Bergvesenet

Postboks 3021, 7002 Trondheim

Rapportarkivet

Bergvesenet rapport nr	Intern Journal nr	Internt arkiv nr	Rapport lokalisering	Gradering
BV 3096	Kasse 31		Trondheim	
Kommer fra ..arkiv	**Ekstern rapport nr**	**Oversendt fra**	**Fortrolig pga**	**Fortrolig fra dato:**
	N-81-1	Tverrfjellet		

Tittel

Folldal project.
1984

Forfatter	Dato	Bedrift
Bakke, Olav Wilberg, Rune	2 1984	Folldal Verk A/S Amoco Norway Oil Company

Kommune	Fylke	Bergdistrikt	1: 50 000 kartblad	1: 250 000 kartblad
Folldal Alvdal Lesja Tynset Os	Hedmark Oppland	Østlandske	14192 15191 15192 16191 16193 16194 19202	Røros

Fagområde	Dokument type	Forekomster
Geologi Geokjemi Geofysikk	Rapport	Folldal Savalen Tynset Os Hauast Lesja
Råstofftype	**Emneord**	
Malm/metall		

Sammendrag

Dette er årsrapporten for 1983.

Diamon drill logs finnes på **BV 3097**.
Kartbilagene finnes på **BV 3098, BV 3099 BV 3100 og BV 3101**.

Folldal Project (N-81-1)

Folldal Verk A/S - Amoco Norway Oil Company

February 1984.

Submitted by:

Olav Bakke and

Rune Wilberg

Table of Contents

SUMMARY AND CONCLUSION

Folldal Verk A/S and Amoco Norway Oil Company entered into a 50-50 joint venture agreement to explore for Cu- Zn massive sulphide deposits in the Folldal area of south central Norway. This agreement was signed in 1981 and field work in the Folldal area continued into 1982 and 1983.

Field work included follow-up with ground geophysics and geochemistry on anomalous areas located by airborne surveys, and also included geochemical work on previously found anomalous gold stream sediment samples. During the last two years over seventy individual geological grids were run, a majority of which included CEM, VLF, Mag, geochemical sampling, geological mapping and selected amounts of Apex max-min surveys. Thirteen drill holes totalling approx 2010 meters were drilled in the 1982 survey and another 26 drill holes totalling approx. 3290 meters were drilled during the 1983 drilling season. Unfortunately no economic zones have so far been intersected. Consentrating our work in volcanic and sedimentary belts of known past Cu-Zn producers (Sivilvangen, Vingelen, Rødalen) many interesting anomalies have still to be verifield, some either by drilling or trenching and others by detailed geochemical and geophysical surveys. The survey area is devided into 6 separate areas, two in which gold is the potential metal and four in which zinc and copper are the most potential metals.

RECOMMENDATIONS

A. Folldal area.

Follow-up work have been carried out in 7 grids based on the 1982 airborn survey, and in 5 grids as a continuation of the follow-up from 1982. Five of the grids are drilltested with discouraging results. More follow-up work are recommended for 6 of the grids, at least two of them should be drilltested.
The most promising grid is the Ørnhovde grid , where follow-up work was started, based on good geochemical stream samples from the 1981 season. At least 4 new grids will be established in 1984 based on the airborn survey from 1982.

B. Savalen area.

Follow-up work in this area include 5 grids that were started in 1982 after the airborn survey.3 of them are drilltested, detecting only thin sulphidezones, but still high-grade ore are found at Sivilvangen (up to 5,6% Zn).
The most promising area is Sivilvangen, but since the grid is extensively prospected during three seasons, the possibilities for detecting economic ore are limited. With this in mind, for further work Svarthue should be given highest priority in the area (possibly one more drillhole).

C. Tynset area

10 of the grids worked in this season are situated in this area. 5 of them are drilltested, and 4-5 more drillholes should follow next season, together with soil sampling, Apex max-min and geological mapping.
The most encouraging results are obtained at Vardtjørna and Nonsvola.

D. Os area.

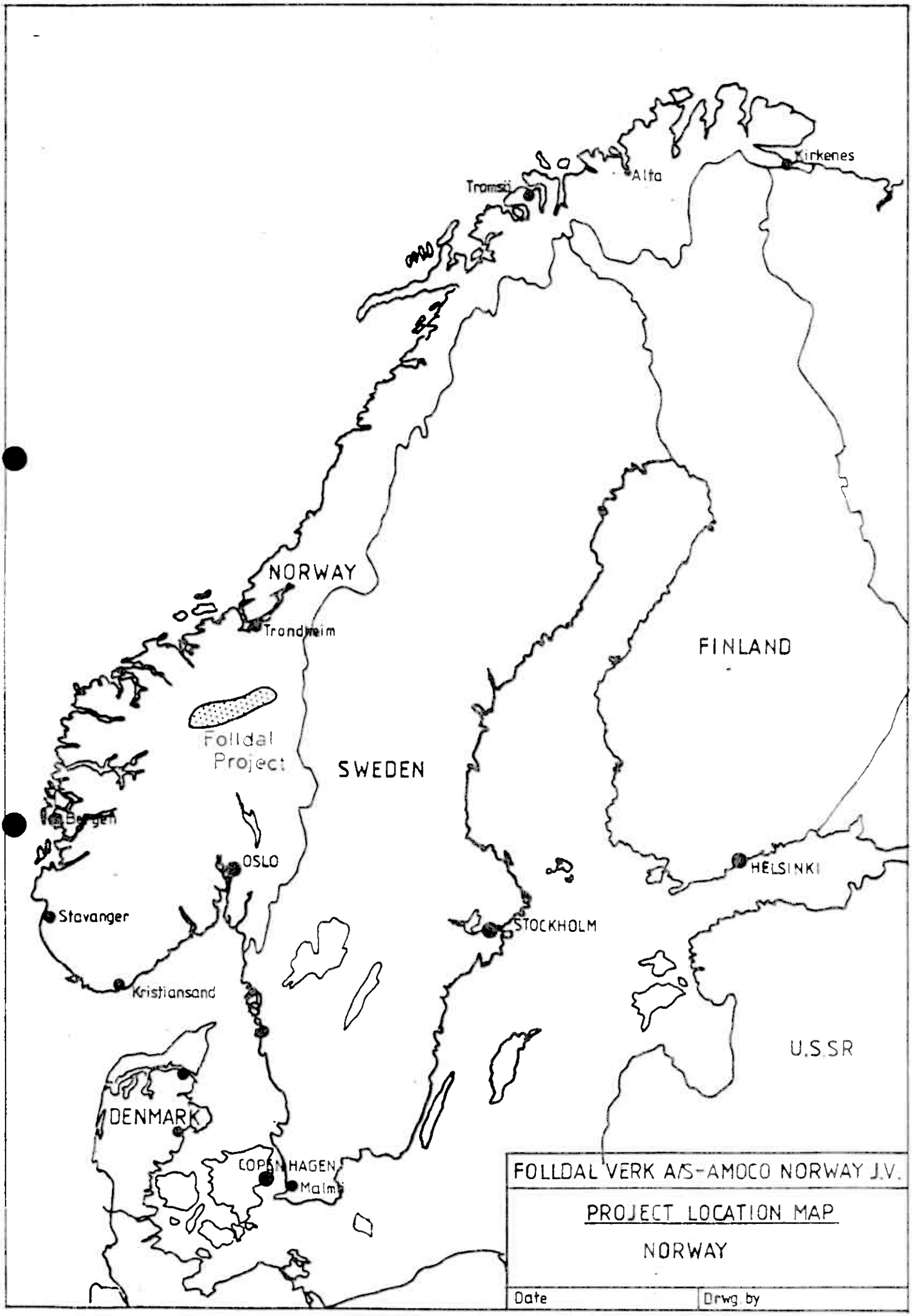
7 grids are worked in this area. 2 of them are drilltested. At least a couple new drill targets are given for next season, with highest priority at Storfloen. Follow-up work next season includes soil sampling, CEM, Apex max-min and geological mapping.

E. Hausta area.

This is basically a gold area, but encouraging geochemical and geophysical anomalies indicate that it would be possible to find a massive sulphide mineralization with good gold grades within this area. The follow-up work is based on reanalysed stream sediments from an old NGU survey program. In 1982 six grids were established for soil sampling, and in three of these more follow-up work was done during the 1982 field season. In contribution to these a fourth grid was established (Hausta IV) in 1982. Two of the grids Hausta II and III should be given low priority in the 1984 season. Encouraging geophysical and geochemical anomalies are received in the two grids Hausta I and Hausta IV, where mineralizations seems to occure in the same stratigraphical possition. Drill testing is recommended for both these grids together with more geophysical and geochemical follow-up work.

F. Lesja area.

This is basically a gold area, which was mapped and covered by stream sediment sampling during the 1981 season. In 1982 10 grids were established for soil sampling. In four of these follow-up work as geophysical measurements, geological mapping and new soil samplings were carried out during the 1983 field season. This area should be given low priority in the 1984 season, because all anomalies are low and do not coinsident good enough to be drill tested. More follow-up work is recommended for Storhorrungen (I, II and III) and for Rjuphovda (I and II).

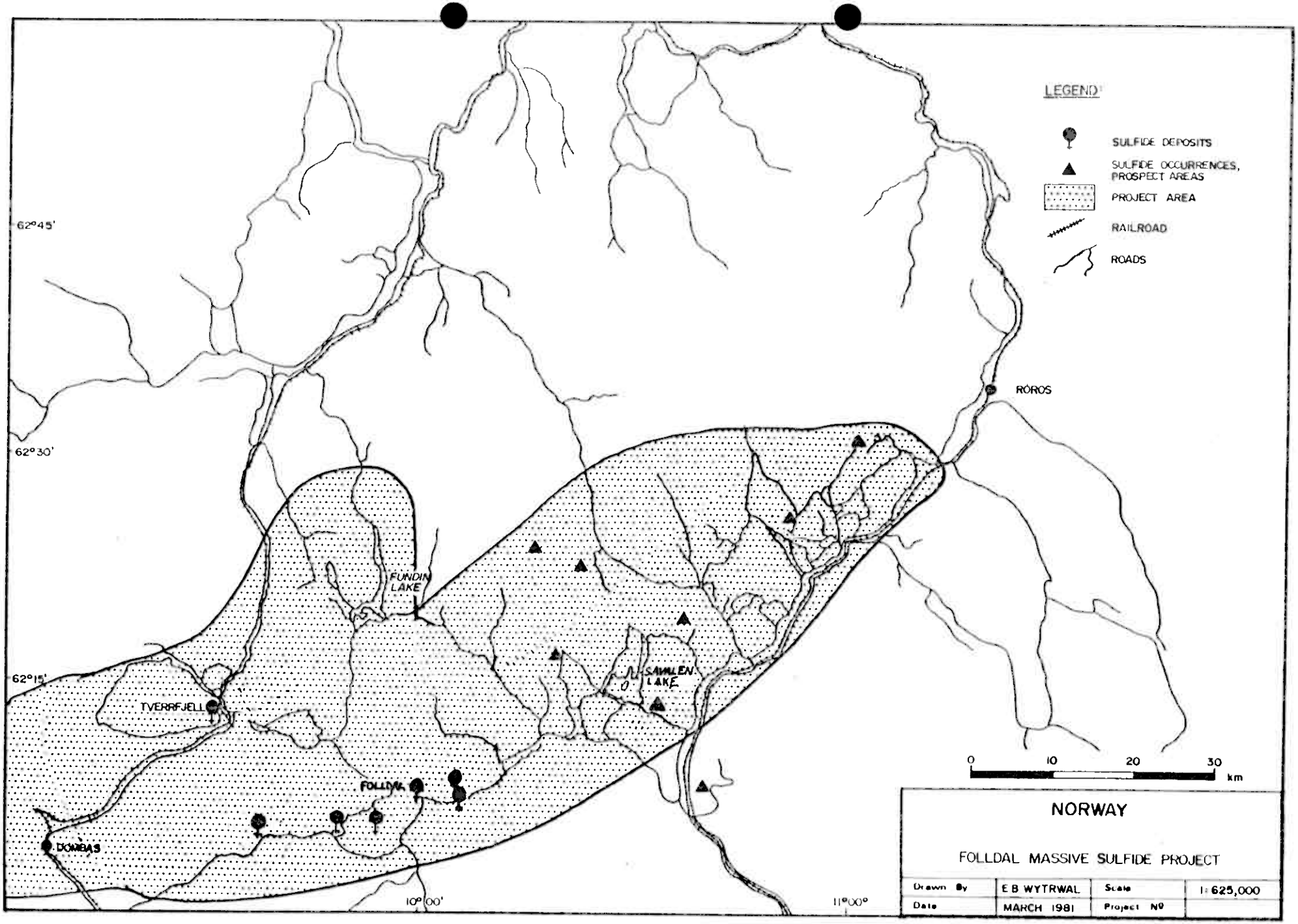


FOLLDAL VERK A/S-AMOCO NORWAY J.V.

