AMAX EXPLORATION, INC.
A SUBSIDIARY OF AMAX INC.

GEOTHERMAL BRANCH

INTER-OFFICE MEMORANDUM

SUBJECT: Summary Hydrogeochemistry from McCoy Borehole 66-8 DATE: April 11, 1980

TO: W. M. Dolan, H. D. Pilkington, H. J. Olson, C. D. Tower, J. T. Gross

FROM: A. E. Shenker

Four water samples were collected and analyzed from the 66-8 wellbore at McCoy, Nevada (864). The drilling depths from which the samples were collected were 1630, 2050 (two samples), and 2410 feet (494, 620, and 730 meters). No temperature data was provided.

Geothermometry was performed on the analytical results and projected subsurface temperatures are reasonably consistent. Silica temperatures (quartz conducting) range from a low of 112°C at 2,410 feet (730 meters) to a high of 148°C at 1,630 feet (494 meters). The Na-K-Ca alkali thermometer yields subsurface temperature values ranging from 194°C at 2,050 feet (620 meters) to 205°C at 1,630 feet (494 meters). The Na-K geothermometer ranges from 214°C to 230°C.

The consistency of the data seems to indicate that although a number of distinct (?) water entries may have been encountered, all waters are similar in chemistry (bicarbonate). The entry at 1,630 feet (494 meters) appears to have a slightly greater component of "thermal water" than the other samples based on higher values of both silica and Na. The subsurface temperature data further suggest that the sampled waters are mixed. This hypothesis is based on the variation between silica and alkali geothermometers (generally differing by 60-80°C). Attempts at employing the "mixing model" failed because the chemical-temperature parameters in the samples under consideration fall out of bounds of the program (i.e., the curve generated does not cross the theoretical curve for silica vs. temperature).

Also of note are the moly values recorded from samples W13453-W13455 (moly for W13456 is not yet available). Moly was run both by colorimetry and atomic absorption and are real. Since contamination by moly grease is possible, assays of selected drill cuttings are suggested to confirm or refute these anomalous values.

Complete chemical analyses follows:

	W13453 1630'	W13454 2050'	W13455 2050'	W13456 2410'
pH	9.4	9.1	9.0	9.0
Cl	38.	31.	32.	31.
F	5.6	3.0	4.4	4.1
SO_4	100.	100.	87.	80.
HCO_3	144.	142.	154.	204.
CO_3	72.	24.	44.	20.
SiO_2	120.	75.	65.	62.
Na	160.	98.	110.	110.
K	21.	14.	14.	14.
Ca	6.6	9.6	8.	6.
Mg	2.6	16.	14.	18.
Li	0.7	0.4	0.4	0.5
TDS	670.	513.	454.	550.
T°C SiO_2	148.	121.	115.	112.
T°C Na/K	218.	230.	214.	214.
T°C Na/K/Ca	205.	197.	194.	197.
Cu	6.	2.	<2.	n.a.
Mo	710.	1400.	210.	n.a.

Allan E. Shenker

A. E. Shenker

AES/c

W13453 MCCOY 1630FT

CONCENTRATION UNITS = PPM

CONC. OF ' CA ' =	6.600	CONC. OF ' NA ' =	160.000
CONC. OF ' K ' =	21.000	CONC. OF 'SIO2' =	120.000

DENSITY = 1.00000 TOTAL DISSOLVED SOLIDS = 400.000

LOG(NA/K) + 1/3LOG(SQRT(CA)/NA) = 1.201E+00
LOG(NA/K) + 4/3LOG(SQRT(CA)/NA) = 1.467E+00

SUBSURFACE TEMPERATURE (DEG. C) FROM CHEMICAL DATA

QTZ TEMP. (CONDUCTIVE) =	147.6
QTZ TEMP. (ADIABATIC) =	141.5
AM. SILICA TEMP. =	26.3
CHALCEDONT TEMP. =	122.1
CRISTOBALITE TEMP. =	97.1
LOG(NA/K) TEMP. =	217.8
LOG(NA/K) + 1/3LOG(SQRT(CA)/NA) TEMP. =	205.5
LOG(NA/K) + 4/3LOG(SQRT(CA)/NA) TEMP. =	171.2

W13454 MCCOY 2050 FT

CONCENTRATION UNITS = PPM

CONC. OF ' CA ' =	9.600	CONC. OF ' NA ' =	98.000
CONC. OF ' K ' =	14.000	CONC. OF 'SIO2' =	75.000

DENSITY = 1.00000 TOTAL DISSOLVED SOLIDS = 350.000

LOG(NA/K) + 1/3LOG(SQRT(CA)/NA) = 1.262E+00
LOG(NA/K) + 4/3LOG(SQRT(CA)/NA) = 1.822E+00

SUBSURFACE TEMPERATURE (DEG. C) FROM CHEMICAL DATA

QTZ TEMP. (CONDUCTIVE) =	121.7
QTZ TEMP. (ADIABATIC) =	119.6
AM. SILICA TEMP. =	3.2
CHALCEDONT TEMP. =	93.5
CRISTOBALITE TEMP. =	71.1
LOG(NA/K) TEMP. =	229.5
LOG(NA/K) + 1/3LOG(SQRT(CA)/NA) TEMP. =	197.1
LOG(NA/K) + 4/3LOG(SQRT(CA)/NA) TEMP. =	132.3

