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**Stratigraphic Sections and Records
of Springs in the Glen Canyon Region
of Utah and Arizona**

By

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**Glen Canyon Reservoir
Upper Colorado River Basin**

**STRATIGRAPHIC SECTIONS AND RECORDS
OF SPRINGS IN THE GLEN CANYON REGION
OF UTAH AND ARIZONA**

as a part of the
Upper Colorado River Basin Salvage Program
in accordance with

Memorandum of Agreement

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between

**The United States National Park Service
and
The Museum of Northern Arizona**

by

M. E. COOLEY

Museum of Northern Arizona

STRATIGRAPHIC SECTIONS AND RECORDS OF SPRINGS IN THE GLEN CANYON REGION OF UTAH AND ARIZONA

INTRODUCTION

In 1957, the Museum of Northern Arizona in cooperation with the National Park Service began an intensive geologic study of Glen and San Juan Canyons. This study was part of salvage investigations in archaeology, biology, geology and history, sponsored by the National Park Service in the area to be inundated by Lake Powell, the reservoir formed behind Glen Canyon Dam. This report contains the descriptions of stratigraphic sections and the records of springs inventoried.

The area investigated includes all of Glen Canyon, the part of Cataract Canyon downstream from the mouth of Dark Canyon, the reach of San Juan Canyon downstream from Grand Gulch, and the upland region between the San Juan and the Colorado Rivers west of the Clay Hills escarpment (Fig. 1). Nineteen stratigraphic sections of rocks ranging from Permian to Jurassic were measured (Table I). In addition, four sections of the Late Recent alluvium in San Juan Canyon were measured. A total of 289 springs were inventoried within the region.

STRATIGRAPHIC SECTIONS

Stratigraphic sections were measured in key places to record the description and thickness of the sedimentary rocks, to identify the formations and members, and to correlate the rock units between different areas. Many sections are of rocks which will be covered by the filling of Lake Powell upon completion of Glen Canyon Dam.

Lithologic samples were taken of each stratigraphic unit at the time of measurement and are stored at the Museum of Northern Arizona at Flagstaff. In addition, other samples collected for detailed examination and not described in this report, were taken of bedrock units and surficial deposits and these are also stored and are available for inspection at the Museum.

The type of rock, color, composition, accessory minerals, and cementation were described in the laboratory with the aid of a binocular microscope from the samples which were collected at the time of measurement. The rock-color chart (Goddard, 1948), was used for all color designations. The determination of grain size, roundness, and degree of sorting was made by visual comparison with charts prepared by Payne (1942). Particle size, in order of increasing grain size, includes clay and silt and very fine-, fine-, medium-, coarse-, and very coarse-grained sand according to the Wentworth (1926) grade scale. The term "mudstone" is used where there is nearly equal proportions of clay and silt. The roundness is classified as well-rounded, rounded, sub-rounded, sub-angular, or angular. The sorting is described as well-sorted, fair-sorted, and poorly sorted (Payne, 1942) and is restricted to sandstone or conglomerate. Quartz is the chief constituent of the rocks and grains of this mineral are described as clear, stained, amber, or frosted. Accessory minerals are muscovite, biotite, pyrite,

TABLE I

STRATIGRAPHIC UNITS IN GLEN-SAN JUAN CANYON REGION
UTAH AND ARIZONA

<u>Quaternary</u>	<u>Lower and Middle(?) Triassic</u>
Alluvium	Moenkopi Formation
Terrace deposits	Upper Siltstone Member
Eolian deposits	Middle Sandstone Member
Landslide deposits	Lower Siltstone Member
	Hoskininni Member
<u>Upper Cretaceous</u>	<u>Permian</u>
Straight Cliffs Sandstone	Cutler Formation
Mancos Shale	White Rim Sandstone Member
Dakota Sandstone	DeChelly Sandstone Member
	Organ Rock Tongue
<u>Upper Jurassic</u>	Cedar Mesa Sandstone Member
Morrison Formation	Halgaito Tongue
Salt Wash Member	
Cow Springs Sandstone	<u>Pennsylvanian and Permian</u>
Entrada Sandstone	Rico Formation
<u>Middle and Upper Jurassic</u>	
Carmel Formation	<u>Pennsylvanian</u>
<u>Upper Triassic(?) and Jurassic</u>	Hermosa Formation
Navajo Sandstone	
<u>Upper Triassic(?)</u>	<u>San Rafael Group</u>
Kayenta Formation	Entrada Sandstone
Moenave Formation	Carmel Formation
Springdale Sandstone Member	<u>Glen Canyon Group</u>
Dinosaur Canyon Member	Navajo Sandstone
	Kayenta Formation
<u>Upper Triassic</u>	Moenave Formation
Wingate Sandstone	Springdale Sandstone Member
Lukachukai Member	Dinosaur Canyon Member
Chinle Formation	Wingate Sandstone
Church Rock Member	Lukachukai Member
Owl Rock Member	
Petrified Forest Member	
Upper Part	
Sonsela Sandstone Bed	
Lower Part	
Moss Back Member	
Monitor Butte Member	
Lower Red Member	
Shinarump Member	

gypsum, and calcite. Other minerals not identified are recorded only for color. The cementation of the rock is noted as very well, well, firmly, or weakly cemented for the consolidated rocks and as weakly, very weakly, or not cemented for the slightly consolidated surficial deposits. Where recognized, the type of bonding is also noted. A non-calcareous, generally weakly cemented unit containing a substantial amount of clay and silt is considered to have an argillaceous cement.

The description of the bedding closely follows that of McKee and Weir (1953) and Harshbarger, Repenning, and Irwin (1957). The bedding is described as flat, irregular, lenticular, gnarly, and crinkled. A unit is described as "structureless" if no bedding features are displayed, although the bounding contacts may be well defined. Pseudocrossbedding (ripple bedding) is a type of bedding which consists entirely of truncated ripple marks. The bedding is classified to thickness as follows:

Very thin-bedded	less than 2 inches
Thin-bedded	2 inches to 2 feet
Thick-bedded.	2 to 4 feet
Very thick-bedded	more than 4 feet

Crossbedding (or cross-stratification) is divided into simple, planer, and trough types which is based on the external features of the similarly oriented groups of crossbeds as described by Harshbarger, Repenning, and Irwin (1957, pp. 58-9): "The simple type shows no apparent signs of erosion along the bounding surfaces of the individual group of crossbeds. The planer type is marked by flat surfaces of erosion bounding this group. The trough type is marked by curved surfaces of erosion bounding the group." The crossbedding is described as tabular, for parallel and sub-parallel planer surfaces; wedge, for converging planer surfaces; and lenticular, for converging curved surfaces. The crossbeds are classified as to shape, angle of dip, size, and thickness as follows:

Shape

Angle of dip:

High.	More than 20 degrees
Medium	10 to 20 degrees
Low.	3 to 10 degrees
Very low.	Less than 3 degrees

Size

Very large-scale	More than 100 feet
Large-scale	100 to 20 feet
Medium-scale	20 feet to 1 foot
Small-scale.	Less than 1 foot

For the most part the other features are self-explanatory and include descriptions of weathering, topographic expression, and splitting property. Hoodoo weathering pertains to irregular, pillar-like forms which have often been referred to as "rock babies." The basal contact of a unit is classified as sharp, flat, irregular, or gradational. The depositional environment was recorded at the time of field observation because it is desirable to indicate the depositional agent or agents of each unit.

INVENTORY OF SPRINGS

Nearly all of the rocks in the Glen-San Juan Canyon area yield some ground water although yields of more than 25 gallons per minute from springs are principally from the Navajo and Wingate Sandstones or from prominent joints in other stratigraphic units. The springs listed in this report constitute only a partial inventory of the region as no attempt was made to visit all the springs. They were visited either on the ground or were observed from the air. Many additional springs, indicated on aerial photographs by small areas of lush vegetation, are not listed in this report.

All of the ground-water developments; springs, dug wells, drilled wells, and test holes drilled for uranium prospecting were assigned a field number, GJ-1 to GJ-363. The field numbers were assigned consecutively at the time inventoried and no distinction was made between springs or other ground-water developments; Table 3 lists only the springs that were inventoried.

Each spring was located in the field on aerial photographs or on the topographic maps. Because of incomplete land survey by Township and Range coordinates, each spring has a field number which locates the spring within the quadrangle map in which it is plotted. The left-hand part of the field number is the distance in miles west of, and the right-hand part is the distance in miles south of, the northeast corner of the quadrangle. Thus, spring GJ-1, the first entry of Table 3, is 4.53 miles west and 1.67 miles south of the northeast corner of the Navajo Mountain 4NE quadrangle.

The discharge of the springs, except where indicated, is estimated. The springs in the canyon region are difficult to measure because of low yield, more than one orifice, thickets of vegetation growing around the orifices, and location of many of the springs on the sides of cliffs. Usually the yield of small springs showing only a few trickles of water and forming a broad seep area partly masked by vegetation was estimated as less than five gallons per minute.

Altitudes of the springs are in feet above mean sea level and were estimated from the topographic maps, as were the altitudes of springs above the floor of canyons.

The stratigraphic units are divided into formations and members and are listed in Table 1. The unit from which the spring discharges is considered as the stratigraphic unit and is called the aquifer. Springs issuing from joints in relatively impermeable rocks are considered as discharging from that unit even though the ground water is derived originally from other rocks. Sandstone (ss) is the chief rock type that yields water in the Glen-San Juan Canyon region. Other water-bearing rocks include limestone (ls) and silty sandstone (si-ss). Unconsolidated deposits which yield ground water to springs are sand (s) and gravel (g).

