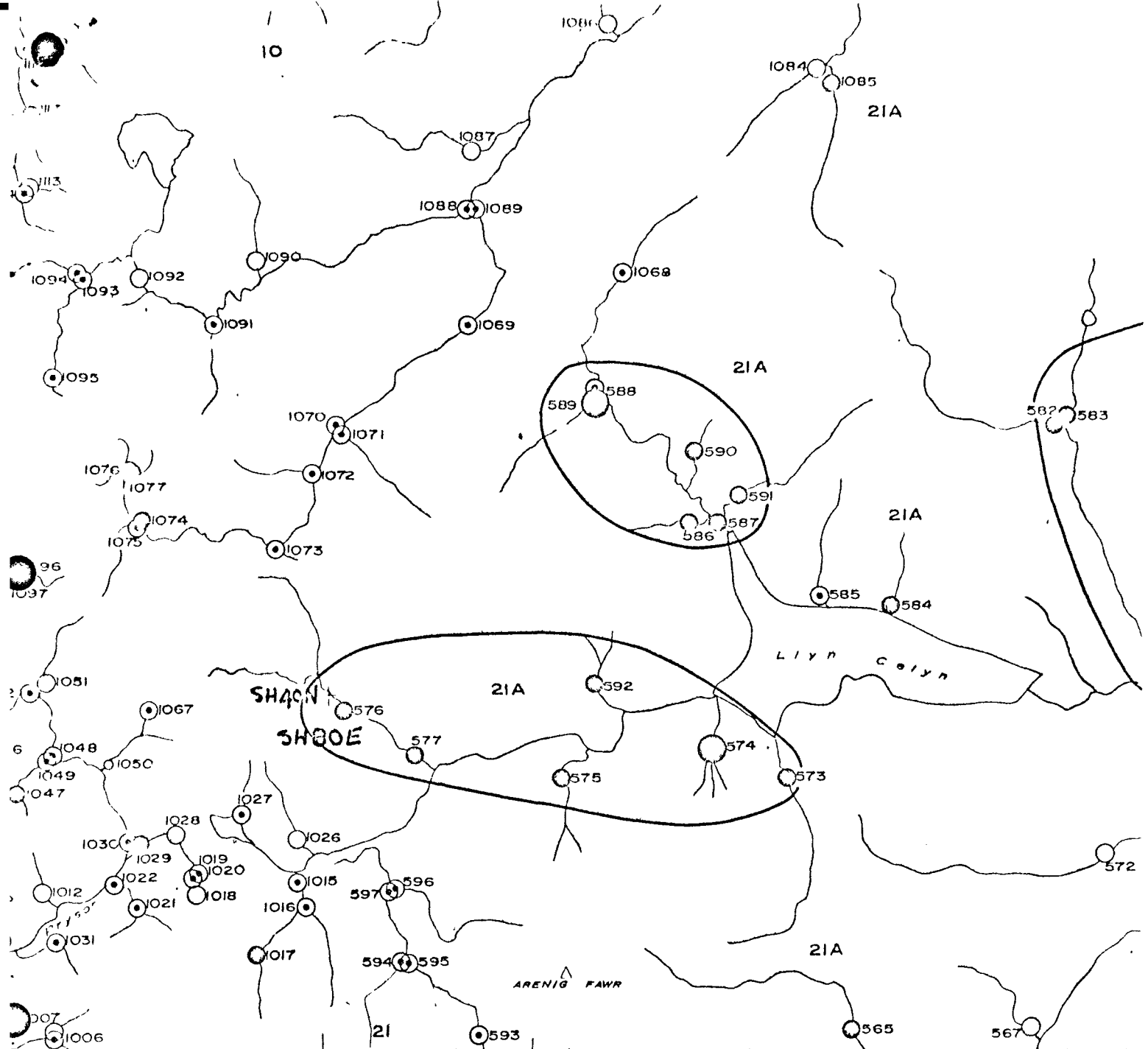
Value

----- Sample number

..... Anomalies of interest (See text)

NORANDA-KERR, LTD.  
MAP 1689/71/5  
Stream Sed. Zn.

Scale: 1" = 1 mile



**Pb LEGEND**

4°45'

ent content of minus 80 mesh fraction of  
am sediments in p.p.m

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 200
- 200 - 500
- 500 and over

----- Sample number  
 - - - - - Anomalies of interest (See text)

NORANDA-KERR, LTD.  
 MAP 1689/71/4  
Stream Sed. Pb.

