

GEOHERMAL BRANCH

October 7, 1981

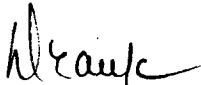
Mr. J. B. Cotter, Director
Energy Application Division
Department of Energy
Nevada Operations Office
P. O. Box 14100
Las Vegas, Nevada 89114

Dear Mr. Cotter:

I have revised the final draft of the report entitled "Tuscarora Area, Nevada-Geothermal Reservoir Assessment Case History - Northern Basin and Range" as requested in your letter of September 9, 1981. Forwarded herewith are the five copies of said report, one reproducible master copy and the signed form DOE-426.

Sincerely,

AMAX EXPLORATION, INC.



H. D. Pilkington
Chief Geologist, Geothermal Branch

HDP/c

Encl: 5 copies final report
1 reproducible master copy
1 signed DOE-426

cc: J. N. Fiore DOE/copy of report
Dennis Nielson URI/copy of report
H. J. Olson/ copy of report

August 20, 1981

Dr. Dennis Nielson
Earth Science Laboratory
University of Utah Research Institute
420 Chipeta Way, Ste. 120
Salt Lake City, Utah 84108

Re: Tuscarora Area

Geothermal-Reservoir Assessment Case History
Northern Basin and Range DE-AC08-79ET27011
Final Report

Dear Dennis:

Pursuant to the provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011, I am enclosing as the 1980 final report, three copies of the following:

1. Tuscarora Area, Nevada, Geothermal Reservoir Assessment Case History Northern Basin and Range, Final Report, 10/1/78-9/9/80 dated August 1981 by H. D. Pilkington.

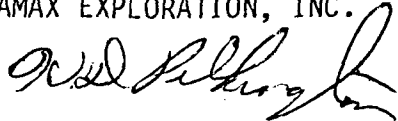
Please acknowledge receipt of the above data by returning a signed copy of this letter.

Dr. Dennis Nielson
August 20, 1981
Page 2

Thank you.

Sincerely,

AMAX EXPLORATION, INC.



H. D. Pilkington
Chief Geologist,
Geothermal Branch

HDP/c

attachment

cc: J.D. Fiore
A. W. Wells
H. J. Olson

Receipt of data acknowledged by



Date

8/24/81

AMAX EXPLORATION, INC.
 GEOTHERMAL BRANCH
 Information Transmittal Form

To: Earth Science Laboratory - UURI 391 Chipeta Way, Salt Lake City, Utah 84108
 Company Address

Attention: Dr. H. P. Ross _____
 Name Title

Authority: Contract _____
 Date of Contract Sections

Enclosed Items: Maps Logs Reports Analyses Plans Schedules AFE

Item	Description	Copy			Date
		Field	Draft	Final	
Tuscarora - 2prints	each and 1 sepiia each for:				
	F, NH ₃ , Hg, Sb, As				
	(Soil Geochemistry)				

Sent by: *W.D. [Signature]* _____ *Jan 12, 1981* _____
 Name Date

Receipt acknowledged by: *Don L. Nitch* _____ *3/10/81* _____
 Name Date

AMAX EXPLORATION, INC.
 GEOTHERMAL BRANCH
 Information Transmittal Form

To: Earth Science Laboratory - UURI 391 Chipeta Way - Salt Lake City, Utah
 Company Address

Attention: Dr. H. P. Ross
 Name Title

Authority: Contract
 Date of Contract Sections

Enclosed Items: Maps Logs Reports Analyses Plans Schedules AFE

Item	Description	Copy			Date
		Field	Draft	Final	
McCoy - MT	2 each prints, 1 each sepia				
Tuscarora - MT	2 each prints, 1 each sepia				

Sent by: *W.D. Beatty* *Jan 12 1981*
 Name Date

Receipt acknowledged by: *Dan L. Nitch* *3/11/81*
 Name Date

November 11, 1980

Mr. Bruce Sibot
Earth Science Laboratory
University of Utah Research Institute
420 Chipeta Way, Suite 120
Salt Lake City, Utah 84108

Dear Bruce:

Enclosed are cutting samples and lith logs from the following holes:
860-32, 860-36 and 860-43. This concludes all samples being sent
at this time. Please mail your results to Dean Pilkington and
John Deymonaz at AMAX Exploration, Inc. at the address below.

Thank you.

Sincerely,



Bill Huntsman

BH/c

Enclosures

GEOHERMAL BRANCH

November 4, 1980

Mr. Bruce Sibot
Earth Science Laboratory
University of Utah Research Institute
420 Chipeta Way, Suite 120
Salt Lake City, Utah 84108

Dear Bruce:

Enclosed are cutting samples and lith logs from hole 860-34. I will be sending more samples to you next week. Please mail your results to Dean Pilkington and John Deymonaz at AMAX Exploration, Inc., Geothermal Branch, 7100 W. 44th. Avenue, Wheat Ridge, Colorado 80033.

Sincerely,



Bill Huntsman

BH/c

Enclosure

UNIVERSITY OF UTAH RESEARCH INSTITUTE

UURI

EARTH SCIENCE LABORATORY
420 CHIPETA WAY, SUITE 120
SALT LAKE CITY, UTAH 84108
TELEPHONE 801-581-5283

December 12, 1980

Mr. R.J. Andrews
Area Manager, Logs
Rocky Mountain Well Log Services
P. O. Box 3150
Denver, CO 80201

Dear Mr. Andrews:

I am transmitting under separate cover geophysical logs for one well drilled under the cooperative DOE/DGE Industry Coupled (geothermal) Program. The hole is Well #66-5, Tuscarora area, Elko County Nevada. The location is: NW- $\frac{1}{4}$, SE- $\frac{1}{4}$, Sec. 5, T41N, R52E. These data may be announced and distributed to the public on December 29 or later. If you have any questions concerning the logs, please feel free to call me.

Sincerely,



Howard P. Ross
Project Manager

HR: jr
✓ cc D.L. Nielson

Logs Transmitted

Tuscarora #66-5, Elko County, Nevada: Sec. 5, T41N, R5E

Gearhart-Owen

Temperature log, 3800--5237 feet, 4-15-80
Spinner survey, 2500--5237 feet, 4-15-80
X-Y caliper, 2200--5237 feet, 4-15-80
Time vs Temperature, 4106 feet, 3-27-80
Temperature log, 2227-5187 feet, 4-28-80
Differential temperature log, 20-4111 feet, 3-27-80
Dual Induction Laterlog, 2227--5186 feet, 4-27-80

Baroid

Geothermal Log, 86-5456 feet

Schlumberger

Caliper log, 71-2226 feet, 3-1-80
Bore hole compensated sonic log, 61-2218 feet, 3-1-80
Bore hole compensated sonic log, 2227-5187 feet, 4-27-80
Temperature log, 52-2228 feet, 3-1-80
Dual Induction-SFL, w. linear correlation log, 76-2223 feet, 3-1-80

GEOTHERMAL BRANCH

November 26, 1980

Dr. H.P. Ross
Earth Science Laboratory
University of Utah Research Institute
391 Chipeta Way
Salt Lake City, Utah 84108

Re: Tuscarora Area

Geothermal Reservoir Assessment Case Study
Northern Basin & Range DE-AC08-79ET27011

Delivery of Thermal Data

Dear Howard:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables) I am enclosing a complete set of rock chip samples from the following Tuscarora deep gradient wells:

860-33	0 to 1000ft
860-41	0 to 1000ft
860-42	0 to 1740ft

Please acknowledge receipt of the above data by returning a signed copy of this letter.

Best regards,

Sincerely,

AMAX EXPLORATION, INC.

