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National Uranium Resource Evaluation

**Airborne Gamma-Ray Spectrometer
And Magnetometer Survey
Medford Quadrangle, Oregon**

Final Report - Volume I

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**Aero Service Division
Western Geophysical Company of America
Houston, Texas 77001**

April 1981

**PREPARED FOR U.S. DEPARTMENT OF ENERGY
Assistant Secretary for Resource Applications
Grand Junction Office, Colorado**

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AIRBORNE GAMMA-RAY SPECTROMETER
AND
MAGNETOMETER SURVEY

MEDFORD QUADRANGLE
OREGON

FINAL REPORT
VOLUME I

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AERO SERVICE DIVISION
WESTERN GEOPHYSICAL COMPANY
OF AMERICA
HOUSTON, TEXAS

MAY, 1981

PREPARED FOR THE U. S. DEPARTMENT OF ENERGY
ASSISTANT SECRETARY FOR RESOURCE APPLICATIONS
GRAND JUNCTION OFFICE, COLORADO
UNDER CONTRACT NO. DE-AC13-76GJ01664
AND BENDIX FIELD ENGINEERING CORPORATION
SUBCONTRACT NO. 80-460
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Figure 1

MEDFORD QUADRANGLE

INDEX MAP

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INTRODUCTION

During the months of August, September, and October of 1980, Aero Service Division Western Geophysical Company of America conducted an airborne high sensitivity gamma-ray spectrometer and magnetometer survey over ten (10) areas over northern California and southwestern Oregon. These include the 2° x 1° NTMS quadrangles of Roseburg, Medford, Weed, Alturas, Redding, Susanville, Ukiah, and Chico along with the 1° x 2° areas of the Coos Bay quadrangle and the Crescent City/Eureka areas combined. This report discusses the results obtained over the Medford, Oregon, map area.

Traverse lines were flown in an east-west direction at a line spacing of three miles. Tie lines were flown north-south approximately twelve miles apart. A total of 16,880.5 line miles of geophysical data were acquired, compiled, and interpreted during the survey, of which 2,925 line miles are in this quadrangle.

This report is a result of work performed under Bendix Field Engineering Corporation Subcontract No. 80-460, Project No. IG0205, as part of the National Uranium Resources Evaluation. NURE is a program of the U. S. Department of Energy's Grand Junction, Colorado, office to acquire and compile geologic and other information with which to assess the magnitude and distribution of uranium resources and to determine areas favorable for the occurrence of uranium in the United States.

The data were reduced and compiled in accordance with the technical specifications of the contract as stated in BFEC 1200-C and BFEC 1250-A. The parameters used in the processing of the radiometric data have been substantiated in a previously submitted calibration report of the Sikorsky S-58T installed airborne gamma-ray spectrometer system.

AERO SERVICE
HOUSTON, TEXAS 77060

X.....FILM IDENTIFIED TRAVERSE/TIE LINE INTERSECTION
.....FILM IDENTIFIED GROUND CONTROL
.....INDEX FIDUCIAL (100 FIDUCIAL INTERVALS)
.....FLOWN 1980

FLIGHT PATH
MEDFORD
NK 10-5
DATE 11/80

FIGURE 2
9/10

DATA ACQUISITION

Aircraft

The survey was conducted using a Sikorsky S-58T helicopter, registration N94523, owned and operated by Carson Helicopters, Inc., Perkasio, Pennsylvania. The flight crew consisted of a pilot (Carson), a navigator (Aero), and an electronics system operator (Aero). Some of the more pertinent characteristics and specifications of the aircraft are listed below:

T A B L E I

Aircraft Specifications and Characteristics

Aircraft	Sikorsky Model S-58T, Registration N94523
Engine	Pratt - Whitney PT 6T Twinpack
Take off power	1875 Shaft HP.
Fuel Capacity	350 U. S. Gal.
Hourly Fuel Consumption	100 U. S. Gal.
Range at Cruise Speed	350 Miles
Rate of Climb	1200 Feet per Min.
Service Ceiling	12500 Feet
Maximum Gross Weight	13000 Lbs.
Empty Weight	7200 Lbs.
Useful Load	5800 Lbs.
Pay Load	1700 Lbs.

Gamma-Ray Spectrometer System

The survey was conducted using Aero Service's HISENS A(irborne) G(amma)-R(ay) S(pectrometer) 2000 R system shown in block diagrammatic form in Figure 3, page 12.

The detector assembly of the spectrometer consists of a primary detector, sensing data over a 4π solid angle, and an upward looking detector, sensing data over a 2π solid angle only. The primary detector package consists of 12

8-19-88 LMR

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DWN	DATE	TITLE
CHKD		

BLOCK DIAGRAM.
HISENS AGRS 2000R SYSTEM

SIZE	DRAWING NO	REV	SHEET
B			

logs of 4" x 4" x 16" of Polyscin®, NaI(Tl), each hermetically sealed in a steel container and coupled to a high quality photo-multiplier tube. The sensors are assembled in three slabs of four logs each. Each slab is enclosed in a heated and thermally stabilized container. Total volume of the primary detector is 3072 cubic inches (50.34 liters).

The upward looking detector consists of two 4" x 4" x 16" logs of Polyscin®, each hermetically sealed in a steel container and coupled to a high quality photo-multiplier tube and enclosed within separate heated and thermally stabilized containers. Each of the upward looking detectors is mounted on top of one of the primary detector packages, separated by a 0.75" slab of lead shielding, in order to provide the 85% shielding effect @ 3.000 MeV.

The preamplifiers provide, with the photo-multipliers, virtually the total signal amplification. In order to ensure maximum stability, the preamplifiers are enclosed within the thermally stabilized packages.

The combined signal of each detector slab is output into the amplifiers, whose main purpose is summing the incoming pulses and shaping them into a bipolar gaussian form.

The summed and shaped signal from the amplifiers is input into the pulse height converter. This unit performs basically three functions: it determines whether a pulse has been received, it determines its amplitude and it converts the amplitude into a digital number. Since a successive approximation analog to digital converter is used, total dead time of the system is the same regardless of the energy of the pulse. This dead time is approximately 8 µseconds per pulse due to the converter and approximately 1.5 µseconds due to the remainder of the electronic circuit, for a combined total dead time of approximately 9.5 µseconds per pulse. The exact system dead time, or rather live time, is measured in microseconds and recorded in milliseconds as channel zero (0) of the multispectral gamma-ray data.

The function of pulse height analyzer is performed by the HP 21 MX series Hewlett-Packard minicomputer, which also stores and formats the data, outputs them on tape and compares the recorded data with the data stored in memory for a fool-proof read after write check.

The gamma-ray spectrometer system includes further a Rosemount barometric

altimeter, a Honeywell radar altimeter and a temperature transducer. A discrete interface exists in the Hewlett Packard minicomputer to accommodate a Doppler navigation system as well as other navigation systems, such as ANA, LORAN-C, OMEGA and others, although none of these were used.

Two tape drives are employed to record the data and automatic switching between the two occurs as each tape ends. Data are collected each second and recorded every five seconds. In addition to the gamma-ray spectrometer data of both the primary and upward looking systems, radar altimeter, barometric altimeter, atmospheric temperature, real time, gamma-ray spectrometer live time and magnetometer data are recorded.

Additional ancillary equipment carried aboard the helicopter includes a cathode ray tube display, a 6-channel heat sensitive analog recorder and a 35mm camera, triggered by the data controller at a preselected interval.

Magnetometer

The magnetic sensor used for the survey was a Varian V-85 proton free-precession magnetometer. This sensor was housed in a fiberglass bird and trailed approximately 100' below the aircraft to ensure optimal signal sensitivity without need for extensive aircraft compensation. The magnetic data were recorded in increments of 0.01 gammas, with a sensitivity of 0.1 gammas.

PRODUCTION SUMMARY

The 2° x 1° NTMS quadrangle of Medford, Oregon, was surveyed as part of a subcontract covering ten (10) areas located over northern California and southwestern Oregon. These include the 2° x 1° quadrangles of Roseburg, Medford, Weed, Alturas, Redding, Susanville, Ukiah, and Chico along with the 1° x 2° areas of the Coos Bay quadrangle and the Crescent City/Eureka areas combined. The subcontract covered the flying of a total of 16,880.5 line miles, of which 2,925 miles are in the Medford quadrangle.

Four main bases of operations were used during the survey. Eugene, Oregon, located just north of the Roseburg quadrangle, was used from the commencement of operations through Flight 27 on August 22, 1980. Medford, Oregon, in the Medford quadrangle, was then used up through Flight 86 on September 19th. The aircraft and crew then moved to Redding, California, for operations through Flight 130 on October 2, 1980. The final base of operations was located at Yuba City, California, in the Chico quadrangle. Throughout the survey, extensive use was made of both a fuel truck and smaller, secondary airstrips for remote refueling stops, thus extending the helicopter's effective production range.

The first production flight was made on August 11, 1980. A total of 143 flights were made with the last flight being completed on October 9, 1980. Production flights were not possible for twenty of the sixty-one days the aircraft and crew were on site. One day was used to complete the high altitude calibration flight, ten days were lost to inclement weather conditions, six days were lost to aircraft maintenance, one day to electronic maintenance, and two days to the illness of the AGRS system operator. Many of these nonproduction days were used to complete the three moves to new operations bases. A complete summary of daily operations is given in Table II, pages 16, 17 and 18.

Total flying time was 253.2 hours for an average production rate of 66.7 miles per hour. An average of 118.1 miles were acquired per production flight and 411.7 miles were acquired each production day. When computed over the total number of days on site, data acquisition averaged 276.7 miles per day.

Flight line directions and spacing for the Medford quadrangle were east-west traverse lines 3 miles apart and north-south tie lines flown at 12 mile intervals. The nominal terrain clearance for the survey was 400 feet.

T A B L E I I
Daily Production Summary

<u>DATE</u>	<u>BASE</u>	<u>ACTIVITY</u>	<u>FLIGHT NO.</u>
08/09/80	Eugene, Oregon	Ferry to Eugene, Ore.	
08/10/80	Eugene, Oregon	High altitude test	
08/11/80	Eugene, Oregon	Production	11, 12
08/12/80	Eugene, Oregon	Weather	
08/13/80	Eugene, Oregon	Weather	
08/14/80	Eugene, Oregon	Production	13, 14
08/15/80	Eugene, Oregon	Abort - helicopter	15
08/16/80	Eugene, Oregon	Helicopter maintenance	
08/17/80	Eugene, Oregon	Helicopter maintenance	
08/18/80	Eugene, Oregon	Helicopter maintenance	
08/19/80	Eugene, Oregon	Helicopter maintenance	
08/20/80	Eugene, Oregon	Production	16, 17, 18, 19
08/21/80	Eugene, Oregon	Production	20, 21, 22
08/22/80	Eugene, Oregon	Production	23, 24, 25, 26, 27
08/23/80	Medford, Oregon	Weather	
08/24/80	Medford, Oregon	Production	28, 29, 30, 31
08/25/80	Medford, Oregon	Production	32, 33, 34, 35, 36
08/26/80	Medford, Oregon	Production	37, 38, 39
08/27/80	Medford, Oregon	Weather	
08/28/80	Medford, Oregon	Production	40
08/29/80	Medford, Oregon	Production	41, 42, 43, 44, 45
08/30/80	Medford, Oregon	Production	46
08/31/80	Medford, Oregon	Abort-cloud cover	47
09/01/80	Medford, Oregon	Production	48, 49, 50
09/02/80	Medford, Oregon	Weather	
09/03/80	Medford, Oregon	Production	51, 52, 53
09/04/80	Medford, Oregon	Production	54, 55, 56
09/05/80	Medford, Oregon	Weather	
09/06/80	Medford, Oregon	Production	57, 58, 59, 60

Daily Production Summary

<u>DATE</u>	<u>BASE</u>	<u>ACTIVITY</u>	<u>FLIGHT NO.</u>
09/07/80	Medford, Oregon	Production then high winds	61, 62
09/08/80	Medford, Oregon	Magnetometer failure then production	63, 64, 65
09/09/80	Medford, Oregon	Helicopter maintenance	
09/10/80	Medford, Oregon	Production	66, 67
09/11/80	Medford, Oregon	Production	68, 69, 70, 71, 72
09/12/80	Medford, Oregon	Weather	
09/13/80	Medford, Oregon	Weather	
09/14/80	Medford, Oregon	Clouds and fog, then production	73, 74, 75, 76, 77
09/15/80	Medford, Oregon	Production	78, 79, 80, 81, 82
09/16/80	Medford, Oregon	Production	83, 84, 85
09/17/80	Medford, Oregon	Production	86
09/18/80	Redding, California	Weather	
09/19/80	Redding, California	Production	87, 88
09/20/80	Redding, California	Production	89
09/21/80	Redding, California	Production	90, 91, 92, 93, 94
09/22/80	Redding, California	Production	95, 96, 97, 98
09/23/80	Redding, California	Production	99, 100, 101, 102
09/24/80	Redding, California	Production	103, 104, 105, 106
09/25/80	Redding, California	Production	107, 108, 109, 110, 111
09/26/80	Redding, California	Production	112, 113, 114, 115
09/27/80	Redding, California	Production	116, 117, 118, 119
09/28/80	Redding, California	Production	120, 121
09/29/80	Redding, California	Production	122, 123, 124, 125
09/30/80	Redding, California	Production	126
10/01/80	Redding, California	Production	127, 128, 129, 130
10/02/80	Redding, California	Operator sick	
10/03/80	Yuba, California	Operator sick	
10/04/80	Yuba, California	Production	131, 132, 133, 134
10/05/80	Yuba, California	Production	135, 136, 137, 138
10/06/80	Yuba, California	Production	139, 140, 141, 142, 143

Daily Production Summary

<u>DATE</u>	<u>BASE</u>	<u>ACTIVITY</u>	<u>FLIGHT NO.</u>
10/07/80	Yuba, California	Production	144, 145, 146, 147
10/08/80	Yuba, California	Production	148, 149, 150, 151
10/09/80	Yuba, California	Production	152, 153

Figure 4 shows a histogram of the terrain clearance of the helicopter as recorded by the radar altimeter. The histogram takes into account all final samples in this quadrangle. The mean terrain clearance, as observed, is approximately 410 feet. The ground speed of the aircraft, as determined from the distances between samples based on their final X-Y positions, is depicted in graphic form in the histogram of Figure 5, page 21.

AERC SERVICE
QUAC MECFORD

TERRAIN CLEARANCE HISTOGRAM
JOB 627

RADAR
ALTIMETER
FEET

-20-
Figure 4

173 POINTS GREATER THAN 1000 FEET

GROUND SPEED
JOB 627

HISTOGRAM

NUMBER OF DATA POINTS

2100 4200 6300 8400 10500 12600 14700 16800 18900 21000 23100

21/22

Figure 5

DATA REDUCTION

The data reduction process as used in the processing of the airborne gamma-ray spectrometer and magnetometer data obtained within the Department of Energy (DOE) National Uranium Resource Evaluation (NURE) program is shown in flow chart form in Figure 6, page 24.

Upon arrival in the Houston office, the digital data are edited and a back-up tape is generally produced. The EDIT consists partly of a data quality check, enabling the elimination of single record spikes in any field, outside a specified preselected limit. The EDIT program further checks for data continuity and flags all data acquired at terrain clearances exceeding the survey specification. The EDIT further sums a preselected number of spectral records at the beginning and end of each survey line and fits a gaussian curve to diagnostic photopeaks, such as the Tl^{208} peak at 2614.5 KeV and the K^{40} peak at 1460 KeV for low altitude lines and the annihilation peak at 511 KeV and the K^{40} peak at 1460 KeV for high altitude lines. The position of these photopeaks is determined with an accuracy of better than 0.1 of a channel and is used to determine the exact position of the energy windows with regard to channel numbers. At the same time the calculated standard deviations of the fitted gaussian curves serve to obtain the system resolution at the photopeaks used. Note that the 2π system resolutions as determined at the K^{40} photopeak proved to exceed the 8% specification throughout much of the survey. This was most likely due to a small crack in one of the two 2π crystals. However, this condition proved not to adversely affect the acquisition or reduction of the radiometric data and it was decided, after consultation with BFEC, not to replace the crystal in the interest of expediting the completion of the survey. The window count rates are normalized for live time and are calculated as follows:

K	:	1362 KeV - 1566 KeV (Channel 114 → 130, @ 12 KeV/Channel)
U	:	1662 KeV - 1866 KeV (Channel 139 → 155, @ 12 KeV/Channel)
T	:	2406 KeV - 2826 KeV (Channel 201 → 235, @ 12 KeV/Channel)
T.C.	:	390 KeV - 2982 KeV (Channel 33 → 248, @ 12 KeV/Channel)
Cosmic	:	3054 KeV - 6000 KeV (Channel 255)
$U_{2\pi}$	:	1662 KeV - 1866 KeV (Channel 139 → 155, @ 12 KeV/Channel)

The above channel numbers are valid only if system gain corresponds

exactly to 12 KeV per channel and there is no zero shift.

The CORRECT program applies the background and cosmic corrections to the single record window count rates, corrects the data for Compton scatter and atmospheric radon, and normalizes the terrain clearance. Background count rates and cosmic factors were determined from high altitude test data acquired over the Pacific Ocean, offshore California.

Potassium Background	=	50.04 counts per second
Uranium Background	=	8.21 counts per second
Thorium Background	=	7.26 counts per second
Total Count Background	=	286.06 counts per second
2 π Bismuth Background	=	0.81 counts per second

Potassium Cosmic factor	=	0.250	c.p.s. per count 4 π cosmic
Uranium Cosmic factor	=	0.202	c.p.s./cps 4 π cosmic
Thorium Cosmic factor	=	0.278	c.p.s./cps 4 π cosmic
Total Count Cosmic factor	=	4.438	c.p.s./cps 4 π cosmic
2 π Bismuth Cosmic factor	=	0.0505	c.p.s./cps 4 π cosmic

The Compton scatter functions were determined from data obtained over the Grand Junction test pads, using the radiometric analysis of the bulk sample with natural water content.

$$\begin{aligned}T/U &= \tau = 0.08 \\U/T &= \alpha = 0.30 + 0.02 + 0.000076H \\K/T &= \beta = 0.37 \\K/U &= \gamma = 0.90\end{aligned}$$

The 2 π and 4 π uranium window count rates are related through the geometric or equivalency factor. For the present system, installed in the Sikorsky S-58T, this factor, $f = 5.1$. Part of the terrestrial radiation of energy higher than 1662 KeV - the lower threshold of the uranium window - is detected in the uranium window of the upward looking detector, due to incomplete shielding, skyshine and shine-around. This shine-through/shine-around effect is assumed to be a function of both the intensity of the terrestrial uranium and thorium radiation and of the aircraft terrain clearance. From multi-altitude data acquired over the Lake Mead Dynamic Test

Range the shine-through/shine-around effect was determined for each altitude level. The data provided a best fit for a linear terrain clearance function as follows:

$$\text{shine-through/shine-around} = (0.067 - 2.6 \times 10^{-5}H) (U_{4\pi} + 0.30T_{4\pi})$$

The shine-through/shine-around corrected Biair Count rate is then:

$$U_{2\pi} \text{ o} = \frac{U_{2\pi} - (U_{4\pi} + 0.30T) (0.067 - 2.6 \times 10^{-5}H)}{1 - 5.1 (0.067 - 2.6 \times 10^{-5}H)}$$

The shine-through/shine-around correction is applied to the $U_{2\pi}$ count rate at each single record. The single record $U_{2\pi}$ count rates are then averaged over 35 records to make them statistically compatible with the data of the primary system. The atmospheric radon correction is applied to both the $U_{4\pi}$ and the Total Count count rates. The equivalency factor for the $U_{4\pi} / U_{2\pi} = 5.1$, for Total Count/ $U_{2\pi}$ it is 73.5.

Within the CORRECT program the data are normalized to a common datum of 400 feet terrain clearance. An exponential formula is used, based on an air column reduced to a standard temperature and pressure of 0°C and 760mm Hg. (32°F and 29.92" Hg). The air absorption coefficients used are those derived from the multiple altitude flight over the Lake Mead Dynamic Test Range for thorium, potassium and Total Count. The air absorption factor for uranium is obtained by straight interpolation between the potassium and thorium air absorption factors. Their values are respectively:

$$\begin{aligned}\mu_K &= 2.67 \times 10^{-3} \text{ per foot} \\ \mu_U &= 2.52 \times 10^{-3} \text{ per foot} \\ \mu_T &= 2.11 \times 10^{-3} \text{ per foot} \\ \mu_{TC} &= 2.16 \times 10^{-3} \text{ per foot}\end{aligned}$$

The formula used for the altitude normalization is:

$$N_{400} = N_H \cdot e^{-\mu(400 - \frac{273}{273+t} \cdot \frac{P}{29.92} \cdot H)}$$

Where N_{400} , N_H are respectively the count rates at 400 feet and at altitude H, μ is air absorption factor, t is temperature in degrees Celsius and P is barometric pressure in inches Hg.

The last operation in the CORRECT program is the determination of statistical adequacy of the data. The criteria for adequacy of the data are based on the work of Lloyd A. Currie (op.cit.). A critical level is recognized, below which all observations made fail to detect a signal, i.e. 95% of all measurements fall within the "normal" distribution of "noise". The detection level is similarly defined as the level above which 95% of the measurements made fall within the normal Poisson distribution of "signal". Currie's critical level has been adopted as the count rate level below which data are inadequate. Data with count rates above the critical level but below the detection level are considered marginal. Above the detection level data are considered adequate. For the single record data the formulas are then:

Count Rate $\leq 2.33 (\text{Sum Corrections})^{1/2}$: data inadequate
 $2.33 (\text{Sum Corrections})^{1/2} < \text{Count Rate} \leq 2.71 + 4.65 (\text{Sum Corrections})^{1/2}$:
 data marginal
 Count Rate $> 2.71 + 4.65 (\text{Sum Corrections})^{1/2}$: data adequate

No ratios have been calculated involving inadequate data in either numerator or denominator. Ratios have been calculated when the data in the numerator are marginal, provided the data in the denominator are adequate.

The thorium, uranium and potassium data are subsequently averaged over 9 records in the SPECAVG program. The output is a spectrometer master tape containing both averaged and single record data.

Parallel with the radiometric data reduction process, the magnetic data are edited and processed. Using the recovered film intersections and the established ground identities, preliminary flight paths are prepared. The flight path is refined in the magnetic adjustment program until an accurate final flight path has been obtained. The reduced spectrometer data are then merged with the final X-Y position of the data points, the reduced magnetic data and the digitized geology, and a master tape is produced with data that pertain to each quadrangle only. The REGROUP program then eliminates all duplicate line segments, inserts reflight segments where required, orders the remaining line segments and renumbers the fiducials of these segments such that the resulting line is directionally consistent with location sequential sample numbers. The renumbered fiducials increase from west to east for traverse lines and south to north for tie lines. A listing relating the

renumbered fiducials to the original fiducial numbers as recorded in flight is included in this volume as Appendix N and can also be found in the back of Volume II. This listing gives both the line number as it appears on all final data and the line number as recorded in flight. Similarly, the start and end fiducials of each final line and/or line segment shown on the flight path base map are given along with the corresponding start and end fiducials as recorded in flight. When correlated with the final fiducial numbers, the original fiducials will increase sequentially for lines flown west to east or south to north and decrease for lines flown in the opposite directions.

The following processing steps are STATANAL and HISTGRM. HISTGRM groups the radiometric data by geological cell units, determines the distribution of the data as normal or lognormal, calculates the mean (for normally distributed data) or the mode (for lognormal distributions) as well as the standard deviations. The results from HISTGRM are used in the STATANAL program, which calculates the signed standard deviation from the mean for each averaged sample for each of the six radiometric parameters. Its output is the Final Spectrometer Master Tape, from which the anomaly maps, the statistical analysis tape, the averaged record and single record reduced data tapes and listings, the flight path maps and the radiometric and magnetic profiles are produced.

DATA PRESENTATION

General

The final data are presented in four different forms: on magnetic tape; on microfiche; in graphic form as profiles and histograms; and in map form as anomaly maps, flight path maps, and computer printer maps.

The histograms and the multiparameter profiles are presented with the anomaly maps and flight path map in a separate bound volume. Complete data listings of both the reduced single record and the reduced averaged record data are found in the back of this report. The format of the printout of the microfiches and the format of the data files delivered on magnetic tape are in accordance with the specifications of the BFEC 1200-C and are described in appendices F through L of this report.