PROJECT LOCATION MAP

NORWAY

Date	Drwg. by


LEGEND
SULFIDE DEPOSITS
SULFIDE OCCURRENCES, PROSPECT AREAS
PROJECT AREA
RAILROAD
ROADS
62°45'
62°30'
62°15'
10°00'
11°00°
RÖROS
FUNDIN LAKE
SAMLEN LAKE
TVERRFJELL
FOLLDAL
DOMBAS
0
10
20
30
km
NORWAY
FOLLDAL MASSIVE SULFIDE PROJECT
Drawn By
E B WYTRWAL
Scale
1:625,000
Date
MARCH 1981
Project Nº

INTRODUCTION.

The Folldal project was first started in the summer of 1981 to explore, in a joint venture between Folldal Verk A/S and Amoco Norway Oil Company, for Cu,Zn massive sulphide deposits. Since 1982 follow-up work have included ground geophysics, geochemical sampling and geological mapping. In addition to this some targets have been diamond drilled (2010 meters in 1982 and 3290 meters in 1983). Anomalous areas were first located by airborne geophysics over the Savalen/Tynset area during 1981, and over the Tolga/Os and Folldal areas in 1982. In 1983 follow-up work continued in the targets which were started in 1981 and 1982 and in addition some new grids were established.Targets have been located for continued work in 1984 and presently priority drill targets have been outlined in close relation to known mineralizations.

LOCATION AND ACCESS.

The Folldal Project is located between latitudes 60°00' and 62° 35' and longitudes 8° 50' and 11° 15' east, trending generally in a north east-south west direction. The area is approximately 300 km north of Oslo and is serviced by major paved roads both in the eastern and western sections.
Secondary roads can be found throughout. Two major rail lines, both of which connect Oslo and Trondheim, service the project area. The western line runs through the towns of Dombås and Hjerkinn, while the eastern line has stations at Alvdal, Tynset and Os. The major supply centers are Dombås, Folldal, Alvdal, Tynset and Os.

LAND STATUS.

Folldal Verk currently holds claims throughout the project area, at Grimsdalen, Tronfjell, Sivilvangen, Rødalen, Fådalen, Vingelen, Os and the old producers around the Folldal area.

PREVIOUS WORK HISTORY:

The Folldal project area includes many various sized (up to 19mm tonnes) massive and disseminated copper zinc- sulphide mines that can be dated back as early as 1748 with the first production from a copper mine in the town of Folldal (Hovedgruve). This mine was worked intermittently until 1940. During this time other mines were put into production in the vicinity of the Folldal camp, namely Nordgruve, Søndregruve and Nygruve.
Other small showings had limited production in the Fådalen, Rødalen and Sivilvangen area from 1722 although these were small scale operations.
To the north of the project, Vingelen, Foss gruve and Oskar II were small but important massive sulphide copper zinc mines.
These old showings are approx. 15 to 25 km south west of the Røros massive sulphide camp and are within the same volcanic belt.
Many small diggings and adits can be found throughout the area, and most if not all surface exposures of sulphide have been found.

Presently, the only producing copper zinc mine in the area is Folldal Verk's Tverrfjellet mine in the western section of the project area. It is one of Norway's largest massive sulphide type deposits. (19mm tonnes).
Previous work by Folldal Verk A/S in the project area has included ground geophysics, stream sediment surveys, and diamond drilling, basically in the vicinity of the old workings.

Name	Production	Tonnage (MM Tonnes)	Cu%	Zn%	Pb%	Ag (ppm)	Au (ppm)	S%
Fadalen	1722-28 1739-47 1738-88	0.1	?	?				
Hovre	Discontinuous 1738-1940	3	1.5	3.0	0.3	-	-	35
Rodalen	1751-1810 1911-1914	0.4	1-4	?	-	?	?	?
Røstvangen	1908-21	0.4	2.6	1.0	-	10-80	0.3-2.0	43
Sivilvangen	1915-17	1200 tons	1.5-2.5	>6.0	?			
Nordre	1936-70	2.5	1.3	3.2	0.2	31	0.2	34
Nygruve	1940-52	0.3						
Sondre	1950-65	0.5						
Grimsdal	No production	3.0	0.8	1.2	.008	-	-	32
Grimsdalen	" "	10.0	0.3	2.8	0.15	10-15	-	25-35
Tverrfjellet	1968-	19.0	1.0	1.2	.06	18	0.1	36

REGIONAL GEOLOGY.

The Folldal project area lies within the southern section of the Trondheim greenstone belt and includes rock types of both sedimentary and volcanic origin. These rocks were deposited in the extensive Caledonian geosyncline during Cambro-Silurian times and can be seen to extend almost the total length of Norway's west coast. The east and west section of the Trondheim greenstone belt show definite rock type co-relation, especially with the main volcanic units, although depositional environment was very different. The western section of the belt, which includes Folldal Verk's large Tverrfjellet mine and even the bigger mine Løkken gruber (30 mm tonnes), is generally thought to be closely associated with ocean floor volcanic activity, and includes rocks of more tholeiitic com,position. The eastern limb of the geosyncline can be seen to include a much more differentiated rock type, perhaps indicating island arc deposition.

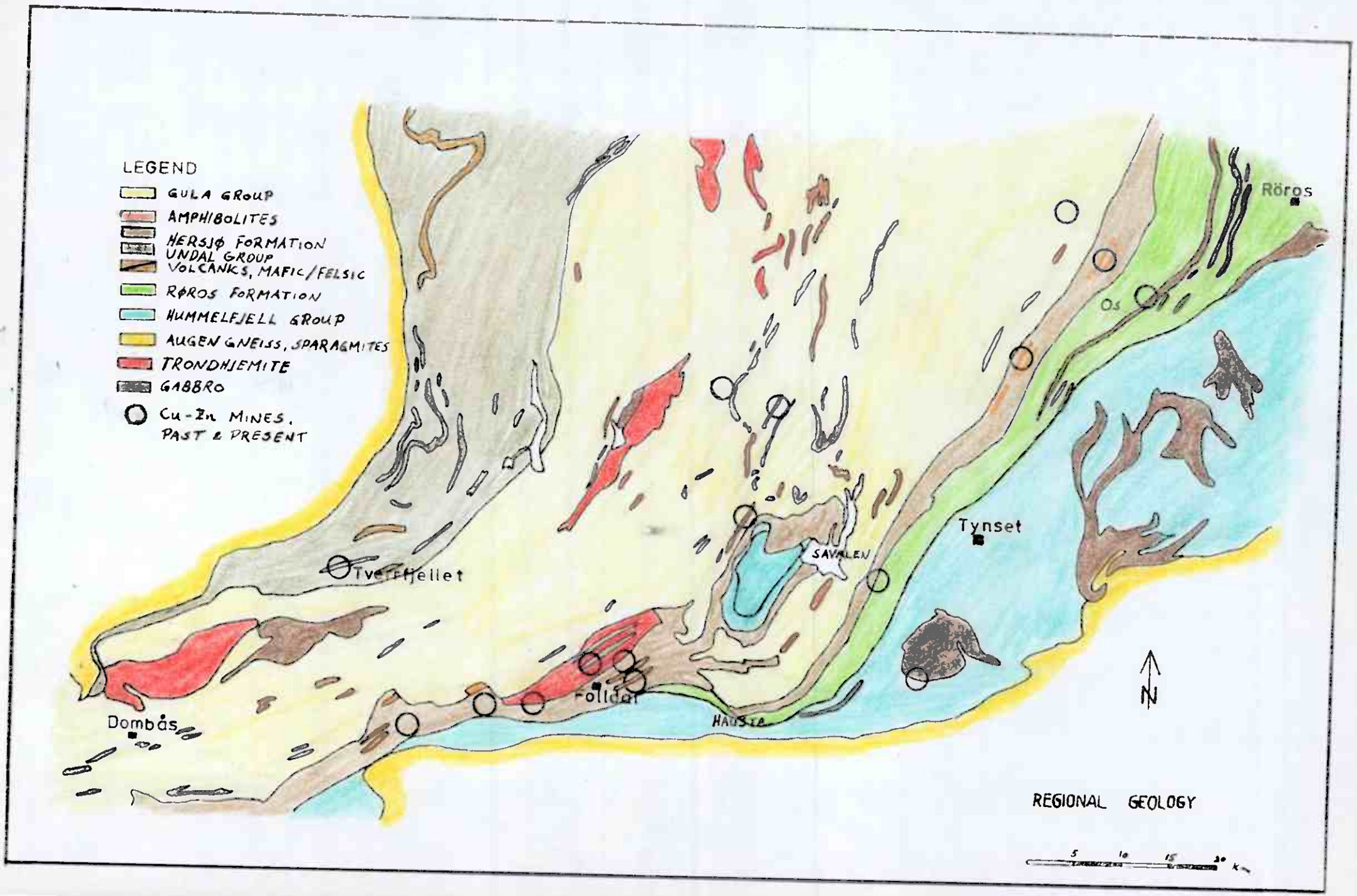
The 1983 field season was restricted to the eastern limb of the syncline and the following describes the associated rock units. The base of the belt is unerlain by a thick succession of sparagmite (feldspathic arkose) and augen gneiss (turbidite sequence) of Eocambrian age. Overlaying the Eocambrian rocks is the Hummelfjell formation of Cambrian age. It includes generally a sedimentary sequence of quartzites, qtz. mica schists and graphite schists, with minor associated mafic tuffs. Overlying the Hummelfjell group is the Røros formation, which has associated ultramafics (dunites, serpentinites), quartz biotite schists, greenstones, and minor graphite schists + conglomerates.
The Hersjø formation is the next in succession and is considerd the main volcanic belt of the eastern limb of the syncline. The volcanics includes a differentiated sequence of greenstones, mafic tuff, felsic tuff (keratophyre), and minor dacite and graphite schists. The Gula group which caps the whole greenstone belt may be in faulted contact with the underlying Hersjø formation and exact age of the group is highly controversial. It includes a large succession of sediments with minor thin beds of mafic volcanics (amphibolites).

