Appendix E: Geochronology data, in Furer, L.C., Fehlmann, R.H., Taylor, A.M., Self, G.W., and Amoco Oil Co., Data compilation of the 1971 field party, southeast Brooks Range and Fort Yukon, Alaska; Vol 1

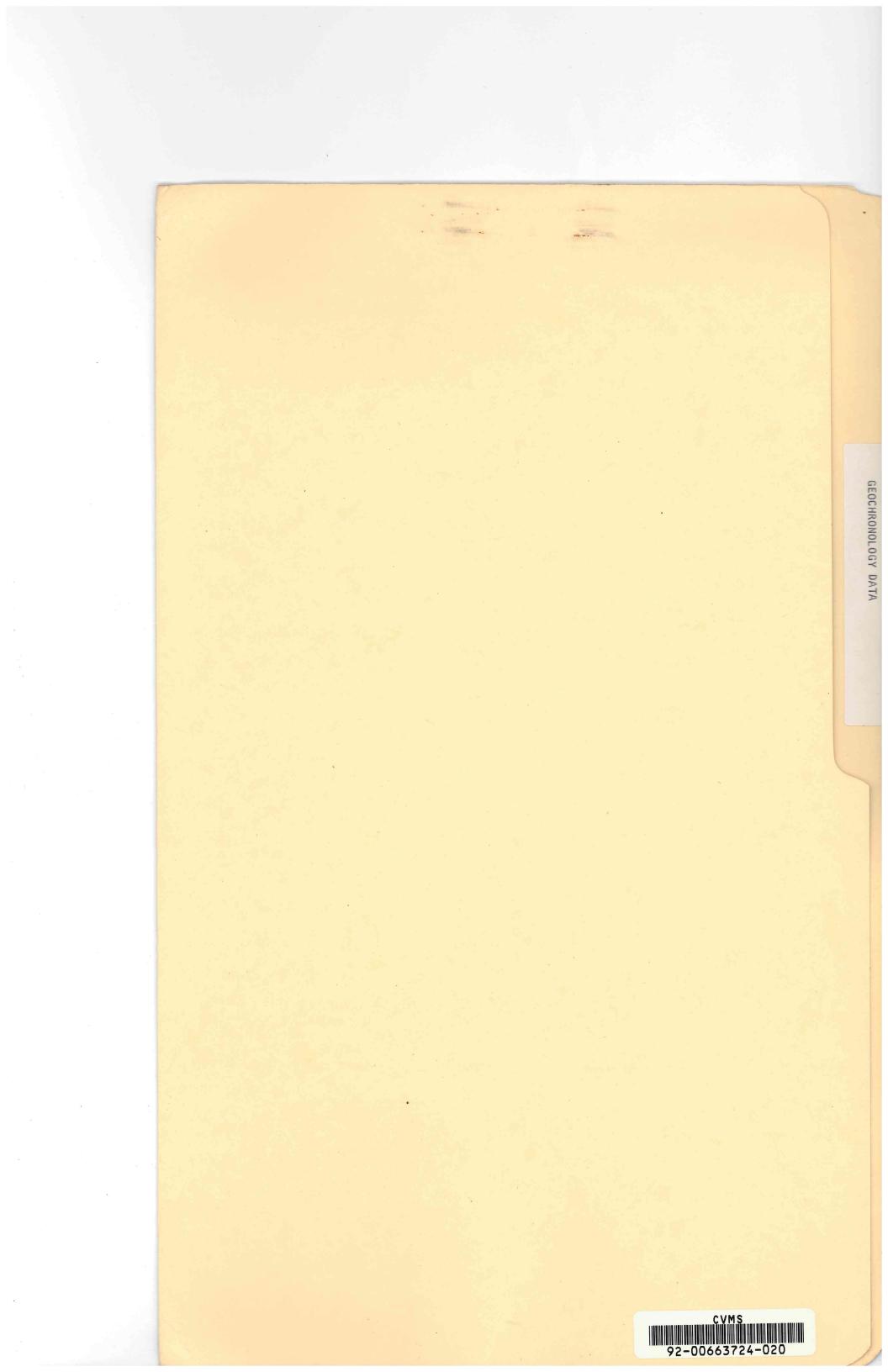
Furer, L.C., and Amoco Oil Co.

GMC DATA REPORT 464E

This GMC data report from the Amoco Heritage collection has been made available through funding from the FY2018 USGS National Geological and Geophysical Data Preservation Program, Grant Number G18AP00054. This project report is presented in its original format and has not been reviewed for technical content or for conformity to the editorial standards of DGGS. It should not be used or cited as reviewed data.

