PRELIMINARY NOTES ON 1951-52 INVESTIGATIONS OF THE THOMAS RANGE FLUORITE DISTRICT, JUAB COUNTY, UTAH

By F. W. Osterwald

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Uraniferous fluorspar pipes cut Paleozoic dolomite in the western part of the Thomas Range, along a ridge known locally as "Spor's Mountain". The fluorspar district (fig. 1) is approximately 50 miles northwest of Delta, Utah, and is in Tps. 12, 13 N., R. 12 W., Salt Lake principal meridian. From July to September 1952 approximately 10 man-months were spent in the district. During this time, field work started in 1951 was completed. Mapping and sampling the fluorspar deposits was done in 1950 (reported in TEI-136). The entire uraniferous fluorspar district has now been mapped at a scale of 1 inch to 1,000 feet, the complete stratigraphic section of the district has been measured in detail, and additional mine mapping and sampling has been done.

The fluorspar district is underlain by Paleozoic dolomites, quartzite, limestones, and shale, locally intruded by rhyolite plugs and masses of intrusive breccia. Large areas in the southern and eastern parts of the district are underlain by rhyolites, tuffs, agglomerates, and basalts of probable Tertiary age. A generalized stratigraphic section of the Paleozoic rocks is given below:

		top covered
Silurian -	Buff, gray, and black limestone	360 ft. plus
	Light-gray, compact, dolomite	1,200 ft.
	Light- to dark-gray dolomite	1,600 ft.
	White massive quartzite	600 ft.
Ordovician -	Green shale, and interbedded dolomite	125 ft.
	Gray limestone	450 ft.
		base covered

Large areas north, west and south of Spor's Mountain are covered by Lake Bonneville sediments of Pleistocene age.

The Paleozoic rocks strike northeast and dip 20° to 60° northwest. In general the strike of beds is more nearly north in the eastern and northeastern parts of the district, and more nearly northeast in the

southern and western parts. In addition, older sediments crop out along the southern and eastern margins, and younger beds crop out to the north and west. These facts suggest that Spor's Mountain is located on the northeast limb of a large, northwest-plunging syncline.

The district is complexly faulted: a total of approximately 939 individual normal and reverse faults were mapped, belonging to at least 4 sets of fractures. The earliest set trends northeast, parallel to strike of beds, and has repeated the light- to dark-gray dolomite unit numerous times throughout the length of Spor's Mountain. The second set trends east to east-northeast, and offsets the northeast set. The faults of the second set are particularly common in the south central part of Spor's Mountain, near the Original Spor mine. The third set trends northwest, and dips nearly 90°. It offsets the northeastward and eastward trending sets. Faults of the third set are most abundant in the northern and western parts of the district, though large faults of this set may be found in all parts. The fourth set trends approximately north and has faulted Tertiary volcanic and pyroclastic rocks down against Paleozoic sediments along the eastern edge of Spor's Mountain. Approximate displacements of the various fault sets are summarized below:

	Approximate displacement of individual faults
set 1 (NE)	20 ft. to 1,000 ft. plus.
set 2 (E)	few feet to several hundred.
set 3 (NW)	few feet to several hundred.
set 4 (N)	few thousands of feet.

Faults of the first set are probably pre-rhyolite. Rhyolite and other volcanic rocks are cut by faults of the younger three sets, though the northwest (third) set is in part contemporaneous with intrusion, as a few small breccia bodies and rhyolite plugs rose along these faults in the northern part of the district. In addition to the four sets of gravity-type faults, small, older thrust faults may be seen at several scattered localities.

All the uraniferous fluorspar pipes known at the present time in the Thomas Range fluorite district are in the Silurian light- to dark-gray dolomite unit, and probably bottom at the quartzite. The upper and lower limestones, and the compact gray dolomite have no known mineralization. Rhyolite contains

small vugs and minute veinlets of dark purple and colorless fluorite at a few localities in the northern part of the district. The deposits in rhyolite are small and could contain only a few tons of low-grade fluorite ore. Fluorspar pipes in dolomite tend to be located: (1) along faults or in broken zones near faults, (2) near Tertiary intrusives, or (3) in complexly faulted areas. Minute veinlets of uranium minerals film fractures in altered intrusive rock at a few deposits. Though all the Thomas Range fluorite is radioactive, highest assays come from deposits in the southeastern part of the district.

As a result of recent detailed mapping of the Fluorine Queen east pipe and the lower four sublevels of the Bell Hill mine, the total fluorspar ore reserves (table 1) of the district (based on preliminary figures) have been revised downward 52, 126 tons. The cross-section area of the Fluorine Queen east pipe diminishes rapidly between the floor of the open cut and the haulage adit 33 feet below, thus reducing the inferred reserves from 76, 470 tons to 60, 600 tons. This reduction is partly offset by the discovery of two small pipes near the pit, which have a total inferred reserve of 5, 600 tons. As a result of recent development work by the owners, the inferred ore reserves of the Fluorine Queen No. 4 have been reduced from 16, 850 tons to 10, 133 tons, a reduction of 6, 717 tons. Detailed mapping of the lower four sublevels of the Bell Hill mine suggests indicated reserves of 37, 360 tons, a decrease of 33, 455 tons over the reserves previously reported. Reserves in various small deposits, as summarized below, add another 4, 801 tons.

Blue Jay claim	46 tons
Lost Soul No. 1	282 tons
Blue Queen No. 1	300 tons
Unnamed dozer trench, W. side Spor's Mtn	333 tons
Dozer cut, 1/4 mi. SW Nielsens claim.	3, 840 tons
Total	4, 801 tons

Thus 10, 401 tons have been added to the total reserve and 62, 527 tons subtracted. The grade ranges approximately from 0. 008 to 0. 2 percent uranium.