The group shows generally a series of recessional sedimentation grading from phyllites up to calcarious schists and into limestone.

Stratigraphic Succession (East limb of Folldal project).

Silurian	Limestone		
U. Ordovician	Amphibolites and greenstone	Gula greenstone	Gula Group
	Calcareous mica schists	Singsås Formation	Gula Group
	Phyllites, Trondjemites	Åslia Formation	Gula Group
	Keratophyre, greenstone, mafic tuffs	Hersjø Formation	Fundsjø Group
Ordovician	Layered gabbro trondjemite		Fundsjø Group
Cambrian	Graphite schists, gtz biotite schists, greenstone, serpentinites, dunites & conglomerates	Røros Formation	Sulåmo Group
Cambrian	Quartz mica schists quartzites, mafic tuffs, and graphite schists	Hummelfjell Formation	
Eocambrian	Augen gneiss Sparagmite		

General strike direction of the units is north easterly, dipping steeply to the north west. Highly folded areas exist throughout and can be found in close association with sulphide mineralization. Faulting is not readily apparent although low angle thrust zones have been mapped within almost every geological unit and consequently a great deal of imagination must be used for interpretation.


LEGEND
GULA GROUP
AMPHIBOLITES
HERSJØ FORMATION
UNDAL GROUP
VOLCANKS, MAFIC/FELSIC
RØROS FORMATION
HUMMELFJELL GROUP
AUGEN GNEISS, SPARAGMITES
TRONDHJEMITE
GABBRO
Cu-Zn MINES, PAST & PRESENT
Røros
Os
Tynset
SAVALEN
Tverrfjellet
Folldal
HAUSLA
Dombås
N
REGIONAL GEOLOGY
5
10
15
20
km

SUMMARY OF PROPERTY AND FIELD WORK.

A. Folldal area.

The following areas or grids are all within the vicinity of old mines and have been followed up as a continuation of work from previous years and have been the results of anomalies from the 1982 airborne survey. The follow up works have been geophysical measurements as shootback, VLF (field strenght), magnetometric measurements and Apex max-min, geological mapping and in a few grids there have been done geochemical survey. Some of the anomalies obtained, have been diamond drilled with discouraging results (mostly graphite horizons). The next seasons investigation in the area will probably be diamond drilling. Three or four new grids will be established where geophysical, geological and geochemical investigations will be done.

The follow up grids from 1983 are:

A. 1. Nygruvhøgda
A. 2. Ørnhovda
A. 3. Reinslia
A. 4. Moseng
A. 5. Brendryen
A. 6. Solbakken
A. 7. Knutshovda
A. 8. Taubanen
A. 9. Sletten
A. 10. Korsvoll
A: 11. Storhovde

In addition to these follow up grids one older grid was diamond drilled.
This is:
A. 12. Bekkensetra.
Four other grids were established in 1982, these are: Søndre, Grimsdalen, Nordre Bekkensetra and Hovedgruva. Since no work have been done on these grids in 1983 no further comments will be done on these grids.

A. 1. Nygruvhøgda. Baseline: 1000 W - 200 E
Profile length: 500 N - 200 S
Follow up work 1983: Shootback, VLF (field strength), MAG and soil sampling.

The grid is situated approximatly 800m south of the old mine Nygruva. The VLF and shootback shows mostly weak anomalies, but in one area both methods gives strong anomalies, which is thought to be graphite related. This anomaly runs across the profiles 300 W-100 W (300 - 400 N). It is hard to follow the weak VLF and shoot-back anomalies from one profile to another, consequently more follow up work are necessary to be able to interprete these data. The MAG is only carried out in the profiles 1000 W to 400 W. Two of these profiles shows high magnetic values and the rest are low. This indicates measuring errors. At point 500 W, 225 N one interesting magnetic anomaly showed up. This profile was not measured with VLF or shootback from 200 N to 500 N and therfor new VLF measurements were carried out, covering the profiles 400 W - 600 W. This indicated a weak conductor that coincided with the mag anomalies. The geochemical map shows interesting copper values at the lines 100 W and OEW. A very weak electromagnetic anomaly runs from 300 W, 200 S to OEW, 75 S. This anomaly may cause the copper anomaly. No zinc or lead anomalies are received although anomal values are scattered over the whole grid.
(Zn up to 140 ppm and lead up to 96 ppm).

Recommendation: Since the geophysical measurements are not carried out over the best geochemical anomaly, it is recommended that VLF and shootback are run southwards to 500 S or even to 700 S to pick up an interesting electromagnetic anomaly received by the airborn survey, in the sothern part of this grid. The grid should also be measured for total magnetic field once more, and geological mapping should be carried out although there are probably very few outcrops. If good results are received in conection with the cu-anomaly it should be drilltested.

A. 2. Ørnhovda.

Baseline: OEW - 1000 E
Profile length: 100 S - 1000 N
Follow up work -83: CEM, VLF, MAG Geochem.

VLF picks up two extensive, parallell conductors (which is longer than the base line, and gives the strike)- probably related to graphite horizons. Here CEM coincides partly with the VLF (and only in the eastern part of the grid). The reason for this could be a change in conductivity along the conductor, or that it consists of smaller lenses.
MAG looks "flat" - except a weak peak between 0-400 EW and 800-900 N coincident with weak CEM and VLF. Another CEM - and VLF conductor at 0 EW and 600 N shows a weak extention NW. A favourable trend in the geochem follow the last named conductor (having the SSW-erly drainage direction in mind), - with values up to 280, 250, 38 ppm Cu, Zn, Pb, (Corresponding background values: 10-20. 20-30, 10 ppm).
The highest Cu-value (360 ppm - and high Zn and Pb) probably relates to the extensive VLF conductor at 400 E and 450 N (although it conflicts a bit with the drainage).

Recommendations:
The geochemical soil samples give high values in Cu,Zn and Pb: highest respectively 360, 250 and 540 ppm - which demands interest and further work. In addition to geological mapping Apex and VLF field strength must be run over the four CEM and VLF anomalies to site the drilltesting that should be done.
Probably one drill site already points out: 400 E and between 600 and 650 N - at the VLF conductor with good geochem.

A. 3. Reinslia

Baseline 11000 W - OEW
Profile length 500 N - 500 S
Follow up work in -83: CEM, MAG, VLF

This grid shows coinciding strong VLF, CEM and MAG anomalies. Two main conductors can be picked out. One of them, which is quite strong on both VLF and CEM, can be followed from OEW, 75 S to 700 W, 250 S. This conductor is most probably a graphite with some pyrrhotite.
The other main conductor, which may in fact be two parallel conductors, differ in direction from the other one, and runs from 400 W, 50 S to 1000 W, 225 N. This conductor is weak in VLF, and strong on CEM. This could be caused by the angle to the transmitting station. Both these strong conductors are overlapped by stong MAG.

Recommendations: The geochem is too discouraging to recommend any more work on this grid.

A. 4. Moseng.

Baseline. 100 W - 600 E
profile length: 300 N - 300S
Follow up work 1983: CEM, MAG, VLF, AREX
Geological mapping, One 150,0m deep drill hole.

This grid is situated approx. 500 m south of the Taubanen grid in the same stratigraphical possition as Storhovde grid. The geological map shows mostly mafic flows (greenstone - greenschist), but some keratophyre is also found. One electromagnetic anomaly runs through the whole grid. Some weaker anomalies are found south of the main conductor. The apex measurements correlate well with the VLF and CEM measurements, but it is very weak in some places.
The main conductor is drilltested at line 300 E, 100 N. Traces of pyrite, pyrrhotite and chalcopyrite are found troughout, but the geophysical anomaly is most probably related to a 30 cm thick graphitic schist with weak mineralization.
Chemical assaies of the drill hole are not yet received.
Recommendations: No further follow up work is recommended.

A. 5. Brennryen : Baseline : OEW - 1000 W
Profile length: 200 N - 200 S
Follow up work 1983: CEM, MAG, VLF, APEX, GEOLOGY
Soil sampling

The area is crossed by powerlines and a lot of the grid is covered by farmlands and roads. These factors makes both geochemical and geophysical ivestigations difficult. In the western profiles it is possible to sort out one anomaly which is not caused by power lines. This anomaly can be seen around BL on profiles 1000 W - 800 W and maybe also weakly on profiles 700 W and 600 W. The VLF anomaly coincidents with high magnetic values. The shootback anomalies are very hard to interprete, but when looking at the VLF anomalies it is possible to pick out the conductor.

Over the most promising area (profile 600 V - 800 V) Apex measurements were carried out. These measurements gave two separate anomalies, one caused by the powerline and one probably caused by a graphite horizon. The last one coincidents with the VLF, MAG and CEM anomalies. The Apex gave strong respons on all frequensies and this means that the conductor, most probably is a graphite horizon.

Geochemical investigations are also carried out on this grid. When interpreting the results of this measurements one should be award of contamination from agricultur and the old mine Søndre Geitryggen, which is situated some 900 - 1500m to the WS W. This mine was closed in 1965 and had a tonnage of 0,5 MM tonnes.

The geochemical results vary quite a lot, and no separate anomaly can be picked out. The max values of the soil samples received

Cu: 89,0 ppm, Zn: 140,0 ppm, Pb: 14 ppm.

Recommendations: Geological mapping, perhaps together with digging over the anomalies. If the conductor is not detected in this way and it is not found interesting enough to drill, it could be interesting to see if Cp "mise a la mase" with (contact) at the Søndre Geitryggen mine could do.

A. 6. Sobakken.

Baseline: OEW - 800 E
Profile length: 300 W - 300 S
Follow up work 1983: Shootback, MAG VLF and Apex.

This grid is situated in the sothernmost end of Hersjø formation of keratophyre, greenstones and mafic tuffs. Unfortunately the base line is not parallel to the strike of the rocks. Nevertheless interesting geophysical anomalies are obtained. Apower line in the sothern part of the grid disturb both the VLF and shootback measurements. When having the strike of the rocks in mind it is quite easy to interprete the geophysical measurements. The most encouraging anomaly, which is detected by all the geophysical methods MAG, VLF, CEM and Apex max-min, runs from (400 E, 100 S) to (700 E, 275 N). This anomaly probably reflect an intermediate conductor, because the Apex max-min shows weak respons on low frequences and strong respons on high frequences.
Recommendation: This anomaly should be drilltested at line 500 E or 600 E. To pick out the best drilling spot, it would be appropriate to establish a new grid with the base line parallel to the strike, and do Apex max-min over the best anomaly. Geological mapping should also be carried out before the anomaly is drill tested.

A. 7. Knutshovde.

Baseline: 100 W - 200 E
Profile length: 100 S - 300 N
Follow up work 1983: MAG, CEM, VLF.

This grid was the last one in 1983, and the measurements are not fullfilled. Interpretation of this work is not possible on this state.
Recommendation: The profiles should be lengthened with at least 200 meters in both directions, and MAG, CEM and VLF should be fullfilled. Geological mapping should also be carried out.

