National Uranium Resource Evaluation

**Airborne Gamma-Ray Spectrometer
And Magnetometer Survey
Ukiah Quadrangle, California**

MASTER

Final Report - Volume II

**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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This report is a result of work performed by Aero Service Division Western Geophysical Company of America through a Bendix Field Engineering Corporation Subcontract, as part of the National Uranium Resource 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.

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GEOLOGIC LEGEND

<u>Aero Symbol</u>	<u>Map Symbol</u>	<u>Unit Description</u>
—	Qs	Recent dune and coast sand
QAL	Qal	Recent alluvium
QSC	Qsc	Recent river and major stream channel deposits in the Great Valley
QF	Qf	Recent alluvial fan deposits in the Great Valley
QB	Qb	Recent basin deposits in the Great Valley
—	Qrv	Recent volcanic rocks, including: rhyolite andesite basalt pyroclastic rocks
—	Qrv ^r	
—	Qrv ^a	
—	Qrv ^b	
QRVP	Qrv ^p	
QT	Qt	Pleistocene to Recent nonmarine terrace deposits
QM	Qm	Pleistocene marine and marine terrace deposits
QC	Qc	Pleistocene nonmarine sedimentary deposits
—	Qpv	Pleistocene volcanic rocks, including: rhyolite andesite basalt pyroclastic rocks
—	Qpv ^r	
—	Qpv ^a	
—	Qpv ^b	
—	Qpv ^p	
QP	QP	Pliocene-Pleistocene nonmarine sedimentary deposits
—	*	Quaternary and/or Pliocene cinder cones
PUC	Puc	Upper Pliocene nonmarine sedimentary rocks
PML	Pml	Middle and/or lower Pliocene marine sedimentary rocks
—	Pv	Pliocene volcanic rocks, including: rhyolite andesite basalt pyroclastic rocks
—	Pv ^r	
—	Pv ^a	
—	Pv ^b	
PVP	Pv ^p	
—	Mm	Middle Miocene marine sedimentary rocks

<u>Aero Symbol</u>	<u>Map Symbol</u>	<u>Unit Description</u>
—	E	Eocene marine sedimentary rocks
EP	Ep	Paleocene marine sedimentary rocks
—	Tv	Tertiary volcanic rocks, including: rhyolite andesite basalt pyroclastic rocks
—	Tv ^r	
—	Tv ^a	
—	Tv ^b	
TVB	Tv ^p	
K	K	Undivided Cretaceous marine sedimentary rocks
KU	Ku	Upper Cretaceous marine sedimentary rocks
KL	Kl	Lower Cretaceous marine sedimentary rocks
KJF	KJf	Franciscan Formation
KJFV	KJfv	Franciscan volcanic and metavolcanic rocks
UB	ub	Mesozoic ultrabasic intrusive rocks
JK	JK	Knoxville Formation
MS	ms	Pre-Cretaceous metasedimentary rocks
MV	mv	Pre-Cretaceous metavolcanic rocks
U		Areas of unknown or incompletely mapped geology
W		Water

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AERO SERVICE
HOUSTON, TEXAS 77001

..... FILM IDENTIFIED TRAVERSE/TIE LINE INTERSECTION
..... FILM IDENTIFIED GROUND CONTROL
..... INDEX FIDUCIAL (100 FIDUCIAL INTERVALS)
FLYING 1966

