UTAH DIVISION OF OIL, GAS AND MINING

REMARKS: WELL LOG ____ ELECTRIC LOGS ____ FILE X WATER SANDS ____ LOCATION INSPECTED ____ SUB. REPORT/ABD. ____

DATE FILED 12-11-78

LAND: FEE & PATENTED STATE LEASE NO. PUBLIC LEASE NO. INDIAN 14-20-H62-3455

DRILLING APPROVED: 12-7-78

SPUDDED IN:

COMPLETED: PUT TO PRODUCING:

INITIAL PRODUCTION:

GRAVITY A.P.I.

GOR:

PRODUCING ZONES:

TOTAL DEPTH:

WELL ELEVATION: 6041' GR

DATE ABANDONED: 3-31-80 LOCATION ABANDONED WELL NEVER DRILLED eff. 10-4-79

FIELD: ~~Wildcat~~ 3/86 Altamont

UNIT:

COUNTY: Duchesne

WELL NO. Ute Tribal 12-1 API NO: 43-013-30479

LOCATION 471' FT. FROM (N) ~~XX~~ LINE. 1957' FT. FROM (E) ~~XX~~ LINE. NW NE ¼ – ¼ SEC. 12

TWP.	RGE.	SEC.	OPERATOR	TWP.	RGE.	SEC.	OPERATOR
				4S	6W	12	W. A. MONCRIEF

3/31/80 - Via telephone conversation Mr. Anderson requested application Cancelled, will Re-file if ever drilled. K/A

FILE NOTATIONS

Entered in NID File .....
Location Map Pinned .....
Card Indexed .....
Checked by Chief .....
Approval Letter .....
Disapproval Letter .....

COMPLETION DATA:

Well Completed .....
Location Inspected .....
Bond released
GW..... OS..... PA.....
State or Fee Land .....

LOGS FILED

Driller's Log.....
Electric Logs (No.) .....
E..... I..... Dual I Lat..... GR-N..... Micro.....
Sonic GR..... Lat..... Mi-L..... Sonic.....
CBLog..... CCLog..... Others.....

3-10-80

Form 9-331 C
(May 1963)

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1425.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK: DRILL [X] DEEPEN [ ] PLUG BACK [ ]

b. TYPE OF WELL: OIL WELL [X] GAS WELL [ ] OTHER — SINGLE ZONE [X] MULTIPLE ZONE [ ]

2. NAME OF OPERATOR: W.A. Moncrief

3. ADDRESS OF OPERATOR: P.O. Box 2573 Casper, Wyoming 82602

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.*)
At surface: 471' FNL - 1957' FEL Section 12, T4S, R6W, U.S.B.& M.
At proposed prod. zone

5. LEASE DESIGNATION AND SERIAL NO.:

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: Ute Indian

7. UNIT AGREEMENT NAME: 14-20-H62-3455

8. FARM OR LEASE NAME: Ute Tribal

9. WELL NO.: #12-1

10. FIELD AND POOL, OR WILDCAT: Wildcat

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec 12, T4S, R6W, U.S.B. & M.

12. COUNTY OR PARISH: Duchesne

13. STATE: Utah

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*: 10 Miles from Duchesne

15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. unit line, if any)

16. NO. OF ACRES IN LEASE: 640

17. NO. OF ACRES ASSIGNED TO THIS WELL: 640

18. DISTANCE FROM PROPOSED LOCATION* TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT.

19. PROPOSED DEPTH: 8200'

20. ROTARY OR CABLE TOOLS: Rotary

21. ELEVATIONS (Show whether DF, RT, GR, etc.): 6041'

22. APPROX. DATE WORK WILL START*: January 31, 1978

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
14 3/4"	10 3/4"	40.5	600'	Circulate to surface
9 5/8"	7 5/8"	26.4	6200'	400 sx
6 1/2"	5"	15#	6000-8200'	300 sx

CONFIDENTIAL

We propose to drill an 8200' Wasatch test and if commercial show of oil and gas are encountered, set casing, perforate and evaluate any productive interval.

State of Utah, Department of Natural Resources
Division of Oil, Gas, and Mining
1588 West North Temple
Salt Lake City, Utah 84116

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen or plug back, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

24.

SIGNED W.A. Moncrief TITLE Representative DATE November 20, 1978

(This space for Federal or State office use)

PERMIT NO. _____ APPROVAL DATE _____

APPROVED BY (Orig. Sgd.) R. A. Henricks TITLE ACTING DISTRICT ENGINEER DATE MAR 22 1979

CONDITIONS OF APPROVAL, IF ANY:

NOTICE OF APPROVAL

CONDITIONS OF APPROVAL ATTACHED TO OPERATOR'S COPY

*See Instructions On Reverse Side

NECESSARY FLARING OF GAS DURING DRILLING AND COMPLETION APPROVED SUBJECT TO ROYALTY (NTL-4)

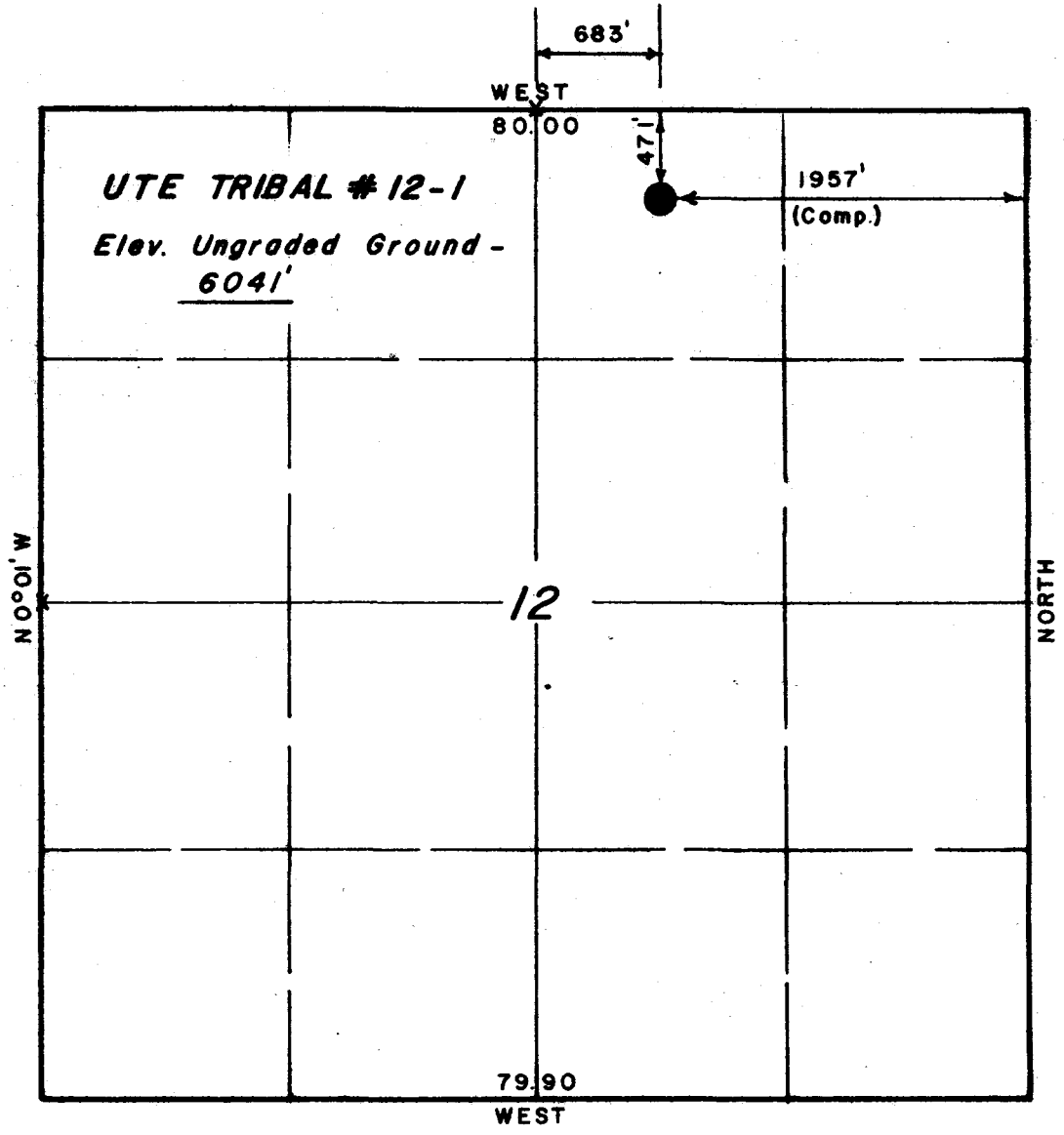
STATE O&G

PROJECT

W.A. MONCRIEF

Well location, *UTE TRIBAL #12-1* located as shown in the NW 1/4 NE 1/4 Section 12, T4S, R6W, U.S.B.&M. Duchesne County, Utah.

T4S, R6W, U.S.B.&M.



X = Section Corners Located

CERTIFICATE

THIS IS TO CERTIFY THAT THE ABOVE PLAT WAS PREPARED FROM FIELD NOTES OF ACTUAL SURVEYS MADE BY ME OR UNDER MY SUPERVISION AND THAT THE SAME ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

Dana Stewart

REGISTERED LAND SURVEYOR
REGISTRATION Nº 3154
STATE OF UTAH

UINTAH ENGINEERING & LAND SURVEYING
P. O. BOX Q – 110 EAST - FIRST SOUTH
VERNAL, UTAH - 84078

SCALE 1" = 1000'	DATE 11 / 14 / 78
PARTY S.S. G.S. J.M. S.M.	REFERENCES GLO Plat
WEATHER Cool & Dry	FILE W.A. MONCRIEF

U. S. GEOLOGICAL SURVEY - CONSERVATION DIVISION

T. 4S., R. 6W., USM

FROM: : DISTRICT GEOLOGIST, [redacted], SALT LAKE CITY, UTAH

TO : DISTRICT ENGINEER, O&G, SALT LAKE CITY, UTAH

SUBJECT: APD MINERAL EVALUATION REPORT LEASE NO. 14-20-H62-3455

OPERATOR: W. A. Moncrief WELL NO. 12-1

LOCATION: ½NW ¼NE ¼ sec. 12, T. 4S, R. 6W, USM

Duchesne County, Utah

1. Stratigraphy: The surface rocks are of the Uintah Formation. The operator is testing the Wasatch Formation 8200' for oil & gas.

2. Fresh Water: Usable water may occur in the Uintah & Wasatch & Green River Fms.

3. Leasable Minerals: This hole will be within lands classified as prospectively valuable for Semi-Solid & Solid Hydrocarbon also within oil shale lands. Both oil shale & bitumens are in the Green River Formation & these beds if encountered should be protected.