A. 8. Taubanen.

Baseline: OEW - 1000 E
Profile length: 200 S - 300 N
Follow up work 1982/83: VLF, MAG, CEM, Apex max-min, soil sampling. One drill hole.

This grid is situated in the continuation to the west of the Geitryggruva deposite. The Geitryggruva is an old mine that had produced 2,5 million tonnes of ore when it in 1970 was closed. The average grade of this deposite was: Cu: 1,3% Zn: 3,2%, Pb: 0,2% Ag: 31 ppm, Au: 0,2 ppm and S: 34%.
Geologicaly this grid is situated within volcanic rocks like massive greenstones and greenschists. No geological mapping have been carried out in this grid.
All the geophysical measurements shows a strong anomaly that runs from (OEW, 75 N) to (1000 E, 250 N). This anomaly is for sure graphite related. The same graphite horizon is known from the N. Geitryggen mine. South of this strong anomaly two smal anomalies are found in the same stratigraphic possision as Geitryggen mine. One of these, which gives just a small magnetic anomaly is drill-tested (co ord 500 E, 30 N). Two separate zones of graphite schists was discovered (43,10 - 44,29m and 70,98 - 72,30m), but in near connection to these smal stringers of massive pyrrhotite and pyrite ores were found. Traces of chalcopyrite were also discovered. The geochemical assaies of soil samples collected north of the base line, shows extremely low values that are thought to be erratic.

Recommendation: The other weak EM anomaly at (200 E, ONS) gives also a magnetic anomaly. The Apex max-min shows little response on low frequency (22 Hz) and strong response on higher frequencies. This is usual for intermediate conductors like massive sulphide ore. Drilltesting of this anomaly is recommended.

A. 9. Sletten.

Baseline: OEW - 1000 E
Profile length: 200 S - 300 N
Follow up work 1982/83: Geological mapping , one drill hole, soil samplings.

Follow up work in this grid was started in 1982 with geophysical measurements (VLF, CEM, MAG and Apex max-min) and soil sampling. Geophysical investigation in this grid turn out to be very difficult because of much disturbance from power lines. The VLF turn out to be of little value because it picked up so many "conductors" that it was imposible to interprete it. Shootback measurements gave much "cleaner" pictures of the anomalies. The MAG showed two separate anomalies, one undulating running from OEW, 100 N to 1000 E, 75 S and one or two parallel magnetic anomalies running from 1000 E, 100 N to 300 E, 125 N. Apex max-min measurements were then carried out covering the whole grid. Several strong conductors were easily sorted out and all of them coinsidented very well with the shootback anomalies. Results from the soil samples showed randomly distributed anomal values spread out over the whole grid. The best values received was: Au: 25 ppb, Cu: 260 ppm, Zn: 210 ppm, Pb: 22 ppm and Ag: 0,5 ppm. In 1983 the area was mapped. It is possible to sort out one thick (150 - 400m) unite of volcanics parallel to the baseline. At both sides of this unite we have grey phyllites with graphite sections. In one location (100 E, 50 S) near the boundary of this units, iron staining has been found. A strong electromagnetic anomaly runs from (OEW, ONS) to (400 E, 100 S). When considering the strike and dip, this conductor would pinch out at the spot where iron staining is located. Therefor this anomaly was drill-tested although no magnetic anomaly was found.
The drill hole was negative, and a 8,75 m thick massive graphite schist was found. Traces of Chalcopyrite, pyrite and galena and up to 3% pyrhotite was found in various sections.
The traces of chalcopyrite and galena can explain the anomal geochemical soil values received several places in the grid.
Recommendations: No further follow up work is recommended. The geophysical anomalies are spread out over the whole grid., and can be explained by the traces of chalcopyrite and galena found in the drill hole.

A. 10. Korsvoll - Einbu

Baseline: 4600 W - 3600 W
Profile length: 200 N - 1000 N
Follow up work 1983: VLF, MAG, Apex max-min and two drill holes.

Follow up work in this grid was established in 1970 after encouraging ground geophysical survey (Turam). One of the best turam anomalies were not drilltested at that time. Therefor more follow up work started early in 1983, covering the most promising turam anomaly.
This grid is situated in the same stratigraphic possision as Bekkensetra, Nordre Geitryggruva mine and Taubanen within greenstones.
The total magnetic field shows only background values ranging from 50300 Gamma to 50600 Gamma except for one value 50870 Gamma at 4400 W, 250 N).
Although the grid is crossed by a power line the VLF is able to pick up a couple of conducting zones. To pick up any drilling spot it was necessary to do more geophysical survey. Apex max-min was tried with 100 m cable, but it picked up too many weak conductors that it was hard to interprete it. With a cable length of 50 m very fine and "clean" anomalies were obtained.
One 131,00 m depth hole at 4300 W, 925 N was than drilled, but no cause of the geophysical anomaly was found, except for a 0,45 m thick zone with up to 15% pyrrhotite. This smal zone with pyrrhotite was not believed to cause the strong Apex anomaly. Therefore a new drill hole was started at 4300 W, 895 N.
THis hole was drilled through a 2,50 m thick strata up to 3% pyrrhotite at the same stratigraphic possision as in the first drill hole. This zone with pyrrhotite is later believed to cause the electromagnetic anomaly.
Recommendation: No further work is recommended for this grid.

A. 11. Storhovde.

Baseline: 900 W - 300 E
Profile length: 100 S - 300 N
Follow up work 1983: MAG, CEM, VLF and soil sampling.

This grid is situated between Nordre Geitryggruva and Søndre Geitryggruva mines in the same stratigraphic possision as Moseng grid. The grid is situated within a unit of green mica-shists. The geochemical map shows very low background values which indicates error (s) with the soil samples. Consequently the geochemical survey gives little information. The magnetic measurements gives several strong anomalies.
The VLF and CEM shows intermediate conductors, that do not coincident with magnetic anomalies.
Recommendation: Detailed geological mapping is recommended. Together with this Apex max-min should be measured at each profile. New geochemical survey could give valuable information, but contamination from the nearby Geitryggruva mine may make it hard to interprete. After having considered apex and may be geochemical result, this grid should be drilltested.

A. 12. Bekkensetra.

Baseline: ONS - 800 N
Profile length: 200 E - 300 W
Follow up work 1983: One 108,50m deep drill hole.

This grid was first located by airborne EM, and later followed up by ground geophysics. The anomalous zone is along strike of the old Nordre Geitryggruva mine and consequently bacame of interest as a possible continuation of the Nordre Geitryggen deposite.

Mag, VLF, CEM were all performed and basically isolated a small conductor to the west of the base line. Mag is coincident with selected zones of the shootback anomalies. Detailing with Max-Min has now defined these zones better.

The geochemical results for this area was not received when the last years report was finished. The back ground values in this grid and surrounding grids like Taubanen and Storhovde are markedly lower than in other parts of the volcanic rocks in the survey area. This difference in back ground values may reflect difference in the composition of the bedrock, but can also be explained by sampling errors. If for example the samples are taken from the A II horizon of the podzol profile, all values will be lower than if they are collected from B horizon. Anomalous areas will theoreticaly be detected by sampling A horizons, but sampling errors will easily give falsh anomalies, Consequently the geochemical results from this area is less reliable than in other areas.
In 1983 one of the electromagnetic anomalies was drilltested with a 108,50 deep hole at 400 N, 150 W. The drill hole was negative with a graphite horizon with minor amount of pyrrhotite and traces of chalcopyrite.
Recommendations: No further work is recommended for this grid.

B. Savalen area.

Is geologicaly the NE continuation of the Folldal area. Occurrences of massive sulphide deposits are known also from this area (Sivilvangen, Rødalen, Røstvangen and Fådal mines.)

Five grids around the lake Savalen are followed from the previous year:

B. 1. Sivilvangen
B. 2. Lomsjøvola
B. 3. Svarthue
B. 4. Bondåsen
B. 5. Fisktjørna

B. 1. Sivilvangen.

Baseline: 4000 N - 6600 N
Profile length: 200 W - 800 E
Follow up work -83: CEM, MAG, VLF, APEX soil samples, 5 drill holes.

This years work on Sivilvangen incudes CEM, MAG, VLF, Apex, soil sampling and five drill holes between 4000 N - 6600 N. The grid is earlier worked in -81 and -82. Small old showings occur throughout this north section, and have small lenses of sphalerite. They all are within a bimodal volcanic environment.
The north section of the grid, from L-4000 N to L-7800 N showed large continuous beds of graphite, usually found capping felsic-mafic volcanic zones. These graphite horizons often have pyrite and pyrrhotite associated and the CEM shootback survey picked these zones up very well. From profiles in old diggings, mineralization is closely associated with these zones and consequently should not be rejected from investigation. The most promising zone of this type stretches from L-5000 N, BIL to L-6200 N, 200 E and rock assays from an old digging in this zone assayed 2,43% Cu, 8,2% Zn. Three zones between L-5000 N and 5400 N, of anomalous Zn with accompaning Cu and Pb are coincident with felsic-mafic contacts and detailed geological mapping should be performed.
A VLF field strength survey was also performed over L-5000 N to 6200 N which shows good correlation to the geochem. This zone is drilltested at _5200 N-60 W, -45°E and L-5200 N - 135 W, -45°E. In both drillholes the same mineralized zone was hit at respectively 45,60m (5-83-4) and 109,50m (5-83-5). The zone becomes poorer downwards: up to 10-15% sphalerite over
2m in the upper hole (4), and in the lower hole (5) 109,50 - 130,25m is a mineralized section with up to 0,26% sphalerite.
A graphite schist underlies the mineralized section in drillhole S-83-5.
Two other drillholes are drilled this year at L-5600 N - 20 E, - 45° E and L-5600 N -40 W, -45°E.
Both holes cut a graphite schist with underlain mineralization up to 0,89% Zn and 0,67% Cu over about 3m.

Soil sampling are re-done along L-4000 N, 4200 N and 4400 N from B.L. to 800 E to check the surprisingly low values from the -82 geochemical survey. This years survey verifyed the results from -81: Geochem anomaly from B.L. to 100 E on L-3800 N, 4000 N and 4200 N - which is coincident with a very slight conductor zone shown by Apex. VLF also show a weak anomaly at 3800 N, 100 E. Favorable rock type and extensive silicification and albitization can be seen throughout this area.

The earlier proposed detailed geological mapping from L-5000 - 5400 N should continue to L- 6200 N between 400 E and 800 E. Here, L-5400 N, 425 E, L-6200 N, 675 E, a strong MAG-anomaly is flanked by a very weak VLF (but no Apex) and a good geochem, anomaly down stream. Possibly an ultramafic zone rich in magnetite.

The VLF anomaly at 5000 N, 450 E is drilltested, and showed graphite schist, and some narrow zones with 1% chalcopyrite.

Two parallel EM conductors run from respectively 600 E and 700 E at L-5000 N, to about 800 E at L-5800. The weaker (the westernmost) is coincident with MAG. No clear geochem anomaly can be seen. The conductors are probably related to graphite with and without pyrrhotite. This should be checked by the proposed geological mapping, eventually even trenching.

