

**FALL INVENTORY OF SEEPS AND SPRINGS
IN THE PERMIT AND ADJACENT AREAS
OF THE CRANDALL CANYON MINE**

1.0 INTRODUCTION

On June 6 and 7, 1985 a seep and spring inventory was conducted in the permit and adjacent areas of the Crandall Canyon Mine near Huntington, Utah. This survey was reconducted on October 14 and 15, 1985 to determine seasonal variations in the quantity and quality of water issuing in the area.

The purpose of this report is to present the results of the October investigation. Methods used to conduct the most recent survey were the same as those used previously (EarthFax Engineering, 1985). Results of the October survey are presented in Section 2.0 of this report, along with a discussion of the findings. References cited are provided in Section 3.0.

2.0 RESULTS AND DISCUSSION

Results of the October seep and spring inventory are contained in Table 1. For purposes of comparison, results of the June survey are provided in Appendix A. Locations of those seeps and springs that were not dry during the October inventory are shown in Figure 1. For comparison, locations of all the seeps and springs found during the June inventory are provided in Figure 2.

As expected, flow rates measured during the October survey were generally significantly less than those found during the June survey. In June, a total of 80 seeps or springs were found, 34 of which had sufficient flow to sample (the remaining 46 were seeps that could not be sampled). In October, 55 of the sources originally discovered were dry. An additional 7 sources existed only as seeps, with only 18 of the original sources containing sufficient flow to sample.

Generally, sources that had a flow of approximately 5 gallons per minute or less in June were dry or existed as seeps in October. Springs with higher flows in June normally were continuing to flow in October. Notable exceptions occurred at SP-7, SP-8, and SP-10. These "springs" were flowing 10, 20, and 40 gallons per minute, respectively, in June but were dry or existed only as a seep in October. Data presented in Appendix A indicate that these sources were issuing from snow patches in

Table 1. Results of October seep and spring inventory.

Field Number	Flow (gpm)	pH (Units)	Specific Cond. (a)	Temp (°C)
SP-1	Dry	-	-	-
SP-2	Dry	-	-	-
SP-3	Dry	-	-	-
SP-4	0	(b)	(b)	(b)
SP-5	Dry	-	-	-
SP-6	Dry	-	-	-
SP-7	Dry	-	-	-
SP-8	Dry	-	-	-
SP-9	Dry	-	-	-
SP-10	0	(b)	(b)	(b)
SP-11	Dry	-	-	-
SP-12	0	(b)	(b)	(b)
SP-13	Dry	-	-	-
SP-14	1	7.74	340	6.0
SP-15	Dry	-	-	-
SP-16	Dry	-	-	-
SP-17	Dry	-	-	-
SP-18	2	8.15	450	3.0
SP-19	1	8.27	530	3.5
SP-20	Dry	-	-	-

Table 1. (Continued).

Field Number	Flow (gpm)	pH (Units)	Specific Cond. (a)	Temp (°C)
SP-21	Dry	-	-	-
SP-22	1	7.32	350	3.5
SP-23	2	8.08	670	3.5
SP-24	Dry	-	-	-
SP-25	Dry	-	-	-
SP-26	0	(b)	(b)	(b)
SP-27	0	(b)	(b)	(b)
SP-28	Dry	-	-	-
SP-29	Dry	-	-	-
SP-30	<1	8.19	1150	4.0
SP-31	Dry	-	-	-
SP-32	Dry	-	-	-
SP-33	Dry	-	-	-
SP-34	Dry	-	-	-
SP-35	Dry	-	-	-
SP-36	1	7.85	950	4.0
SP-37	Dry	-	-	-
SP-38	Dry	-	-	-
SP-39	Dry	-	-	-
SP-40	Dry	-	-	-

Table 1. (Continued).

Field Number	Flow (gpm)	pH (Units)	Specific Cond. (a)	Temp (°C)
SP-41	Dry	-	-	-
SP-42	Dry	-	-	-
SP-43	Dry	-	-	-
SP-44	Dry	-	-	-
SP-45	Dry	-	-	-
SP-46	Dry	-	-	-
SP-47	Dry	-	-	-
SP-48	Dry	-	-	-
SP-49	Dry	-	-	-
SP-50	Dry	-	-	-
SP-51	Dry	-	-	-
SP-52	1	8.00	540	7.0
SP-53	5	7.95	470	5.0
SP-54	5	8.07	500	5.5
SP-55	10	7.59	530	5.5
SP-56	15	7.90	470	6.5
SP-57	6	7.56	470	4.5
SP-58	5	7.70	500	9.0
SP-59	1	7.86	520	5.0
SP-60	Dry	-	-	-

Table 1. (Continued).

