

Preliminary results of 25 Apatite fission track analyses of samples from the following five wells on the North Slope of Alaska:

Husky Oil NPR Operations Inc. Lisburne Test Well No. 1,  
core (2080'-13605');

Husky Oil NPR Operations Inc. Seabee Test Well No. 1,  
core (3000'-13,220');

Exxon Corporation Alaska State C-1,  
cuttings (2200'-13600');

Standard Alaska Production Co. Prudhoe Bay Unit J-1,  
cuttings (3500'-11420'); and

BP Alaska Inc. Kemik Unit No. 2,  
cuttings (6100'-8000').

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**Preliminary Results of 25 Apatite Fission Track Analyses of Samples From  
Five Wells on the North Slope of Alaska.**

**Husky Lisburne Test Well #1  
Husky Seabee Test Well #1  
Exxon Alaska State C-1  
Prudhoe Bay Unit J-1  
B.P. Kemik #2**

Public Data File

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## WELL LOCATION DATA

Lisburne Test Well #1 -	Sec. 17, T 11 S, R 16 W (UM)	68°30' N/155°45 W
Seabee Test Well #1 -	Sec. 5, T 1 S, R 1 W (UM)	69°26' N/152°5 W
Alaska State C-1 -	Sec. 14, T 9 S, R 23 E (UM)	
Prudhoe Bay Unit J-1		
Kemik #2 -	Sec. 6, T 1 S, R 21 E (UM)	69°20' N/147°20 W

## INTRODUCTION

This is a preliminary report of apatite fission track analysis data of samples from five wells drilled on the North Slope of Alaska. During May 1989, sandstone, siltstone, and conglomerate samples were collected from drill-core and cuttings located at the State of Alaska's Geologic Materials Center in Eagle River. Apatite grains were separated from the collected samples and analyzed in Melbourne Australia at the La Trobe University Fission Track Research Laboratory. Separations, grain-mounts, and all analyses were completed by the author.

For the purpose of this report, fission track ages were determined using 20-25 individual grain ages (if possible) from each sample and as many confined track length measurements up to ~100. Though typical yields for the samples were very poor, in most cases >20 dateable grains were found on each mount. Due to relatively young ages and low uranium content, only 3 mounts contained 100 or more confined tracks and an additional 2 mounts had between 50 and 100 tracks. Ten mounts had less than 10 confined tracks. A few samples yielded grains representing multiple populations so the mean age is presented (shown by a \* in table). For those which it was determined that the dated grains could represent a single population, the pooled age is presented.

Each analysis includes two parts: 1) age report; and 2) track length distributions. The age report shows a listing of the individual grain ages, the resulting age and pertinent information used in determining the age. A guide to read the information is as follows:

POS 22A-Tucktu Fm.

Irradiation:

Crystal

NS

NI

NA

Ratio

U(ppm)

RHOs

RHOi

F.T.Age(Ma)

CHI Squared

p(chi squared)

Variance of SQR

NS/NI

Mean Ratio

Pooled Age

Mean Age

-Sample number and unit collected

-In-house number for grouping samples from the same irradiation package

-Number of each grain counted

-Number of spontaneous tracks counted

-Number of induced tracks counted

-Number of area units counted in grain

-Ratio of (NS/NI) for each grain

-Uranium concentration of each grain

-Density of spontaneous tracks (per cm<sup>2</sup>)

-Density of induced tracks (per cm<sup>2</sup>)

-Individual grain ages

-Statistical test for determining multiple grain populations

-probability of less than 5% indicates multiple grain populations

-Statistical comparison of values of NS or NI for all grains

-Pooled ratio of (NS/NI). Uses total number of spontaneous and induced tracks counted for whole sample. Value used in age calculation if sample is of a single population

-Average ratio of (NS/NI) for grains

-Age calculated using NS/NI(single population)

-Age calculated Using "Mean Ratio" (multiple populations)

The track length distributions for each sample are histograms showing the relative numbers of tracks measured at a particular length, the mean length of the tracks measured, the standard deviation of the tracks measured, and the total number of tracks measured for the sample (N).

**LIST OF SAMPLES**  
(by depth)

**Lisburne #1**

Sample #	Unit	Depth (ft)	Results (data)
89 POS 01A	Shublik Fm.	13,605	Age Only
89 POS 02A	Pebble Shale	11,164	Not Dateable
89 POS 03A	Pebble Shale	8,734	Age Only
89 POS 04A	Pebble Shale	6,220	Age and Length
89 POS 05A	Pebble Shale	3,902	Age and Length
89 POS 06A	Ft. Mtn. Fm.	2,080	Age and Length

**Seabee #1**

Sample #	Unit	Depth (ft)	Results (data)
89 POS 07A	Kingak Shale	13,220	Age and Length
89 POS 08A	Ft. Mtn. Fm.	12,020	Age and Length
89 POS 09A	Ft. Mtn. Fm.	10,875	Age and Length
89 POS 10A	Ft. Mtn. Fm.	10,065	Age and Length
89 POS 11A	Torok Fm.	6,545	Age and Length
89 POS 12A	Torok Fm.	5,397	Age and Length
89 POS 13A	Nanushuk Gp.	3,000	Age and Length

**Alaska State C-1**

Sample #	Unit	Depth (ft)	Results (data)
89 POS 14A	Thompson SS.	13,600	Age Only
89 POS 15A	Thompson SS.	13,000	Age and Length
89 POS 16A	Canning Fm.	11,450	Age and Length
89 POS 17A	Canning Fm.	9,100	Age and Length
89 POS 18A	Sagavanirktok Fm.	5,900	Not Dateable
89 POS 19A	Sagavanirktok Fm.	2,200	Age and Length

**Prudhoe Bay J-1**

Sample #	Unit	Depth (ft)	Results (data)
89 POS 20A	Kekiktuk Cong.	11,420	Age Only
89 POS 21A	Itkilyariak Fm.	11,280	Combined w/ 20A
89 POS 22A	Ivishak Fm.	9,100	Age and Length
89 POS 23A	Shublik Fm.	8,520	Age Only
89 POS 24A	Colville Gp.	6,290	Age and Length
89 POS 25A	Colville Gp.	3,500	Age and Length

**Kemik #2**

Sample #	Unit	Depth (ft)	Results (data)
89 POS 26A	Echooka Fm.	8,000	Age Only
89 POS 27A	Ivishak Fm.	7,000	Age Only
89 POS 28A	Shublik Fm.	6,100	Age and Length

## SAMPLE INFORMATION

Sample No.	Unit	Lengths (#)	Mean Len. ( $\mu\text{m}$ )	Grains (#)	Age (Ma $\pm 1\sigma$ )
89 POS 01A	Shublik Fm.	0	-	6	20.5 $\pm$ 15.2
89 POS 03A	Pebble Shale	0	-	10	16.1 $\pm$ 5.9
89 POS 04A	Pebble Shale	4	10.67	8	36.8 $\pm$ 10.7
89 POS 05A	Pebble Shale	67	13.01	26	65.6 $\pm$ 6.1
89 POS 06A	Ft. Mtn. Fm.	13	14.22	20	92.1 $\pm$ 10.3
89 POS 07A	Kingak Shale	15	9.63	25	15.6 $\pm$ 3.9*
89 POS 08A	Ft. Mtn. Fm.	7	10.14	25	6.1 $\pm$ 2.0
89 POS 09A	Ft. Mtn. Fm.	8	9.68	25	22.2 $\pm$ 4.3
89 POS 10A	Ft. Mtn. Fm.	40	10.38	26	26.7 $\pm$ 2.9
89 POS 11A	Torok Fm.	31	12.72	25	37.5 $\pm$ 5.8
89 POS 12A	Torok Fm.	53	11.51	25	50.1 $\pm$ 5.9
89 POS 13A	Nanushuk Gp.	102	12.14	25	102.3 $\pm$ 8.7*
89 POS 14A	Thompson SS.	0	-	14	11.2 $\pm$ 5.2
89 POS 15A	Thompson SS.	26	8.79	26	53.4 $\pm$ 5.1
89 POS 16A	Canning Fm.	41	9.93	25	82.6 $\pm$ 16.7*
89 POS 17A	Canning Fm.	21	12.27	20	100.3 $\pm$ 20.4*
89 POS 19A	Sagavanirktok	31	12.14	12	81.0 $\pm$ 24.1*
89 POS 20+21A	Kekiktuk	2	11.83	11	80.2 $\pm$ 21.2*
89 POS 22A	Ivishak Fm.	43	10.29	25	43.8 $\pm$ 10.1*
89 POS 23A	Shublik Fm.	0	-	4	81.9 $\pm$ 38.8*
89 POS 24A	Colville Gp.	103	11.87	25	131.2 $\pm$ 6.9
89 POS 25A	Colville Gp.	104	12.83	25	94.6 $\pm$ 6.7
89 POS 26A	Echooka Fm.	1	7.89	5	13.1 $\pm$ 5.5
89 POS 27A	Ivishak Fm.	2	7.73	16	16.6 $\pm$ 4.3
89 POS 28A	Shublik Fm.	21	12.04	25	22.8 $\pm$ 5.7

## TRACK LENGTH DATA

Sample Number	Track Length Range (μm)														
	<5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	>17	
01A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
03A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
04A	1	0	0	0	0	0	0	2	0	0	1	0	0	0	
05A	0	0	0	0	0	3	9	14	9	17	8	5	1	0	
06A	0	0	0	0	0	0	0	0	1	4	5	3	0	0	
07A	0	0	0	2	3	2	5	3	0	0	0	0	0	0	
08A	0	0	0	0	1	2	2	2	0	0	0	0	0	0	
09A	1	0	1	0	1	0	1	2	2	0	0	0	0	0	
10A	1	0	1	6	5	4	4	8	6	3	2	0	0	0	
11A	0	0	0	0	1	2	4	4	4	5	9	2	0	0	
12A	2	2	1	1	2	1	6	8	12	12	6	0	0	0	
13A	1	2	2	1	3	7	6	15	22	26	14	2	1	0	
14A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
15A	2	0	5	3	5	2	4	1	4	0	0	0	0	0	
16A	0	0	3	2	9	11	3	6	5	2	0	0	0	0	
17A	0	1	0	1	1	3	1	2	2	2	5	3	0	0	
19A	0	0	0	0	5	4	2	2	4	5	4	4	1	0	
20+21A	0	0	0	0	0	0	1	0	0	1	0	0	0	0	
22A	3	1	2	0	1	7	12	8	7	1	1	0	0	0	
23 A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
24A	0	0	0	4	3	4	15	28	25	15	7	2	0	0	
25A	0	0	2	0	1	5	7	16	20	22	23	7	1	0	
26A	0	0	0	1	0	0	0	0	0	0	0	0	0	0	
27A	0	1	0	0	0	0	1	0	0	0	0	0	0	0	
28A	0	1	1	0	0	3	1	3	4	2	3	2	1	0	

# GRAIN-AGE DATA FROM HUSKY LISBURNE TEST WELL #1

89 POS 01A APATITE 13,605' - SHUBLIK FM. - LISBURNE #1

IRRADIATION LU059

SLIDE NUMBER 1

COUNTED BY: POS

No.	Ns	Ni	Na	RATIO	U (ppm)	RHOs	RHOi	F.T. AGE (Ma)
1	1	3	12	0.333	3.0	9.259E+04	2.778E+05	71.6 ± 82.7
2	0	7	9	0.000	9.2	0.000E+00	8.642E+05	0.0 ± 0.0
3	0	4	6	0.000	7.9	0.000E+00	7.407E+05	0.0 ± 0.0
4	1	4	6	0.250	7.9	1.852E+05	7.407E+05	53.8 ± 60.1
5	0	2	2	0.000	11.9	0.000E+00	1.111E+06	0.0 ± 0.0
6	0	1	4	0.000	3.0	0.000E+00	2.778E+05	0.0 ± 0.0
	2	21			6.4	5.698E+04	5.983E+05	