Scale: 1" = 1 mile

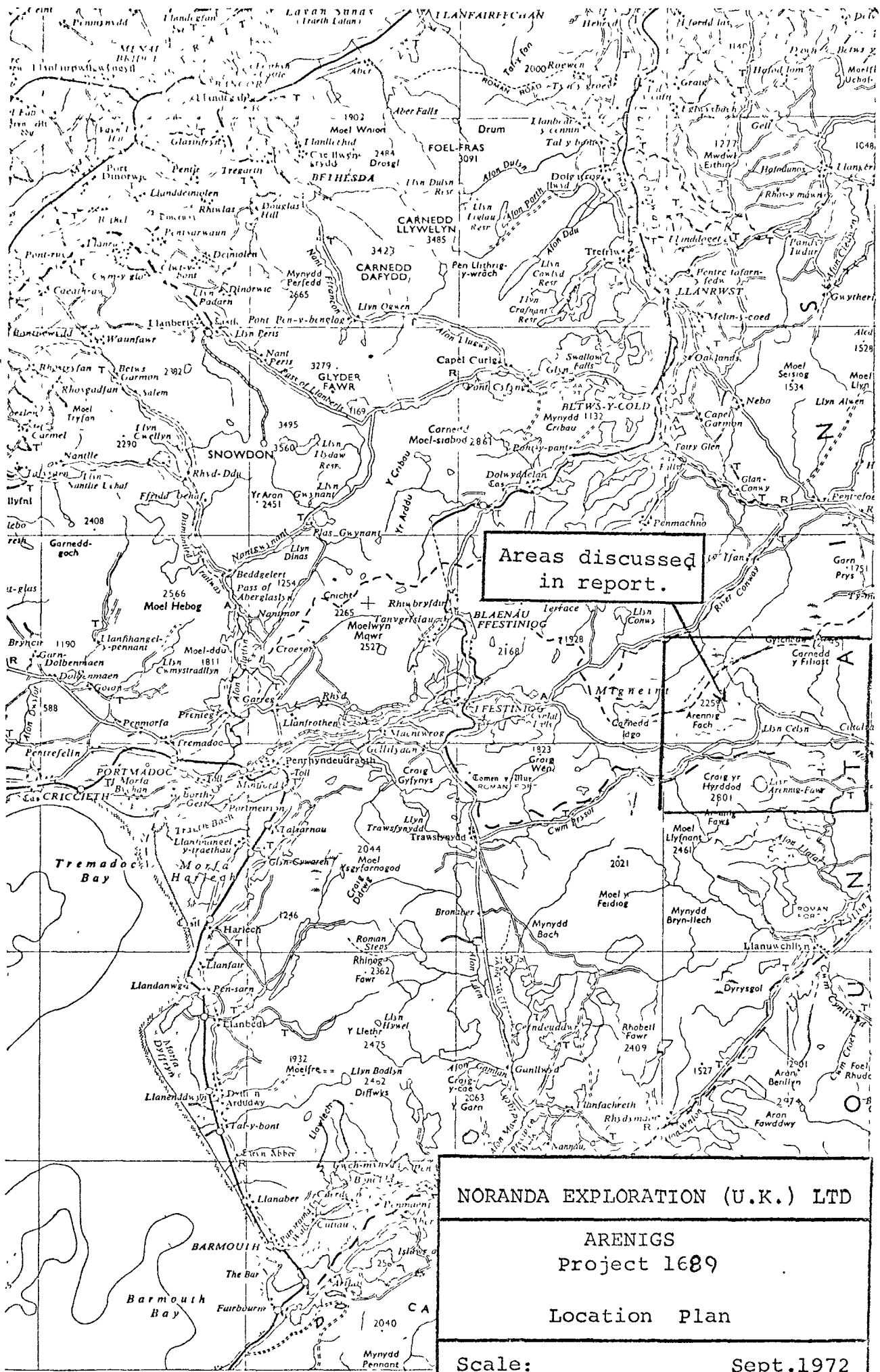
NORANDA EXPLORATION (U.K.) LTD.

PROJECT 1689 - ARENIG

NORTH WALES

P.D. DUNGATE

SEPT. 1972.



Areas discussed  
in report.