Field Number	Flow (gpm)	pH (Units)	Specific Cond. (a)	Temp (°C)
SP-61	1	8.16	450	9.0
SP-62	Dry	-	-	-
SP-63	Dry	-	-	-
SP-64	Dry	-	-	-
SP-65	<1	8.18	500	3.5
SP-66	Dry	-	-	-
SP-67	Dry	-	-	-
SP-68	Dry	-	-	-
SP-69	Dry	-	-	-
SP-70	0	(b)	(b)	(b)
SP-71	0	(b)	(b)	(b)
SP-72	Dry	-	-	-
SP-73	Dry	-	-	-
SP-74	Dry	-	-	-
SP-75	Dry	-	-	-
SP-76	1	8.35	850	5.0
SP-77	Dry	-	-	-
SP-78	Dry	-	-	-
SP-79	Dry	-	-	-
SP-80	Dry	-	-	-

(a) In umhos/cm at 25°C

(b) Insufficient water to sample

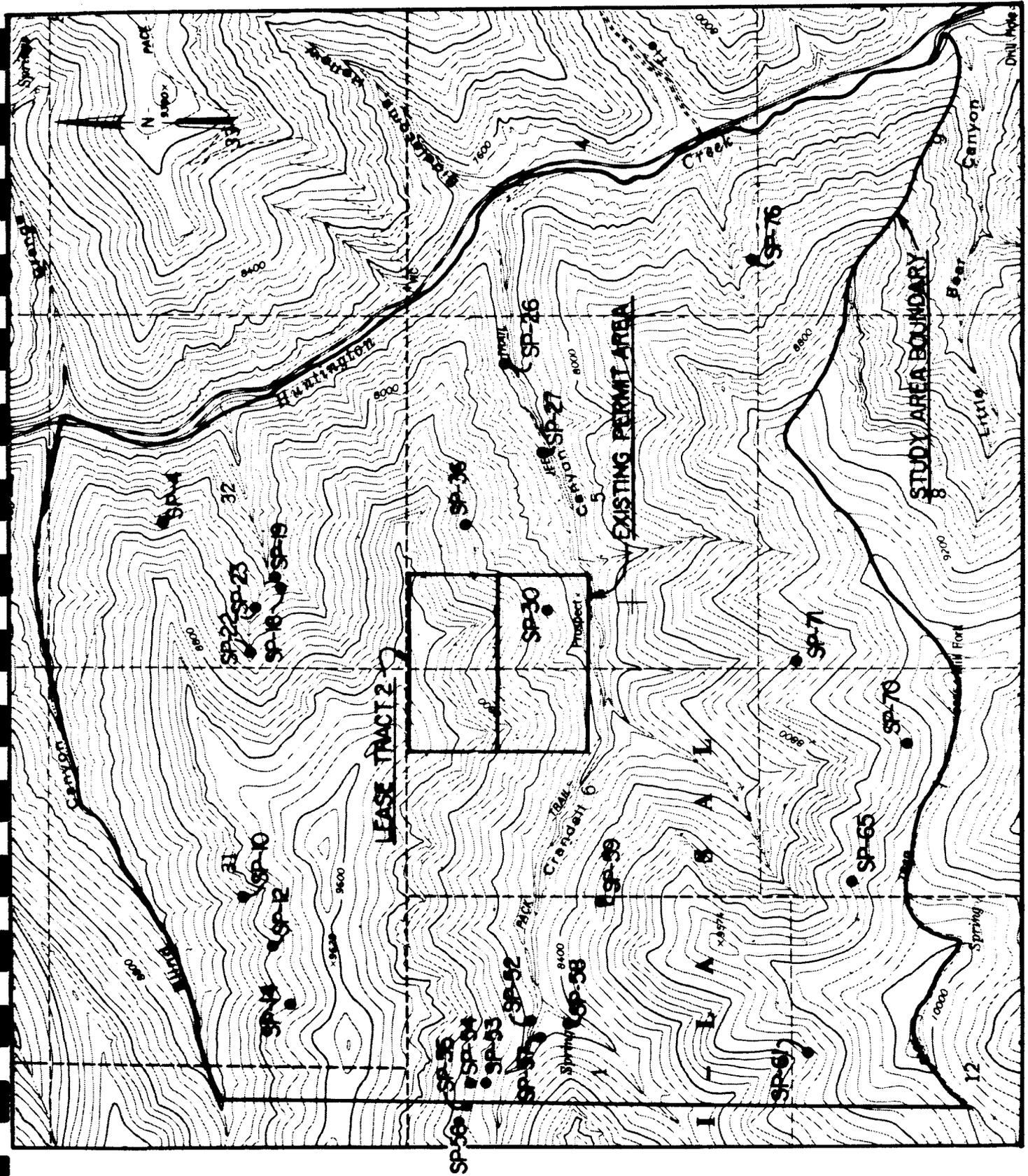


Figure 1. Locations of seeps and springs from October inventory.