Radiometric Multiple-Parameter Stacked Profiles

The radiometric profiles have been prepared at the horizontal scales of 1:250,000 and 1:500,000 on an automated flatbed plotter. Displayed are from top to bottom: total magnetic intensity, IGRF removed, in gammas; radar altimeter, in feet; ratio of eT concentration in ppm/potassium concentration in %; ratio of eU/K; eU/eT ratio, atmospheric radon (BIAC) in counts per second, equivalenced to the 4π count rate; apparent concentration of terrestrial eT in ppm, apparent concentration of terrestrial eU in ppm; apparent concentration of potassium in %; "Total Count" count rate. Flags are indicated, where needed, below the base line of the corresponding parameter. A short flag indicates marginal data, including terrain clearances between 700 and 1000 feet, while a long flag indicates inadequate data. Fiducial markers are plotted every 200 records, along the top of the profile, every 10 records near the bottom.

The flight path and the geologic formations overflown along the line are shown on the bottom of both the radiometric and magnetic multiple-parameter stacked profiles below the lower fiducial markers. Six tiers of formation identifiers along with short markers on the flight line are used to indicate changes along the profile with the base of the identifier letters aligned with the corresponding marker. The first identifier found on the westernmost end of the profile applies to the start of the line and this formation continues until the next marker is encountered. Subsequent changes to the geology are

similarly indicated along the profile.

Magnetic and Ancillary Parameter Stacked Profiles

The magnetic profiles have also been plotted at scales of 1:250,000 and 1:500,000 on an automated flatbed plotter. The plotting sequence of the profiles is, from top to bottom: barometric pressure at aircraft altitude in mm Hg; atmospheric ambient temperature in degrees Celsius, terrain clearance in feet; magnetic variations at base station, in gammas; total magnetic intensity, IGRF removed, plotted at 50 gammas per scale division. Fiducial markers are again plotted every 200 records along the top of the profiles, every 10 records near the bottom.

Histograms

Histograms have been prepared for the six radiometric parameters for each geologic cell unit of the NTMS quadrangle area. The horizontal scale of the plots is constant for each of the parameters. Frequency grouping has generally been done in 100 groups per full scale, although in some cases more groups may have been used for better definition. In all cases the vertical scale was normalized to the number of samples observed in the group with the highest sample frequency.

For each histogram the frequency distribution type (normal or lognormal) is listed, as well as the mean (or mode in case of lognormal distribution) and the signed standard deviations. Note that for both the normal and lognormal distribution curves the standard deviation is given in terms of the parameter value (K, eU, eT, eU/K, eU/eT and eT/K). The actual standard deviation is obtained by subtracting the mean parameter value from the +1 standard deviation figure in case of a normal distribution, by dividing the mode value into the +1 standard deviation figure in case of a lognormal distribution. In case of lognormal distribution curves the standard deviation is thus a multiplication factor.

Each histogram further lists the total number of samples observed in the geologic unit and the number of statistically adequate/marginal data samples in each parameter plot.

Anomaly Maps

The anomaly maps have been prepared at scales of 1:250,000 and 1:500,000

on an automated flatbed plotter. The fiducial numbers along the flight lines match those of the corresponding profiles. Positive signed deviations of the mean are indicated by a plus sign to the north or west of the flight lines, while negative signed deviations are indicated by a minus, plotted to the south or east of the line. The number of pluses or minuses corresponds with the levels of standard deviation from the mean. To avoid crowding, standard deviation signs are calculated and plotted for every fifth sample only.

Computer Printer Maps

Computer printer plots are produced for the total field and the six radiometric channels. Upper and lower limits were chosen based on the minimum and maximum values of the gridded data. Ten intervals are represented by the contour values 0 to 9. A minus (-) or a plus (+) sign represents those values less than the lower limit or those values higher than the upper limit.

The interval for each integer contour is further divided into two groups. For those values less than .5, the contour is printed; e.g. for values 4.0 to 4.5, the value 4 is printed, while values of 4.6 through 4.9 are left blank.

GEOLOGY

General

The Medford quadrangle is located in southwestern Oregon. Its boundaries are latitudes 42°00' north and 43°00' north and 122°00' west and 124°00' west. The region is mountainous and heavily forested. The cities of Medford and Grants Pass are in the central part of the quadrangle, and Ashland is in the south center. They are located in a poorly defined valley along the Rogue River, which follows an irregular southeastward course across the central part of the map sheet. Northeast of the Rogue River Valley are the mountains of the Cascade Range, reaching elevations on the order of six thousand to eight thousand feet above sea level.

West and southwest of the Rogue River are the Siskiyou Mountains. Peaks in the south and southwest also reach elevations of six thousand to seven thousand feet above sea level. In the northwestern part of the map sheet the Siskiyou Mountains are lower, attaining elevations of four thousand to five thousand feet above sea level. Dendritic drainage is predominant throughout the quadrangle.

The most spectacular feature on the Medford quadrangle is Crater Lake, in the extreme northeast corner of the map sheet. It occupies the five mile wide caldera of the extinct volcano, Mount Mazama. The surface of the lake is approximately six thousand two hundred feet above sea level. The rim of the caldera has maximum elevation of eight thousand seventy five feet above sea level on the south edge. The portion of the map sheet that includes Mount Mazama was omitted from the survey.

The main source for the mapped geology of the Medford quadrangle is the United States Geological Survey Mineral Investigations Field Studies Map MF-38, compiled by Francis G. Wells from several sources.

Stratigraphy

The rock units exposed in the Medford quadrangle range in age from pre-Triassic schists, of unknown age, to Pleistocene volcanics and Recent alluvial material in the river valleys. However, the most widely exposed are the interbedded sediments and volcanics of Jurassic age in the western half of the map sheet, the Dothan, Rogue and Galice formations, and the Eocene, Miocene and Pliocene volcanics which effectively cover all of the eastern half of the

map sheet and mask the underlying structure.

Brief descriptions of the rock units outcropping on the Medford quadrangle follow, beginning with the oldest.

Old Schists (os)

Highly foliated chlorite, epidote, sericite and graphite schists, partly sedimentary and partly volcanic in origin. Pre-Triassic in age.

Contact Aureole (Ca)

Zones of contact metamorphism in Jurassic and older rocks.

Applegate Group (Rav, Ras, Rag)

Altered lava flows, flow breccias and pyroclastic rocks, mostly of basic composition with some intrusive rocks (Rav). Tuffaceous sediments, argillite, quartzite, chert and limestone (Rav). In general, the sedimentary layers are less than a few thousand feet thick and a few miles long. The limestone lentils are thinner and shorter (Ras). Banded crystalline rocks made up of dark hornblende-rich layers and light siliceous layers (Rag). The group is Triassic in age, possibly upper Triassic.

Jurassic Volcanic Rocks (Jv)

Volcanic rocks resembling the Rogue Formation, but their precise stratigraphic position is uncertain.

Dothan Formation (Jds, Jdv)

Predominantly medium-grained indurated sandstone in part, massive and thickly bedded and, in part, thinly bedded with intervening layers of dark gray or black mudstone, shale and siltstone that have locally slaty cleavage (Jds). Some interbedded dense lava flows that commonly have amygdaloidal and pillow structures (Jdv). Jurassic in age.

Rogue Formation (Jrv, Jrg)

Massive, light to dark gray altered lava flows, tuffs agglomerates and flow breccias, mainly of dacitic and andesitic composition. Contains some almost contemporaneous rocks (Jrv). Banded medium-grained rocks consisting of dark hornblende-rich layers and light siliceous layers. Derived from altered Rogue Formation (Jrg). Jurassic in age.

Galice Formation (Jgs, Jgv)

Dark gray to black, fine-grained to dense, thinly layered rocks generally with slaty cleavage, a few medium-grained sandstone beds up to three feet in thickness commonly including tabular fragments of black shale and some thin layers of grit (Jgs). Also large thicknesses of andesitic flows, mainly porphyritic; some amygdaloidal. In places, flow aggregates are common, (Jgv). Jurassic in age.

Knoxville Formation (Jk)

Dark gray sandstone and some shale, with massive conglomerate at the base. Aucella fossils are usually present in the finer conglomerates and the coarser sandstones. Jurassic.

Peridotite (pd, sp)

Green medium-grained intrusive rock consisting of olivine with or without other mafic minerals; weathered rock buff to rust colored. In places largely altered to serpentine (pd). Completely serpentized peridotite broken by shearing into small blocks or an aggregation of curved shiny translucent plates from yellow through olive green to black (sp). Jurassic or Cretaceous.

Intrusive Granitoid Rocks (gb, di, qd, gd, gr)

Fine to coarse-grained intrusive granitoid rocks ranging in composition from gabbro (gb), through diorite (di), quartz diorite (qd), and granodiorite (gd) to granite (gr). Jurassic or Cretaceous.

Paskenta Formation (Kp)

Grayish-green arkosic sandstone and siltstone, weathers buff where long exposed. Coarse to fine-grained dark colored conglomerate and interbedded sandstone near base. Cretaceous in age.

Hornbrook Formation (Ko)

Indurated uniform fine-grained, greenish-gray arkosic sandstone with local lenses of coarse conglomerate and sandy shale. Fossiliferous and calcareous in places. Cretaceous is age.

Arago Group and Umpqua Formation (Tea, Teu)

Soft khaki colored medium to coarse-grained sandstones, massive and in some places pebbly passing into coarse conglomerates with pebbles of all

sorts, in places quite fossiliferous. Includes gray to black rhythmically banded shales locally quite carbonaceous, and locally including coal beds. Arago Group (Tea), Umpqua Formation, (Teu). Eocene age.

Eocene Volcanic Rocks (Tev)

A series of volcanic rocks commonly with a layer of well-rounded volcanic pebbles and cobbles at the base. Mostly pyroclastic in lower part containing fine and coarse pyroclastics. Flows are more common in upper part. Rocks of varying composition, mostly andesitic and dioritic, with some rhyolitic material, especially in the upper part where fine-grained rhyolite tuffs are common. An upper Eocene fauna is found in these tuffs. Age is upper Eocene.

Intrusive Rocks (Tig)

They include dioritic rocks and basalt dikes, dacite dikes and dacite sill-like bodies, intruding all but the Miocene volcanic rocks, (Tig). Age is pre-Miocene, presumably Oligocene.

Miocene Volcanic Rocks (Tmv)

Volcanic rocks including dense flows, platy flows, flow breccias, and agglomerates, mainly gray and of andesitic composition. Probably Miocene.

Pliocene Volcanic Rocks (Tpb, Tpib)

Volcanic rocks of the High Cascades, largely olivine basalts and mafic andesites (Tpb). Olivine basalts within canyons of the High Cascades, (Tpib). Probably Pliocene.

Quaternary Volcanic Rocks (Qps, Qmv)

Pumice and scoriae flows of Mount Mazama, Pleistocene volcanic peak at present site of Crater Lake (Qps). Dacite flows of Mount Mazama (Qmv).

Alluvium (Qal, Qs)

Recent or Pleistocene deposits. Alluvium including sand and gravel deposits in present stream channels, also terrace deposits at levels of up to five hundred feet above present streams. These deposits occasionally contain placer gold (Qal). Sand and gravel deposits along beaches. They are gray quartz sands including a high percentage of rock fragments, some ilmenite, magnetite and chromite and traces of gold (Qs).

Structure

The structural framework of southwestern Oregon is incompletely understood and it has been undergoing revision in recent years. The overriding event that has shaped the regional geologic structure is the Cascade Orogeny, which began in the late Cenozoic and probably continues into the present time.

Pre-Cascade structures of Mesozoic to early Cenozoic age, are exposed in the western and south central part of the Medford quadrangle. They strike northeast-southwest in this region, as part of a larger arcuate structural pattern that continues to the south, in California, and to the north in west central Oregon.

In the eastern half of the quadrangle, vast sheets of middle to upper Tertiary volcanics have been extruded from the source vents in the Cascades along the eastern edge of the sheet and beyond. These flows mask the underlying structures in the eastern half of the quadrangle.

Faulting and thrusting, believed to be effects of the Cascade Orogeny, are present in the eastern half of the map sheet. The main trend of faulting and thrusting is north-south, with subsidiary tear faults normal to the main fault direction.

Economic Geology

Numerous deposits of gold have been observed in the rocks of the Applegate Group volcanic members (Eav) in the western part of the quadrangle. The gold mineralization is found in quartz veins penetrating the altered lava flow rocks, tuffs, argillites, cherts and quartzites. A concentration of gold deposits is present in the Applegate Group rocks adjacent to the north end of the Grayback diorite pluton.

In addition, there are a few vulcanogenic sulfide deposits (copper, zinc, gold and silver) present in the Applegate Group rocks.

INTERPRETATION

General

The airborne gamma-ray spectrometer survey is conducted in support of the Department of Energy's National Uranium Resource Evaluation (NURE) program. The primary purpose of the survey is regional resource evaluation as opposed to local anomaly identifications. The interpretation of the radiometric data is directed towards determining zones of possible depletion of uranium which may have served as possible uranium sources, outlining areas of regional enrichment in uranium and indicating the geological formations which are most likely to be mineralized within a possible uranium province.

The areas of possible uranium depletion/enrichment are outlined with the aid of anomaly maps, which have been previously described. Enrichment or depletion of uranium on a regional scale is assumed to have taken place if the U/T and U/K ratio values remain higher/lower than at least one standard deviation above/below the mean for a distance of at least a mile, provided the K, U and T count rates are at the same time not less than one standard deviation below the mean. One mile equals approximately 35 samples.

The probability of a geologic formation to be mineralized by a given element may be estimated from the dispersion of the geochemical distribution curve (i.e. the smaller the ratio of the standard deviation over the mean) the less the likelihood that an extremely high concentration of that element exists within that formation. Obviously, the opposite holds true as well.

The decision of both the "favorability" of a formation and of the presence of a regional geochemical anomaly is influenced to a large extent by the choice of the geological cell units used in the correlation of the radiometric and geologic data.

The radiometric parameters used in the present report are concentrations in parts per million of equivalent uranium and equivalent thorium and in percent of potassium and their ratios. The radiometric count rates of the helicopter borne A.G.R.S. (Airborne Gamma-Ray Spectrometer) system were calibrated at the Lake Mead Dynamic Test Range against sources of known concentrations of potassium, uranium and thorium. The sensitivities of the A.G.R.S. system, normalized to 400 feet terrain clearance at standard temperature and pressure are:

<u>Radioelement</u>	<u>Count Rate</u>	<u>Concentration</u>
Potassium	105.71	1%K
Uranium	12.05	1ppm eU
Thorium	7.32	1ppm eT

Geochemical Analysis

Thirty-three rock formations in the Medford quadrangle have been recognized and sampled in the course of the survey. Of these, twenty-four were encountered over a sufficient range of traverse distance to provide adequate sampling for reliable statistical analysis.

The most widely exposed of the sedimentary rock units are the sandstones and shales of the Dothan Formation (Jds), which outcrop extensively in a northeast-southwest striking belt in the northwestern part of the quadrangle, and slaty shales of the Galice Formation (Jgs) which outcrop in a number of more restricted belts in the west center, striking northeast-southwest. Both of these widely exposed rock units display normal element distribution and similar mean concentrations and curve dispersions, which suggest that they have, overall, similar compositions.

The Quaternary alluvium (Qal) is principally exposed along portions of the Rogue River Valley and in the valley north of the Upper Klamath Lake along the eastern margin of the map sheet. The histogram curves show normal distributions on all three spectral channels. Some irregularities are apparent on the thorium and potassium distribution curves, indicating that distinct compositional facies exist in the several isolated occurrences of Quaternary alluvium (Qal).

Two contemporaneous Eocene units have been sampled extensively, the Arago Group (Tea) and the Umpqua Formation (Teu). The stratigraphic distinction between the two units is not made clear in the geologic literature; the Preliminary Geologic Map of Southwestern Oregon suggests that the Umpqua Formation is a member of the Arago Group. Other references in the literature describe an "Umpqua Group" as including three smaller stratigraphic units, with no mention of the Arago Group. Both are mapped as exposures in the west and northwest. The more restricted Umpqua Formation (Teu) exhibits higher mean concentrations of thorium and potassium than does the Arago Group (Tea), although the stratigraphic legend on the Preliminary Geologic Map of

Southwestern Oregon includes both units in the same description, sandstones passing into conglomerates.

Sediments of the Applegate Group (Ras) occur in numerous small exposures in the central part of the Medford quadrangle. The histogram curves of this formation show normal distribution, with some irregularity in the potassium spectral channel.

Only two metamorphic rock units were encountered to a sufficient degree to allow reliable statistical analysis; the Rogue Formation (Jrg), described as volcanic rocks of intermediate to felsic composition partially metamorphosed to pyroxene gneisses and chlorite schists, and the undifferentiated pre-Triassic schists (os).

The Rogue Formation (Jrg) histograms show normal distribution on all three spectral channels and unusually low concentrations of uranium, thorium and potassium. This suggests that their compositions tend to be relatively mafic. The "Old Schists" (os), with only four hundred thirty-seven samples, are characterized by extreme irregularity, although the histogram distribution is normal on all three spectral windows.

Of the five intrusive rock bodies that were encountered and analyzed, all of them displayed lognormal histogram distributions on at least two of the three diagnostic channels, with pronounced "tailing" typical. The ultramafic rocks, such as serpentine (sp) and peridotite (pd) have extremely low elemental concentrations; however, the assymetry of their histograms nevertheless suggests some variation in composition. The quartz diorite shows extreme tailing, especially in the potassium channel. This again demonstrates a wide range of composition. The gabbros (gb) were only encountered in five hundred seventy-seven samples, so that the histogram curves are very erratic; however, there is clear indication of dual peaks in the thorium and potassium spectral windows. This suggests the presence of at least two different types of gabbro.

Most of the quadrangle is covered by volcanic rock units. The Pliocene olivine basalts (Tpb) are very widely exposed in the eastern part of the map sheet. The histogram curves are normal in all channels for this formation and show slight dispersion, and the unit is considered to be fairly homogeneous in composition.

The Eocene volcanics (Tev) are also exposed in a wide north-south trending belt in the east center and they, also, display well defined histogram curves, normal on the thorium and potassium channels and lognormal on the uranium channel. Dispersion is greater than in the case of the Pliocene basalts (Tpb). Interestingly, the composition of the Eocene volcanics (Tev) is described as being more felsic ("andesitic") than the Pliocene basalts (Tpb) and the histograms correspondingly show significantly higher mean concentrations of thorium and potassium, and a slightly higher range of uranium concentration for the former rock unit.

The altered lava flows of the Triassic Applegate Group (Tav) are discontinuously exposed in the central and south central portions of the map sheet. Their description suggests that they are mafic in composition, and their mean concentrations are relatively low and are compatible with such overall composition. However, the thorium and potassium histograms display clear dual peaks, leading to the conclusion that there are at least two compositional types in the mapped exposures of Applegate lavas.

The Rogue Formation volcanics (Jrv), most widely outcropping in northeast-southwest trending belts in the west, display normal thorium and potassium histogram distributions and lognormal uranium distribution, with modest dispersion. The elemental mean concentrations are lower than would be anticipated from the rock descriptions (andesite, dacite).

The several remaining volcanic rock formations generally show increasingly irregular histogram distributions because they are more restricted in their outcrop areas and; therefore, have been sampled less frequently. They are not amenable to reliable statistical evaluation.

Computer Printer and Anomaly Map Analysis

Computer generated maps were prepared for the total magnetic intensity, the three diagnostic gamma radiation windows, and their comparative ratios at a scale of 1:500,000 to supplement the 1:250,000 standard deviation profile anomaly maps. The grid spacing of the 1:500,000 maps is 1270 meters by 2117 meters. This coarseness of grid sampling precludes the possibility of detailed interpretation.

TABLE III

LEGEND TO TOTAL FIELD MAP (GAMMA)

<u>CONTOUR VALUE</u>	<u>LOWER LIMIT</u>	<u>UPPER LIMIT</u>
-		52700.0
0	52700.0	52800.0
1	52800.0	52900.0
2	52900.0	53000.0
3	53000.0	53100.0
4	53100.0	53200.0
5	53200.0	53300.0
6	53300.0	53400.0
7	53400.0	53500.0
8	53500.0	53600.0
9	53600.0	53700.0
+	53700.0	

```
X4= 417000.0
Y4= 4770069.0
```

```
X3= 585000.0
Y3= 4770069.0
```

[illegible]

```
X1= 417000.0
Y1= 4649400.0
```

```

X2= 585000.0
Y2= 4649400.0

```

TABLE IV

LEGEND TO POTASSIUM AVERAGE MAP (PERCENT)

<u>CONTOUR VALUE</u>	<u>LOWER LIMIT</u>	<u>UPPER LIMIT</u>
-		0.10
0	0.10	0.22
1	0.22	0.34
2	0.34	0.46
3	0.46	0.58
4	0.58	0.70
5	0.70	0.82
6	0.82	0.94
7	0.94	1.06
8	1.06	1.18
9	1.18	1.30
+	1.30	

CALIFORNIA MEDFORD POTASSIUM AVG GRID FILE PRINT

X4= 417000.0

Y4= 4770069.0

X3= 585000.0

$$Y3 = 4770069.0$$

2 2 4 4 +++ 1 3 2

.5433 5678E76554443222 3 444443 3 4431 135554321 2466520 13 886532 4 56887522 332 3 4 567764321111111 233

.3 4 5 6 66 5 444 3 3 4 4 33 3 44 433 565 4 32 2467642 3456787643 4 55543 3 45 553 21 2 233332 3333

.33 45 54 3 3 455 4321 1245655 5 4 555 6789987654 56765 3 3443 2 3 3333 22 2 2 344 3 33

.4 5 6666 5 4 3 3 3 345554321 246766 54 4 55 6 789 98643 4545 2 233 2 2 3 2 33 2 22 34 33333 33

.6 777 776 5 5443 33 4 55544 55 6 76543 3 33 45688887654 32 11 1333 2 33 4432 233 34443 2 3 4 3

.6666 7 65 4444 444 4 56665 66666 542 2 36898 7654 4421 1333 3 4 42 23 33 455553 2 2 3 3

.4 5788754 3 3 4 555 444 55555 5 44 333222 3 45666 5543 2 1 1233 333 45 655444444 45 654 33 2 3 44 33

.865 58 8532 345 665 555 5 54 2 23433 4565 54 4431 123 44 4 5 67655 4 433 3 3 3 3333333322

.777665554 3 44 45 6666666555 54 33333333 4 566 5 444432 1 23454 33333 45 665 444 43 33 2222 22

.776653 22 23455 4 57888877766653 345432 34 56754 4 532 11111 258853 345 654 454 3 2 2 32 344

.6665432 23 4 555 66 7 66665 43 3 45432 234 5 7764 45321 1 22 345 433333 45 5 5544 333 22 3333 222 2222 333 33 3

.45 6642 1344 5666 6 6 3 33 3 2 221 1346777532 1 11 123454444 4 677653 2344 3 2 2 333 444 44

.44 543 1 344 445 67 6666 54 3333 444 3 2 221 124555542 1 11 13454 4 4 5676532 2 344 3 22 2 222222 3 33 2 3 4 43

.555421 135555 665 6 7776531 124677542 2221 12221 0 12 21 11 0000 123455 4 443 34543 2 3 44432 2 3 2 1 2 22 2 2

.55542 24666 6 666 7 77642 124687642 2 21 12210 01 1 1 0 0 24665 44 443 3442 23 44 32 2 3 21 1 2 2 2

.542 1345555555 677 765432 23456653 22 2 22 1 0 0 1 11 1 0 0 12467765 44 4 3 2 2 2 222222 1 1 222222 22 2

.3221 3454 4 5788 7542 23467654 3332 12321 0 1 111 0 02 3469 865 555 43 2 2 2 2 2 1 1 22 22 2 2

.22 3455555555 67 76542 23456554 44443 21 111 234332222 1 0 012 346777665 5 4 3 2 1 111 11111 222 3333 21 1

.2 34 5666666 77777532 12346654 4687532 1 0 0256765433310 0 12 346 7 66653 3331 1 22 1 1 22 22 3 444 3 21 11

.3 4 5666 6 7 7 66421 1234665 4 6898632 11 0 1456544443210 11 22 33 4567 666543 3 321 22 11 1 1 22 11 2 3 44 33 2 11 00