A spring is described as issuing from a joint, along a bedding plane, on a contact between two stratigraphic units, or directly from the rock or unconsolidated deposit regardless of the bedding and joints. Pools of water occur in places on the canyon floor and some probably maintained by the ground-water table are described as springs. Faults, causing permeable zones in rocks of generally low permeability, are used as conduits from one aquifer to another. Many springs are along faults and discharge ground water which has percolated downward from the overlying units, or water which has moved upward under artesian pressure from an aquifer at depth.

The physiographic position of the springs and items in the remarks column are believed to be self-explanatory. Some of the springs were sampled and a chemical analysis was made by laboratories of the Quality of Water Branch, U. S. Geological Survey, either in Salt Lake City, Utah, or in Albuquerque, New Mexico.

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TABLE 3

Spring No.	Location No. (Miles)	Quadrangle	Estimated Discharge (Gals. per Minute)	Date of Measurement	Altitude Above Mean Sea Level (ft)	Altitude Above Canyon Bottom of Stream (ft)	Stratigraphic Unit	Rock Type	Descriptions of Spring	Physiographic Position	Water Sample Taken	Remarks and General Location
GJ-1	4.53-1.67	Navajo Mts. 4 NE	Dry	10-10-57	4520	50	Chinle (Shinarump)		Shinarump-Moenkopi contact	Head of canyon	-	Flows only during wet weather; side canyon
GJ-2	1.47-1.85	Navajo Mts. 4 NE	---	10-11-57	3565	0	Alluvium	S,G	Pool in bottom of wash	Bottom of gorge	-	Water derived from Shinarump originally; mouth of Castle Creek
✓ GJ-3	1.82-7.20	Clay Hills 3 NW	---	10-31-57	4390	15	Cutler (Cedar Mesa)		Joints and fractures	Under overhanging ledge	-	Seep; upper Plute Farms Wash
✓ GJ-4	5.3-7.0 Approx.	Clay Hills 3 NW	---	10-31-57	4200	30	Cutler (DeChelly)	SS	Contact between DeChelly-Organ Rock	Base of small cliff	-	Seep area; Copper Canyon
GJ-5	3.13-4.42	Navajo Mts. 4 NE	3+	11-23-57	3710	0	Chinle (Shinarump)	SS	Crossbedding planes and massive sandstone	Shallow gorge	Yes	Several pools, flows downstream for 300 Ft. Nokai Canyon
GJ-6	3.56-6.19	Navajo Mtn. 4 NE	5+	11-23-57	3850	0	Chinle (Shinarump)	SS	Pools on sandstone and thin alluvium	Narrow gorge	-	Flows downstream for 200 ft.; Nokai Canyon
GJ-7	3.59-6.54	Navajo Mtn. 4 NE	---	11-23-57	3880	0	Chinle (Shinarump)	SS	Disconnected pools on rock floor	Head of narrow gorge	-	Pools extend downstream to spring GJ-8; Nokai Canyon
GJ-8	3.6-0.2	Navajo Mtn. 4 SE	3+	11-23-57	4110	0	Alluvium	S	--	Narrow gorge	Yes	Some from Shinarump; flows downstream about 300 yds.; Nokai Canyon
GJ-34	3.50-4.22	Navajo Mtn. 4 NE	2-3	11-25-57	3875	0	Chinle (Shinarump)	SS	--	Shallow gorge	-	Flows downstream for 300 ft.; Nokai Canyon
GJ-36	3.57-3.58	Navajo Mtn. 4 NE	5	12-11-57	3605	0	Chinle (Shinarump)	SS	--	Shallow gorge	-	Flows downstream for 500 ft.; Nokai Canyon
GJ-60	3.51-3.45	Navajo Mtn. 4 NE	5-8	12-12-57	3600	0	Chinle (Shinarump)	SS	Bedding planes	Deep gorge	-	Flows downstream for 1,000 ft.; Nokai Canyon
GJ-78	0.47-3.10	Navajo Mtn. 4 NE	<1/4	12-13-57	3740	4	Chinle (Shinarump)	SS	Crossbeds	Inner gorge	-	Copper Canyon
GJ-79	0.21-3.24	Navajo Mtn. 4 NE	10	12-13-57	3760	0	Alluvium	S,G	--	Inner gorge	Yes	Flows downstream 1,000 ft.; Copper Canyon

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GJ-78	0.47-3.10	Navajo Mtn. 4 NE	<1/4	12-13-57	3740	4	Chinle (Shinarump)	SS	Crossbeds	Inner gorge	-	Copper Canyon
GJ-79	0.21-3.24	Navajo Mtn. 4 NE	10	12-13-57	3760	0	Alluvium	S,G	--	Inner gorge	Yes	Flows downstream 1,000 ft.; Copper Canyon

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✓GJ-80	6.38-5.64	Clay Hills, 3 NW	2-3	12-13-57	3955	355	Alluvium	S,G	--	Bed of Wash	-	Flows downstream about 500 Ft.; Copper Canyon
✓GJ-81	5.73-6.77	Clay Hills, 3 NW	2-3	12-13-57	4035	0	Alluvium	S,G	--	Bed of Wash	-	Flows 300 Ft. down stream-Copper Canyon
GJ-82	None	Navajo Mtn. 4 NE	---	12-13-57	5600	1600	Kayenta	SS	Bedding planes	Side of mesa	-	Seep line, Nokai Canyon
✓GJ-83	2.00-8.22	Mt. Ellsworth	10	4-16-58	3425	35	Landslide	S,SS	Talus	Talus slope	Yes	White spring; water stop on river trips Glen Canyon
✓GJ-84	6.25-14.14	Mt. Ellsworth	10-20	4-16-58	3800	0	Navajo	SS	Joints, bed- ding planes	Head of can- yon	-	Forgotten canyon
✓GJ-85	5.20-14.18	Mt. Ellsworth	---	4-16-58	3800	0	Navajo	SS	Joints, bed- ding planes	Head of inner canyon	-	Forgotten Canyon
✓GJ-86	4.68-13.88	Mt. Ellsworth	---	4-16-58	3700	0	Navajo	SS	Joints, bed- ding planes	Bottom of canyon	-	Combination spring; Forgotten Canyon
✓GJ-87	7.69-10.52	Mt. Ellsworth	---	4-16-58	3760	0	Navajo	SS	Joints, bed- ding planes	Bottom of canyon	-	Combination Spring; flows to river; Smith Fork
✓GJ-88	6.52-13.45	Mt. Ellsworth	1	4-16-58	3800	50	Navajo	SS	Joints, bed- ding planes	Head of can- yon	-	Glen Canyon
✓GJ-89	11.34-0.82	Lake Canyon	5-10	4-18-58	3450	0	Navajo	SS	Joints, bed- ding planes	Bottom of canyon	-	Good taste; Stanton Canyon
✓GJ-90	12.91-8.08	Lake Canyon	2	4-21-58	3425	113	Navajo	SS	Bedding planes, contact	Alcove	-	Pool in alcove at discharge point; Glen Canyon
✓GJ-91	12.64-8.32	Lake Canyon	3	4-21-58	3425	115	Navajo	SS	Bedding planes, contact	Alcove	-	Flows across ter- race to river; Glen Canyon
✓GJ-92	12.43-8.46	Lake Canyon	5	4-21-58	3425	115	Navajo	SS	Bedding planes, contact	Large alcove	-	Flows across ter- race to river; Glen Canyon
✓GJ-93	13.81-12.07	Lake Canyon	2	4-21-58	3500	150	Navajo	SS	Contact; bed- ding planes	Alcove	-	Wilson Canyon
GJ-94	0.73-11.95	The Rincon	5	4-21-58	3300	0	Wingets (Lukachukai)	SS	Vertical joints	Alcove, undercut	Yes	Good taste, Wilson Canyon
GJ-95	0.88-12.66	The Rincon	<1/2	4-21-58	3650	365	Kayenta	SS	Bedding planes	Head of small canyon	-	Glen Canyon
GJ-96	1.06-12.44	The Rincon	5	4-21-58	3460	175	Landslide	S,SS	---	Head of valley	-	Developed; Glen Canyon