2019 State of Alaska Department of Natural Resources Division of Geological & Geophysical Surveys **GEOLOGIC MATERIALS CENTER**





24 Blackstone Street, Cambridge, Mass. 02139 Telephone TRowbridge 6-3691

le N. A.K. Greach

achron aboratories,

4 January 1972

Duane H. Reno Amoco Production Co. Security Life Bldg. Denver, Colorado 80202

Dear Mr. Reno:

We have now completed the K-Ar age determinations on the seven (7) samples described in your letter of 12 November 1971. You will find the complete analytical reports enclosed.

All but one of the samples had to be analyzed as whole rocks; we were able to get a quite good sanidine concentrate from sample HRL-1. The samples gave quite a spread of ages, from about 20 million years to 309 million years. The ages of the obviously sheared and altered rocks should of course be considered to be minimum ages of the rocks and probably approach the times of metamorphism and/or alteration. I would expect the ages of HRL-1 and LCF-19 to be close to the true ages of the rocks. Sample 8007 appeared to be a migmatite which contained inclusions of slaty material. We crushed this sample and handpicked several grams of the slate, which was then analyzed as a whole rock. I would expect the age of 8007 to be very close to the age of metamorphism of the original material.

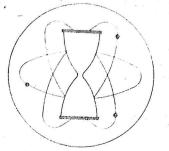
I trust that you will find these reports useful and if you should have any questions about them please do not hesitate to contact me. In the meantime, I am enclosing our invoice for this work. I hope that we may be able to serve you again in the near future.

Sincerely, GEOCHRON LABORATORIES DIV.

H. Decorecor Richard H. Reesman

General Manager

RHR/dm



24 BLACKSTONE STREET . CAMBRIDGE, MA. 02139 . (617) - 876 - 3691

POTASSIUM-ARGON AGE DETERMINATION

Our Sample No. R--2167

Your Reference: 6112

Submitted by: Duane H. Reno Amoco Production Co. Security Life Bldg. Denver, Colorado 80202

Sample Description & Locality: Sheared andesite (?) Northern Alaska

Material Analyzed: Whole rock, crushed to -40/+100 mesh.

 $Ar^{40}*/K^{40} = .005837$

Argon Analyses:

Ar 4 0	*, ppm.	

•	0.1.1.27	
	01114	

Potassium Analyses:

% K 1.576 1.571

Constants Used:

Ave. %K

Ar⁴⁰*/Total Ar⁴⁰

.495

.735

REPORT OF ANALYTICAL WORK

Date Received: 29 November 1971 Date Reported: 4 January 1972

 $AGE = 97.2 \pm 4.1$

M.Y.

Ave. Ar 40*, ppm.

.01121

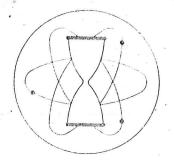
K⁴⁰, ppm

1.919

$$AGE = \frac{1}{\lambda_e + \lambda_\beta} \ln \left[\frac{\lambda_\beta + \lambda_e}{\lambda_e} \times \frac{Ar^{40*}}{K^{40}} + 1 \right]$$

$$\begin{split} \lambda \beta &= 4.72 \times 10^{-10} / \text{ year} \\ \lambda_e &= 0.585 \times 10^{-10} / \text{ year} \\ \text{K}^{40} / \text{K} &= 1.22 \times 10^{-4} \text{ g./g.} \end{split}$$

Note: Ar ⁴⁰* refers to radiogenic Ar ⁴⁰. M.Y. refers to millions of years.



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POTASSIUM-ARGON AGE DETERMINATION

REPORT OF ANALYTICAL WORK

Date Received: 29 November 1971

Date Reported: 4 January 1972

Our Sample No.R-2164

Your Reference: 8007

Submitted by: Duane H. Reno Amoco Production Co. Security Life Bldg. Denver, Colorado 80202

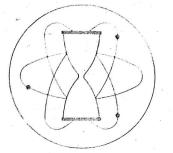
Sample Description & Locality: Metasediment (?) Metacgl. Northern Alaska

Material Analyzed: Slaty fragments, handpicked from rock, crushed to -40/+100 mesh.

 $Ar^{40} * / K^{40} = .007851$ AGE = 130 + 5 M.Y. Argon Analyses: Ar^{40*}, ppm. Ar^{40*}/ Total Ar⁴⁰ Ave. Ar^{40*}, ppm. .05185 .786 .05123 .05061 .802 Potassium Analyses: % K Ave. %K K⁴⁰, ppm 5.361 5.348 6.525 5.336 **Constants Used:** $AGE = \frac{1}{\lambda_e + \lambda_\beta} \ln \left[\frac{\lambda_\beta + \lambda_e}{\lambda_e} \times \frac{Ar^{40*}}{K^{40}} + 1 \right]$ $\lambda \beta = 4.72 \times 10^{-10}$ / year $\lambda_e = 0.585 \times 10^{-10}$ / year

 $K^{40}/K = 1.22 \times 10^{-4} \text{ g./g.}$

Note: Ar ⁴⁰* refers to radiogenic Ar ⁴⁰. M.Y. refers to millions of years.