.34 567 8777777 641 11 24544 568987 7551 00 0 2 222 3 4 5 777776653 3479975 3 3 33 2 34321 1 1 122 1 1 2 2 10 -

.44 5 6 777 6 5 432 1 23455 57899887630 01 3456 78888887543 479975 3 332 2 3322111111 11 11 2 2 1 0 -

.33 4566 6531 1 21 245665 57999 86410 0 0 1 2345 68 98 765555 6 6543 344433 44432 1 1 2 2 10 -

.3 4 5 6 665410 01 2 2346665 4789 998521 0 0 02455 68 977 887 7776 5 544 455544 56532 1 11111 23321 0 -

.3 4 5 665421 00 0 123467654 2 4578 8643100 12211 355 67876 7899998765 4 46787775421 1 22 11 1 2 2 10 -

.2355 66420 0123 4665431 12369 865530 02 20 13565 5776 68 865 4 45788888642 1 11 22 2 1 1 2 210 -

.1245 6542100 0 2344 432 1 2357 98642000 0 014666666 77 89 998765 44 5 6666 55443321 1 2 2 2222222 11 2 210 -

.3455 676521 00 0246542 2 358 9630 00 25787 77 888 77 8 87 5 554 4554 456665321 1 22 2 3333 21 1 2 2210 -

.4 55 54210 0000 1234432 22 344 56789999975210 1245777 7 8999988 87 5 5 555 5 555 6 543321 2 2 33 2 11 2 100 -

.55 5 54310 01 22 3 32 2 2457864 5678 9 9741 124566 7 78 8 9975 5 5 4 56666665 432 2222 2 2 222200 -

.4 55 5420 00 12 3 3 2 3568875 567 8 99642 124666 77 7899 96 9976 55 4 456 6 65 5432 2 2 1 2 2 22 321 0

.5 665421 0 0 1 34433 2 345788 87766 79 8410 13455 678887 66 7 8 8 77765 4 4 56 5 566654322 1 12 3444322 2 332 222

.35654210 0 1 3 331 1246789999987 79 7410 124565 6788876 6 78 8888765 4 45 54 456776653 22 1 1234 5 432 23 3 2

.555421 00 1 23 2 1 23567 88 98754 44432 246777666 77 6 67 895957 7898754 4 5 5 4 5677 6533 2222222 3 3332 22 3 3 3

.443210 0 1 2 21 124677 754210 0 1 24678 7777 7776 7 8999976 78998654 44 677 6543 34443 2 2222 3 4 333333

.111 0 0 1 1 12467 88 76432 100 12467898 7 7 7 77 8 88 8 99987765 44 4 3 45 65443 2222222 111 2 2 2 3 33 222

-- 0 1 1 124578999864 3221111 12369 97 8887 7 8 996 7 93 9 864 443 356643 2 1 1 2 22 2 2 10

.222100 0 11111 111 0 134578 887543 2 11 2111 2368987 78 7 7 7 7 7 79 9 9 975 44 433 5 543 22 111 1 1 1111 2 1

.54310 012222 1 0 02577765 44321 0 03

$$K1 = 417000.2 \quad 3$$

Y1= 4649403.0 0

X2= 585000.0

$$Y2 = 4649400.0$$

TABLE V

LEGEND TO URANIUM AVERAGE MAP (PPM)

<u>CONTOUR VALUE</u>	<u>LOWER LIMIT</u>	<u>UPPER LIMIT</u>
-		0.25
0	0.25	0.35
1	0.35	0.45
2	0.45	0.55
3	0.55	0.65
4	0.65	0.75
5	0.75	0.85
6	0.85	0.95
7	0.95	1.05
8	1.05	1.15
9	1.15	1.25
+	1.25	

```
+.....+
.
.
.
.
.
6          3          4      +++      2          2          4
.899864 57899864332322 3 45555531 233210 01233210 123444 69 + 84 478 998731 234 5 6 78++++ 7421 2345 222
. 8 877 18 77765444 3 44 44 568864332 33 3 333 4 5 679 + 9987655 6 66433 42 245 678998632111 23 3 4321 2 21
.34568886 6765 7753 455 43 2 2356 66443 3 4565 6 87 89876665 4 3 34 43 35676665 379864 321 12 4443 333
. 677 76 5 4 46765 6655 43 21 136788654 33 456 67899+ 775 42 11 13442 23444 55 469 73 2443211 2 2 3 333 44433
.++ 98 7 542 234 6764 46 665555 789997643 3 3578 9 9865432 1 1 2344322 2344 5542 235788532 11 2 344 3
. 66 7 87632 34 4 6 63 467177777 9 8531 2 2 368998 96 444330 134 432 23443 35543 578752 1 12 2 34444444
. 3456 78886433 44 35655 67 8888887766544322222 3457 888775432 11 2 3322 357876555 54 57764222221 2 2 1 234 44
.766 689 852 2699888766 7 8 97643 2 22 2 36876 654 31 1 23321 136789877 554 332 34542 232 12455 444
. 8877 666543 3456 7867 7 8999888764 222 22 34577765 4321 0 1233333 222 3 4 44444443 1 12344 3222 11 234 555 44
.79 841 1 3567 8 7 89 987653 2 344332 358 85 45641 011 368852 2 2 2 3 321 245 4321 12222 3 4 4 555431 233
. + 8543222 3456789998 9876 78 863 2 2 3 2 34679985 3 43200 1 22 34 54433 44433 3 44432 111 23443 2 111 2 3333 4 4 3 44 322 3
.67897542 34567 88 9976 443 3 32 233310 014678 61 1 11 246665 6542 23578741 0 134432 1 122 2443 2 3 456654
.3456543 455 6 77 899987654 33 4 5432 22210 0 24567654 21111 1 11111 2466 666433 45 4 21111 34 4321 1 1 23 31 2345432
.367630 26 98 888 99875321 1247997421 1 11 12332 234431 1 111 2345 5 666432 35541 12 45 766541 11 1 22 1 1 2 222 3
.78 74 36 88 998 9 96310 148 9631 110 13431 024431 0 11 0 034566654 455320 035541 12368 98874 1 11 22 1 0 1 1 0
.764 45678 99888 9 9764 21 245666543322 11 222 10 1 1 000 1 3456777644 3 3 43 3 31 12 33 4 421 1 2 2 1 0 0111 221 0
.433 48876 787 97 78640 0257874 355431 134321 1 21 0 14567 942 2357764 3321 2 11 134 42 1 2 1 0 012 23320-
.655 677 7 8 88 9 7522 3 456653 34654321 11 345553210000 0 1 222 3 456776543 34333 3211 1 2 22 11 1 111 2 3221 -
.4 5 6789 99 899 852 245665 6 7 8 63 21 037 73 11 0 00 02332 23566 5 65432 2 4321 111 22 21 11 111 1 1 34554310 00
.+999 9999 8888 9 742 235 5 679 743 20 012577531 22 33210 13 3 34 56554 543 2 2 3 21 2222 1 11111 11 1 1233332 1110-
.8+ 8 7 9420 02554 49 8310 00 1234432 12467 9 985543 36788532 1 2 22 22 2 1 2222 1 1 111 0 01 10 -
.++ 99 9999865 66521 1 24665 47 961 0 12331 03578 95 42 269 952 1222 3332 2 34432 1111 1 0 11 1 0 1 1 00 -
.56 7899 853 2 233 45665 579 985310 0 12222 1 2469 8 66 6666 666542 2 3 43 4433 333322222 11111 0 011 1 11 210 0
.4 679 9 941 0 123 44 56652 26 62 0 01 10 0121 16 7 6 6 6763 35654 56532 1 2 333321 11 22222 1 12 332210 0
.5 68 9947642 1000 1356787641 23566654 221000 24431 1 23468 976 6 7 887655543 367754321 0 01222 332111 1 22 11111 1 1111 0
.4568 99731 0 0 123579962 047863 23420 02331 0124579875 79996777 65321 269985 432111 12 2 2 21 110 0 1 1 1 0
.369999875310 00 0 12345 44 32 3689975433 3211111 2 3 456 7 7 777 7665 4 3 22 344 33 33221 2 2 2221110 01221 0 1 1 0
.++ 741 0 0 036751 0244 457 7665444321 1 1 245555 5 67898 77643 2 2 23432 2 23466553 2 2220 024530 01 1 0
.9887777642100 00 1344333 4566532 34 4443211 0 013 4 5 55 689 86 5432 22 345543 443 44 33 2 2 111 2 10 1 11 0
.55 688641 0 1 135544 579 843 3 3 321 0 0 124654 45 5 66 543 2 35642 56666653 1233 2 222 2221 1 22 11111 0
.4 5 7754200000 135555 689 9754443 43221 0 11 2 355 4 55 5 5 433 22 3 32 246666 5311 2 22 2 22 11 2 3332111 2 2 2 3321
.54 676410 0 111 1234 56788888887544 554321 12333 568765555 5 5544333 3 322 4 4 3 5553 2 1 0 000 134554 33333 3332 2
.3 345530 012 1 23 579 99 74 4 66531 11 2 333 58987 6766 5 443210 0 12455 357753321 0 00 1356643 333332 2
.++ 731 01 210 0122222 4579 85 33333 22 34443 44 5665 576886 676542 34554 5544 5676554321111111 23 4333 333 222 1
.+ 7410 012210 01222 36 96333 2 2 4 544 4 5 5654 579 97 67876544 554 5665 68986 6542 2 34432 1 12 3 3 222 221
.5320 0 1 11 00 1 1 369 63 2 2 222 1 24666655 44 5 543 3456 78876 6666543 4 4 3 4 5 432 2 3 3 222111 2 2 2222221
.0- 011 11 0 0221 15 975431 13310 247974 35665 4 54 469 74 589853 244320 0135541 12332 1 1 2 
```

TABLE VI

LEGEND TO THORIUM AVERAGE MAP (PPM)

<u>CONTOUR VALUE</u>	<u>LOWER LIMIT</u>	<u>UPPER LIMIT</u>
-		0.50
0	0.50	0.95
1	0.95	1.40
2	1.40	1.85
3	1.85	2.30
4	2.30	2.75
5	2.75	3.20
6	3.20	3.65
7	3.65	4.10
8	4.10	4.55
9	4.55	5.00
+	5.00	

X3= 585000.0
Y3= 4770069.0

[illegible]

TABLE VII

LEGEND TO URANIUM/POTASSIUM RATIO MAP

<u>CONTOUR VALUE</u>	<u>LOWER LIMIT</u>	<u>UPPER LIMIT</u>
-		0.50
0	0.50	0.70
1	0.70	0.90
2	0.90	1.10
3	1.10	1.30
4	1.30	1.50
5	1.50	1.70
6	1.70	1.90
7	1.90	2.10
8	2.10	2.30
9	2.30	2.50
+	2.50	

```
X4= 417000.0
Y4= 4770069.0
```

[illegible]

TABLE VIII

LEGEND TO URANIUM/THORIUM RATIO MAP

<u>CONTOUR VALUE</u>	<u>LOWER LIMIT</u>	<u>UPPER LIMIT</u>
-		0.24
0	0.24	0.26
1	0.26	0.28
2	0.28	0.30
3	0.30	0.32
4	0.32	0.34
5	0.34	0.36
6	0.36	0.38
7	0.38	0.40
8	0.40	0.42
9	0.42	0.44
+	0.44	

X4= 4170.00.0

$$\times 3 = 585000.0$$
$$Y_4 = 4779069.0$$
$$Y3 = 4770069.0$$

5++ 7----	023331	10 0-	012346644	---	22 --	0565320----	0 36 952-	14643320 -	017+	6 6764	3578775	7++	543
67520	0234	32211111	2 3	5654200 -		34 5421	0136 65 33 33	222 21 1451-	045 5	44444443	3564	5442	3433
012210	6985	5531	121 1221 1	1 11	1 2442	0 14664321	0 1 1 0343 38	8 9843 79743 20		132-	35543	555	
-	0 0	25643	442 121	01 2	320	0 122 1 1	366 7540	11 3651 368 8863	39 7	4761	1 10 34	5677 78	
00	132	24420	0	024331	12 34	5555432	45654 3 344	57774 320	255553-	255431	11	12442	234 678
-	121	012	3552	00 13567644	4788 9	951 4787620	15530 2 341	024 5530	12321	01	03541	246 78+	
-	02210	0	021000	1 2 3444	4 555 5	6788653 4 55	4311 2 21 0 110	024543 2 10	0	01 21	13452	27	++
--	03542	022 21	1111 2576420	01465 4 4 3	233 13574 79 83	2442 0	13310 010	1330 03651	27850	1+	+++		
0	1210	01 2 310	0 134 44322	3456788520	13 45554 332 22	2100 0 00 0	1 10	245431	24652	26	++		
0122	121	1 2563	13 56641	156 80	2366 66420	256544320 00	1441	0121	04898410	26886 689	92	133	
642	02210	00 1 2 1100	029974 233 5 9	93 1 3 67665	321 24543	22 3333 320	12211 33320	01355444	68	9	95 1 2		
--	4883	110 01 10	476 5678852	0	345 630 0 23 553	343 46654310	0121	232	24430	38 75	568+	7	
--	0247642	11 1000 11	0000 0234 345 6430	0	72 33321 0133 5530	023 2 345 6542	0 11 0 10	013310	020	35762	2478751		
-	01 36997421	1 20 0 1	12320 2345552	01577652	2444322 343	432 3331	134666410	1322	34 66 76541	010	0110	245 44 68+	
12221	355431	1231 01211	1 10 1 34541	059 84	146521 234 45655	762	04552	2433	59 9 862	157763	0-	3552	-
33333322	33321	2221111	1 22222 4555421	013333 2	23454322 3	358 9643331000	1 10 025544220	023333221	0	01358 952-	022	232 -	
0146662	145322	2	0344432 2589851	11 0 01247874111	2 35664 2 33111	0 5 92 20	34210 0 0	12 36 840	03	37850-			
3333	22 2 3 2	2 32210	24553 46643 3 32	22221 0 12321	0 1 24653 2 111	0 025865310	1332 00 1 1 10	13432	2456530	-			
2220	1343 11	123320 3	4 4 92 3 1 245310	120	6974 00 0	24 66521 1	024 58620	132 14655440	16	61	135		
+87421	2 321 0	123320 28 94 4	72 2 1234321	0	00	443 01 0	12345432220	258765420	132 3687642	148873	46752		
9+ 953	2 2	023331	0331 4 7 530	034 44331	0 0 1 2 1211 1 0	021 1 1 2 2 26751	256530	1579 862 38 94	110 246				
56664322	3320	011 0 10	1332 3652 11	034555 653	1 23433 4532 0	032 1 0	02347 94	03688632110	1245654	59 930	02 259 +		
012	34 65210	0	4663 12200321	2100 135776 7652	11111 23443210	01 11 111 1233 3	5421 1234555431	010	159 8631	234569 +			
123 43	3468731	10	2210 021 11 3652	269875 53 1 1	157631	021 24640 13442	1220 02357 762	02577	84	03577 89			
4333	3 2 34320		02356642000	02467 77765321	0 1 234210	0 1221 232	23320 12 2321	04788654321	1235677				
21	24421 2330		013 57874 2431	146 7 732 20									

$$K1 = 417000.0$$
$$2 = 585000.0$$

Y1= 4649400.0

Y2= 4649400.0

• Figure 12

TABLE IX

LEGEND TO THORIUM/POTASSIUM RATIO MAP

<u>CONTOUR VALUE</u>	<u>LOWER LIMIT</u>	<u>UPPER LIMIT</u>
-		2.50
0	2.50	3.05
1	3.05	3.60
2	3.60	4.15
3	4.15	4.70
4	4.70	5.25
5	5.25	5.80
6	5.80	6.35
7	6.35	6.90
8	6.90	7.45
9	7.45	8.00
+	8.00	

X3= 585000.0

$$Y3 = 477.0069.0$$

5 0 1 3 333 6 3 3

.333 45544 43321 234567654333221 23454322210 123322 2 3 43 1111 234543 44321 355543 44 5443210 135 222

.4555 6665 4 3333 456 54 5 222 344 5 2 11 233 2 2 3 443322 2 3 444 322 4 5555554 32 3466522221 11

.34 568885 4 5 6666665 33 321 0 1 2 3 33 22 222 2 233 3 2 1 123444 444333 3578875 4 33 45543 2221

.9 986 65 5 5 56643 34310 11 3 33 2 11 22 245653210 134 555 4 3 3 579 97654 444 44433 2 2 2100

.55 6777654 566 5 5665 43333333 3 2 1 1 22222222 1 234 4 54 3 56665 665 44 4 3 22 2 33332 1 0

.34 566 54 4 54 4579976544 555544 333210 0 1 2 22 1 1 1 2444 4554 3333 46654 4555 4 32 2 3 4443 1 0

.56665 4 4 4 4 566 65555 4 3 222 1110 1 1 1 111 2 3 333 2 34 555 5 4444 3 22 3 2 3321 0 11

.357885 46652 2466 4 45666 5 5 55 443 2 1 1 1 2222222 1 1 1 3 3 2 2 3 4 68853 234 3 4432 2210 0 111

.2345 65 44444 5 555 5555 444 3 2 111 11 22222 2 1 1 0 1 222222 3 4443322 2 345666521 123 33 32 1 1 1111 1 11

.3 57 8853 2455 55 5 43 3 33210 01222 2 2 21 11 0 011 2 2 2456654432 2 24699740 14543 3432 0 0 122211 1 1 1 2111

.45 6 6665555 5 5 55 43 22 1 1 12222 2 222 21 0 1100 122 222 3 44 33 3 22 3 45654311 23 333 3 211 2333 2 1111 1 1

.77776 575986 76 5 56665 44 3 2221 036651 1 2 321 0220 03421 1244 2 2 3 32 2 34 554 444443 3 321 2344332 1 1 1

.55554 45 6 66 5 5 44 3 33332013443 1 2 3 200 12210 12332 3444332 3 3 2 2 345 54 3 4444433333 3 32 1 12222 1 0

.55 420 135 555 43 33 2 332 2 22 2 1 233 22 4431 211 34444 56554433 332 222 344 3 456765444443 34443 33332 32210

.44 432 344 43 332 2333 23321 1 12332 3553 1 22 22 247 8 5 4 3333 2 2 2 3443 4689865 6664 345543 4443333221

.44 4444 555 4 4 32 111 2 222 11 111 2 33332 321 00000 123456776 543 2222 2 34 57886 3 358 8777776433 322 23 3 2 1

.4 5 6665 78764 4 4420 013310 01 1 123 33 33321 01368876554321 11 26876 6774 359 9 999853 3 31 23 3 332 1

.7766 5 444 5 5555 4 3 21 11 1 0 00 1 1 2 2 2344332 10 013444 544443 2 11 1 2357998765 44 679 986 55543 222 1 1 234432 11

.55 6 54 4 4 32 23320 02221 12331 134 32210 0 1234 3 2 1 1 5 73 34 58 62 124432 110 0 2578741 00

.555 4 4 5 4 332 222210 123332 23332 12555 3221100 1 2333333 3 22 11 1 48 964 456 78 9632 34321 0 0 12355310 -

.54 4 4 44 5677643 2 233 44321 3331 14787532 122 33322 2 3 32 111 1 23442 4689998 9 84 4555443321 2333 110

.7654 444 56787643222222 2 33 431 13431 1577531 0123433321 123 4321 1 221 134544 55 6789998765555 43 33 2111 2 3 2 1

.876 4 4 5 543 3 432 22 2 322 00 12 222 3 32 10 12 2 2 3444 3 211 1 22 3 33 579 9 999877666543 2 2 22

.44 55 4 4 44 5 54 45542 22 34210 01333 21 0 0 2 2 2467643 2 1 1 24442 23579 9 99 9887543 2 22 233 2

.765 443 3 45 543 222 1 0 1233320 012 3 22 11000 1 2 2222 3 44 3 21 1 1 1 1357 97 7998 76 54 43333 2 23 332

.44 431 024666642 2210 25651 013432 2 1 12 22 23333 3 2 3 44211 1 1 1 234579 85 589865 554 44444332 23443 3

.44 4 43211 234 432 1 22 3 443210 012 455531 1 111 2 22 1 2 22 1 23 45666 55555532 1 1 23 3 332 3 3 33

.55 4 4 432 2343 22221 1357764420 02333 11 1 11 1 1 1 2222 1111 2 46643 3 320 0 12 34 543 3 4

.44 4 4 32 1 2455433 2 1 1 23 33210 012 1 1111 000 1 1111 22 1 00 1 2 2 3 33 3 3 20 012 3 566 54 345

.44 5 42 21 1356543 21 0 0 1233210 12 1 11 22 1 01 222222 2 10 02221 2 33 2 23 332100 12 58 964 345655

.44 5 543 21 34543 2 1 0 1 23 21 0 1 2 11 1 1100 1 111 2 222 1 00 1 22 1 2332 23443 21 12 4677643 34 5

.4 5 54 2 322 233 2222 1111 22 33210 01 0 01 00 1 1 1111 1 234332 1 1 1111 22 2222 444 2 11 12 33 2 111 1 23

.55 432 23432 2 32 22 1 12 3 210 011100 1 0 011 0 0 0 13454 32 1 222 222 2 2 44321 12 2 0 0 123

.66543 489852 23322 11 2 22000000 11 0000 1110 01 22 3 43 2 2 2 222 2 3 33211 22 2111 111 22

.55432 246652 1 1 11 23433 3 2 331 1222221 0 0 1 10 0123 3 333 22 2 2 3332 1367643 433 2 1 1 21

.332 3443 2222 10 0 1 233 3 2 2 111 22 11 0 00000 111 1000 12 222 33 2 2 3333333 3 45677 88877666554443321 23 4

.01233 5542 234310 013444 32 2 321 12210 0 012222 11111 1 2 2 2 333 2 2 345554 343 49 777 99 87776665432 467

.4 55555432 11111 22222 23444 3 2 1 2 2 1 221 0 0 00000 1 11 1 111 2 22 2 2 3 3333333 33 6

$$X2 = 585000.0$$

Y2= 4649400.0

• Figure 13

The generalized map of total magnetic intensity indicates the presence of a broad zone of strong magnetic relief in the eastern part of the quadrangle. Local relief is in excess of one thousand gammas, with individual anomalies apparently irregular in shape and lacking observable trend. The anomalous zone generally corresponds to the region in the east that is overlain by Pliocene basalts (Tpb).

Other areas on the total magnetic intensity map display relatively gentle relief. In the extreme west center, there is an elongate positive anomaly, trending northeast-southwest, flanked to the northwest by a negative complement. This feature is consistent in trend with the regional geologic strike and it apparently corresponds in location to a body of exposed Jurassic/Cretaceous intrusive granitoid rocks (gb, di, and qd).

The radiometric maps indicate several areas of general enrichment in uranium and thorium concentration. The most prominent of these are in the central part of the map sheet, across a large exposure of Applegate Group banded crystalline rocks (Bag) in the south center across an area of exposed Jurassic/Cretaceous quartz diorite (qd), and in the southeast in a portion of the quadrangle mapped as being underlain by Pliocene olivine basalts (Tpb).

Only one anomaly attributable to radiation in the uranium spectral channel is observed, on line 240 fiducials 1910-2000. It is associated with an exposure of Jurassic volcanic rocks (Jv) described as resembling the Rogue Formation (Jrv) but otherwise uncorrelated. Presumably it is dacitic or andesitic in gross composition.

There are twenty-eight anomalies singled out as thorium features. Eight of these are in the northeastern part of the quadrangle and are associated with Eocene volcanic rocks (Tev).

In the central part of the sheet, four thorium anomalies are correlated with exposed rocks of the Galice Formation (Jgs) and its contemporaneous andesite flows (Jgv) and in the southwest, three additional thorium anomalies are present that are correlated with the Galice Formation (Jgs).

In the south center, four thorium anomalies occur over the variegated altered flows, breccias and intrusive members of the Applegate Group (Bav and Bas), and in the southeast, three broad thorium anomalies are observed over exposures of quartz diorite.