Spring No.	Location No. (Miles)	Quadrangle	Estimated Discharge (Gals. per Minute)	Date of Measurement	Altitude Above Mean Sea Level (ft)	Altitude Above Canyon Bottom of Stream (ft)	Stratigraphic Unit	Rock Type	Descriptions of Spring	Physiographic Position	Water Sample Taken	Remarks and General Location
GJ-96	1.06-12.44	The Rincon	5	4-21-58	3460	175	Landslide	S,SS	---	Head of valley	-	Developed; Glen Canyon
GJ-97	6.75-10.43	The Rincon	<5	4-22-58	3800	525	Navajo	SS	Contact; bedding planes	Alcove	-	Glen Canyon
GJ-98	6.91-10.54	The Rincon	5	4-22-58	3800	525	Navajo	SS	Contact; bedding planes	Alcove	-	Glen Canyon
GJ-99	6.95-10.65	The Rincon	5	4-22-58	3800	525	Navajo	SS	Contact; bedding planes	Alcove	-	Glen Canyon
GJ-100	7.02-10.90	The Rincon	5	4-22-58	3750	475	Navajo	SS	Contact; bedding planes	Alcove	-	Glen Canyon
GJ-101	6.98-11.34	The Rincon	5	4-22-58	3750	475	Navajo	SS	Contact; bedding planes	Alcove	-	Glen Canyon
GJ-102	7.03-14.63	The Rincon	5	4-22-58	3600	320	Navajo	SS	Contact; bedding planes	Alcove	-	Escalante River
GJ-103	7.9-17.22	The Rincon	10-15	4-22-58	3500	240	Navajo	SS	Bedding planes, faults	Canyon	Yes	Flows to river; used by rivermen; at Hole-in-the-rock; Glen Canyon
GJ-104	9.08-5.48	Navajo Mtn.	---	4-23-58	3300	45	Navajo	SS	Pool	Amphitheater	-	Powell's group tossed rocks in pool because of acoustics of "temple" Music Temple
GJ-105	11.66-8.55	Navajo Mtn.	15	4-24-58	3300	0	Alluvium	S,G	---	Bed of wash in amphitheater	-	Water originates from Navajo; flows to river; Twilight Canyon
GJ-106	11.90-11.95	Navajo Mtn.	2E	4-25-58	3750	125	Navajo	SS	Bedding planes	Alcove	-	Bridge Canyon
GJ-107	12.20-11.45	Navajo Mtn.	2E	4-25-58	3680	200	Navajo	SS	Bedding planes	Alcove	-	Bridge Canyon
GJ-108	12.68-10.94	Navajo Mtn.	100E	4-25-58	3550	4	Navajo	SS	Large joint	Base of cliff	-	Joint intercepts water from Aztec Creek upstream; Forbidding Canyon
✓GJ-109	10.82-5.25	Cummings Mesa	25-35	4-25-58	3580	0	Entrada	SS	Contact	Bed of wash	-	Rock Creek
✓GJ-110	9.9-7.85	Cummings Mesa	-	4-25-58	3350	0	Alluvium	S	---	Bed of wash	-	Flows to Colorado River; Rock Creek
✓GJ-111	13.10-18.05	Cummings Mesa	5	4-26-58	3250	65	Navajo	SS	Bedding planes, joints	Alcove canyon	-	Glen Canyon

GJ-112	3.23-7.85	Hite	50E	8-5-58	3470	10	Alluvium	Sand	River channel and bar	Base of cliff	Yes	Sulfur deposits; bubbling of gas out of river; Canyon
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✓ GJ-110	9.9-7.85	Cummings Mesa	-	4-25-58	3350	0	Alluvium	S	---	Bed of wash	-	Flows to Colorado River; Rock Creek
✓ GJ-111	13.10-16.05	Cummings Mesa	5	4-26-58	3250	65	Navajo	SS	Bedding planes, joints	Alcove canyon	-	Glen Canyon

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GJ-112	3.23-7.65	Hite	50E	8-5-58	3470	10	Alluvium	Sand	River channel and bar	Base of cliff	Yes	Sulfur deposits; bubbling of gas out of river; Cataract Canyon
✓ GJ-113	13.1-7.82	Mancos Mesa	10E	8-6-58	4000	600	Chinle (Church Rock)	SS	Bedding planes	Base of cliff	-	Flows 5 mi. downstream; good taste Water originates from Wingate; "Little" Rincon
✓ GJ-114	13.22-7.76	Mancos Mesa	10E	8-6-58	4000	600	Chinle (Church Rock)	SS	Bedding planes	Base of cliff	-	Good taste; joins GJ-113 downstream; "Little" Rincon
✓ GJ-115	12.91-7.76	Mancos Mesa	8-10E	8-6-58	4200	800	Landslide	SS	Joints, bedding planes	Slump block	-	Good taste; joins GJ-1B; "Little" Rincon
✓ GJ-116	12.86-7.56	Mancos Mesa	<1/2	8-6-58	3800	400	Alluvium Landslide	S,SS	Talus	Bed of wash	Yes	Flows for 15 ft.; "Little" Rincon
✓ GJ-117	12.65-7.68	Mancos Mesa	<1/3	8-6-58	4000	600	Alluvium Landslide	SS	Talus	Near base of cliff	-	Flows for 10 ft.; forms small pool; "Little" Rincon
✓ GJ-118	12.67-7.45	Mancos Mesa	5E	8-6-58	3800	400	Alluvium Landslide	S,SS	Talus	Side of Talus slope	-	Good taste; flows 1/4 mi.; "Little" Rincon
✓ GJ-119	12.5-7.48	Mancos Mesa	2-3E	8-6-58	3920	525	Alluvium Landslide	S,SS	Talus	Bed of wash	-	Originates near faults; "Little" Rincon
✓ GJ-120	13.82-8.9	Mancos Mesa	2E	8-7-58	3410	5	Terrace	Gravel	Base of channel	Bank of river	-	Flows to river; accumulative discharge of GJ-113-119; "Little Rincon"
✓ GJ-121	1.81-8.1	Mt. Ellsworth	2E	8-7-58	3400	10	Landslide	SS	Talus	Bank of river	-	Glen Canyon
✓ GJ-122	3.55-7.77	Mt. Ellsworth	5E	8-7-58	3440	50	Landslide	S,SS	Talus	Bank of river	-	Water originates from Wingate; Glen Canyon
✓ GJ-123	4.11-8.45	Mt. Ellsworth	<5E	8-7-58	3720	100	Wingate (Lukachukai)	SS	Joints, bedding planes	Head of canyon	-	Pools of water on Alluvium which overlies Wingate; Sevenmile Creek
✓ GJ-124A	4.83-8.34	Mt. Ellsworth	---	8-7-58	3600	0	Wingate (Lukachukai)	SS	Joints; bedding planes	Bottom of canyon	-	Sevenmile Creek
✓ GJ-124B	4.29-8.65	Mt. Ellsworth	10E	8-7-58	3675	0	Wingate (Lukachukai)	SS	Joints; bedding planes	Bottom of canyon	-	Flows downstream 300 ft.; Sevenmile Creek

Spring No.	Location No. (Miles)	Quadrangle	Estimated Discharge (Gals. per Minute)	Date of Measurement	Altitude Above Mean Sea Level (ft)	Altitude Above Canyon Bottom of Stream (ft)	Stratigraphic Unit	Rock Type	Descriptions of Spring	Physiographic Position	Water Sample Taken	Remarks and General Location
✓GJ-125	5.58-9.75	Mt. Ellsworth	5E	8-7-58	3600	100	Tongue of Navajo in Kayenta	SS	Bedding planes	Alcove	-	Warm Spring Creek
✓GJ-126	5.71-9.6	Mt. Ellsworth	20E	8-7-58	3580	75	Navajo	SS	Contact	Alcove	-	Warm Spring Creek
✓GJ-127	5.95-9.4	Mt. Ellsworth	5E	8-7-58	3600	100	Navajo	SS	Bedding planes	Alcove canyon	-	Warm Spring Creek
✓GJ-128	6.15-9.54	Mt. Ellsworth	5E	8-7-58	3600	50	Navajo	SS	Bedding planes	Alcove	-	Good taste; Warm Spring Creek
GJ-129	6.08-2.37	Navajo Mtn. 4NE	<1	6-17-58	3640	100	Cutler (DeChelly)	SS	Contact	Base of cliff	-	San Juan Canyon
GJ-130A	---	---	>5	6-17-58	--	0	Cutler (Cedar Mesa)	SS	Bedding planes	Head of canyon	-	Combination spring; Grand Gulch
GJ-130B	---	---	5	6-17-58	--	0	Alluvium	S, G	---	Bed of wash	-	Grand Gulch
GJ-130C	---	---	<1	6-17-58	--	0	Rice	SS, LS	Bedding planes	Overhanging ledge	-	Used by rivermen; Grand Gulch
128 ✓GJ-131	.5-5.25	Clay Hills, 2SE	<5	6-17-58	3800	120	(Cedar Mesa) Cutler	SS	Bedding planes	Alcove canyon	-	San Juan Canyon
✓GJ-132	1.88-6.27	Clay Hills, 2SE	<5	6-17-58	3690	30	Cutler (Cedar Mesa)	SS	Bedding planes	Alcove canyon	-	San Juan Canyon
✓GJ-133	9.55-16.94	Lake Canyon	-	6-19-58	3640	0	Wingate (Lukachukai)	SS	Pools	Bottom of canyon	-	Side canyon
✓GJ-134	10.1-16.38	Lake Canyon	3	6-20-58	3840	350	Kayenta Moenave	SS	Contact	Alcove	-	Good taste; used by rivermen; San Juan Canyon
✓GJ-135	10.9-16.12	Lake Canyon	5-10	6-20-58	3500	0	Wingate (Lukachukai)	SS	Bedding planes	Head of inner gorge	-	Broad seepage area; springs in Alcove Canyon reported by Miser (1924); Alcove Canyon
✓GJ-136	10.57-15.5	Lake Canyon	5	6-20-58	3700	0	Alluvium	S	---	Bottom of canyon	-	Water originates in Kayents but issues from alluvium and flows downstream 300 feet; Alcove Canyon
✓GJ-137	10.54-15.22	Lake Canyon	5-10	6-20-58	3760	0	Kayenta	SS	Bedding planes	Bottom of canyon	-	Flows downstream 300 feet; Alcove Canyon

✓GJ-138	10.28-14.68	Lake Canyon	-	6-20-58	3920	0	Navajo	SS	Contact, bedding planes	Head of canyon	-	Forms seep area for 1/2 mile in canyon; Alcove Canyon
✓GJ-139	11.4-16.15	Lake Canyon	5	6-20-58	3496	8	Wingate (Lukachukai)	SS	Crossbeddings	Side of cliff	-	Seep 200 ft. long;