Area of basic unit = .0000009 cm-2

Chi Squared = 3.477 with 5 degrees of freedom

P(chi squared) = 62.7 %

Correlation Coefficient = 0.000

Variance of SQR(Ns) = 0.27

Variance of SQR(Ni) = 0.32

Ns/Ni = 0.095 ± 0.070

Mean Ratio = 0.095 ± 0.070

Ages calculated using a zeta of 352.7 ± 5 for SRM612 glass

Rho D = 1.225E+06cm-2; ND = 2756

POOLED AGE = 20.5 ± 15.2 Ma

MEAN AGE = 21.0 ± 13.5 Ma

## 89 POS 03A APATITE 8,734' - PEBBLE SHALE - LISBURNE #1

IRRADIATION LU059  
SLIDE NUMBER 2  
COUNTED BY: POS

No.	Ns	Ni	Na	RATIO	U (ppm)	RHOs	RHOi	F.T. AGE (Ma)
1	1	6	15	0.167	4.8	7.407E+04	4.444E+05	35.9 ± 38.8
2	0	8	24	0.000	4.0	0.000E+00	3.704E+05	0.0 ± 0.0
3	1	17	30	0.059	6.7	3.704E+04	6.296E+05	12.7 ± 13.1
4	0	6	10	0.000	7.1	0.000E+00	6.667E+05	0.0 ± 0.0
5	2	16	18	0.125	10.6	1.235E+05	9.877E+05	26.9 ± 20.2
6	0	5	10	0.000	5.9	0.000E+00	5.556E+05	0.0 ± 0.0
7	0	11	24	0.000	5.4	0.000E+00	5.093E+05	0.0 ± 0.0
8	1	7	6	0.143	13.9	1.852E+05	1.296E+06	30.8 ± 32.9
9	1	12	20	0.083	7.1	5.556E+04	6.667E+05	18.0 ± 18.7
10	2	19	30	0.105	7.5	7.407E+04	7.037E+05	22.7 ± 16.9
	8	107			6.8	4.753E+04	6.358E+05	

\* Area of basic unit = .0000009 cm<sup>2</sup>

Chi Squared = 3.963 with 9 degrees of freedom

P(chi squared) = 91.4 %

Correlation Coefficient = 0.726

Variance of SQR(Ns) = 0.37

Variance of SQR(Ni) = 0.60

Ns/Ni = 0.075 ± 0.027

Mean Ratio = 0.075 ± 0.027

Ages calculated using a zeta of 352.7 ± 5 for SRM612 glass

Rho D = 1.225E+06cm<sup>-2</sup>; ND = 2756

POOLED AGE = 16.1 ± 5.9 Ma

MEAN AGE = 14.7 ± 4.5 Ma



**89 POS 04A APATITE 6,220' - PEBBLE SHALE - LISBURNE #1**
**IRRADIATION LU059**
**SLIDE NUMBER 3**
**COUNTED BY: POS**

No.	Ns	Ni	Na	RATIO	U (ppm)	RHOs	RHOi	F.T. AGE (Ma)
1	1	3	12	0.333	3.0	9.259E+04	2.778E+05	71.6 ± 82.7
2	1	21	50	0.048	5.0	2.222E+04	4.667E+05	10.3 ± 10.5
3	0	5	16	0.000	3.7	0.000E+00	3.472E+05	0.0 ± 0.0
4	5	34	16	0.147	25.2	3.472E+05	2.361E+06	31.7 ± 15.2
5	3	9	15	0.333	7.1	2.222E+05	6.667E+05	71.6 ± 47.8
6	0	4	9	0.000	5.3	0.000E+00	4.938E+05	0.0 ± 0.0
7	1	2	4	0.500	5.9	2.778E+05	5.556E+05	107.1 ± 131.2
8	3	4	9	0.750	5.3	3.704E+05	4.938E+05	160.0 ± 122.3
	14	82			7.4	1.187E+05	6.955E+05	

Area of basic unit = .0000009 cm-2

Chi Squared = 10.146 with 7 degrees of freedom

P(chi squared) = 18.0 %

Correlation Coefficient = 0.655

Variance of SQR(Ns) = 0.65

Variance of SQR(Ni) = 2.43

Ns/Ni = 0.171 ± 0.049

Mean Ratio = 0.177 ± 0.056

Ages calculated using a zeta of 352.7 ± 5 for SRM612 glass

Rho D = 1.225E+06cm-2; ND = 2756

**POOLED AGE = 36.8 ± 10.7 Ma**
**MEAN AGE = 56.8 ± 20.4 Ma**

## 89 POS 05A APATITE 3,902' - PEBBLE SHALE - LISBURNE #1

IRRADIATION LU059

SLIDE NUMBER 4

COUNTED BY: POS

No.	Ns	Ni	Na	RATIO	U (ppm)	RHOs	RHOi	F.T. AGE (Ma)
1	1	2	35	0.500	0.7	3.175E+04	6.349E+04	107.1 ± 131.2
2	12	18	28	0.667	7.6	4.762E+05	7.143E+05	142.4 ± 53.2
3	7	31	15	0.226	24.6	5.185E+05	2.296E+06	48.6 ± 20.4
4	1	16	12	0.062	15.8	9.259E+04	1.481E+06	13.5 ± 13.9
5	2	6	10	0.333	7.1	2.222E+05	6.667E+05	71.6 ± 58.5
6	4	8	16	0.500	5.9	2.778E+05	5.556E+05	107.1 ± 65.6
7	8	18	36	0.444	5.9	2.469E+05	5.556E+05	95.3 ± 40.6
8	1	1	16	1.000	0.7	6.944E+04	6.944E+04	212.5 ± 300.5
9	3	10	6	0.300	19.8	5.556E+05	1.852E+06	64.5 ± 42.5
10	4	17	25	0.235	8.1	1.778E+05	7.556E+05	50.6 ± 28.2
11	4	16	28	0.250	6.8	1.587E+05	6.349E+05	53.8 ± 30.1
12	8	12	48	0.667	3.0	1.852E+05	2.778E+05	142.4 ± 65.1
13	10	30	28	0.333	12.7	3.968E+05	1.190E+06	71.6 ± 26.2
14	14	21	10	0.667	25.0	1.556E+06	2.333E+06	142.4 ± 49.3
15	10	63	18	0.159	41.6	6.173E+05	3.889E+06	34.2 ± 11.7
16	9	30	50	0.300	7.1	2.000E+05	6.667E+05	64.5 ± 24.6
17	3	16	20	0.188	9.5	1.667E+05	8.889E+05	40.4 ± 25.4
18	12	35	30	0.343	13.9	4.444E+05	1.296E+06	73.6 ± 24.7
19	2	9	20	0.222	5.3	1.111E+05	5.000E+05	47.8 ± 37.4
20	0	7	18	0.000	4.6	0.000E+00	4.321E+05	0.0 ± 0.0
21	2	10	24	0.200	5.0	9.259E+04	4.630E+05	43.1 ± 33.4
22	7	31	30	0.226	12.3	2.593E+05	1.148E+06	48.6 ± 20.4
23	9	39	54	0.231	8.6	1.852E+05	8.025E+05	49.7 ± 18.4
24	2	8	15	0.250	6.3	1.481E+05	5.926E+05	53.8 ± 42.5
25	9	34	36	0.265	11.2	2.778E+05	1.049E+06	56.9 ± 21.4
26	14	30	60	0.467	5.9	2.593E+05	5.556E+05	100.0 ± 32.5
158	518				8.9	2.552E+05	8.366E+05	

Area of basic unit = .0000009 cm-2

Chi Squared = 29.583 with 25 degrees of freedom

P(chi squared) = 24.0 %

Correlation Coefficient = 0.691

Variance of SQR(Ns) = 1.00

Variance of SQR(Ni) = 2.56

Ns/Ni = 0.305 ± 0.028

Mean Ratio = 0.308 ± 0.032

Ages calculated using a zeta of 352.7 ± 5 for SRM612 glass

Rho D = 1.225E+06cm-2; ND = 2756

POOLED AGE = 65.6 ± 6.2 Ma

MEAN AGE = 74.6 ± 9.4 Ma

## 89 POS 06A APATITE 2,080' - FT. MTN. FM. - LISBURN #1

IRRADIATION LU059

SLIDE NUMBER 5

COUNTED BY: POS

No.	Ns	Ni	Na	RATIO	U (ppm)	RHOs	RHOi	F.T. AGE (Ma)
1	20	22	12	0.909	21.8	1.852E+06	2.037E+06	193.5 ± 59.9
2	3	4	32	0.750	1.5	1.042E+05	1.389E+05	160.0 ± 122.3
3	23	47	28	0.489	19.9	9.127E+05	1.865E+06	104.9 ± 26.8
4	0	3	12	0.000	3.0	0.000E+00	2.778E+05	0.0 ± 0.0
5	8	9	12	0.889	8.9	7.407E+05	8.333E+05	189.2 ± 92.1
6	3	7	42	0.429	2.0	7.936E+04	1.852E+05	91.9 ± 63.5
7	6	20	42	0.300	5.7	1.587E+05	5.291E+05	64.5 ± 30.1
8	37	71	40	0.521	21.1	1.028E+06	1.972E+06	111.6 ± 22.8
9	3	14	8	0.214	20.8	4.167E+05	1.944E+06	46.1 ± 29.4
10	0	5	6	0.000	9.9	0.000E+00	9.259E+05	0.0 ± 0.0
11	2	12	8	0.167	17.8	2.778E+05	1.667E+06	35.9 ± 27.4
12	2	14	15	0.143	11.1	1.481E+05	1.037E+06	30.8 ± 23.3
13	1	1	15	1.000	0.8	7.407E+04	7.407E+04	212.5 ± 300.5
14	0	5	25	0.000	2.4	0.000E+00	2.222E+05	0.0 ± 0.0
15	0	4	27	0.000	1.8	0.000E+00	1.646E+05	0.0 ± 0.0
16	2	4	25	0.500	1.9	8.889E+04	1.778E+05	107.1 ± 92.8
17	1	15	18	0.067	9.9	6.173E+04	9.259E+05	14.4 ± 14.9
18	2	5	4	0.400	14.9	5.556E+05	1.389E+06	85.8 ± 71.8
19	6	11	36	0.545	3.6	1.852E+05	3.395E+05	116.8 ± 59.3
20	0	4	24	0.000	2.0	0.000E+00	1.852E+05	0.0 ± 0.0
119		277			7.6	3.068E+05	7.141E+05	

Area of basic unit = .0000009 cm-2

Chi Squared = 30.043 with 19 degrees of freedom

P(chi squared) = 5.1 %

Correlation Coefficient = 0.939

Variance of SQR(Ns) = 2.87

Variance of SQR(Ni) = 3.23

Ns/Ni = 0.430 ± 0.047

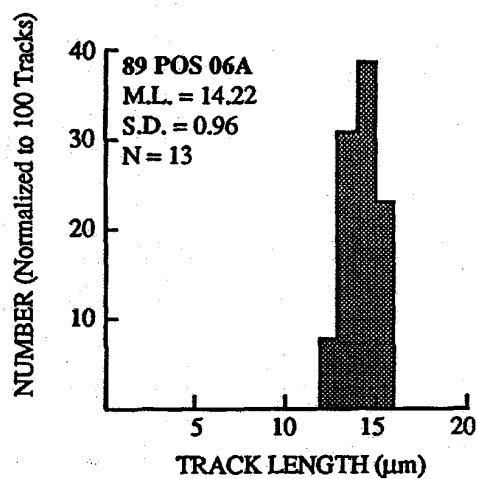
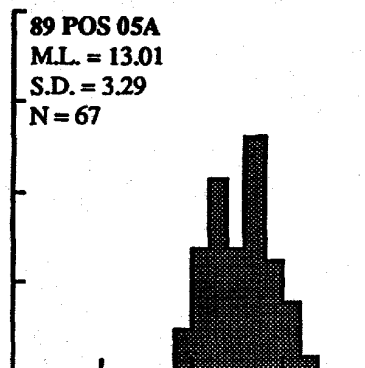
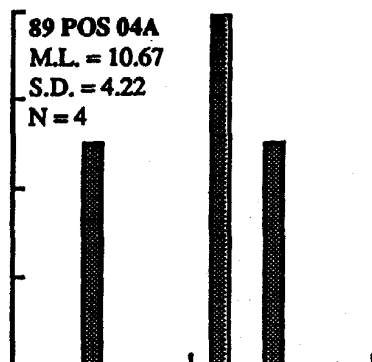
Mean Ratio = 0.363 ± 0.064