AERO SERVICE

LEGEND

- ③ URANIUM ANOMALY NO. 3
- IV THORIUM ANOMALY NO. 4

INTERPRETATION MAP
MEDFORD QUADRANGLE
U.S. DEPARTMENT OF ENERGY

FIGURE 14
73/74

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A P P E N D I X A

Geologic Legend

GEOLOGIC LEGEND

<u>Aero Symbol</u>	<u>Map Symbol</u>	<u>Unit Description</u>
QAL	Qal	Quaternary alluvium
QS	Qs	Beach deposits
QPS	Qps	Pumic and Scoriae of Mt. Mazama
QMV	Qmv	Dacite flows of Mt. Mazama
TPB	Tpb	Pliocene volcanic rocks of the High Cascades, primarily olivine-bearing basalts and basic andesites
TPIB	Tpib	Olivine basalts within canyons of the High Cascades
TMV	Tmv	Miocene volcanic rocks
TIG	Tig dp	Intrusive rocks, including: dioritic rocks, basalt dikes, dacite dikes, and dacite sill-like bodies
TEV	Tev	Eocene volcanic rocks
TEA	Tea	Arago Group
TEU	Teu	Umpqua Formation
KC	Kc	Cretaceous Hornbrook Formation
KP	Kp	Paskenta and Horsetown formations
GB	gb	Jurassic or Cretaceous intrusive rocks including: gabbro
DI	di	diorite
QD	qd	quartz diorite
GD	gd	granodiorite
GR	gr	granite
PD	pd	Peridotite
SP	sp	Serpentine
JK	Jk	Jurassic Knoxville Formation
JGS	Jgs	Sediments of the Galice Formation
JGV	Jgv	Volcanics of the Galice Formation
JRV	Jrv	Volcanics of the Rogue Formation

<u>Aero Symbol</u>	<u>Map Symbol</u>	<u>Unit Description</u>
JRG	Jrg	Metamorphic rocks derived from the Rogue Formation
JDS	Jds	Sediments of the Dothan Formation
JDV	Jdv	Volcanics of the Dothan Formation
JV	Jv	Jurassic volcanic rocks
TRAV	T av	Volcanics of the Applegate Group
TRAS	T as	Sediments of the Applegate Group
TRAG	T ag	Bander crystalline rocks of the Applegate Group
OS	os	Schists
CA	Ca	Areas of stray contact metamorphism in Jurassic and older rocks
W		Water

A P P E N D I X B

List of Geologic Units by Anomaly

List of Geologic Units by Anomaly

(Uranium Anomaly)

<u>Anomaly</u>	<u>Formations</u>	<u>Line</u>	<u>Fiducial Interval</u>	<u>Brief Description</u>
1	Jv, Jgs	240	1910-2000	U peak, minor Th, good U/Th
(Thorium Anomalies)				
I	Tev	220	5360-5460	Good Th, Weak U, no U/Th, U/K or Th/K
II	Tev	220	5820-5980	Irregular weak, Th, minor U, no U/Th, U/K or Th/K
III	sp, Rav	240	2060-2170	Isolated dual Th spikes, slight U, no U/Th, U/K, Th/K
IV	Tev	2060	8600-8680	Irregular Th, smaller U, no U/Th, U/K, Th/K
V	Tea	250	5820-5890	Broad, strong Th, no U, no U/Th, U/K, Th/K
VI	qd	260	4700-4740	Th spike, small U, no U/Th, U/K, Th/K
VII	Tev	260	5910-5370	Good Th, smaller U, no U/Th, U/K, Th/K
VIII	Jgs, Jv	270	11490-11620	Irregular regional Th, lower U, no U/Th, U/K, Th/K
IX	Jds	280	16340-16370	Small Th, very slight U, no U/Th, U/K, Th/K
X	Jrv	280	16530-16630	Irregular regional Th, smaller U, no U/Th, U/K, Th/K
XI	Jgs	280	16970-17020	Small Th, very slight U, no U/Th, U/K, Th/K
XII	Jgv	280	17200-17230	Small Th, very slight U, no U/Th, U/K, Th/K
XIII	Tev	280	17680-17750	Irregular Th, very slight U, no U/Th, U/K, Th/K

<u>Anomaly</u>	<u>Formations</u>	<u>Line</u>	<u>Fiducial Interval</u>	<u>Brief Description</u>
XIV	Jv	290	15650-15710	Isolated Th, smaller U, no U/Th, U/K, Th/K
XV	Tev	290	16460-16550	Irregular Th increase, slight U, no U/Th, U/K, Th/K
XVI	Tev	310	11400-11480	Irregular modest Th, slight U, no U/Th, U/K, Th/K
XVII	qd	340	6950-7000	Isolated Th peak, no U, no U/Th, U/K, Th/K
XVIII	Tev	370	7580-7680	Minor regional Th, no U, no U/Th, U/K, Th/K
XIX	Jgs	390	12070-12290	Regional Th increase, slight U, no U/Th, U/K, Th/K
XX	Jgs	400	5380-5600	Regional Th increase, slight U, no U/Th, U/K, Th/K
XXI	Rav	400	6700-6740	Abrupt Th spike, minor U, slight Th/K and U/K
XXII	Jgs Jv	410	1690-1810	Irregular Th, slight U, no U/Th, U/K, Th/K
XXIII	Rav	410	2100-2140	Th spike, no U, no U/Th, U/K or Th/K
XXIV	Rav Bas	410	2460-2530	Minor Th, slight U, no U/Th, U/K, Th/K
XXV	qd Teu	410	3050-3200	Regional Th increase, smaller U, no U/Th, U/K, Th/K
XXVI	Bas Rav	430	2030-2090	Abrupt Th spike, minor U, no U/Th, U/K, Th/K
XXVII	qd	430	2740-3020	Broad regional Th, lower U, interrupted by zones of no response. No U/Th, U/K, Th/K
XXVIII	qd	440	5320-5430	Broad regional Th, lower U, no U/Th, U/K, Th/K

A P P E N D I X C

List of Anomalies by Geologic Unit

List of Anomalies by Geologic Unit

<u>Aero Symbol</u>	<u>Map Symbol</u>	<u>No. of Samples</u>	<u>No. of U. Anomalies</u>	<u>No. of Th. Anomalies</u>
TEV	Tev	12932	-	8
TEA	Tea	4352	-	1
TEU	Teu	1893	-	1
QD	qd	4286	-	5
SP	sp	2224	-	1
JGS	Jgs	5311	1	5
JGV	Jgv	1998	-	1
JRV	Jrv	4455	-	1
JDS	Jds	7506	-	1
JV	Jv	735	1	3
TRAV	Tav	11072	-	5
TRAS	Tas	1313	-	2

ALL OTHER GEOLOGIC UNITS HAVE NO ASSOCIATED ANOMALIES

A P P E N D I X D

Mean Radiometric Values by Geologic Unit

MEAN VALUE BY GEOLOGIC MAP UNIT

MEDFORO

QUAD

LINE 220

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
TEA	0.24	0.83	11.34	0.252	1.201	4.981
KP	0.15	0.66	9.78	0.273	1.026	3.851
JV	0.07	0.32	4.33	0.323	1.472	3.999
SP	0.13	0.68	6.17	0.220	1.138	4.932
JDS	0.19	0.53	9.18	0.203	0.912	4.934
QAL	0.24	0.66	14.32	0.182	0.705	3.941
JK	0.16	0.48	10.44	0.185	0.655	3.692

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
JRV	0.09	0.50	5.29	0.339	1.162	4.177
JGS	0.28	1.24	14.59	0.297	1.379	4.655
QD	0.15	0.66	8.52	0.244	1.092	4.150
TEV	0.21	1.01	10.09	0.326	1.568	4.882
TPIB	0.14	0.57	8.07	0.281	1.094	3.926
CPS	0.12	0.46	7.76	0.259	0.903	3.649
QMV	0.09	0.34	7.29	0.248	0.734	2.864

LINE 230

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
TEA	0.24	0.85	10.10	0.248	1.354	5.518
JV	0.09	0.95	4.32	0.339	1.890	4.146
SP	0.06	0.50	3.03	0.291	0.986	2.861
TEU	0.19	0.76	13.05	0.212	0.656	3.671
QAL	0.28	1.03	14.84	0.243	1.047	4.346
KP	0.22	0.87	11.98	0.244	1.105	4.316
JK	0.20	0.62	10.79	0.191	0.875	4.382
JRV	0.21	0.87	12.90	0.263	1.039	3.840

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
JGS	0.26	1.03	15.83	0.246	1.026	4.040
QD	0.22	0.66	12.60	0.199	1.015	4.330
TRAG	0.07	0.39	5.60	0.269	0.813	2.883
TEV	0.16	0.75	7.14	0.310	1.694	5.511
TPIB	0.15	0.63	7.90	0.233	0.913	5.137
TPB	0.14	0.43	8.50	0.210	0.773	3.805
CPS	0.13	0.66	8.15	0.318	1.206	3.880
QMV	0.11	0.45	7.70	0.272	0.988	3.444

LINE 240

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
TEA	0.31	0.91	12.32	0.198	1.138	5.825
JDS	0.29	1.01	12.20	0.238	1.301	5.660
JRV	0.10	0.55	6.91	0.339	1.051	3.106
JGS	0.28	1.19	17.05	0.279	1.054	3.823
QD	0.18	0.82	11.45	0.279	1.392	3.508
JV	0.21	1.51	14.37	0.378	1.361	3.382
TPB	0.13	0.60	7.13	0.291	1.215	4.371

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
SP	0.14	0.91	8.84	0.293	1.119	3.526
TRAV	0.07	0.36	3.50	0.122	0.853	4.191
TEV	0.18	0.67	8.62	0.241	1.286	5.212
TMV	0.16	0.65	7.03	0.259	1.333	5.711
CPS	0.16	0.67	8.79	0.271	1.027	4.354
TPIB	0.13	0.38	6.88	0.195	0.839	4.392

LINE 250

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
TEA	0.38	1.07	15.30	0.189	1.146	6.207
KP	0.28	1.13	8.76	0.261	1.945	7.445
JK	0.19	0.91	7.24	0.284	1.673	6.062
JDV	0.04	0.50	5.57	0.0	0.908	2.515
JDS	0.26	0.96	10.74	0.246	1.417	5.725
JRV	0.11	0.48	7.87	0.268	0.971	3.445
JGS	0.25	1.02	14.80	0.274	1.079	3.905
JV	0.09	0.53	6.27	0.290	1.306	3.377
TPB	0.13	0.56	7.46	0.301	1.103	4.057

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
QD	0.05	0.30	3.26	0.308	1.561	3.531
SP	0.03	0.25	3.44	0.0	1.594	2.258
TRAV	0.05	0.0	2.98	0.0	0.0	3.882
TRAG	0.10	0.44	6.66	0.270	0.938	3.219
TEV	0.20	0.70	10.96	0.221	0.939	4.344
TMV	0.30	0.94	10.28	0.205	1.593	7.502
TPIB	0.16	0.66	8.15	0.270	1.218	4.560
QPS	0.16	0.87	8.13	0.318	1.415	4.506

MEAN VALUE BY GEOLOGIC MAP UNIT

MEDFCRD

QUAC

LINE 260

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
TEA	0.35	1.15	13.58	0.205	1.274	6.150
KP	0.18	0.33	6.00	0.101	0.701	7.080
JK	0.15	0.43	8.48	0.183	0.829	4.330
JDV	0.07	0.47	4.66	0.286	1.184	3.920
JDS	0.31	1.03	14.01	0.229	1.184	5.231
JRV	0.12	0.55	8.35	0.317	1.111	3.471
JGS	0.24	1.05	13.99	0.269	1.077	3.947
QD	0.09	0.42	5.97	0.258	0.944	3.271
QAL	0.09	0.33	6.93	0.168	0.561	2.667

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
JV	0.11	0.63	7.34	0.274	0.937	3.042
SP	0.16	0.90	10.36	0.301	1.107	3.655
TRAV	0.08	0.48	5.95	0.350	1.142	3.194
TRAG	0.06	0.0	3.45	0.0	0.0	4.270
TEV	0.20	0.62	10.46	0.207	0.984	4.897
TPIB	0.16	1.11	8.06	0.413	1.733	5.106
QPS	0.13	0.54	7.17	0.297	1.206	4.264
TPB	0.10	0.51	6.97	0.291	1.112	3.267
QMV	0.11	0.55	7.03	0.331	1.214	3.705

LINE 270

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
TEA	0.37	0.82	13.07	0.144	0.956	6.547
KP	0.20	0.70	9.45	0.192	0.974	4.755
JK	0.12	0.68	5.51	0.351	1.665	4.907
JDV	0.08	0.47	1.61	0.316	0.0	9.687
JDS	0.31	0.96	12.48	0.203	1.215	5.990
SP	0.09	0.55	5.98	0.224	0.962	3.260
JRV	0.11	0.58	7.34	0.314	1.480	4.272
QAL	0.11	0.22	7.82	0.123	0.382	3.402
TPB	0.12	0.51	7.10	0.268	1.087	4.025

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
JGS	0.22	1.26	12.40	0.320	1.242	3.586
JGV	0.09	0.95	5.31	0.424	1.865	3.805
JV	0.16	0.79	9.96	0.277	1.024	3.160
QC	0.06	0.37	2.88	0.144	2.005	3.752
TRAV	0.05	0.33	2.26	0.298	1.859	5.134
TEV	0.18	0.73	9.62	0.241	1.074	4.668
TPIB	0.18	0.74	9.28	0.241	1.055	5.002
QPS	0.15	0.53	9.15	0.221	0.846	3.991

LINE 280

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
TEA	0.31	1.00	13.02	0.210	1.198	5.636
SP	0.07	0.46	3.15	0.276	1.237	4.295
JK	0.11	0.29	6.36	0.196	0.695	4.192
JDV	0.05	0.40	3.30	0.671	1.892	2.795
JDS	0.31	1.13	14.19	0.240	1.258	5.134
GB	0.14	0.68	7.83	0.350	1.673	4.318
JRV	0.10	0.44	6.13	0.244	1.042	4.015
JGS	0.26	1.01	13.56	0.254	1.098	4.345
QPS	0.13	0.57	7.26	0.315	1.156	4.247

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
JGV	0.08	0.55	3.88	0.337	1.898	4.188
JV	0.04	0.43	2.72	0.0	1.906	3.316
CD	0.08	0.47	3.25	0.306	1.867	5.073
TRAV	0.04	0.29	1.83	0.278	2.176	4.423
TRAG	0.04	0.29	1.19	0.0	0.0	0.0
TEV	0.18	0.69	9.25	0.246	1.198	4.647
TPIB	0.17	1.06	8.50	0.402	1.883	4.873
TPB	0.13	0.42	5.58	0.208	1.141	5.362

LINE 290

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
TEA	0.14	0.33	7.44	0.153	0.671	4.391
KP	0.24	0.96	11.55	0.259	1.259	4.900
JK	0.18	0.47	7.99	0.174	0.893	5.487
JDV	0.16	0.75	6.06	0.314	1.775	5.927
JDS	0.30	1.00	13.16	0.226	1.254	5.692
JRV	0.09	0.57	7.51	0.301	0.867	2.517
GB	0.05	0.0	2.29	0.0	0.0	4.257
JGS	0.20	0.90	8.94	0.238	0.987	4.080
JGV	0.08	0.52	4.59	0.392	2.105	3.850
JV	0.19	0.71	10.61	0.262	1.079	4.346

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
SP	0.19	0.81	8.39	0.235	1.110	4.752
KC	0.05	0.40	2.22	0.379	2.059	4.518
TRAV	0.04	0.25	4.03	0.0	1.036	1.953
QD	0.05	0.29	4.40	0.0	1.125	2.458
TRAG	0.05	0.35	1.30	0.0	0.0	6.841
TEU	0.10	0.62	2.68	0.257	2.141	7.845
TEV	0.22	0.91	12.53	0.281	1.141	4.280
TPIB	0.14	0.57	5.85	0.245	1.446	6.364
TPB	0.12	0.53	5.30	0.277	1.654	5.648
QAL	0.11	0.54	6.56	0.323	1.260	3.951

MEAN VALUE BY GEOLOGIC MAP UNIT

MEDFCRD

QUAD

LINE 300

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
TEA	0.22	0.81	9.30	0.230	1.276	5.639
JDS	0.33	1.22	15.12	0.244	1.246	5.167
JRV	0.10	0.93	8.61	0.518	1.576	2.742
QD	0.13	0.42	8.68	0.181	0.619	3.774
GB	0.04	0.0	1.35	0.0	0.0	4.923
SP	0.06	0.0	4.57	0.0	0.0	2.685
JRG	0.11	0.42	5.57	0.217	0.964	4.445
JGS	0.24	0.96	13.08	0.228	0.952	4.234
JGV	0.12	0.52	5.58	0.217	1.373	3.506

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
TRAS	0.35	0.17	1.47	0.0	0.0	5.496
KC	0.37	1.61	13.19	0.288	1.915	6.678
TRAV	0.06	0.36	3.46	0.189	0.549	2.665
TRAG	0.07	0.80	4.01	0.462	2.067	3.897
TEU	0.16	0.38	7.52	0.158	0.667	5.080
TEV	0.18	0.70	10.61	0.245	1.005	4.828
TPIB	0.12	0.41	5.14	0.244	1.437	5.907
TPB	0.11	0.50	5.96	0.306	1.360	4.921
QAL	0.04	0.29	3.38	0.306	1.114	3.079

LINE 310

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
SP	0.09	0.41	3.17	0.209	1.219	4.678
JDV	0.19	1.33	8.07	0.505	2.855	5.202
JDS	0.33	1.26	14.57	0.263	1.378	5.327
W	0.31	1.14	15.59	0.243	1.115	4.594
JRV	0.14	0.66	8.86	0.280	0.986	3.965
QD	0.17	0.63	10.87	0.206	0.791	3.767
QS	0.06	0.34	2.64	0.0	0.0	4.482
JRG	0.12	0.33	7.38	0.198	0.667	3.742
TPB	0.10	0.39	5.06	0.265	1.258	5.125

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
JGS	0.27	1.30	14.46	0.307	1.299	4.388
JGV	0.19	0.78	5.57	0.185	1.156	5.804
TRAV	0.05	0.28	1.84	0.0	0.0	3.895
QAL	0.13	0.31	9.17	0.182	0.673	3.275
TRAG	0.30	1.30	15.95	0.271	1.187	4.278
TEU	0.19	0.67	11.48	0.220	0.890	4.038
TEV	0.17	0.68	10.26	0.241	0.956	3.991
TPIB	0.10	0.45	3.26	0.301	2.256	7.320

LINE 320

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
JDS	0.27	1.09	12.35	0.259	1.327	5.172
W	0.26	1.47	14.34	0.369	1.614	4.367
JRV	0.12	0.64	3.88	0.286	1.763	6.396
QD	0.16	0.82	10.41	0.258	1.081	3.932
JRG	0.08	0.64	4.42	0.277	1.526	4.486
GB	0.15	0.44	8.91	0.181	0.675	4.235
SP	0.12	0.38	6.15	0.230	0.990	4.524
JGS	0.28	1.02	15.31	0.239	0.979	4.104

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
JGV	0.15	0.67	8.50	0.217	0.861	4.064
TRAV	0.10	0.59	5.20	0.269	1.833	3.933
QAL	0.12	0.54	8.54	0.254	0.742	2.978
TRAG	0.32	1.37	18.66	0.271	1.034	3.840
TEU	0.33	1.06	15.58	0.196	1.033	5.109
TEV	0.20	0.76	11.99	0.252	0.960	3.934
TPIB	0.13	0.56	4.52	0.286	2.359	8.003
TPB	0.11	0.45	4.80	0.267	1.541	5.464

LINE 330

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
W	0.21	0.94	10.10	0.252	1.307	5.246
JDS	0.25	0.92	11.41	0.244	1.204	4.797
JRV	0.07	0.17	2.78	0.157	0.716	4.185
QD	0.15	0.65	12.00	0.221	0.656	3.177
JRG	0.09	0.34	5.27	0.202	0.837	3.779
GB	0.04	0.24	0.99	0.0	0.0	0.0
PD	0.03	0.0	1.08	0.0	0.0	0.0
SP	0.09	0.55	5.72	0.333	1.386	3.510
JGS	0.24	1.10	13.66	0.311	1.197	4.000
TPB	0.10	0.36	4.75	0.249	1.419	5.333

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
JGV	0.12	0.71	8.42	0.285	0.942	2.740
QAL	0.18	0.77	9.78	0.241	1.189	4.705
GD	0.14	0.62	13.98	0.300	0.735	2.510
TRAV	0.12	0.73	7.30	0.258	1.214	3.653
TRAG	0.23	0.99	13.68	0.287	1.124	4.053
TRAS	0.20	0.91	14.82	0.304	0.945	3.113
TEU	0.38	1.12	21.58	0.199	0.785	4.098
TEV	0.17	0.66	9.94	0.229	1.083	4.763
TPIB	0.16	0.56	5.47	0.244	1.759	7.144

MEAN VALUE BY GEOLOGIC MAP UNIT

MEDFORD

QUAD

LINE 340

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
TEA	0.29	1.70	12.44	0.381	2.092	5.515
QD	0.21	1.06	16.85	0.280	0.568	3.283
JDS	0.33	1.26	14.70	0.269	1.374	5.212
JDV	0.13	0.65	6.86	0.269	1.512	4.067
QS	0.04	0.0	2.52	0.0	0.0	3.290
JRG	0.06	0.19	2.61	0.159	0.617	3.945
PD	0.04	0.25	1.06	0.0	0.0	0.0
QAL	0.14	0.87	8.76	0.291	1.190	3.927
JGS	0.28	1.16	14.95	0.284	1.220	4.918
JGV	0.13	0.63	8.11	0.241	0.918	3.551
W	0.04	0.08	2.32	0.198	0.446	3.365

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
SP	0.09	0.57	5.79	0.312	1.703	4.310
GC	0.06	0.0	4.59	0.0	0.0	2.685
CA	0.02	0.0	1.91	0.0	0.0	2.515
TRAV	0.15	0.75	9.49	0.259	0.791	3.301
TRAS	0.18	0.72	14.68	0.285	0.713	2.778
TEU	0.23	0.85	15.98	0.247	0.794	3.295
TPB	0.11	0.50	6.65	0.308	1.189	4.013
TEV	0.18	0.65	11.54	0.217	0.821	3.746
TMV	0.10	0.72	5.08	0.417	2.486	5.268
TPB	0.12	0.47	5.67	0.226	1.032	5.012

LINE 350

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
JDS	0.28	0.96	12.16	0.225	1.214	5.391
JDV	0.08	0.30	3.80	0.303	1.761	4.646
QD	0.13	0.57	12.80	0.267	0.764	2.407
GB	0.19	0.51	13.01	0.139	0.716	2.778
SP	0.05	0.25	3.43	0.0	0.0	2.300
DI	0.13	0.35	6.36	0.196	0.773	5.154
JGV	0.13	0.57	8.08	0.178	0.690	3.494
TPB	0.11	0.47	5.73	0.286	1.256	4.828

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
JGS	0.26	1.32	15.06	0.250	1.046	3.957
QAL	0.20	0.69	14.25	0.228	0.722	3.375
TRAV	0.19	0.67	12.67	0.202	0.696	3.370
TRAS	0.25	0.75	15.19	0.212	0.767	3.762
TEV	0.17	0.68	11.93	0.255	0.867	3.421
W	0.13	0.77	9.51	0.240	0.894	4.455
TMV	0.07	0.51	4.37	0.387	1.863	4.171

LINE 360

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
JDS	0.29	0.78	12.16	0.178	1.008	5.577
JDV	0.28	1.30	13.07	0.311	1.512	4.910
QD	0.11	0.66	10.17	0.331	0.844	2.713
GB	0.04	0.19	1.40	0.198	0.0	5.384
PD	0.05	0.48	3.07	0.0	2.427	3.266
GR	0.05	0.30	2.43	0.277	1.648	3.861
SP	0.07	0.25	3.60	0.259	0.489	3.646
JRG	0.14	0.44	6.63	0.170	0.786	5.237
JRV	0.15	0.35	9.77	0.154	0.543	3.438
JGS	0.31	1.16	16.86	0.246	1.049	4.084