GJ-137	10.54-15.22	Lake Canyon	5-10	6-20-58	3760	0	Kayenta	SS	Bedding planes	Bottom of canyon	-	300 feet; Alcove Canyon Flows downstream 300 feet; Alcove Canyon
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GJ-138	10.28-14.68	Lake Canyon	-	6-20-58	3920	0	Navajo	SS	Contact, bedding planes	Head of canyon	-	Forms seep area for 1/2 mile in canyon; Alcove Canyon
GJ-139	11.4-16.15	Lake Canyon	5	6-20-58	3498	8	Wingate (Lukachukai)	SS	Crossbeddings bedding planes	Side of cliff	-	Seep 200 ft. long; reported by Miser (1924); San Juan Canyon
GJ-140	4.22-0.48	Navajo Mtn. 4NW	-	6-20-58	3850	490	Navajo	SS	Contact, bedding planes	Alcove	-	Flows almost to river; San Juan Canyon
GJ-141	4.66-5.99	Navajo Mtn. 4NW	3	6-23-58	3900	450	Wingate (Lukachukai)	SS	Contact	Head of small canyon	-	Excellent Taste; Piute Canyon
GJ-142	4.06-8.21	Navajo Mtn. 4NW	1-2	6-23-58	3550	0	Alluvium	S,G	---	Bottom of canyon	-	Good taste; Piute Canyon
GJ-143	3.98-6.37	Navajo Mtn. 4NW	2-3	6-23-58	3580	0	Alluvium	S,G	---	Bottom of canyon	-	Piute Canyon
GJ-144	4.19-7.24	Navajo Mtn. 4NW	10-20	6-23-58	3900	275	Wingate (Lukachukai)	SS	Contact, fault plane	Head of small canyon	-	Combination spring; reported by Miser (1924); flows to Piute Creek
GJ-145	2.83-.45	Navajo Mtn. 4SW	2-3	6-23-58	3950	0	Alluvium	S,G	---	Bottom of canyon	-	Good taste; Piute Canyon
GJ-146	2.63-1.24	Navajo Mtn. 4SW	2	6-23-58	4060	0	Chinle (Shinarump)	SS	Bedding planes	Bottom of canyon	-	Piute Canyon
GJ-147	2.75-1.95	Navajo Mtn. 4SW	5	6-23-58	4145	5	Alluvium	G	Contact	Alluvial terrace	-	Soda water spring; excellent taste; Piute Canyon
GJ-148	.26-3.36	Navajo Mtn. 4NW	1	6-24-58	4400	950	Landslide	S,SS	---	Slump below cliff	-	San Juan Canyon
GJ-149	4.95-4.91	Navajo Mtn. 4NW	-	6-24-58	3480	50	Landslide	S,SS	---	Slump at base of cliff	-	San Juan Canyon
GJ-150	5.58-3.92	Navajo Mtn. 4NW	< 2	6-24-58	3540	145	Wingate (Lukachukai)	SS	Contact	Alcove	-	San Juan Canyon
GJ-151	6.40-5.61	Navajo Mtn. 4NW	< 1	6-24-58	3500	0	Chinle (Church Rock)	SS	Bedding planes	Head of inner gorge	-	Used by rivermen; water originates from Wingate; Deep Canyon
GJ-152A	2.24-3.88	Navajo Mtn.	-	-	3725	0	Kayenta	SS	Bedding planes	Bottom of canyon	-	Upper end of permanent water in Wilson Canyon
GJ-152B	1.87-4.60	Navajo Mtn.	-	6-24-58	3500	0	Wingate (Lukachukai)	SS	Joints	Bottom of canyon	-	Wilson Canyon

Spring No.	Location No. (Miles)	Quadrangle	Estimated Discharge (Gals. per Minute)	Date of Measurement	Altitude Above Mean Sea Level (ft)	Altitude Above Canyon Bottom of Stream (ft)	Stratigraphic Unit	Rock Type	Descriptions of Spring	Physiographic Position	Water Sample Taken	Remarks and General Location
GJ-152C	2.25-4.15	Navajo Mtn.	-	-	3650	0	Wingate (Lukachukai)	SS	Joints, bedding planes	Bottom of canyon	-	Issues most of water in Wilson Canyon
GJ-153	5.86-5.77	Navajo Mtn.	100E	6-25-58	3440	30	Wingate (Lukachukai)	SS	Contact	Head of canyon	-	Flows to river; used by rivermen; less than ICFS 9-2-21 Miser (1924); Red Bud Canyon
GJ-154	2.6-7.81	Hite	5E	8-5-58	3500	15	Alluvium	S	River bar	Alluvial terrace	-	H ₂ S odor; sulfur deposits; water originates from joints in Rico-Halgaito; Cataract Canyon
GJ-155	8.9-4.92	Navajo Mtn.	< 5	6-25-58	3275	0	Kayenta	SS	Joints	Bottom of canyon	-	Peels on alluvium; Cottonwood Gulch
GJ-156	9.84-4.74	Navajo Mtn.	5	6-25-58	3400	150	Navajo	SS	Contact, bedding planes	Head of canyon	-	Good taste; flows to river; Glen Canyon
GJ-157	9.62-4.83	Navajo Mtn.	2-3	6-25-58	3350	100	Navajo	SS	Contact, bedding planes	Alcove	-	Glen Canyon
GJ-158	9.42-4.81	Navajo Mtn.	< 5	6-25-58	3370	110	Navajo	SS	Contact, bedding planes	Alcove	-	Glen Canyon
GJ-159	11.03-6.55	Navajo Mtn.	1-2	6-26-58	3500	255	Navajo	SS	Bedding planes	Large alcove	-	Glen Canyon
GJ-160	11.0-8.20	Navajo Mtn.	5	6-25-58	3280	40	Navajo	--	Bedding planes	Alcove canyon	-	Flows to river; Glen Canyon
GJ-161	11.08-8.46	Navajo Mtn.	-	6-26-58	3280	0	Navajo	SS	Bedding planes	Side of canyon	-	Pools in alluvium for 300 ft. downstream; Oak Canyon
GJ-162	12.72-10.94	Navajo Mtn.	5	6-26-58	3560	0	Kayenta	SS	Contact, joints	Bottom of canyon	-	Forbidding Canyon
GJ-163	12.75-9.30	Navajo Mtn.	1/8	6-26-58	3275	25	Navajo	SS	Bedding planes	Alcove	-	Used by rivermen; Forbidding Canyon
✓GJ-164	11.34-7.30	Mouth of Dark Canyon	10	7-17-58	3580	5	Hermosa	LS,SS	Bedding planes	Bottom of canyon	-	Good taste; mouth of Dark Canyon
GJ-165	1.43-7.60	Hite	100	7-19-58		25	Hermosa	LS,SS	Fault plane	Base of cliff	-	Several spring openings; Cataract Canyon
GJ-166	1.58-8.46	Hite	100	7-19-58	3500	25	Rico	SS,LS	Joints, small faults	Base of cliff	-	Very good taste; several spring openings; Cataract Canyon

GJ-167	1.48-8.52	Hite	25	7-19-58	3500	20	Rico	SS,LS	Joints, small faults	Base of cliff	-	Seeps along fault; Cataract Canyon
GJ-168	1.40-8.81	Hite	25	7-19-58	3400	20	Rico	SS,LS	Joints, small faults	Base of cliff	-	Seeps along fault; Cataract Canyon

GJ-165	1.43-7.60	Hite	100	7-19-58		25	Hermosa	LS, SS	Fault plane	Base of cliff		ings; Cataract Canyon
GJ-166	1.58-8.46	Hite	100	7-19-58	3500	25	Rico	SS, LS	Joints, small faults	Base of cliff	-	Very good taste; several spring openings; Cataract Canyon