Ages calculated using a zeta of 352.7 ± 5 for SRM612 glass

Rho D = 1.225E+06cm-2; ND = 2756

POOLED AGE = 92.1 ± 10.3 Ma

MEAN AGE = 78.6 ± 16.0 Ma

**LISBURNE TEST WELL #1 LENGTH DISTRIBUTIONS**

# GRAIN-AGE DATA FROM HUSKY SEABEE TEST WELL #1

89 POS 07A APATITE 13,220' - KINGAK SHALE - SEABEE #1

IRRADIATION LU059

SLIDE NUMBER 6

COUNTED BY: POS

No.	Ns	Ni	Na	RATIO	U (ppm)	RHOs	RHOi	F.T. AGE (Ma)
1	0	7	24	0.000	3.5	0.000E+00	3.241E+05	0.0 ± 0.0
2	1	36	25	0.028	17.1	4.444E+04	1.600E+06	6.0 ± 6.1
3	3	27	20	0.111	16.0	1.667E+05	1.500E+06	24.0 ± 14.6
4	0	15	50	0.000	3.6	0.000E+00	3.333E+05	0.0 ± 0.0
5	3	8	15	0.375	6.3	2.222E+05	5.926E+05	80.5 ± 54.5
6	3	116	40	0.026	34.5	8.333E+04	3.222E+06	5.6 ± 3.3
7	0	36	30	0.000	14.3	0.000E+00	1.333E+06	0.0 ± 0.0
8	0	30	16	0.000	22.3	0.000E+00	2.083E+06	0.0 ± 0.0
9	1	29	36	0.034	9.6	3.086E+04	8.951E+05	7.4 ± 7.6
10	0	21	20	0.000	12.5	0.000E+00	1.167E+06	0.0 ± 0.0
11	3	34	25	0.088	16.2	1.333E+05	1.511E+06	19.0 ± 11.5
12	0	18	27	0.000	7.9	0.000E+00	7.407E+05	0.0 ± 0.0
13	2	34	30	0.059	13.5	7.407E+04	1.259E+06	12.7 ± 9.2
14	2	28	24	0.071	13.9	9.259E+04	1.296E+06	15.4 ± 11.3
15	3	29	16	0.103	21.5	2.083E+05	2.014E+06	22.3 ± 13.5
16	1	21	18	0.048	13.9	6.173E+04	1.296E+06	10.3 ± 10.5
17	3	90	16	0.033	66.8	2.083E+05	6.250E+06	7.2 ± 4.2
18	16	195	24	0.082	96.5	7.407E+05	9.028E+06	17.7 ± 4.6
19	2	9	30	0.222	3.6	7.407E+04	3.333E+05	47.8 ± 37.4
20	0	20	40	0.000	5.9	0.000E+00	5.556E+05	0.0 ± 0.0
21	1	21	40	0.048	6.2	2.778E+04	5.833E+05	10.3 ± 10.5
22	4	21	40	0.190	6.2	1.111E+05	5.833E+05	41.0 ± 22.4
23	1	11	15	0.091	8.7	7.407E+04	8.148E+05	19.6 ± 20.5
24	1	5	18	0.200	3.3	6.173E+04	3.086E+05	43.1 ± 47.2
25	0	13	40	0.000	3.9	0.000E+00	3.611E+05	0.0 ± 0.0
50		874			15.3	8.182E+04	1.430E+06	

Area of basic unit = .0000009 cm-2

Chi Squared = 38.529 with 24 degrees of freedom

P(chi squared) = 3.1 %

Correlation Coefficient = 0.830

Variance of SQR(Ns) = 0.90

Variance of SQR(Ni) = 6.86

Ns/Ni = 0.057 ± 0.008

Mean Ratio = 0.057 ± 0.010

Ages calculated using a zeta of 352.7 ± 5 for SRM612 glass

Rho D = 1.225E+06cm-2; ND = 2756

POOLED AGE = 12.3 ± 1.8 Ma

MEAN AGE = 15.6 ± 3.9 Ma

89 POS 08A APATITE 12,020' - FT. MTN. FM. - SEABEE #1

IRRADIATION LU059

SLIDE NUMBER 7

COUNTED BY: POS

No.	Ns	Ni	Na	RATIO	U (ppm)	RHOs	RHOi	F.T. AGE (Ma)
1	0	5	4	0.000	14.9	0.000E+00	1.389E+06	0.0 ± 0.0
2	1	16	9	0.062	21.1	1.235E+05	1.975E+06	13.5 ± 13.9
3	0	12	4	0.000	35.6	0.000E+00	3.333E+06	0.0 ± 0.0
4	0	3	9	0.000	4.0	0.000E+00	3.704E+05	0.0 ± 0.0
5	1	7	4	0.143	20.8	2.778E+05	1.944E+06	30.8 ± 32.9
6	1	5	3	0.200	19.8	3.704E+05	1.852E+06	43.1 ± 47.2
7	0	12	9	0.000	15.8	0.000E+00	1.481E+06	0.0 ± 0.0
8	0	15	6	0.000	29.7	0.000E+00	2.778E+06	0.0 ± 0.0
9	0	6	6	0.000	11.9	0.000E+00	1.111E+06	0.0 ± 0.0
10	0	3	4	0.000	8.9	0.000E+00	8.333E+05	0.0 ± 0.0
11	0	4	4	0.000	11.9	0.000E+00	1.111E+06	0.0 ± 0.0
12	0	6	8	0.000	8.9	0.000E+00	8.333E+05	0.0 ± 0.0
13	0	2	4	0.000	5.9	0.000E+00	5.556E+05	0.0 ± 0.0
14	0	3	2	0.000	17.8	0.000E+00	1.667E+06	0.0 ± 0.0
15	0	21	12	0.000	20.8	0.000E+00	1.944E+06	0.0 ± 0.0
16	0	1	4	0.000	3.0	0.000E+00	2.778E+05	0.0 ± 0.0
17	0	5	6	0.000	9.9	0.000E+00	9.259E+05	0.0 ± 0.0
18	2	27	18	0.074	17.8	1.235E+05	1.667E+06	16.0 ± 11.7
19	2	25	6	0.080	49.5	3.704E+05	4.630E+06	17.3 ± 12.7
20	0	6	12	0.000	5.9	0.000E+00	5.556E+05	0.0 ± 0.0
21	1	45	15	0.022	35.6	7.407E+04	3.333E+06	4.8 ± 4.9
22	0	15	8	0.000	22.3	0.000E+00	2.083E+06	0.0 ± 0.0
23	1	68	16	0.015	50.5	6.944E+04	4.722E+06	3.2 ± 3.2
24	1	5	6	0.200	9.9	1.852E+05	9.259E+05	43.1 ± 47.2
25	0	4	10	0.000	4.8	0.000E+00	4.444E+05	0.0 ± 0.0
10		321			20.2	5.879E+04	1.887E+06	

Area of basic unit = .0000009 cm-2

Chi Squared = 18.340 with 24 degrees of freedom

P(chi squared) = 78.6 %

Correlation Coefficient = 0.512

Variance of SQR(Ns) = 0.29

Variance of SQR(Ni) = 2.98

Ns/Ni = 0.031 ± 0.010

Mean Ratio = 0.031 ± 0.010

Ages calculated using a zeta of 352.7 ± 5 for SRM612 glass

Rho D = 1.225E+06cm-2; ND = 2756

POOLED AGE = 6.7 ± 2.2 Ma

MEAN AGE = 6.9 ± 2.7 Ma

89 POS 09A APATITE 10,875' - FT. MTN. FM. - SEABEE #1

IRRADIATION LU059

SLIDE NUMBER 8

COUNTED BY: POS

No.	Ns	Ni	Na	RATIO	U (ppm)	RHOs	RHOi	F.T. AGE (Ma)
1	3	17	20	0.176	10.1	1.667E+05	9.444E+05	38.0 ± 23.8
2	10	41	16	0.244	30.4	6.944E+05	2.847E+06	52.5 ± 18.5
3	0	4	6	0.000	7.9	0.000E+00	7.407E+05	0.0 ± 0.0
4	0	5	16	0.000	3.7	0.000E+00	3.472E+05	0.0 ± 0.0
5	3	12	9	0.250	15.8	3.704E+05	1.481E+06	53.8 ± 34.7
6	0	7	9	0.000	9.2	0.000E+00	8.642E+05	0.0 ± 0.0
7	0	12	24	0.000	5.9	0.000E+00	5.556E+05	0.0 ± 0.0
8	0	3	6	0.000	5.9	0.000E+00	5.556E+05	0.0 ± 0.0
9	1	1	32	1.000	0.4	3.472E+04	3.472E+04	212.5 ± 300.5
10	0	9	9	0.000	11.9	0.000E+00	1.111E+06	0.0 ± 0.0
11	1	14	15	0.071	11.1	7.407E+04	1.037E+06	15.4 ± 16.0
12	0	3	12	0.000	3.0	0.000E+00	2.778E+05	0.0 ± 0.0
13	0	4	28	0.000	1.7	0.000E+00	1.587E+05	0.0 ± 0.0
14	1	10	16	0.100	7.4	6.944E+04	6.944E+05	21.6 ± 22.6
15	8	50	32	0.160	18.6	2.778E+05	1.736E+06	34.5 ± 13.2
16	0	23	20	0.000	13.7	0.000E+00	1.278E+06	0.0 ± 0.0
17	0	4	12	0.000	4.0	0.000E+00	3.704E+05	0.0 ± 0.0
18	0	5	6	0.000	9.9	0.000E+00	9.259E+05	0.0 ± 0.0
19	1	4	16	0.250	3.0	6.944E+04	2.778E+05	53.8 ± 60.1
20	1	6	4	0.167	17.8	2.778E+05	1.667E+06	35.9 ± 38.8
21	1	34	9	0.029	44.9	1.235E+05	4.198E+06	6.4 ± 6.4
22	0	8	16	0.000	5.9	0.000E+00	5.556E+05	0.0 ± 0.0
23	0	9	12	0.000	8.9	0.000E+00	8.333E+05	0.0 ± 0.0
24	0	1	4	0.000	3.0	0.000E+00	2.778E+05	0.0 ± 0.0
25	0	5	15	0.000	4.0	0.000E+00	3.704E+05	0.0 ± 0.0
	30	291			9.5	9.158E+04	8.883E+05	

