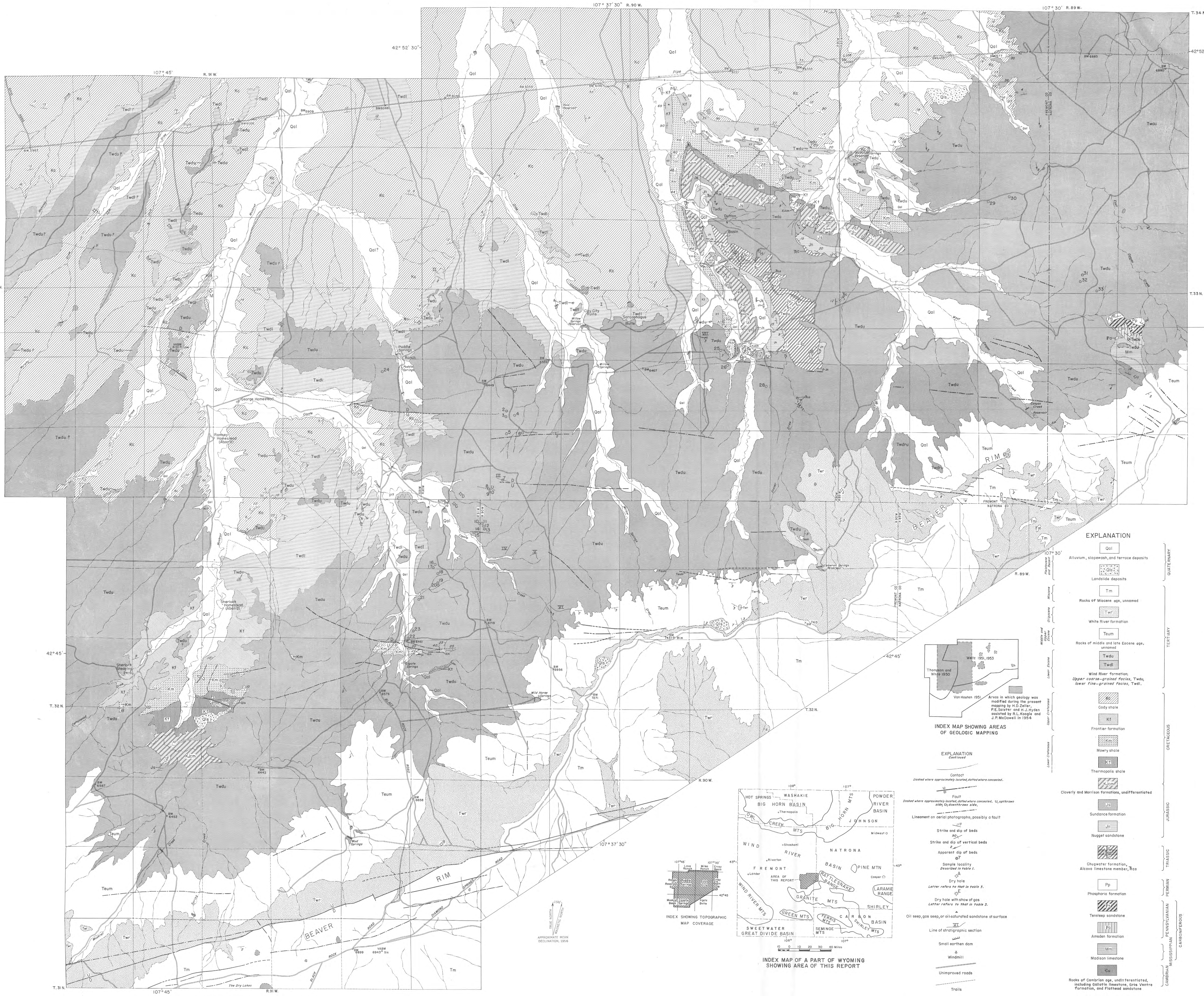
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN BEHALF OF THE
U. S. ATOMIC ENERGY COMMISSION

MINERAL INVESTIGATIONS
FIELD STUDIES MAP MF 83
SHEET 1 OF 2



EXPLANATION

QUATERNARY
- Pleistocene and Recent: Qal — Alluvium, slopewash, and terrace deposits
- Qls — Landslide deposits