4. Additional Logs Needed: none.

5. Potential Geologic Hazards: Unknown.

6. References and Remarks: none.

Signature: emb Date: 12-4-78

Oil and Gas Drilling EA No. 081-79

United States Department of the Interior
Geological Survey
8440 Federal Building
Salt Lake City, Utah 84138

Unusual Environmental Analysis No. 081-79

Application for Permit to Drill
W. A. Moncrief, Operator

Well No. 12-1 Ute Tribal Lease No. 14-20-H62-3455
NW/4 NE/4 Sec. 12, T.4S., R.6W.
USB&M, Duchesne County, Utah

Prepared by: George Diwachak, Environmental Scientist, Salt Lake City, Utah
John Evans, Environmental Scientist, Grand Junction, Colorado

Date: February 20, 1979

Related Environmental Analyses

(1) EA No. 1181

Noted - G. Diwachak

Table of Contents

Appendices

Appendix 1 - Geological Survey Reports

Appendix 2 - Surface Management Agency Concurrence and Correspondence

Appendix 3 - Endangered and Threatened Species Clearance

Appendix 4 - Cultural Resource Clearance

Appendix 5 - Relevent Correspondence, Private Surface Rehabilitation Requirements, Conservation Division Responses

Appendix 6 - Mitigative Measures and Stipulations

Appendix 7 - Maps and Photographs

Appendix 8 - Copy of Proposed Plan

Introduction:

The following participated in a joint inspection of the proposed wellsite and access on January 10, 1979.

Name	Representing
John Evans	U.S. Geological Survey, Grand Junction, Colorado
Lynn Hall	Bureau of Indian Affairs, Fort Duchesne, Utah
Clayton Norby	W. A. Moncrief
Mike Stewart	Uintah Engineering
Jack Skewes	Skewes and Hamilton Contractors
Brent Neilson	M & M Oil Field Service

Proposed Action:

On December 26, 1978, W. A. Moncrief filed an Application for Permit to Drill the No. 12-1 development well, a 8200 ft. oil test of the Wasatch Formation. The proposed test is located 471' FNL and 1957' FEL, NW¼ NE¼ Sec. 12, T.4S., R.6W., USB&M at 6041 feet above sea level on the Uinta Formation on Ute Tribal mineral lands and surface under lease No. 14-20-H62-3455.

A rotary rig would be used for drilling. The proposed casing and cementing program would be adequate to protect other leasable solid minerals and for a producing oil and gas well. All fresh water zones should be cased off and cemented.

A blow-out preventer would be used during the drilling of the well. The proposed pressure rating is considered adequate for tests in the area. It should be noted, however, that Mountain Fuel Supply reported a blowout at 8,471 feet in the Green River Formation in its oil and gas test No. 2 Cedar River drilled about 6 miles northwest of this proposal in SW/4 NE/4 Sec. 20, T.3S., R.6W., USB&M. The operator's NTL-6 10-Point Subsurface and 13-Point Surface Protection Plans are included in Appendix 8.

The operator proposes to construct a drilling pad 175' x 325' (about 1.4 acres) and a reserve pit 100' x 150' wide (0.3 acres) and 8' deep. At least half of the 8 foot depth should be below the existing ground surface. A poor jeep trail would be upgraded for 1.25 miles to an 18' crown road. The remaining portion of road would be new construction. The operator would abandon portions of the existing jeep trail while constructing the new access road in order to maintain grades less than 8%. Total access road construction would be 1.6 miles in length.

The operator would be required to permanently close, water bar and reseed those abandoned portions of the jeep trail. The operator would also be required to install drainage ditches, reseed slope cut areas, and restrict grades to a maximum of 8% along the entire proposed access road. It is important that grades be reduced to less than 8% to accomodate possible oil truck transports, thus minimizing spill potential. Three culverts 18" x 30' would be necessary. Refer to Map B of operator's 13-Point Surface Protection plan included in Appendix 8. The access road was changed at the operator's request to enter the location at stake corner #8 (See Diagram B of 13-Point Surface Protection Plan, Appendix 8) to reduce the grade onto the proposed pad. A portion of the access road in NE/4 SE/4 Section 14, T.4S., R.6W., USB&M crosses private land (see Map B of 13-Point Plan). The operator has secured the necessary private surface rehabilitation agreement. (See Appendix 5.) The junction of the existing improved road and the proposed access road (NE/4 SW/4 Section 14) is located on a ridgetop on a curve of the existing road, creating a blind intersection. Two "Trucks Entering Highway, Be Prepared To Stop" or similar warning signs should be placed 200 feet from the junction of the proposed access road, on the existing improved road. Disturbed surface of the road construction would average 24' in width and cummulate about 4.8 acres.

If production is established the operator would erect production facilities on disturbed areas of the proposed pad. The pad would be widened 25' to accommodate production facilities as requested on Diagram D of the 13-Point Plan. This construction would not occur until production is established. The additional disturbance encompasses 0.15 acres.

Rehabilitation plans would be decided upon as the well neared completion. Concerned surface management agencies would be consulted for technical expertise on those arrangements.

The anticipated starting date of operations is upon approval, depending on rig availability. The duration of drilling activities would be about 75 days.

There was no objection raised during the field examination to the proposed wellsite. No objection was raised to the access road except for culvert size. The diameter of culverts was increased to 18" from the 12" size proposed.

Location and Access:

The proposed test site is located approximately 10 miles west of Duchesne, Utah, the nearest town. Starvation Reservoir is approximately 0.5 miles to the north. A registered land survey plot (in operator's APD, Appendix 8)

shows the precise land location of the proposed hole and its approximate ground elevation of 6041 feet above sea level.

Road access to the proposed site is shown on Maps A and B of the 13-Point Plan, and figure 1, Appendix 7.

Topography:

The proposed site is in an area located along the northern slope of the Book Cliff Mountains forming a part of the West Tavaputs Plateau. The region is interlaced with numerous canyons, ridges, and bench lands with relatively steep side slopes with ledges formed by sandstone and conglomerates.

The proposed location is on a NE by SW trending ridge, sloping SW at approximately 4% grade, that separates Weeint Hollow on the east from Skitzy Canyon on the west. The pad is situated in a small saddle with a 6077' ridgetop peak to the north. See figure 1, Appendix 7. This topographic location tends to obscure the proposed location from the view of reservoir users.

Starvation Reservoir has a designed active conservation stage of 5,712.0' above sea level, an inactive stage of 5,624.8', and a maximum water stand of 5,718.3'. The proposed test would be within about 2640 feet of the high water line and range, with the changing stage levels, from about 223 to 416 feet above the reservoir surface.

Geology:

References concerning the geology and petroleum potential of the area include: Alvord, 1978, Crawford, 1963, Keroher, et al, 1966, Nackowski, et al, 1963 and Price and Miller, 1975.

The proposed test is located in the western portion of the Uinta Basin. Major structural elements related to the basin's history and setting are shown in figure 2, Appendix 7. The geologic section and aerial geology of the Duchesne area is summarized on figure 3, Appendix 7. Figures 4, 5, and 5a, Appendix 7 outline structural and stratigraphic features relevant to the setting of the proposed test.

The Uinta Basin is a large synclinal trough formed by the deformation of tertiary and older rocks. The main axis of the syncline trends generally eastward and lies roughly 10 to 20 miles north of the central portion of the basin. Thus, the rock strata in the basin dip generally to the north.

Among the rock formations listed on figure 3, Appendix 7, only the Wasatch, Green River, and Uinta Formations are of direct concern to the

application. Surface rocks throughout most of the Starvation Reservoir area are of the Uinta Formation, Eocene in age. The operator claims that the Green River Formation is at the surface, however, a search of the literature, and the Mineral Evaluation geologic report (Appendix 1) shows the Uinta Formation to be exposed at the surface.

The exposures of Uinta rocks are chiefly made up of complex interstratified lenticular units of quartz wacke sandstone and bentonitic shales. The sandstone is mostly light gray weathering buff to slightly reddish brown, fine-to-medium grained, moderately consolidated, locally calcareous. The shale is variegated shades of grayish red, grayish green, and medium-dark gray, silty to sandy, bentonitic, and locally calcareous. When not eroded the maximum thickness of the Uinta Formation is about 4,000 feet. These surface rocks dip from 2-4^{o}north to northeast, in conformity with the regional structure of the Uinta Basin. All the proposed surface activity will be in these rocks or soils derived thereof.

The Green River Formation is known only from the subsurface in the application area. Of Paleocene and Eocene in age, this formation is made up mainly of complexly interstratified mostly thin beds of shale, siltstone, sandstone, and limestone of lacustrine origin and some beds of oil shale and carbonate evaporties. Units with lithologies clearly of Green River in nature interfinger with both the overlying Uinta Formation and the underlying Wasatch Formation. In the western part of the Uinta Basin and the vicinity of Duchesne, the maximum thickness of the Green River may approach 7,000 feet.

Paleocene in age, the Wasatch Formation consists chiefly of lacustrine grayish red shale, sandstone, and conglomerate. It interfingers with the underlying formations and its maximum lithostratigraphic thickness may exceed 5,000 feet in the western Uinta Basin area. The formation is an important source of oil and gas in the Uinta Basin.

Hydrocarbons:

In the Duchesne region of the Uinta Basin natural gas, condensates, and oil is produced from the top of the Lower Green River Formation to the base of the Wasatch Formation (top of the Cretaceous). State regulated drilling units are 640 acres with no more than one well on any such unit in production from the defined common source of supply. Accumulation and entrapment is largely stratigraphic in sandstone effected in part, by structural gradients, and in part by complex intertonguing and lithofacies changes, both inter-and intra-formation. Fault control is inferred locally. Production from the upper part of the Wasatch and Units A and B of the Black Shale facies of the Green River Formation, has been comingled in some wells, but more commonly first production is obtained

from the Wasatch, the reserves in the Green River being held for later test and production.

The oils from the Duchesne area are paraffin based with high gravity and pour points. Solidifying temperatures as high as 130°F are reported. Reportedly, the oil leaves the ground at temperatures as high as 150°F. The A.P.I. gravity rating averages at about 40. Although the high gravity-pour point of this oil creates problems in production and transport, the same property reduces the chance of an oil spill reaching a drainage almost to zero. At nearly any potential ambient temperature, the oil will be like shoe-polish-wax or grease, will flow very short distances and will not soak into the soil.

The oil is light yellow, practically free of sulfur. Natural gas from the area is "sweet" or essentially free of hydrogen sulfide and generally high in BTU value.

Other Leasable Minerals:

Geological Survey information indicates that all of the lands within figure 1, Appendix 7, are valuable for oil and gas, oil shale, and asphalt (bituminous limestone and wurtzilite), and are without value for other minerals, either metalliferous or non-metalliferous. All of these lands are in oil shale withdrawal by Executive Order No. 5327, approved April 15, 1930.

