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TEM 508

TEM 508
 AIRBORNE RADIOACTIVITY SURVEY
 OF THE PUMPKIN BUTTES AREA,
 CAMPBELL & JOHNSON COUNTIES,
 WYOMING
 by....Stead, Balsley, Moxham,
 and Reinhardt

WITHDRAWN



IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

MAR - 6 1953

AEC-763/3

Dr. Phillip L. Merritt, Assistant Director
Division of Raw Materials
U. S. Atomic Energy Commission
P. O. Box 30, Ansonia Station
New York 23, New York

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Dear Phil:

Transmitted herewith are six copies of TM-508, "Airborne radioactivity survey of the Pumpkin Buttes Area, Campbell and Johnson Counties, Wyoming", by F. W. Stead, J. R. Balsley, R. M. Moxham and P. W. Reinhardt, February 1953.

As discussed by V. E. McKelvey and you on August 6, 1952, we plan to open-file this report and distribute copies to the offices listed in the Commission press release of July 13, 1952 announcing the public release of data on airborne radioactivity surveys. Additional copies of the report will be posted at the Geological Survey offices in Laramie and Casper, Wyoming. We are asking Mr. Hosted to approve this plan.

Sincerely yours,

W. H. Bradley

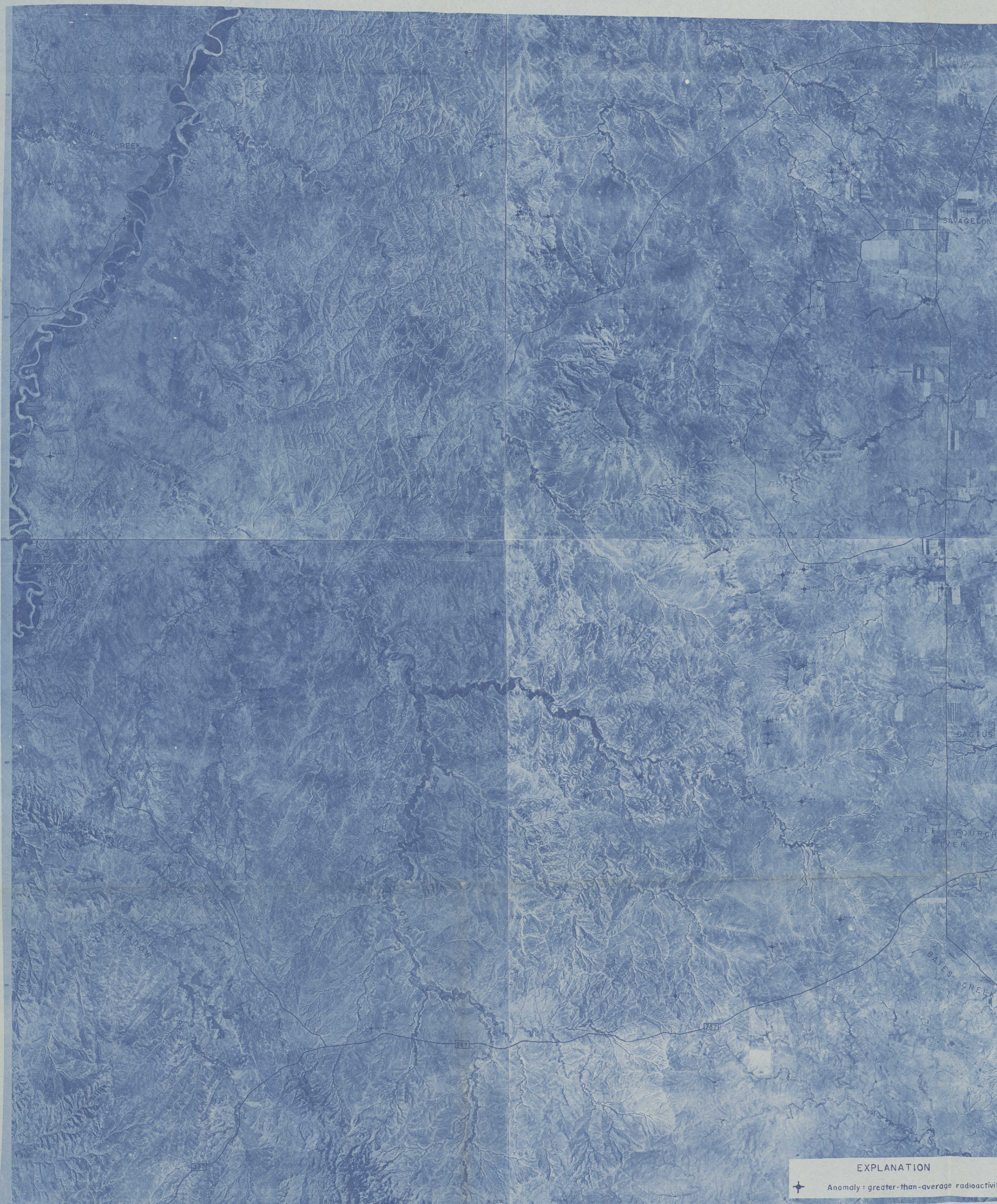
W. H. Bradley
Chief Geologist

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USGS - TEM Report 508

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AIRBORNE RADIOACTIVITY SURVEY OF THE PUMPKIN BUTTES AREA,
CAMPBELL AND JOHNSON COUNTIES, WYOMING

By F. W. Stead¹, J. R. Balesley², R. M. Moxham¹, and P. W. Reinhardt²

The accompanying map shows the results of an airborne radioactivity survey in an area of 800 square miles in Campbell and Johnson Counties, Wyoming. The survey was made by the U. S. Geological Survey from August 21 to September 3, 1952, as part of a cooperative program with the U. S. Atomic Energy Commission.