NORANDA EXPLORATION (U.K.) LTD  
 ARENIGS  
 Project 1689  
 Location Plan

Scale: 1 inch = 4 miles  
 Sept. 1972  
 Fig 1



## PROJECT 1689 - THE ARENIGS

### 1. Introduction

See Fig. 1

The area under investigation comprises one of the bleakest and least developed areas of Wales. For about a hundred square miles in Project 1689 and continuing westward into Project 1688 the country is barren moorland. A few scattered sheep farms are the only human habitation and it is very rare to see another human being in the course of a days work.

Good access is provided by the new Transfynydd to Bala road and most of the area is now within an hour's walk of a driveable track. Progress by foot however is often slow over the frequently boggy terrain.

Mineral Rights

Crown Estates

9,536 Acres

### 2. Geology

Recent geological mapping of this area is confined to the south west of the area. Exposure over the remainder of the area is often poor. The area is underlain by Ordovician sediments of Arenig, Llanvirn and Bala age with frequent thick and thin interbedded andesitic and rhyolitic ashes. The rhyolitic ashes are often manganese rich.

A post-graduate thesis by Dr. B.D.T. Lynas on the Geology of the Migneint area was not forthcoming from the author. A copy is reported to be held at the Cambridge University Library and it is understood that a brief account of the work is to be published shortly in the Q.J.G.S.

### 3. Old Workings

This area is not characterised by the multiplicity of small base metal workings that occur in other areas of N. Wales. This is a reflection of both its distance from the major mineralised regions of the Harlech Dome and Snowdonia, and its extensive peat cover and lack of exposure. The metal workings that do exist are on a very small scale. At five locations manganese ores have been worked, Mynydd Nodol (SH 863 396), Ffridd Nant-yr-Helfa (SH 831 400), Mochowgryn (SH 805 405), and Gelli-Dog (SH 845 388). Of these Mynydd Nodal was the largest, about a dozen levels and trenches have been dug. The deposits at these mines were similar.

At Nant Ddu (SH 801 383) a small quartz vein carrying galena

has had several shafts sunk on it but production must have been very small. To the south of this area at Castell Carndochan (SH 848 387) a quartz vein carries native gold with mixed base metal sulphides, and was worked on a small but profitable scale. At Rhiwlas (SH 911 416) bauxite has been worked.

4. Previous Work

In 1970 a reconnaissance stream sediment survey was carried out by Huntings on behalf of Noranda. This showed a large number of high lead values, a few high zinc values and generally low or very low copper values. Manganese values were universally high or very high, up to 7%.

5. Recent work

See Fig. 2.

A programme of detail stream sampling was now carried out over this area to localise and check anomalies. Visual examination of the area showed that over large areas the underlying rock contained several percent of manganese and coupled with the highly organic environment encountered on the peat covered moorland it was expected that a large number of samples would show high zinc values. This is in fact what happened. Some cultural sources of zinc exist to augment the natural supply and under these conditions high zinc contents in stream sediment samples should be treated with suspicion until confirmed by soil sampling.

The detail stream sampling programme did not reveal any high copper values. A number of the lead anomalies revealed by the reconnaissance survey were confirmed and a soil sample grid was laid out to cover the most promising of these, and a nearby strong zinc anomaly. Cessation of field operations prevented the completion of the detail stream sampling programme and any further soil sampling.

6. Soil Sampling Results

See Fig. 3

Soil samples were taken during July 1972, on 100 x 800 ft grid, in the area to the east of Llyn Arenig Fach, in order to test the results of the stream programme. As was expected the high zinc anomalies in the streams were not detected on the ground. Lead anomalies were also insignificant, the highest being 426ppm. As can be seen on the plan these anomalies were not extensive, the largest being detected in two sample position only.

### Conclusions

The limited amount of soil sampling has confirmed the opinion that high zinc values are most generally due to the secondary environment and that Lead anomalies are usually of limited extent but are probably genuine.

The area to the north of Llyn Celyn has been adequately stream sampled and it is not thought that this area is likely to be an area of significant base mineralisation

To the south of Llyn Celyn, although the stream sampling was incomplete some streams were found to give anomalous values. It is thought that this area is similar to the north except that there is a greater number of small vein deposits. The area is not considered to offer any potential for base metal mining.

The soil sampling detected the lead anomaly which is the probable cause of the stream anomalies to the N.E. of Llyn Arenig fach, but did not locate the source of the lead in the streams to the south of the lake, although there was some slight rise in the lead content of the soil. It is likely that lead veins exist on the farm land near the River Tryweryn



Sept 72.