Area of basic unit = .0000009 cm-2

Chi Squared = 27.613 with 24 degrees of freedom

P(chi squared) = 27.7 %

Correlation Coefficient = 0.809

Variance of SQR(Ns) = 0.85

Variance of SQR(Ni) = 2.46

Ns/Ni = 0.103 ± 0.020

Mean Ratio = 0.086 ± 0.023

Ages calculated using a zeta of 352.7 ± 5 for SRM612 glass

Rho D = 1.225E+06cm-2; ND = 2756

POOLED AGE = 22.2 ± 4.3 Ma

MEAN AGE = 21.1 ± 9.0 Ma

## 89 POS 10A APATITE 10,065' - FT. MTN. FM. - SEABEE #1

IRRADIATION LU059  
SLIDE NUMBER 9  
COUNTED BY: POS

No.	Ns	Ni	Na	RATIO	U (ppm)	RHOs	RHOi	F.T. AGE (Ma)
1	3	44	6	0.068	87.1	5.556E+05	8.148E+06	14.7 ± 8.8
2	8	40	12	0.200	39.6	7.407E+05	3.704E+06	43.1 ± 16.7
3	4	26	6	0.154	51.5	7.407E+05	4.815E+06	33.1 ± 17.8
4	0	8	9	0.000	10.6	0.000E+00	9.877E+05	0.0 ± 0.0
5	18	93	15	0.194	73.7	1.333E+06	6.889E+06	41.7 ± 10.8
6	2	9	4	0.222	26.7	5.556E+05	2.500E+06	47.8 ± 37.4
7	0	2	16	0.000	1.5	0.000E+00	1.389E+05	0.0 ± 0.0
8	5	18	14	0.278	15.3	3.968E+05	1.429E+06	59.7 ± 30.2
9	7	29	9	0.241	38.3	8.642E+05	3.580E+06	51.9 ± 21.9
10	1	7	15	0.143	5.5	7.407E+04	5.185E+05	30.8 ± 32.9
11	0	3	12	0.000	3.0	0.000E+00	2.778E+05	0.0 ± 0.0
12	5	57	12	0.088	56.4	4.630E+05	5.278E+06	18.9 ± 8.8
13	2	27	9	0.074	35.6	2.469E+05	3.333E+06	16.0 ± 11.7
14	1	12	9	0.083	15.8	1.235E+05	1.481E+06	18.0 ± 18.7
15	1	23	9	0.043	30.4	1.235E+05	2.840E+06	9.4 ± 9.6
16	1	7	8	0.143	10.4	1.389E+05	9.722E+05	30.8 ± 32.9
17	0	3	12	0.000	3.0	0.000E+00	2.778E+05	0.0 ± 0.0
18	1	3	30	0.333	1.2	3.704E+04	1.111E+05	71.6 ± 82.7
19	2	73	15	0.027	57.8	1.481E+05	5.407E+06	5.9 ± 4.2
20	0	24	28	0.000	10.2	0.000E+00	9.524E+05	0.0 ± 0.0
21	23	187	20	0.123	111.1	1.278E+06	1.039E+07	26.5 ± 5.9
22	6	52	12	0.115	51.5	5.556E+05	4.815E+06	24.9 ± 10.7
23	0	1	16	0.000	0.7	0.000E+00	6.944E+04	0.0 ± 0.0
24	5	29	9	0.172	38.3	6.173E+05	3.580E+06	37.1 ± 18.0
25	1	6	16	0.167	4.5	6.944E+04	4.167E+05	35.9 ± 38.8
26	5	34	6	0.147	67.3	9.259E+05	6.296E+06	31.7 ± 15.2
101	817				29.5	3.411E+05	2.759E+06	

Area of basic unit = .0000009 cm<sup>-2</sup>

Chi Squared = 26.028 with 25 degrees of freedom

P(chi squared) = 40.6 %

Correlation Coefficient = 0.894

Variance of SQR(Ns) = 1.59

Variance of SQR(Ni) = 8.62

Ns/Ni = 0.124 ± 0.013

Mean Ratio = 0.123 ± 0.016

Ages calculated using a zeta of 352.7 ± 5 for SRM612 glass

Rho D = 1.225E+06cm<sup>-2</sup>; ND = 2756

POOLED AGE = 26.6 ± 2.9 Ma

MEAN AGE = 25.0 ± 4.0 Ma



## 89 POS 11A APATITE 6,545' - TOROK FM. - SEABEE #1

IRRADIATION LU059

SLIDE NUMBER 10

COUNTED BY: POS

No.	Ns	Ni	Na	RATIO	U (ppm)	RHOs	RHOi	F.T. AGE (Ma)
1	2	5	4	0.400	14.9	5.556E+05	1.389E+06	85.8 ± 71.8
2	2	7	4	0.286	20.8	5.556E+05	1.944E+06	61.4 ± 49.3
3	1	3	4	0.333	8.9	2.778E+05	8.333E+05	71.6 ± 82.7
4	3	18	24	0.167	8.9	1.389E+05	8.333E+05	35.9 ± 22.4
5	2	1	4	2.000	3.0	5.556E+05	2.778E+05	418.2 ± 512.3
6	2	8	21	0.250	4.5	1.058E+05	4.233E+05	53.8 ± 42.5
7	2	9	4	0.222	26.7	5.556E+05	2.500E+06	47.8 ± 37.4
8	0	3	6	0.000	5.9	0.000E+00	5.556E+05	0.0 ± 0.0
9	1	4	6	0.250	7.9	1.852E+05	7.407E+05	53.8 ± 60.1
10	2	7	6	0.286	13.9	3.704E+05	1.296E+06	61.4 ± 49.3
11	4	16	6	0.250	31.7	7.407E+05	2.963E+06	53.8 ± 30.1
12	2	22	9	0.091	29.0	2.469E+05	2.716E+06	19.6 ± 14.5
13	0	9	8	0.000	13.4	0.000E+00	1.250E+06	0.0 ± 0.0
14	2	2	8	1.000	3.0	2.778E+05	2.778E+05	212.5 ± 212.5
15	3	17	6	0.176	33.7	5.556E+05	3.148E+06	38.0 ± 23.8
16	1	14	12	0.071	13.9	9.259E+04	1.296E+06	15.4 ± 16.0
17	3	30	12	0.100	29.7	2.778E+05	2.778E+06	21.6 ± 13.1
18	11	42	6	0.262	83.2	2.037E+06	7.778E+06	56.3 ± 19.1
19	0	3	9	0.000	4.0	0.000E+00	3.704E+05	0.0 ± 0.0
20	0	5	6	0.000	9.9	0.000E+00	9.259E+05	0.0 ± 0.0
21	1	5	6	0.200	9.9	1.852E+05	9.259E+05	43.1 ± 47.2
22	1	6	12	0.167	5.9	9.259E+04	5.556E+05	35.9 ± 38.8
23	5	38	18	0.132	25.1	3.086E+05	2.346E+06	28.4 ± 13.5
24	0	7	8	0.000	10.4	0.000E+00	9.722E+05	0.0 ± 0.0
25	0	6	8	0.000	8.9	0.000E+00	8.333E+05	0.0 ± 0.0
50		287			15.7	2.560E+05	1.470E+06	

Area of basic unit = .0000009 cm-2

Chi Squared = 23.327 with 24 degrees of freedom

P(chi squared) = 50.1 %

Correlation Coefficient = 0.808

Variance of SQR(Ns) = 0.68

Variance of SQR(Ni) = 2.10

Ns/Ni = 0.174 ± 0.027

Mean Ratio = 0.174 ± 0.027

Ages calculated using a zeta of 352.7 ± 5 for SRM612 glass

Rho D = 1.225E+06cm-2; ND = 2756

POOLED AGE = 37.5 ± 5.8 Ma

MEAN AGE = 57.1 ± 17.9 Ma

## 89 POS 12A APATITE 5,397' - TOROK FM. - SEABEE #1

IRRADIATION LU059  
SLIDE NUMBER 11  
COUNTED BY: POS

No.	Ns	Ni	Na	RATIO	U (ppm)	RHOs	RHOi	F.T. AGE (Ma)
1	2	17	9	0.118	22.4	2.469E+05	2.099E+06	25.4 ± 19.0
2	2	19	9	0.105	25.1	2.469E+05	2.346E+06	22.7 ± 16.9
3	5	42	30	0.119	16.6	1.852E+05	1.556E+06	25.7 ± 12.2
4	3	6	6	0.500	11.9	5.556E+05	1.111E+06	107.1 ± 75.8
5	3	5	20	0.600	3.0	1.667E+05	2.778E+05	128.3 ± 93.8
6	5	13	20	0.385	7.7	2.778E+05	7.222E+05	82.6 ± 43.5
7	9	55	16	0.164	40.8	6.250E+05	3.819E+06	35.3 ± 12.7
8	18	44	15	0.409	34.9	1.333E+06	3.259E+06	87.8 ± 24.6
9	0	5	15	0.000	4.0	0.000E+00	3.704E+05	0.0 ± 0.0
10	4	24	4	0.167	71.3	1.111E+06	6.667E+06	35.9 ± 19.4
11	1	8	18	0.125	5.3	6.173E+04	4.938E+05	26.9 ± 28.6
12	0	3	8	0.000	4.5	0.000E+00	4.167E+05	0.0 ± 0.0
13	1	7	18	0.143	4.6	6.173E+04	4.321E+05	30.8 ± 32.9
14	6	28	12	0.214	27.7	5.556E+05	2.593E+06	46.1 ± 20.8
15	2	13	27	0.154	5.7	8.230E+04	5.350E+05	33.1 ± 25.2
16	2	7	12	0.286	6.9	1.852E+05	6.481E+05	61.4 ± 49.3
17	4	10	20	0.400	5.9	2.222E+05	5.556E+05	85.8 ± 50.8
18	2	5	9	0.400	6.6	2.469E+05	6.173E+05	85.8 ± 71.8
19	2	4	4	0.500	11.9	5.556E+05	1.111E+06	107.1 ± 92.8
20	3	8	8	0.375	11.9	4.167E+05	1.111E+06	80.5 ± 54.5
21	9	40	9	0.225	52.8	1.111E+06	4.938E+06	48.4 ± 17.9
22	0	5	8	0.000	7.4	0.000E+00	6.944E+05	0.0 ± 0.0
23	2	5	6	0.400	9.9	3.704E+05	9.259E+05	85.8 ± 71.8
24	3	5	6	0.600	9.9	5.556E+05	9.259E+05	128.3 ± 93.8
25	3	13	9	0.231	17.2	3.704E+05	1.605E+06	49.7 ± 31.8
91	391				14.6	3.180E+05	1.366E+06	

Area of basic unit = .0000009 cm<sup>2</sup>

Chi Squared = 22.503 with 24 degrees of freedom  
P(chi squared) = 54.9 %  
Correlation Coefficient = 0.790  
Variance of SQR(Ns) = 0.89  
Variance of SQR(Ni) = 2.78

Ns/Ni = 0.233 ± 0.027  
Mean Ratio = 0.233 ± 0.029

Ages calculated using a zeta of 352.7 ± 5 for SRM612 glass  
Rho D = 1.225E+06cm<sup>-2</sup>; ND = 2756