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
JGV	0.08	0.46	5.88	0.345	1.130	3.526
CAL	0.23	0.84	16.70	0.254	0.759	3.147
CA	0.07	0.19	6.30	0.176	0.535	2.778
TRAV	0.17	0.84	12.09	0.310	0.906	2.905
TRAS	0.18	0.74	13.24	0.275	0.895	3.112
TEU	0.32	0.66	15.84	0.137	0.644	4.824
TEV	0.19	0.69	12.15	0.222	0.825	3.754
TMV	0.09	0.41	5.26	0.232	0.900	4.059
TPB	0.11	0.59	7.88	0.334	1.148	3.372
W	0.08	0.28	3.44	0.269	1.006	4.564

LINE 370

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
QD	0.22	1.11	10.65	0.293	1.323	4.794
JDV	0.31	1.24	14.79	0.263	1.247	4.776
PD	0.06	0.37	2.97	0.244	1.244	4.025
SP	0.05	0.45	2.96	0.323	2.451	3.462
JRV	0.08	0.52	6.49	0.318	1.069	3.225
JGV	0.05	0.51	3.52	0.0	1.451	3.090
JGS	0.30	1.37	15.32	0.301	1.366	4.567
TRAV	0.16	0.67	10.41	0.253	0.833	3.382

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
QAL	0.20	0.79	13.99	0.268	0.943	3.445
DI	0.11	0.0	9.38	0.0	0.0	3.004
TRAS	0.22	0.96	17.14	0.270	0.807	3.082
KC	0.23	1.16	24.12	0.337	0.742	2.231
TEU	0.36	0.76	17.84	0.137	0.632	4.709
TEV	0.19	0.88	11.62	0.304	1.152	3.923
TMV	0.17	0.65	9.25	0.245	1.168	4.657
TPB	0.13	0.50	7.98	0.270	1.038	3.900

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LINE 380

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
JDS	0.03	0.28	1.51	0.0	1.550	3.205
QD	0.03	0.37	1.70	0.0	0.0	4.807
PD	0.05	0.60	2.38	0.500	2.236	4.036
DI	0.21	1.12	15.88	0.239	0.681	2.700
JRV	0.07	0.43	4.23	0.355	1.502	3.784
JGV	0.04	0.35	5.20	0.0	1.320	1.751
QAL	0.22	0.75	14.42	0.191	0.717	3.405
TPB	0.13	0.43	5.06	0.219	1.279	6.278

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
SP	0.20	0.57	9.65	0.184	0.581	4.191
JGS	0.33	1.46	16.89	0.285	1.314	4.651
TRAV	0.17	0.70	11.40	0.230	0.804	3.371
TRAS	0.20	1.13	11.28	0.285	1.193	3.857
KC	0.34	1.18	23.31	0.220	0.734	3.375
TEU	0.44	1.00	23.88	0.151	0.638	4.249
TMV	0.17	0.52	7.89	0.196	1.034	5.638

LINE 390

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
JDS	0.28	1.01	11.02	0.239	1.426	5.935
QD	0.09	0.81	3.16	0.275	1.859	6.359
SP	0.12	0.56	6.58	0.214	0.950	3.708
JRV	0.08	0.47	6.03	0.378	1.101	2.848
JGV	0.12	1.00	5.70	0.0	2.753	3.614
PD	0.05	0.36	1.57	0.233	2.260	7.512
QAL	0.22	0.85	15.29	0.240	0.789	3.431
JGS	0.30	1.10	14.79	0.202	1.041	5.161

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
TRAV	0.16	0.70	11.92	0.276	0.787	2.849
TRAS	0.15	0.62	10.13	0.264	0.962	3.737
DI	0.22	0.80	17.75	0.226	0.640	2.958
TEU	0.34	0.88	18.03	0.169	0.744	4.370
TEV	0.19	0.68	12.59	0.236	0.810	3.507
TMV	0.14	0.45	7.51	0.217	0.867	4.684
W	0.14	0.0	4.60	0.0	0.0	8.353
TPB	0.10	0.46	4.42	0.265	1.453	5.595

LINE 400

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
JDS	0.06	0.23	2.92	0.0	0.980	4.724
PD	0.04	0.35	1.83	0.0	0.0	2.874
SP	0.04	0.35	3.06	0.0	1.502	1.616
JRG	0.04	0.32	2.55	0.0	1.742	2.318
JRV	0.05	0.35	5.15	0.401	1.527	2.458
GB	0.0	0.0	0.54	0.0	0.0	0.0
JGS	0.32	1.18	16.28	0.232	1.120	4.825
QAL	0.16	0.82	11.63	0.297	0.995	3.461
TPB	0.16	0.60	6.85	0.248	1.329	5.533

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
TRAS	0.22	0.73	12.54	0.224	0.820	4.244
TRAV	0.16	0.76	11.07	0.314	1.096	3.147
TRAG	0.26	0.80	16.13	0.180	0.679	3.648
CD	0.32	1.02	21.79	0.215	0.769	3.518
TEU	0.33	0.88	19.65	0.191	0.709	3.827
TEV	0.16	0.58	10.99	0.227	0.776	3.483
TMV	0.12	0.35	6.79	0.183	0.739	4.299
W	0.09	0.31	5.89	0.221	0.778	3.515

LINE 410

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
JDS	0.08	0.56	3.29	0.221	1.102	4.885
PD	0.05	0.42	2.46	0.294	1.218	4.095
JRG	0.0	0.0	0.0	0.0	0.0	0.0
SP	0.03	0.37	0.42	0.0	0.0	0.0
JRV	0.05	0.34	4.57	0.313	1.154	2.590
JGS	0.13	0.62	7.69	0.287	1.514	5.205
QAL	0.14	0.71	9.38	0.264	0.961	3.267
TRAV	0.14	0.64	11.18	0.263	0.867	2.834
JV	0.22	1.02	14.68	0.315	1.065	3.418

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
TRAG	0.19	0.86	11.20	0.267	1.057	4.170
CC	0.26	1.26	15.47	0.279	1.109	3.832
TRAS	0.14	0.75	13.72	0.318	0.833	2.315
DI	0.12	0.66	9.72	0.304	1.005	2.927
KC	0.56	1.90	33.16	0.213	0.838	3.845
W	0.18	0.60	7.37	0.212	1.247	5.793
TEV	0.21	0.52	12.23	0.152	0.632	4.100
TPB	0.14	0.49	6.75	0.218	1.142	5.104
TMV	0.16	0.52	8.24	0.263	1.498	5.447

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LINE 420

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
JDS	0.31	1.27	12.36	0.232	1.461	5.883
JRG	0.07	0.25	4.74	0.150	0.681	4.220
SP	0.06	0.33	3.68	0.316	1.421	3.336
PD	0.06	0.34	1.64	0.0	0.0	9.627
JGS	0.16	0.33	7.35	0.114	0.504	4.732
QAL	0.15	0.64	7.57	0.235	1.309	4.994
TRAV	0.15	0.71	10.23	0.290	1.050	3.417
TPB	0.16	0.48	6.75	0.209	1.165	5.751

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
QD	0.20	0.89	13.75	0.258	0.869	3.289
TRAG	0.13	0.54	9.47	0.408	1.310	3.149
TRAS	0.22	0.75	15.29	0.220	0.754	3.382
DI	0.07	0.82	9.96	0.586	1.397	1.655
TIG	0.36	0.92	19.84	0.166	0.704	4.242
TEV	0.16	0.64	11.29	0.215	0.800	3.270
TMV	0.18	0.54	12.14	0.193	0.693	3.672

LINE 430

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
JDS	0.24	1.16	8.90	0.281	1.762	6.242
SP	0.11	0.68	5.25	0.250	1.256	4.613
PD	0.11	0.43	3.57	0.260	1.484	7.805
JRG	0.28	0.49	6.77	0.112	1.161	9.917
DI	0.18	0.51	11.33	0.210	0.714	3.660
QD	0.22	0.93	13.40	0.224	0.823	3.795
QAL	0.16	0.60	8.43	0.254	1.250	5.039

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
KP	0.20	0.78	10.94	0.232	1.003	4.204
TRAS	0.22	0.82	13.03	0.271	0.970	3.732
TRAV	0.12	0.55	8.32	0.259	0.893	3.537
TRAG	0.12	0.92	7.22	0.177	0.632	4.318
TEV	0.25	0.90	15.94	0.254	0.895	3.561
TMV	0.18	0.64	10.78	0.226	0.877	3.784
TPB	0.17	0.57	7.72	0.200	1.093	5.920

LINE 440

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
PD	0.08	0.46	4.87	0.168	1.074	6.263
JDS	0.17	0.52	7.89	0.159	1.077	6.687
SP	0.13	0.60	6.75	0.260	1.232	4.045
QAL	0.13	0.61	8.05	0.251	1.036	4.072
JRV	0.06	0.0	2.26	0.0	0.0	6.565
JGS	0.23	0.87	10.20	0.215	1.167	5.458
KP	0.32	1.17	13.23	0.240	1.356	5.686
TRAV	0.12	0.50	6.48	0.248	1.108	4.151
TRAS	0.13	0.66	7.04	0.288	1.485	4.439
QD	0.32	1.22	16.18	0.249	1.074	4.266

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
TRAG	0.15	0.60	8.86	0.260	1.000	3.891
DI	0.12	0.56	11.45	0.278	0.760	2.518
CA	0.09	0.70	7.50	0.500	1.451	2.937
CS	0.15	0.68	9.84	0.266	1.033	3.482
W	0.30	1.05	15.58	0.232	1.030	4.526
GB	0.09	0.0	6.32	0.0	0.0	3.373
TEU	0.53	1.15	24.85	0.144	0.705	4.920
TEV	0.27	0.86	18.19	0.202	0.687	3.498
TMV	0.17	0.53	12.90	0.210	0.627	3.031
TPB	0.17	0.49	8.68	0.196	1.490	6.656

LINE 2000

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
JDS	0.21	0.95	8.93	0.268	1.512	5.670
PD	0.06	0.30	2.32	0.170	1.759	8.353
SP	0.04	0.51	1.41	0.621	3.951	4.219
JRG	0.03	0.18	1.09	0.0	0.0	0.0
QD	0.07	0.43	3.01	0.208	1.237	4.635

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
JDV	0.15	0.85	6.39	0.303	1.877	5.351
TEA	0.28	1.09	11.00	0.268	1.545	6.075
JGV	0.27	1.24	9.98	0.302	1.849	6.411
JK	0.22	1.04	7.77	0.305	1.994	6.765
KP	0.21	0.90	9.50	0.280	1.464	5.251

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LINE 2010

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
JGS	0.27	1.16	12.19	0.256	1.322	5.212
QAL	0.18	0.88	6.82	0.266	1.845	7.035
PD	0.05	0.23	3.08	0.283	1.744	4.071
SP	0.05	0.34	2.37	0.340	0.819	3.201
JGV	0.08	0.53	4.50	0.307	1.333	4.475
TEA	0.20	0.68	9.57	0.244	1.206	5.034

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
JRV	0.09	0.38	5.89	0.221	0.929	3.419
JRG	0.11	0.39	5.99	0.199	1.093	4.219
GB	0.07	0.36	2.46	0.0	0.0	6.253
QD	0.06	0.28	1.78	0.145	3.053	7.228
JDS	0.33	1.15	13.96	0.234	1.292	5.621

LINE 2020

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
TRAV	0.14	0.56	7.94	0.227	0.884	4.031
TRAS	0.19	0.66	10.83	0.220	0.839	3.708
QAL	0.23	0.88	11.95	0.219	1.075	4.483
SP	0.09	0.40	4.08	0.154	0.981	4.288
QD	0.16	0.97	9.45	0.247	1.114	4.104

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
JGS	0.34	1.16	18.03	0.227	0.969	4.345
JRV	0.14	0.71	9.55	0.268	1.017	3.373
JDS	0.27	1.10	13.13	0.275	1.338	4.912
TEU	0.22	0.53	13.79	0.170	0.821	4.811
JV	0.09	0.0	6.11	0.0	0.0	3.176

LINE 2030

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
TRAS	0.14	0.60	9.15	0.235	0.866	3.931
TRAV	0.12	0.62	7.37	0.288	1.099	3.754
TRAG	0.11	0.78	6.81	0.425	1.461	3.681
QD	0.15	0.84	13.47	0.372	1.180	3.254
QAL	0.15	0.67	11.40	0.263	0.859	3.085
JRV	0.12	0.58	8.44	0.255	1.007	3.560

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
DI	0.15	0.79	13.58	0.331	0.878	2.620
JGV	0.13	0.62	5.15	0.243	1.386	5.993
JGS	0.25	0.85	13.11	0.205	0.954	4.533
SP	0.06	0.26	3.41	0.109	1.042	4.034
JV	0.05	0.25	2.61	0.0	1.214	4.353

LINE 2040

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
OS	0.29	0.85	15.31	0.196	0.854	4.465
TRAV	0.15	0.65	11.69	0.240	0.782	3.086
QD	0.10	0.72	7.85	0.333	0.816	3.299
TRAS	0.22	0.77	16.03	0.218	0.702	3.185
QAL	0.24	0.75	17.69	0.219	0.644	3.135
JGS	0.21	0.61	12.85	0.193	0.773	3.867

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
GB	0.32	1.27	28.45	0.254	0.664	2.647
TEU	0.28	0.39	18.46	0.253	0.813	3.671
TRAG	0.22	0.87	11.12	0.243	1.138	4.086
SP	0.13	0.31	5.92	0.166	1.056	4.403
JV	0.03	0.41	2.09	0.0	2.450	2.657

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LINE 2050

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
QD	0.22	0.84	14.89	0.248	0.856	3.457
TRAG	0.16	0.59	14.15	0.259	0.646	2.575
TRAV	0.13	0.51	13.63	0.282	0.614	2.262
TEV	0.16	0.66	9.76	0.249	0.989	4.005

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
KC	0.15	1.30	16.09	0.583	1.235	2.235
QAL	0.29	1.53	18.16	0.371	1.349	3.682
TEU	0.35	1.02	19.02	0.186	0.780	4.268

LINE 2060

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
TMV	0.18	0.66	10.19	0.229	0.934	4.188
TEV	0.19	0.68	10.71	0.220	0.956	4.332

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
TPIB	0.11	0.48	4.53	0.276	1.797	6.242
TPB	0.13	0.42	6.00	0.217	1.071	5.010

LINE 2070

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
TPB	0.13	0.55	6.28	0.285	1.402	4.987
TEV	0.12	0.45	5.75	0.262	1.442	5.296

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
QPS	0.16	0.61	8.67	0.275	1.147	4.258
QMV	0.15	0.72	7.81	0.314	1.408	4.571

LINE 2080

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
TPB	0.14	0.49	7.01	0.245	1.106	4.720
QAL	0.08	0.41	3.95	0.284	0.998	4.244
QMV	0.12	0.33	7.92	0.181	0.641	3.590

UNIT	E THOR	E URN	POT PCT	U/TH	U/K	TH/K
W	0.01	0.0	0.0	0.0	0.0	0.0
CPS	0.12	0.69	7.69	0.377	1.297	3.729

95/96

A P P E N D I X E

Standard Deviation Table

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FORMATION

QAL

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	4257	2.47	NORMAL	-1.91	-0.45	1.01	3.63	5.38	6.84
E URANIUM	3042	0.66	NORMAL	-0.47	-0.09	0.28	1.04	1.41	1.79
POTASSIUM	4308	0.73	NORMAL	-0.54	-0.12	0.30	1.15	1.57	1.99
EU/K	2995	0.81	NORMAL	-0.48	-0.05	0.38	1.24	1.68	2.11
EU/ETH	2921	0.22	NORMAL	-0.08	0.02	0.12	0.32	0.42	0.52
ETH/K	2981	3.60	NORMAL	0.33	1.42	2.51	4.09	5.78	6.87

FORMATION

QS

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	59	0.53	NORMAL	-0.85	-0.39	0.07	0.96	1.45	1.91
E URANIUM	12	0.26	NORMAL	-0.19	-0.04	0.11	0.41	0.56	0.71
POTASSIUM	84	0.14	NORMAL	-0.07	-0.00	0.07	0.21	0.28	0.36
EU/K	0	0.0	R) \$	0.0	0.0	0.0	0.0	0.0	0.0
EU/ETH	0	0.0	R) \$	0.0	0.0	0.0	0.0	0.0	0.0
ETH/K	0	0.0	R) \$	0.0	0.0	0.0	0.0	0.0	0.0

FORMATION

QPS

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	1387	1.90	NORMAL	-0.16	0.74	1.32	2.48	3.36	3.64
E URANIUM	1097	0.53	NORMAL	-0.21	0.04	0.28	0.78	1.02	1.27
POTASSIUM	1387	0.51	NORMAL	0.13	0.26	0.38	0.64	0.76	0.89
EU/K	1097	0.99	NORMAL	-0.41	0.05	0.52	1.46	1.93	2.40
EU/ETH	1090	0.27	NORMAL	-0.09	0.03	0.15	0.39	0.51	0.62
ETH/K	1097	3.74	NORMAL	1.34	2.14	2.94	4.55	5.35	6.15

FORMATION

QMV

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	196	1.61	NORMAL	-0.44	-0.83	1.22	2.00	2.39	2.78
E URANIUM	126	0.45	NORMAL	-0.32	-0.06	0.20	0.71	0.97	1.23
POTASSIUM	196	0.47	NORMAL	0.27	0.34	0.41	0.54	0.61	0.68
EU/K	126	0.99	NORMAL	-0.48	0.01	0.50	1.48	1.97	2.46
EU/ETH	126	0.26	NORMAL	-0.04	0.06	0.16	0.36	0.46	0.56
ETH/K	126	3.66	NORMAL	1.24	2.05	2.85	4.46	5.27	6.08

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FORMATION TPB

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	14859	1.65	NORMAL	-0.54	0.20	0.95	2.43	3.17	3.92
E URANIUM	9162	0.42	NORMAL	-0.23	-0.02	0.20	0.64	0.86	1.07
POTASSIUM	14846	0.35	NORMAL	-0.02	0.12	0.25	0.52	0.66	0.79
EU/K	9124	1.12	NORMAL	-0.52	0.03	0.57	1.67	2.21	2.76
EU/ETH	8674	0.23	NORMAL	-0.12	-0.00	0.12	0.35	0.47	0.59
ETH/K	9115	3.57	LOGNORMAL	0.97	1.50	2.31	5.51	8.52	13.16

FORMATION TPB

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	1847	1.82	NORMAL	-0.26	0.43	1.13	2.51	3.21	3.90
E URANIUM	1285	0.39	LOGNORMAL	0.08	0.13	0.22	0.66	1.14	1.97
POTASSIUM	1863	0.35	NORMAL	-0.18	-0.00	0.18	0.53	0.71	0.89
EU/K	1262	0.90	LOGNORMAL	0.13	0.25	0.47	1.70	3.24	6.15
EU/ETH	1251	0.26	NORMAL	-0.12	0.01	0.14	0.39	0.51	0.64
ETH/K	1262	4.15	LOGNORMAL	1.10	1.72	2.68	6.55	10.23	15.99

FORMATION TMV

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	4004	2.19	NORMAL	-1.07	0.02	1.11	3.28	4.37	5.45
E URANIUM	2646	0.50	NORMAL	-0.34	-0.06	0.22	0.78	1.07	1.35
POTASSIUM	4018	0.38	LOGNORMAL	0.11	0.16	0.25	0.55	0.91	1.41
EU/K	2644	0.74	LOGNORMAL	0.10	0.20	0.38	1.42	2.72	5.22
EU/ETH	2576	0.20	NORMAL	-0.08	0.02	0.11	0.30	0.39	0.49
ETH/K	2642	3.41	LOGNORMAL	0.74	1.23	2.05	5.67	9.42	15.66

FORMATION TIG

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	12	5.24	NORMAL	3.44	4.04	4.64	5.84	6.44	7.04
E URANIUM	12	0.83	NORMAL	0.34	0.51	0.67	0.99	1.16	1.32
POTASSIUM	12	1.28	NORMAL	0.83	0.98	1.13	1.43	1.58	1.73
EU/K	12	0.57	NORMAL	0.18	0.31	0.44	0.71	0.84	0.97
EU/ETH	12	0.14	NORMAL	0.03	0.07	0.10	0.17	0.21	0.24
ETH/K	12	4.02	NORMAL	3.45	3.64	3.83	4.21	4.40	4.59

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FORMATION

TEU

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	1891	4.48	NORMAL	-1.48	0.51	2.49	6.46	8.45	10.44
E URANIUM	1670	0.72	LOGNORMAL	0.19	0.29	0.46	1.12	1.75	2.74
POTASSIUM	1893	1.11	NORMAL	-0.24	0.21	0.66	1.56	2.01	2.46
EU/K	1669	0.67	NORMAL	-0.26	0.05	0.36	0.98	1.29	1.60
EU/ETH	1670	0.17	NORMAL	-0.08	0.01	0.09	0.25	0.34	0.42
ETH/K	1669	3.99	NORMAL	1.45	2.30	3.14	4.83	5.67	6.52

FORMATION

TEA

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	4335	3.05	LOGNORMAL	0.93	1.38	2.05	4.53	6.72	9.98
E URANIUM	4021	0.84	NORMAL	-0.35	0.05	0.44	1.23	1.63	2.02
POTASSIUM	4341	0.73	NORMAL	-0.09	0.18	0.45	1.00	1.27	1.54
EU/K	3987	1.16	NORMAL	-0.43	0.10	0.63	1.70	2.23	2.76
EU/ETH	3983	0.21	NORMAL	-0.07	0.02	0.12	0.30	0.40	0.49
ETH/K	3986	5.41	NORMAL	1.32	2.69	4.05	6.77	8.13	9.49

FORMATION

TEV

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	12882	2.58	NORMAL	-0.70	0.39	1.48	3.67	4.76	5.85
E URANIUM	9609	0.39	LOGNORMAL	0.06	0.12	0.21	0.72	1.31	2.40
POTASSIUM	12892	0.66	NORMAL	-0.21	0.08	0.37	0.95	1.23	1.52
EU/K	9592	0.74	LOGNORMAL	0.11	0.20	0.39	1.41	2.68	5.10
EU/ETH	9482	0.23	NORMAL	-0.09	0.02	0.12	0.33	0.44	0.54
ETH/K	9587	3.63	LOGNORMAL	0.88	1.41	2.26	5.83	9.37	15.05

FORMATION

KC

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	292	4.27	NORMAL	-6.00	-2.57	0.85	7.70	11.12	14.55
E URANIUM	249	1.20	NORMAL	-0.76	-0.10	0.55	1.86	2.51	3.17
POTASSIUM	286	1.24	NORMAL	-1.43	-0.54	0.35	2.13	3.02	3.91
EU/K	236	0.77	LOGNORMAL	0.18	0.29	0.48	1.26	2.04	3.32
EU/ETH	220	0.25	NORMAL	0.02	0.10	0.18	0.33	0.40	0.48
ETH/K	235	3.58	NORMAL	0.44	1.48	2.53	4.63	5.68	6.73

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FORMATION

KP

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	445	2.83	NORMAL	-0.43	0.66	1.74	3.92	5.00	6.09
E URANIUM	321	0.77	NORMAL	-0.30	0.06	0.41	1.12	1.48	1.83
POTASSIUM	437	0.64	NORMAL	-0.02	0.20	0.42	0.86	1.08	1.30
EU/K	321	1.08	NORMAL	-0.34	0.13	0.61	1.56	2.03	2.51
EU/ETH	320	0.23	NORMAL	-0.02	0.06	0.15	0.32	0.40	0.49
ETH/K	321	4.53	NORMAL	1.47	2.49	3.51	5.55	6.57	7.59

FORMATION

GB

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	404	0.52	LCGNORMAL	0.05	0.10	0.23	1.18	2.65	5.96
E URANIUM	242	0.24	LCGNORMAL	0.03	0.06	0.12	0.49	0.99	1.99
POTASSIUM	509	0.07	LCGNORMAL	0.00	0.01	0.02	0.23	0.76	2.44
EU/K	171	0.67	NORMAL	-0.46	-0.08	-0.29	1.05	1.43	1.81
EU/ETH	157	0.18	NORMAL	-0.09	0.00	0.09	0.27	0.36	0.45
ETH/K	165	2.34	LCGNORMAL	0.91	1.24	1.71	3.21	4.41	6.04

FORMATION

DI

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	370	1.75	LCGNORMAL	0.46	0.73	1.14	2.80	4.40	6.90
E URANIUM	205	0.43	LCGNORMAL	0.10	0.16	0.26	0.73	1.15	1.89
POTASSIUM	376	0.74	NORMAL	-0.37	0.00	0.37	1.11	1.49	1.86
EU/K	202	0.71	NORMAL	-0.20	0.11	0.41	1.01	1.31	1.62
EU/ETH	178	0.24	NORMAL	-0.08	0.03	0.14	0.35	0.46	0.56
ETH/K	202	2.62	NORMAL	0.73	1.36	1.99	3.25	3.88	4.51