Oil Shale:

The thickest and the richest of the oil shale deposits occur near the deepest part of the Uinta Basin. The lands involved here are situated near the edge of the basin and, though they are in the Oil Shale Withdrawal, would have a nominal value for oil shale. Preliminary data indicates that the oil shale deposits in this area are approximately 15 feet thick and would yield about 15 gallons of oil, or less, per ton of rock.

Asphaltic Materials:

It has been known since 1901 (and probably earlier) that the Green River Formation in the general area of lands involved in this report contains some bituminous limestones. The bitumen impregnated limestones are generally two to six feet thick with an outcrop length of 50 to 500 feet and commonly contain between 10 and 20 percent bitumen, with a maximum of 70 percent. Wurtzilite veins also occur in this area, enclosed in the bituminous marlstones of the Uinta Formation. Liquid quartzilite oozes from the bed of the Stawberry River west of Duchesne.

A geologic review of the proposed action has been furnished by the Area Geologist, U.S. Geological Survey, Salt Lake City, Utah, and is included in Appendix 1.

The operator's drilling, cementing, casing and blowout prevention programs have been reviewed by the Geological Survey engineers and determined to be adequate.

Geologic Hazards:

Geologic hazards in the area can be classified as minimal. Flash flooding might prove to be costly in terms of road maintenance but would not be of scope to endanger workers. The topographic situation of the proposed drill pad eliminates the hazard of flash floods at the site. The project is in a zone of minimal seismic risk where only a minor danger from earthquakes would be expected. All recorded earthquake activity from 1853 to 1975 in the west central Uinta Basin area and surroundings is shown on figure 6, Appendix 7.

Soils:

No detailed soil survey has been made of the project area. However, generalized information is available (Wilson, et. al., 1975). The top soils in the area range from a silty clay loam to a gravelly and cobbly loam. The soils are well drained and moderately permeable. Runoff potential is medium and sediment production would be moderately high. The soils are mildly to moderately alkaline and support the pinyon, juniper association. The soils have little agricultural value. They are used mainly for range, wildlife habitat, water yielding areas and recreation. Some use is made of tree species for fuel and fence posts.

Top soils would be removed from the surface and stockpiled. The soil would be spread over the surface of disturbed areas when abandoned to aid in rehabilitation of the surface. Rehabilitation is necessary to prevent erosion and encroachment of undesired species on the disturbed areas. The operator proposes to rehabilitate the location and access roads per the recommendations of the Bureau of Indian Affairs, as designated by the surface owner. (See Private Rehabilitation Agreement, Appendix 5.)

Due to the permeability of the soils and rock outcrops, the reserve pit should be lined with an impervious material, preferably plastic, to insure pit integrity. Experience with other wells in the area has proven the need to line reserve pits. Due to the critical area involved with this proposal, plastic would be preferred over a clay type lining.

Climate:

At a general altitude of 5,520' above sea level on the flood plain of the Duchesne and Stawberry Rivers, the climate at the town of Duchesne is semiarid. During the interval 1906-1972 annual precipitation at Duchesne ranged from 4.60 to 15.70 inches and averaged 9.19 inches. Dryer than average cycles occurred in the area during the mid-1930's, the late 1950's, the early 1960's, and from 1965-1972. Most precipitation in the area falls in the July-October period, the season of peak thunderstorm activity in the Uinta Basin. During this period local torrential rains result in rapid run off and flash floods.

The area has hot summers and cold winters. During the interval 1941-1972, the mean annual temperature at Duchesne ranged from less than $20^{o}F$ in January to about $70^{o}F$ in July. During the same period the annual temperature averaged $45.3^{o}F$ and the coldest January averaged $17.9^{o}F$. However, minimum midwinter temperatures commmonly fall below $0^{o}F$ and maximum midsummer temperatures commonly exceed $90^{o}F$. The growing season-average number of days between the last spring-first fall temperature of $28^{o}F$-is about 150 days.

Evapotranspiration in the Uinta Basin area is high. Average annual lake evaporation in most of the area exceeds 36 inches which greatly exceeds the average annual supply from precipitation.

Winds are medium and gusty, occurring predominately from the southwest toward the northeast, but there are no data available concerning this or the pattern of the winds velocities. Air mass inversions are seasonal, occurring frequently in winter.

Air Quality:

No specific data on air quality is available at the proposed location. The proposed test is in an area where all National Ambient Air Quality Standards (NAAQS) are being met for all evaluation pollutants (SO_2, CO, HC, NO_2, O_x and SPM) and is included in a Class II Prevention of Significant Deterioration (PSD) requirement area. That is, the area is an "attaining area" in which new facilities are subject to PSD requirements.

Hydrology:

The Stawberry River, including Starvation Reservoir, is the only perennial surface drainage serving the application area. Drainage from the proposed location would be eastward toward Weeint Hollow, but some drainage to the Skitzy Canyon system (westward) is possible. (See Figure 1, Appendix 7.) Both Skitzy Canyon and Weeint Hollow drain northward to Starvation Reservoir. Longterm discharge measurements at gaging stations located close above Starvation Reservoir and at Duchesne are reported in Water Plates No. 1 and 2, Appendix 7 (taken from Hood, et al. 1976).

Potable ground-water in the area occurs mainly in unconsolidated glacial outwash and alluvium along the Stawberry River Channel (now beneath Starvation Reservoir), and in the consolidated rocks of the Uinta and Green River Formations. However, the rocks of the basin generally have low permeability and commonly yield very saline to briny water. Some of the rocks do have high permeability where they are fractured.

The Uinta Formation is not water bearing in many places, having been drained by deeply incised streams. Sandstone, principally in the upper part of the Uinta, commonly contains water under artesian pressure but the aquifers generally have low permeabilities. Where saturated, generally in perched aquifers, the formation commonly yields less than 5 gal/min. to springs (Price and Miller, 1975.).

The overall permeability of the Green River Formation is low. Most spring discharges are from the Parachute Creek member with yields less than 10 gal./min. (Price and Miller, 1975). The upper part of the formation is not water bearing in many places owing to low permeability or having been drained by deeply incised streams.

Overall permeability of the Wasatch Formation is generally low. The formation generally yields less than 50/gal/min of water to springs and wells (oil and gas wells) (Price and Miller, 1975).

Water quality of the Stawberry River water from gaging stations and sampling sites located close above Starvation Reservoir and at Duchesne are reported on Water Plates No. 3, 4, and 5, Appendix 7 (taken from Hood, et al. 1976). In general the water quality above the reservoir is good with dissolved solids averaging around 500 mg/l. Water quality decreases slightly downstream of the reservoir as evidenced by the increase of dissolved solids. This results predominately from increases in concentrations of sulfate and sodium (Mundorff, 1977). The increase of these and other elements is attributed to inflow of saline ground water, runoff, irrigation return flows and to concentration of dissolved solids by evapotranspiration of the stream water (Price and Miller, 1975).

Ground water in the area ranges from fresh to very saline, depending upon the lithology and the depth of burial of the producing zone. Plates 6 and 7, Appendix 7 (taken from Price and Miller, 1975), show chemical analysis of water taken from various water and oil and gas wells in the area. Observation of well samples drilled in various sections in T.4S., R.6W and T.4S., R.5W. USB&M, nearest the proposed test, shows dissolved solids concentrations near 3000 mg/l for Uinta Formation wells, and concentrations about 7500 mg/l for Green River and Wasatch Formation wells. Only the Uinta Formation water would be useable for livestock and at best could be considered fair (Price and Miller, 1975).

Ground-water recharge is normally derived from precipitation that falls within and nearby the area of concern and from seepage losses along the perennial drainage ways. Since the Starvation Reservoir was established, it is likely that seepage intake along this portion of the Stawberry River has increased at some localities. Although the rate of groundwater movement is slow in most places because of the generally low permeability of the rocks, the probable extent and configuration of fractured ground in the locality of the proposed test cannot be predicted. Also, available water-level data are insufficient to determine direction of groundwater movement in the area. It is possible that fresh or useable saline water reserves in the vicinity of the proposed test, at times move towards the reservoir and at other times are receiving water from the reservoir, depending upon changes in the potentiometric surface and in the levels of the reservoir. Most likely, at the proposed test water occurring in the upper several hundred feet of the rock column flows slowly through the rocks towards the reservoir.

Flora and Fauna:

The application area is within the pinyon-juniper, or pigmy conifer, zone of vegetation which occurs between 5,500 and 7,000 feet in the Uinta Basin region. Generally, sagebrush tends to occupy valleys, mesas or gentle slopes with fine deep soils, while pigmy conifers utilize ridges, canyons or rough slopes with coarse, rocky or shallow soil (Zarn, 1977).

The project area is vegetated by an overstory of pinyon and juniper trees. Due to the heavy snow cover at the time of the onsite inspection, the understory vegetation could not be determined.

The fauna of the area consists predominately of mule deer, coyotes, rabbits, foxes and varieties of small ground squirrels and other types of rodents and various types of reptiles. Although not abundant, bobcats and badgers inhabit the area. The birds of the area are raptors, finches, ground squirrels, magpies, crows and jays.

According to the Bureau of Indian Affairs Environmental Impact Analysis for the proposal (Enclosed in Appendix 7) there are no endangered species inhabiting the project area.

The application area is within the distribution range of six species of wildlife Federally listed as endangered. These species include: the black-footed ferret, the American peregrine falcon, the whooping crane, the bald eagle, the Colorado River squawfish and humpbacked chub. The area is also within the range of the bobcat, which is on the States list of declining species.

Eastern Utah is on the western fringe of the black-footed ferret distribution range (Snow, 1972). However, the lack of prairie dog habitat in the project area, of which ferrets are closely associated would make their presence improbable.

The whooping crane, although not indigenous to the area, could be present during migration. Recent wildlife projects in Idaho, where whooping crane eggs were hatched beneath greater sandhill crane parents, have been successful in producing adult birds.

A memorandum from the U.S. Fish and Wildlife Service (Appendix 3) states that the bald eagle winters throughout Utah and may be seen near Starvation Reservoir from mid-November to mid-March. It also states that the peregrine falcon has been reported in Duchesne County during the breeding season (March-July). No nest sites have been identified in the area of concern; however, several peregrine eyries are located in northeastern Utah. In addition, peregrines may hunt along the shores of the reservoir during the migratory season.

The Colorado River squawfish and humpbacked chub, although indigineous to the Green River system which includes the Duchesne River, would be unlikely inhabitants of Starvation Reservoir. The reservoir dam would limit any migrations of these species.

The U.S. Fish and Wildife memorandum (Appendix 3) reports that no federally listed endangered plant species occur near the proposed well site; however, three plants proposed for Federal listing occur near Starvation Reservoir. Eriogonums hylophilum (wild buckwheat), Lepidium barneybyanum (pepperweed), and Sclerocactus glaucus (no common name) have been collected in Duchesne County and may occur in T.4S., R.6W.