TERTIARY
- Miocene: Tm — Rocks of Miocene age, unnamed
- Oligocene: Twr — White River formation
- Middle and Upper Eocene: Teum — Rocks of middle and late Eocene age, unnamed
- Lower Eocene: Twdu, Twdl — Wind River formation; *Upper coarse-grained facies, Twdu; lower fine-grained facies, Twdl.*

CRETACEOUS
- Upper Cretaceous: Kc — Cody shale
- Kf — Frontier formation
- Lower Cretaceous: Km — Mowry shale
- Kt — Thermopolis shale
- KJcm — Cloverly and Morrison formations, undifferentiated

JURASSIC
- Js — Sundance formation
- Jn — Nugget sandstone

TRIASSIC
- Ꞧc, Ꞧca — Chugwater formation, Alcova limestone member, Ꞧca

PERMIAN
- Pp — Phosphoria formation

CARBONIFEROUS
- PENNSYLVANIAN: Pt — Tensleep sandstone
- Pa — Amsden formation
- MISSISSIPPIAN: Mm — Madison limestone

CAMBRIAN
- Ꞓu — Rocks of Cambrian age, undifferentiated, including Gallatin limestone, Gros Ventre formation, and Flathead sandstone

EXPLANATION
Continued

Contact
Dashed where approximately located, dotted where concealed.

Fault
Dashed where approximately located; dotted where concealed. U, upthrown side; D, downthrown side.

Lineament on aerial photographs; possibly a fault

Strike and dip of beds

Strike and dip of vertical beds

Apparent dip of beds

Sample locality
Described in table 1.

Dry hole
Letter refers to that in table 3.

Dry hole with show of gas
Letter refers to that in table 3.

Oil seep, gas seep, or oil-saturated sandstone at surface

Line of stratigraphic section

Small earthen dam

Windmill

Unimproved roads

Trails

Table 1. Analyses, in percent, of samples and brief description of mineral localities shown on geologic map