GJ-167	1.48-8.52	Hite	25	7-19-58	3500	20	Rico	SS, LS	Joints, small faults	Base of cliff	-	Seeps along fault; Cataract Canyon
GJ-168	1.40-8.81	Hite	25	7-19-58	3490	20	Rico	SS, LS	Joints, small faults	Base of cliff	-	Cataract Canyon
GJ-169	1.89-9.01	Hite	100	7-19-58	3485	15	Alluvium	S	River bar-sand dune	Alluvial terrace	-	Origin from faults and joints in Rico; Cataract Canyon
GJ-170	2.38-8.93	Hite	< 5	7-19-58	3480	10	Rico	SS, LS	Joints, bedding planes	Base of cliff	Yes	Sulphur deposited; Cataract Canyon
GJ-171	2.42-8.73	Hite	5	7-19-58	3475	10	Rico	SS, LS	Bedding planes	Base of cliff	-	Sulphur deposited; Cataract Canyon
GJ-172	3.12-7.64	Hite	20	7-19-58	3485	10	Alluvium	S	River bar	Base of cliff	-	Origin from joints in Halgalto; H ₂ S odor, deposited sulphur; Cataract Canyon
GJ-173	8.37-9.35	Hite	5	7-19-58	3455	0	Cutler (Cedar Mesa)	SS	Crossbedding planes	Base of cliff	-	Glen Canyon
GJ-174	7.36-7.64	Hite	< 5	7-19-58	3460	5	Cutler (Cedar Mesa)	SS	Bedding planes	Base of cliff	-	Cataract Canyon
✓GJ-175	1.04-3.01	Mt. Ellsworth	15-20	7-22-58	3880	10	Wingate (ukachukai)	SS	Contact	Bottom of canyon	-	Good taste; used by rivermen; Tica Boo Creek
✓GJ-176	5.08-10.24	Mt. Ellsworth	-	8-7-58	3400	20	Kayenta	SS	Pool	Head of inner gorge	-	Cedar Canyon
✓GJ-177	5.12-12.05	Mt. Ellsworth	-	8-7-58	3450	50	Kayenta	SS	Pool	Bottom of canyon	-	Knowles Canyon
✓GJ-178	5.29-12.43	Mt. Ellsworth	< 5	8-7-58	3600	220	Navajo	SS	Bedding planes, contact	Alcove	-	Glen Canyon
✓GJ-179	5.38-12.68	Mt. Ellsworth	10E	8-7-58	3600	220	Navajo	SS	Bedding planes, contact	Alcove	-	Glen Canyon
✓GJ-180	5.55-12.9	Mt. Ellsworth	< 5	8-7-58	3600	220	Navajo	SS	Bedding planes, contact	Alcove	-	Glen Canyon
✓GJ-181	6.6-12.88	Mt. Ellsworth	< 5	8-7-58	3600	220	Navajo	SS	Bedding planes, contact	Base of cliff	-	Glen Canyon
✓GJ-182	5.23-10.98	Mt. Ellsworth	< 5	8-7-58	3600	220	Navajo	SS	Bedding planes, contact	Alcove	-	Glen Canyon
✓GJ-183	5.20-11.20	Mt. Ellsworth	5E	8-7-58	3600	220	Navajo	SS	Bedding planes, contact	Alcove	-	Glen Canyon
✓GJ-184	7.57-13.95	Mt. Ellsworth	< 5	8-8-58	3440	70	Navajo	SS	Bedding planes	Head of canyon	-	Flows almost to river; Glen Canyon
✓GJ-185	7.45-14.34	Mt. Ellsworth	-	8-9-58	3440	70	Navajo	SS	Bedding planes	Head of canyon	-	Glen Canyon

Spring No.	Location No. (Miles)	Quadrangle	Estimated Discharge (Gals. per Minute)	Date of Measurement	Altitude Above Mean Sea Level (ft)	Altitude Above Canyon Bottom or Stream (ft)	Stratigraphic Unit	Rock Type	Descriptions of Spring	Physiographic Position	Water Sample Taken	Remarks and General Location
✓ GJ-186	8.5-0.65	Lake Canyon	< 5	8-9-58	3500	140	Navajo	SS	Bedding planes	Alcove	-	Glen Canyon
✓ GJ-187	13.76-2.66	Lake Canyon	3-5E	8-9-58	3430	0	Navajo	SS	Bedding planes	Head of small canyon	-	Flows almost to river; a side canyon
✓ GJ-188	13.75-3.28	Lake Canyon	< 5	8-9-58	3600	220	Navajo	SS	Bedding planes	Alcove	-	Flows almost to river; Glen Canyon
✓ GJ-189	13.4-3.69	Lake Canyon	5E	8-9-58	3550	170	Navajo	SS	Bedding planes	Alcove	-	Flows almost to river; Glen Canyon
✓ GJ-190	13.08-4.06	Lake Canyon	5E	8-9-58	3440	100	Navajo	SS	Bedding planes	Alcove	-	Glen Canyon
✓ GJ-191	11.11-5.69	Lake Canyon	3E	8-9-58	3420	0	Kayenta	SS	Bedding planes	Bed of wash	Yes	Used by rivermen; Lake Canyon
✓ GJ-192	11.25-6.25	Lake Canyon	< 5	8-9-58	3440	60	Navajo	SS	Bedding planes	Alcove	-	Glen Canyon
✓ GJ-193	13.0-8.41	Lake Canyon	< 5	8-9-58	3520	140	Navajo	SS	Contact, bedding planes	Alcove	-	Glen Canyon
✓ GJ-194	13.2-8.39	Lake Canyon	5-10E	8-9-58	3520	140	Navajo	SS	Contact	Large alcove	-	Glen Canyon
✓ GJ-195	13.09-9.68	Lake Canyon	5E	8-9-58	3520	130	Navajo	SS	Bedding planes	Alcove	-	Glen Canyon
✓ GJ-196	12.8-10.76	Lake Canyon	5-10E	8-10-58	3350	50	Wingate (Lukachukai)	SS	Bedding planes	Base of ledge	-	Side canyon
✓ GJ-197	13.2-10.92	Lake Canyon	< 5	8-10-58	3550	170	Kayenta	SS	Bedding planes	Alcove	-	Glen Canyon
GJ-198	0.53-12.08	Rincon	< 5	8-10-58	3600	225	Navajo	SS	Contact, bedding planes	Alcove	-	Wilson Canyon
GJ-199	2.78-12.26	Rincon	2E	8-12-58	3325	95	Cutler (White Rim)	SS	Bedding planes	Base of cliff	-	Glen Canyon
GJ-200	2.32-12.5	Rincon	1/2E	8-10-58	3340	75	Cutler (White Rim)	SS	Joints	Shallow canyon	Yes	Glen Canyon
GJ-201	2.38-12.27	Rincon	2E	8-12-58	3325	95	Cutler (White Rim)	SS	Bedding planes	Small alcove	-	Forms pool on bed-rock; Glen Canyon
GJ-202	5.43-10.4	Rincon	< 5	8-13-58	3450	170	Wingate (Lukachukai)	SS	Bedding planes, joints	Head of canyon	-	Glen Canyon
✓ GJ-203	6.14-9.38	Mt. Ellsworth	50E	8-7-58	3575	0	Navajo	SS	Bedding planes	Head of canyon	-	Combination spring; good taste; Warm Spring Creek
GJ-204	6.08-12.4	Rincon	5-10E	8-13-58	3840	565	Navajo	SS	Contact, bedding planes	Alcove	-	Glen Canyon
GJ-205	5.66-14.82	Rincon	< 5	8-13-58	3800	530	Navajo	SS	Contact, bedding planes	Alcove	-	Glen Canyon

GJ-206	7.02-15.44	Rincon	< 5	8-13-58	3680	410	Navajo	SS	Contact, bedding planes	Side of cliff	-	Flows to river; Glen Canyon
GJ-207	7.0-15.55	Rincon	< 5	8-13-58	3680	410	Navajo	SS	Contact, bedding planes	Alcove	-	Flows to river;

GJ-204	5.08-14.2	Rincon	< 5	8-13-58	3800	530	Navajo	SS	ding planes	Alcove	-	Glen Canyon
GJ-205	5.66-14.82	Rincon	< 5	8-13-58	3800	530	Navajo	SS	Contact, bedding planes	Alcove	-	Glen Canyon

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GJ-206	7.02-15.44	Rincon	< 5	8-13-58	3680	410	Navajo	SS	Contact, bedding planes	Side of cliff	-	Flows to river; Glen Canyon
GJ-207	7.0-15.55	Rincon	< 5	8-13-58	3680	410	Navajo	SS	Contact, bedding planes	Alcove	-	Flows to river; Glen Canyon
GJ-208	5.99-16.48	Rincon	-	8-13-58	3325	50	Wingate (Lukachukai)	SS	---	Head of inner gorge	-	Small pool on bed-rock; Glen Canyon
GJ-209	7.47-17.12	Rincon	< 5	8-13-58	3500	230	Kayenta	SS	Bedding planes	Alcove	-	Glen Canyon
GJ-210	8.36-2.61	Navajo Mtn.	5E	8-13-58	3800	540	Navajo	SS	Contact, bedding planes	Alcove	-	Glen Canyon
GJ-211	8.34-5.35	Navajo Mtn.	-	8-13-58	3360	100	Kayenta	SS	Bedding planes	Base of cliff	-	Glen Canyon
GJ-212	12.42-8.55	Navajo Mtn.	< 5	8-13-58	3360	100	Navajo	SS	Bedding planes	Alcove	-	Glen Canyon
GJ-213	13.68-9.49	Navajo Mtn.	-	8-13-58	3250	0	Navajo	SS	Pool on alluvium	Bottom of canyon	-	A side canyon
✓ GJ-214	0.25-9.37	Cummings Mesa	< 5	8-13-58	3360	135	Navajo	SS	Bedding planes	Alcove canyon	-	Glen Canyon
✓ GJ-215	0.6-8.8	Cummings Mesa	5-10	8-13-58	3920	0	Navajo	SS	Joints, bedding planes	Head of small canyon	-	Side canyon
✓ GJ-216	0.9-9.33	Cummings Mesa	< 5	8-13-58	3280	60	Navajo	SS	Large joints, bedding planes	Alcove	-	Flows to river; Glen Canyon
✓ GJ-217	4.31-0.94	Cummings Mesa	< 5	8-13-58	3360	60	Navajo	SS	Joints	Alcove canyon	-	Glen Canyon
✓ GJ-218	5.08-9.63	Cummings Mesa	5E	8-14-58	3280	0	Navajo	SS	Joints, bedding planes	Bottom of canyon	-	Dangling Rope Canyon
✓ GJ-219	5.02-9.43	Cummings Mesa	15E	8-14-58	3360	0	Navajo	SS	Large joints	Bottom of canyon	-	Combination spring; Dangling Rope Canyon
✓ GJ-220	6.0-9.78	Cummings Mesa	< 5	8-14-58	3280	70	Navajo	SS	Joints, bedding planes	Alcove canyon	-	Glen Canyon
✓ GJ-221	6.63-9.4	Cummings Mesa	5E	8-14-58	3440	0	Navajo	SS	Bedding planes	Head of canyon	-	A side canyon
✓ GJ-222	7.78-11.62	Cummings Mesa	5E	8-14-58	3225	0	Navajo	SS	Joints, bedding planes	Head of canyon	-	Grotto Canyon
✓ GJ-223	8.65-11.25	Cummings Mesa	5E	8-14-58	3220	0	Navajo	SS	Bedding planes	Head of canyon	-	Dungeon Canyon
✓ GJ-224	11.4-12.83	Cummings Mesa	< 5	8-14-58	3350	55	Navajo	SS	Joints, bedding planes	Alcove canyon	-	Glen Canyon
✓ GJ-225	11.76-13.5	Cummings Mesa	< 5	8-14-58	3360	65	Navajo	SS	Joints, bedding planes	Head of small canyon	-	Glen Canyon
GJ-226	8.33-2.68	Navajo Mtn.	< 5	8-13-58	3800	540	Navajo	SS	Contact, bedding planes	Alcove	-	Glen Canyon
✓ GJ-227	6.5-8.82	Lake Canyon	Dry	9-6-58	4080	0	Navajo	SS	Bedding planes	Base of cliff	-	Partly developed; upper Lake Canyon
✓ GJ-228	5.88-8.65	Lake Canyon	2E	9-6-58	4070	0	Alluvium	S	Bedding planes	Head of wash	-	Upper Lake Canyon
GJ-229	10.97-8.65	Navajo Mtn.	7E	8-23-58	3360	30	Navajo	SS	Bedding planes	Side of cliff	-	Oak Canyon