Socio-economics and Land Use:

The area is sparsely populated, averaging about 3.7 persons per square mile. About 2,250 people reside at Duchesne (Alvord, 1978), the only town in the immediate area. Some 15-20% of Duchesne's population depend upon oil and gas for income; about 25% on the U.S. Bureau of Reclamation, 40% upon services and trades, and 20% upon farming and ranching.

Social and economic conditions in the area are in disequilibrium due to a growing, if somewhat fluctuating movement from a century-long totally agrarian based economy towards a diversified economy in which exploration and production of oil and gas, river basin development (Bureau of Reclamation), tourism, hunting and fishing, summer residence, and allied service industries, have become major if not predominant. Seemingly, people who are almost exclusively of one religion and common socio-economic culture, are being overwhelmed by people of mostly other religions, differing life styles, and notably higher incomes.

Drillers and operators would employ some local people (drivers and helpers) as well as obtain goods and shelter in Duchesne. This increase

in the local economy is temporary but welcome by the merchants and motel operators. The proposed action would not strain facilities as the town has adequate transient facilities, even during the tourist season.

The proposal is on Ute Tribal Surface where controlled grazing, hunting and wildlife habitat are the only established uses. There are no occupied or abandoned dwellings in the area. Neither archaeological sites or fossils of unusual scientific interest are known in the area of the proposal. Archaeological clearance has been granted by the Bureau of Indian Affairs based upon a survey conducted by Dr. Clifton M. Wingall, Archaeologist. (See Appendix 4.). The surrounding area has exploration and production of oil and gas as the most economically important activity. In view of the nations increasing desperate need for convenient petroleum products and the current research towards improved methods of secondary and tertiary production, it is likely the area will see increased development-production expenditures and associated employment for at least 50 years.

The site is approximately 2640 feet south of Starvation Reservoir, an important recreation area. The reservoir is used for fishing, boating, swimming, camping and general scenic value. The monthly visitation record for Starvation Reservoir in 1977 is tabulated below.

Month	Visitors
January	825
February	926
March	2,202
April	4,914
May	18,974
June	15,005
July	28,044
August	17,399
September	12,965
October	3,115
November	1,029
December	845
1977	106,243

See socio-economic Plate No. 1, Appendix 7 for a detailed summary of the physical features, recreational facilities, and uses made of this reservoir.

Other than the reservoir, there are no formally designated recreational facilities, nor national, state or local parks, forests, wildlife refuges or ranges, grasslands, monuments or trails near the proposed location.

Environmental Effects:

Construction of the well pad would denude approximately 1.7 acres of land. The new and reconstructed access road would disturb about 4.8 acres. An estimated 13 ft. cut (15,665 cu. yds.) and 4 ft. fill (4,245 cu. yds.) would be necessary to level the pad area. Vegetation would be removed and a minor relocation of wildlife in the immediate area, particularly small rodents, would be anticipated. Livestock and wildlife grazing and open space qualities would be degraded and restricted to the vicinity of the test. Vegetation removal and construction activities would also increase the erosional potential. If erosion became serious, additional drainage controls such as water bars and dikes would be installed to minimize the problem.

Ground water and surface water quality could be degraded by the proposal. Some minor pollution of ground water systems would occur with the introduction of drilling fluids into aquifers. The potential for communication contamination and comingling of formations via the well bore would be possible. There should, however, be no tangible effect on water migration in fresh water aquifers. The additional erosion expected and the potential for pollution from leaks and spills should have minor impacts on the surface water systems. However, one of the primary sources of water quality degradation, especially in developing oil and gas fields, is the non-point erosion from drill pad areas and access roads. This results in a general cumulative degradation of perennial waterways as a result of increased sedimentation and siltation.

There would be a minor increase in air pollution due to emmissions from rig and support traffic engines. Particulate matter would increase due to dust from travel over unpaved dirt roads. The potential for increased air pollution due to leaks, spills, and fires would be possible.

Relatively heavy traffic would be anticipated during the drilling-operations phase, increasing dust levels and exhaust pollutants in the area. If the well was to be completed for production, traffic would be reduced substantially to a maintenance and production schedule with a corresponding decrease of dust levels and exhaust pollutants to minor levels. If the project results in a dry hole, all operations and impact from vehicular traffic would cease after abandonment. Due to the limited number of service vehicles and limited time span of their operation, the air quality would not be substantially reduced.

Toxic or noxious gases would not be anticipated.

Minor distractions from aesthetics would occur over the lifetime of the project and is judged to be minor. Local topography would eliminate a view of the drill pad and production equipment from reservoir users. The ridge top located to the north of the site (see figure 1, Appendix 7) would block a portion of the drill rig from view. Furthermore,

considering the duration of drilling (75 days) and time of year, the rig would pose a minor and temporary impact to the view of reservoir users.

The site is not visible from any major roads. After drilling operations, completion equipment would not be visible to most passersby of the area and should not present a major instrusion. Painting completion equipment a color to blend with the environment should reduce the visibility of the equipment.

Noise from the drilling operation may temporarily disturb wildlife and people in the area. Noise levels would be moderately high during drilling and completion operations. Upon completion, noise levels would be infrequent and significantly less. If the area is abandoned, noise levels should return to pre-drilling levels.

The economic effect of one well would be difficult to determine. The overall effect of oil and gas drilling and production activity are significant in Duchesne County.

But should this well discover a significant new hydrocarbon source, local, state and possibly national economics might be improved. In this instance, other development wells would be anticipated, with substantially greater environmental and economic impacts.

Should the wellsite be abandoned, surface rehabilitation would be done according to the surface agency's requirements and to USGS's satisfaction. This would involve leveling, contouring, reseeding, etc., of the location and possibly the access road. If the well should produce hydrocarbons, measures would be undertaken to protect wildlife and domestic stock from the production equipment.

Even with adequate blow-out prevention equipment, contingency plans, and experienced crews, a blow-out could happen. A blow-out of gas might burn, which would be visible from the reservoir, but such a burn would be of short duration. If a blow-out of oil were to occur, the oil could be easily cleaned up before reaching Starvation Reservoir.

Approval of the proposed action would be conditioned that adequate and sufficient electric/radioactive/density logging surveys would be made to locate and identify any potential mineral resources. Production casing and cementing would be adjusted to assure no influence of the hydrocarbon zones through the well bore on these minerals. In the event the well is abandoned, cement plugs would be placed with drilling fluid in the hole to assure protection of any mineral resource and fresh water zones.

The potential for loss of circulation would exist. Loss of circulation may result in the lowering of the mud levels, which might permit exposed upper formations to blow out or to cause formations to slough and stick to drill pipe. A loss of circulation would result in contamination due

to the introduction of drilling muds, mud chemicals, filler materials, and water deep into the permeable zone, fissures, fractures, and caverns within the formation to which fluid loss is occurring. The use of special drilling techniques, drilling muds, and lost circulation materials may be effective in controlling lost circulation.

Waste Disposal:

The mud and reserve pits would contain all fluids used during the operations. All trash would be contained in a portable steel mesh trash cage on location and hauled to a sanitary landfill. Sewage would be handled according to State sanitary codes. For further information, see the 13-Point Surface Plan, Appendix 8.

Mitigative Measures and Stipulations:

If the proposal is approved, the following mitigative measures and stipulations should be incorporated into the operator's plan:

1. Two "Trucks Turning Be Prepared to Stop" or similar warning signs would be placed two hundred feet from the junction of the proposed access road, on the existing improved road to reduce traffic hazards on the blind intersection.

2. The portions of the existing jeep trail, abandoned during access road construction should be permanently closed, water barred and reseeded.

3. The operator would install drainage ditches, reseed slope cut areas and restrict grades to a maximum of 8% along the entire proposed access road.

4. Three 18" x 30' culverts would be necessary to allow proper access (See Map B of 13-Point Surface Protection Plan).

5. The operator should take any measure necessary to ensure that all produced fluids, drill cuttings, etc., are contained in approved pits. Pits would be constructed with one-half of the depth below the existing land surface. Due to the permeability and conglomeratic characteristics of the soils, the pits should be lined with an impervious material, preferably plastic, to prevent seepage or leakage.

6. The flare pit (marked Burn Pit on Diagram B of the 13-Point Plan) would be used for flaring and should be constructed a minimum of 125 feet from the wellhead.

7. All topsoil would be saved and used for rehabilitation only. Spoil materials should not be pushed off the ridge top as they would increase erosion and be difficult to recover for rehabilitation.

8. If erosion became serious on the road or drill pad, drainage systems such as water bars and dikes would be installed to minimize the problem.

9. All completion and production equipment would be painted a color to blend in with the natural terrain.

10. The operator would be required to report any leaks and spills to the USGS and other proper authorities.

11. If fresh water should be available from the well, the surface agency may request completion as a water well, if given approval.

12. Any fresh water zones, oil shale zones, bitumin zones, and other mineral bearing formations encountered during drilling should be adequately cased and cemented.

13. If a historic artifact, an archaeological feature or site is discovered during construction operations; activity would cease until the extent, the scientific importance, and the method of mitigating the adverse effects could be determined by a qualified cultural resource specialist.

14. Should the wellsite be abandoned, surface rehabilitation would be done according to the surface agency's requirements and to USGS' satisfaction. This would involve leveling, contouring, reseeding, and possibly replanting of the location and possibly of the access road. If the well should produce hydrocarbons, measures would be undertaken to protect wildlife and domestic stock from the production equipment.

15. Any stipulations of concurrence as determined by the Bureau of Indian Affairs.

Adverse Environmental Effects Which Cannot Be Avoided:

Surface scars resulting from construction work, wellpad and the access road would be visible in the immediate area for the life of the project and for a significant period of time after abandonment while rehabilitation is completed. Grazing would be eliminated in the disturbed areas and there would be a minor and temporary disturbance of wildlife and livestock. Minor induced air pollution due to exhaust emmissions from rig engines and support traffic engines would occur. Minor increases in dust pollution would occur due to vehicular traffic associated with the operation. If the well is a producer additional surface disturbances would be required to install production facilities. Traffic hazards with recreational and other vehicles would be present especially at the blind curve mentioned

previously. Noise levels would increase during construction and drilling and would remain somewhat increased if the well was completed and a pumping unit installed. The potential for fluid spills, gas, leaks, and related accidents would be present, and would provide the potential for pollution to Starvation Reservoir, however, the hazard is judged to be low. Some erosion would be anticipated with the removal of vegetative cover. Erosion is probably the primary impact noted in this area. The potential for subsurface damage to fresh water aquifers and other geologic formations exists. Some minor pollution of ground water systems would occur with the introduction of drilling fluids (filltrate) into the aquifer. This is normal and unavoidable during rotary drilling operations. If hydrocarbons would be discovered and produced, further development of the area would be expected to occur which would result in the extraction of an irreplaceable resource, and further negative environmental impacts. These impacts include the cumulative loss of wildlife habitat due to the areas necessary for roads, pipelines, drillsites, and transmission lines. These actions may disrupt wildlife social behavior and force habitat relocation over an extended period of time. In addition, the cumulative effects of non-point erosion become substantial in a developing field, primarily those located near perennial streams where siltation and sedimentation are critical to aquatic life cycles.