FLIGHT PATH
UKIAH
NJ 10-2
DOE/MURE

→ 90°

0 1 2 3 MILES
|-----|
0 1 2 3 4 5 KILOMETERS

AERO SERVICE
JOB 0627
FLOWN 1980

DOE/NURE
UKIAH
LINE 890

AERO SERVICE
JOB 0627
FLOWN 1980

DOE/NURE
UKIHH
LINE 3000

AERO SERVICE
JOB 0627
FLOWN 1980

AERO SERVICE
JOB 0627
FLOWN 1980

DOE/NURE
UKIAH
LINE 3030

AERO SERVICE
JOB 0627
FLOWN 1980

→ 90°

0 1 2 3 MILES
0 1 2 3 4 5 KILOMETERS

AERO SERVICE
JOB 0627
FLOWN 1980

DOE/NURE
UKIAH
LINE 690

$\rightarrow 90^\circ$

0 1 2 3 MILES
0 1 2 3 4 5 KILOMETERS

AERO SERVICE
JOB 0627
FLOWN 1980

DOE/NURE
UKIAH
LINE 710

$\rightarrow 90^\circ$

0 1 2 3 MILES

0 1 2 3 4 5 KILOMETERS

AERO SERVICE
JOB 0627
FLOWN 1980

DOE/NURE
UKIAH
LINE 730

→

90°

0 1 2 3 MILES

0 1 2 3 4 5 KILOMETERS

AERO SERVICE
JOB 0627
FLOWN 1980

DOE/NURE
UKIAH
LINE 770

→ 90°

0 1 2 3 MILES
0 1 2 3 4 5 KILOMETERS

AERO SERVICE
JOB 0627
FLOWN 1980

DOE/NURE
UKIAH
LINE 790

$\longrightarrow 90^\circ$

0 1 2 3 MILES
0 1 2 3 4 5 KILOMETERS

AERO SERVICE
JOB 0627
FLOWN 1980

DOE/NURE
UKIAH
LINE 810

→ 90°

0 1 2 3 MILES
0 1 2 3 4 5 KILOMETERS

AERO SERVICE
JOB 0627
FLOWN 1980

DOE/NURE
UKIAH
LINE 850

$\rightarrow 90^\circ$

0 1 2 3 MILES

0 1 2 3 4 5 KILOMETERS

AERO SERVICE
JOB 0627
FLOWN 1980

DOE/NURE
UKIAH
LINE 870

→ 90°

0 1 2 3 MILES
0 1 2 3 4 5 KILOMETERS

AERO SERVICE
JOB 0627
FLOWN 1980

DOE/NURE
UKIAH
LINE 910

AERO SERVICE
JOB 0627
FLOWN 1980

DOE/NURE
UKIAH
LINE 3000

0 1 2 3 MILES
0 1 2 3 4 5 KILOMETERS

AERO SERVICE
JOB 0627
FLOWN 1980

DOE/NURE
UKIAH
LINE 3010

AERO SERVICE
JOB 0627
FLOWN 1980

DOE/NURE
UKIAII
LINE 3020

AERO SERVICE
JOB 0627
FLOWN 1980

DOE/NURE
UKIAH
LINE 3030

0 1 2 3 MILES
0 1 2 3 4 5 KILOMETERS

AERO SERVICE
JOB 0627
FLOWN 1980

DOE/NURE
UKIAH
LINE 3040

0 1 2 3 MILES
0 1 2 3 4 5 KILOMETERS

AERO SERVICE
JOB 0627
FLOWN 1980

DOF/NIIRF
UKIAH
LINE 3050

UKIAH
N 10-2

FORMATION QAL
TOTAL SAMPLES 1363

AERO SERVICE
1980

UKIAH
NJ 10-2

FORMATION
TOTAL SAMPLES 608

AERO SERVICE
1980

UKIAH
NJ 10-2

FORMATION QF
TOTAL SAMPLES 3519

AERO SERVICE
1980

UKIAH
NJ 10-2

FORMATION QB
TOTAL SAMPLES 1805

AERO SERVICE
1980

UKIAH
NJ 10-2

FORMATION
TOTAL SAMPLES

QRVP
26

AERO SERVICE
1980

UKIAH
NJ 10-2

FORMATION OT
TOTAL SAMPLES 388

AERO SERVICE
1980

UKIAH
NJ 10-2

FORMATION QM
TOTAL SAMPLES 221

AERO SERVICE
1980

UKIAH
NJ 10-2

FORMATION QC
TOTAL SAMPLES 924

AERO SERVICE
1980

UKIAH
NJ 10-2