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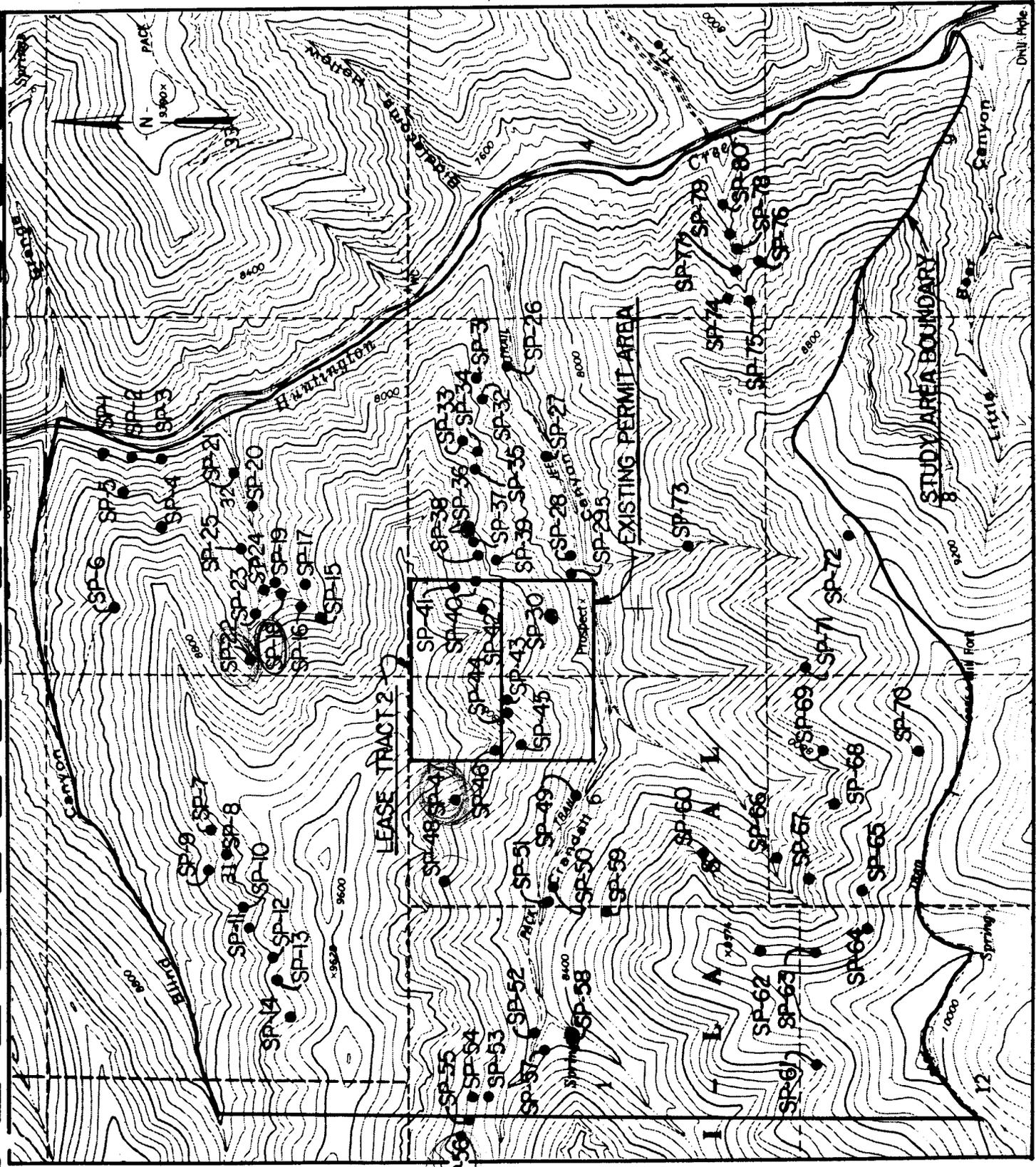


Figure 2. Locations of seeps and springs from June inventory.

June, suggesting that most (if not all) of the flow was coming from snow melt.

Springs SP-53 through SP-58 showed relatively little variation in flow between June and October. These springs all issue from fractures located in sandstone lenses of the Blackhawk Formation near the western edge of the study area. Travertine deposits near several of the springs suggest that their source is not the Blackhawk Formation but rather a limestone formation. The Blackhawk Formation apparently serves only as a conveyance formation.

It is of note that only one seep or spring (SP-30) was found during the October survey within the area of potential subsidence (compare with Figure 3 of EarthFax Engineering, 1985). All other seeps or springs discovered during the June inventory in the area of potential subsidence were dry during the October survey due to natural seasonal variations in flow. It is also of note that no seeps or springs were discovered during the October inventory within the Tract 2 permit area.

In those springs with sufficient water to sample, pH generally increased slightly between June and October. Increases normally amounted to 0.1 to 0.5 pH unit. Specific conductance varied in relation to the June data, with approximately as many increases as decreases between June and October.

As with the June survey, no signs were noted of sheep or cattle usage of springs within the survey area. Hence, even though water rights exist for stockwatering usage of certain of these springs (see the Tract 2 Permit Application Package), the results of the June and October inventories indicate that these rights are not currently utilized.

4.0 REFERENCES

EarthFax Engineering, Inc. 1985. Seep and Spring Inventory of the Crandall Canyon Mine Permit and Adjacent Areas. Project report prepared for Genwal Coal Company. Murray, Utah.