Locality number	U	eU	V	Mn	Fe	Description
1	0.864	0.556				A selected sample from a prospect pit, containing meta-autunite and a yellow unnamed uranium phosphate. Host rock is coarse-grained arkosic friable crossbedded noncalcareous sandstone with scattered granite pebbles. Yellow uranium minerals are disseminated in a ring about a light-brown sandstone core and are in turn enclosed in a limonitic shell. This podlike deposit is 2 feet in maximum diameter and occurs 2.5 feet below the soil zone.
2	3.71	2.24				A selected sample from a prospect pit, containing meta-autunite, uraniferous carbonate-fluorapatite, and uraniferous opal. The host rock is a very coarse grained arkosic sandstone and contains abundant secondary phosphates. The ore minerals are disseminated in the sandstone.
	1.52	2.11				An 18-inch channel sample. Occurrence as described above.
	3.30	1.65				A selected sample. Occurrence as described above.
3	4.34	2.22				A selected sample from a prospect pit. Meta-autunite disseminated in a coarse-grained arkosic sandstone.
4	1.40	0.96	0.03			Selected sample of sandstone with yellow uranium minerals; taken immediately below the soil zone.
5						Radioactivity anomaly in sandstone; 1 mr/hr* (probe shielded); 1.9 mr/hr (probe unshielded). Anomaly occurs 2 feet below surface in drill hole. No visible uranium minerals.
6	0.071	0.094	0.02			A 5-foot vertical channel sample from a prospect pit; 1 mr/hr. Meta-autunite coats sand grains of host rock. Host rock is coarse-grained arkosic sandstone. Mineralized zone is 1.3 feet thick and lies 1 foot below surface.
	2.33	1.42				A selected sample from pit described above.
7	1.7	1.1	0.03			A selected sample. Meta-autunite in a medium- to very coarse-grained arkosic sandstone. Minerals lie below a hard, calcareous, loglike concretion.
8						A selected sample from a prospect pit. Uraniferous opal, meta-autunite, and an unnamed uranium phosphate are disseminated in an arkosic sandstone at top of pit. The unnamed phosphate coats the top of the pebbles and cobbles of a conglomerate, which lies below the mineralized sandstone. A small fault is exposed in pit, but no uranium minerals are visible near the fault.
9	0.62	0.29				A selected sample from a prospect pit. Uraniferous opal, meta-autunite, and an unnamed uranium phosphate coat the pebbles and cobbles of a granite conglomerate.
10	20†					A sample of a mineralized log; unnamed uranium silicate. Uranium in this locality and in localities 11, 12, and 13 is in an interval of granite cobble conglomerate, ferruginous sandstone, carbonaceous siltstone, and disseminated carbonized wood; the interval is overlain by calcareous sandstone.
11						Yellow uranium minerals coating granite cobbles and pebbles.
12						Yellow uranium minerals coating granite cobbles and pebbles.
13	0.135	0.10	0.02			A grab sample of carbonaceous siltstone.
	0.074	0.12	0.02	0.02	5.02	A grab sample of very limonitic sandstone.
	12.1	6.6	0.03			A selected sample of carbonized wood (a small log 0.3 foot in diameter and 1 foot long). The log was in a ferruginous conglomeratic sandstone.
14	1.8	0.89	0.03			A selected sample from a small pit. Yellow uranium minerals occur in a small lens of limonitic sandstone immediately adjacent to a fault that trends about N. 87° W. and dips 71° N.
15	0.006	0.075	0.04			A selected sample of limonitic sandstone that registered 1.7 mr/hr.
	0.39	0.18	0.03	0.07	2.32	A selected sample from a prospect pit. Becquerelite and meta-autunite are disseminated in a grayish-brown sandstone concretion. Host rock is light-gray arkosic sandstone.
16	1.25	0.80	0.02	0.03	2.06	A selected sample from a prospect pit. Meta-autunite is disseminated in a limonitic roll-like body on floor of pit. Host rock is gray, medium- to coarse-grained arkosic sandstone.
17	0.455	0.37	0.01	0.20	3.52	A selected sample from a prospect pit. Yellow uranium minerals are disseminated in a coarse-grained conglomeratic sandstone bed in association with black carbonized wood. The mineralized bed is overlain by a dark-brown carbonaceous sandstone and is underlain by a very limonitic sandstone.
18	0.485	0.53	0.03			A selected sample from a prospect pit. Meta-autunite and an unnamed uranium phosphate are disseminated in a medium- to coarse-grained arkosic sandstone. Some limonite and jarosite present. The host rock is calcareous in part and varies from sandstone to conglomerate; some pebbles are coated with uraniferous silica.
19	0.095	0.17	0.05			A selected sample from a prospect pit. Yellow uranium minerals are disseminated in a light yellowish-gray fine-grained sandstone lens, which overlies a weathered granite cobble and boulder conglomerate. Abundant limonitic spots stain the conglomerate. The mineralized lens is overlain by light-gray conglomeratic arkosic limonitic sandstone, which has large bleached spots.
20	1.05	0.49	0.04			A selected sample from a prospect pit. Unnamed uranium phosphate mineral coated pebbles; meta-autunite and unnamed uranium phosphate are disseminated among sand grains. Host rock is coarse-grained conglomeratic arkosic sandstone.
21	1.55	1.1	0.39			A grab sample from a truck load of ore. Yellow uranium minerals are disseminated in a granite pebble-cobble conglomerate and in a coarse-grained sandstone underlying the conglomerate. The mineralized sandstone contains mineral charcoal (?) and other carbonaceous material.