Harry

Harry J. Olson
Managing Geologist
Geothermal Exploration

Receipt of the data acknowledged by

Howard P. Ross

Date December 4, 1980

cc: J.D. Fiore
A.W. Wells

September 5, 1980

Contracting Officer
Engineering & Energy Applications Division
Department of Energy
Nevada Operations Office
P. O. Box 14100
Las Vegas, Nevada 89114

Attn: Joseph D. Fiore

Re: Tuscarora Area

Geothermal Reservoir Assessment Case Study
Northern Basin and Range DE-AC08-79ET27011

Delivery of MT Data

Dear Joe:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing one copy of the following report:

Magnetotelluric Survey
Tuscarora Prospect Nevada
July 1980
by: Terraphysics

There are no sepias for the plates in the back packet. Reproductions can be made by a xerox or other copier.

Please acknowledge receipt of the above data by returning a signed copy of this letter.

Best regards,

Sincerely,
AMAX EXPLORATION, INC.

Harry

Harry J. Olson
Managing Geologist
Geothermal Exploration

Receipt of the data acknowledged by Howard P. Ross

Date Sept. 10, 1980

cc: H. P. Ross ✓
A. W. Wells

dm

October 3, 1980

Dr. H. P. Ross
Earth Science Laboratory
University of Utah Research Institute
391 Chipeta Way
Salt Lake City, Utah 84108

Re: Tuscarora Area

Geothermal Reservoir Assessment Case Study
Northern Basin and Range DE-AC08-79ET27011

Delivery of Drilling Summary: Well #66-5

Dear Howard:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables) I am enclosing three each copies of the drilling summary, including the drilling history of the Tuscarora production test well #66-5.

Please acknowledge receipt of the above data by returning a signed copy of this letter.

Best regards,

Sincerely,

AMAX EXPLORATION, INC.



Harry J. Olson
Managing Geologist
Geothermal Exploration

Receipt of the data acknowledged by Howard P. Ross

Date Oct 9, 1980

cc: J. D. Fiore
A. W. Wells

dm

June 17, 1980

Dr. H. P. Ross
Earth Science Laboratory
University of Utah Research Institute
391 Chipeta Way
Salt Lake City, Utah 84108

Re: Geothermal Reservoir Assessment Case Study
Northern Basin and Range (Tuscarora Area)
DE-AC08-79ET27011

Dear Howard:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing three copies (two blue line and one sepia) of the geochemical soil maps. Included are:

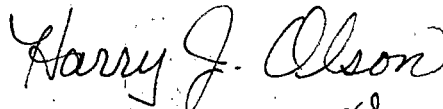
NH₃, Si, F, B, Hg, Sb, As, Bi, Cl, Mn, Ag

Ni, Pb, Fe, Cu, Mo, Zn

Best regards,

Sincerely,

AMAX EXPLORATION, INC.



Harry J. Olson
Managing Geologist
Geothermal Exploration

cc: J. D. Fiore
A. W. Wells

dm

September 5, 1980

Dr. H. P. Ross
Earth Science Laboratory
University of Utah Research Institute
391 Chipeta Way
Salt Lake City, Utah 84108

Re: Tuscarora Area
Geothermal Reservoir Assessment Case Study
Northern Basin and Range DE-AC08-79ET27011
Delivery of MT Data

Dear Howard:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing three copies of the following data:

Magnetotelluric Survey
Tuscarora Prospect Nevada
July 1980
by: Terraphysics

There are no sepias for the plates in the back packet. Reproductions can be made by a xerox or other copier.

Please acknowledge receipt of the above data by returning a signed copy of this letter.

Best regards,

Sincerely,
AMAX EXPLORATION, INC.

Harry

Harry J. Olson
Managing Geologist
Geothermal Exploration

Receipt of the data acknowledged by Howard P. Ross
Date Sept 10, 1980

cc: J. D. Fiore

A. W. Wells

dm

August 27, 1980

Dr. H. P. Ross
Earth Science Laboratory
University of Utah Research Institute
391 Chipeta Way
Salt Lake City, Utah 84108

Re: Tuscarora Area

Geothermal Reservoir Assessment Case Study
Northern Basin and Range DE-AC08-79ET27011

Data Delivery - Well 66-5

Dear Howard:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing three copies of the following data:

Lithologic Log
Tuscarora
Well 66-5

Please acknowledge receipt of the above data by returning a signed copy of this letter.

Best regards,

Sincerely,

AMAX EXPLORATION, INC.



Harry J. Olson
Managing Geologist
Geothermal Exploration

Receipt of the data acknowledged by
Date September 3, 1980



cc: J. D. Fiore
A. W. Wells

dm

August 27, 1980

GEOTHERMAL BRANCH

Contracting Officer
Engineering & Energy Applications Division
Department of Energy
Nevada Operations Office
P. O. Box 14100
Las Vegas, Nevada 89114

Attn: Joseph D. Fiore

Re: Tuscarora Area

Geothermal Reservoir Assessment Case Study
Northern Basin and Range DE-AC08-79ET27011

Data Delivery - Well 66-5

Dear Joe:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing one copy of the following data:

Lithologic Log
Tuscarora
Well 66-5

Please acknowledge receipt of the above data by returning a signed copy of this letter.

Best regards,

Sincerely,

AMAX EXPLORATION, INC.

Harry
Harry J. Olson
Managing Geologist
Geothermal Exploration

Receipt of the data acknowledged by *H.P. Ross*

Date *Sept. 3, 1980*

cc: H. P. Ross ✓
A. W. Wells

dm

TUSCARORA

GEOHERMAL BRANCH

August 7, 1980

Dr. H. P. Ross
Earth Science Laboratory
University of Utah Research Institute
391 Chipeta Way
Salt Lake City, Utah 84108

Re: Tuscarora Area
Geothermal Reservoir Assessment Case Study
Northern Basin and Range DE-AC08-79ET27011
Delivery of Thermal Data

Dear Howard:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables) I am enclosing three each copies of the following computer runouts:

Geothermal Log
Well 66-5
June 2, 1980

Gradient Plot
Well 66-5
June 2, 1980

Please acknowledge receipt of the above data by returning a signed copy of this letter.

Best regards;

Sincerely,
AMAX EXPLORATION, INC.



Harry J. Olson
Managing Geologist
Geothermal Exploration

Receipt of the data acknowledged by Howard P. Ross

Date August 11, 1980

cc: J. D. Fiore
A. W. Wells

October 3, 1980

Contracting Officer
Engineering & Energy Applications Division
Department of Energy
Nevada Operations Office
P. O. Box 14100
Las Vegas, Nevada 89114

Attn: Joseph D. Fiore

Re: Tuscarora Area

Geothermal Reservoir Assessment Case Study
Northern Basin and Range DE-AC08-79ET27011

Delivery of Drilling Summary: Well #66-5.

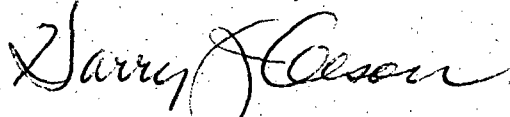
Dear Joe:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing one each copy of the drilling summary, including the drilling history of the Tuscarora production test well #66-5.

Please acknowledge receipt of the above data by returning a signed copy of this letter.

Sincerely,

AMAX EXPLORATION, INC.



Harry J. Olson
Managing Geologist
Geothermal Exploration

Receipt of the data acknowledged by Howard P. Ross

Date Oct 3, 1980

cc: H. P. Ross ✓
A. W. Wells

dm

July 15, 1980

GEOHERMAL BRANCH

Contracting Officer
Engineering & Energy Applications Division
Department of Energy
Nevada Operations Office
P. O. Box 14100
Las Vegas, Nevada 89114

Attn: Joseph D. Fiore

Re: Tuscarora Area
Geothermal Reservoir Assessment Case Study
Northern Basin and Range DE-AC08-79ET27011
Delivery of Flow Test Report - Well 66-5

Dear Joe:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing one copy of the following report:

Enthalpy Inc., July 1980
Report on Flow Tests
Tuscarora 66-5
22nd April, 1980

Please acknowledge receipt of the above data by returning a signed copy of this letter.

Best regards,

Sincerely,
AMAX EXPLORATION, INC.