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POTASSIUM-ARGON AGE DETERMINATION

REPORT OF ANALYTICAL WORK

Our Sample No. F-2168

Your Reference: HRL-1.

Date Received: 29 November 1971

Date Reported: 4 January 1972

Submitted by: Duane H. Reno Amoco Production Co. Security Life Bldg. Denver, Colorado 80202

Sample Description & Locality:

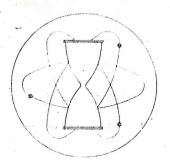
Altered rhyolite porphyry Northern Alaska

Material Analyzed: Feldspar concentrate, -40/+100 mesh.

$Ar^{40} * / K^{40} = .003$	3215	AGE	= 54.2 <u>+</u> 2.0 M.Y.
Argon Analyses:	name faithe faith intern many arow when point and a	na non man ana ana ana ana kan kan kan ana ana a	. אוויז איש אישר אוויז
Ar ^{40*} , ppm.		Ar ⁴⁰ */ Total Ar ⁴⁰	Ave. Ar ^{40*} , ppm.
.03549 .03592		.485 .513	.03571
Potassium Analyses:	а с с с с с с с с с с с с с с с с с с с		
% K	с 20	Ave. %K	K ⁴⁰ , ppm
9.062 9.144		9.103	11.105
	т м		The second s
Constants Used:			
$\beta = 4.72 \times 10^{-10} / \text{ y}$	ear	$AGE = \frac{1}{\lambda_e + \lambda_\beta} \ln \left[\frac{\lambda_\beta}{\lambda_e}\right]$	$\frac{\beta + \lambda_e}{\lambda_e} \times \frac{Ar^{40*}}{\kappa^{40}} + 1$
$\lambda_{\rm e} = 0.585 \times 10^{-10}/$	year	c β ks	K K K

Note: Ar ⁴⁰* refers to radiogenic Ar ⁴⁰. M.Y. refers to millions of years.

 $K^{40}/K = 1.22 \times 10^{-4} \text{ g./g.}$



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POTASSIUM-ARGON AGE DETERMINATION

REPORT OF ANALYTICAL WORK

Our Sample No. R-2165

Your Reference: 6229

Submitted by: Duane H. Reno Amoco Production Co. Security Life Bldg. Denver, Colorado 80202

Sample Description & Locality: Phyllite Northern Alaska

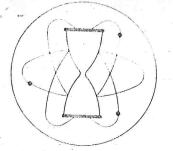
Material Analyzed: Whole rock, crushed to -40/+100 mesh.

Argon Analyses:		, , , , , , , , , , , , , , , , , , ,
Ar ⁴⁰ *, ppm.	Ar ⁴⁰ */ Total Ar ⁴⁰	Ave. Ar ⁴⁰ *, ppm.
.08815 .09161	.920 .925	.08988
Potassium Analyses:		
% K	Ave. %K	K ⁴⁰ , ppm
3.702 3.812	3.757	4.583

$$\begin{split} \lambda \beta &= 4.72 \times 10^{-10} / \text{ year} \\ \lambda_e &= 0.585 \times 10^{-10} / \text{ year} \\ \text{K}^{40} / \text{K} &= 1.22 \times 10^{-4} \text{ g./g.} \end{split}$$

 $AGE = \frac{1}{\lambda_e + \lambda_\beta} \ln \left[\frac{\lambda_\beta + \lambda_e}{\lambda_e} \times \frac{Ar^{40*}}{K^{40}} + 1 \right]$

Note: Ar ⁴⁰ * refers to radiogenic Ar ⁴⁰. M.Y. refers to millions of years. Date Received: 29 November 1971 Date Reported: 4 January 1972



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POTASSIUM-ARGON AGE DETERMINATION

REPORT OF ANALYTICAL WORK

Our Sample No. R- 2166

Your Reference: 6053

Submitted by: Duane H. Reno Amoco Production Co. Security Life Bldg. Denver, Colorado 80202

Sample Description & Locality: Sheared andesite Northern Alaska

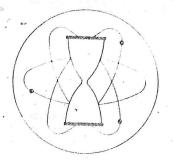
Material Analyzed: Whole rock, crushed to -40/+100 mesh.