Spring No.	Location No. (Miles)	Quadrangle	Estimated Discharge (Gals. per Minute)	Date of Measurement	Altitude Above Mean Sea Level (ft)	Altitude Above Canyon Bottom or Stream (ft)	Stratigraphic Unit	Rock Type	Descriptions of Spring	Physiographic Position	Water Sample Taken	Remarks and General Location
GJ-230	10.93-8.81	Navajo Mtn.	2E	8-24-58	3510	150	Navajo	SS	Bedding planes	Side of cliff	-	Good taste; Oak Canyon
✓GJ-242	2.71-12.60	Gunsight Butte	10	9-1-58	3200	0	Navajo	SS	Bedding planes	Side of cliff	-	Measured by Univ. Utah Archaeology Field party; good taste; Kane Creek
GJ-243	12.86-0.33	Navajo Creek	100E	8-31-58	3400	0	Navajo	SS	Joints, bedding planes	Base of cliff	-	Face Canyon
GJ-244	10.89-2.08	Leche-e Rock	25E	9-1-58	3170	20	Navajo	SS	Bedding planes	Side of cliff	-	Glen Canyon
GJ-245	7.48-5.40	Navajo Mtn.	2+	6-25-58	3600	340	Navajo	SS	Contact, bedding planes	Alcove	-	San Juan Canyon
✓GJ-246	12.19-1.8	Cummings Mesa	<1/8	9-29-58	5500	-	Morrison (Salt Wash)	SS	Bedding planes	Head of shallow canyon	-	Grand Bench
GJ-247	6.75-6.67	Navajo Mtn.	40-50	6-25-58	3550	0	Wingate (Lukachukai)	SS	Contact	Head of canyon	-	Flows to river; San Juan Canyon
✓GJ-248	3.91-12.95	Gunsight Butte	200	9-1-58	3280	0	Navajo	SS	Combination	Head of small canyon	-	Tributary of Glen Canyon
✓GJ-249	3.30-13.66	Gunsight Butte	80	9-1-58	3280	100	Navajo	SS	Joints, bedding planes	Alcove canyon	-	Flows to river; Glen Canyon
✓GJ-250	4.22-15.48	Gunsight Butte	15	9-1-58	3280	0	Navajo	SS	Large joint	Bottom of canyon	-	Flows to river; Glen Canyon
✓GJ-251	3.10-16.95	Gunsight Butte	5	9-1-58	3180	-	Navajo	SS	Large joint	Head of small canyon	-	Flows to river; Labyrinth Canyon
✓GJ-252	2.23-7.95	Mt. Ellsworth	<5	4-15-59	3550	160	Wingate (Lukachukai)	SS	---	Head of small canyon	-	Pools at base of Talus; Glen Canyon
✓GJ-253	4.86-12.15	Mt. Ellsworth	5-10	4-15-59	3600	125	Navajo	SS	Contact, bedding planes	Alcove canyon	-	Knowles Canyon
✓GJ-254	3.32-16.80	Gunsight Butte	5	4-20-59	3180	-	Navajo	SS	Joint	Alcove canyon	-	Tributary of Glen Canyon
✓GJ-255	9.54-8.64	Cummings Mesa	3	4-20-59	3300	3	Navajo	SS	Bedding planes	Narrow canyon	-	Rock Creek
✓GJ-256	9.61-9.55	Cummings Mesa	5-6	4-20-59	3250	4	Navajo	SS	Joint	Narrow canyon	-	Rock Creek
✓GJ-257	5.03-5.11	Clay Hills	2	5-12-59	5480	250	Wingate (Lukachukai)	SS	Contact	Side of canyon	-	Green Irish Spring; Castle Creek
✓GJ-258	6.22-5.98	Clay Hills	2	5-12-59	5350	0	Alluvium	Sand	---	Bottom of canyon	-	Green Water Spring; Castle Creek
✓GJ-259	6.21-8.23	Lake Canyon	1-2	5-12-59	4040	0	Navajo	SS	Bedding planes	Side of wash	-	Lake Canyon

✓GJ-260	11.13-2.58	Mancos Mesa	1	5-12-59	3400	0	Navajo and (Alluvium)	SS, S	Bedding planes	Bottom of wash	-	Lake Canyon
✓GJ-261	11.14-2.47	Mancos Mesa	1-2	5-13-59	3440	10	Moenkopi	SS	Bedding planes	Base of cliff	-	Red Canyon
✓GJ-262	11.13-2.58	Mancos Mesa	1	5-12-59	3400	0	Navajo and (Alluvium)	SI-SS	Bedding planes	Base of cliff	-	Red Canyon

✓GJ-258	6.22-5.98	Clay Hills	2	5-12-59	5350	0	Alluvium	Sand	---	Bottom of canyon	-	Green Water Spring; Castle Creek
✓GJ-259	6.21-8.23	Lake Canyon	1-2	5-12-59	4040	0	Navajo	SS	Bedding planes	Side of wash	-	Lake Canyon

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							Navajo and (Alluvium)	SS, S	Bedding planes	Bottom of wash	-	Lake Canyon
✓GJ-261	11.14-2.47	Mancos Mesa	1-2	5-13-59	3440	10	Moenkopi	SS	Bedding planes	Base of cliff	-	Red Canyon
✓GJ-262	11.13-2.58	Mancos Mesa	1	5-13-59	3480	50	Moenkopi	SS	Bedding planes	Small side valley	-	Red Canyon
✓GJ-263	9.50-3.44	Mancos Mesa	400	5-13-59	3625	0	Moenkopi	SS	Large joints	Bottom of canyon	-	200 GPM issues from a single joint flows to river; gas bubble from stream bed; Red Canyon
GJ-264	8.3-10.3	Hite	-	-	3450	0	Cutler (Cedar Mesa)	SS	Joint	Base of cliff	-	25 GPM rept; by C. W. Edgell; Glen Canyon
GJ-265	8.6-10.6	Hite	-	-	3450	0	Cutler (Cedar Mesa)	SS	Joint	Base of cliff	-	25 GPM and mineralized-rept. by C. W. Edgell; Glen Canyon
✓GJ-266	11.64-9.87	Mouth of Dark Canyon	-	-	3840	0	Cutler (Cedar Mesa)	SS	Fault	Bottom of canyon	-	10 GPM rept. by C. W. Edgell; Sheep Canyon
GJ-267	1.08-12.07	Hite	-	-	4975	-	Cutler (Cedar Mesa)	SS	Bedding planes	Stripped plain	-	Permanent water rept. by C. W. Edgell; seep in bottom of dirt tank; White Canyon area
GJ-268	0.4-11.75	Hite	-	-	5040	10	Cutler (Cedar Mesa)	SS	Bedding planes	Bottom of canyon	-	Pool-rept. by C. W. Edgell; White Canyon area
GJ-269	0.94-13.75	Hite	-	-	5000	0	Cutler (Cedar Mesa)	SS	Bedding planes	Shallow canyon	-	Pool, permanent water rept. by C. W. Edgell; White Canyon
✓GJ-270	9.5-12.7	Mouth of Dark Canyon	-	-	4800	0	Cutler (Halgaito)	SS	Joint-bedding planes	Deep canyon	-	Combination spring; rept. by C. W. Edgell Lost Canyon
✓GJ-271	7.3-15.2	Mouth of Dark Canyon	-	-	5950	0	Cutler (Cedar Mesa)	SS	---	Deep canyon	-	Combination spring; rept. by C. W. Edgell Lost Canyon
GJ-272	9.10-12.77	Hite	-	-	3520	20	Cutler (Organ Rock)	SS	---	Base of cliff	-	2 GPM and dry in summer-rept. by C.W. Edgell; White Canyon Store
GJ-273	8.93-12.64	Hite	20	5-14-59	3540	0	Cutler (Organ Rock)	SS	Joints, bedding planes	Bottom of wash	-	Flows downstream 1/2 mi; supplies White Canyon Store
GJ-274	9.8-13.6	Hite	-	-	3475	0	Moenkopi	SS	Joints	Base of cliff	-	Flows 10-25 GPM when not covered by alluvium-rept. by C.W. Edgell; White Canyon