POOLED AGE = 50.1 ± 5.9 Ma  
MEAN AGE = 56.9 ± 7.9 Ma

## 89 POS 13A APATTITE 3,000' - NANUSHUK GP. - SEABEE #1

IRRADIATION LU059

SLIDE NUMBER 12

COUNTED BY: POS

No.	Ns	Ni	Na	RATIO	U (ppm)	RHOs	RHOi	F.T. AGE (Ma)
1	24	56	15	0.429	44.4	1.778E+06	4.148E+06	91.9 ± 22.5
2	6	17	24	0.353	8.4	2.778E+05	7.870E+05	75.8 ± 36.0
3	29	72	18	0.403	47.5	1.790E+06	4.444E+06	86.4 ± 19.1
4	8	14	25	0.571	6.7	3.556E+05	6.222E+05	122.3 ± 54.3
5	10	23	20	0.435	13.7	5.556E+05	1.278E+06	93.2 ± 35.4
6	2	2	42	1.000	0.6	5.291E+04	5.291E+04	212.5 ± 212.5
7	94	221	36	0.425	72.9	2.901E+06	6.821E+06	91.2 ± 11.4
8	1	7	9	0.143	9.2	1.235E+05	8.642E+05	30.8 ± 32.9
9	15	39	50	0.385	9.3	3.333E+05	8.667E+05	82.6 ± 25.2
10	26	64	12	0.406	63.4	2.407E+06	5.926E+06	87.2 ± 20.4
11	4	11	90	0.364	1.5	4.938E+04	1.358E+05	78.1 ± 45.6
12	11	21	28	0.524	8.9	4.365E+05	8.333E+05	112.2 ± 41.8
13	8	10	20	0.800	5.9	4.444E+05	5.556E+05	170.5 ± 81.0
14	7	17	42	0.412	4.8	1.852E+05	4.497E+05	88.3 ± 39.7
15	9	27	40	0.333	8.0	2.500E+05	7.500E+05	71.6 ± 27.6
16	62	183	36	0.339	60.4	1.914E+06	5.648E+06	72.8 ± 10.8
17	29	60	24	0.483	29.7	1.343E+06	2.778E+06	103.6 ± 23.6
18	97	199	20	0.487	118.2	5.389E+06	1.106E+07	104.4 ± 13.2
19	22	26	28	0.846	11.0	8.730E+05	1.032E+06	180.2 ± 52.4
20	8	20	12	0.400	19.8	7.407E+05	1.852E+06	85.8 ± 36.0
21	131	157	25	0.834	74.6	5.822E+06	6.978E+06	177.8 ± 21.5
22	5	17	32	0.294	6.3	1.736E+05	5.903E+05	63.2 ± 32.2
23	7	15	9	0.467	19.8	8.642E+05	1.852E+06	100.0 ± 45.8
24	100	197	16	0.508	146.3	6.944E+06	1.368E+07	108.7 ± 13.6
25	7	24	40	0.292	7.1	1.944E+05	6.667E+05	62.7 ± 27.0
722	1499				25.0	1.125E+06	2.336E+06	

Area of basic unit = .0000009 cm-2

Chi Squared = 42.706 with 24 degrees of freedom

P(chi squared) = 1.1 %

Correlation Coefficient = 0.934

Variance of SQR(Ns) = 8.73

Variance of SQR(Ni) = 16.20

Ns/Ni = 0.482 ± 0.022

Mean Ratio = 0.466 ± 0.033

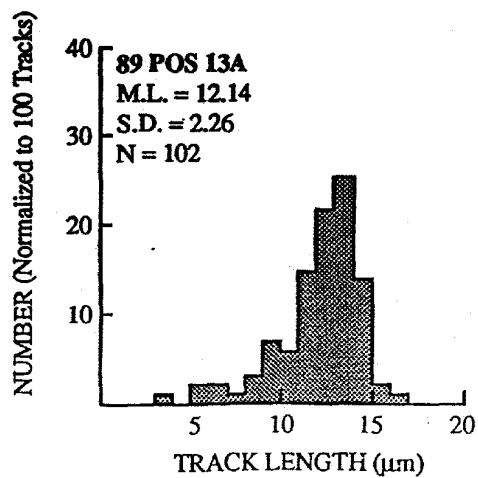
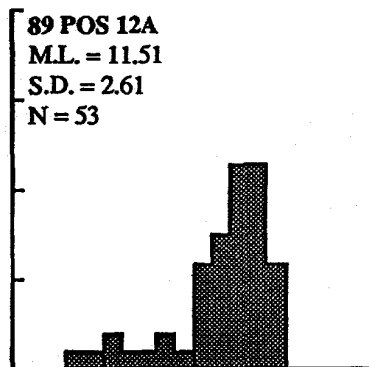
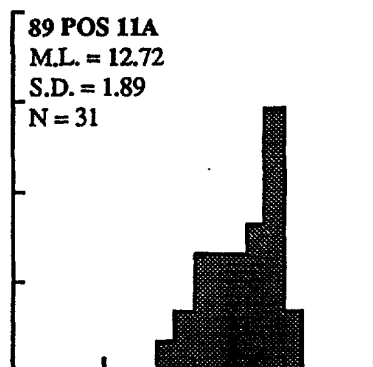
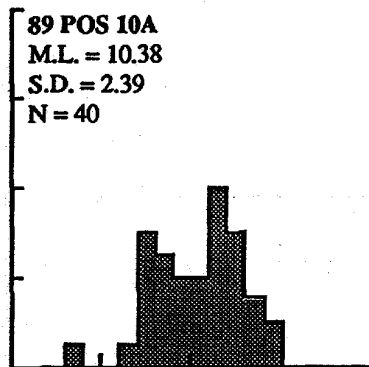
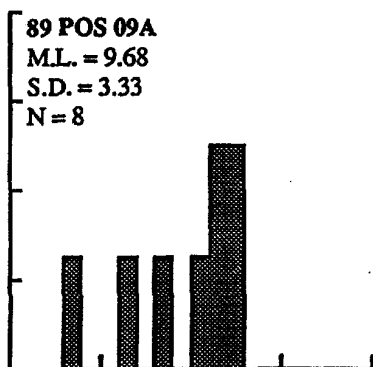
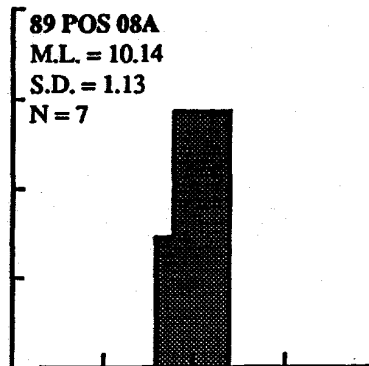
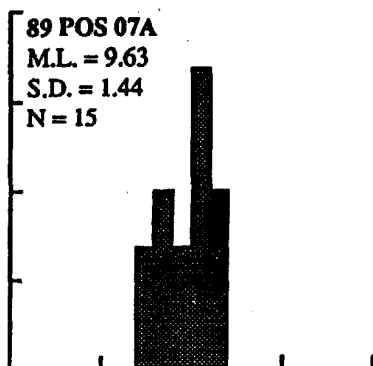
Ages calculated using a zeta of 352.7 ± 5 for SRM612 glass

Rho D = 1.225E+06cm-2; ND = 2756

POOLED AGE = 103.2 ± 5.3 Ma

MEAN AGE = 102.3 ± 8.8 Ma

## SEABEE TEST WELL #1 LENGTH DISTRIBUTIONS



# GRAIN-AGE DATA FROM EXXON ALASKA STATE C-1

89 POS 14A APATITE 13,600' - THOMPSON SS. - ALASKA STATE C-1

IRRADIATION LU059

SLIDE NUMBER 13

COUNTED BY: POS

No.	Ns	Ni	Na	RATIO	U (ppm)	RHOs	RHOi	F.T. AGE (Ma)
1	0	5	8	0.000	7.4	0.000E+00	6.944E+05	0.0 ± 0.0
2	0	4	4	0.000	11.9	0.000E+00	1.111E+06	0.0 ± 0.0
3	0	12	12	0.000	11.9	0.000E+00	1.111E+06	0.0 ± 0.0
4	1	7	10	0.143	8.3	1.111E+05	7.778E+05	30.8 ± 32.9
5	0	4	6	0.000	7.9	0.000E+00	7.407E+05	0.0 ± 0.0
6	0	3	4	0.000	8.9	0.000E+00	8.333E+05	0.0 ± 0.0
7	2	14	18	0.143	9.2	1.235E+05	8.642E+05	30.8 ± 23.3
8	0	7	9	0.000	9.2	0.000E+00	8.642E+05	0.0 ± 0.0
9	0	3	4	0.000	8.9	0.000E+00	8.333E+05	0.0 ± 0.0
10	0	4	6	0.000	7.9	0.000E+00	7.407E+05	0.0 ± 0.0
11	1	6	6	0.167	11.9	1.852E+05	1.111E+06	35.9 ± 38.8
12	0	7	12	0.000	6.9	0.000E+00	6.481E+05	0.0 ± 0.0
13	1	11	8	0.091	16.3	1.389E+05	1.528E+06	19.6 ± 20.5
14	0	9	12	0.000	8.9	0.000E+00	8.333E+05	0.0 ± 0.0
	5	96			9.6	4.669E+04	8.964E+05	

Area of basic unit = .0000009 cm-2

Chi Squared = 7.516 with 13 degrees of freedom

P(chi squared) = 87.4 %

Correlation Coefficient = 0.618

Variance of SQR(Ns) = 0.28

Variance of SQR(Ni) = 0.42

Ns/Ni = 0.052 ± 0.024

Mean Ratio = 0.052 ± 0.024

Ages calculated using a zeta of 352.7 ± 5 for SRM612 glass

Rho D = 1.225E+06cm-2; ND = 2756

POOLED AGE = 11.2 ± 5.2 Ma

MEAN AGE = 8.4 ± 3.8 Ma

## 89 POS 15A APATITE 13,000' - THOMPSON SS. - ALASKA STATE C-1

IRRADIATION LU059

SLIDE NUMBER 14

COUNTED BY: POS

No.	Ns	Ni	Na	RATIO	U (ppm)	RHOs	RHOi	F.T. AGE (Ma)
1	1	11	10	0.091	13.1	1.111E+05	1.222E+06	19.6 ± 20.5
2	2	3	16	0.667	2.2	1.389E+05	2.083E+05	142.4 ± 130.1
3	0	3	30	0.000	1.2	0.000E+00	1.111E+05	0.0 ± 0.0
4	1	5	15	0.200	4.0	7.407E+04	3.704E+05	43.1 ± 47.2
5	7	45	49	0.156	10.9	1.587E+05	1.020E+06	33.5 ± 13.6
6	11	20	30	0.550	7.9	4.074E+05	7.407E+05	117.7 ± 44.3
7	10	51	12	0.196	50.5	9.259E+05	4.722E+06	42.2 ± 14.6
8	0	5	35	0.000	1.7	0.000E+00	1.587E+05	0.0 ± 0.0
9	32	118	40	0.271	35.1	8.889E+05	3.278E+06	58.3 ± 11.7
10	1	7	20	0.143	4.2	5.556E+04	3.889E+05	30.8 ± 32.9
11	0	15	35	0.000	5.1	0.000E+00	4.762E+05	0.0 ± 0.0
12	3	5	10	0.600	5.9	3.333E+05	5.556E+05	128.3 ± 93.8
13	3	19	35	0.158	6.4	9.524E+04	6.032E+05	34.0 ± 21.2
14	1	3	20	0.333	1.8	5.556E+04	1.667E+05	71.6 ± 82.7
15	1	3	24	0.333	1.5	4.630E+04	1.389E+05	71.6 ± 82.7
16	0	3	25	0.000	1.4	0.000E+00	1.333E+05	0.0 ± 0.0
17	6	19	28	0.316	8.1	2.381E+05	7.540E+05	67.9 ± 31.8
18	5	25	18	0.200	16.5	3.086E+05	1.543E+06	43.1 ± 21.1
19	1	9	12	0.111	8.9	9.259E+04	8.333E+05	24.0 ± 25.3
20	9	32	16	0.281	23.8	6.250E+05	2.222E+06	60.5 ± 22.9
21	6	10	12	0.600	9.9	5.556E+05	9.259E+05	128.3 ± 66.3
22	2	27	30	0.074	10.7	7.407E+04	1.000E+06	16.0 ± 11.7
23	0	3	12	0.000	3.0	0.000E+00	2.778E+05	0.0 ± 0.0
24	0	4	15	0.000	3.2	0.000E+00	2.963E+05	0.0 ± 0.0
25	4	13	21	0.308	7.4	2.116E+05	6.878E+05	66.1 ± 37.8
26	38	122	24	0.311	60.4	1.759E+06	5.648E+06	66.9 ± 12.5
	144	580			11.6	2.694E+05	1.085E+06	