The survey was made with scintillation-detection equipment mounted in a Douglas DC-3 aircraft. Parallel traverse lines, spaced at quarter-mile intervals, were flown approximately 500 feet above the ground. Aerial photographs were used for pilot guidance, and the flight path of the aircraft was recorded by a gyrostabilized, continuous-strip-film camera. The distance of the aircraft from the ground was measured with a continuously recording radio altimeter.

At 500 feet above the ground, the width of the zone from which anomalous radioactivity is measured varies with the intensity of radiation of the source and, for strong sources, the width would be as much as 1,400 feet. Quarter-mile spacing of the flight paths of the aircraft should be adequate to detect anomalies from strong sources of radioactivity. However, small areas of considerable radioactivity midway between flight paths may not be noted.

The approximate location of each radioactivity anomaly is shown on the accompanying map. The plotted position of an anomaly may be in error by as much as a quarter of a mile owing to errors in the available base maps or to the existence of areas on the base maps up to several square miles in which it is impossible to find and plot recognizable landmarks.

The radioactivity anomalies shown on the accompanying map cannot be interpreted in terms of either the radioactive content or the extent of the source materials. The present technique of airborne radioactivity measurement does not permit distinguishing between activity due to thorium and that due to uranium. An anomaly, therefore, may represent radioactivity due entirely to uranium, or to thorium, or to a combination of uranium and thorium.

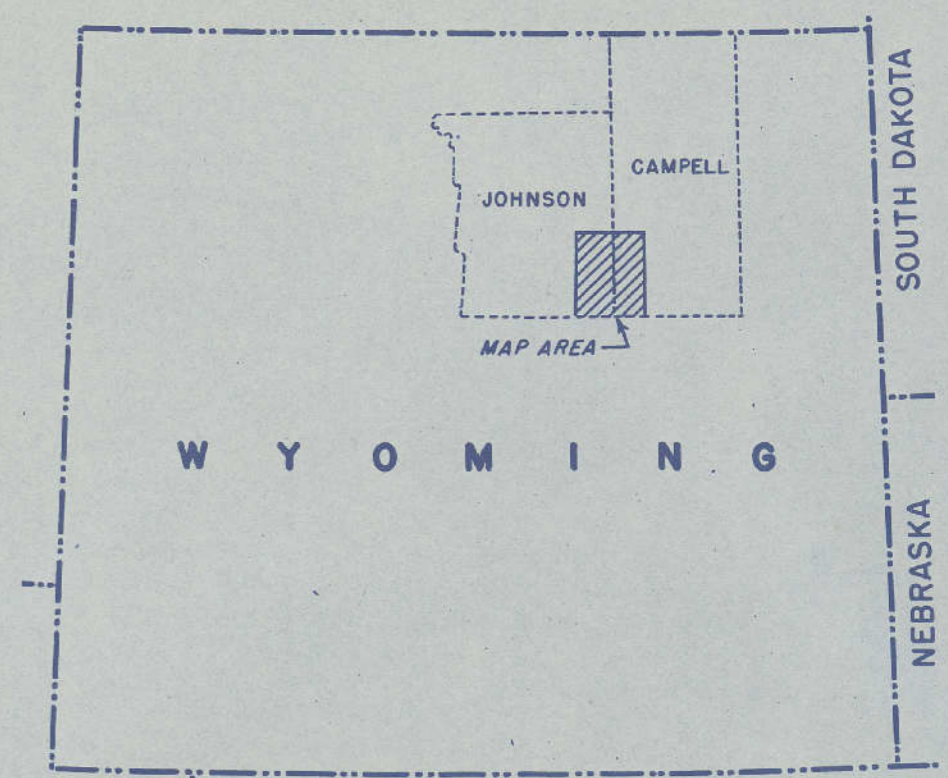
A radioactivity anomaly that is recorded by airborne measurements at 500 feet above the ground can be caused by:

1. A moderately large area in which the rocks and soils are slightly more radioactive than the rocks and soils of the surrounding area.
2. A smaller area in which the rocks and soils are considerably more radioactive than rocks and soils in the surrounding area.
3. A very small area in which the rocks and soils are much more radioactive than the rocks and soils of the surrounding area.

Any particular anomaly, therefore, may represent either slightly greater-than-average radioactivity over an area of a few thousand square feet, or high radioactivity over an area of a few hundred square feet. The radioactivity anomalies shown on the accompanying map indicate localities of more-than-average radioactivity and, therefore, suggest areas in which uranium or thorium deposits are more likely to occur.

¹Geologist, U. S. Geological Survey
²Physicist, Oak Ridge National Laboratory

EXPLANATION
★ Anomaly: greater-than-average radioactivity



INDEX MAP SHOWING AREA OF RADIOACTIVITY SURVEY IN
CAMPBELL AND JOHNSON COUNTIES, WYOMING

This report has not been edited or reviewed for conformity with U.S. Geological Survey standards and nomenclature.