MIS

1689

AE 78

APPLICATION FOR CONTRIBUTIONS UNDER THE  
MINERAL EXPLORATION AND INVESTMENT GRANTS ACT 1972

This form should be completed in the light of the information given in the DTI booklet 'A Guide for Industry' and submitted to: Department of Trade and Industry, MME1, Thames House South, Millbank, London SW1P 4QJ.

Section 1 GENERAL INFORMATION

State

A i Name and DTI reference of the project

PROJECT 1689 ARENIG - AE 78

ii Date and reference of the company's letter submitting to the Department the programme to which this application refers

24th November, 1971

iii Date and reference of the Department's letter commenting on the programme to which this application refers

13th January, 1972. MME 1/AE 78

B Name and address of the registered office of the applicant company

Noranda-Kerr Ltd.,  
Stratton House,  
Stratton Street, W.1.

C Name and address to which payment should be made if different from above

D Brief details of the exploration area to which this application refers

East of Ffestiniog, Merionethshire.

(this area is described more fully and defined in the submission (Aii above) in answer to Question 4(b) of Annex 1 to the 'Guide for Industry')

E Mineral(s) being sought

Copper, lead, zinc

F If the programme to which this application for payment relates arises from an earlier programme which has been assisted under the Scheme give the name(s) and DTI reference(s) of the earlier programme(s)

G Name and address and telephone number of contact for enquiries

Dr. Barry Scott or Noranda Exploration (U.K.) Ltd.,  
Mr. Hans Morris Stratton House, Stratton Street, W.1. Tel: 499 7124

H State full title and address of the Inspector of Taxes dealing with the taxation of the applicant's business profits

H.M. INSpector of Taxes (Pall Mall)  
58 Conduit Street, W.1.

Section 2 PERIOD COVERED BY APPLICATION

State	From	To
A calendar period covered by the work programme	February, 1972.	March, 1972.
B calendar period covered by this application	January, 1972.	August, 1972.

Work carried out before the Department has received relevant details will not qualify for assistance (ie work carried out before the Department receives the letter at Section 1 Aii)

Section 3 STATEMENT OF EXPLORATION EXPENDITURE

Give details of expenditure incurred\* on the work programme for which assistance is now claimed. The expenditure should be itemised in the same categories as those used in the programme submitted to the Department prior to the start of work. Items should be numbered in sequence and given a description to make them easily identifiable. Annexed to this form is a list of examples of qualifying and non-qualifying expenditure.

<u>Item</u>	<u>Description</u>	<u>Cost</u>
	<u>Stream Sediment check sampling</u>	£
		£
1.	Salaries and living expenses	164
2.	Travelling expenses	35
3.	Field office expenses	31
4.	Assaying and preparation	74
		<hr/> 304
	<u>Grid Soil Sampling</u>	
5.	Salaries and living expenses	86
6.	Travelling expenses	17
7.	Field office expenses	52
8.	London office overhead	108
		<hr/> 263
	<u>Geological Examination</u>	
9.	Salary and living expenses	149
10.	Travelling expenses	38
11.	London office overhead	77
	Total	<hr/> 264
	Total brought forward from continuation sheets	<hr/> £831
	Grand Total	<hr/> £831

If necessary continuation sheets may be used; these should include the DTI reference; the name of the company; the name of the project; and the period covered by the claim.

Expenditure will be treated as incurred at the time when the sums of which it consists become due and payable. Expenditure which does not consist of a sum payable to another person shall be deemed to be incurred at the time when the matters giving rise to that expenditure occurred.

Section 4 ADDITIONAL INFORMATION

The following information should be given in respect of the expenditure included in Section 3.

A OVERHEAD EXPENDITURE

Do any of the items include amounts for Overhead Expenditure?

Answer "Yes" or "No" YES

If "Yes" give full particulars including

i the items and the amounts

Field Office	£83
London Office	£185

ii the methods of apportionment: if the methods differ from those normally used by your company, an explanation should be given

Both the above have been charged on the basis of a recovery rate on directly charged salaries of geologists and assistants. Overheads are not normally apportioned in the Company's accounts.

B CAPITAL ASSETS

Do any of the items include expenditure on the acquisition of tangible capital assets? (See Para 2c of Annex)

Answer "Yes" or "No"

NO

If "Yes" give full particulars, including

i the items and the amounts

ii the nature of the assets and the reason for their inclusion

Section 4 (Contd)

C DEPRECIATION

Do any of the items include charges for depreciation?