Harry J. Olson
Managing Geologist
Geothermal Exploration

Receipt of the data acknowledged by H. P. Ross

Date July 18, 1980

cc: H. P. Ross, A. W. Wells

June 24, 1980

Dr. H. P. Ross
Earth Science Laboratory
University of Utah Research Institute
391 Chipeta Way
Salt Lake City, Utah 84108

Re: Geothermal Reservoir Assessment Case Study
Northern Basin and Range (Tuscarora Area)
DE-AC08-79ET27011

Dear Howard:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing three each copies of the following report:

Sperry-Sun, Inc.
Directional Survey Report
April 27, 1980

Tuscarora Project
Elko County, Nevada

Best regards,

Sincerely,

AMAX EXPLORATION, INC.

Harry J. Olson
Harry J. Olson
Managing Geologist
Geothermal Exploration

cc: J. D. Fiore
A. W. Wells

dm

June 24, 1980

GEOTHERMAL BRANCH

Contracting Officer
Engineering & Energy Applications Division
Department of Energy
Nevada Operations Office
P. O. Box 14100
Las Vegas, Nevada 89114

Attn: Joseph D. Fiore

Re: Geothermal Reservoir Assessment Case Study
Northern Basin and Range (Tuscarora Area)
DE-AC08-79ET27011

Dear Joe:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing one each copy of the following report:

Sperry-Sun, Inc.
Directional Survey Report
April 27, 1980
Tuscarora Project
Elko County, Nevada

Best regards,

Sincerely,

AMAX EXPLORATION, INC.

Harry J. Olson

Harry J. Olson
Managing Geologist
Geothermal Exploration

cc: H. P. Ross ✓
A. W. Wells

dm

May 16, 1980

GEOTHERMAL BRANCH

Contracting Officer
Engineering & Energy Applications Division
Department of Energy
Nevada Operations Office
P. O. Box 14100
Las Vegas, Nevada 89114

Attn: Joseph D. Fiore

Re: Geothermal Reservoir Assessment Case Study
Northern Basin and Range (Tuscarora Area)
DE-AC08-79ET27011

Dear Joe:

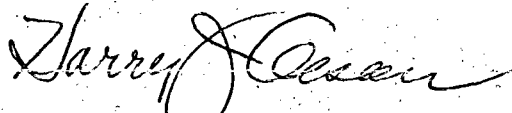
Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing one each copy of the following data:

GO Wireline Service Logs for well #66-5

4-15-80	Temperature Log	3800-5237 feet
4-15-80	X-Y Caliper	2232-5237 feet
4-15-80	Spinner Survey	2500-5237 feet

Sincerely,

AMAX EXPLORATION, INC.



Harry J. Olson
Managing Geologist
Geothermal Exploration

cc: W. M. Dolan
G. J. Kitchen
H. P. Ross ✓
A. W. Wells

dm

July 15, 1980

GEOTHERMAL BRANCH

Dr. H. P. Ross
Earth Science Laboratory
University of Utah Research Institute
391 Chipeta Way
Salt Lake City, Utah 84108

Re: Tuscarora Area
Geothermal Reservoir Assessment Case Study
Northern Basin and Range DE-AC08-79ET27011
Delivery of Flow Test Report - Well 66-5

Dear Howard:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing three copies of the following data:

Enthalpy Inc., July 1980
Report on Flow Tests
Tuscarora 66-5
22nd April 1980

Please acknowledge receipt of the above data by returning a signed copy of this letter.

Best regards,

Sincerely,
AMAX EXPLORATION, INC.



Harry J. Olson
Managing Geologist
Geothermal Exploration

Receipt of the data acknowledged by Howard P. Ross

Date July 18, 1980

cc: J. D. Fiore
A. W. Wells

dm



EXPLORATION, INC.

A SUBSIDIARY OF AMAX INC.

4704 HARLAN STREET • DENVER, COLORADO 80212 • (303) 433-6151

July 19, 1979

Contracting Officer
 Engineering & Energy Applications Division
 Department of Energy
 Nevada Operations Office
 P. O. Box 14100
 Las Vegas, Nevada 89114

Attn: Joseph D. Fiore

Re: Geothermal Reservoir Assessment
 Case Study - Northern Basin
 and Range (Tuscarora Area)
 DE-AC08-79ET27011

Dear Joe:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing one each black line print of the following data:

Geometrics - Aeromagnetic Survey, Tuscarora, Nevada

- 1 - Flight Recovery Path, 1/62,500 scale
- 2 - Residual Magnetic Intensity, 1/62,500 scale
- 3 - Residual Magnetic Intensity, 1/62,500 scale
(Base Overlay)
- 4 - Residual Magnetic Intensity Profiles, 1/62,500 scale
(25 Lines)

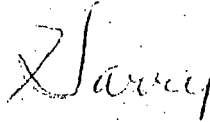
Line 0-0	8-0	16-0
1-0	9-0	17-0
2-0	10-0	18-0
3-0	11-0	19-0
4-0	12-0	20-0
5-0	13-0	21-0
6-0	14-0	
7-0	15-0	

Line 1001 - 0
1002 - 0
1003 - 1

Best regards,

Sincerely,

AMAX EXPLORATION, INC.



Harry J. Olson
Managing Geologist
Geothermal Exploration

dm

Encl. (3)

cc: W. M. Dolan
G. J. Kitchen
M. W. Sherbring
H. P. Ross - UURI ✓

July 9, 1980

Dr. H. P. Ross
Earth Science Laboratory
University of Utah Research Institute
391 Chipeta Way
Salt Lake City, Utha 84108

Re: Tuscarora Area

Geothermal Reservoir Assessment Case Study
Northern Basin and Range DE-AC08-79ET27011

Dear Howard:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am sending under separate cover three copies (two black line and one sepia print of the maps and IBM prints of the remainder) of the following data:

Tuscarora, Nevada, Thermal Wells 1/62,500 scale maps

- ✓ Thermal Wells (Location) 2-21-79, revised 12-79
- ✓ Heat Flow 12-79
- ✓ Gradient °C/kw 12-79
- ✓ Depth to 200°C Isotherm 12-79
- ✓ Temperature at 100m 12-79
- ✓ Temperature at 1000m 12-79
- ✓ Temperature at 2000m 12-79

Shallow Gradient Wells

860-3	860-18	860-29
-4	-19	-30
-7	-20	-31
-8	-21	-35
-13	-23	-36
-14	-25	-37
-15	-26	-38
-16	-27	-39
-17	-28	-40

Data includes:

Computer plot of temperature profile
Computer representation of temperature and depth data
Lithologic Description of Gradient Wells

Deep Gradient Wells

860-32	860-41
-33	-42
-34	-43

Data includes:

Computer plot of temperature profile
Computer representation of temperature and depth data
Lithologic Description of Gradient wells

Sorry about the delay in delivering this data.

Best regards,

Sincerely,

AMAX EXPLORATION, INC.



Harry J. Olson
Managing Geologist
Geothermal Exploration

cc: J. D. Fiore
A. W. Wells

dm

Receipt of the data acknowledged by Howard P. Ross

Date July 11, 1980

July 7, 1980

GEOTHERMAL BRANCH

Dr. H. P. Ross
Earth Science Laboratory
University of Utah Research Institute
391 Chipeta Way
Salt Lake City, Utah 84108

TUSCARORA

Re: Tuscarora Area

Geothermal Reservoir Assessment Case Study
Northern Basin and Range DE-AC08-79ET27011

Dear Howard:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing one sepa each of the following data:

Microgeophysics Corporation

July 30, 1979

Tuscarora, Nevada

Self Potential:

- ✓Plate 1 - Contoured Unfiltered Data
- ✓Plate 2 - Profiled Unfiltered Data
- ✓Plate 3 - Contoured Filtered Data
- ✓Plate 4 - Profiled Filtered Data

Microgeophysics Corporation

January 1, 1980

Tuscarora, Nevada

Gravity Survey:

- Plate 1 - Terrain Corrected Bouguer Anomaly
CI=5mgals
- Plate 2 - Terrain Corrected Bouguer Anomaly
CI=2.5mgals

Dr. H. P. Ross
UURI
July 7, 1980
Page 2

Microgeophysics Corporation
September 22, 1978
Tuscarora, Nevada
Seismicity:

Plate 4.1 - Hypocenters
Plate 4.2 - Cross Sections
Plate 4.3 - Strain Release
Plate 4.4 - Poisson's Ratio (shallow 5km)
Plate 4.5 - Poisson's Ratio (deep 5km)
Plate 5.1 - P-Wave Delay Raw Data
Plate 5.2 - P-Wave Delay Altitude Correction
Plate 5.3 - P-Wave Delay Depth to Interface
Plate 5.4 - Relative Signal Strength in db,
Relative to Average Signal Strength

Only the sepia plates are being sent. The reports were transmitted to the DOE previously.