FORMATION QP
TOTAL SAMPLES 408

AERO SERVICE
1980

UKIAH
NJ 10-2

FORMATION PUC
TOTAL SAMPLES 1589

AERO SERVICE
1980

UKIAH
NJ 10-2

FORMATION
TOTAL SAMPLES

PVP
34

AERO SERVICE
1980

UKIAH
NJ 10-2

FORMATION EP
TOTAL SAMPLES 14

AERO SERVICE
1980

UKIAH
NJ 10-2

FORMATION TVB
TOTAL SAMPLES 8

AERO SERVICE
1980

UKIAH
NJ 10-2

FORMATION KU
TOTAL SAMPLES 1310

AERO SERVICE
1980

UKIAH
NJ 10-2

FORMATION KL
TOTAL SAMPLES 2291

AERO SERVICE
1980

UKIAH
NJ 10-2

FORMATION KJF
TOTAL SAMPLES 14892

AERO SERVICE
1980

UKIAH
NJ 10-2

FORMATION UB
TOTAL SAMPLES 1300

AERO SERVICE
1980

UKIAH
NJ 10-2

FORMATION JK
TOTAL SAMPLES 1141

AERO SERVICE
1980

UKIAH
NJ 10-2

FORMATION MS
TOTAL SAMPLES 2649

AERO SERVICE
1980

UKIAH
NJ 10-2

FORMATION MV
TOTAL SAMPLES 175

AERO SERVICE
1980

UKIAH
NJ 10-2

FORMATION U
TOTAL SAMPLES 522

AERO SERVICE
1980

UKIAH
NJ 10-2

FORMATION W
TOTAL SAMPLES 742

AERO SERVICE
1980

AERO SERVICE
HOUSTON, TEXAS 77001

FLIGHT PATH PLOTTED.....DATA ADEQUATE
FLIGHT PATH BLANK.....DATA INADEQUATE

+.....COUNT RATE GREATER THAN 3.2,1 STANDARD DEVIATION(S)
+.....ABOVE MEAN
+.....COUNT RATE LOWER THAN 3.2,1 STANDARD DEVIATION(S)
+.....BELOW MEAN

NEITHER + NOR -.....COUNT RATE WITHIN ONE STANDARD DEVIATION OF MEAN
FLOWN AND COMPILED.....1980 - 1981

URANIUM ANOMALY MAP

UKIAH

NJ 10-2

DGE / NURE

AERO SERVICE
HOUSTON, TEXAS 77001

FLIGHT PATH PLOTTED.....UHA ADEQUATE
FLIGHT PATH BLANK.....DATA INADEQUATE

.....COUNT RATE GREATER THAN 3.2.1 STANDARD DEVIATION(S)
ABOVE MEAN
.....COUNT RATE LOWER THAN 3.2.1 STANDARD DEVIATION(S)
BELOW MEAN

NEITHER + NORCOUNT RATE WITHIN ONE STANDARD DEVIATION OF MEAN
FLOWN AND COMPILED.....1980 - 1981

POTASSIUM ANOMALY MAP

UKIAH

NJ 10-2

DOE / NURE

AERO SERVICE
HOUSTON, TEXAS 77001

FLIGHT PATH PLOTTED.....DATA ADEQUATE
FLIGHT PATH BLANK.....DATA INADEQUATE

+.....COUNT RATE GREATER THAN 9.2.1 STANDARD DEVIATION(S)
ABOVE MEAN
-.....COUNT RATE LOWER THAN 3.2.1 STANDARD DEVIATION(S)
BELOW MEAN

NEITHER + NOR -.....COUNT RATE WITHIN ONE STANDARD DEVIATION OF MEAN
FLOWN AND COMPILED.....1980 - 1981

THORIUM ANOMALY MAP

UKIAH
NJ 10-2
OBE / NURE

AERO SERVICE
HOUSTON, TEXAS 77001

FLIGHT PATH PLOTTED.....DATA ADEQUATE
FLIGHT PATH BLANK.....DATA INADEQUATE

+.....COUNT RATE GREATER THAN 3.2,1 STANDARD DEVIATION(S)
ABOVE MEAN
+.....COUNT RATE LOWER THAN 3.2,1 STANDARD DEVIATION(S)
BELOW MEAN