Answer "Yes" or "No"

YES

If "Yes" give the following particulars

i the items and the amounts

Field office overheads (see A above) includes depreciation on field equipment amounting to 15% of these overheads.

ii a brief description of the methods used and the rates adopted: if these methods and rates differ from those normally used by your company an explanation should be given

Equipment is written-off on a straight-line basis over the estimated useful life of five years.

D HIRE CHARGES

Do any of the items include hire charges?

Answer "Yes" or "No"

YES

If "Yes" give

i items hired

Estate car on long-term hire

ii for how long

Used for 23 days on this project.

iii the cost

£40 per month

iv from whom hired

Reading Garage Co.  
Basingstoke Road,  
Reading.

Section 4 (Contd)

E FEES TO CONTRACTORS

Do any of the items include fees to contractors?

Answer "Yes" or "No" YES

If "Yes" give

i particulars of the service

Analysing soil and stream sediment samples

ii the cost

£74

iii the names of the contractors

Noranda Exploration Ireland LTD.

F TRANSACTIONS WITH ASSOCIATED BUSINESSES

Were any of the goods or services provided by an associated or connected company or business?

Answer "Yes" or "No" YES

If "Yes" state

i the name of the company or business

Noranda Exploration Ireland Ltd.

ii the nature of the association

Both companies are controlled by Noranda Mines Limited, Toronto, Ontario, Canada.

iii the items and the amounts

Analysing the soil and stream sediment samples at a cost of £74

iv whether the transactions were on an arms-length basis ie on terms which would have been mutually acceptable had the transactions been with a third party not associated or connected with the applicants

The cost to Noranda-Kerr is below normal market price because of their association.

For this purpose "associated companies" includes companies

a which are members of the same group, within the meaning of the Companies Act 1948

or



#### Section 4 (Contd)

b which are companies under common ownership

or

c where there is effectively a relationship between them of that of partners in a joint venture or consortium

or

d where the association is long-term and one company owns not less than 20% of the equity voting rights of the other and is in a position to exercise significant influence over it.

#### Section 5 PLANNING PERMISSION

For all works listed in Section 3 which require planning permission, or confirmation from the local planning authority that planning permission is not required, attach copies of:

A the application(s) for planning permission which describe the works as in your submission (see Section 1Aii above) and the local planning authority's consent(s) and/or

B letter(s) to the local planning authority which describe the works as in your submission (see Section 1Aii above) and their letter(s) showing that planning permission is not required

for the area referred to in Section 1D above in respect of which assistance is sought.

#### Section 6

State whether there has been an increase or reduction in the number of your rights and options in the exploration area since the date given at Section 1A(ii) of this application or whether any of those rights and options have been varied since that date.

Answer: YES/NO

Crown held - no change

#### Section 7 DECLARATION AND APPLICATION

A We declare:

- i that the information in this application is true and correctly stated
- ii that the expenditure listed in Section 3 of this application has been incurred in respect of the exploration areas described in Section 1D
- iii that we have read and understood the schedule of conditions forming part of this application
- iv that the geological and other technical data obtained in carrying out the work described in Section 3 have been passed to the Department in the required form and detail and that any fresh

Section 6 (Contd)

results will be so passed

- v. this application does not cover any expenditure in respect of which financial aid, loans or grants from Government funds have been or will be received or applied for.

B We hereby apply for financial assistance in respect of the exploration expenditure incurred by us, listed in Section 3 of this application, in the area described in Section 1D of this application. We understand that any such assistance which may be made to us by the Department pursuant to this application will be paid subject to the observance and performance by us of the conditions contained in the schedule herein and of such other conditions as may have been separately communicated to us by the Department.

(This declaration and application must be signed by a director)

Name of Applicant ..... NORANDA-KERR LTD .....  
 Signature ..... *Barry Scott* .....  
 Designation of Signatory ..... Managing Director .....  
 Date ..... November, 1972 .....  
 Name of Signatory ..... BARRY SCOTT .....  
 (BLOCK letters)

Section 7 REPORT BY INDEPENDENT ACCOUNTANT

This section should be completed by an INDEPENDENT ACCOUNTANT who is (a) qualified under section 161 of the Companies Act 1948 for appointment as auditor of a company and (b) is not disqualified under the terms of that section from acting for the applicant.