Controversial Issues:

The writers have not encountered any controversial issues during the preparation of this analysis.

Alternatives to the Proposed Action:

1. Not approving the proposed permit--The oil and gas lease grants the Lessee exclusive right to drill for, mine, extract, remove and dispose of all oil and gas deposits.

Under leasing provisions, the Geological Survey has an obligation to allow mineral development if the environmental consequences are not too severe or irreversible. Upon rehabilitation of the site, the environmental effects of this action would be substantially mitigated, if not totally annulled. Permanent damage to the surface and subsurface would be prevented as much as possible under the U.S. Geological Survey and other controlling agencies supervision with rehabilitation planning reversing almost all effects. Additionally, the growing scarcity of oil and gas should be taken into consideration. Therefore, the alternative of not proceeeding with the proposed action at this time is rejected.

2. Minor relocation of the well site and access road or any special, restrictive stipulations or modifications to the proposed program would not significantly reduce the environmental impact. There are no severe vegetative, animal or archaeological-historical-cultural conflicts at

the site. At abandonment, rehabilitation of the area such as contouring reseeding, etc., would be undertaken with an eventual return to the present status as outlined in the 13-Point Surface Plan.

3. The only other alternative would be to deny the operator his rights under the federal oil and gas lease.

Determination:

In my opinion, the proposed action does/does not constitute a major Federal action significantly affecting the quality of the human environment in the sense of NEPA, Section 102(2)(c), and the environmental impacts of the proposed action are not likely to be highly controversial.

District Engineer _____ Date _____

I Concur

Area Supervisor _____ Date _____

I determine that preparation of an Environmental Impact Statement is not required.

Conservation Manager _____ Date _____

Selected References

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Hood, J. W., 1976, Characteristics of Aquifers in the Northern Uinta Basin, Utah and Colorado: Utah Dept. of Natural Resources Tech. Pub. No. 53, 71 p.

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Nackowski, M.P., Fisher, Donald, Beer, Lawrence, 1963, Mineral Resources of Duchesne County: Bulletin of the University of Utah No. 125, 97 p.

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Staff, Upper Colorado Regional Office, 1978 Uintah Unit, Central Utah Project, Utah: U.S. Bureau of Reclamation Draft Environmental Statement, 228 p.

Staff, 1978, Onshore Environmental Assessment Series: CDM 632-Oil and Gas, U.S. Geological Survey, 29 p.

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Appendix No. 1

Memorandum

To: District Oil and Gas Engineer, Mr. Edward Guynn

From: Mining Supervisor, Mr. Jackson W. Moffitt

Subject: Application for Permit to Drill (form 9-331c) Federal oil and gas lease No. 14-20-H62-3455

1. The location appears potentially valuable for:

☐ strip mining.*

☐ underground mining.**

☑ has no known potential.

2. The proposed area is

☐ under a Federal lease for _____ under the jurisdiction of this office.

☑ not under a Federal lease under the jurisdiction of this office.

☐ Please request the operator to furnish resistivity, density, Gamma-Ray, or other appropriate electric logs covering all formations containing potentially valuable minerals subject to the Mineral Leasing Act of 1920.

*If location has strip mining potential:

Surface casing should be set to at least 50 feet below the lowest strip minable zone at _____ and cemented to surface. Upon abandonment, a 300-foot cement plug should be set immediately below the base of the minable zone.

**If location has underground mining potential:

The minable zones should be isolated with cement from a point 100 feet below the formation to 100 feet above the formation. Water-bearing horizons should be cemented in like manner. Except for salines or water-bearing horizons with potential for mixing aquifers, a depth of 4,000 feet has been deemed the lowest limit for cementing.

Signed William A. Hauzo

U. S. GEOLOGICAL SURVEY - CONSERVATION DIVISION

T. 4 S., R. 6 W., USM

FROM: : DISTRICT GEOLOGIST, ME, SALT LAKE CITY, UTAH

TO : DISTRICT ENGINEER, O&G, SALT LAKE CITY, UTAH

SUBJECT: APD MINERAL EVALUATION REPORT LEASE NO. 14-20-H62-3455

OPERATOR: W. A. Moncrief WELL NO. 12-1

LOCATION: ¼NW ¼NE ¼ sec. 12, T. 4S, R. 6W, USM

Duchesne County, Utah

1. Stratigraphy: The surface rocks are of the Uintah Formation. The operator is testing the Wasatch Formation 8200' for oil + gas.

2. Fresh Water: Usable water may occur in the Uintah & Wasatch & Green River Frns.

3. Leasable Minerals: This hole will be within lands classified as prospectively valuable for Semi-Solid & Solid Hydrocarbons. Also within oil shale lands. Both oil shale & bitumens are in the Green River Formation & these beds if encountered should be protected.

4. Additional Logs Needed: none.

5. Potential Geologic Hazards: Unknown.

6. References and Remarks: none.

Signature: emb Date: 12-4-78

Appendix No. 2

United States Department of the Interior
BUREAU OF INDIAN AFFAIRS
UINTAH AND OURAY AGENCY
Fort Duchesne, Utah 84026
801 722-2406 Ext. 41

IN REPLY REFER TO:
Land Operations, SMC

January 15, 1979

Mr. Ed Guynn
District Engineer
USGS Conservation Division
8440 Federal Building
Salt Lake City, Utah 84138

Re: Moncrief Ute Tribal #12-1 located in NWNE, Sec. 12, T.4S., R. 6W., USB&M

Dear Mr. Guynn:

Enclosed is an Environmental Analysis and Negative Declaration. The Surface Use Plan submitted by the operator as part of the application for Permit to drill is adequate with the changes as made at the on site inspection and with the following stipulations:

1. Employees are prohibited from carrying firearms while on the Reservation.

2. The operator will pay surface damages for the pinyon and juniper trees destroyed during construction. Estimated values is $300 per acre.

Archaeological clearance is granted based upon a survey conducted by Dr. Clifton M. Wignall, Archaeologist.

Sincerely,

Acting Superintendent

cc:

Real Property Management

OPTIONAL FORM NO. 10
5010-106

UNITED STATES GOVERNMENT

Memorandum

TO : REAL PROPERTY MANAGEMENT
THROUGH : SUPERINTENDENT

DATE: JANUARY 15, 1979

FROM :SUPVY. SOIL CONSERVATIONIST

SUBJECT:ENVIRONMENTAL ANALYSIS AND NEGATIVE DECLARATION

WE ARE ENCLOSING THE ABOVE NAMED DOCUMENTS FOR W.A. MONCRIEF FOR PERMIT TO DRILL AN OIL WELL.

R. Lynn Hall

R. LYNN HALL

FY/23

NEGATIVE DECLARATION

APPROVAL BY SECRETARY OF THE INTERIOR OF Application for permit to drill an Oil Well FROM Ute Indian Tribe, permitter, TO W. A. Moncrief, permittee, COVERING THE FOLLOWING DESCRIBED TRUST INDIAN LANDS IN Duchesne COUNTY, STATE OF UTAH.

LEGAL DESCRIPTION:

Well site located: 471 feet FNL and 1957 feet FEL in the NWNE, Sec. 12, T. 4S., R.6W.

Access road crosses Indian land in the E½NE¼, Sec. 14, in the SESE, Sec. 11, and in the SW¼, and N½, Sec. 12, all in T.4S., R.6W., USB&M.

IT HAS BEEN DETERMINED AFTER REVIEW OF THE ACCOMPANYING ENVIRONMENTAL ANALYSIS, THAT THE APPROVAL OF THIS permit IS NOT SUCH A MAJOR FEDERAL ACTION SIGNIFICANTLY AFFECTING THE QUALITY OF THE HUMAN ENVIRONMENT AS TO REQUIRE THE PREPARATION OF AN ENVIRONMENTAL IMPACT STATEMENT UNDER SECTION 102(2)(c) OF THE NATIONAL ENVIRONMENTAL POLICY ACTION OF 1969 (42 U.S.C. § 4332 (2)(c).

January 12, 1979
DATE

Acting SUPERINTENDENT

FY:79-23

LEASE# 14-20-H62-3455

WELL No. MONCRIEF-UTE TRI

12-1

UINTAH AND OURAY AGENCY
ENVIRONMENTAL IMPACT ANALYSIS

1. PROPOSED ACTION: W. A. Moncrief proposes to drill an Oil well (Ute Tribal #12-1) to, a proposed depth of 82.00 feet; to construct approximately 1.6 (~~feet~~, miles) of new access road; and upgrade approximately none (feet, miles) of existing access road.

2. LOCATION AND NATURAL SETTING: The proposed wellsite is located approximately 10 miles west of Duchesne, Utah in the NW¼NE¼ Sec. 12 T. 4S., R. 6W., USB& meridian. This area is used for winter range for deer, wildlife habitat, livestock, grazing, hunting and recreation. The topography ~~is~~ at the well site is a large ridgetop, with steep slopes nearby. The vegetation consist of: pinyon and juniper trees.
Wildlife habitat for: x Deer 0 Antelope 0 Elk 0 Bear x Small Mammals x Birds 0 Endangered species x Other rabbits, ground squirrels, other small rodents, coyotes, bobcats, badgers, reptiles, magpies, crows, raptores, jays, ground sparrows.

3. EFFECTS ON ENVIRONMENT BY PROPOSED ACTION: (1) all vegetation (predominantly pinyon and juniper trees) will be cleared and the land surface disturbed on approximately 8 acres used for well site and access road. (2) The scenic and aesthetic values of this area will be lowered. (3) Some soil erosion will occur along access roads and at well site. (4) Some disturbance of wildlife, mainly deer, may occur. (5) Some minor pollution of the atmosphere will occur in the form of dust and exhaust emissions from engines.

4. ALTERNATIVES TO THE PROPOSED ACTION: None, if the well is to be drilled and produced. Alternate access route and well site could not be found that would cause less impact.

5. ADVERSE EFFECTS THAT CANNOT BE AVOIDED: None of the adverse effects listed in item #3 above can be avoided: In order to minimize these effects the operator will: (1) Follow the Surface Use and Operating Plan. (2) Restore and reseed all disturbed land areas to Bureau of Indian Affairs specifications as soon as possible. (3) Prohibit employees from carrying firearms while on the reservation or disturbing wildlife. (4) Control erosion by diverting runoff water from drainage ways along roads and by reseeding disturbed areas.