NEITHER + NORCOUNT RATE WITHIN ONE STANDARD DEVIATION OF MEAN
FLOWN AND COMPILED.....1980 - 1981

URANIUM/POTASSIUM ANOMALY MAP

UKIAH

NJ 10-2

DBE / NURE

AERO SERVICE
HOUSTON, TEXAS 77001

FLIGHT PATH PLOTTED..... DATA ADEQUATE
FLIGHT PATH BLANK..... DATA INADEQUATE

++..... COUNT RATE GREATER THAN 3.2,1 STANDARD DEVIATION(S)
+..... ABOVE MEAN
-..... COUNT RATE LOWER THAN 3.2,1 STANDARD DEVIATION(S)
..... BELOW MEAN

NEITHER + NOR -..... COUNT RATE WITHIN ONE STANDARD DEVIATION OF MEAN
FLOWN AND COMPILED..... 1980 - 1981

URANIUM/THORIUM ANOMALY MAP

UKIAH

NJ 10-2

DBE / NURE

AERO SERVICE
HOUSTON, TEXAS 77001

FLIGHT PATH PLOTTED.....DATA ADEQUATE
FLIGHT PATH BLANK.....DATA INADEQUATE

+.....COUNT RATE GREATER THAN 3.2.1 STANDARD DEVIATION(S)
+.....ABOVE MEAN
-.....COUNT RATE LOWER THAN 3.2.1 STANDARD DEVIATION(S)
-.....BELOW MEAN

NEITHER + NOR -.....COUNT RATE WITHIN ONE STANDARD DEVIATION OF MEAN
FLOWN AND COMPILED.....1980 - 1981

THORIUM/POTASSIUM ANOMALY MAP

UKIAH

NJ 10-2

DBE / NURE

RENUMBERED TO ORIGINAL FIDUCIAL CORRELATIONS

The data reduction process as used in the processing of the airborne gamma-ray spectrometer and magnetometer data includes steps to eliminate duplicate line segments, insert reflight segments where required, order the remaining line segments, and renumber the fiducials of these segments such that the resulting final line is directionally consistent and has location sequential sample numbers. All fiducial numbers shown on the maps and profiles included in this volume are the new, renumbered fiducials. The following listing relates these numbers to the original fiducial numbers recorded in flight. 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.

UKIAH QUADRANGLE

LINE 690 FLOWN AS LINE 690 AND 693 AND 694
MAP FIDUCIALS 3510 TO 5880 CORRESPOND TO ORIGINAL FIDUCIALS 5880 TO 3510
MAP FIDUCIALS 5881 TO 6493 CORRESPOND TO ORIGINAL FIDUCIALS 83 TO 1001
MAP FIDUCIALS 6494 TO 6753 CORRESPOND TO ORIGINAL FIDUCIALS 4483 TO 4742

LINE 710 FLOWN AS LINE 710
MAP FIDUCIALS 132 TO 3130 CORRESPOND TO ORIGINAL FIDUCIALS 3130 TO 132
MAP FIDUCIALS 3131 TO 3359 CORRESPOND TO ORIGINAL FIDUCIALS 6855 TO 7084

LINE 730 FLOWN AS LINE 732 AND 733
MAP FIDUCIALS 1286 TO 2389 CORRESPOND TO ORIGINAL FIDUCIALS 2389 TO 1286
MAP FIDUCIALS 2390 TO 3930 CORRESPOND TO ORIGINAL FIDUCIALS 8527 TO 8289

LINE 750 FLOWN AS LINE 750
MAP FIDUCIALS 16872 TO 19921 CORRESPOND TO ORIGINAL FIDUCIALS 19921 TO 16872

LINE 770 FLOWN AS LINE 770
MAP FIDUCIALS 14208 TO 16765 CORRESPOND TO ORIGINAL FIDUCIALS 16795 TO 14208
MAP FIDUCIALS 16766 TO 17005 CORRESPOND TO ORIGINAL FIDUCIALS 8619 TO 8859