Please acknowledge receipt of the above data by returning a signed copy of this letter.

Best regards,

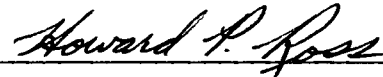
Sincerely,

AMAX EXPLORATION, INC.



Harry J. Olson
Managing Geologist
Geothermal Exploration

Receipt of the data acknowledged by



Date July 15, 1980

cc: J. D. Fiore
A. W. Wells

*Self-potential survey data received July 9, 1980
with McCoy deliverables.*

dm

*Gravity and Seismicity Plates received July 15, 1980.
H. P. Ross*

GEOTHERMAL BRANCH

July 9, 1980

Dr. H. P. Ross
Earth Science Laboratory
University of Utah Research Institute
391 Chipeta Way
Salt Lake City, Utah 84108

Re: Geothermal Reservoir Assessment Case Study
Northern Basin and Range (Tuscarora Area)
DE-AC08-79ET27011

Dear Howard:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing three copies of the field notes for the thermal logging of well 66-5 to a depth of 340 meters on April 25, 1980. Final copies will be sent as soon as the data have been computer plotted.

Best regards.

Sincerely,

AMAX EXPLORATION, INC.

Harry

Harry J. Olson
Managing Geologist,
Geothermal Exploration

cc: J. D. Fiore
A. W. Wells

HJO/c

Receipt of the data acknowledged by

Howard P. Ross

Date

July 15, 1980

GEOHERMAL BRANCH

July 9, 1980

Dr. H. P. Ross
 Earth Science Laboratory
 University of Utah Research Institute
 391 Chipeta Way
 Salt Lake City, Utha 84108

Re: Tuscarora Area

Geothermal Reservoir Assessment Case Study
 Northern Basin and Range DE-AC08-79ET27011

Dear Howard:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am sending under separate cover three copies (two black line and one sepia print of the maps and IBM prints of the remainder) of the following data:

Tuscarora, Nevada, Thermal Wells 1/62,500 scale maps

- Thermal Wells (Location) 2-21-79, revised 12-79
- Heat Flow 12-79
- Gradient °C/km 12-79
- Depth to 200°C Isotherm 12-79
- Temperature at 100m 12-79
- Temperature at 1000m 12-79
- Temperature at 2000m 12-79

1 map

*Old
 860-1
 2
 5
 9
 10
 11
 16*

Shallow Gradient Wells

860-3	860-18	860-29
-4'	-19'	-30'
-7'	-20'	-31'
-8'	-21'	-35'
-13'	-23'	-36'
-14'	-25'	-37'
-15'	-26'	-38'
-16'	-27'	-39'
-17'	-28'	-40'

27

Data includes:

- Computer plot of temperature profile
- Computer representation of temperature and depth data
- Lithologic Description of Gradient Wells

Deep Gradient Wells

860-32 ✓
-33 ✓
-34 ✓

860-41 ✓
-42 ✓
-43 ✓

Data includes:

Computer plot of temperature profile
Computer representation of temperature and depth data
Lithologic Description of Gradient wells

Sorry about the delay in delivering this data.

Best regards,

Sincerely,

AMAX EXPLORATION, INC.



Harry J. Olson
Managing Geologist
Geothermal Exploration

cc: J. D. Fiore
A. W. Wells

dm

Receipt of the data acknowledged by _____

Date _____

July 9, 1980

Contracting Officer
Engineering & Energy Applications Division
Department of Energy
Nevada Operations Office
P. O. Box 14100
Las Vegas, Nevada 89114

Attn: Joseph D. Fiore

Re: Tuscarora Area
Geothermal Reservoir Assessment Case Study
Northern Basin and Range DE-AC08-79ET27011

Dear Joe:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am sending under separate cover one each black line print (or IBM copy) of the following thermal data:

Tuscarora, Nevada, Thermal Wells 1/62,500 scale maps

Thermal Wells (Location) 2-21-79, revised 12-79
Heat Flow 12-79
Gradient °C/kw 12-79
Depth to 200°C Isotherm 12-79
Temperature at 100m 12-79
Temperature at 1000m 12-79
Temperature at 2000m 12-79

Shallow Gradient Wells

860-3	860-18	860-29
-4	-19	-30
-7	-20	-31
-8	-21	-35
-13	-23	-36
-14	-25	-37
-15	-26	-38
-16	-27	-39
-17	-28	-40

Data includes:

Computer plot of temperature profile
Computer representation of temperature and depth data
Lithologic Description of Gradient wells

Deep Gradient Wells

860-32	860-41
-33	-42
-34	-43

Data includes:

Computer plot of temperature profile
Computer representation of temperature and depth data
Lithologic Description of Gradient wells

Sorry about the delay in delivering this data.

Best regards,

Sincerely,

AMAX EXPLORATION, INC.



Harry J. Olson
Managing Geologist
Geothermal Exploration

cc: H. P. Ross ✓
A. W. Wells

dm

Receipt of the data acknowledged by _____

Date _____

July 14, 1980

GEOHERMAL BRANCH

Dr. H. P. Ross
Earth Science Laboratory
University of Utah Research Institute
391 Chipeta Way
Salt Lake City, Utah 84108

Re: Tuscarora Area
Geothermal Reservoir Assessment Case Study
Northern Basin and Range DE-AC08-79ET27011

Dear Howard:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing one sepa each of the following data:

Microgeophysics Corporation.
January 1, 1980
Tuscarora, Nevada
Gravity Survey:

- ✓ Plate 1 - Terrain Corrected Bouguer Anomaly
CI=5mgals
- ✓ Plate 2 - Terrain Corrected Bouguer Anomaly
CI-2.5mgals

Microgeophysics Corporation
September 22, 1978
Tuscarora, Nevada
Seismicity:

- ✓ Plate 4.1 - Hypocenters
- ✓ Plate 4.2 - Cross Sections
- ✓ Plate 4.3 - Strain Release
- ✓ Plate 4.4 - Poisson's Ratio (shallow 5 km)
- ✓ Plate 4.5 - Poisson's Ratio (deep 5km)
- ✓ Plate 5.1 - P-Wave Delay Raw Data
- ✓ Plate 5.2 - P-Wave Delay Altitude Correction
- ✓ Plate 5.3 - P-Wave Delay Depth to Interface
- Plate 5.4 - *Relative signal strength in db,
Relative to Average Signal Strength*

We regret the error in omitting this data from our previous shipment to you dated July 7, 1980.

Sincerely,

AMAX EXPLORATION, INC.

Harry J. Olson

Harry J. Olson
Managing Geologist
Geothermal Exploration

H

dm

GEOHERMAL BRANCH

July 9, 1980

Contracting Officer
Engineering & Energy Applications Division
Department of Energy
Nevada Operations Office
P. O. Box 14100
Las Vegas, Nevada 89114

Attn: Joseph D. Fiore

Re: Geothermal Reservoir Assessment Case Study
Northern Basin and Range (Tuscarora Area)
DE-AC08-79ET27011

Dear Joe:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing one each copy of the field notes for the thermal logging of well 66-5 to a depth of 340 meters on April 25, 1980. A final copy will be sent as soon as the data have been computer plotted.