FORMATION

QD

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	6458	0.66	LCGNORMAL	0.04	0.10	0.26	1.65	4.14	10.39
E URANIUM	4286	0.34	LCGNORMAL	0.03	0.07	0.16	0.73	1.58	3.39
POTASSIUM	6894	0.12	LCGNORMAL	0.01	0.02	0.04	0.34	0.93	2.56
EU/K	4147	0.65	LCGNORMAL	0.10	0.19	0.35	1.20	2.22	4.11
EU/ETH	3787	0.24	NORMAL	-0.06	0.04	0.14	0.34	0.44	0.54
ETH/K	4022	3.41	NORMAL	-0.50	0.81	2.11	4.71	6.01	7.32

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QUAD

FORMATION

GD

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	90	1.78	NORMAL	-0.50	0.26	1.02	2.54	3.29	4.05
E URANIUM	83	0.54	NORMAL	-0.03	0.16	0.35	0.72	0.91	1.10
POTASSIUM	90	0.84	NORMAL	-0.50	-0.05	0.40	1.29	1.74	2.18
EU/K	83	0.60	NORMAL	-0.14	0.11	0.35	0.85	1.10	1.35
EU/ETH	83	0.27	NORMAL	0.01	0.10	0.18	0.36	0.45	0.54
ETH/K	83	2.05	LEGNORMAL	0.92	1.20	1.57	2.68	3.50	4.56

FORMATION

GR

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	22	0.53	NORMAL	-0.08	0.13	0.33	0.73	0.94	1.14
E URANIUM	30	0.21	NORMAL	-0.05	0.04	0.13	0.30	0.39	0.48
POTASSIUM	32	0.13	NORMAL	-0.08	-0.01	0.06	0.21	0.28	0.35
EU/K	23	1.10	LEGNORMAL	0.33	0.49	0.73	1.64	2.46	3.69
EU/ETH	9	0.19	LEGNORMAL	0.07	0.10	0.14	0.26	0.36	0.50
ETH/K	20	3.21	LEGNORMAL	1.61	2.02	2.55	4.04	5.09	6.41

FORMATION

PD

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	1620	0.50	LEGNORMAL	0.04	0.09	0.21	1.19	2.79	6.55
E URANIUM	537	0.33	NORMAL	-0.22	-0.03	0.15	0.51	0.69	0.87
POTASSIUM	1306	0.06	LEGNORMAL	0.00	0.01	0.02	0.17	0.43	1.13
EU/K	212	1.43	NORMAL	-0.59	0.08	0.75	2.10	2.77	3.45
EU/ETH	179	0.15	LEGNORMAL	0.05	0.08	0.12	0.30	0.47	0.75
ETH/K	195	5.98	NORMAL	-4.14	-0.77	2.61	9.35	12.73	16.10

FORMATION

SP

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	1562	0.52	LEGNORMAL	0.35	0.10	0.23	1.17	2.64	5.93
E URANIUM	795	0.32	LEGNORMAL	0.06	0.11	0.19	0.56	0.96	1.66
POTASSIUM	1735	0.08	LEGNORMAL	0.00	0.01	0.03	0.21	0.58	1.58
EU/K	585	1.14	NORMAL	-0.36	0.14	0.64	1.64	2.15	2.65
EU/ETH	488	0.23	NORMAL	-0.08	0.03	0.13	0.33	0.44	0.54
ETH/K	563	4.05	NORMAL	0.68	1.80	2.93	5.17	6.30	7.42

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FORMATION JK

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	400	2.51	NORMAL	-0.48	0.52	1.52	3.51	4.50	5.50
E URANIUM	292	0.31	LOGNORMAL	0.04	0.08	0.16	0.61	1.21	2.38
POTASSIUM	399	0.56	NORMAL	-0.09	0.12	0.34	0.78	1.00	1.22
EU/K	288	0.45	LOGNORMAL	0.05	0.11	0.22	0.92	1.87	3.79
EU/ETH	290	0.20	NORMAL	-0.10	0.00	0.10	0.30	0.40	0.50
ETH/K	288	4.72	NORMAL	0.58	1.96	3.34	6.09	7.47	8.85

FORMATION JGS

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	5165	3.90	NORMAL	-0.82	0.75	2.32	5.47	7.04	8.62
E URANIUM	4519	1.03	NORMAL	-0.34	0.12	0.57	1.48	1.94	2.39
POTASSIUM	5200	0.93	NORMAL	-0.09	0.25	0.59	1.27	1.61	1.95
EU/K	4482	0.98	NORMAL	-0.16	0.22	0.60	1.36	1.74	2.13
EU/ETH	4463	0.23	NORMAL	-0.03	0.06	0.14	0.32	0.40	0.49
ETH/K	4478	4.20	NORMAL	1.86	2.64	3.42	4.98	5.76	6.54

FORMATION JGV

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	1726	0.72	LOGNORMAL	0.08	0.16	0.34	1.53	3.23	6.82
E URANIUM	970	0.29	LOGNORMAL	0.04	0.07	0.15	0.56	1.10	2.16
POTASSIUM	1897	0.14	LOGNORMAL	0.02	0.03	0.07	0.30	0.62	1.31
EU/K	825	0.93	LOGNORMAL	0.21	0.34	0.56	1.53	2.53	4.17
EU/ETH	698	0.25	NORMAL	-0.12	0.00	0.13	0.37	0.50	0.62
ETH/K	793	3.24	LOGNORMAL	0.95	1.43	2.15	4.86	7.31	10.99

FORMATION JRV

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	4222	1.37	NORMAL	-0.82	-0.09	0.64	2.11	2.84	3.57
E URANIUM	2194	0.32	LOGNORMAL	0.05	0.10	0.18	0.58	1.04	1.88
POTASSIUM	4400	0.45	NORMAL	-0.26	-0.03	0.21	0.69	0.93	1.17
EU/K	2140	0.71	LOGNORMAL	0.12	0.22	0.40	1.27	2.27	4.05
EU/ETH	1886	0.28	NORMAL	-0.10	0.03	0.15	0.40	0.53	0.65
ETH/K	2123	3.35	NORMAL	-0.40	0.85	2.10	4.61	5.86	7.11

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FORMATION JRG

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	732	1.15	NORMAL	-1.49	-0.61	0.27	2.03	2.90	3.78
E URANIUM	326	0.30	NORMAL	-0.26	-0.08	0.11	0.49	0.67	0.86
POTASSIUM	735	0.30	NORMAL	-0.29	-0.09	0.10	0.49	0.69	0.89
EU/K	276	0.68	LCGNORMAL	0.12	0.21	0.38	1.21	2.15	3.82
EU/ETH	216	0.15	LCGNORMAL	0.03	0.05	0.08	0.25	0.45	0.79
ETH/K	261	4.11	NORMAL	0.21	1.51	2.81	5.40	6.70	8.00

FORMATION JDS

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	7324	4.14	NORMAL	0.57	1.76	2.95	5.33	6.52	7.71
E URANIUM	6902	0.96	NORMAL	-0.27	0.14	0.55	1.37	1.78	2.19
POTASSIUM	7347	0.79	NORMAL	0.04	0.29	0.54	1.04	1.29	1.55
EU/K	6822	1.16	NORMAL	-0.21	0.25	0.72	1.64	2.10	2.56
EU/ETH	6756	0.22	NORMAL	-0.04	0.05	0.13	0.30	0.39	0.47
ETH/K	6802	5.24	NORMAL	2.44	3.37	4.31	6.18	7.11	8.05

FORMATION JDV

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	519	0.62	LCGNORMAL	0.06	0.13	0.29	1.35	2.91	6.28
E URANIUM	351	0.42	LCGNORMAL	0.10	0.16	0.25	0.68	1.11	1.82
POTASSIUM	525	0.28	LCGNORMAL	0.06	0.10	0.17	0.47	0.78	1.30
EU/K	297	1.40	LCGNORMAL	0.39	0.59	0.91	2.15	3.30	5.07
EU/ETH	224	0.27	LCGNORMAL	0.06	0.10	0.17	0.44	0.72	1.16
ETH/K	274	4.70	NORMAL	-1.13	0.81	2.75	6.64	8.58	10.52

FORMATION JV

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	683	0.56	LCGNORMAL	0.05	0.12	0.25	1.23	2.69	5.91
E URANIUM	375	0.31	LCGNORMAL	0.03	0.07	0.14	0.68	1.48	3.22
POTASSIUM	729	0.19	LCGNORMAL	0.02	0.05	0.10	0.39	0.78	1.56
EU/K	359	0.99	LCGNORMAL	0.27	0.41	0.64	1.53	2.36	3.65
EU/ETH	283	0.26	LCGNORMAL	0.09	0.13	0.18	0.38	0.54	0.78
ETH/K	342	3.59	NORMAL	0.79	1.73	2.66	4.52	5.46	6.39

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FORMATION TRAV

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	9734	1.89	NORMAL	-2.18	-0.82	0.54	3.25	4.61	5.97
E URANIUM	6193	0.58	NORMAL	-0.44	-0.10	0.24	0.92	1.26	1.60
POTASSIUM	10530	0.60	NORMAL	-0.78	-0.32	0.14	1.06	1.52	1.98
EU/K	5833	0.83	NORMAL	-0.48	-0.04	0.39	1.26	1.69	2.13
EU/ETH	5269	0.24	NORMAL	-0.10	0.02	0.13	0.36	0.47	0.58
ETH/K	5684	3.13	NORMAL	-0.07	0.99	2.06	4.19	5.26	6.32

FORMATION TRAS

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	1316	2.55	NORMAL	-1.14	0.09	1.32	3.77	5.00	6.23
E URANIUM	1006	0.66	NORMAL	-0.37	-0.02	0.32	1.01	1.35	1.69
POTASSIUM	1342	0.75	NORMAL	-0.31	0.04	0.40	1.11	1.46	1.81
EU/K	998	0.81	NORMAL	-0.37	0.03	0.42	1.21	1.60	1.99
EU/ETH	976	0.23	NORMAL	-0.08	0.02	0.13	0.34	0.44	0.54
ETH/K	992	3.38	NORMAL	0.39	1.38	2.38	4.38	5.37	6.37

FORMATION TRAG

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	1848	0.70	LOGNORMAL	0.06	0.13	0.30	1.62	3.73	8.60
E URANIUM	1312	0.61	LOGNORMAL	0.13	0.22	0.36	1.02	1.70	2.85
POTASSIUM	1859	0.67	NORMAL	-0.72	-0.26	0.20	1.13	1.59	2.05
EU/K	1235	0.99	NORMAL	-0.34	0.11	0.55	1.43	1.87	2.32
EU/ETH	1185	0.26	NORMAL	-0.08	0.04	0.15	0.37	0.48	0.59
ETH/K	1222	3.71	NORMAL	1.12	1.98	2.85	4.58	5.44	6.31

FORMATION OS

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	435	2.57	NORMAL	-2.83	-1.03	0.77	4.37	6.17	7.98
E URANIUM	352	0.65	NORMAL	-0.32	-0.00	0.32	0.97	1.29	1.62
POTASSIUM	437	0.70	NORMAL	-0.17	0.12	0.41	0.99	1.28	1.57
EU/K	351	0.86	NORMAL	-0.33	0.07	0.46	1.26	1.66	2.06
EU/ETH	310	0.19	LOGNORMAL	0.04	0.06	0.11	0.33	0.57	0.99
ETH/K	349	3.53	NORMAL	-0.17	1.07	2.30	4.76	5.99	7.23

MECFORD

QUAD 4

FORMATION CA

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	33	0.71	NORMAL	-1.20	-0.57	0.07	1.35	1.98	2.62
E URANIUM	15	0.48	NORMAL	-0.45	-0.14	0.17	0.79	1.09	1.40
POTASSIUM	38	0.27	NORMAL	-0.25	-0.08	0.10	0.45	0.63	0.80
EU/K	15	1.10	NORMAL	-0.59	-0.02	0.54	1.66	2.23	2.79
EU/ETH	15	0.38	NORMAL	-0.19	0.00	0.19	0.58	0.77	0.96
ETH/K	15	2.73	NORMAL	1.23	1.73	2.23	3.23	3.73	4.23

FORMATION W

DATA	SAMPLES	MEAN		-3	-2	-1	+1	+2	+3
E THORIUM	199	2.32	NORMAL	-3.42	-1.51	0.41	4.24	6.15	8.07
E URANIUM	119	0.79	NORMAL	-0.42	-0.02	0.38	1.19	1.59	2.00
POTASSIUM	187	0.55	NORMAL	-0.77	-0.33	0.11	0.99	1.43	1.87
EU/K	118	1.01	NORMAL	0.09	0.39	0.70	1.31	1.62	1.93
EU/ETH	116	0.22	NORMAL	0.03	0.09	0.16	0.29	0.35	0.42
ETH/K	118	4.43	NORMAL	1.17	2.25	3.34	5.52	6.61	7.70

A P P E N D I X F

Format, Single Record Data Listing

REC NJ.	LAT	LONG	RESID MAG	TERR CL	FLG	GEOL UNIT	QUSM CPS	U CPS	AIM COUNT	FLG	ETH PPM	FLG	EU PPM	FLG	K PCT	FLG	LU/ETH	EU/K	ETH/K	TEMP CELCIUS	BAKU PRES MMHG
5079	64.0086	-160.9197	55305	763	MAR	W	31	1	-12	NAD	-1.1	NAD	-0.5	NAD	0.0	NAD	0.0	0.0	0.0	12.7	746.8
5080	64.0087	-160.9189	55305	751	MAR	W	20	1	36	MAR	0.0	NAD	0.1	NAD	0.1	NAD	0.0	0.0	0.0	12.7	747.1
5081	64.0087	-160.9176	55305	741	MAR	W	26	1	4	NAD	0.2	NAD	0.1	NAD	-0.1	NAD	0.0	0.0	0.0	12.7	747.4
5082	64.0088	-160.9166	55305	730	MAR	W	35	1	-60	NAD	0.0	NAD	0.3	NAD	-0.1	NAD	0.0	0.0	0.0	12.7	747.7
5083	64.0088	-160.9154	55305	722	MAR	W	26	1	-4	NAD	-2.7	NAD	2.3		-0.4	NAD	0.0	0.0	0.0	12.7	748.0
5084	64.0089	-160.9144	55305	712	MAR	W	20	1	-12	NAD	0.5	NAD	-1.7	NAD	0.0	NAD	0.0	0.0	0.0	12.7	748.1
5085	64.0089	-160.9131	55305	702	MAR	W	23	1	37	MAR	0.0	NAD	0.4	NAD	-0.3	NAD	0.0	0.0	0.0	12.7	748.5
5086	64.0090	-160.9121	55305	691		W	22	1	50		0.3	NAD	-0.1	NAD	0.0	NAD	0.0	0.0	0.0	12.7	748.8
5087	64.0091	-160.9109	55305	680		W	23	1	46		0.3	NAD	0.0	NAD	-0.0	NAD	0.0	0.0	0.0	12.7	749.1
5088	64.0092	-160.9099	55305	673		W	17	1	72		0.6	MAR	0.3	NAD	-0.3	NAD	0.0	0.0	0.0	12.8	749.3
5089	64.0092	-160.9087	55305	668		W	20	1	156		-1.6	NAD	0.7	MAR	-0.0	NAD	0.0	0.0	0.0	12.8	749.4
5090	64.0093	-160.9075	55304	666		W	32	1	113		0.0	NAD	0.6	MAR	0.0	NAD	0.0	0.0	0.0	12.8	749.4
5091	64.0093	-160.9064	55304	667		W	30	1	247		-0.2	NAD	0.6	MAR	0.1	NAD	0.0	0.0	0.0	12.8	749.3
5092	64.0094	-160.9052	55304	671		W	29	1	343		0.2	NAD	1.1		0.3		0.0	4.0	0.0	12.8	749.2
5093	64.0094	-160.9042	55304	679		W	23	1	659		2.9		-0.8	NAD	0.8		0.0	0.0	3.5	12.8	748.9
5094	64.0095	-160.9030	55304	683		W	34	0	965		3.2		1.4		0.8		0.5	1.9	4.1	12.9	748.5
5095	64.0096	-160.9017	55305	647		KS	24	0	1208		8.6		0.0	NAD	0.5		0.0	0.0	18.3	12.9	748.1
5096	64.0096	-160.9007	55305	463		KS	12	0	945		2.5		1.7		0.5		0.7	3.5	5.2	12.9	747.8
5097	64.0098	-160.8995	55305	455		KS	20	0	831		3.0		1.5		0.6		0.5	2.8	5.5	12.9	747.6
5098	64.0098	-160.8985	55305	457		KS	22	0	759		2.2		1.4		0.3		0.8	5.1	8.1	12.9	747.1
5099	64.0099	-160.8973	55305	465		KS	29	0	699		1.7		2.0		0.5		1.1	4.4	4.1	12.9	746.5
5100	64.0100	-160.8962	55305	479		KS	28	0	610		0.5	NAD	1.3		0.4		0.0	3.7	0.0	12.9	746.1
5101	64.0100	-160.8950	55305	497		KS	26	0	581		2.2		0.5	MAR	0.3		0.2	1.6	7.0	12.9	746.0
5102	64.0101	-160.8940	55304	518		KS	35	0	512		1.3		-0.2	NAD	0.3		0.0	0.0	4.2	12.9	745.7
5103	64.0101	-160.8928	55303	540		KS	20	0	677		2.1		1.0		0.2		0.5	5.6	11.2	12.8	745.5
5104	64.0102	-160.8918	55303	569		KS	26	0	579		1.7		1.2		0.1	MAR	0.7	12.6	17.8	12.8	745.9
5105	64.0103	-160.8905	55304	608		KS	21	-1	611		3.2		3.1		0.0	NAD	1.0	0.0	0.0	12.8	745.6
5106	64.0103	-160.8895	55303	614		KS	16	-1	551		3.7		0.2	NAD	0.3		0.0	0.0	11.1	12.8	745.5
5107	64.0104	-160.8883	55304	595		KS	37	-1	488		1.6		2.4		0.1	MAR	1.5	18.6	12.5	12.8	745.4
5108	64.0105	-160.8873	55302	575		KS	22	-1	510		0.2	NAD	1.3		0.3		0.0	5.1	0.0	12.8	745.3
5109	64.0106	-160.8860	55304	552		KS	28	-1	437		0.0	NAD	1.0		0.1	MAR	0.0	9.0	0.0	12.8	745.2
5110	64.0107	-160.8848	55305	532		KS	25	-1	405		0.9	NAD	1.1		0.3		0.0	4.0	0.0	12.8	745.1
5111	64.0107	-160.8838	55305	514		KS	25	-1	379		1.0	MAR	-0.1	NAD	0.3		0.0	0.0	3.0	12.8	744.7
5112	64.0108	-160.8826	55305	501		KS	35	-1	325		0.5	MAR	1.4		0.1	MAR	2.5	13.6	5.5	12.8	744.5
5113	64.0108	-160.8816	55305	490		KS	20	-1	411		0.0	NAD	1.1		0.0	NAD	0.0	0.0	0.0	12.8	744.3
5114	64.0109	-160.8803	55305	481		KS	22	-1	417		1.0		1.0		0.1	MAR	1.0	12.7	12.9	12.8	744.3
5115	64.0110	-160.8791	55305	477		KS	28	-1	517		0.8	MAR	1.1		0.3		1.3	4.0	3.1	12.8	744.1
5116	64.0110	-160.8781	55304	479		KS	17	0	616		1.4		0.7		0.5		0.9	1.4	2.8	12.8	744.0
5117	64.0111	-160.8769	55304	486		KS	23	0	623		4.3		0.8		0.6		0.2	1.4	7.0	12.8	743.9
5118	64.0111	-160.8759	55303	493		KS	22	0	607		2.5		1.5		0.1		0.6	10.2	17.5	12.8	744.0
5119	64.0112	-160.8746	55303	500		KS	21	0	693		3.5		0.5	MAR	0.5		0.2	1.1	7.4	12.8	744.2
5120	64.0113	-160.8734	55303	509		KS	22	-1	633		2.2		2.6		0.3		1.2	8.6	7.2	12.8	744.2
5121	64.0113	-160.8724	55302	516		KS	30	-1	636		3.7		0.2	NAD	0.3		0.0	0.0	10.9	12.8	744.5
5122	64.0113	-160.8712	55302	519		KS	25	-2	777		5.1		1.5		0.3		0.3	5.9	20.2	12.8	744.9
5123	64.0113	-160.8701	55302	518		KS	26	-2	658		3.8		0.9		0.4		0.2	2.2	9.0	12.8	745.1
5124	64.0113	-160.8689	55302	517		KS	32	-2	718		0.8	MAR	1.9		0.7		2.1	2.8	1.3	12.8	745.6
5125	64.0113	-160.8677	55302	523		KS	32	-2	763		2.7		2.2		0.2		0.8	13.0	16.0	12.8	746.1
5126	64.0114	-160.8667	55302	541		KS	25	-1	781		3.2		1.3		0.6		0.4	2.4	5.9	12.8	746.4
5127	64.0114	-160.8654	55301	559		KS	26	-1	736		1.1	MAR	2.6		0.3		2.2	8.2	3.8	12.9	746.8
5128	64.0114	-160.8644	55300	574		KS	23	-1	668		3.2		0.2	NAD	0.4		0.0	0.0	7.4	12.9	747.1
5129	64.0114	-160.8632	55300	592		KS	21	0	640		2.4		3.5		-0.0	NAD	1.4	0.0	0.0	12.9	747.3
5130	64.0113	-160.8620	55303	606		KS	14	0	696		1.9		1.9		0.3		1.0	7.1	6.9	12.9	747.3
5131	64.0113	-160.8609	55302	617		KS	27	0	595		1.4		0.7	MAR	0.3		0.5	2.4	4.4	13.0	747.7