LINE 790 FLOWN AS LINE 791 AND 792
MAP FIDUCIALS 8815 TO 11373 CORRESPOND TO ORIGINAL FIDUCIALS 11373 TO 8815
MAP FIDUCIALS 11374 TO 11617 CORRESPOND TO ORIGINAL FIDUCIALS 10250 TO 10494

LINE 810 FLOWN AS LINE 810 AND 811
MAP FIDUCIALS 11428 TO 14046 CORRESPOND TO ORIGINAL FIDUCIALS 14046 TO 11428
MAP FIDUCIALS 14047 TO 14284 CORRESPOND TO ORIGINAL FIDUCIALS 11822 TO 11584

LINE 830 FLOWN AS LINE 830 AND 831
MAP FIDUCIALS 6008 TO 8621 CORRESPOND TO ORIGINAL FIDUCIALS 8621 TO 6008
MAP FIDUCIALS 8622 TO 8852 CORRESPOND TO ORIGINAL FIDUCIALS 12005 TO 12236

LINE 850 FLOWN AS LINE 850 AND 851
MAP FIDUCIALS 3457 TO 5937 CORRESPOND TO ORIGINAL FIDUCIALS 5937 TO 3457
MAP FIDUCIALS 5938 TO 6167 CORRESPOND TO ORIGINAL FIDUCIALS 13597 TO 13368

LINE 870 FLOWN AS LINE 873 AND 874
MAP FIDUCIALS 4956 TO 7792 CORRESPOND TO ORIGINAL FIDUCIALS 7792 TO 4956
MAP FIDUCIALS 7793 TO 7539 CORRESPOND TO ORIGINAL FIDUCIALS 15289 TO 15520

LINE 890 FLOWN AS LINE 893 AND 894 AND 890
MAP FIDUCIALS 3779 TO 5241 CORRESPOND TO ORIGINAL FIDUCIALS 5241 TO 3779
MAP FIDUCIALS 5242 TO 6344 CORRESPOND TO ORIGINAL FIDUCIALS 9078 TO 7975
MAP FIDUCIALS 6345 TO 6557 CORRESPOND TO ORIGINAL FIDUCIALS 16973 TO 17185

LINE 910 FLOWN AS LINE 911
MAP FIDUCIALS 1000 TO 3704 CORRESPOND TO ORIGINAL FIDUCIALS 3704 TO 1000

LINE 3000 FLOWN AS LINE 3002
MAP FIDUCIALS 2580 TO 3127 CORRESPOND TO ORIGINAL FIDUCIALS 3127 TO 2580

UKIAH QUADRANGLE

LINE 3010 FLOWN AS LINE 3011 AND 3012
MAP FIDUCIALS 3306 TO 4831 CORRESPOND TO ORIGINAL FIDUCIALS 4831 TO 3306
MAP FIDUCIALS 4832 TO 5406 CORRESPOND TO ORIGINAL FIDUCIALS 14613 TO 15187

LINE 3020 FLOWN AS LINE 3022 AND 3020
MAP FIDUCIALS 105 TO 1097 CORRESPOND TO ORIGINAL FIDUCIALS 1097 TO 105
MAP FIDUCIALS 1098 TO 2168 CORRESPOND TO ORIGINAL FIDUCIALS 3821 TO 4892

LINE 3030 FLOWN AS LINE 3034 AND 3035
MAP FIDUCIALS 5343 TO 6284 CORRESPOND TO ORIGINAL FIDUCIALS 6284 TO 5343
MAP FIDUCIALS 6285 TO 7444 CORRESPOND TO ORIGINAL FIDUCIALS 3595 TO 2435

LINE 3040 FLOWN AS LINE 3044
MAP FIDUCIALS 1102 TO 2762 CORRESPOND TO ORIGINAL FIDUCIALS 2762 TO 1102

LINE 3050 FLOWN AS LINE 3051
MAP FIDUCIALS 3070 TO 5155 CORRESPOND TO ORIGINAL FIDUCIALS 5155 TO 3070