Ar 40 */K 40 = .009562		2 2	AGE =	157 <u>+</u> 10	M.Y.
Argon Analyses:		na maa kaan kara shar shar shar ahar kara shar shar ahar ahar ahar	nadara (danima bayon) bahari dinana andara dayan garar	a manufi kalala kulana milaka kalana karata kulana kiraka dipara kulana, a	NAME AND ADDRESS ADDRESS AND A DROPES
Ar ⁴ ⁰ *, ppm.	£	r ⁴⁰ */ Total Ar ⁴⁰		Ave. Ar 40 *	, ppm.
•003403 •003538		.342 .375		.003	471
Potassium Analyses:					
% K		Ave. %K	3	K ⁴⁰ , ppm	
•299 •296		.297		.362	
4					· · · ·
Constants Used:	•				
$\lambda_{\beta} = 4.72 \times 10^{-10} / \text{ year}$ $\lambda_{e} = 0.585 \times 10^{-10} / \text{ year}$		$AGE = \frac{1}{\lambda_e + \lambda_\beta}$	$-\ln\left[\frac{\lambda_{\beta}+\lambda_{e}}{\lambda_{e}}\right]$	$\frac{2}{K^{40}} \times \frac{Ar^{40}}{K^{40}} + 1$	

 $\lambda_e = 0.585 \times 10^{-10}$ / year K ⁴⁰/K = 1.22 × 10⁻⁴ g./g.

Note: Ar ⁴⁰* refers to radiogenic Ar ⁴⁰. M.Y. refers to millions of years. Date Received: 29 November 1971

Date Reported: 4 January 1972



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POTASSIUM-ARGON AGE DETERMINATION

REPORT OF ANALYTICAL WORK

29 November 1971

4 January 1972

Date Received:

Date Reported:

Our Sample No. R-2170

Your Reference: LCF-22

Submitted by: Duane H. Reno Amoco Production Co. Security Life Bldg. Denver, Colorado 80202

Sample Description & Locality: Sheared basalt (?) Northern Alaska

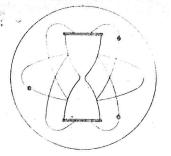
Material Analyzed: Whole rock, crushed to -40/+100 mesh.

$Ar^{40} * / K^{40} = .01729$		AGE =	275 <u>+</u> 11 M.Y.
Argon Analyses:		annes prare under Liker Store barry radia	
Ar ⁴⁰ *, ppm.	Ar ⁴⁰ */ Total Ar ⁴⁰		Ave. Ar ⁴⁰ *, ppm.
.02756 .02662	.827 .679		.02709
Potassium Analyses:		· *	
% К	Ave. %K		14 40
1.278 1.290	1.284		K ⁴⁰ , ppm 1.566

Constants Used:

$$\begin{split} \lambda \beta &= 4.72 \times 10^{-10} / \text{ year} \\ \lambda_e &= 0.585 \times 10^{-10} / \text{ year} \\ \text{K}^{40} / \text{K} &= 1.22 \times 10^{-4} \text{ g./g.} \end{split}$$

Note: Ar ⁴⁰* refers to radiogenic Ar ⁴⁰. M.Y. refers to millions of years. $AGE = \frac{1}{\lambda_e + \lambda_\beta} \ln \left[\frac{\lambda_\beta + \lambda_e}{\lambda_e} \times \frac{Ar^{40*}}{K^{40}} + 1 \right]^{\frac{1}{4}}$



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POTASSIUM-ARGON AGE DETERMINATION

REPORT OF ANALYTICAL WORK

Our Sample No. R-2169

Your Reference: LCF-19

Submitted by: Duane H. Reno Amoco Production Co. Security Life Bldg. Denver, Colorado 80202

Sample Description & Locality: Basalt Northern Alaska

Material Analyzed: Whole rock, crushed to -40/+100 mesh.

 $Ar^{40} * / K^{40} = .001153$

AGE = 19.6 + 1.0 M.Y.

Argon Analyses:

Ar ^{40*} , ppm.	Ar ⁴⁰ */ Total Ar ⁴⁰	Ave. Ar ^{40*} , ppm.
.002059 .001934	.188 .168	.001997

Potassium Analyses:

% K 1.428 1.411

e e Ave. %K 1.419 K⁴⁰, ppm 1.731

 $AGE = \frac{1}{\lambda_e + \lambda_{\beta}} \ln \left[\frac{\lambda_{\beta} + \lambda_e}{\lambda_e} \times \frac{Ar^{40*}}{K^{40}} + 1 \right],$

Constants Used:

$$\begin{split} \lambda \beta &= 4.72 \times 10^{-10} / \text{ year} \\ \lambda_e &= 0.585 \times 10^{-10} / \text{ year} \\ \text{K}^{40} / \text{K} &= 1.22 \times 10^{-4} \text{ g./g.} \end{split}$$

Note: Ar ⁴⁰ * refers to radiogenic Ar ⁴⁰. M.Y. refers to millions of years. Date Received: 29 November 1971 Date Reported: 4 January 1972

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