SINGLE RECORD DATA

LINE

240

PAGE

1

FINISHED OUTPUTTING LINE 240

LINE 220 FIDS 2935 TO 4865 OUTPUT TO SRRO TAPE

A P P E N D I X G

Format, Average Record Data Listing

RECORD NUMBER	LATITUDE	LONGITUDE	REC ID TOTAL FIELD GAMMA	GEOL UNIT	COSM CPS	ATM. TRAN CPS	TOTAL COUNT CPS	ETH PPM	STD FLG DEV	STD FLG DEV	POT FLG DEV	STD FLG DEV	FU LTH RATIO DEV	STD FLG DEV	FU POTA RATIO DEV	STD FLG DEV	FTH POTA RATIO DEV	STD FLG DEV	
5238	64.0098	-160.7455	55285	M	33	-6	980	3.7	1	1.9	2	0.7	1	0.5	0	2.8	0	5.2	0
5239	64.0098	-160.7444	55283	KS	43	-6	952	3.7	0	1.9	0	0.7	0	0.5	1	2.9	0	5.3	0
5240	64.0098	-160.7434	55283	KS	27	-5	998	3.7	0	2.1	0	0.7	0	0.6	2	3.1	1	5.3	0
5241	64.0098	-160.7422	55287	KS	33	-5	1047	3.5	0	2.2	0	0.7	0	0.6	2	3.2	1	5.2	0
5242	64.0098	-160.7412	55288	KS	31	-5	1083	3.5	0	2.1	0	0.7	0	0.6	2	2.9	0	4.8	0
5243	64.0097	-160.7399	55287	KS	30	-4	1156	3.7	0	1.9	0	0.7	0	0.5	1	2.7	0	5.0	0
5244	64.0097	-160.7389	55287	KS	31	-4	1182	4.1	0	1.9	0	0.8	0	0.5	1	2.5	0	5.3	0
5245	64.0097	-160.7379	55286	KS	26	-4	1245	4.0	0	1.7	0	0.8	0	0.4	0	2.1	0	4.9	0
5246	64.0096	-160.7366	55285	KS	38	-4	1148	3.8	0	1.6	0	0.8	0	0.4	0	2.1	0	4.8	0
5247	64.0097	-160.7356	55283	KS	30	-3	1211	3.7	0	1.5	0	0.8	0	0.4	0	1.9	0	4.5	0
5248	64.0096	-160.7344	55285	KS	30	-3	1076	3.8	0	1.5	0	0.8	0	0.4	0	1.9	0	4.7	0
5249	64.0096	-160.7334	55284	KS	29	-3	1016	3.7	0	1.3	0	0.8	0	0.4	0	1.6	0	4.6	0
5250	64.0096	-160.7324	55283	KS	33	-3	975	3.7	0	1.2	0	0.8	0	0.3	0	1.6	0	4.8	0
5251	64.0095	-160.7311	55283	KS	23	-3	976	3.5	0	1.2	0	0.7	0	0.3	0	1.7	0	5.0	0
5252	64.0095	-160.7301	55283	KS	30	-3	948	3.7	0	1.1	0	0.7	0	0.3	0	1.6	0	5.1	0
5253	64.0095	-160.7299	55284	KS	33	-3	921	3.8	0	1.0	-1	0.7	0	0.3	0	1.4	-1	5.2	0
5254	64.0095	-160.7278	55284	KS	37	-2	803	4.0	0	1.0	-1	0.7	0	0.3	0	1.5	-1	5.6	0
5255	64.0095	-160.7266	55283	KS	23	-2	954	4.1	0	1.0	-1	0.7	0	0.3	-1	1.4	-1	5.5	0
5256	64.0094	-160.7256	55293	KS	29	-1	1006	4.3	0	1.0	-1	0.7	0	0.2	-1	1.3	-1	5.8	0
5257	64.0094	-160.7244	55283	KS	37	-1	1133	4.0	0	1.0	-1	0.7	0	0.2	-1	1.3	-1	5.5	0
5258	64.0094	-160.7233	55284	KS	23	0	1106	4.1	0	1.0	-1	0.7	0	0.2	-1	1.4	-1	5.9	0
5259	64.0094	-160.7221	55285	KS	28	0	1034	4.1	0	0.8	-1	0.7	0	0.2	-1	1.2	-1	6.1	0
5260	64.0094	-160.7211	55284	KS	21	0	963	4.1	0	0.8	-1	0.7	0	0.2	-1	1.3	-1	6.2	0
5261	64.0093	-160.7199	55294	KS	27	0	840	3.7	0	0.8	-1	0.6	0	0.2	-1	1.3	-1	6.1	0
5262	64.0093	-160.7188	55294	KS	29	0	718	3.2	0	0.9	-1	0.5	-1	0.3	0	1.7	0	6.0	0
5263	64.0092	-160.7176	55284	KS	33	0	605	2.5	-1	0.9	-1	0.5	-1	0.4	0	1.8	0	5.2	0
5264	64.0092	-160.7166	55294	KS	32	0	635	2.1	-1	0.8	-1	0.4	-1	0.4	0	1.9	0	5.2	0
5265	64.0093	-160.7156	55283	KS	35	0	507	1.7	-1	0.7	-1	0.3	-1	0.4	0	2.2	0	5.3	0
5266	64.0092	-160.7143	55283	KS	26	-1	521	1.6	-1	0.7	-1	0.3	-1	0.5	1	2.5	0	5.4	0
5267	64.0092	-160.7133	55283	KS	19	-1	465	1.4	-1	0.8	-1	0.3	-1	0.6	2	2.9	1	5.1	0
5268	64.0091	-160.7121	55283	M	34	-1	287	1.3	0	0.9	1	0.3	1	0.7	1	3.1	0	4.6	-1
5269	64.0091	-160.7110	55282	KS	29	-1	398	1.3	-1	1.0	-1	0.3	-1	0.8	3	3.4	1	4.4	0
5270	64.0092	-160.7100	55282	KS	42	-1	516	1.7	-1	1.1	0	0.3	-1	0.6	2	3.2	1	5.1	0
5271	64.0092	-160.7090	55283	KS	29	0	716	1.9	-1	1.0	-1	0.4	-1	0.6	2	2.8	0	5.1	0
5272	64.0092	-160.7078	55283	KS	25	0	781	2.1	-1	1.1	0	0.4	-1	0.5	1	2.9	0	5.2	0
5273	64.0092	-160.7068	55282	KS	32	0	738	2.4	-1	1.1	0	0.4	-1	0.5	1	2.7	0	6.0	0
5274	64.0091	-160.7057	55281	KS	25	0	853	2.5	-1	1.1	0	0.4	-1	0.5	1	2.7	0	5.9	0
5275	64.0091	-160.7047	55282	KS	22	0	796	2.5	-1	1.1	0	0.5	-1	0.4	0	2.4	0	5.8	0
5276	64.0091	-160.7037	55281	KS	21	0	904	2.9	-1	1.0	-1	0.5	-1	0.4	0	2.2	0	6.1	0
5277	64.0092	-160.7025	55281	KS	37	1	810	2.9	-1	1.0	-1	0.4	-1	0.4	0	2.3	0	6.5	0
5278	64.0092	-160.7014	55280	KS	27	2	764	3.0	0	0.9	-1	0.5	-1	0.3	0	1.9	0	6.3	0
5279	64.0092	-160.7004	55282	KS	31	1	750	2.9	-1	0.9	-1	0.5	-1	0.3	0	2.0	0	6.0	0
5280	64.0092	-160.6994	55283	KS	33	1	790	2.9	-1	1.0	-1	0.5	-1	0.3	0	2.1	0	6.2	0
5281	64.0092	-160.6984	55283	KS	32	1	745	3.3	0	0.8	-1	0.5	-1	0.2	-1	1.7	0	7.1	0
5282	64.0092	-160.6973	55283	KS	36	1	779	3.7	0	0.8	-1	0.5	0	0.2	-1	1.5	-1	6.5	0
5283	64.0092	-160.6963	55283	KS	31	1	821	3.8	0	0.8	-1	0.6	0	0.2	-1	1.4	-1	6.6	0
5284	64.0092	-160.6951	55283	KS	31	1	858	3.8	0	1.0	-1	0.6	0	0.3	0	1.8	0	6.5	0
5285	64.0092	-160.6941	55284	KS	30	1	948	3.7	0	1.2	0	0.6	0	0.3	0	2.0	0	6.0	0
5286	64.0093	-160.6931	55284	KS	26	0	1054	3.7	0	1.3	0	0.6	0	0.3	0	2.1	0	6.0	0
5287	64.0093	-160.6920	55282	KS	32	0	963	3.3	0	1.5	0	0.6	0	0.4	0	2.4	0	5.7	0
5288	64.0093	-160.6910	55281	KS	30	0	1040	3.3	0	1.3	0	0.6	0	0.4	0	2.1	0	5.5	0
5289	64.0093	-160.6900	55281	KS	25	0	997	3.3	0	1.3	0	0.6	0	0.4	0	2.2	0	5.5	0
5290	64.0093	-160.6890	55281	KS	32	0	944	3.0	0	1.5	0	0.6	0	0.5	1	2.5	0	5.0	0

A P P E N D I X H

Format, DOE SINGLE RECORD REDUCED DATA TAPE

DOE SINGLE RECORD REDUCED DATA TAPE

Line Number	Character Number	12345678901234567890123456789012345678901234567890123456789012
1	02 0978	(DATA TAPE TYPE AND FORMAT SPECIFICATION DATE CODES)
2		
3		SINGLE RECORD REDUCED DATA TAPE
4		
5		FORMAT FOR TAPE IDENTIFICATION BLOCK (SECOND BLOCK)
6		
7	ITEM	FORMAT DESCRIPTION
8	1	A40 QUADRANGLE NAME AS PROJECT IDENTIFICATION
9	2	A20 NAME OF SUBCONTRACTOR
10	3	I4 APPROXIMATE DATE OF SURVEY (MONTH, YEAR)
11	4	I1 NUMBER OF AERIAL SYSTEMS USED TO COLLECT DATA FOR THIS QUADRANGLE
12		
13	5	I1 AERIAL SYSTEM IDENTIFICATION CODE FOR FIRST SYSTEM
14	6	A20 AIRCRAFT IDENTIFICATION BY TYPE AND FAA NUMBER FOR FIRST SYSTEM
15		
16	7	F6.1 NOMINAL ALTITUDE SYSTEM SENSITIVITY RELATIVE TO TERRESTRIAL POTASSIUM (K-40) TO ONE DECIMAL PLACE IN CPS PER PERCENT K FOR FIRST SYSTEM
17		
18		
19	8	F6.1 NOMINAL ALTITUDE SYSTEM SENSITIVITY RELATIVE TO TERRESTRIAL URANIUM (BI-214) TO ONE DECIMAL PLACE IN CPS PER PPM EQUIVALENT U
20		
21		
22	9	F6.1 NOMINAL ALTITUDE SYSTEM SENSITIVITY RELATIVE TO TERRESTRIAL THORIUM (TL-208) TO ONE DECIMAL PLACE IN CPS PER PPM EQUIVALENT TH
23		
24		
25	10	I6 BLANK FIELD (999999)
26	11	F6.3 4PI-SYSTEM DATA COLLECTION INTERVAL TO THREE DECIMAL PLACES IN SECONDS FOR FIRST SYSTEM
27		
28	12	F6.3 2PI-SYSTEM DATA COLLECTION INTERVAL TO THREE DECIMAL PLACES IN SECONDS FOR FIRST SYSTEM
29		
30	13	I3 NUMBER OF CHANNELS (0-3 MEV) IN 4 PI SYSTEM FOR FIRST AERIAL SYSTEM
31		
32	14	I3 NUMBER OF CHANNELS (0-3 MEV) IN 2 PI SYSTEM FOR FIRST AERIAL SYSTEM
33		
34	15-24	(SAME) REPEAT OF ITEMS 5-14 FOR SECOND AERIAL SYSTEM
35	*	*
36	*	*
37	*	*
38	85-94	(SAME) REPEAT OF ITEMS 5-14 FOR NINTH AERIAL SYSTEM
39	95	I3 NUMBER OF FLIGHT LINES ON THIS TAPE
40	96	I4 FIRST FLIGHT LINE NUMBER ON THIS TAPE
41	97	I6 FIRST RECORD NUMBER OF FIRST FLIGHT LINE
42	98	I3 JULIAN DATE (DAY OF YEAR) FIRST FLIGHT-LINE DATA WAS COLLECTED
43		
44	99-101	I4,6, &3 REPEAT OF ITEMS 96-98 FOR SECOND FLIGHT LINE ON THIS TAPE
45		
46	*	*
47	*	*
48		
49	390-392	I4,6, &3 REPEAT OF ITEMS 96-98 FOR 99TH FLIGHT LINE ON THIS TAPE
50		
51		

Line	Character Number
Number	12345678901234567890123456789012345678901234567890123456789012

52	FORMAT FOR SINGLE RECORD REDUCED DATA RECORD (THIRD THRU LAST BLOCK)		
53			
54	ITEM	FORMAT	DESCRIPTION
55	1	I1	AERIAL SYSTEM IDENTIFICATION CODE
56	2	I4	FLIGHT LINE NUMBER
57	3	I6	RECORD IDENTIFICATION NUMBER
58	4	I6	GMT TIME OF DAY (HHMMSS)
59	5	F8.4	LATITUDE TO FOUR DECIMAL PLACES IN DEGREES
60	6	F8.4	LONGITUDE TO FOUR DECIMAL PLACES IN DEGREES
61	7	F6.1	TERRAIN CLEARANCE TO ONE DECIMAL PLACE IN METERS
62	8	F7.1	RESIDUAL (IGRF REMOVED) MAGNETIC FIELD INTENSITY
63			TO ONE DECIMAL PLACE IN GAMMAS
64	9	A8	SURFACE GEOLOGIC MAP UNIT CODE
65	10	I4	QUALITY FLAG CODES
66	11	F6.1	APPARENT CONCENTRATION OF TERRESTRIAL POTASSIUM
67			(K-40) TO ONE DECIMAL PLACE IN PERCENT K
68	12	F4.1	UNCERTAINTY IN TERRESTRIAL POTASSIUM TO ONE DECIMAL
69			PLACE IN PERCENT K
70	13	F6.1	APPARENT CONCENTRATION OF TERRESTRIAL URANIUM
71			(BI-214) TO ONE DECIMAL PLACE IN PPM EQUIVALENT U
72	14	F4.1	UNCERTAINTY IN TERRESTRIAL URANIUM TO ONE DECIMAL
73			PLACE IN PPM EQUIVALENT U
74	15	F6.1	APPARENT CONCENTRATION OF TERRESTRIAL THORIUM
75			(TL-208) TO ONE DECIMAL PLACE IN PPM EQUIVALENT TH
76	16	F4.1	UNCERTAINTY IN TERRESTRIAL THORIUM TO ONE DECIMAL
77			PLACE IN PPM EQUIVALENT TH
78	17	F6.1	URANIUM-TO-THORIUM RATIO TO ONE DECIMAL PLACE IN
79			PPM EQUIVALENT U PER PPM EQUIVALENT TH
80	18	F6.1	URANIUM-TO-POSTASSIUM RATIO TO ONE DECIMAL PLACE IN
81			PPM EQUIVALENT U PER PERCENT K
82	19	F6.1	THORIUM-TO-POTASSIUM RATIO TO ONE DECIMAL PLACE IN
83			PPM EQUIVALENT TH PER PERCENT K
84	20	F8.1	GROSS GAMMA (0.4-3.0 MEV) COUNT RATE TO ONE DECIMAL
85			PLACE IN COUNTS PER SECOND
86	21	F6.1	UNCERTAINTY IN GROSS GAMMA COUNT RATE TO ONE DECIMAL
87			PLACE IN COUNTS PER SECOND
88	22	F5.1	ATMOSPHERIC BI-214 4PI CORRECTION TO ONE DECIMAL
89			PLACE IN PPM EQUIVALENT U
90	23	F4.1	UNCERTAINTY IN ATMOSPHERIC BI-214 4PI CORRECTION
91			TO ONE DECIMAL PLACE IN PPM EQUIVALENT U
92	24	F4.1	OUTSIDE AIR TEMPERATURE TO ONE DECIMAL PLACE IN
93			DEGREES CELSIUS
94	25	F5.1	OUTSIDE AIR PRESSURE TO ONE DECIMAL PLACE IN MMHG