6. DETERMINATION: This request action (~~does~~) (does not) constitute a major Federal action significantly affecting the quality of the human environment as to require the preparation of an environmental impact statement under Section 102 (2)(c) of the National Environmental Policy Act of 1969 (42 U.S.C. s 4332 (2)(c). Archaeological clearance is granted based upon survey conducted by Dr. Clifton M. Wegnall.

REPRESENTATIVE: John Evans, USGS
Clayton Norby - W.A. Moncrief Co.
Jack Skewes - Skewes & Hamilton Const.
Mike Stewart - Uintah Engr. - Vernal, Ut.

R. Lynn Hall 1-11-79
BIA Representative Date
R. Lynn Hall

COPY TO:
USGS, P.O. BOX 1037, Vernal, Utah 84078
USGS, Dist, Engr., Cons. Div., 8426 Federal Building., Salt Lake City, Utah 84138

Lease #. 14-20-H62-3455
Well #. MONCRIEF-UTE TRIBAL 12-1

FY-79-23

Appendix No. 3

UNITED STATES GOVERNMENT

memorandum

DATE: February 27, 1979

REPLY TO ATTN OF: Robert Shields, FWS
Area Manager

SUBJECT: Endangered Species near Starvation Reservoir in Duchesne County, Utah

TO: Edwin Guynn, U.S. Geological Survey
District Engineer, Salt Lake City

The Endangered Species Act of 1973 requires Federal agencies to conserve endangered and threatened species. Also, Section 7 of the Act requires Federal agencies to consult with the Fish and Wildlife Service (FWS) about projects which may affect endangered species.

We appreciate your concerns about the possible impacts of an oil well on threatened or endangered species in Section 12 T4S R6W near Starvation Reservoir in Duchesne County, Utah. At the verbal request of Mr. George Diwachak, we are happy to provide the following comments on listed species. The bald eagle (Haliaeetus leucocephalus) winters throughout Utah and may be seen near Starvation Reservoir from mid-November to mid-March. The peregrine falcon (Falco peregrinus) has been reported in Duchesne County during the breeding season (March-July). No known nest sites have been identified in the area of concern; however, several peregrine eyries are located in northeastern Utah. In addition, peregrines may hunt along the shores of Starvation Reservoir during the migratory seasons. At present, no Federally listed plant species occurs near the oil well site; however, three plants proposed for Federal listing occur near Starvation Reservoir. Eriogonums hylophilum, Lepidium barnebyanum, and Sclerocactus glaucus have been collected in Duchesne County and may occur in T4S R6W.

If we can be of further assistance on this project or future ones please feel free to contact us. We appreciate your interest in conserving threatened or endangered species.

Mitchell G. Sheldon

OPTIONAL FORM NO. 10
(REV. 7-76)
GSA FPMR (41 CFR) 101-11.6
5010-112

Appendix No. 4

United States Department of the Interior

BUREAU OF INDIAN AFFAIRS

UINTAH AND OURAY AGENCY
Fort Duchesne, Utah 84026
801 722-2406 Ext. #41

IN REPLY REFER TO:
Soil, Moisture Conservation

February 5, 1979

Mr. Ed Guynn, District Engineer
U.S.G.S., Conservation Division,
8440 Federal Building,
Salt Lake City, Utah 84138

Dear Mr. Guynn:

We are granting archeological clearance for the wells identified below. Archeological clearance is based upon a survey and report submitted by Mr. Clifton M. Wagnall Ph. D., Archaeologist who resides at 2317, Arriba Court, Grand Junction, Colorado 81501.

Ute Tribal 1-14-B4 Gulf Oil Corporation SWNE, 14, T4S., R6W.
Ute Tribal 1-16-B2 Gulf Oil Corporation NENE, 14, T4S., R6W.
Ute Tribal 12-1 W.A. Moncrief NWNE, 12 T4S., R6W.

Sincerely yours,

Acting Superintendent

Appendix No. 5

United States Department of the Interior

GEOLOGICAL SURVEY
Conservation Division
8440 Federal Building
Salt Lake City, Utah 84138

TO: Well File

DATE: February 14, 1979

THROUGH: George Diwachak, Environmental Scientist

FROM: J. T. Evans, Environmental Scientist
Grand Junction

In re: W. A. Moncrief 12-1
Sec. 12, T4S,R6W
Duchesne County, Utah
Lease 14-20-H62-3455

SUBJECT: Environmental Analysis 081-79

This will confirm the changes and modifications made and agreed to during the on-site inspection of the referenced well. The inspection was made by Clayton Norby, Moncrief; Mike Stewart, Uintah Engineering; Jack Skewes, Skewes & Hamilton; Brent Neilsen, M&M Oil Field Service; John Evans, U. S. Geological Survey, and Lynn Hall, Bureau of Indian Affairs, on January 10, 1979.

1. The request by the company for a "tight hole" will be respected. All geologic information will remain confidential for official use only.

2. The following items refer to the 13-Point Plan:

   A. Item 2-5 - The following addition was made: Culverts to minimum size of 18 inches.

   B. Item 7-5 was changed to read: No burn pit will be constructed. A portable steel mesh trash cage will be used to contain trash on location until it is hauled to the sanitary landfill. (The operator indicated no burning of trash would occur.)

3. A portion of access road in NE/4 SE/4 sec 14 crosses private land; therefore, a private surface owner rehabilitation agreement is required.

4. "Trucks turning - Slow" warning signs will be placed two hundred feet from the junction of the proposed access road, on the existing improved road. The proposed access road junction is on a ridgetop where the existing road curves, creating a blind curve intersection.

5. The operator proposes to upgrade a poor jeep trail for 1.25 miles. The operator will abandon portions of the existing jeep trail while constructing the new access road in order to maintain grades less than 8%. The operator would be required to permantly close, water bar and reseed those portions of the jeep trail abandoned. The operator will be required to install drainage ditches, reseed slope cut areas and restrict grades to a maximum of 8% along entire proposed access road. It is important that grades be reduced to less than 8% to accommodate possible oil truck transports, thus minimizing spill potential.

6. The operator will take any measure necessary to ensure that all produced fluids, drill cuttings, etc., are contained in approved pits. All pits will be lined with impervious material to prevent seepage or leakage. Pits will be constructed with 1/2 their depth below existing land surface.

7. The flare pit (marked Burn Pit on Diagram B of 13-Point Plan) would be used for flaring and will be constructed 125' minimum from well head.

8. The access road was changed on Diagram B to enter at stake corner #8. This was done by operator request to reduce grade onto location.

9. All topsoil will be saved and used for rehabilitation only. Spoil material would not be pushed off the ridgetop. Spoils so wasted would increase erosion and would be difficult to recover for rehabilitation.

10. An additional 25' of surface disturbance for production facilities as requested on Diagram D would not be constructed until production is established.

11. Pinyon-Juniper trees to be bladed off to sides of drill pad and road and to be used for firewood. The BIA will sell wood permits this spring.

Existing Environment:

The proposed location is on a NE by SW trending ridge that separates Weeint Hollow on the east from Skitzy Canyon on the west. The location is in a small saddle with a 6077' ridgetop peak to the north. The topographic location tends to obscure the proposed location from view.

Drainage from location favors drainage to Weeint Hollow but some drainage to Skitzy Canyon system is possible. With normal construction practice and erosion control, minor or no impact is anticipated on drainage systems in area. Accidental spills could contribute to erosion and pollution to these drainages. Erosion would eventually reach Strawberry Reservoir 0.6 miles to the north.

The proposed drill site should not be visible from reservoir. The drill site would be visible from other nearby ridges and impact judged to be minor. Several other existing wells can be seen in general area.

The proposed action will destroy Pinyon-Juniper trees which will be salvaged for firewood. It is estimated 15 to 20 cords or 3 acres of trees would be destroyed by proposed action.

A cultural resource clearance is needed prior to approval. The BIA has indicated they will give a conditional clearance as snowcover prevents an on-the-ground clearance.

The on-site inspection was made while 18 inches of snow was on the ground. Snowmobiles provided access to the well stake. Three photographs are attached for your reference.

A rock ledge outcrops on both sides of proposed location approximately 10' below elevation of hole. Reserve pit may encounter this fractured sandstone and may require extra precautions such as grouting, plastic liner. The operator is responsible to insure a tight pit.

The operator was made aware of the possible delays while an unusual analysis was prepared. The proposed action, in my judgment, is only unusual due to proximity to Starvation Reservoir. Minor or no impact on this resource is anticipated.

cc: BIA

MEMORANDUM

TO: E. W. Guynn, District Engineer
Salt Lake City

DATE: February 20, 1979

FROM: J. T. Evans, Environmental Scientist
Grand Junction

SUBJECT: Reserve pits - Duchesne/Strawberry Reservoir Area

A recent reserve pit failure (Ref. File Memo Gulf 1-14-B2, Sec. 14, T4S, R6W) indicated present procedures of allowing clay to be used as a lining material to assure reserve pit integrity is not adequate in the shaly soil conditions around Ducnesne.

It is recommended that all future Permits to Drill in this area in which reserve pit lining is necessary that the permit be conditioned to utilize a method that will insure pit integrity. Any method that would be proposed by the operator that will insure pit integrity would be acceptable; however, it is most likely that the use of plastic liners would be required.

To my knowledge, there are at least two applications (Gulf Loc. Sec. 16, T4S, R6W and Moncrief Sec. 12, T4S, R6W) in our office that may require additional stipulations to be placed on pending or approved applications to drill. Operators of these proposed locations have been contacted by telecon or through their representative for their input as to a method that will insure reserve pit integrity and were advised of the failure of clay as a lining material.

cc: Cook
Diwachak
Evans

JTE/jbh

P. O. Box 2573
CASPER, WYOMING 82602
307-237-2541

January 2, 1979

Mr. Bill Martin
U. S. Geological Survey
8440 Federal Building
125 South State Street
Salt Lake City, Utah 84138

Re: Ute Tribal 12-1 Well
NW NE Section 12, T 4S, R 6W
Duchesne County, Utah

Dear Mr. Martin:

Pursuant to our conversation enclosed herewith are original and two copies of Rehabilitation Plan for the captioned well.

Yours very truly,

David S. Kamber

David S. Kamber

mc

Enclosures

cc: Mr. Clayton Norby
Box 449
Duchesne, Utah 84021

REHABILITATION PLAN

Lease No.: 14-20-H62-3455 Well Name and No.: Ute Tribal 12-1;
Location: NW¼NE¼, Sec. 12, T. 4S N., R. 6 W.

W. A. Moncrief Oil Company intends to drill a well on surface owned by Uinta and Ouray Indian Tribe. The lessee/operator agrees to complete the following rehabilitation work if the well is a producer:

☒ Yes ☐ No Maintain access road and provide adequate drainage to road.