B. 2. Lomsjøvola.

Baseline: 1600 S - ONS
Profile length: 500 W - 600 E
Follow up work 1983: Soil samples

The area is situated in the Gula group. The grid was worked for MAG, CEM and VLF in -82 with additional soil sampling in -83. Both MAG, CEM and VLF show one extensive conductor at 75 E- 100 E. This conductor is very similar to the Snausjøvola I and II garnet cummingtonite ultramafic, although it shows sections of massive pyrrhotite. It may be closely related to Snausjøvola II, and additional rock samples along this zone should be analysed for gold. Rock samples along this zone have copper geochem values of up to 965 ppm with an average of near 650 ppm, definitely well above background of the similar rock types of the area.

We await results from soil samples. A CEM and MAG anomaly at 1000 S, 250 W should be searched in the soil samples. Untill now only gold assayes are received from the soil samples, and they showed no anomal values.

E. 3. Svarthue.

Baseline: ONS - 1600 N
Profile length: 500 W - 400 E
Follow up work 1983: MAG, Apex, soil samples (Au), drilltested

This grid covers a contact between the Hersjø formations micaschist and the Gula groups greenstone.
The anomalous zone has its main conductor basically along the base line and dissappears southwards into Savalen lake. Winter geophysics has picked up the same extensive conductor under the lake.
This zone is graphite related (graphite found in outcrop).
Also pyrite and pyrrhotite are found along this zone, and rock samples from L-840 N, 50 E give 2596 ppm Zn, in addition to albitization in felsic keratophyre. This encouraging informations gave rise for drilling at L-1000 N, 125 E - 45° W.

Only thin sulphidezones of Zn, Pb and Cu were found:up to 0,2 % Zn, < 0,1% Pb and traces of Cu at 63,20 - 63,25m, 63,45 - 63,80 and 64,15.

Recommendation:
Since soil sampling will be very incomplete, because of the big swamps - this is not recommended. But Pb- and Zn mineralization found in the drillhole makes the grid an interesting target for further work,ev. more drilling.

B. 4. Bondåsen.

Baseline: ONS - 1400 N
Profile length: 400 W - 600 E
Follow up work 1983: Soil samples.

Apex and geological mapping have been done in 1982, followed by soil sampling in -83. Apex pointed out a weak conductor at the contact between a micaschist and a conglomerate, probably related to graphite. Although the area for soil sampling are too narrow, it looks like the anomalous gold (up to 20 ppb) follows the conglomerate.
It is recommended to take rock samples of the conglomerate and analyse for gold.

B. 5. Fisktjønna.

Baseline: ONS - 1200 N
Profilelength: 500 W - 500 E
Follow-up work 1983: Apex and diamond drilling.

CEM, VLF, MAG, soil sampling and geological mapping have been done during the 1982 season, and followed up by Apex and drilling in -83 at 600 N, 50 W - 45° E. The conductor is verified to be graphite related. In fact three graphite zones are found: 26,50-34,00 (with up to 2% pyrrhotite and pyrite), 51,05 - 51,65 (2-3% and traces of chalcopyrite) and 52,65 - 57,80m (2-3% pyrrhotite and traces of pyrite and chalcopyrite). The interbedded chlorite schist is in places folded and contains sulfides-up to 5-6% pyrrhotite and some pyrite.
Soil over this zone show no place anomalous areas. No further work on this grid is recommended.

C. TYNSET AREA.

Some of the grids in this area are established this year, while others are started in-82 and continued in -83. All as a result of airborne geophysics from -81. Some of the grids have allready been diamonddrilled, while others are to be tested next season. The follow-up work have consisted of ground geophysics (VLF, shootback, magnetometry), soil sampling and geological mapping.

Next seasons follow-up should include Apex max-min, soil sampling and geological mapping in addition to drilltesting.

Grids worked in 1983:

C. 1. Stormyra
C. 2. Knappåsen
C. 3. Åsvangen
C. 4. Hallrøsta
C. 5. Flatvollen
C. 6. Vardtjønna
C. 7. Snausjøvola I
C. 8. Snausjøvola II
C. 9. Nonsvola

C. 1. Stormyra. Baseline: ONS - 1000 N
Profilelength: 300 W - 500 E
Follow-up work 1983: CEM, MAG, Geology.

The stratigraphy of the area is relatively good understood. The rocks are from the bottom to the top in the sequence: Mixed mafic-felsic tuff, quartz keratophyre,dark grey phyllite, greenschist, mafic tuff, quartz keratophyre,ultramafic, mixed mafic-felsic tuff and dark grey phyllite.
A strong CEM-anomaly overlapped by MAG, follow the quartz keratophyre at about 150 E. This extensive conductor indicates graphite with pyrrhotite - propably the same graphite horizon as in Nonsvola and Åsvangen. In some locations pyrite is found in the keratophyre. CEM picks up two interesting anomalies aside of the graphite related conductor: One between 500 N and 800 N, 75 E and one at 500 - 600 N, 200 Ø

Recommendation: Since no geochem are done here, soil samples should be taken east of B.L. to cover the anomalies (although all the swamps can disturb the picture). Later drillhole(s) to test these EM anomalies are very possible.

C. 2. Knappåsen

Baseline: ONS - 1500 N
Profile length: 300 W - 300 E
Follow up work 1983: CEM, MAG, Geology and soil sampling.

This grid shows just a few outcrops of phyllites and some mafic tuffs. From the regional geological maps we see that the grid is situated on the border between greenstones of the Hersjø formation and micaschists, greywackes, graphite schists and minor volcanics of the Røros formation. The magnetic measurements shows a very constant total field strength, ranging from 50500 to 50600 gamma. A few values reach up to 50800 gamma, but these does not coinsident with CEM anomalies. The CEM outline at least two conductors, both dipping 50^{o}-70^{o} to the west. These conductors are most probably graphite related, because they have great conductivity, are continuous in strike direction and are parallel to each other. The geochemical results shows very low copper values, ranging from < 0,5 to 46,0 ppm with a background less than 20 ppm. The background values of lead and zinc are more normal compared with other soil assaies from other grids in this volcanic environments. The anomal zinc values reach up to 220 ppm with associated background values of 10-50 ppm. Anomal lead values up to 20 ppm are found in a few places. The back ground value for lead is about 8 ppm. When comparing the geochemical map with geophysical anomalies it seems like slightly anomal lead and zinc values follows the conductors.

Recommendation:

When considering the untill now received data from this grid, it is expected that the anomalies are caused by graphite horizons with associated enrichment og zinc and lead. If further follow up work should be run for this grid, it would involve diamond drilling. Therefore the next step would be to measure Apex max-min covering the best anomalies, to pick out the best drilling spot. The best geophysical anomaly runs from (1200 N, 275 E) towards BL of 1700 N. This anomaly is reflected both on CEM and MAG, but the geochemical anomaly is weak. Another interesting anomaly runs through the whole grid from (ONS, 150 W) to (1400 N, 225W). At this anomaly it is one zinc value of 220 ppm (400 N, 150 W). Apex max-min measurements are recommended for the profiles 200 N-500 N from 400 E to 200 W and for 1100 N - 1300 N from 400 E to BL.

C. 3. Åsvangen.

Baseline: 500 S - 1500 N
Profile length: 300 W - 300 E
Follow up work 1983: CEM, MAG, VLF

This area is established along a main graphite horizon from Nonsvola and Stormyra, to cover EM/MAG anomalies aside of the graphite horizon, from the airborne survey. In fact an extensive graphite related anomaly along the B.L. is picked up by the VLF. Interesting anomalies are picked up aside of it.
Recommendation: This grid should be covered with soil sampling and geological mapping.

C. 4. Hallrøsta.

Baseline: ONS - 1100 N
Profile length: 500 W - 300 E
Follow up work 1983: CEM, MAG, Geology, soil samples.

This grid cover quite a lot of farmland, tracks and roads and across it there are running two powerlines, which makes it difficult to interprete geophysical measurments. The outcrops shows rocks as Trondhjemite, , quartz-keratophyre, black shale, sericite shale, greenstone and gabbro. Pyrite is located in one outcrop of black shale. The MAG shows one interesting anomaly at 300 N (125 E to 50 W) and 400 N (25 E to 62,5 W). This anomaly coinsidents with an outcrop of gabbro. Gabbros do often carry a lot of pyrrhotite and also some magnetite, so that may be the reason why we get an higher MAG-value at this spot. The shootback shows some small anomalies in the southern part of the grid, but they are very difficult to interprete . In the northern part of the grid there are some strong anomalies, which most probably are caused by fenses and power lines, although in some profiles the power lines gives no response.
Recommendations: It is very difficult to do prospecting in this grid. The geochemical soil sampling are discouraging. A lead anomaly follows the biggest road. No further work are recommended.

C. 5. Flatvollen.

Baseline: 300 W - 1200 E
Profile length: 700 N - 300 S
Follow up work - 83: Soil samples, geology.

The gelogy that can be seen consists of an ultramafic body (with a chromite showing) surrounded by phyllites, greywacke and micaschist.
Soil samples have scattered highs of Au and Zn, but very low Cu. Anomalous gold are consentrated between 300 W - 100 W, 100 N - 200 N. The closest EM-anomaly, which possibly can be related to this gold, runs along B.L., where the rocks are phyllite and micaschist.
No further work is recommended on this grid.

C. 6. Vardtjørna.

Baseline: 1000 S - 1400 N
Profile length: 600 W - 800 E
Follow up work 1983: VLF, CEM, MAG, soil samples, IP-RP, 3 drillholes.

This grid is within the Hersjø formation, and the main geological units are keratophyre, mafic-, and mixed mafic-felsic tuff.
Several resent diggings are within this area, and geophysics/ geochem, gives good anomalies that demands for drilltesting.
3 holes are allready drilled: At 500 N, 75 W, where the conductor was graphite. It is also drilled at an IP-anomaly 400 N, 375 E with discouraging results - only weak dissemination of pyrrhotite throughout the hole.
A geochem anomaly (up to 770 ppm Cu in soil) are outlined along baseline, 400 S - 400 N. IP-RP are measured along ONS, and gave anomaly at 25 E (coinsident with field strength).
Drilltesting showed no conductor except of pyrite and pyrrhotite dissemination and narrow bands including some chalcopyrite.

Recommendation: This last mentioned Cu-anomaly is too promising to be given up. Since anomalous Cu are found upstreams of the drillhole (ONS, 40 W) - one good drilltarget should be to test the EM-conductor at 200 W, 300 N.
The grid should be extended to the south (because of one high Cu- value (1345 ppm)) - and to the north (because of one Pb-value (725 ppm) in the northern end).
High Pb and Zn values are found over a big area between 600 N and 1400 N. Several EM-anomalies in this area are verifield to be graphite related, and the high Pb_Zn values could be related to this horizons. Rock samples should be analysed from the diggings in this area.

C. 7. Snausjøvola I.

Baseline: ONS - 1600 N
Profile length: 300 W - 700 E
Follow up work 1983: One 101,60m drill hole.

One main conductor was located here, possibly the same unit as Snausjøvola II, although no copper geochem was coincident with the conductor. The unit is an ultramafic garnet-cummingtonite magnetite rich body. Cross sections at L-1000 N B/L showed heavy concentrations of graphite. Soil profiles up to 80 cm deep have been taken across the conductor zone on L-570 N, where a massive sulphide (Cu, Zn, Py) boulder has been found.