Best regards.

Sincerely,

AMAX EXPLORATION, INC.

Harry

Harry J. Olson
Managing Geologist,
Geothermal Exploration

cc: H. P. Ross ✓
A. W. Wells

HJO/c

Receipt of the data acknowledged by _____

Date _____

AMAX EXPLORATION, INC.

A SUBSIDIARY OF AMAX INC.

4704 HARLAN STREET • DENVER, COLORADO 80212 • (303) 433-6151

March 15, 1979

Dr. H. P. Ross
 Earth Science Laboratory
 University of Utah Research Institute
 391 Chipeta Way
 Salt Lake City, Utah 84108

Re: Geothermal Reservoir Assessment
 Case Study - Northern Basin
 and Range (Tuscarora Area)
 DE-AC08-79ET27011

Dear Dr. Ross:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing three each copy of the following data:

1. Map (1:24,000 scale) showing location of six gradient/lithology holes (AMAX holes 860-1, 2, 5, 5 offset, 9, 10, and 11) ✓
 ✓ ✓ ✓ ✓
2. Temperature profiles from surface to total depth on each of the six holes (except 860-1)
3. Lithologic description from surface to total depth on each of six holes, and
4. Computer representation of the temperature data (except 860-1)
5. Report - Tuscarora Seismicity, Microgeophysics Corporation
6. AMAX memo dated 2-21-79 listing conductivity measurements and heat flow calculations for each of the ten holes drilled to date.

rec. data 6 holes

Best regards.

Sincerely,

AMAX EXPLORATION, INC.

Harry J. Olson
 Harry J. Olson
 Managing Geologist
 Geothermal Exploration

HJO:d
 Encl. (3)

AMAX EXPLORATION, INC.

A SUBSIDIARY OF AMAX INC.

4704 HARLAN STREET • DENVER, COLORADO 80212 • (303) 433-6151

March 15, 1979

Dr. H. P. Ross
 Earth Science Laboratory
 University of Utah Research Institute
 391 Chipeta Way
 Salt Lake City, Utah 84108

Re: Geothermal Reservoir Assessment
 Case Study - Northern Basin
 and Range (Tuscarora Area)
 DE-AC08-79ET27011

Dear Dr. Ross:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing three each copy of the following data:

1. Map (1:24,000 scale) showing location of six gradient/lithology holes (AMAX holes 860-1, 2, 5, 5 offset, 9, 10, and 11)
2. Temperature profiles from surface to total depth on each of the six holes (except 860-1)
3. Lithologic description from surface to total depth on each of six holes, and
4. Computer representation of the temperature data (except 860-1)
5. Report - Tuscarora Seismicity, Microgeophysics Corporation
6. AMAX memo dated 2-21-79 listing conductivity measurements and heat flow calculations for each of the ten holes drilled to date.

see data @ holes

Best regards.

Sincerely,

AMAX EXPLORATION, INC.

Harry J. Olson

Harry J. Olson
 Managing Geologist
 Geothermal Exploration

HJO:d
 Encl. (3)

May 28, 1980

GEOHERMAL BRANCH

Contracting Officer
Engineering & Energy Applications Division
Department of Energy
Nevada Operations Office
P. O. Box 14100
Las Vegas, Nevada 89114

Attn: Joseph D. Fiore

Re: Geothermal Reservoir Assessment Case Study
Northern Basin and Range (Tuscarora Area)
DE-AC08-79ET27011

Dear Joe:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing one each copy of the following data:

Gearhart-Owen

4-28-80 Temp Log 119' - 2796.5'
4-27-80 Dual Induction Log 2203.5' - 5196.5'
4-27-80 B.H.C. Sonic Log 2150.5' - 5190.0'
3-27-80 Time vs. Temperature Log Surface - 2232'
3-27-80 Differential Temp. Log Surface - 2232'

Schlumberger

3-1-80 Temperature Log 50' - 2240'
3-1-80 Dual Induction SFL 80' - 2230'
3-1-80 Caliper Log 70' - 2230'
3-1-80 Borehole Compensated Sonic Log 60' - 2230'

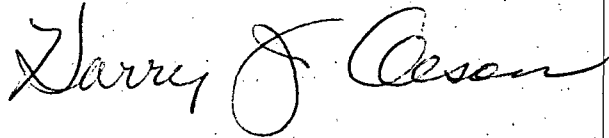
Baroid

2-16-80 to 4-26-80
Geothermal Log 86' - 5456'

Best regards,

Sincerely,

AMAX EXPLORATION, INC.

A handwritten signature in cursive script that reads "Harry J. Olson".

Harry J. Olson
Managing Geologist
Geothermal Exploration

cc: W. M. Dolan
G. J. Kitchen
H. P. Ross ✓
A. W. Wells

dm

May 28, 1980

Dr. H. P. Ross
Earth Science Laboratory
University of Utah Research Institute
391 Chipeta Way
Salt Lake City, Utah 84108

Re: Geothermal Reservoir Assessment Case Study
Northern Basin and Range (Tuscarora Area)
DE-AC08-79ET27011

Dear Howard:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing three copies (two blue line and one sepia) of the following data:

Gearhart-Owen

4-28-80 Temp Log 119' - 2796.5'
4-27-80 Dual Induction Log 2203.5' - 5196.5'
4-27-80 B.H.C. Sonic Log 2150.5' - 5190.0'
3-27-80 Time vs. Temperature Log Surface - 2232'
3-27-80 Differential Temp. Log Surface - 2232'

Schlumberger

3-1-80 Temperature Log 50' - 2240'
3-1-80 Dual Induction SFL 80' - 2230'
3-1-80 Caliper Log 70' - 2230'
3-1-80 Borehole Compensated Sonic Log 60' - 2230'

Baroid

2-16-80 to 4-26-80
Geothermal Log 86' - 5456'

Best regards,

Sincerely,

AMAX EXPLORATION, INC.



Harry J. Olson
Managing Geologist
Geothermal Exploration

cc: J. D. Fiore
A. W. Wells

GEOTHERMAL BRANCH

June 6, 1980

Dr. H. P. Ross
Earth Science Laboratory
University of Utah Research Institute
391 Chipeta Way
Salt Lake City, Utah 84108

Re: Geothermal Reservoir Assessment Case Study
Northern Basin and Range (Tuscarora Area)
DE-AC08-79ET27011

Dear Howard:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing one sepia each of the following data:

Magnetotelluric Data Corrections
April 1980
Tuscarora Project, Nevada
by Terraphysics

Plate 2A: Line AA', One dimensional inversion TE Mode
Resistivity values in ohm meters

Plate 2B: Line AA', Alternate interpreted axis for
stations M10, A10 & B10
(Orthogonal to those indicated in Plate 5)

Plate 3: Line BB', MT inversion, TE mode

Plate 4: Line CC', MT inversion, TE mode

Plate 5: Location Map

Only the sepia plates are being sent. The reports were transmitted to the DOE on May 21, 1980.

Please acknowledge receipt of the above data by returning a signed copy of this letter.

Best regards,

Sincerely,

AMAX EXPLORATION, INC.



Harry J. Olson
Managing Geologist
Geothermal Exploration

Receipt of the data acknowledged by Howard P. Ross

Date June 16, 1980

cc: J. D. Fiore
A. W. Wells

dm

June 17, 1980

GEOTHERMAL BRANCH

Contracting Officer
Engineering & Energy Applications Division
Department of Energy
Nevada Operations Office
P. O. Box 14100
Las Vegas, Nevada 89114

Attn: Joseph D. Fiore

Re: Geothermal Reservoir Assessment Case Study
Northern Basin and Range (Tuscarora Area)
DE-AC08-79ET27011

Dear Joe:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing one each copy of the geochemical soil maps. Included are:

NH₃, Li, F, B, Hg, Sb, As, Bi, Cl, Mn, Ag,

Ni, Pb, Fe, Cu, Mo, Zn.

Best regards,

Sincerely,
AMAX EXPLORATION, INC.