Spring No.	Location No. (Miles)	Quadrangle	Estimated Discharge (Gals. per Minute)	Date of Measurement	Altitude Above Mean Sea Level (ft)	Altitude Above Canyon Bottom or Stream (ft)	Stratigraphic Unit	Rock Type	Descriptions of Spring	Physiographic Position	Water Sample Taken	Remarks and General Location
GJ-275	9.91-11.62	Hite	1	5-15-59	3480	50	Cutler (Organ Rock)	SS SI-SS	Joints	Base of cliff	-	Base of travertine deposit; Glen Canyon
✓ GJ-279	6.52-6.03	Clay Hills	< 2	5-11-59	5300	0	Alluvium	S	---	Bottom of canyon	-	Pit made by bulldozer
GJ-280	7.7-7.5	Hite	450-900	-	3450	0	Cutler (Cedar Mesa)	SS	Joint	Narrow canyon	-	Reported by Lawrence Lopp; Dirty Devil River
GJ-281	12.5-15.2	Hite	-	-	3800	375	Wingate (Lukachukai)	SS	Contact	Side of cliff	-	Enough water to be used in drilling operations rept. by Lawrence Lopp; Glen Canyon
GJ-282	8.0-7.3	Hite	< 1	-	3455	0	Cutler (Cedar Mesa)	SS	Joint	Narrow canyon	-	Reported by Lawrence Lopp; Dirty Devil River
GJ-283	7.75-7.45	Hite	< 1	-	3470	0	Cutler (Cedar Mesa)	SS	Joint	Narrow canyon	-	Reported by Lawrence Lopp; Dirty Devil River
GJ-284	7.6-6.4	Hite	< 1	-	3475	0	Cutler (Cedar Mesa)	SS	Fault	Narrow canyon	-	Reported by Lawrence Lopp; Dirty Devil River
GJ-285	7.65-6.2	Hite	< 1	-	3485	0	Cutler (Cedar Mesa)	SS	Joint	Narrow canyon	-	Reported by Lawrence Lopp; Dirty Devil River
GJ-286	13.63-17.03	The Rincon	1	5-27-59	4040	0	Alluvium	S,G	---	Bottom of wash	-	Several small dirt tanks; Fifty Mile Creek
✓ GJ-287	3.50-1.20	Gunsight Butte	1-2	5-28-59	3925	0	Alluvium	S	---	Bottom of wash	-	Croton Canyon
GJ-288	1.05-1.64	Mt. Hillers	450-900	5-30-59	4425	0	Navajo	SS	Joint	Head of canyon	-	Head of perennial water; Hog Canyon
GJ-290	10.17-7.75	Hite	5	5-30-59	3610	0	Cutler (White Rim)	SS	Contact	Base of cliff	-	North Wash
GJ-291	13.20-11.48	Hite	10E	5-30-59	3650	0	Alluvium	S,G	---	Bottom of wash	-	Trechyte Creek
GJ-292	11.36-12.91	Hite	2-3	5-30-59	4510	0	Alluvium	S,G	---	Bottom of wash	-	Sometimes covered by alluvium reported by Lawrence Lopp; Trechyte Creek
GJ-294	10.75-4.8	Navajo Mtn.	< 10	9-17-59	3525	0	Navajo	SS	Joints	Bottom of canyon	-	Flows to river; Hidden Passage
GJ-295	13.85-8.35	Navajo Mtn.	< 5	9-17-59	3560	0	Navajo	SS	Joints	Bottom of canyon	-	Tributary to Glen Canyon

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GJ-296	10.45-3.55	Navajo Mtn.	10	9-17-59	3700	0	Navajo	SS	Joint	Bottom of canyon	-	Head of perennial flow; tributary of Cottonwood Gulch
GJ-297	9.5-3.6	Navajo Mtn.	10	9-17-59	3550	0	Navajo	SS	Joint	Bottom of	-	Head of perennial

GJ-294	10.75-4.8	Navajo Mtn.	< 10	9-17-59	3525	0	Navajo	SS	Joints	Bottom of canyon	-	Flows to river; Hidden Passage
GJ-295	13.85-8.35	Navajo Mtn.	< 5	9-17-59	3560	0	Navajo	SS	Joints	Bottom of canyon	-	Tributary to Glen Canyon

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137	✓	GJ-296	10.45-3.55	Navajo Mtn.	10	9-17-59	3700	0	Navajo	SS	Joint	Bottom of canyon	-	Head of perennial flow; tributary of Cottonwood Gulch
		GJ-297	9.5-3.6	Navajo Mtn.	10	9-17-59	3550	0	Navajo	SS	Joint	Bottom of canyon	-	Head of perennial flow; Cottonwood Gulch
		GJ-298	10.1-1.35	Navajo Mtn.	10	9-17-59	3740	0	Navajo	SS	---	Bottom of canyon	-	Head of perennial flow; Llewellyn Gulch
		GJ-299	1.85-10.50	Lees Ferry	< 5	9-18-59	3400	0	Navajo	SS	---	Head of canyon	-	Tributary to Glen Canyon
	✓	GJ-300	10.1-9.75	Mouth of Dark Canyon	10-20	9-16-59	4000	0	Hermosa	LS-SS	Fault	Bottom of canyon	-	Dark Canyon
		GJ-301	0.70-2.6	Mt. Hillers	10	9-16-59	4450	0	Navajo	SS	Joint	Alcove canyon	-	Hog Canyon
	✓	GJ-302	9.55-13.7	Mt. Ellsworth	20	9-16-59	3490	0	Navajo	SS	Joint	Bottom of canyon	-	Head of perennial flow; Hansen Creek
	✓	GJ-303	13.1-11.15	Clay Hills	< 5	9-16-59	4750	0	Wingate (Lukachukai)	SS	---	Bottom of canyon	-	Rock Spring; Castle Creek
	✓	GJ-304A	10.15-10.65	Clay Hills	< 5	9-16-59	5040	125	Navajo-Kayenta Wingate	SS	Fault-Contact	Alcove	-	Mikes Canyon
	✓	GJ-304B	11.05-11.30	Clay Hills	< 5	9-16-59	5000	300	Navajo-Kayenta Wingate	SS	Fault-Contact	Alcove	-	Mikes Canyon
	✓	GJ-304C	11.30-11.65	Clay Hills	< 5	9-16-59	5000	325	Navajo-Kayenta Wingate	SS	Fault - contract	Alcove	-	Mikes Canyon
	✓	GJ-305	6.5-0.15	Clay Hills	< 5	9-16-59	4850	0	Wingate (Lukachukai)-Alluvium	SS-S	Fault	Bottom of canyon	-	Moqui Canyon
	✓	GJ-306	11.35-2.25	Clay Hills	20	9-16-59	4700	0	Wingate (Lukachukai)	SS	---	Bottom of canyon	-	Moqui Canyon
	✓	GJ-307	11.35-2.85	Clay Hills	< 5	9-16-59	4950	-	Navajo	SS	---	Head of canyon	-	Burnt spring; Moqui Canyon
	✓	GJ-308	1.85-2.45	Clay Hills	-	9-30-59	5800	100	Wingate (Lukachukai)	SS	---	Side of cliff	-	Steer Pasture Canyon
	✓	GJ-309	13.7-3.15	Clay Hills	25	9-16-59	4450	-	Navajo-Kayenta	SS	Joints	Head of canyon	-	Moqui Canyon
	✓	GJ-310	5.85-1.45	Lake Canyon	5	9-17-59	3550	0	Navajo	SS	Joint	Head of canyon	-	Moqui Canyon
	✓	GJ-311	13.25-8.90	Lake Canyon	5	9-17-59	3950	0	Navajo	SS	Fault	Head of canyon	-	Air check; Glen Canyon
	✓	GJ-312	13.15-9.0	Lake Canyon	5	9-17-59	4000	0	Navajo	SS	Joint	Head of canyon	-	Air check; Glen Canyon
	✓	GJ-313	6.7-0.85	Lake Canyon	10	9-17-59	3520	0	Navajo	SS	---	Head of canyon	-	Air check; Moqui Canyon