Table 1. -- Preliminary tonnage estimates, Thomas Range fluorspar district 1/

	Property	Tons, total fluorspar ore reserves	
4/	Bell Hill	37, 360	
4/	Blowout	51, 552	2/
	Blue Jay	46	
	Blue Queen No. 1	300	
	Dell Nos. 1, 2, 3	100	2/
	Dell No. 5	2, 000	2/
	Eagle Rock	40	2/
4/	Fluorine Queen east pipe	60, 600	
	Fluorine Queen west pipe	24, 826	2/
	Fluorine Queen No. 4	10, 133	
	Harrisite	10	
4/	Lost Sheep	61, 068	2/
	Lost Soul No. 1	282	
4/	Lucky Louie	2, 265	
	Nonella No. 1	3, 300	2/
	Original Spor (Floride)	31, 795	2/
	Oversight	10	2/
	Purple Spar No. 3	None	
	Thursday	7, 790	2/
	Unnamed B. D. trench, west side Spor's Mountain	333	3/
	B. D. cut 1/4 mi. SW Nielsen's claim	3, 840	3/
	Total (rounded)	298, 000	

1/ Final figures depend on further sampling and assays, as recent work shows that average grade in percent uranium drops sharply with depth in individual ore pipes.

2/ Figures previously reported in TEI-136, revised to include recent production where records available.

3/ Grade of fluorspar is very low.

4/ Currently producing mines.

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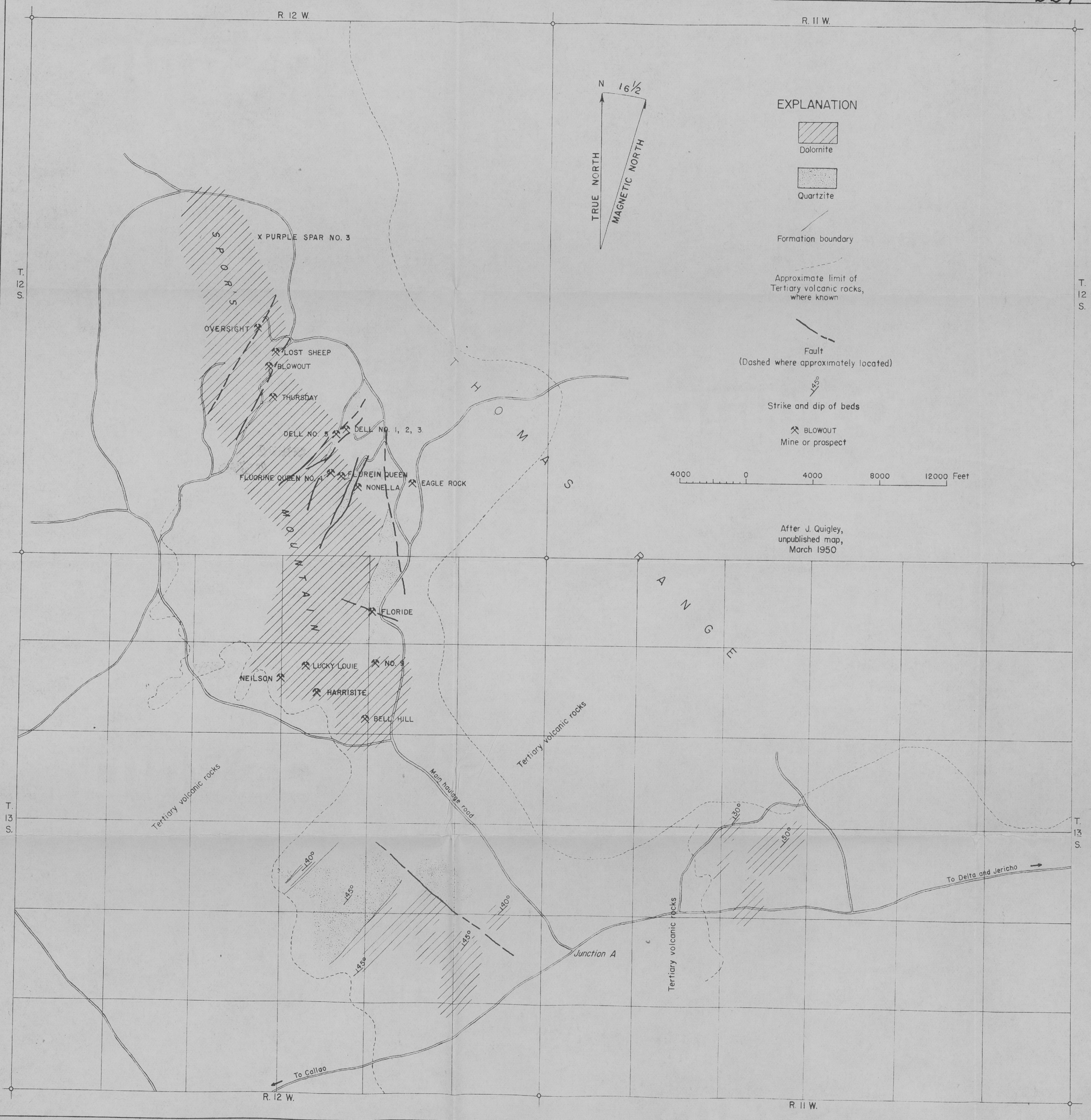

FIGURE 1 - INDEX MAP OF THE THOMAS RANGE FLUORITE DISTRICT, JUAB COUNTY, UTAH

From Fig. 2, TEIR 136, 1951