Harry J. Olson
Managing Geologist
Geothermal Exploration

cc: H. P. Ross
A. W. Wells

dm

May 16, 1980

GEOHERMAL BRANCH

Dr. H. P. Ross
Earth Science Laboratory
University of Utah Research Institute
391 Chipeta Way
Salt Lake City, Utah 84108

Re: Geothermal Reservoir Assessment Case Study
Northern Basin and Range (Tuscarora Area)
DE-AC08-79ET27011

Dear Howard:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing three copies (one blue line and two sepias) of the following data:

GO Wireline Service Logs for Well #66-5

4-15-80	Temperature Log	3800-5237 feet
4-15-80	X-Y Caliper	2232-5237 feet
4-15-80	Spinner Survey	2500-5237 feet

Best regards,

Sincerely,
AMAX EXPLORATION, INC.



Harry J. Olson
Managing Geologist
Geothermal Exploration

cc: J. D. Fiore-DOE
A. W. Wells

dm

June 6, 1980

Dr. H. P. Ross
Earth Science Laboratory
University of Utah Research Institute
391 Chipeta Way
Salt Lake City, Utah 84108

Re: Geothermal Reservoir Assessment Case Study
Northern Basin and Range (Tuscarora Area)
DE-AC08-79ET27011

Dear Howard:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am sending in a separate package the drill cuttings from Tuscarora well #66-5. Drill cuttings are in envelopes representing a ten foot interval and are packaged in seven boxes.

Please acknowledge receipt of the drill cuttings by returning a signed copy of this letter.

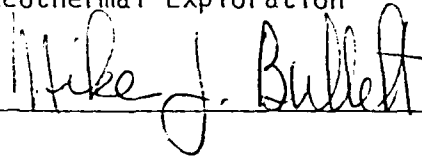
Best regards,

Sincerely,
AMAX EXPLORATION, INC.



Harry J. Olson
Managing Geologist
Geothermal Exploration

Receipt of data acknowledged by



Date 6-12-80

cc: J. D. Fiore
A. W. Wells

Chris Towers ~~dropped off~~: McCoy 66-8

McCoy 14-7

dm

6-13-80

MJB

June 6, 1980

Dr. H. P. Ross
Earth Science Laboratory
University of Utah Research Institute
391 Chipeta Way
Salt Lake City, Utah 84108

Re: Geothermal Reservoir Assessment Case Study
Northern Basin and Range (Tuscarora Area)
DE-AC08-79ET27011

Dear Howard:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am sending in a separate package the drill cuttings from Tuscarora well #66-5. Drill cuttings are in envelopes representing a ten foot interval and are packaged in seven boxes.

Please acknowledge receipt of the drill cuttings by returning a signed copy of this letter.

Best regards,

Sincerely,
AMAX EXPLORATION, INC.



Harry J. Olson
Managing Geologist
Geothermal Exploration

Receipt of data acknowledged by Howard P. Ross

Date June 19, 1980

cc: J. D. Fiore
A. W. Wells

dm

*Cuttings received at the
Geothermal Sample Library by
Mike Balliett, June 16, 1980*

May 21, 1980

GEOTHERMAL BRANCH

Contracting Officer
Engineering & Energy Applications Division
Department of Energy
Nevada Operations Office
P. O. Box 14100
Las Vegas, Nevada 89114

Attn: Joseph D. Fiore

Re: Geothermal Reservoir Assessment Case Study
Northern Basin and Range (Tuscarora Area)
DE-AC08-79ET27011

Dear Joe:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing one each copy of the following data:

Report: Magnetotelluric Data Corrections
April 1980
Tuscarora Prospect, Nevada
Terraphysics

The report contains corrections and additions to the Terraphysics Telluric-Magnetotelluric report sent to the DOE February 14, 1980. All stations in the February report are not affected. However all the data are presented in the April report.

Plate 5 (a plate not presented in the February report) contains approximate directions of the tipper strike and axis used for the TE mode one dimensional inversions. Significant changes are made to the inversions of stations M10, A10, B10 and B7. These are due to some corrections but predominantly due to a reinterpretation of the orthogonal axis used for the TE mode inversion. These are shown in plate 2A. An additional interpretation using the orthogonal axis for stations M10, A10 and B10 is presented in plate 2B.

These results suggest that the near surface thermal fluids in the area of M1 and A1 may extend to the south toward stations A3 and B3 at a depth of about one kilometer, to the west toward B2 and possibly M8, and toward

A10 to the northeast. The deep thermal source may lie to the south beneath M3 or to the north beneath A5 to B5. Additional MT stations in these areas and correlating the results with other geological and geophysical information may aid in evaluating these possible sources.

Best regards,

Sincerely,

AMAX EXPLORATION, INC.

Harry J. Olson

Harry J. Olson
Managing Geologist
Geothermal Exploration

cc: W. Lodder
W. M. Dolan
G. J. Kitchen
H. P. Ross, UURI ✓
A. W. Wells

dm

May 21, 1980

GEOTHERMAL BRANCH

Dr. H. P. Ross
Earth Science Laboratory
University of Utah
391 Chipeta Way
Salt Lake City, Utah 84108

Re: Geothermal Reservoir Assessment Case Study
Northern Basin and Range (Tuscarora Area)
DE-AC08-79ET27011

Dear Dr. Ross:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing three copies of the following report. Also enclosed under separate cover are sepias of the plates:

Magnetotelluric Data Corrections
April 1980
Tuscarora Prospect, Nevada
Terraphysics

The report contains corrections and additions to the Terraphysics Telluric-Magnetotelluric report sent to the DOE February 14, 1980. All stations in the February report are not affected. However all the data are presented in the April report.

Plate 5 (a plate not presented in the February report) contains approximate directions of the tipper strike and axis used for the TE mode one dimensional inversions. Significant changes are made to the inversions of stations M10, A10, B10 and B7. These are due to some corrections but predominately due to a reinterpretation of the orthogonal axis used for the TE mode inversion. These are shown in plate 2A. An additional interpretation using the orthogonal axis for stations M10, A10 and B10 is presented in plate 2B.

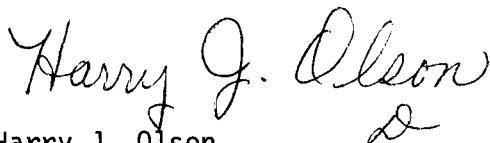
These results suggest that the near surface thermal fluids in the area of M1 and A1 may extend to the south toward stations A3 and B3 at a depth of about one kilometer, to the west toward B2 and possibly M8, and toward A10 to the northeast. The deep thermal source may lie to the south

beneath M3 or to the north beneath A5 to B5. Additional MT stations in these areas and correlating the results with other geological and geophysical information may aid in evaluating these possible sources.

Best regards,

Sincerely,

AMAX EXPLORATION, INC.

A handwritten signature in cursive script that reads "Harry J. Olson". There is a small flourish or mark at the end of the signature.

Harry J. Olson
Managing Geologist
Geothermal Exploration

Encl (3)

cc: J. D. Fiore - DOE

dm

February 14, 1980

GEOTHERMAL BRANCH

Dr. H. P. Ross
Earth Science Laboratory
University of Utah Research Institute
391 Chipeta Way
Salt Lake City, Utah 84108

Re: Geothermal Reservoir Assessment Case Study
Northern Basin and Range (Tuscarora Area)
DE-AC08-79ET27011

Dear Howard:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing three copies of the following data:

Report: Terraphysics, November, 1979
Tuscarora, Nevada
Telluric-Magnetotelluric Survey

The magnetotelluric survey defines two principal conductors. A shallow conductor occurs at the center of the thermal anomaly. On the northern line the shallow anomaly extends to the northwest parallel to the thermal anomaly. A deep conductor occurs along the eastern side of Independence Valley.

Best regards,

Sincerely,
AMAX EXPLORATION, INC.