The results of these soil assaies were:

Point	Horizon	Depth (cm)	Cu (ppm)	Zn(ppm)	Pb(ppm)
570N-125 W	A II	10	2	20	10
	B	30	11	33	8
	C	50	40	45	14
	C	70	230	46	20
570N-115W	A I	5	19	48	8
	B	20	14	56	8
	B	30	14	49	10
	C	60	29	39	8
	C	80	41	41	6
570N-100W	A I	5	13	37	10
	B	20	9	300	10
	C	50	28	39	8
	C	70	29	39	6

From these assaies we see that falsh anomalies can be obtained by sampling wrong horizons. Another interesting fact is that the copper values increases with depth and are weakly enrished in the A I horizon (humus?).Lead values seems almost independent of depth. More investigation of soil profiles, would strengthend our understanding and interpretation of geochemical soil sampling.
The copper background values are very low (< 20 ppm), with a few anomal values (up to 64 ppm) coincident with the conductor.
Weakly anomal zinc values are also coinsident with the conductor.
Anomal lead and weakly anomal silver values are coincident with the conductor. The soil samples were assied for gold and arsenic.
Encouraging gold (up to 1100 ppb) and arsenic values (up to 99 ppm) were obtained in various locations.
The 1983 field season concisted of putting down a 101,60m long drill hole at 400 N, 200 W enccuraged by the boulder of massive sulphide and a strong electromagnetic anomaly. The hole cuts through a 80 cm thick iron formation and a 135 cm thick zone with bands of massive pyrrhotite, with coincident anomal gold and arsenic values.

Recommendation: Soil sampling should be carried out for the lines 1100 N and 1300 N to 1600 N. If using 25m between each sampling point we would probably be able to pick out a drilling spot based on the geochemical assaies. To do deep soil sampling up to 1 m over at least one profile is also recommended.
Geological mapping should be carried out once more.

C. 8. Snausjøvola II.

Baseline: 1000 S - ONS
Profile length: 500 E - 200 W
Follow up work 1983: two diamond drill holes (103,30 and 81,00m).

Follow up on this area was the result of airborne EM and mag along strike of the old Fådalen mines at Gruvkletten, and was started in 1982. Located about eleven kilometers south west of the old mines this area showed one major shootback conductor with coincident and flanking mag, and a gold-copper geochem halo basically following these geophysical highs. Geological mapping located very few outcrops although the mag and shootback conductors were in close association to a greenstone/phyllite contact, running approximately N 30°E from the point L-800 S, 150 W.
In 1983 the strongest EM anomaly was drilltested at line 500 S after Apex max-min had been carried out for this line.
The first hole at 140 W was negative. Small zones of iron formations with pyrrhotite and magnetite are believed to be the cause for the EM and magnetic anomalies. Traces of chalcopyrite was found, but not enough to explain the geochemical anomalies. Therefore the parallel running anomaly was drilltested at 40W. A five meter thick horizon of stringers with massive pyrrhotite is believed to be the cause for this EM anomaly.
Recommendation: In this state of the follow up work it is difficult to recommend any further work without big costs. Until now we have found a lot of encouraging factors, except for a massive sulphide ore. The iron formations could represent stringer zones in connection to the underlying massive pyrrhotite. Pyrrhotite is known as a distal mineral of massive sulphide ores.

This means that the "main orebody" may be situated at a deeper level. Therefore it is recommended to extend the SN II-83-1 also that the massive pyrrhotite horizon is reached. By geochemical assaies it may be possible to indicate the direction to the "main orebody". A short drill hole at line 400 S would also be of great value in the further understanding of this orebody.

C. 9. Nonsvola.

Baseline: ONS - 1500 N
Profile length: 300 E - 300 W
Follow up work 1983: CEM, MAG, Soil sampling, geological mapping and one 119 deep drill hole.

This grid is one of the most encouraging in the Folldal project. It is situated within the Hersjø formation covering one about 200 m thick keratophyre horizon. Vingelen mine is situated in the same stratigraphical position some 4 km north of this grid.
The geophysical survey showed very interesting anomalies. The magnetic total field gives strong anomalies west of a distinct line from (ONS,100 W) to (1200 N, 225 E). This line which is reflected both in the geochemical map and the shootback survey differ in direction by some 10^{o} - 20^{o} to the strike. This means that this line may represent a tectonic diclocation.
The shootback survey is difficult to interprete because there are several conductors west of the possible dislocation. Some of these shootback anomalies are for sure caused by graphite horizons. Graphite is found at 3 locations which all gives shootback anomalies.
This area has quite a lot of outcrops, and therefore it has been possible to make a detailed geological map with a lot of interesting information. The magnetic and shootback anomalies seems to follow the keratophyre horizon(s). Generally there are silicious sediments west of the keratophyre and volcanic tuffs and greenstones east of the keratophyre. In the middle of the grid there is an intrusive Trondhjemite body. Pyrite is found on several outcrops and four old diggings are located at line 1100 N and 1200 N 150 E.

In one location (60 N, 210 W) blocks of massive sphalerite ore are found in a stream near the border between quartzkeratophyre and silicious sediments in connection with a graphite horizon. Encouraged by this discovery it was drilled a hole at (200 N, 225W) dipping 45° to the east. The drill hole cut through 17m of Qtz feldspar graphite schist with up to 1 % pyrrhotite.
If the drill hole had been drilled some 30-40m longer it would probably cut another graphite horizon with possible associated mineralization.We would maybe also be able to find out if it is a foulting east of the quartz-keratophyre,if the drill hole had been longer.
The geochemical soil assaies were also very encouraging in this grid. Spesially the zinc anomalies were good, with 13 values higher than 200 ppm (up to 1700 ppm) with fearly low back ground values (20-50 ppm). Associated lead and copper anomalies ranges from 12-26 ppm and 60-230 ppm respectivly. The best zinc values are found in an area from 300 N, OEW to 400 N, 150 W following a bog on the geological map. It is known that zinc can be enriched in bogs. Another geochemical anomaly, which runs from (700 N, 50 E) to (800 N, 100 W), may also be associated with small bogs and peats. The line 1100 N shows anomal zinc values from 50 W to 300 E. This anomaly is associated with old diggings.
Recommendation: This grid require probably several drill holes to detect the source for the geochemical anomaly. Therefore it is recommended to measure Apex max-min over the whole grid to decide exact drilling spots. Soil samplings should be carried out for the line 1200 N - 1500 N. The grid should also be extended in southern direction.
Detailed stratigraphical studies should be done in the whole grid and the nearby area.

C. 10 Bakkvollen.

Baseline: 400 S - 2000 N
Profile length: 500 W - 600 E
Follow up work 1983: 1 diamond drill hole

This grid is located within the lower part of the main volcanic group - the Hersjø formation - and includes good airborne EM and mag conductors.
The earlier found positive indications - albitization and a massive pyrite bed (10cm) at L-1000 N - are unfortunately not followed by high geochem.
An EM anomaly close east of baseline are drilltested at L-700 N, 25 W where soil samples came out good. The conductor was graphite.
Recommendation: If more work is to be done on this grid, a possible target is to drilltest the EM anomaly at 150 W - 200 W, from ONS to at least 700 N - with anomalous zinc and lead between ONS-400 N. THe possibility is that the zinc and lead are related to graphite-like the already drilltested anomaly at L-700 N.

D. Os area.

This area includes grids established this year and grids that are followed up from -82.
The work includes VLF, CEM, MAG, IP, soil sampling, geological mapping and diamond drilling.

D. 1. Storfloen
D. 2. Vangsåsen II
D. 3. Oskar
D. 4. Djupsjøen
D. 5. Nordervollen
D. 6. Nyås
D. 7. Grue

D. 1. Storfloen

Baseline: 0 - 900 E
Profile length: 300 S - 300 N
Follow up work 1983: VLF, CEM, MAG, Drilled.

This grid is sited in a big swamp. Both VLF, CEM and MAG shows one interesting anomaly running along B.L. from 400 E to 800 E. This anomaly was therefor drilltested at 700 E, 50 N, 45° S to a depth of 95,5m. The conductor was massive graphite argillites with up to 10% pyrrhotite as stringers and patches, and traces of pyrite from 65,10 to 80,50 m. High gold (900 ppb) are found at 73 - 74 m.

Recommendation: In addition to the known graphite, small CEM - anomalies are seen on each side at 800 E (125 N and 150 S respectively). The one on the northern side also cross the 700 E - profile. These two conductors should be followed up by Apex to give possible drillsites.

D. 2. Vangsåsen II.

Baseline: 100 S - 1000 N
Profile length: 300 W - 300 E
Follow up work 1983: CEM, MAG, Soil samples, Geology.

Several anomalies can be seen. The most extensive CEM conductor (weak)runs from 400 N - 800 N, 50 - 100W , and are overlapped by weak MAG. Another conductor between 700 and 900 N, 75 - 100 E with stronger MAG. One showing CEM and no MAG at ONS - 300 N, 25-50 W. A strong CEM - anomaly at 400 N, 275 W weakens at 500 N.

Recommendation: Because soil samples shows discouraging results it is suggested to give this area low priority. But gold is high at 500 N, 100 E and a few other values, combined with a weak CEM-anomaly, in case of further work Apex should be used here.

D. 3. Oskar.

Baseline: 4500 S - 1000 N
Profile length: 100 E - 500 W
Follow up work 1983: CEM, Soil samples, Geology.

The old Oscar mine (ONS-OEW) is covered with a grid to 1000 N, where only geological mapping is done - and extended south to 4500 S, with mapping between 1300 S and 1800 S, and 3500 S - 4500 S, covered by CEM and soil samples (+ soil samples 1300 S - 1500 S). The orezone is hosted by phyllite, close to gabbro and ultrab site. Geophysi s and geochem are planned north of the mine, while two favourable areas south of the mine are picked out from he airborne.
Recommendation: A CEM - anomaly around B.L., between 1300 S and 1500 S, lies in ultrabasite, and should therefor be followed by magnetometry and also soil sampling.
Soil sampling are run at 3500 S- 4500 S, with discouraging results. No further work is recommended in this part of the grid.

D. 4. Djupsjøen.

Baseline: ONS - 1400 N
Profile length: 300 W - 400 E
Follow up work 1983: CEM, MAG, Soil samples, Geology.

The anomaly cause on this grid is beleaved to be related to graphite with pyrrhotite stretching from 300 N, 25 W to 900 N, 125 W. This CEM conductor is overlapped by MAG, and the soil samples are discouraging. Geochem give good Pb- anomalies in the NW part of the grid, with a CEM- anomaly at 100 W , 1300 N - 1400 N.
Recommendation:
The cause for this anomaly should be checked by searching in the stream that cross the baseline, where more outcrop probably are found. All this streams should be examined before possible drilltesting are suggested.

D. 5. Nordervollen.

Baseline: ONS - 4000 N
Profile length: 500 W - 500 E
Follow up work 1983: CEM, VLF, MAG, Soil samples, Geological mapping, Ip-RP (1000 N - profile). 2 drill holes.

One interesting anomaly at 100 - 600 N, 75 - 100 E, shown by VLF, overlapped by CEM between 200 N and 400 N, and MAG at 200 N and 400 N, but not verifield by geochem - are drill tested at 425 N, 25 E. It showed to be graphite with pyrite and pyrrhotite.

A CEM conductor with high Cu and Zn in soil are drill tested at 2250 N, 75 E. Mineralized greenschist with up to 1200 ppm Cu and > 4000 ppm Zn in m-sections. Rock samples from a digging 1000 N, 125 E have 1,2 % Cu, but IP-survey showed no clear anomaly.
Recommendation: Following EM- anomalies are coinsident with geochem, and drilltesting are recommended (decreasing order): 2800 N-3000 N, 175 E - 125 E and 3500 N - 3600 N, 50 E - 75 E.