22						Radioactivity anomaly; 1.5 mr/hr. No uranium minerals visible.
23	0.32	0.40	0.06			A grab sample from a prospect pit. Meta-autunite and a yellow unnamed uranium phosphate are disseminated in coarse-grained sandstone and coat the pebbles in conglomeratic sandstone. These yellow uranium minerals are found in the interior of highly weathered granite pebbles. A white highly fluorescent crust of uraniferous silica coats the bottom surface of some of the pebbles.
24	0.28	0.17	0.11			A selected sample from a prospect pit. Metatorbernite is disseminated in a light-brown very coarse grained somewhat tuffaceous sandstone, which also contains specks of carbonaceous material. The mineralized zone is overlain by a coarse-grained arkosic sandstone and underlain by a light-green mudstone.
25	0.472	1.074	0.05			A selected sample from a prospect pit. An unidentified bright-yellow earth uranium phosphate coats bedding planes and fractures. Meta-autunite is disseminated in host rock. White uraniferous silica, which fluoresces bright green, encrusts larger grains along bedding. Brown carbonate fluorapatite has been identified here. Host rock is grayish-yellow to brown coarse-grained arkosic sandstone.
	0.047	0.755	0.13			A grab sample from prospect pit above.
	0.013	0.011	0.01	0.02	7.00	Dark-gray pyritic sandstone below main ore horizon.
26	0.70	0.54	0.01	0.07	10.1	A selected sample of limonitic sandstone from prospect pit; about 3 feet below dark-gray lens of ore.
	0.26	2.3	0.022			A selected sample from prospect pit above principal ore zone. Yellow minerals are disseminated in a dark-yellowish zone 2 feet thick, which overlies the dark-gray pyritic ore zone. Host rock is a medium- to coarse-grained conglomeratic sandstone, which is crossbedded, poorly sorted, and noncalcareous.
	8.89	7.5				A selected sample of dark-gray ore from the mine pit. Uraninite intimately mixed with pyrite occurs in a dark-gray sandstone zone. The dark zone is 0.5 foot to 3 feet thick, 10 to 14 feet wide, and extends laterally in a curving configuration. The pyrite and uraninite mixture fills the pore space and in part replaces grains of a coarse-grained granulitic calcareous sandstone. Veinlets of liebigite, a bright-green highly fluorescent uranium carbonate, are scattered through the ore zone. Pink to bright-red iron oxide specks are disseminated in a yellow and rust-colored coarse-grained arkosic sandstone above the dark-gray zone.
	0.42	0.71				A mill pulp sample from pit described above.
	1.82	1.9				A mill pulp sample from pit described above.
27	0.295	0.053	0.06			A 2-foot channel sample from the base of a small ridge. The ridge is an erosional remnant of basal Morrison formation, dipping westward on the west flank of the Gas Hills anticline. Meta-autunite is disseminated in a light greenish-gray sandstone at the base of the ridge. The host rock is a fine-grained well-sorted crossbedded sandstone.
	0.838	0.543	0.05			A selected sample from pit described above.
28	0.09	0.06				A grab sample from a prospect pit. Uranophane occurs with carbonaceous material and limonite staining in a brown coarse-grained conglomeratic very friable sandstone.
29						A radioactivity anomaly; 2.2 mr/hr in bulldozed pit. A yellow uranium mineral occurs in a yellow coarse-grained arkosic sandstone. Carbonaceous shale pods occur in the mineralized zone.
30	0.56	0.4				A selected sample from a prospect pit. Black carbonaceous material (possibly the remains of a tree limb) extends in a 2-inch zone diagonally down across side of bulldozer cut. The carbonaceous material is surrounded by white sandstone. The scintillometer recorded 3 mr/hr on the carbonaceous material.
	6.2	5.7				A selected sample from same pit as above. A small pod-shaped zone of sandstone contains gray coarse-grained arkosic sandstone.
	0.30	0.37				A selected sample from same pit as above. Sandstone surrounding carbonaceous material. This rock has a bleached white appearance and is a coarse-grained arkosic sandstone.
31	0.31	0.31	0.046			A selected sample of carbonaceous shale from a prospect pit. The brown micaceous and carbonaceous shale lens is in a coarse-grained arkosic sandstone.
32	1.6	1.0	0.022			A selected sample from a prospect trench. Uranocircite is disseminated in a pod-shaped zone about 1 foot in diameter, at base of trench wall. The mineralized zone is a reddish-brown conglomerate, with granite and quartzite pebbles in a sand and silt matrix. Overlying the mineralized zone is a yellow and red poorly sorted sandstone with lenses of conglomerate and large mudstone balls.
	0.25	0.92	0.040			A selected sample from same trench as above, but 22 feet south of mineralized location described above. Meta-autunite flakes are disseminated in a small pod-shaped zone, which is colored red by a dense assemblage of iron oxide specks. The host rock is a yellowish-gray fine-grained sandstone.
33						A high radioactivity anomaly where carbonaceous shale is exposed in a prospect pit. No uranium minerals visible.

*Milliroentgens per hour.
†Estimated uranium content.

PRELIMINARY GEOLOGIC MAP OF THE GAS HILLS URANIUM DISTRICT, FREMONT AND NATRONA COUNTIES, WYOMING

By
H. D. Zeller, P. E. Soister, and H. J. Hyden

Scale 1:31 680

1 0 1 2 3 Miles

1956

Wyoming (Gas Hills uranium district). Geol. 1:31,680. 1956
~~Sheet 1~~
~~cop. 1~~

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SHEET 1 OF 2