Spring No.	Location No. (Miles)	Quadrangle	Estimated Discharge (Gals. per Minute)	Date of Measurement	Altitude Above Mean Sea Level (ft)	Altitude Above Canyon Bottom or Stream (ft)	Stratigraphic Unit	Rock Type	Descriptions of Spring	Physiographic Position	Water Sample Taken	Remarks and General Location
GJ-314	8.0-14.65	The Rincon	25-50	9-17-59	3550	0	Navajo	SS	Joint	Head of canyon	-	Head of perennial flow; air check; Indian Creek
GJ-315	9.1-14.6	The Rincon	25-50	9-17-59	3525	0	Navajo	SS	---	Bottom of canyon	-	Head of perennial flow; air check; Clear Creek
GJ-316	11.4-14.3	The Rincon	50	9-17-59	3400	0	Navajo	SS	---	Bottom of canyon	-	Head of perennial flow; air check; Davis Gulch
GJ-317	12.15-12.55	The Rincon	50	9-17-59	3725	0	Navajo	SS	Fault or large joint	Bottom of canyon	-	Head of perennial flow; air check; Davis Gulch
GJ-318	7.9-12.8	The Rincon	< 5	9-17-59	3700	200	Navajo	SS	Contact, joints	Alcove canyon	-	Air check; Escalante River
GJ-319	8.25-12.65	The Rincon	< 5	9-17-59	3500	100	Navajo	SS	Contact	Alcove canyon	-	Air check; Escalante River
GJ-320	8.55-11.9	The Rincon	< 5	9-17-59	3500	100	Navajo	SS	Contact	Head of canyon	-	Air check; Escalante River
GJ-321	9.5-10.75	The Rincon	5-10	9-17-59	3600	200	Navajo	SS	---	Bottom of canyon	-	Air check; tributary of Escalante River
GJ-322	8.8-8.15	The Rincon	5-10	9-17-59	3850	0	Navajo	SS	Contact	Head of canyon	-	Air check; tributary of Escalante River
GJ-323A	10.1-8.35	The Rincon	< 5	9-17-59	3700	0	Navajo	SS	Contact	Alcove canyon	-	Air check; Escalante River
GJ-323B	10.35-8.3	The Rincon	< 5	9-17-59	3700	0	Navajo	SS	Contact	Alcove canyon	-	Air check; Escalante River
GJ-324	9.6-6.6	The Rincon	< 5	9-17-59	3850	0	Navajo	SS	Contact	Head of canyon	-	Air check; Fence Canyon
GJ-325	12.3-6.55	The Rincon	< 5	9-17-59	3850	300	Navajo	SS	Contact	Alcove	-	Air check; Escalante River
GJ-326	11.9-6.15	The Rincon	< 5	9-17-59	3850	300	Navajo	SS	Contact	Alcove	-	Air check; Escalante River
GJ-327	11.3-5.75	The Rincon	< 5	9-17-59	3800	0	Navajo	SS	Contact	Head of canyon	-	Air check; tributary to Escalante River
GJ-328	8.65-4.5	The Rincon	< 5	9-17-59	4150	150	Navajo	SS-	Contact	Alcove	-	Air check; Cow Canyon
GJ-329	7.75-4.3	The Rincon	< 5	9-17-59	4250	0	Navajo	SS	Contact	Head of canyon	-	Air check; Cow Canyon

GJ-330	9.25-4.0	The Rincon	< 5	9-17-59	4300	300	Navajo	SS	Contact	Alcove	-	Air check; Cow Canyon
GJ-331	7.7-2.55	The Rincon	< 5	9-17-59	4350	0	Navajo	SS	Contact	Head of canyon	-	Air check; Cow Canyon
GJ-332	7.25-2.05	The Rincon	< 5	9-17-59	4350	0	Navajo	SS	Contact	Head of canyon	-	Air check; Cow Canyon

GJ-328	8.65-4.5	The Rincon	< 5	9-17-59	4150	150	Navajo	SS-	Contact	Alcove	-	Air check; Cow Canyon
GJ-329	7.75-4.3	The Rincon	< 5	9-17-59	4250	0	Navajo	SS	Contact	Head of canyon	-	Air check; Cow Canyon

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GJ-330	9.25-4.0	The Rincon	< 5	9-17-59	4300	300	Navajo	SS	Contact	Alcove	-	Air check; Cow Canyon
GJ-331	7.7-2.55	The Rincon	< 5	9-17-59	4350	0	Navajo	SS	Contact	Head of canyon	-	Air check; Cow Canyon
GJ-332	7.25-2.85	The Rincon	< 5	9-17-59	4350	0	Navajo	SS	Contact	Head of canyon	-	Air check; Cow Canyon
GJ-333	5.85-4.85	The Rincon	< 5	9-17-59	4600	100	Navajo	SS	Contact	Side of cliff	-	Air check; Long Canyon
GJ-334	5.80-4.0	The Rincon	< 5	9-17-59	4600	0	Navajo	SS	Contact	Head of canyon	-	Air check; Long Canyon
GJ-335A	5.05-5.05	The Rincon	< 5	9-17-59	4550	100	Navajo	SS	Contact	Head of canyon	-	Air check; Long Canyon
GJ-335B	4.95-5.25	The Rincon	< 5	9-17-59	4550	100	Navajo	SS	Contact	Head of canyon	-	Air check; Long Canyon
GJ-336	4.55-6.05	The Rincon	< 5	9-17-59	4550	0	Navajo	SS	Contact	Head of canyon	-	Air check; Long Canyon
GJ-337	4.70-6.70	The Rincon	< 5	9-17-59	4500	50	Navajo	SS	Contact	Head of canyon	-	Air check; Long Canyon
GJ-338	4.65-7.0	The Rincon	< 5	9-17-59	4500	50	Navajo	SS	Contact	Alcove	-	Air check; Long Canyon
GJ-339	5.70-7.20	The Rincon	< 5	9-17-59	4450	375	Navajo	SS	Contact	Alcove	-	Air check; Long Canyon
GJ-340	6.05-9.5	The Rincon	50	9-17-59	3650	0	Wingate (Lukachukai)	SS	---	Head of inner canyon	-	Air check; Long Canyon
GJ-341	4.0-8.85	The Rincon	< 5	9-17-59	4400	100	Navajo	SS	Joint	Alcove	-	Air check; Long Canyon
✓GJ-342	3.2-12.95	Cummings Mesa	5-10	9-17-59	3625	0	Navajo	SS	Joint	Bottom of canyon	-	Air check; False Entrance Canyon
✓GJ-343	6.0-12.4	Cummings Mesa	5-10	9-17-59	3550	0	Navajo	SS	Joint	Bottom of canyon	-	Air check; Catfish Canyon
GJ-344	6.7-1.7	Navajo Creek	20	9-16-59	3600	0	Navajo	SS	Joint	Bottom of canyon	-	Air check; West Canyon Creek
GJ-345	6.05-3.05	Navajo Creek	5	9-16-59	3950	0	Navajo	SS	Joint	Shallow canyon	-	Air check; West Canyon Creek
GJ-346	1.95-5.85	Navajo Creek	< 5	9-16-59	4600	0	Navajo	SS	---	Shallow canyon	-	Air check; West Canyon Creek
GJ-347	2.8-5.05	Navajo Creek	< 5	9-16-59	4300	0	Navajo	SS	---	Shallow canyon	-	Air check; West Canyon Creek
✓GJ-348	9.85-15.8	Gunsight Butte	5-10	9-18-59	3300	0	Navajo	SS	Joint	Shallow canyon	-	Air check; Warm Creek
✓GJ-349	8.4-14.45	Gunsight Butte	< 1	12-4-59	3980	0	Alluvium	S	---	Bottom of wash	-	Cottonwood Wash

Spring No.	Location No. (Miles)	Quadrangle	Estimated Discharge (Gals. per Minute)	Date of Measurement	Altitude Above Mean Sea Level (ft)	Altitude Above Canyon Bottom or Stream (ft)	Stratigraphic Unit	Rock Type	Descriptions of Spring	Physiographic Position	Water Sample Taken	Remarks and General Location
✓ GJ-350	12.17-16.0	Gunsight Butte	1/4	12-4-59	3980	0	Entrada	SS	Contact	Hillside	-	On divide between Warm and Wahweap Creeks
GJ-352	13.10-1.80	Leche-e Rock	Check	12-5-59	3240	0	Navajo	SS	Joint	Bottom of canyon	-	Wahweap Creek
GJ-353	6.44-6.7	Navajo Mtn.	-	-	3600	60	Wingate (Lukachukai)	SS	Joint	Side of canyon	-	Flow would fill 1-inch pipe; reported by Miser (1924); Bald Rock Canyon
GJ-354	1.0-4.7	Navajo Mtn.	-	-	3700	200	Wingate (Lukachukai)	SS	Contact	Alcove canyon	-	Reported by Miser (1924); Wilson Canyon
✓ GJ-355	6.2-16.78	Lake Canyon	-	-	4325	0	Landslide	-	---	Bottom of wash	-	Flows for 1 mile Sept. 1921 (Miser, 1924); no flow in 1958-59; Side Canyon
140 ✓ GJ-356	1.65-16.48	Lake Canyon	-	-	4700	500	Wingate (Lukachukai)	SS	Contact	Side of canyon	-	Fills 2-inch pipe (Miser, 1924); Castle Creek
✓ GJ-357	0.58-15.08	Lake Canyon	-	-	5100	25	Navajo	SS	Joint	Shallow canyon	-	Reported by Miser (1924); side tributary
GJ-358	8.2-10.5	Navajo Mtn.	5	9-24-59	4400	0	Navajo	SS	Joint	Head of canyon	-	Mystery Canyon
GJ-359	8.25-8.4	Navajo Mtn.	-	9-59	3350	0	Navajo	SS	Pools	Head of shallow canyon	-	Mystery Canyon
GJ-360	5.95-7.8	Navajo Mtn.	-	9-59	4010	0	Navajo	SS	Pools	Bottom of canyon	-	Baldrock Canyon
GJ-361	9.2-10.15	Navajo Mtn.	-	9-59	3975	0	Navajo	SS	Pot hole	Head of canyon	-	Mystery Canyon
✓ GJ-362	6.2-14.07	Nipple Butte	-	12-59	3655	0	Alluvium	S,G	---	Flood plain	-	Not visited; Wiregrass Spring; Waheap Creek
✓ GJ-363	13.05-9.2	Gunsight Butte	< 5	12-59	3440	0	Norrison (Salt Wash)	SS	---	Side of valley	-	Air check; Warm Creek