The grid should be extended to the west from 500 W at lines 1100 N to 1400 N because of encouraging geochem.

D. 6. Nyås.

Baseline: 0-300 N
Profile length: 300 W - 300 E
Follow up work 1983: CEM, Soil samples.

This grid is just started(4 profiles) and because of a disturbing powerline and a fence in east, CEM interpretation is difficult. But it looks like a CEM anomaly at 100 N- 50 E is caused by a conductor dipping to the W and possibly continue along the base line to 300 N (powerline?).This anomaly is followed by anomalous CU and Zn - which however can be contamination from the nearby mine "Gruvåsen" to the W.
Recommendation: CEM and soil sampling should be carried through, supplemented by VLF and Apex, and geological mapping.

D. 7. Grue.

Baseline: 300 W - 1700 E
Profile length: 400 N - 600 S
Follow up work 1983: CEM, MAG, VLF.

This grid is located within the Hersjø formation - the main volcanic group. Geophysics has isolated a continuous conductor, most probably graphite related, running the length of the grid at 100 - 200 N. The conductor is partly showing a weak MAG - anomaly, so pyrrhotite intermixed in the graphite is likely.
A second conductor are found at 1200 - 1500 E, 425 S by VLF (CEM not measured) and high MAG.

Recommendation: Beside geological investigation of the two conductors, soil samples should be taken over the two zones. This will of course be limited much because of the lake. If the geochem. is discouraging, drilling is not recommended.

E. Hausta area.

The follow up investigation in this area was started, because some good gold values were reportet after reanalyzing old stream sediments from N.G.U. (Norges geologiske undersøkelse). There have been no airborne geophysical survey over this area. Therefore the grids are established only from anomalous gold in the stream sediments. In spite of this, encouraging geophysical anomalies are obtained in the follow up grids.

Six small grids were layed out and were covered by soil samplings in the 1982 field season. Three of these gave gold anomalies worth further investigation. In the 1983 field season these grids were covered by geophysical measurements (Total field proton magnetometer and VLF field strength) and by geological mapping. Another big grid was established. (Hausta IV) where soil sampling, geophysical measurements and ~~geological mapping~~ was carried out.

All the grids of this area are situated in the - Sulåmo Group, and the gold from stream sediments was generally coincident with the ultramafic belt just north west of Alvdal, although gold in other areas(Bratthø, Tverrvola now given up) may also be closely associated with a major tectonic"break" between the Gula group and the underlying Hersjø formation. The magnetic total field shows generally just weak anomalies except at Hausta II. This means that the ultramafic bodies are not situated within the grid, and therefore the spatial relationship between gold anomalies and ultramafic rocks are weak.

Geochemical soil samplings from these grids shows interesting gold anomalies and extremely weak Cu-Zn and Pb values to be within a volcanic belt. One exception of this is Hausta IV, where very encouraging anomalies of all the elements Au,Cu,Zn,Pb are found and with good correlation to each other.

The overburdon of these grids are generally quite thick, which means that geological mapping are of limited values.

The four grids of this area which were followed up in 1983 are:

E. 1. Hausta I
E. 2 Hausta II
E. 3. Hausta III
E. 4. Hausta IV.

E. 1. Hausta I.

Baseline: 1400 W - OEW
Profile length: 700 N - 500 S
Follow up work 1983: MAG, VLF,
(field strength) geological mapping.

This grid shows quite interesting VLF and magnetic anomalies which coinsidents very well, but in some cases it is difficult to follow the anomaly from one profile to another. Both the VLF and the MAG gives relatively small anomalies, which could be caused by intermediate conductors (massive sulphides).
Since the overburdon is quite thick little information is received from geological mapping (which is not done north of 500 N). One outcrop of phyllite is found. It seems like the rocks of this grid is turning more east west than in the other nearby grids, which have a more North East, South West strike.
Unfortunately the grids from soil sampling in 1982 where not found and a new grid was established in 1983. The basis of the new grid differ by some 52g in direction from the old one. This makes the correlation between the geochemical and geophysical measurements difficult. The soil assaies showed very fine anomalous values, with gold values up to 250 ppb, copper up to 270 ppm, zink up to 400 ppm, lead up to 35 ppm and silver up to 2,5 ppm. These anomalous values gives two interesting dispersion patterns, one at each side of the stream.
The soil anomaly at the north side of the stream seems most interesting (400 W, 50 N to 400 W, 500 N old grid) When transferring the geochemical values from the old grid to the new, the best anomaly will be found app.at lines 400 W to 800 W north of the stream. In this area we have at least two very interesting geophysical anomalies. One of these which is just detected by VLF, runs from 1000 W, ONS to 400 W, 175 N.
The other one gives both VLF and MAG anomaly and runs from 1400 W, 275 N to 400 W, 700 N. Both these geophysical anomalies could cause the geochemical anomaly.
The soil anomalies at the south side of the stream is not so easy to interprete. Weak VLF anomalies are found in this area, but these are very hard to follow from one profile to another. One interesting aspect of this anomaly is that it could correspond to geochemical anomalies found at Hausta IV.

Recommendation: This grid seems interesting and a drilling program should be started. It is though difficult to decide any drilling spot without more investigations. The best, but expensive program would be to do new soil samplings in the new grid. Together with the results of these samples Apex max-min would probably locate drilling spot(s).
One less expensive way would be to measure Apex max-min over the best anomalies recieved so far, and by this decide drilling spot(s).

E. 2. Hausta II.

Baseline: 400 S - 1800 N
Profile length: 500 W - 500 E
Follow up work 1983: MAG, VLF (field strength) geological mapping.

THis grid is situated at the border between Røros formation of graphite schists, qtz biotite schists, greenstone, serpentinites, dunites& conglomerates and Hummelfjell formation of qtz mica schists quartzites, mafic tuffs and graphite schists. Magnetometric survey shows strong anomalies that most probably is related to the serpentinites or dunites of Røros formation. Geological mapping showed, although there is just a few outcrops , that there are ultramafic rocks in this grid. The outcrops of ultramafics are small, which can explain why no magnetic anomaly are received at these localities.
The geochemical survey from 1982 gave encouraging gold anomalies with values up to 430 ppb. All the other elements showed only background values. One interesting strong magnetic anomaly runs through the whole grid from 400 S, 350 W to 1800 N, 50 W.
At both sides of this anomaly we have VLF anomalies. One of these VLF anomalies coinsidents with graphite found at location (210-S, 140-W).
Over the line ONS to 400 N from 250 E to 400 W we have a continuous area with anomal gold values. The lines 200 S and 400 S is not covered with soil samplings.
Recommendation: This grid have so good gold values that it should be drilled, but with the to now received data, it is difficult to pick out any drilling spot. Since no other elements than gold shows anomal values we must expect to find gold as disseminated in rocks around the ultramafic body, not as a part of a massive sulphide deposite.It is though possible, but this seems less probably. The best way to detect disseminated depos ts by geophysic is to use IP. Therefore IP measurements should be carried out over the profiles 400 S to 400 N. Soil sampling should be carried out over the profiles 200 S and 400 S.
A trained geologist should also try to make a better geological map covering the profiles were IP measurements are done. The geologist could also do some rock sampling for gold analyses.

E. 3. Hausta III.

Baseline : ONS - 1400 N
Profile length: 500 W - 500 E
Follow up work 1983: MAG, VLF,
(field strengt) Geological mapping
(Geochemical soil sampling 1982).

This grid was followed up in 1983 because of encouraging gold anomalies from the 1982 soil sampling program. The soil assaies from 1982 show continues anomalies with gold values ranging from 5-92 ppb. All the other elements were low (Cu up to 63 ppm, Zn up to 64, Ag up to 1 ppm and Pb up to 14 ppm).
The geological mapping gave very little information, since the overburdon is quite thick. Just one outcrop of phyllite was discovered.
Recommendation: This grid should be given low priority this year. If encouraging results come out of the other grids more follow up work are proposed.

E. 4. Hausta IV.

Baseline: ONS - 3200 N
Profile length: 300 W - 500 E
Follow up work 1983: VLF (field strength), MAG and Geochemical soil sampling.

This grid is situated about 500 m south of the Hausta II grid and in the same stratigraphical possition. When going from north to south the strike turns more westly towards the Hausta I grid. Geological mapping is not yet done in this grid. The grid shows weak VLF anomalies that is hard to follow from one profile to another. The dip angle alone gives very little information, but along with the field strength some weak conductors can be interpreted. The MAG gives mostly weak anomalies, except from two stronger anomalies at line 600 N, 300 E and 475 E. These anomalies are not detected with the dip angle of VLF, but the field strength is slightly stronger than in the rest of the grid. These strong magnetic anomalies are most probably related to small ultramafic boddies. The geochemical soil assaies gives very interesting Cu-anomalies.

The results of the soil samples shows values up to:
Au 91 ppb, Cu 570 ppm, Zn 180 ppm and Pb 40 ppm.
The anomalies of all these elements, except forCu, is spread out over the whole grid.
The anomal Cu-values is restricted to smaller and very interesting anomalies. The best Cu-anomaly runs from 800 N, 50 W to 1200 N, 200 E with possible conection to the anomal values found near a stream running parallel to line 1800 N from 250 E and westwords. Because the VLF anomalies, that could explain these Cu-anomalies is very weak another geophysical methode should be tryed.
Recommendation: This grid should sooner or later be drilltested, but more follow up work must first be performed. Detailed geological mapping with special interest to the Cu-anomalies must first be carried out. IP,RP measurements of the lines 800 N, 1000 N, 1200 N and 1800 N are recommended to pick out a drilling spot. If no IP anomaly are received we could try if Apex max,min would clear out the mess of weak VLF anomalies near the encouraging Cu- anomaly.

F. Lesja.

The Lesja area is located on the western edge of the southern most tip of the Trondheim greenstone belt, and is similar in many respect, in rock type, to that found along the base on the eastern side of the geosyncline. A general succession of the rocks are as follows.

Stratagraphic Succession (Lesja gold area)

	Mafic and felsic volcanics, quartzitic gneiss (from keratophyre)	Bottheim Group	Andbergs høi Complex
	Feldspathic mica schists		
	Amphibolites and ultramafics		
	Augen gneiss, orthogneiss, dioritic gneiss, quartzites	Vestfjell Group	
Eocambrian	K-feldspar rich quartzites Sparagmites	Sparagmite	
Precambrian	Granitic gneiss, augen gneiss basic and aplitic dykes	Liafjell Group	

This area was originally ivestigated for gold potential derived from ultramafic rocks. Three possible rock sources were defined:

1) Amphibolites and ultramafic
2) Qtz veins in quartzitic gneisses
3) Aplite dykes of the Liafjell group.