- A I/We have examined the statement of expenditure in Section 3 and the further details and explanatory notes referred to in that section and in Section 4 of this application. I/We have also examined the books and records of the applicant and have obtained such explanations and carried out such tests as I/We have considered necessary.
- B On the basis of my/our examination and of the explanations given to me/us, I/we report that in my/our opinion subject to reservations set out in my/our

Section 7 (Contd)

~~letter dated~~ <sup>7\*</sup> during the period specified in Section 2(B) the applicant incurred the exploration expenditure detailed in Section 3 amounting in total to £ 831 in respect of the area referred to in Section 1D.

Signature ..... *[Handwritten Signature]* ..... Date ..... *28.11.72* .....  
Name and Business Address Alan Redfern ..... Qualification Chartered Accountant  
..... 21 Blandford Road, .....  
..... St. Albans, Hertfordshire .....  
Name and Telephone Number for enquiries ..St. Albans 54245.....

\* Delete if not applicable

SCHEDULE OF CONDITIONS

The Schedule of Conditions above mentioned

- 1 In the following clauses of these conditions:-  
"the application" means the present application for a contribution;  
"the applicants" means the company applying for contributions;  
"commercial quantity" in relation to mineral deposits found in, lifted or extracted from the exploration area means that those mineral deposits have been sold or disposed of for value or have been included as a capital asset in the applicant's balance sheet and "commercial production" shall be construed accordingly;  
"the exploration area" means the area or areas referred to in section 1D of the application;  
"the Department" means the Department of Trade and Industry;

COMMERCIAL: IN CONFIDENCE

✓ Dr E H Francis *See DL* *Mr EG Smith*  
*6/1/73*

~~Dr S H U Bowie~~

## MINERAL EXPLORATION AND INVESTMENT GRANTS ACT 1972

NORANDA PROJECT 1689: ARENIG, N. WALES

Following my minute of 21 December advising that an application for payment for work carried out on this project had been received, please find attached a copy of the application covering the period January - August 1972, supported with geological information to meet the requirements of the Act.

In a covering letter to DTI the Company states that the final cost of geochemical sampling was higher than originally estimated because of the extreme roughness of the terrain and difficulty of access, both of which unfortunately were under-estimated in comparison with other areas in the original submission.

We would be grateful to receive your opinion as early as possible as to whether this information complies with Section 1 (3) of the Act and whether the costs are reasonable.

  
 A H J Todd

Institute of Geological Sciences  
 Exhibition Road

4 January 1973

COMMERCIAL: IN CONFIDENCE

NORANDA-KERR LIMITED

PROJECT No. 1689 - ARENIG, N. WALES

Application for Financial Assistance

APPENDIX 2 : ESTIMATED COST

(Stage 2)	<u>Stream Sediment check sampling of 3 square-mile area, about 40 samples per square mile.</u>	
1.	Salaries plus living expenses (6 man-days at £6.50)	£39
2.	Travelling expenses for 2 man crew (3 days at £4.00)	12
3.	Field Office expenses (£1.50 per day)	4
4.	Assaying and preparation of samples (120 samples at £0.55 per sample, based on Company Lab. costs and comparable contract charges).	66
		<hr/>
	Stage 2	<u>£121</u>
(Stage 3)	<u>Grid Soil Sampling of 1½ square miles on 800 x 100ft. spacing, about 525 samples, at about 30 samples per man-day.</u>	
5.	Salaries plus living expenses. (18 man-days at £6.50)	£117
6.	Travelling expenses, 2 man crew (9 days at £4.00)	36
7.	Field Office expenses (£1.50 per day)	14
8.	London Office Overhead (Stage 2 and 3) (12 days at £10.00.	120
		<hr/>
	Stage 3	<u>£287</u>
(Stage 4)	<u>Geological Examination of anomalous areas, and supervision of geological work.</u>	
9.	Geologists' salary and living expenses (10 days at £18)	£180
10.	Travelling expenses (10 days at £4.00)	40
11.	London Office Overhead (6 days at £10.00)	60
		<hr/>
	Stage 4	<u>£280</u>
	TOTAL:	<u>£688</u>

1684 / Mining

Request.

Stage 2. Ocean sampling follow up on lead anomalies found earlier.

Stage 3. Grid soil sampling of locally defined anomalies - estimated 1 1/2 sq. miles. Analysis for Cu Pb Zn Ag

Stage 4 Geol. examination of anomalous areas

~~X~~ NO maps showing anomalies ~~X~~  
1684 / 1, 2, 3, 4, 5.