H. Dean Pilkington
Chief Geologist
Geothermal Branch

cc: J. D. Fiore-DOE
Office Manager

dm

February 14, 1980

GEOTHERMAL BRANCH

Contracting Officer
Engineering & Energy Applications Division
Department of Energy
Nevada Operations Office
P. O. Box 14100
Las Vegas, Nevada 89114

Attn: Joseph D. Fiore

Re: Geothermal Reservoir Assessment Case Study
Northern Basin and Range (Tuscarora Area)
DE-AC08-79ET27011

Dear Joe:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing one each copy of the following data:

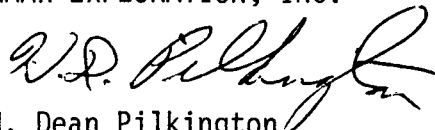
Report: Terraphysics, November, 1979
Tuscarora, Nevada
Telluric-Magnetotelluric Survey

The magnetotelluric survey defines two principal conductors. A shallow conductor occurs at the center of the thermal anomaly. On the northern line the shallow anomaly extends to the northwest parallel to the thermal anomaly. A deep conductor occurs along the eastern side of Independence Valley.

I am enclosing invoices detailing expenditures. Total cost of the survey was \$29,850.61. DOE's share of the expenditures is 50%.

In accordance with Article 4, paragraph A (Estimated Costs and Cost Sharing) of the contract schedule, I would appreciate it if you would send AMAX a check in the amount of \$14,925.31.

Sincerely,
AMAX EXPLORATION, INC.



H. Dean Pilkington
Chief Geologist
Geothermal Branch

cc: W. M. Dolan
G. J. Kitchen
H. P. Ross ✓
Office Manager

January 18, 1980

GEOTHERMAL BRANCH

Dr. H. P. Ross
Earth Science Laboratory
University of Utah Research Institute
391 Chipeta Way
Salt Lake City, Utah 84108

Re: Geothermal Reservoir Assessment Case Study
Northern Basin and Range (Tuscarora Area)
DE-AC08-79ET27011

Dear Mr. Ross:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing three copies of the following data:

Report: Microgeophysics Corporation, January 1, 1980
Tuscarora, Nevada
Gravity Survey

The gravity survey defines the northerly trending structures of the north end of Independence Valley, its northern continuation, and the north-east trending Jack Creek fault. These intersecting faults could provide the main zone of permeability and fluid migration outlining the thermal anomaly in the area.

Best regards,

Sincerely,
AMAX EXPLORATION, INC.



Harry J. Olson
Managing Geologist
Geothermal Exploration

Encl. (3)

cc: J. D. Fiore - DOE
A. L. Broussard w/o attachments

*Received 1/28/80
Howard P. Ross*

January 17, 1980

GEOTHERMAL BRANCH

Contracting Officer
Engineering & Energy Applications Division
Department of Energy
Nevada Operations Office
P. O. Box 14100
Las Vegas, Nevada 89114

Attn: Joseph D. Fiore

Re: Geothermal Reservoir Assessment Case Study
Northern Basin and Range (Tuscarora Area)
DE-AC08-79ET27011

Dear Joe:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing one each copy of the following data:

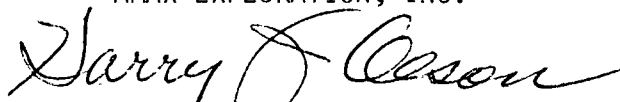
Report: Microgeophysics Corporation, January 1, 1980
Tuscarora, Nevada
Gravity Survey

The gravity survey defines the northerly trending structures of the north end of Independence Valley, its northern continuation, and the north-east trending Jack Creek fault. These intersecting faults could provide the main zone of permeability and fluid migration outlining the thermal anomaly in the area.

I am also enclosing invoices detailing expenditures. Total cost of the survey is \$22,509.80. DOE's share of these expenditures is 50%.

In accordance with Article 4, paragraph A (Estimated Cost and Cost Sharing) of the Contract Schedule, I would appreciate it if you would send AMAX a check in the amount of \$11,254.90

Sincerely,
AMAX EXPLORATION, INC.



Harry J. Olson
Managing Geologist
Geothermal Exploration

cc: W. M. Dolan
G. J. Kitchen
A. L. Broussard
H. P. Ross

November 30, 1979

GEOTHERMAL BRANCH

Dr. H. P. Ross
Earth Science Laboratory
University of Utah Research Institute
391 Chipeta Way
Salt Lake City, Utah 84108

Re: Tuscarora Project
Geothermal Reservoir Assessment Case Study
Northern Basin and Range (DE-AC08-79ET27011)
Delivery of Dipole-Dipole Data

Dear Dr. Ross:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables). I am enclosing three copies (including one sepia copy of the figures*) of the following data:

Report: Resistivity Survey - Mining Geophysical Surveys, Inc.
Tuscarora Project
Elko County, Nevada
August 17, 1979

Best regards,

Sincerely,
AMAX EXPLORATION, INC.



Harry J. Olson
Managing Geologist
Geothermal Exploration

dm

*Sepia will be sent under separate cover

Encl.

cc: J. D. Fiore

November 30, 1979

GEOHERMAL BRANCH

Dr. H. P. Ross
Earth Science Laboratory
University of Utah Research Institute
391 Chipeta Way
Salt Lake City, Utah 84108

Re: Tuscarora Project
Geothermal Reservoir Assessment Case Study
Northern Basin and Range (DE-AC08-79ET27011)
Delivery of Dipole-Dipole Data

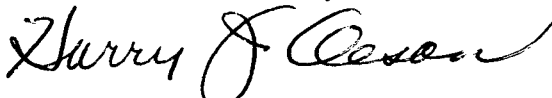
Dear Dr. Ross:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables). I am enclosing three copies (including one sepia copy of the figures*) of the following data:

Report: Resistivity Survey - Mining Geophysical Surveys, Inc.
Tuscarora Project
Elko County, Nevada
August 17, 1979

Best regards,

Sincerely,
AMAX EXPLORATION, INC.



Harry J. Olson
Managing Geologist
Geothermal Exploration

dm
*Sepia will be sent under separate cover

Encl.

cc: J. D. Fiore

*Received 3 copies as
indicated on December 7, 1979
Sepia copy received earlier.
Howard P. Ross
Project Manager*

November 30, 1979

GEOTHERMAL BRANCH

Contracting Officer
Engineering & Energy Applications Division
Department of Energy
Nevada Operations Office
P. O. Box 14100
Las Vegas, Nevada 89114

Attn: Joseph D. Fiore

Re: Tuscarora Project
Geothermal Reservoir Assessment Case Study
Northern Basin and Range (DE-AC08-79ET27011)
Delivery of Dipole-Dipole Data

Dear Joe:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables) and modification No. A001 to Contract No. DE-AC08-79ET27011 dated August 1, 1979, I am enclosing one each copy of the following data:

Report: Resistivity Survey - Mining Geophysical Surveys, Inc.
Tuscarora Project
Elko County, Nevada
August 17, 1979

I am also enclosing invoices detailing expenditures. Total cost of the survey is \$21,661.63. DOE's share of these expenditures is 100% to a maximum of \$15,000.

In accordance with Article 4, paragraph A (Estimated Cost and Cost Sharing) of the Contract Schedule, I would appreciate it if you would send AMAX a check in the amount of \$15,000.

Best regards,

Sincerely,
AMAX EXPLORATION, INC.

Harry J. Olson
Harry J. Olson
Managing Geologist
Geothermal Exploration

cc: W. M. Dolan
G. J. Kitchen
A. L. Broussard
H. P. Ross ✓

w/o enclosures

dm

AMAX EXPLORATION, INC.

A SUBSIDIARY OF AMAX INC.