Area of basic unit = .0000009 cm-2

Chi Squared = 28.762 with 25 degrees of freedom

P(chi squared) = 27.4 %

Correlation Coefficient = 0.961

Variance of SQR(Ns) = 2.59

Variance of SQR(Ni) = 6.72

Ns/Ni = 0.248 ± 0.023

Mean Ratio = 0.241 ± 0.026

Ages calculated using a zeta of 352.7 ± 5 for SRM612 glass

Rho D = 1.225E+06cm-2; ND = 2756

POOLED AGE = 53.4 ± 5.1 Ma

MEAN AGE = 48.8 ± 8.6 Ma

## 89 POS 16A APATTIE 11,450' - CANNING FM. - ALASKA STATE C-1

IRRADIATION LU060

SLIDE NUMBER 1

COUNTED BY: POS

No.	Ns	Ni	Na	RATIO	U (ppm)	RHOs	RHOi	F.T. AGE (Ma)
1	2	5	12	0.400	5.0	1.852E+05	4.630E+05	85.4 ± 71.4
2	7	89	42	0.079	25.3	1.852E+05	2.354E+06	16.9 ± 6.6
3	1	2	9	0.500	2.7	1.235E+05	2.469E+05	106.5 ± 130.5
4	34	107	18	0.318	71.0	2.099E+06	6.605E+06	67.9 ± 13.5
5	4	9	25	0.444	4.3	1.778E+05	4.000E+05	94.8 ± 57.0
6	1	13	6	0.077	25.9	1.852E+05	2.407E+06	16.5 ± 17.1
7	2	1	12	2.000	1.0	1.852E+05	9.259E+04	415.9 ± 509.4
8	1	6	30	0.167	2.4	3.704E+04	2.222E+05	35.7 ± 38.6
9	3	8	14	0.375	6.8	2.381E+05	6.349E+05	80.0 ± 54.2
10	1	2	9	0.500	2.7	1.235E+05	2.469E+05	106.5 ± 130.5
11	4	34	24	0.118	16.9	1.852E+05	1.574E+06	25.2 ± 13.3
12	2	6	12	0.333	6.0	1.852E+05	5.556E+05	71.2 ± 58.2
13	4	10	24	0.400	5.0	1.852E+05	4.630E+05	85.4 ± 50.5
14	13	34	42	0.382	9.7	3.439E+05	8.995E+05	81.6 ± 26.7
15	2	3	28	0.667	1.3	7.936E+04	1.190E+05	141.6 ± 129.3
16	2	6	25	0.333	2.9	8.889E+04	2.667E+05	71.2 ± 58.2
17	0	4	28	0.000	1.7	0.000E+00	1.587E+05	0.0 ± 0.0
18	0	17	16	0.000	12.7	0.000E+00	1.181E+06	0.0 ± 0.0
19	2	13	20	0.154	7.8	1.111E+05	7.222E+05	33.0 ± 25.0
20	2	5	12	0.400	5.0	1.852E+05	4.630E+05	85.4 ± 71.4
21	3	13	50	0.231	3.1	6.667E+04	2.889E+05	49.4 ± 31.6
22	31	42	48	0.738	10.5	7.176E+05	9.722E+05	156.6 ± 37.3
23	4	7	16	0.571	5.2	2.778E+05	4.861E+05	121.6 ± 76.3
24	7	61	40	0.115	18.2	1.944E+05	1.694E+06	24.6 ± 9.8
25	6	16	15	0.375	12.7	4.444E+05	1.185E+06	80.0 ± 38.4
138	513				10.6	2.657E+05	9.879E+05	

Area of basic unit = .0000009 cm-2

Chi Squared = 57.627 with 24 degrees of freedom

P(chi squared) = 0.0 %

Correlation Coefficient = 0.722

Variance of SQR(Ns) = 1.89

Variance of SQR(Ni) = 6.11

Ns/Ni = 0.269 ± 0.026

Mean Ratio = 0.281 ± 0.046

Ages calculated using a zeta of 352.7 ± 5 for SRM612 glass

Rho D = 1.218E+06cm-2; ND = 2741

POOLED AGE = 57.5 ± 5.7 Ma

MEAN AGE = 82.6 ± 16.7 Ma

## 89 POS 17A APATITE 9,100' - CANNING FM. - ALASKA STATE C-1

IRRADIATION LU060

SLIDE NUMBER 2

COUNTED BY: POS

No.	Ns	Ni	Na	RATIO	U (ppm)	RHOs	RHOi	F.T. AGE (Ma)
1	6	15	15	0.400	12.0	4.444E+05	1.111E+06	85.4 ± 41.3
2	4	8	16	0.500	6.0	2.778E+05	5.556E+05	106.5 ± 65.3
3	3	14	10	0.214	16.7	3.333E+05	1.556E+06	45.9 ± 29.2
4	2	12	12	0.167	12.0	1.852E+05	1.111E+06	35.7 ± 27.3
5	0	5	18	0.000	3.3	0.000E+00	3.086E+05	0.0 ± 0.0
6	3	4	6	0.750	8.0	5.556E+05	7.407E+05	159.1 ± 121.6
7	8	20	24	0.400	10.0	3.704E+05	9.259E+05	85.4 ± 35.8
8	8	64	21	0.125	36.4	4.233E+05	3.386E+06	26.8 ± 10.1
9	3	7	15	0.429	5.6	2.222E+05	5.185E+05	91.4 ± 63.1
10	4	2	16	2.000	1.5	2.778E+05	1.389E+05	415.9 ± 360.3
11	4	9	12	0.444	9.0	3.704E+05	8.333E+05	94.8 ± 57.0
12	4	7	15	0.571	5.6	2.963E+05	5.185E+05	121.6 ± 76.3
13	7	82	20	0.085	49.0	3.889E+05	4.556E+06	18.3 ± 7.2
14	67	221	70	0.303	37.7	1.063E+06	3.508E+06	64.8 ± 9.2
15	15	21	18	0.714	13.9	9.259E+05	1.296E+06	151.6 ± 51.4
16	17	44	35	0.386	15.0	5.397E+05	1.397E+06	82.5 ± 23.6
17	10	15	18	0.667	10.0	6.173E+05	9.259E+05	141.6 ± 57.9
18	2	5	8	0.400	7.5	2.778E+05	6.944E+05	85.4 ± 71.4
19	52	69	40	0.754	20.6	1.444E+06	1.917E+06	159.9 ± 29.6
20	7	71	30	0.099	28.3	2.593E+05	2.630E+06	21.1 ± 8.4
	226	695			19.8	5.993E+05	1.843E+06	

Area of basic unit = .0000009 cm-2

Chi Squared = 74.470 with 19 degrees of freedom

P(chi squared) = 0.0 %

Correlation Coefficient = 0.830

Variance of SQR(Ns) = 3.65

Variance of SQR(Ni) = 11.15

Ns/Ni = 0.325 ± 0.025

Mean Ratio = 0.362 ± 0.059

Ages calculated using a zeta of 352.7 ± 5 for SRM612 glass

Rho D = 1.218E+06cm-2; ND = 2741

POOLED AGE = 69.5 ± 5.6 Ma

MEAN AGE = 100.3 ± 20.4 Ma



## 89 POS 19A APATITE 2,200' - SAGAVANIRKTOK FM. - ALASKA STATE C-1

IRRADIATION LU060

SLIDE NUMBER 4

COUNTED BY: POS

No.	Ns	Ni	Na	RATIO	U (ppm)	RHOs	RHOi	F.T. AGE (Ma)
1	113	287	70	0.394	49.0	1.794E+06	4.556E+06	84.0 ± 9.5
2	14	41	9	0.341	54.4	1.728E+06	5.062E+06	72.9 ± 22.6
3	0	6	36	0.000	2.0	0.000E+00	1.852E+05	0.0 ± 0.0
4	1	2	9	0.500	2.7	1.235E+05	2.469E+05	106.5 ± 130.5
5	11	19	4	0.579	56.8	3.056E+06	5.278E+06	123.2 ± 46.8
6	0	9	9	0.000	12.0	0.000E+00	1.111E+06	0.0 ± 0.0
7	0	4	4	0.000	12.0	0.000E+00	1.111E+06	0.0 ± 0.0
8	0	1	16	0.000	0.7	0.000E+00	6.944E+04	0.0 ± 0.0
9	4	4	4	1.000	12.0	1.111E+06	1.111E+06	211.3 ± 149.5
10	46	62	30	0.742	24.7	1.704E+06	2.296E+06	157.4 ± 30.9
11	1	1	9	1.000	1.3	1.235E+05	1.235E+05	211.3 ± 298.9
12	0	4	49	0.000	1.0	0.000E+00	9.070E+04	0.0 ± 0.0
	190	440			21.1	8.478E+05	1.963E+06	

Area of basic unit = .0000009 cm-2

Chi Squared = 22.047 with 11 degrees of freedom

P(chi squared) = 2.4 %

Correlation Coefficient = 0.980

Variance of SQR(Ns) = 11.13

Variance of SQR(Ni) = 20.73

Ns/Ni = 0.432 ± 0.037

Mean Ratio = 0.401 ± 0.080

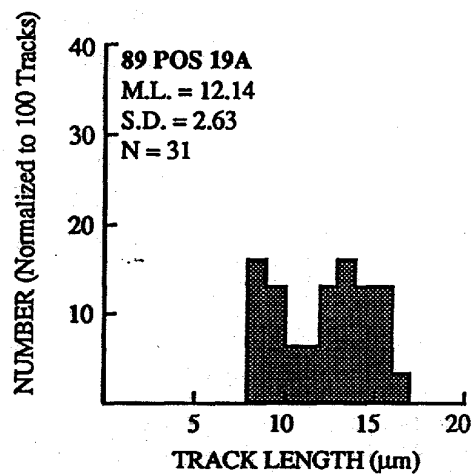
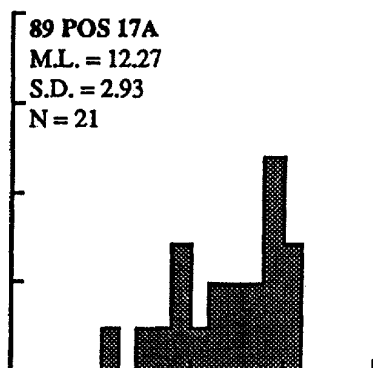
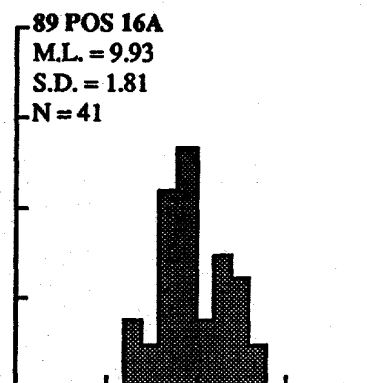
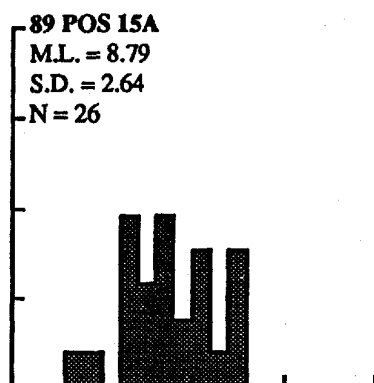
Ages calculated using a zeta of 352.7 ± 5 for SRM612 glass