☒ Yes ☐ No Reshape and reseed any area not needed for maintenance of the pump and support facilities.

Other requirements: _____

The following work will be completed when the well is abandoned:

☒ Yes ☐ No Pit will be fenced until dry, then filled to conform to surrounding topography.

☒ Yes ☐ No Water bars will be constructed as deemed necessary.

☒ Yes ☐ No Site will require reshaping to conform to surrounding topography.

☒ Yes ☐ No Entire disturbed area will be reseeded. If yes, the following seed mixture will be used:
B.I.A. specifications

☐ Yes ☒ No Access road will be closed, rehabilitated and reseeded using the same seed mixture as above.

☒ Yes ☐ No Access road will remain for surface owner's use.

☒ Yes ☐ No Water bars will be constructed on the access road as deemed necessary.

Other requirements: Right-of-way across SE¼ Section 14-4S-6W to location.

Surface Owner:		Operator/Lessee	
Name:	C. L. Lott	Name:	W. A. Moncrief
Address:	P. O. Box 305	Address:	P. O. Box 2573
City:	Duchesne	City:	Casper
State:	Utah 84021	State:	Wyoming 82602
Telephone:	801-549-3700	Telephone:	307-237-2541
Date:	Dec. 22, 1978	Date:	Dec. 22, 1978

I CERTIFY rehabilitation has been discussed with me, the surface owner:

X C. L. Lott

(Surface owner's signature)

This plan covers rehabilitation requirements only and does not affect any other agreements between the lessee/operator and surface owner.

WY-069-3109-3(4/77)

Appendix No. 6

Mitigative Measures and Stipulations

If the proposal is approved, the following mitigative measures and stipulations should be incorporated into the operator's plan:

1. Two "Trucks Turning - Be Prepared to Stop" or similar warning signs would be placed two hundred feet from the junction of the proposed access road, on the existing improved road to reduce traffic hazards on the blind intersection.

2. The portions of the existing jeep trail, abandoned during access road construction should be permanently closed, water barred and reseeded.

3. The operator would install drainage ditches, reseed slope cut areas and restrict grades to a maximum of 8% along the entire proposed access road.

4. Three 18" x 30" culverts would be necessary to allow proper access (See Map B of 13-Point Surface Protection Plan).

5. The operator should take any measure necessary to ensure that all produced fluids, drill cuttings, etc. are contained in approved pits. Pits would be constructed with one-half of the depth below the existing land surface. Due to the permeability and conglomerite characteristics of the soils, the pits should be lined with an impervious material, perferably plastic, to prevent seepage or leakage.

6. The flare pit (marked Burn Pit on Diagram B of the 13-Point Plan) would be used for flaring and should be constructed a minimum of 125 feet from the wellhead.

7. All topsoil would be saved and used for rehabilitation only. Spoil materials should not be pushed off the ridge top as they would increase erosion and be difficult to recover for rehabilitation.

8. If erosion became serious on the road or drill pad, drainage systems such as water bars and dikes would be installed to minimize the problem.

9. All completion and production equipment would be painted a color blend in with the natural terrain.

10. The operator would be required to report any leaks and spills to the USGS and other proper authorities.

11. If fresh water should be available from the well, the surface agency may request completion as a water well, if given approval.

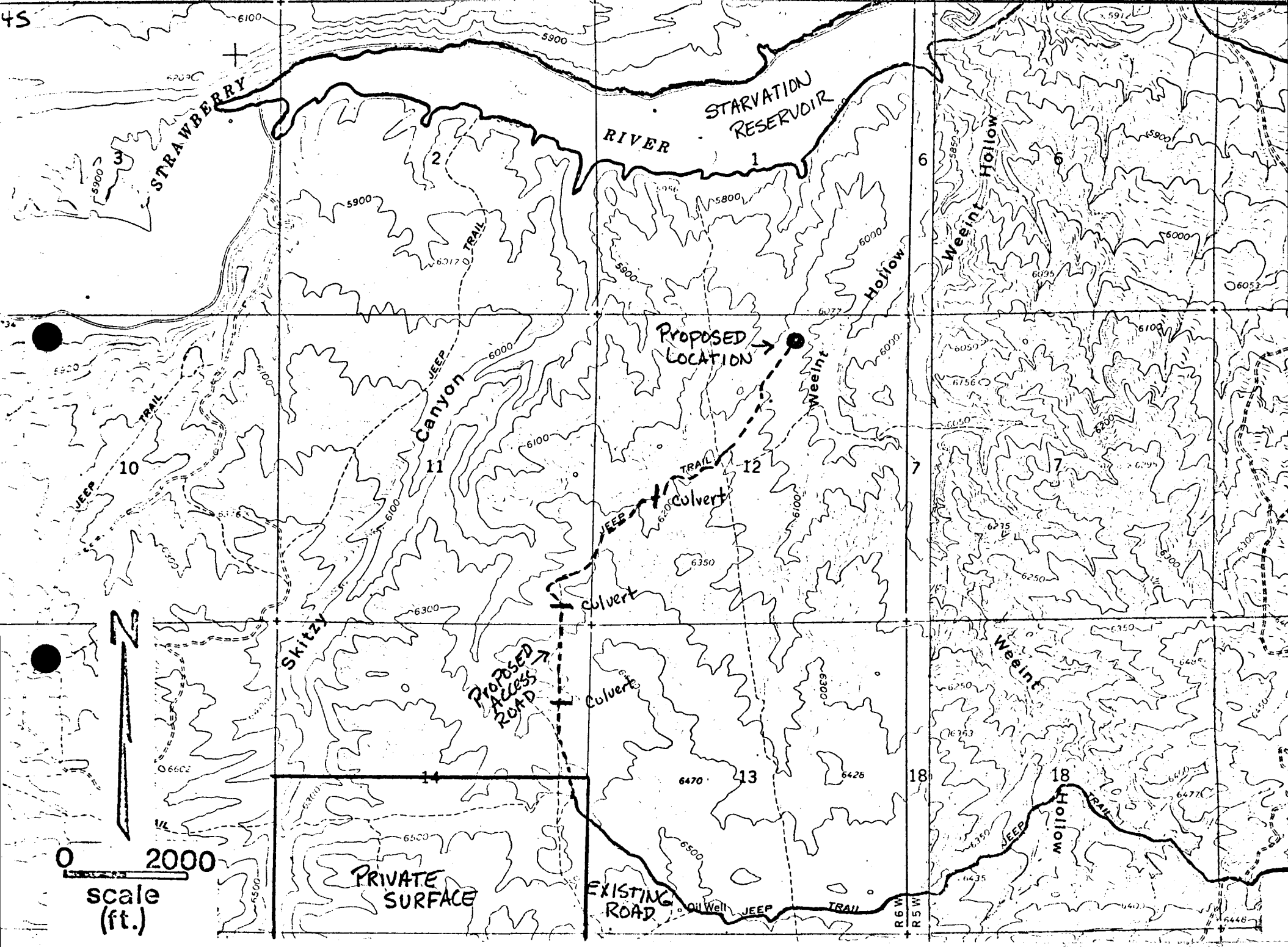
12. Any fresh water zones, oil shale zones, lutumin zones and other mineral bearing formations encountered during drilling should be adequately cased and cemented.

13. If a historic artifact, an archeological feature or site is discovered during construction operations, activity would cease until the extent, the scietific importance, and the method of mitigating the adverse effects could be determined by a qualified cultural resource specialist.

14. Should the wellsite be abandoned, surface rehabilitation would be done according to the surface agency's requirements and to USGS' satisfaction. This would involve leveling, contouring, reseeding, and possibly replanting of the location and possibly of the access road. If the well should produce hydrocarbons, measures would be undertaken to protect wildlife and domestic animals from the production equipment.

15. Any stipulations of concurrence as determined by the Bureau of Indian Affairs.

Appendix No. 7


45
STRAWBERRY
RIVER
STARVATION RESERVOIR
Weeint Hollow
Hollow
Canyon
JEEP TRAIL
PROPOSED LOCATION
Culvert
Culvert
Culvert
PROPOSED ACCESS ROAD
Skitzy
PRIVATE SURFACE
EXISTING ROAD
Oil Well
JEEP TRAIL
Weeint Hollow
JEEP TRAIL
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12
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6
R6W
R5W
0 2000
scale (ft.)