A P P E N D I X I

Format, DOE RAW SPECTRAL DATA TAPE

DOE RAW SPECTRAL DATA TAPE

Line Character number
 Number 12345678901234567890123456789012345678901234567890123456789012

```

1 01 0978 (DATA TAPE TYPE AND FORMAT SPECIFICATION DATE CODES)
2
3 RAW SPECTRAL DATA TAPE
4
5 FORMAT FOR TAPE IDENTIFICATION BLOCK (SECOND BLOCK ON TAPE)
6
7 ITEM      FORMAT  DESCRIPTION
8 1         A40     QUADRANGLE NAME AS PROJECT IDENTIFICATION
9 2         A20     NAME OF SUBCONTRACTOR
10 3        I4      APPROXIMATE DATE OF SURVEY (MONTH, YEAR)
11 4        I1      AERIAL SYSTEM IDENTIFICATION CODE
12 5        A20     AIRCRAFT IDENTIFICATION BY TYPE AND FAA NUMBER
13 6        I3      BFEC CALIBRATION REPORT NUMBER
14 7        F6.3    4PI SYSTEM DATA COLLECTION INTERVAL TO THREE DECIMAL
15                PLACES IN SECONDS
16 8        F6.3    2PI SYSTEM DATA COLLECTION INTERVAL TO THREE DECIMAL
17                PLACES IN SECONDS
18 9        I3      NUMBER OF CHANNELS (0-3 MEV) FOR 4PI SYSTEM
19 10       I3      NUMBER OF CHANNELS (0-3 MEV) FOR 2PI SYSTEM
20 11       I3      NUMBER OF FLIGHT LINES ON THIS TAPE
21 12       I4      FIRST FLIGHT LINE NUMBER ON THIS TAPE
22 13       I6      FIRST RECORD NUMBER OF FIRST FLIGHT LINE
23 14       I3      JULIAN DATE (DAY OF YEAR) FIRST FLIGHT LINE WAS
24                COLLECTED
25 15-17    I4,6 &3 REPEAT OF ITEMS 12-14 FOR SECOND FLIGHT LINE ON THIS
26                TAPE
27 *        *              *
28 *        *              *
29 *        *              *
30 306-308  I4,6 &3 REPEAT OF ITEMS 12-14 FOR 99TH FLIGHT LINE ON THIS
31                TAPE
32
33 FORMAT FOR RAW SPECTRAL DATA RECORD (THIRD THRU LAST BLOCK ON TAPE)
34
35 ITEM      FORMAT  DESCRIPTION
36 1         I1      AERIAL SYSTEM IDENTIFICATION CODE
37 2         I4      FLIGHT LINE NUMBER
38 3         I6      RECORD IDENTIFICATION NUMBER
39 4         I6      GMT TIME OF DAY (HHMMSS)
40 5         F8.4    LATITUDE TO FOUR DECIMAL PLACES IN DEGREES
41 6         F8.4    LONGITUDE TO FOUR DECIMAL PLACES IN DEGREES
42 7         F6.2    TERRAIN CLEARANCE TO ONE DECIMAL PLACE IN METERS
43 8         F7.1    TOTAL MAGNETIC FIELD INTENSITY TO ONE DECIMAL PLACE
44                IN GAMMAS
45 9         A8      SURFACE GEOLOGIC MAP UNIT CODE
46 10        I4      QUALITY FLAG CODES
47 11        F4.1    OUTSIDE AIR TEMPERATURE TO ONE DECIMAL PLACE IN
48                DEGREES CELSIUS
49 12        F5.1    OUTSIDE AIR PRESSURE TO ONE DECIMAL PLACE IN MMHG
50 13        F5.3    LIVE TIME COUNTING PERIOD TO THREE DECIMAL PLACES IN
51                SECONDS
  
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Line	Character Number																															
Number	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2

52	14	I4	SUMMED RAW OUTPUT FROM COSMIC CHANNELS (3-6 MEV) IN
53			COUNTS
54	15	I4	RAW OUTPUT FROM CHANNEL 1 IN COUNTS
55	16	I4	RAW OUTPUT FROM CHANNEL 2 IN COUNTS
56	*	*	*
57	*	*	*
58	*	*	*
59	270	I4	RAW OUTPUT FROM CHANNEL 256 IN COUNTS

A P P E N D I X J

Format, DOE STATISTICAL ANALYSIS DATA TAPE

DOE STATISTICAL ANALYSIS DATA TAPE

Line Number	Character Number	
1	03 0978	(DATA TAPE TYPE AND FORMAT SPECIFICATION DATE CODES)
2		
3		STATISTICAL ANALYSIS DATA TAPE
4		
5		FORMAT FOR TAPE IDENTIFICATION BLOCK (SECOND BLOCK)
6		
7	ITEM	FORMAT DESCRIPTION
8	1	A40 QUADRANGLE NAME AS PROJECT IDENTIFICATION
9	2	A20 NAME OF SUBCONTRACTOR
10	3	I4 APPROXIMATE DATE OF SURVEY (MONTH, YEAR)
11	4	I1 NUMBER OF AERIAL SYSTEMS USED TO COLLECT DATA FOR THIS QUADRANGLE
12		
13	5	I1 AERIAL SYSTEM IDENTIFICATION CODE FOR FIRST SYSTEM
14	6	A20 AIRCRAFT IDENTIFICATION BY TYPE AND FAA NUMBER FOR FIRST SYSTEM
15		
16	7	F6.1 NOMINAL ALTITUDE SYSTEM SENSITIVITY RELATIVE TO TERRESTRIAL POTASSIUM (K-40) TO ONE DECIMAL PLACE IN CPS PER PERCENT K
17		
18		
19	8	F6.1 NOMINAL ALTITUDE SYSTEM SENSITIVITY RELATIVE TO TERRESTRIAL URANIUM (B1-214) TO ONE DECIMAL PLACE IN CPS PER PPM EQUIVALENT U
20		
21		
22	9	F6.1 NOMINAL ALTITUDE SYSTEM SENSITIVITY RELATIVE TO TERRESTRIAL THORIUM (TL-208) TO ONE DECIMAL PLACE IN CPS PER PPM EQUIVALENT TH
23		
24		
25	10	I6 BLANK FIELD (999999)
26	11	F6.3 4PI-SYSTEM DATA COLLECTION INTERVAL TO THREE DECIMAL PLACES IN SECONDS FOR FIRST SYSTEM
27		
28	12	F6.3 2PI-SYSTEM DATA COLLECTION INTERVAL TO THREE DECIMAL PLACES IN SECONDS FOR FIRST SYSTEM
29		
30	13	I3 NUMBER OF CHANNELS (0-3 MEV) IN 4 PI SYSTEM FOR FIRST AERIAL SYSTEM
31		
32	14	I3 NUMBER OF CHANNELS (0-30 MEV) IN 2 PI SYSTEM FOR FIRST AERIAL SYSTEM
33		
34	15-24	(SAME) REPEAT OF ITEMS 5-14 FOR AERIAL SYSTEM
35	*	*
36	*	*
37	*	*
38	85-94	(SAME) REPEAT OF ITEMS 5-14 FOR NINTH AERIAL SYSTEM
39	95	I3 NUMBER OF FLIGHT LINES ON THIS TAPE
40	96	I4 FIRST FLIGHT LINE NUMBER ON THIS TAPE
41	97	I6 FIRST RECORD NUMBER OF FIRST FLIGHT LINE
42	98	I3 JULIAN DATE (DAY OF YEAR) FIRST FLIGHT LINE DATA WAS COLLECTED
43		
44	99-101	I4,6 &3 REPEAT OF ITEMS 96-98 FOR SECOND FLIGHT LINE ONE THIS TAPE
45		
46	*	*
47	*	*
48	*	*
49	390-392	I4,6 &3 REPEAT OF ITEMS 96-98 FOR 99TH FLIGHT LINE ON THIS TAPE
50		
51		

Line	Character Number
Number	12345678901234567890123456789012345678901234567890123456789012

52	FORMAT FOR STATISTICAL ANALYSIS DATA RECORD (THIRD THRU LAST BLOCK)		
53			
54	ITEM	FORMAT	DESCRIPTION
55	1	I1	AERIAL SYSTEM IDENTIFICATION CODE
56	2	I4	FLIGHT LINE NUMBER
57	3	I6	RECORD IDENTIFICATION NUMBER
58	4	I6	GMT TIME OF DAY (HHMMSS)
59	5	F.84	LATITUDE TO FOUR DECIMAL PLACES IN DEGREES
60	6	F8.4	LONGITUDE TO FOUR DECIMAL PLACES IN DEGREES
61	7	F6.1	TERRAIN CLEARANCE TO ONE DECIMAL PLACE IN METERS
62	8	F7.1	RESIDUAL (IGRF REMOVED) MAGNETIC FIELD INTENSITY
63			TO ONE DECIMAL PLACE IN GAMMAS
64	9	A8	SURFACE GEOLOGIC MAP UNIT CODE
65	10	I5	QUALITY FLAG CODES
66	11	F6.1	AVERAGED CONCENTRATION OF TERRESTRIAL POTASSIUM
67			(K-40) TO ONE DECIMAL PLACE IN PERCENT K
68	12	F4.1	UNCERTAINTY IN TERRESTRIAL POTASSIUM TO ONE DECIMAL
69			PLACE IN PERCENT K
70	13	F5.1	POTASSIUM STANDARD DEVIATION FROM THE MEAN TO ONE
71			DECIMAL PLACE AND ALGEBRAICALLY SIGNED
72	14	F6.1	AVERAGED CONCENTRATION OF TERRESTRIAL URANIUM
73			(BI-214) TO ONE DECIMAL PLACE IN PPM EQUIVALENT U
74	15	F4.1	UNCERTAINTY IN TERRESTRIAL URANIUM TO ONE DECIMAL
75			PLACE IN PPM EQUIVALENT U
76	16	F5.1	URANIUM STANDARD DEVIATION FROM THE MEAN TO ONE
77			DECIMAL PLACE AND ALGEBRAICALLY SIGNED
78	17	F6.1	AVERAGED CONCENTRATION OF TERRESTRIAL THORIUM
79			(TL-208) TO ONE DECIMAL PLACE IN PPM EQUIVALENT TH
80	18	F4.1	UNCERTAINTY IN TERRESTRIAL THORIUM TO ONE DECIMAL
81			PLACE IN PPM EQUIVALENT TH
82	19	F5.1	THORIUM STANDARD DEVIATION FROM THE MEAN TO ONE
83			DECIMAL PLACE AND ALGEBRAICALLY SIGNED
84	20	F8.1	GROSS GAMMA (0.4-3.0 MEV) COUNT RATE TO ONE DECIMAL
85			PLACE IN COUNTS PER SECOND
86	21	F6.1	UNCERTAINTY IN GROSS GAMMA COUNT RATE TO ONE DECIMAL
87			PLACE IN COUNTS PER SECOND
88	22	F5.1	ATMOSPHERIC BI-214 4PI CORRECTION TO ONE DECIMAL
89			PLACE IN PPM EQUIVALENT U
90	23	F4.1	UNCERTAINTY IN ATMOSPHERIC BI-214 4PI CORRECTION
91			TO ONE DECIMAL PLACE IN PPM EQUIVALENT U
92	24	F6.1	AVERAGED URANIUM-TO-THORIUM RATIO TO ONE DECIMAL
93			PLACE IN PPM EQUIVALENT U PER PPM EQUIVALENT TH
94	25	F5.1	URANIUM-TO-THORIUM RATIO STANDARD DEVIATION FROM THE
95			MEAN TO ONE DECIMAL PLACE AND ALGEBRAICALLY SIGNED
96	26	F6.1	AVERAGED URANIUM-TO-POTASSIUM RATIO TO ONE DECIMAL
97			PLACE IN PPM EQUIVALENT U PER PERCENT K
98	27	F5.1	URANIUM-TO-POTASSIUM RATIO STANDARD DEVIATION FROM
99			THE MEAN TO ONE DECIMAL PLACE AND ALGEBRAICALLY
100			SIGNED
101	28	F6.1	AVERAGE THORIUM-TO-POTASSIUM RATIO TO ONE DECIMAL
102			PLACE IN PPM EQUIVALENT TH PER PERCENT K
103	29	F5.1	THORIUM-TO-POTASSIUM RATIO STANDARD DEVIATION FROM
104			THE MEAN TO ONE DECIMAL PLACE AND ALGEBRAICALLY
105			SIGNED

A P P E N D I X K

Format, DOE STATISTICAL ANALYSIS SUMMARY DATA TAPE

DOE STATISTICAL ANALYSIS SUMMARY DATA TAPE

Line	Character Number
Number	12345678901234567890123456789012345678901234567890123456789012

1 05 0978 (DATA TAPE TYPE AND FORMAT SPECIFICATION DATE CODE)

2
3 STATISTICAL ANALYSIS SUMMARY TAPE (OR FILE)

4
5 FORMAT FOR TAPE IDENTIFICATION BLOCK (SECOND BLOCK)

6			
7	ITEM	FORMAT	DESCRIPTION
8	1	A40	QUADRANGLE NAME AS PROJECT IDENTIFICATION
9	2	A20	NAME OF SUBCONTRACTOR
10	3	I4	APPROXIMATE DATE OF SURVEY (MONTH, YEAR)
11	4	I6	NUMBER OF GEOLOGIC MAP UNITS USED FOR THIS
12			QUADRANGLE

13
14 FORMAT FOR STATISTICAL ANALYSIS SUMMARY DATA RECORD (THIRD THRU LAST
15 BLOCK)

16			
17	ITEM	FORMAT	DESCRIPTION
18	1	A8	SURFACE GEOLOGIC MAP UNIT IDENTIFYING CODE
19	2	I6	TOTAL RECORDS FOR GEOLOGIC MAP UNIT
20	3	I6	NUMBER OF POTASSIUM RECORDS COMPUTED FOR GEOLOGIC
21			UNITS
22	4	F6.1	POTASSIUM CONCENTRATION MEAN TO ONE DECIMAL PLACE
23			IN PERCENT K
24	5	F6.1	POTASSIUM CONCENTRATION STANDARD DEVIATION TO ONE
25			DECIMAL PLACE IN PERCENT K
26	6	A3	POTASSIUM CONCENTRATION DISTRIBUTION CODE
27	7	I6	NUMBER OF URANIUM RECORDS COMPUTED FOR GEOLOGIC UNIT
28	8	F6.1	URANIUM CONCENTRATION MEAN TO ONE DECIMAL PLACE
29			IN PPM EQUIVALENT U
30	9	F6.1	URANIUM CONCENTRATION STANDARD DEVIATION TO ONE
31			DECIMAL PLACE IN PPM EQUIVALENT U
32	10	A3	URANIUM CONCENTRATION DISTRIBUTION CODE
33	11	I6	NUMBER OF THORIUM RECORDS COMPUTED FOR GEOLOGIC UNIT
34	12	F6.1	THORIUM CONCENTRATION MEAN TO ONE DECIMAL PLACE IN
35			PPM EQUIVALENT TH
36	13	F6.1	THORIUM CONCENTRATION STANDARD DEVIATION TO ONE
37			DECIMAL PLACE IN PPM EQUIVALENT TH
38	14	A3	THORIUM CONCENTRATION DISTRIBUTION CODE
39	15	I6	NUMBER OF URANIUM-TO-THORIUM RATIO RECORDS COMPUTED
40			FOR GEOLOGIC UNIT
41	16	F6.1	URANIUM-TO-THORIUM RATIO MEAN TO ONE DECIMAL PLACE
42			IN PPM EQUIVALENT U PER PPM EQUIVALENT TH
43	17	F6.1	URANIUM-TO-THORIUM RATIO STANDARD DEVIATION TO ONE
44			DECIMAL PLACE IN PPM EQUIVALENT U PER PPM EQUIVALENT
45			TH
46	18	A3	URANIUM-TO-THORIUM RATIO DISTRIBUTION CODE
47	19	I6	NUMBER OF URANIUM-TO-POTASSIUM RATIO RECORDS
48			COMPUTED FOR GEOLOGIC UNIT
49	20	F6.1	URANIUM-TO-POTASSIUM RATIO MEAN TO ONE DECIMAL PLACE
50			IN PPM EQUIVALENT U PER PERCENT K

Line	Character Number											
Number	1	2	3	4	5	6	7	8	9	0	1	2

51	21	F6.1	URANIUM-TO-POTASSIUM RATIO STANDARD DEVIATION TO ONE
52			DECIMAL PLACE IN PPM EQUIVALENT U PER PERCENT K
53	22	A3	URANIUM-TO-POTASSIUM RATIO DISTRIBUTION CODE
54	23	I6	NUMBER OF THORIUM-TO-POTASSIUM RATIO RECORDS
55			COMPUTED FOR GEOLOGIC UNIT
56	24	F6.1	THORIUM-TO-POTASSIUM RATIO MEAN TO ONE DECIMAL PLACE
57			IN PPM EQUIVALENT TH PER PERCENT K
58	25	F6.1	THORIUM-TO-POTASSIUM RATIO STANDARD DEVIATION TO ONE
59			DECIMAL PLACE IN PPM EQUIVALENT TH PER PERCENT K
60	26	A3	THORIUM-TO-POTASSIUM RATIO DISTRIBUTION CODE

A P P E N D I X L

Format, DOE MAGNETIC DATA TAPE

DOE MAGNETIC DATA TAPE FORMAT

Line Character Number
 Number 12345678901234567890123456789012345678901234567890123456789012

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1 04 0978 (DATA TAPE TYPE AND FORMAT SPECIFICATION DATE CODES)
2
3 MAGNETIC DATA TAPE
4
5 FORMAT FOR TAPE IDENTIFICATION BLOCK (SECOND BLOCK)
6
7 ITEM      FORMAT  DESCRIPTION
8 1         A40     QUADRANGLE NAME AS PROJECT IDENTIFICATION
9 2         A20     NAME OF SUBCONTRACTOR
10 3        I4      APPROXIMATE DATE OF SURVEY (MONTH, YEAR)
11 4        I3      NUMBER OF FLIGHT LINES ON THIS TAPE
12 5        I4      FIRST FLIGHT LINE OF THIS TAPE
13 6        I6      FIRST RECORD NUMBER OF FIRST FLIGHT LINE
14 7        I3      JULIAN DATE (DAY OF YEAR) FIRST FLIGHT LINE DATA WAS
15                COLLECTED
16 8        F8.4    LATITUDE OF GROUND BASE STATION TO FOUR DECIMAL
17                PLACES IN DEGREES FOR FIRST FLIGHT LINE
18 9        F8.4    LONGITUDE OF GROUND BASE STATION TO FOUR DECIMAL
19                PLACES IN DEGREES FOR FIRST FLIGHT LINE
20 10-14    (SAME)  REPEAT OF ITEMS 5-9 FOR SECOND FLIGHT LINE ON THIS
21                TAPE
22 *        *              *
23 *        *              *
24 *        *              *
25 495-499  (SAME)  REPEAT OF ITEMS 5-9 FOR 99TH FLIGHT LINE ON THIS
26                TAPE
27
28 FORMAT FOR MAGNETIC DATA RECORD (THIRD THRU LAST BLOCK)
29
30 ITEM      FORMAT  DESCRIPTION
31 1         I1      AERIAL SYSTEM IDENTIFICATION CODE
32 2         I4      FLIGHT LINE NUMBER
33 3         I6      RECORD IDENTIFICATION NUMBER
34 4         I6      GMT TIME OF DAY (HHMMSS)
35 5        F8.4    LATITUDE TO FOUR DECIMAL PLACES IN DEGREES
36 6        F8.4    LONGITUDE TO FOUR DECIMAL PLACES IN DEGREES
37 7        F6.1    TERRAIN CLEARANCE TO ONE DECIMAL PLACE IN METERS
38 8        F5.1    OUTSIDE AIR PRESSURE TO ONE DECIMAL PLACE IN MMHG
39 9         A8      SURFACE GEOLOGIC MAP UNIT CODE
40 10       F7.1    TOTAL MAGNETIC FIELD INTENSITY TO ONE DECIMAL PLACE
41                IN GAMMAS
42 11       F7.1    RESIDUAL (IGRF REMOVED) MAGNETIC FIELD INTENSITY
43                TO ONE DECIMAL PLACE IN GAMMAS
44 12       F7.1    DIURNAL MAGNETIC INTENSITY VARIATION TO ONE DECIMAL
45                PLACE IN GAMMAS
46 13       F7.1    MAGNETIC DEPTH-TO-BASEMENT TO ONE DECIMAL PLACE
47                IN METERS (IF REQUIRED)

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A P P E N D I X M

Reduced Calibration and Test Line Data

Reduced Calibration and Test Line Data

<u>Date</u>	<u>Flight</u>	Res. Thor.	Res. Thor.	Low Preflight			Low Postflight		
		<u>583</u>	<u>2615</u>	<u>Alt.</u>	<u>T.C.</u>	<u>2π</u>	<u>Alt.</u>	<u>T.C.</u>	<u>2π</u>
08/24/81	28	6.4%	9.3%	400'	1225	11	400'	1200	9
08/24/80	29	6.4%	9.3%	400'	1225	11	400'	1200	9
08/24/80	30	6.4%	9.3%	400'	1225	11	400'	1200	9
08/24/80	31	6.4%	9.3%	400'	1225	11	400'	1200	9
08/25/80	32	5.8%	3.7%	400'	1225	12	400'	1200	9
08/25/80	33	5.8%	3.7%	400'	1225	12	400'	1200	9
08/25/80	34	5.8%	3.7%	400'	1225	12	400'	1200	9
08/25/80	35	5.8%	3.7%	400'	1225	12	400'	1200	9
08/25/80	36	5.8%	3.7%	400'	1225	12	400'	1200	9
08/26/80	37	6.2%	3.9%	400'	1250	12	No Test		
08/26/80	38	6.2%	3.9%	400'	1250	12	No Test		
08/26/80	39	6.2%	3.9%	400'	1250	12	No Test		
08/30/80	46	5.8%	3.7%	400'	1225	12	No Test		
09/01/80	48	6.3%	9.7%	400'	1225	11	No Test		
09/01/80	49	6.3%	9.7%	400'	1225	11	No Test		
09/01/80	50	6.3%	9.7%	400'	1225	11	No Test		
09/03/80	51	6.0%	3.9%	400'	1225	10	No Test		
09/03/80	52	6.0%	3.9%	400'	1225	10	No Test		

<u>Date</u>	<u>Flight</u>	<u>Res. Thor.</u> <u>538</u>	<u>Res. Thor.</u> <u>2615</u>	<u>Low Preflight</u>			<u>Low Postflight</u>		
				<u>Alt.</u>	<u>T.C.</u>	<u>2π</u>	<u>Alt.</u>	<u>T.C.</u>	<u>2π</u>
09/03/80	53	6.0%	8.9%	400'	1225	10	No Test		
09/04/80	54	5.5%	8.3%	400'	1225	10	No Test		
09/04/80	55	5.5%	8.3%	400'	1225	10	No Test		
09/05/80	57	6.2%	9.0%	400'	1250	12	400'	1250	11
09/05/80	60	6.2%	9.0%	400'	1250	12	400'	1250	11
09/08/80	64	6.1%	9.2%	400'	1325	11	No Test		
09/08/80	65	6.1%	9.2%	400'	1325	11	No Test		
09/10/80	66	6.0%	9.0%	No Test			No Test		
09/10/80	67	6.0%	9.0%	No Test			No Test		
09/14/80	73	6.0%	9.5%	400'	1200	9	400'	1200	8
09/14/80	74	6.0%	9.5%	400'	1200	9	400'	1200	8
09/15/80	78	5.3%	8.8%	400'	1225	11	350'	1200	10
09/15/80	80	5.3%	8.8%	400'	1225	11	350'	1200	10
09/15/80	82	5.3%	8.8%	400'	1225	11	350'	1200	10
09/15/80	84	6.2%	9.3%	400'	1225	11	No Test		
09/17/80	86	5.9%	9.4%	No Test			No Test		
09/23/80	101	5.5%	8.5%	400'	1175	8	400'	1150	7

A P P E N D I X N

Renumbered to Original Fiducial Correlations

MEDFORD QUADRANGLE

LINE 220 FLOWN AS LINE 222 AND 220
MAP FIDUCIALS 3424 TO 5380 CORRESPOND TO ORIGINAL FIDUCIALS 5380 TO 3424
MAP FIDUCIALS 5381 TO 6535 CORRESPOND TO ORIGINAL FIDUCIALS 3477 TO 4632

LINE 230 FLOWN AS LINE 230 AND 231
MAP FIDUCIALS 348 TO 1797 CORRESPOND TO ORIGINAL FIDUCIALS 1797 TO 348
MAP FIDUCIALS 1798 TO 3385 CORRESPOND TO ORIGINAL FIDUCIALS 6725 TO 5137

LINE 240 FLOWN AS LINE 240 AND 241
MAP FIDUCIALS 395 TO 1699 CORRESPOND TO ORIGINAL FIDUCIALS 1699 TO 395
MAP FIDUCIALS 1700 TO 3595 CORRESPOND TO ORIGINAL FIDUCIALS 9000 TO 7104

LINE 250 FLOWN AS LINE 250 AND 251
MAP FIDUCIALS 5656 TO 7008 CORRESPOND TO ORIGINAL FIDUCIALS 7008 TO 5656
MAP FIDUCIALS 7009 TO 8803 CORRESPOND TO ORIGINAL FIDUCIALS 5013 TO 6808

LINE 260 FLOWN AS LINE 260 AND 261
MAP FIDUCIALS 3490 TO 4768 CORRESPOND TO ORIGINAL FIDUCIALS 4768 TO 3490
MAP FIDUCIALS 4768 TO 6550 CORRESPOND TO ORIGINAL FIDUCIALS 18193 TO 20240

LINE 270 FLOWN AS LINE 272 AND 270
MAP FIDUCIALS 10084 TO 11071 CORRESPOND TO ORIGINAL FIDUCIALS 11071 TO 10084
MAP FIDUCIALS 11072 TO 15226 CORRESPOND TO ORIGINAL FIDUCIALS 17985 TO 15226

LINE 280 FLOWN AS LINE 280
MAP FIDUCIALS 15669 TO 16628 CORRESPOND TO ORIGINAL FIDUCIALS 16628 TO 15669
MAP FIDUCIALS 16629 TO 19099 CORRESPOND TO ORIGINAL FIDUCIALS 7067 TO 2304

LINE 290 FLOWN AS LINE 290 291 AND 292
MAP FIDUCIALS 14283 TO 15302 CORRESPOND TO ORIGINAL FIDUCIALS 15302 TO 14283
MAP FIDUCIALS 15303 TO 16684 CORRESPOND TO ORIGINAL FIDUCIALS 12369 TO 10987
MAP FIDUCIALS 16685 TO 18030 CORRESPOND TO ORIGINAL FIDUCIALS 723 TO 2068

LINE 300 FLOWN AS LINE 300
MAP FIDUCIALS 6816 TO 7743 CORRESPOND TO ORIGINAL FIDUCIALS 7743 TO 6816
MAP FIDUCIALS 7744 TO 10186 CORRESPOND TO ORIGINAL FIDUCIALS 12579 TO 15023

LINE 310 FLOWN AS LINE 310 AND 311
MAP FIDUCIALS 9301 TO 10311 CORRESPOND TO ORIGINAL FIDUCIALS 10311 TO 9301
MAP FIDUCIALS 10312 TO 12891 CORRESPOND TO ORIGINAL FIDUCIALS 22349 TO 19770

LINE 320 FLOWN AS LINE 320 AND 322
MAP FIDUCIALS 11719 TO 12657 CORRESPOND TO ORIGINAL FIDUCIALS 12657 TO 11719
MAP FIDUCIALS 12658 TO 15009 CORRESPOND TO ORIGINAL FIDUCIALS 12048 TO 14399

LINE 330 FLOWN AS LINE 332 AND 331
MAP FIDUCIALS 18406 TO 19392 CORRESPOND TO ORIGINAL FIDUCIALS 19392 TO 18406
MPA FIDUCIALS 19393 TO 21776 CORRESPOND TO ORIGINAL FIDUCIALS 16843 TO 14459

LINE 340 FLOWN AS LINE 340 AND 342
MAP FIDUCIALS 5582 TO 6484 CORRESPOND TO ORIGINAL FIDUCIALS 6484 TO 5582
MAP FIDUCIALS 6485 TO 8692 CORRESPOND TO ORIGINAL FIDUCIALS 7178 TO 9385

MEDFORD QUADRANGLE

LINE 350 FLOWN AS LINE 351 AND 350
MAP FIDUCIALS 14814 TO 15923 CORRESPOND TO ORIGINAL FIDUCIALS 15923 TO 14814
MAP FIDUCIALS 15924 TO 18184 CORRESPOND TO ORIGINAL FIDUCIALS 11720 TO 9460

LINE 360 FLOWN AS LINE 361 AND 360
MAP FIDUCIALS 12134 TO 13217 CORRESPOND TO ORIGINAL FIDUCIALS 13217 TO 12134
MAP FIDUCIALS 13218 TO 15554 CORRESPOND TO ORIGINAL FIDUCIALS 17349 TO 19686

LINE 370 FLOWN AS LINE 370 AND 371 AND 372
MAP FIDUCIALS 5404 TO 6943 CORRESPOND TO ORIGINAL FIDUCIALS 6943 TO 5404
MAP FIDUCIALS 6944 TO 7718 CORRESPOND TO ORIGINAL FIDUCIALS 7718 TO 6944
MAP FIDUCIALS 7719 TO 9044 CORRESPOND TO ORIGINAL FIDUCIALS 264 TO 1589

LINE 380 FLOWN AS LINE 381 AND 384
MAP FIDUCIALS 7501 TO 9534 CORRESPOND TO ORIGINAL FIDUCIALS 9534 TO 7501
MAP FIDUCIALS 9535 TO 10308 CORRESPOND TO ORIGINAL FIDUCIALS 883 TO 1657
MAP FIDUCIALS 10309 TO 10901 CORRESPOND TO ORIGINAL FIDUCIALS 2215 TO 1623

LINE 390 FLOWN AS LINE 390 AND 391
MAP FIDUCIALS 11359 TO 11918 CORRESPOND TO ORIGINAL FIDUCIALS 11918 TO 11359
MAP FIDUCIALS 11919 TO 14643 CORRESPOND TO ORIGINAL FIDUCIALS 68 TO 2784

LINE 400 FLOWN AS LINE 400 AND 401
MAP FIDUCIALS 4736 TO 7333 CORRESPOND TO ORIGINAL FIDUCIALS 7333 TO 4736
MAP FIDUCIALS 7334 TO 8246 CORRESPOND TO ORIGINAL FIDUCIALS 939 TO 1851

LINE 410 FLOWN AS LINE 400 AND 401
MAP FIDUCIALS 726 TO 3396 CORRESPOND TO ORIGINAL FIDUCIALS 3396 TO 726
MAP FIDUCIALS 3397 TO 4300 CORRESPOND TO ORIGINAL FIDUCIALS 4058 TO 3154

LINE 420 FLOWN AS LINE 422 AND 420
MAP FIDUCIALS 1283 TO 3774 CORRESPOND TO ORIGINAL FIDUCIALS 3774 TO 1283
MAP FIDUCIALS 3775 TO 4754 CORRESPOND TO ORIGINAL FIDUCIALS 2816 TO 1836

LINE 430 FLOWN AS LINE 430 AND 431
MAP FIDUCIALS 687 TO 3155 CORRESPOND TO ORIGINAL FIDUCIALS 3155 TO 687
MAP FIDUCIALS 3156 TO 4002 CORRESPOND TO ORIGINAL FIDUCIALS 6237 TO 5390

LINE 440 FLOWN AS LINE 441 AND 440
MAP FIDUCIALS 3070 TO 3938 CORRESPOND TO ORIGINAL FIDUCIALS 3938 TO 3070
MAP FIDUCIALS 3939 TO 6526 CORRESPOND TO ORIGINAL FIDUCIALS 2552 TO 5140

LINE 2000 FLOWN AS LINE 2001 AND 2000
MAP FIDUCIALS 2860 TO 4092 CORRESPOND TO ORIGINAL FIDUCIALS 4092 TO 2860
MAP FIDUCIALS 4093 TO 5262 CORRESPOND TO ORIGINAL FIDUCIALS 2948 TO 1778

LINE 2010 FLOWN AS LINE 2010 AND 2011
MAP FIDUCIALS 333 TO 1701 CORRESPOND TO ORIGINAL FIDUCIALS 1701 TO 333
MAP FIDUCIALS 1702 TO 2703 CORRESPOND TO ORIGINAL FIDUCIALS 10422 TO 9420

LINE 2020 FLOWN AS LINE 2021 AND 2020
MAP FIDUCIALS 311 TO 2084 CORRESPOND TO ORIGINAL FIDUCIALS 9836 TO 9235
MAP FIDUCIALS 2085 TO 2681 CORRESPOND TO ORIGINAL FIDUCIALS 9836 TO 9235

MEDFORD QUADRANGLE

LINE 2030 FLOWN AS LINE 2032 AND 2031 AND 2030

MAP FIDUCIALS 4487 TO 5180 CORRESPOND TO ORIGINAL FIDUCIALS 5180 TO 4487

MAP FIDUCIALS 6393 TO 6882 CORRESPOND TO ORIGINAL FIDUCIALS 415 TO 904

LINE 2040 FLOWN AS LINE 2040

MAP FIDUCIALS 804 TO 2988 CORRESPOND TO ORIGINAL FIDUCIALS 2988 TO 804

LINE 2050 FLOWN AS LINE 2050 AND 2051

MAP FIDUCIALS 643 TO 1262 CORRESPOND TO ORIGINAL FIDUCIALS 1262 TO 643

MAP FIDUCIALS 1263 TO 1463 CORRESPOND TO ORIGINAL FIDUCIALS 1009 TO 2605

LINE 2060 FLOWN AS LINE 2061 AND 2060

MAP FIDUCIALS 6536 TO 7594 CORRESPOND TO ORIGINAL FIDUCIALS 7594 TO 6536

MAP FIDUCIALS 7595 TO 8917 CORRESPOND TO ORIGINAL FIDUCIALS 186 TO 1509

LINE 2070 FLOWN AS LINE 2070

MAP FIDUCIALS 7813 TO 9905 CORRESPOND TO ORIGINAL FIDUCIALS 9905 TO 7813

LINE 2080 FLOWN AS LINE 2080

MAP FIDUCIALS 16 TO 1590 CORRESPOND TO ORIGINAL FIDUCIALS 1590 TO 16