BY JK DATE 6/30/78 SUBJECT Cu/Mo Samples — Analytical Lab Work

CHKD. BY ____ DATE ____

SHEET NO ____ OF ____

JOB NO. 864/860

Sample #	Project #	Hole	Depth (ft.)		Sample #	Project #	Hole	Depth (ft.)
A 64601	864	51	160		A 64619	860	9	160
A 64602	864	47	160		A 64620	860	11	320
A 64603	864	48	160					
A 64604	864	33	110					
A 64605	864	31	160					
A 64606	864	50	160					
A 64607	864	21	160					
A 64608	864	28	140					
A 64609	864	52	160					
A 64610	864	20	160					
A 64611	864	22	160					
A 64612	864	19	160					
A 64613	864	39	160					
A 64614	864	29	160					
A 64615	864	27	160					
A 64616	864	24	160					
A 64617	864	34	300					
A 64618	864	46	160					

TYPE OF SAMPLE
W=Water, S=Soil
SS=Stream Sediment
V=Vegetation
R=Rock
DR=Dump Rock
DF=Dump Fines
CR=Core
CM=Composite
P=Pulp

ABBREVIATIONS
Alk=K_2O, Na_2O, CaO
T.E=Trace Elements (Standard elements unless defined otherwise.)
t=Total; tMo, tS ox=Oxide
s=Sulfide; as sNi
ns=Non-Sulfide; as nsCu
5=Cu, Mo, Pb, Zn, Ag
10=5 + Co, Ni, Fe, Mn, Cd
Org=Organic Extraction Cu Zn

PH

Nº 5099

REQUISITION FOR ANALYTICAL WORK

(REFER TO REQUISITION NO. IN ALL CORRESPONDENCE)

TO: (LAB AND ADDRESS) P.O. Box C, 12620 W. Cedar Drive
Denver, Colo. 80226

A TOTAL OF 1 (No of Boxes or Sacks) HAS BEEN SHIPPED VIA Trailways (Carrier) ON 7/3/78 (Date)

WAYBILL No. _____ AMAX PROJECT No. See below

Project #

SAMPLE NUMBERS		No.	Type	ASSAYS (%) tMo	MoS_2	Cu	nsCu				GEOCHEMICAL (ppm) Mo	Cu	W	Ni	pH			OTHER Alk	T.E.	5	10	Org	
864 A 64601	to 64618										X	X										
860 A 64619	to 64620										X	X										
_____	to _____																					
_____	to _____																					
_____	to _____																					
_____	to _____																					
TOTAL SAMPLES																						

REJECTS: Save ☐ Discard ☐ (RETURN ALL PULPS TO D. Pilkington OFFICE)

SAMPLES MISSING _____

SPECIAL INSTRUCTIONS OR REMARKS _____

SEND COPIES OF RESULTS TO:

1. Dean Pilkington
2. W. Codder
3. _____
4. AMAX EXPLORATION INC., P.O. BOX C, BELMAR STATION, DENVER, COLORADO 80226 (2 Copies)

Original — Lab. via Mail
Pink cc — Lab. with sample
Yellow cc — Denver office
White cc — Retain by sender

REQUESTED BY Dean Pilkington

DATE 7/1/78

LAB AMAX - DENVER

ANALYTICAL REPORT

DATE 7/18/78 REQ. NO. 5099 JOB NO. _____

ANALYST SAL PROJECT 864(64601-618); 860(64619-620)

TYPE SAMPLES R REQUESTED BY DEAN PILKINGTON

	SAMPLE	Mo PPM	Cu PPM					SAMPLE					
01	A64601	<1	2				31						
02	602	<1	4				32						
03	603	1	4				33						
04	604	1	8				34						
05	605	<1	2				35						
06	606	<1	3				36						
07	607	1	2				37						
08	608	<1	16				38						
09	609	2	2				39						
10	610	<1	4				40						
11	A64611	<1	3				41						
12	612	1	4				42						
13	613	<1	4				43						
14	614	2	4				44						
15	615	<1	5				45						
16	616	1	6				46						
17	617	<1	3				47						
18	618	<1	2				48						
19	619	<1	12				49						
20	620	<1	14				50						
21							51						
22	G-25	13	400				52						
23	G-28	35	150				53						
24							54						
25							55						
26							56						
27							57						
28							58						
29							59						
30							60						

METHODS: Digestion- $HClO_4 : HNO_3$ Sample Weight- 1.5g

Determination- Cu - AA

Mo: <15PPM - COLORIMETRIC

REMARKS: Mo: >15PPM - AA

NOTE: Mail Original to
AMAX Exploration, Inc.,
P. O. Box C
Denver, Colorado 80226

Copies to:
1. DEAN PILKINGTON At _____
2. W. LODDER At _____
3. _____ At _____