Rho D = 1.218E+06cm-2; ND = 2741

POOLED AGE = 92.1 ± 8.3 Ma

MEAN AGE = 81.0 ± 24.1 Ma

## ALASKA STATE C-1 LENGTH DISTRIBUTIONS



# GRAIN-AGE DATA FROM B.P. PRUDHOE BAY UNIT J-1

89 POS 20A APATTITE 11,420' - KEKIKTUK CONG. - PRUDHOE BAY UNIT J-1

IRRADIATION LU060

SLIDE NUMBER 5

COUNTED BY: POS

No.	Ns	Ni	Na	RATIO	U (ppm)	RHOs	RHOi	F.T. AGE (Ma)
1	26	67	36	0.388	22.2	8.025E+05	2.068E+06	82.8 ± 19.2
2	1	2	9	0.500	2.7	1.235E+05	2.469E+05	106.5 ± 130.5
3	0	9	12	0.000	9.0	0.000E+00	8.333E+05	0.0 ± 0.0
4	23	30	20	0.767	17.9	1.278E+06	1.667E+06	162.6 ± 45.2
5	0	7	15	0.000	5.6	0.000E+00	5.185E+05	0.0 ± 0.0
6	9	11	8	0.818	16.4	1.250E+06	1.528E+06	173.4 ± 78.0
7	2	12	10	0.167	14.3	2.222E+05	1.333E+06	35.7 ± 27.3
8	7	10	24	0.700	5.0	3.241E+05	4.630E+05	148.6 ± 73.3
9	1	8	21	0.125	4.6	5.291E+04	4.233E+05	26.8 ± 28.4
10	0	2	36	0.000	0.7	0.000E+00	6.173E+04	0.0 ± 0.0
11	4	6	20	0.667	3.6	2.222E+05	3.333E+05	141.6 ± 91.5
	73	164			9.3	3.844E+05	8.636E+05	

Area of basic unit = .0000009 cm-2

Chi Squared = 18.895 with 10 degrees of freedom

P(chi squared) = 4.2 %

Correlation Coefficient = 0.893

Variance of SQR(Ns) = 3.31

Variance of SQR(Ni) = 3.71

Ns/Ni = 0.445 ± 0.063

Mean Ratio = 0.388 ± 0.094

Ages calculated using a zeta of 352.7 ± 5 for SRM612 glass

Rho D = 1.218E+06cm-2; ND = 2741

POOLED AGE = 94.9 ± 13.5 Ma

MEAN AGE = 80.2 ± 21.3 Ma

## 89 POS 22A APATTIE 9,100' - IVISHAK FM. - PRUDHOE BAY UNIT J-1

IRRADIATION LU060

SLIDE NUMBER 7

COUNTED BY: POS

No.	Ns	Ni	Na	RATIO	U (ppm)	RHOs	RHOi	F.T. AGE (Ma)
1	7	12	6	0.583	23.9	1.296E+06	2.222E+06	124.1 ± 59.1
2	3	12	12	0.250	12.0	2.778E+05	1.111E+06	53.5 ± 34.5
3	0	10	9	0.000	13.3	0.000E+00	1.235E+06	0.0 ± 0.0
4	1	23	25	0.043	11.0	4.444E+04	1.022E+06	9.3 ± 9.5
5	2	8	9	0.250	10.6	2.469E+05	9.877E+05	53.5 ± 42.3
6	6	117	16	0.051	87.4	4.167E+05	8.125E+06	11.0 ± 4.6
7	1	9	15	0.111	7.2	7.407E+04	6.667E+05	23.8 ± 25.1
8	1	13	15	0.077	10.4	7.407E+04	9.630E+05	16.5 ± 17.1
9	12	79	20	0.152	47.2	6.667E+05	4.389E+06	32.5 ± 10.1
10	3	46	24	0.065	22.9	1.389E+05	2.130E+06	14.0 ± 8.3
11	0	13	20	0.000	7.8	0.000E+00	7.222E+05	0.0 ± 0.0
12	0	5	12	0.000	5.0	0.000E+00	4.630E+05	0.0 ± 0.0
13	3	15	12	0.200	14.9	2.778E+05	1.389E+06	42.8 ± 27.1
14	3	9	15	0.333	7.2	2.222E+05	6.667E+05	71.2 ± 47.5
15	1	9	20	0.111	5.4	5.556E+04	5.000E+05	23.8 ± 25.1
16	0	8	6	0.000	15.9	0.000E+00	1.481E+06	0.0 ± 0.0
17	8	21	20	0.381	12.5	4.444E+05	1.167E+06	81.3 ± 33.8
18	0	15	16	0.000	11.2	0.000E+00	1.042E+06	0.0 ± 0.0
19	3	39	24	0.077	19.4	1.389E+05	1.806E+06	16.5 ± 9.9
20	2	9	20	0.222	5.4	1.111E+05	5.000E+05	47.6 ± 37.2
21	3	20	9	0.150	26.6	3.704E+05	2.469E+06	32.1 ± 19.9
22	41	54	28	0.759	23.0	1.627E+06	2.143E+06	161.1 ± 33.6
23	5	37	21	0.135	21.1	2.646E+05	1.958E+06	29.0 ± 13.8
24	8	9	9	0.889	12.0	9.877E+05	1.111E+06	188.2 ± 91.5
25	3	11	18	0.273	7.3	1.852E+05	6.790E+05	58.3 ± 38.0
116	603				18.0	3.214E+05	1.671E+06	

Area of basic unit = .0000009 cm-2

Chi Squared = 106.127 with 24 degrees of freedom

P(chi squared) = 0.0 %

Correlation Coefficient = 0.412

Variance of SQR(Ns) = 1.92

Variance of SQR(Ni) = 4.49

Ns/Ni = 0.192 ± 0.020

Mean Ratio = 0.180 ± 0.038

Ages calculated using a zeta of 352.7 ± 5 for SRM612 glass

Rho D = 1.218E+06cm-2; ND = 2741

POOLED AGE = 41.2 ± 4.3 Ma

MEAN AGE = 43.8 ± 10.1 Ma

## 89 POS 23A APATTIE 8,520' - SHUBLIK FM. - PRUDHOE BAY UNIT J-1

IRRADIATION LU060

SLIDE NUMBER 8

COUNTED BY: POS

No.	Ns	Ni	Na	RATIO	U (ppm)	RHOs	RHOi	F.T. AGE (Ma)
1	7	12	12	0.583	12.0	6.481E+05	1.111E+06	124.1 ± 59.1
2	0	7	20	0.000	4.2	0.000E+00	3.889E+05	0.0 ± 0.0
3	1	6	10	0.167	7.2	1.111E+05	6.667E+05	35.7 ± 38.6
4	11	14	24	0.786	7.0	5.093E+05	6.481E+05	166.6 ± 67.2
	19	39			7.1	3.199E+05	6.566E+05	

Area of basic unit = .0000009 cm-2

Chi Squared = 6.073 with 3 degrees of freedom

P(chi squared) = 10.8 %

Correlation Coefficient = 0.977

Variance of SQR(Ns) = 2.29

Variance of SQR(Ni) = 0.39

Ns/Ni = 0.487 ± 0.136

Mean Ratio = 0.422 ± 0.159

Ages calculated using a zeta of 352.7 ± 5 for SRM612 glass

Rho D = 1.218E+06cm-2; ND = 2741

POOLED AGE = 103.8 ± 29.1 Ma

MEAN AGE = 81.9 ± 38.8 Ma

## 89 POS 24A APATITE 6,290' - COLVILLE GP. - PRUDHOE BAY UNIT J-1

IRRADIATION LU060

SLIDE NUMBER 9

COUNTED BY: POS

No.	Ns	Ni	Na	RATIO	U (ppm)	RHOs	RHOi	F.T. AGE (Ma)
1	2	3	24	0.667	1.5	9.259E+04	1.389E+05	141.6 ± 129.3
2	32	43	40	0.744	12.8	8.889E+05	1.194E+06	157.9 ± 37.1
3	18	29	24	0.621	14.4	8.333E+05	1.343E+06	132.0 ± 39.7
4	20	21	20	0.952	12.5	1.111E+06	1.167E+06	201.4 ± 63.1
5	30	29	20	1.034	17.3	1.667E+06	1.611E+06	218.5 ± 57.1
6	8	6	27	1.333	2.7	3.292E+05	2.469E+05	280.2 ± 151.5
7	4	3	20	1.333	1.8	2.222E+05	1.667E+05	280.2 ± 214.1
8	13	22	20	0.591	13.1	7.222E+05	1.222E+06	125.7 ± 44.1
9	18	16	40	1.125	4.8	5.000E+05	4.444E+05	237.2 ± 81.7
10	2	5	12	0.400	5.0	1.852E+05	4.630E+05	85.4 ± 71.4
11	140	196	30	0.714	78.1	5.185E+06	7.259E+06	151.6 ± 17.2
12	4	3	28	1.333	1.3	1.587E+05	1.190E+05	280.2 ± 214.1
13	1	2	18	0.500	1.3	6.173E+04	1.235E+05	106.5 ± 130.5
14	43	72	28	0.597	30.7	1.706E+06	2.857E+06	127.0 ± 24.7
15	1	3	30	0.333	1.2	3.704E+04	1.111E+05	71.2 ± 82.2
16	2	2	20	1.000	1.2	1.111E+05	1.111E+05	211.3 ± 211.4
17	7	7	20	1.000	4.2	3.889E+05	3.889E+05	211.3 ± 113.1
18	14	20	32	0.700	7.5	4.861E+05	6.944E+05	148.6 ± 51.9
19	127	208	30	0.611	82.9	4.704E+06	7.704E+06	129.8 ± 14.9
20	31	46	12	0.674	45.8	2.870E+06	4.259E+06	143.2 ± 33.4
21	5	3	16	1.667	2.2	3.472E+05	2.083E+05	348.4 ± 254.6
22	12	39	16	0.308	29.1	8.333E+05	2.708E+06	65.8 ± 21.8
23	21	60	32	0.350	22.4	7.292E+05	2.083E+06	74.7 ± 19.0
24	36	81	32	0.444	30.2	1.250E+06	2.812E+06	94.8 ± 19.1
25	84	175	48	0.480	43.6	1.944E+06	4.051E+06	102.3 ± 13.8
675	1094				20.5	1.174E+06	1.902E+06	

Area of basic unit = .0000009 cm-2

Chi Squared = 35.887 with 24 degrees of freedom

P(chi squared) = 5.6 %

Correlation Coefficient = 0.972

Variance of SQR(Ns) = 8.75

Variance of SQR(Ni) = 15.74

Ns/Ni = 0.617 ± 0.030

Mean Ratio = 0.635 ± 0.046

Ages calculated using a zeta of 352.7 ± 5 for SRM612 glass

Rho D = 1.218E+06cm-2; ND = 2741

POOLED AGE = 131.2 ± 7.1 Ma

MEAN AGE = 165.5 ± 16.0 Ma

## 89 POS 25A APATITE 3,500' - COLVILLE GP. - PRUDHOE BAY UNIT J-1

IRRADIATION LU060

SLIDE NUMBER 10

COUNTED BY: POS

No.	Ns	Ni	Na	RATIO	U (ppm)	RHOs	RHOi	F.T. AGE (Ma)
1	8	27	20	0.296	16.1	4.444E+05	1.500E+06	63.3 ± 25.5
2	5	11	24	0.455	5.5	2.315E+05	5.093E+05	96.9 ± 52.3
3	19	60	15	0.317	47.8	1.407E+06	4.444E+06	67.7 ± 17.9
4	70	184	16	0.380	137.4	4.861E+06	1.278E+07	81.2 ± 11.6
5	102	140	40	0.729	41.8	2.833E+06	3.889E+06	154.6 ± 20.5
6	6	10	50	0.600	2.4	1.333E+05	2.222E+05	127.6 ± 66.0
7	11	34	18	0.324	22.6	6.790E+05	2.099E+06	69.1 ± 24.0
8	2	13	16	0.154	9.7	1.389E+05	9.028E+05	33.0 ± 25.0
9	17	23	20	0.739	13.7	9.444E+05	1.278E+06	156.8 ± 50.3
10	44	120	18	0.367	79.7	2.716E+06	7.407E+06	78.3 ± 13.9
11	8	18	25	0.444	8.6	3.556E+05	8.000E+05	94.8 ± 40.3
12	50	154	25	0.325	73.6	2.222E+06	6.844E+06	69.4 ± 11.4
13	8	24	32	0.333	9.0	2.778E+05	8.333E+05	71.2 ± 29.1
14	25	35	18	0.714	23.2	1.543E+06	2.160E+06	151.6 ± 39.9
15	5	18	24	0.278	9.0	2.315E+05	8.333E+05	59.4 ± 30.1
16	25	61	40	0.410	18.2	6.944E+05	1.694E+06	87.4 ± 20.9
17	2	4	16	0.500	3.0	1.389E+05	2.778E+05	106.5 ± 92.3
18	11	27	24	0.407	13.4	5.093E+05	1.250E+06	86.9 ± 31.2
19	27	86	56	0.314	18.4	5.357E+05	1.706E+06	67.1 ± 14.9
20	32	47	10	0.681	56.2	3.556E+06	5.222E+06	144.6 ± 33.3
21	8	16	12	0.500	15.9	7.407E+05	1.481E+06	106.5 ± 46.2
22	5	10	9	0.500	13.3	6.173E+05	1.235E+06	106.5 ± 58.4
23	10	22	20	0.455	13.1	5.556E+05	1.222E+06	96.9 ± 37.0
24	18	43	24	0.419	21.4	8.333E+05	1.991E+06	89.3 ± 25.2
25	5	11	30	0.455	4.4	1.852E+05	4.074E+05	96.9 ± 52.3
523	1198				23.8	9.653E+05	2.211E+06	