In 1981 we started a regional program with stream sediments-geochemistry. Before this, in 1979/80, the area was covered by regional geological mapping. In 1982 there were established 11 grids for soil sampling. Several good soil anomalies were isolated and in 1983 7 of these anomalies were followed up by:

a) Geophysical measuring with protonmagnetometer and VLF in the grids.

b) Detailed geological mapping (M1:2500)

c) 602 soil samples assaied for Au, Cu, Zn

The Lesja grids are:

F. 1a. Storhorrungen I

F. 1b. Storhorrungen II

F. 1c. Storhorrungen III

F. 2a. Rjuphovda I

F. 2b. Rjuphovda II

F. 3. Reindølsnabben

F. 4. Kvitmyrin

F. 1. Storhorrungen.

The area is characterized by a majority of mica schists, quartz mica gneiss, ultramafics, with minor amphibolite and quartzite. The source here for gold is closely related to the ultramafics, amphibolites, and possibly quartz veining in the gneisses.
In 1982 it was established a big grid called Storhorrungen where 450 soil samples were collected. The anomalous gold ranged from 12 ppb to 210 ppb.
Last year this big grid was subdevided into 3 smaller grids (Storhorrungen I, II and III) focused on the best anomalies.

F. 1a. Storhorrungen I.

Baseline 300 W to 1200 E
Profile length: 500 S to 500 N
Follow up work 1983: Geochemestr
VLF (field strength) Protonmagnetometer
and geological mapping.

Geochemical sampling gave no anomalous gold values, although anomalous gold values up to 1700 ppb was found in soil samples from the same area in 1982. This great difference of the gold values means that there has been done some error (s) with the treatment of the samples. The Cu values ranges from 2 to 77 ppm and the Zn values ranges from 6 to 140 ppm which both is in the range of background values. One possible explanation for the low gold values of the 1983 prospection for this grid, is that the samples were collected from humus (AI horizon), where metals as copper and zink are known to be enriched in the same way as in the B horizon.
Good results from VLF was not expected, because the grid is crossed by power lines. It is possible though, to detect a weak conductor from (150 E, 475 S) to (150 W, 450 S). This conductor does not coinsident with any magnetometric anomaly. The measurements with protonmagnetometer gives one strong anomaly which is caused by the ultrabasic body in SW of the grid. In close relationship with this ultrabasic body there are found outcrops of amphibolite. This geological environment could be a good source for gold. Therefore the investigation should continue.

Recommendation: A few soil samples should be taken from the B horizon to find out if the soil samples from 1983 was not taken from this horizon. If so, new soil samples should be taken from the B horizon in 1984.

F. 1b. Storhorrungen II. Baseline: 450 W to 450 E
Profile length: 450 S to 550 N
Follow up work 1983: Geochemestry, VLF (field strength), Protonmagnetometer and geological mapping.

Geochemical sampling gave anomalous gold values ranging from 17 to 180 ppb. The copper values ranges from 3 to 66 ppm and the zinc values ranges from 10 to 64 ppm, which both are background values in this area. The VLF measurements detects a lot of interesting conducting zones. Some of these are positively graphite horizons because graphite schist is found on location (450 W - 300 S). The VLF anomalies are still interesting because there are found iron stainings in streams and in a couple of outcrops pyrite is located. The VLF anomalies is located south of the baseline in profile 450 W to profile 300 E. This area shows slightly anomalous magnetic values. Another interesting VLF anomaly is flanking the ultrabasic body in NW, and this also gives a strong magnetic anomaly.
Recommendation: This grid seems promising and further investigations should be done. Detailed geological mapping and rock sampling by a geologist shold be carried out with spessial interest on profile 150 E (500 S - BL) and profile 300 E (400 N - 550 N). If no essential new information is obtained in this way, diamond drilling on the weak VLF anomaly 150 E, 125 S to 300 E, 100 S which coinsidents with gold values up to 110 ppb in soil samples, should be done.

F. 1c. Storhorrungen. III. Baseline: OEW to 1200 E
Profile length: 400 S to 400 N
Follow up work 1983: Geochemestry, VLF (field strength), Protonmagnetometer and geological mapping.

Geochemical soil sampling gave low gold values (<10 ppb) except from two slightly higher values of 13 ppb and 40 ppb (0 EW, 250 N and 150 E, 200 N). The associated copper values range from a background of 10-40 ppm up to 80 ppm. The zinc values are ranging from 18 - 84 ppm. As in the grid Storhorrungen I the gold values from the 1983 samplings are much lower than the 1983 samplings of the same area. This means that there have been sampling error (s) in the last years investigation. (See Storhorrungen I).
The VLF measurements shows some interesting anomalies. These anomalies seems to flank the big ultrabasic body on both sides. The magnetic map outlines the ultrabasic body and shows some other small, but strong anomalies. These strong anomalies does not coinsident with the VLF anomalies and could therefore be caused by smaller utrabasic bodies. In spite of the low geochemical gold values of this years investigation, the grid have so good VLF anomalies, that the investigation should continue.
Recommendation: The gold values from the 1982 investigations were so encouraging (up to 210 ppb) that it, together with the VLF anomaly, makes it worthwile to diamond drill in this grid. This drilling can be done this year by checking one of the VLF anomalies or another soil sampling program could be carried out first. It would maybe also be possible to drill based on the 1982 geochemical results, if the old pickets are found.
Rock sampling and detailed geological mapping should be done first. Together with this work it would be possible to locate the samplepoints with anomalous gold values and check if these coinsidents with the VLF anomalies. In this way a better drilling spot can be picked out.

F. 2. Rjuphovda.

This area is dominated by gneiss, with closely associated amphibolites and aplite dykes. Gold concentrations from the 1982 prospectation seems related to biotite rich aplite dykes, and anomalous values range from 12 ppb to 320 ppb.
In 1983 this grid was devided into two separate smaller grids covering the best anomalies from 1982.

F. 2a. Rjuphovda I.

Baseline: ONS - 750 S
Profile length: 200 W - 400 E
Follow up work 1983: VLF,(field strength), Protonmagnetometer and Geological mapping.

The geology of this grid, which has a lot of outcrops, is dominated by gneisses. In one location amphibolite is found (450 S, 60 W) and in another phyllite is found (450 S, 280 E).
The geophysical measurements gave just weak anomalies. Small anomalies where obtained by protonmagnetometer, but these can not be used to pick out any drilling spot without considering the geochemical soil samples.
Recommendation: Since good gold anomalies were found with geochemical soil sampling in 1982 the area seems interesting,inspite of the discouraging geophysical results. Therefore the prospectation should continue this year with geochemical soil sampling.

F. 2b. Rjuphovda II.

Baseline: 750 W - OEW
Profile length: 200 S - 800 N
Follow up work 1983: MAG, VLF (field strength) soil sampling and Geological mapping.

This area is dominated by grey and redish gneiss and augen gneiss. Amphibolite is found in some locations. Pyrite, iron staining and quartzveins are all interesting observations.In the northern part of this grid very little outcrops are found and this could mean that the over barden is quite thick.

At the lines 750 W - 450 W geochemical soil sampling have been carried out from the baseline to 700 N. The gold values range from <2 - 50 ppb, copper from 0,5 - 96 ppm and zinc from 7 - 79 ppm. At least 3 separate VLF anomalies can be picket out. One of these running from 750 W. 450 N to 660 W, 425 N coinsidents with slightly anomalous magnetometric values.
This anomaly could cause the weak geochemical gold anomaly from 225 N to 325 N at line 750 W. The great distance between the geophysical and the geochemical anomaly could be explained by thick over bardon at line 750 W from about 200 N and further to the north.
Recommendation: This grid shows just weak gold anomalies and should consequently be given low priority. It would though be interesting to see if the VLF anomaly at line 600 W 225 N could be detected by other geophysical methods like Apex max,min or shootback. If so the anomaly could be diamond drilled. In contribution to this it would be interesting to see if geochemical soil sampling over the other weak VLF anomalies would give gold anomalies.

F. 3. Reinsdølsnabben.

Baseline: ONS - 750 N
Profile length: 500 E - 500 W
Follow up work: VLF (field strength) Protonmagnetometer and geological mapping.

The geological mapping in this grid gave very little contribution to the investigations, since just a few outcrops of gneiss were discovered. From the geological map sheet Dombås (1:50 000) the grid is situated on the (thrust) border between pink feldspatic quartzites and orthogneisses of the Snøhetta Complex.
Geochemical survey from 1982 gave anomalous gold values ranging from 12 ppb to 220 ppb which were basically restricted to the profiles 300 N to 750 N.
Both VLF (field strength) and protonmagnetometric measurments gave just very weak anomalies that is hard to interprete.

Recommendation: Diamond drilling in this grid would be quite expensive because of topografical problems getting the rig to the drilling spot. In contribution it would be a gambling to pick out a drilling spot, since the geophysical anomalies is very weak. No further investigation is recommended.

F. 4. Kvitmyrin.

Baseline: OEW - 1050 E
Profile length: 200 S - 500 N
Follow up work 1983: VLF (field strength) Protonmagnetometer and geological mapping.

The follow up performed in 1982 showed very discouraging results for this grid. One encouraging fact was a small amout of copper found in a quartz vein, which coincidented with a single gold soil anomaly. Therefore the investigations continued into 1983 with more geological mapping and geophysical measurements.25 rock samples were collected and assaied for Au, Cu, Zn and Pb. Non of these assaies were encouraging. Gold values ranged from <2 to 16 ppb, copper from 3,5 to 280 ppm, zinc from 2,0 to 110 ppm and lead from < 2 to 14 ppm.
The grid which has a lot of outcrops is dominated by light gneisses and minor amphibolites. In one location graphitic shist is found. In two locations iron staining are found, but non of these coinsident with any VLF anomaly. Some weak VLF anomalies which most probably is graphite related, can be picked out. The MAG shows quite strong anomalies, that differ in strike from the VLF anomalies. The magnetometric anomalies may be caused by small ultrabasic boddies that have no outcrops.
Recommendation: This grid should be given low priority in the 1984 field season. Detailed searching for mineralized quartzveins near the geochemical anomalies, together with 1- 10 new soil samples around these locatities, could given valuable information.

MAPS.

Includes all surveys performed on each grid for the 1983 field season. Surveys include VLF, CEM, MAG, Apex max,min, IP, RP, Geochemical sampling, and geological mapping.

1) Box I of 4
   Folldal area

2) Box II of 4
   Lesja / Hausta area

3) Box III of 4
   Tynset area

4) Box IV of 4
   Savalen / Os area

References:

1) Bugge, J. A. W. — Mineral Deposits of Europe, Vol. 1. Northwest Europe. Edited by S. H. Bowie, A. Walheim and H. W. Huslam. The Institute of Mining and Metallurgy.

2) Cuttle, J. — Folldal Project (N-81-1), 1982.

3) Guezon, J. C. — 1978. Geology and Structure of the Dombås - Lesja area, southern Trondheim region, south central Norway, Norges geol. Unders., 340, pp 1 - 34.

4) Hutchinson, R. W. — 1973. Volcanogenic Sulphide Deposits and their Metallogenic Significance. Econ. Geol. Vol. 68, 8. pp 1223-1246.

5) Nilsen, O. — 1978. Caledonian Sulphide Deposits and Minor Iron-Formations of the Southern Trondheim Region, Norway. Norges geol. Unders. 340, pp 35-85.

6) Skinner, B. J. (ed) — 1981. Economic Geology. Seventy - Fifth Anniversary Vol. (1905-1980). The Economic Geology Publishing Co., El Paso, Texas.

7) Vokes, F. M. — 1976. Caledonian massive sulphide deposits in Scandinavia: A comparative review. In Wolf, K. H. (ed.): Handbook of stratabound and stratiform ore deposits, Vol. 6. Elsevier, N. Y., pp 79 - 127.