4704 HARLAN STREET • DENVER, COLORADO 80212 • (303) 433-6151

July 19, 1979

*Recovered from
Eric's Files
Nov. 28, 1979*

Dr. H. P. Ross
Earth Science Laboratory
University of Utah Research Institute
391 Chipeta Way
Salt Lake City, Utah 84108

Re: Geothermal Reservoir Assessment
Case Study - Northern Basin
and Range (Tuscarora Area)
DE-AC08-79ET270111

Dear Dr. Ross:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing three each black line prints and one each sepia print of the following data:

Geometrics - Aeromagnetic Survey, Tuscarora, Nevada

- 1 - Flight Recovery Path, 1/62,500 scale
- 2 - Residual Magnetic Intensity, 1/62,500 scale
- 3 - Residual Magnetic Intensity, 1/62,500 scale
(Base Overlay)
- 4 - Residual Magnetic Intensity Profiles, 1/62,500 scale
(25 Lines)

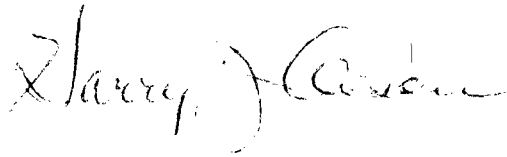
Line 0-0	8-0	16-0
1-0	9-0	17-0
2-0	10-0	18-0
3-0	11-0	19-0
4-0	12-0	20-0
5-0	13-0	21-0
6-0	14-0	
7-0	15-0	

Line 1001 - 0
1002 - 0
1003 - 0

Best regards,

Sincerely,

AMAX EXPLORATION, INC.

A handwritten signature in cursive script that reads "Harry J. Olson". The signature is written in dark ink and is positioned below the typed name.

Harry J. Olson
Managing Geologist
Geothermal Exploration

dm

Encl. (3)

cc: J. D. Fiore - DOE

AMAX EXPLORATION, INC.

A SUBSIDIARY OF AMAX INC

4704 HARLAN STREET • DENVER, COLORADO 80212 • (303) 433-6151

August 8, 1979

Contracting Officer
Engineering & Energy Applications Division
Department of Energy
Nevada Operations Office
P. O. Box 14100
Las Vegas, Nevada 89114

Attn: Joseph D. Fiore

Re: Geothermal Reservoir Assessment
Case Study - Northern Basin and Range
(Tuscarora Area) DE-AC08-79ET27011

Dear Joe:

Pursuant to provisions of the AMAX/DOE Tuscarora contract DE-AC08-79ET27011 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing one each copy of the following data:

Report: Microgeophysics Corporation, July 30, 1979,
Self-Potential Survey, Tuscarora, Nevada

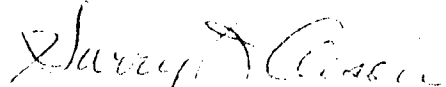
I am also enclosing invoices detailing expenditures. Total cost of the survey is \$21,368. DOE's share of these expenditures is 50%.

In accordance with Article 4, paragraph A (Estimated Cost and Cost Sharing) of the Contract Schedule, I would appreciate it if you would send AMAX a check in the amount of \$10,684.

Best regards,

Sincerely,

AMAX EXPLORATION, INC.



Harry J. Olson
Managing Geologist
Geothermal Exploration

cc: W. M. Dolan
G. J. Kitchen
W. M. Sherbring
H. P. Ross

*Chrono***AMAX** EXPLORATION, INC.

A SUBSIDIARY OF AMAX INC.

4704 HARLAN STREET • DENVER, COLORADO 80212 • (303) 433-6151

July 16, 1979

Contracting Officer
 Engineering & Energy Applications Division
 Department of Energy
 Nevada Operations Office
 Post Office Box 14100
 Las Vegas, Nevada 89114

Attn: Joseph D. Fiore

Re: Geothermal Reservoir Assessment
 Case Study - Northern Basin
 and Range (McCoy Area)
 DE-AC08-79ET27010

Dear Joe:

Pursuant to provisions of the AMAX/DOE McCoy contract DE-AC08-79ET27010 Appendix A, paragraph E.2 (Transmittal of Deliverables), I am enclosing one each copy of the following data:

Report:

Microgeophysics Corporation, June 15, 1979,
 Self-Potential Survey, McCoy, Nevada

I am also enclosing invoices detailing expenditures. DOE's share of these expenditures is 50%.

In accordance with Article 4 paragraph A (Estimated Cost and Cost Sharing) of the Contract Schedule, I would appreciate it if you would send AMAX a check in the amount of \$8951.25.

Best regards,

Sincerely,

AMAX EXPLORATION, INC.

Harry J. Olson
 Harry J. Olson
 Managing Geologist,
 Geothermal Exploration

HJO/dm

cc: W. M. Dolan
 G. J. Kitchen
 M. W. Sherbring

U. P. Ross - *U. P. Ross*

AMAX EXPLORATION, INC.

A SUBSIDIARY OF AMAX INC.

4704 HARLAN STREET • DENVER, COLORADO 80212 • (303) 433-6151

November 30, 1978

Dr. H. P. Ross
University of Utah Research Institute
391 Chipeta Way, Suite A
Salt Lake City, Utah 84108

Re: Geothermal Reservoir Assessment
Case Study - Northern Basin and
Range (Tuscarora Area)
DE-AC08-79ET27011

Dear Dr. Ross:


Pursuant to provisions of the AMAX-DOE Tuscarora contract DE-AC08-79ET27011 Appendix A paragraph D.1 (Existing Data) and Appendix A paragraph E.2 (Transmittal of Deliverables) I am enclosing three each copies of the following data:

- 1) Map (1:24,000 scale) showing location of four gradient/lithology holes (AMAX holes 860-3, 4, 7, and 8)
Three black line prints, one sepia, mailed separately
- 2) Temperature profiles from surface to total depth on each of the four holes
- 3) Lithologic description from surface to total depth on each of the four holes, and
- 4) Computer representation of the temperature data.

Best regards.

Sincerely,

AMAX EXPLORATION, INC.



Harry J. Olson
Managing Geologist
Geothermal Exploration

HJO:d

Encl.

cc: w/o attach.
W. M. Dolan
G. J. Kitchen
M. W. Sherbring
J. N. Fiore (DOE)

AMAX EXPLORATION, INC.

A SUBSIDIARY OF AMAX INC.

4704 HARLAN STREET • DENVER, COLORADO 80212 • (303) 433-6151

March 6, 1979

Contracting Officer
Engineering and Energy Applications Division
Department of Energy
Nevada Operations Office
P. O. Box 14100
Las Vegas, Nevada 89114

Attention: Joseph D. Fiore

Re: Geothermal Reservoir Assessment
Case Study - Northern Basin and
Range (Tuscarora Area)
DE-AC08-79ET-27011

Technical Progress Report
February 1979

Dear Joe:

During February contractors for the proposed gravity, SP and MT surveys were contracted, but no firm contracts have been let as yet. These surveys are still tentatively scheduled, dependent upon weather and contractor availability, for May and June. Geometrics is scheduled to fly the aeromagnetic survey during the first week of March.

Thermal gradient and lithologic logs of the wells drilled during June 1978 have been assembled and will be shipped to the DOE with invoices during the first part of March. Fifteen 150 meter thermal gradient wells are permitted now and are scheduled to be drilled to depths of about 100 meters and logged during May and June by the All Terrain Exploration Drilling Company. A shallow, three meter (10 foot), thermal survey also is scheduled at the same time to test the effectiveness of this technique and if effective to provide thermal data in the Tuscarora area in locations not accessible to conventional drill rigs.

Reports of the MEQ survey conducted at Tuscarora by Microgeophysics Corp. last year have been received. These will be shipped to the DOE with invoices during the first part of March. The survey was quite successful in that a prolific swarm of microearthquakes occurred in the survey area during the survey period. Several velocity anomalies were recognized from the refraction results of the controlled seismic experiment conducted in the Snake River Plane by the USGS and the University of Utah. Attenuation studies proved unsuccessful, however, due to the lack of horizontal component measurements.

Best regards.

Sincerely,

AMAX EXPLORATION, INC.



Harry J. Olson
Managing Geologist
Geothermal Exploration

HJO:d

cc: Dr. H. P. Ross, UURI (3 copies)