Area of basic unit = .0000009 cm-2

Chi Squared = 40.782 with 24 degrees of freedom

P(chi squared) = 1.8 %

Correlation Coefficient = 0.897

Variance of SQR(Ns) = 4.76

Variance of SQR(Ni) = 10.09

Ns/Ni = 0.437 ± 0.023

Mean Ratio = 0.432 ± 0.033

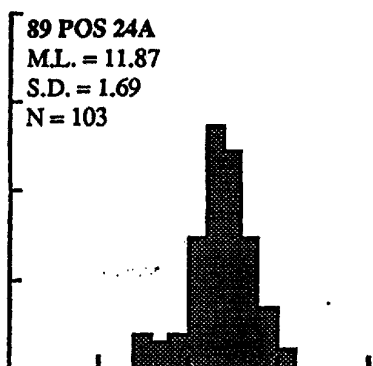
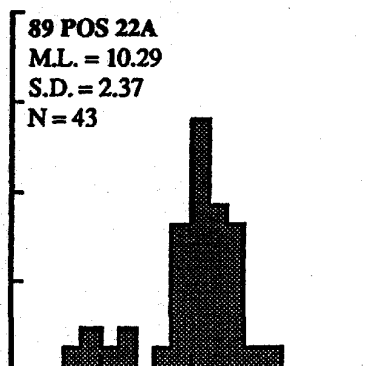
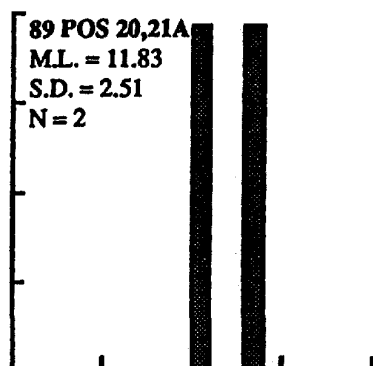
Ages calculated using a zeta of 352.7 ± 5 for SRM612 glass

Rho D = 1.218E+06cm-2; ND = 2741

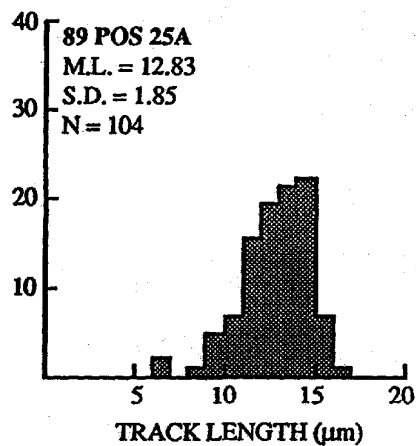
POOLED AGE = 93.1 ± 5.4 Ma

MEAN AGE = 94.6 ± 6.8 Ma

## PRUDHOE BAY UNIT J-1 LENGTH DISTRIBUTIONS



NUMBER (Normalized to 100 Tracks)

TRACK LENGTH ( $\mu\text{m}$ )



## GRAIN-AGE DATA FROM B.P. KEMIK #2

89 POS 26A APATITE 8,000' - ECHOOKA FM. - KEMIK #2

IRRADIATION LU060

SLIDE NUMBER 11

COUNTED BY: POS

No.	Ns	Ni	Na	RATIO	U (ppm)	RHOs	RHOi	F.T. AGE (Ma)
1	1	14	12	0.071	13.9	9.259E+04	1.296E+06	15.3 ± 15.9
2	1	6	8	0.167	9.0	1.389E+05	8.333E+05	35.7 ± 38.6
3	2	26	9	0.077	34.5	2.469E+05	3.210E+06	16.5 ± 12.1
4	1	25	30	0.040	10.0	3.704E+04	9.259E+05	8.6 ± 8.8
5	1	27	6	0.037	53.8	1.852E+05	5.000E+06	8.0 ± 8.1
	6	98			18.0	1.026E+05	1.675E+06	

Area of basic unit = .0000009 cm-2

Chi Squared = 1.479 with 4 degrees of freedom

P(chi squared) = 83.0 %

Correlation Coefficient = 0.387

Variance of SQR(Ns) = 0.03

Variance of SQR(Ni) = 1.42

Ns/Ni = 0.061 ± 0.026

Mean Ratio = 0.061 ± 0.026

Ages calculated using a zeta of 352.7 ± 5 for SRM612 glass

Rho D = 1.218E+06cm-2; ND = 2741

POOLED AGE = 13.1 ± 5.5 Ma

MEAN AGE = 16.8 ± 5.1 Ma

## 89 POS 27A APATITE 7,000' - IVISHAK FM. - KEMIK #2

IRRADIATION LU060  
SLIDE NUMBER 12  
COUNTED BY: POS

No.	Ns	Ni	Na	RATIO	U (ppm)	RHOs	RHOi	F.T. AGE (Ma)
1	1	3	8	0.333	4.5	1.389E+05	4.167E+05	71.2 ± 82.2
2	2	23	4	0.087	68.7	5.556E+05	6.389E+06	18.6 ± 13.8
3	2	15	9	0.133	19.9	2.469E+05	1.852E+06	28.6 ± 21.5
4	1	12	3	0.083	47.8	3.704E+05	4.444E+06	17.9 ± 18.6
5	0	12	6	0.000	23.9	0.000E+00	2.222E+06	0.0 ± 0.0
6	1	14	4	0.071	41.8	2.778E+05	3.889E+06	15.3 ± 15.9
7	0	7	9	0.000	9.3	0.000E+00	8.642E+05	0.0 ± 0.0
8	1	10	12	0.100	10.0	9.259E+04	9.259E+05	21.4 ± 22.5
9	0	12	8	0.000	17.9	0.000E+00	1.667E+06	0.0 ± 0.0
10	1	12	6	0.083	23.9	1.852E+05	2.222E+06	17.9 ± 18.6
11	0	3	10	0.000	3.6	0.000E+00	3.333E+05	0.0 ± 0.0
12	1	11	6	0.091	21.9	1.852E+05	2.037E+06	19.5 ± 20.4
13	1	21	6	0.048	41.8	1.852E+05	3.889E+06	10.2 ± 10.5
14	2	20	4	0.100	59.8	5.556E+05	5.556E+06	21.4 ± 15.9
15	1	15	12	0.067	14.9	9.259E+04	1.389E+06	14.3 ± 14.8
16	2	17	9	0.118	22.6	2.469E+05	2.099E+06	25.2 ± 18.9
16		207			21.3	1.533E+05	1.983E+06	

Area of basic unit = .0000009 cm-2

Chi Squared = 5.891 with 15 degrees of freedom

P(chi squared) = 98.2 %

Correlation Coefficient = 0.654

Variance of SQR(Ns) = 0.29

Variance of SQR(Ni) = 0.78

Ns/Ni = 0.077 ± 0.020

Mean Ratio = 0.077 ± 0.020

Ages calculated using a zeta of 352.7 ± 5 for SRM612 glass

Rho D = 1.218E+06cm-2; ND = 2741

POOLED AGE = 16.6 ± 4.3 Ma

MEAN AGE = 17.6 ± 4.3 Ma

## 89 POS 28A APATITE 6,100' - SHUBLIK FM. - KEMIK #2

IRRADIATION LU060

SLIDE NUMBER 13

COUNTED BY: POS

No.	Ns	Ni	Na	RATIO	U (ppm)	RHOs	RHOi	F.T. AGE (Ma)
1	3	7	24	0.429	3.5	1.389E+05	3.241E+05	91.4 ± 63.1
2	2	9	24	0.222	4.5	9.259E+04	4.167E+05	47.6 ± 37.2
3	0	6	16	0.000	4.5	0.000E+00	4.167E+05	0.0 ± 0.0
4	0	6	9	0.000	8.0	0.000E+00	7.407E+05	0.0 ± 0.0
5	1	3	16	0.333	2.2	6.944E+04	2.083E+05	71.2 ± 82.2
6	1	5	8	0.200	7.5	1.389E+05	6.944E+05	42.8 ± 46.9
7	0	5	18	0.000	3.3	0.000E+00	3.086E+05	0.0 ± 0.0
8	1	3	9	0.333	4.0	1.235E+05	3.704E+05	71.2 ± 82.2
9	0	6	16	0.000	4.5	0.000E+00	4.167E+05	0.0 ± 0.0
10	1	7	16	0.143	5.2	6.944E+04	4.861E+05	30.6 ± 32.7
11	0	5	15	0.000	4.0	0.000E+00	3.704E+05	0.0 ± 0.0
12	1	9	20	0.111	5.4	5.556E+04	5.000E+05	23.8 ± 25.1
13	0	6	12	0.000	6.0	0.000E+00	5.556E+05	0.0 ± 0.0
14	1	4	9	0.250	5.3	1.235E+05	4.938E+05	53.5 ± 59.8
15	1	8	21	0.125	4.6	5.291E+04	4.233E+05	26.8 ± 28.4
16	0	9	20	0.000	5.4	0.000E+00	5.000E+05	0.0 ± 0.0
17	0	4	14	0.000	3.4	0.000E+00	3.175E+05	0.0 ± 0.0
18	0	7	12	0.000	7.0	0.000E+00	6.481E+05	0.0 ± 0.0
19	2	9	20	0.222	5.4	1.111E+05	5.000E+05	47.6 ± 37.2
20	0	10	24	0.000	5.0	0.000E+00	4.630E+05	0.0 ± 0.0
21	1	3	18	0.333	2.0	6.173E+04	1.852E+05	71.2 ± 82.2
22	0	10	20	0.000	6.0	0.000E+00	5.556E+05	0.0 ± 0.0
23	1	6	16	0.167	4.5	6.944E+04	4.167E+05	35.7 ± 38.6
24	1	9	15	0.111	7.2	7.407E+04	6.667E+05	23.8 ± 25.1
25	1	13	27	0.077	5.8	4.115E+04	5.350E+05	16.5 ± 17.1
18	18	169			4.8	4.773E+04	4.482E+05	

Area of basic unit = .0000009 cm-2

Chi Squared = 19.102 with 24 degrees of freedom

P(chi squared) = 74.7 %

Correlation Coefficient = 0.110

Variance of SQR(Ns) = 0.35

Variance of SQR(Ni) = 0.25

Ns/Ni = 0.106 ± 0.026

Mean Ratio = 0.106 ± 0.026

Ages calculated using a zeta of 352.7 ± 5 for SRM612 glass

Rho D = 1.218E+06cm-2; ND = 2741

POOLED AGE = 22.8 ± 5.7 Ma

MEAN AGE = 26.2 ± 5.8 Ma

**KEMIK #2 LENGTH DISTRIBUTIONS**