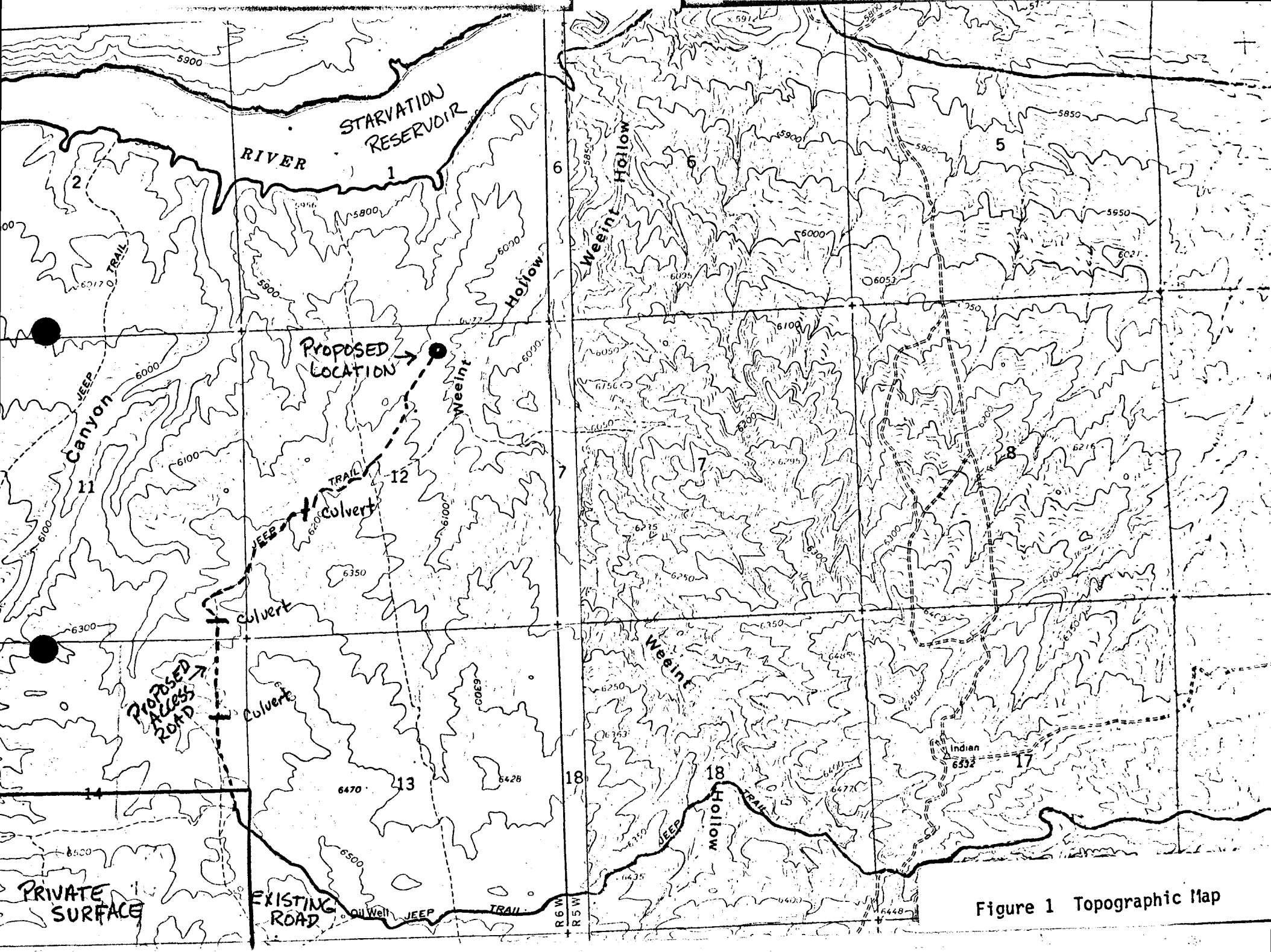


Figure 1 Topographic Map

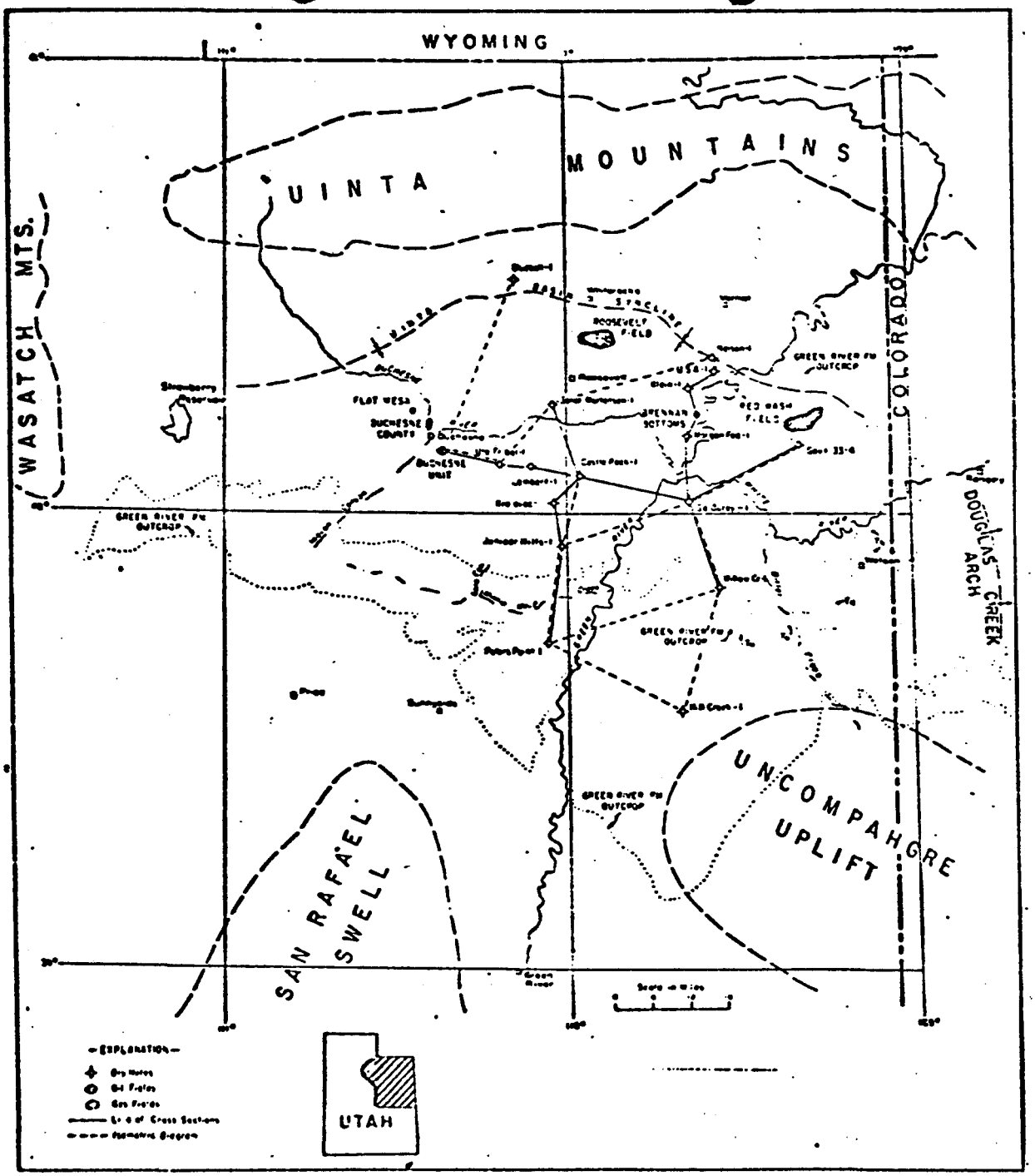
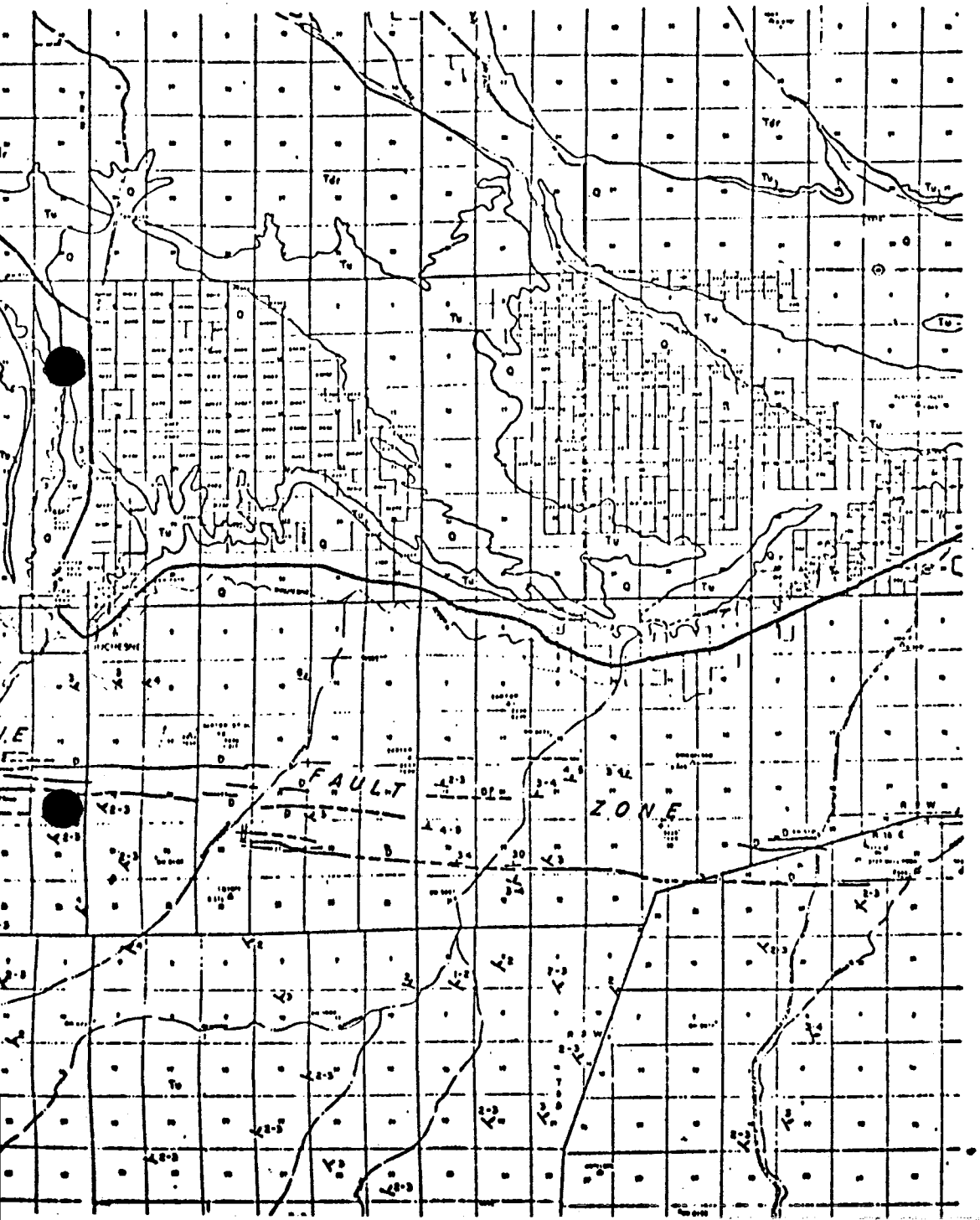


Figure 2. - Index Figure 2.- Index map of Uintah Basin including application area and some of the Basin's oil and gas fields

sne region including application area



EXPLANATION

JURASSIC — CRETACEOUS — TERTIARY

Q	Quaternary
Tan	Volcanics and conglomerate
T	Tertiary undivided
Tb	Bishop conglomerate
Tbp	Browns Park formation
Tdr	Duchesne River formation
Tbr	Bridger formation
Tu	Uinta formation
Tgr	Green River formation
Tw	Wasatch formation
TKn	North Horn formation
K	Cretaceous undivided
Kcc	Currant Creek formation
Kmv	Mesaverde group
Kpr	Price River formation
Kbh	Blackhawk formation
Ksp	Star Point sandstone
Kmc	Mancos shale
Kd	Dakota sandstone
J	Jurassic undivided
Jm	Morrison formation
Jo	Older Jurassic undivided
Jc	Curtis formation
Je	Entrada sandstone
Jca	Carmel formation
Jtc	Twin Creek limestone
Jn	Navajo sandstone

PRECAMBRIAN — CAMBRIAN - DEVONIAN — MISSISSIPPIAN — PENNSYLVANIAN — PERMIAN — TRIASSIC

Tr	Triassic undivided
Ppc	Park City formation
Cw	Weber sandstone
Cu	Carboniferous undivided
Cma	Morgan formation
M	Mississippian undivided
Cbs	Black shale unit
Ch	Humbug formation
Clu	Limestone unit
Cdm	Deseret - Madison limestone
D-C	Devonian - Cambrian undivided
C	Cambrian undivided
pC	Precambrian undivided

- Location
- Dry hole
- Oil well
- Abandoned oil well
- Oil and gas well
- Abandoned oil and gas well

Fault, showing down-thrown side, dashed where questionable.

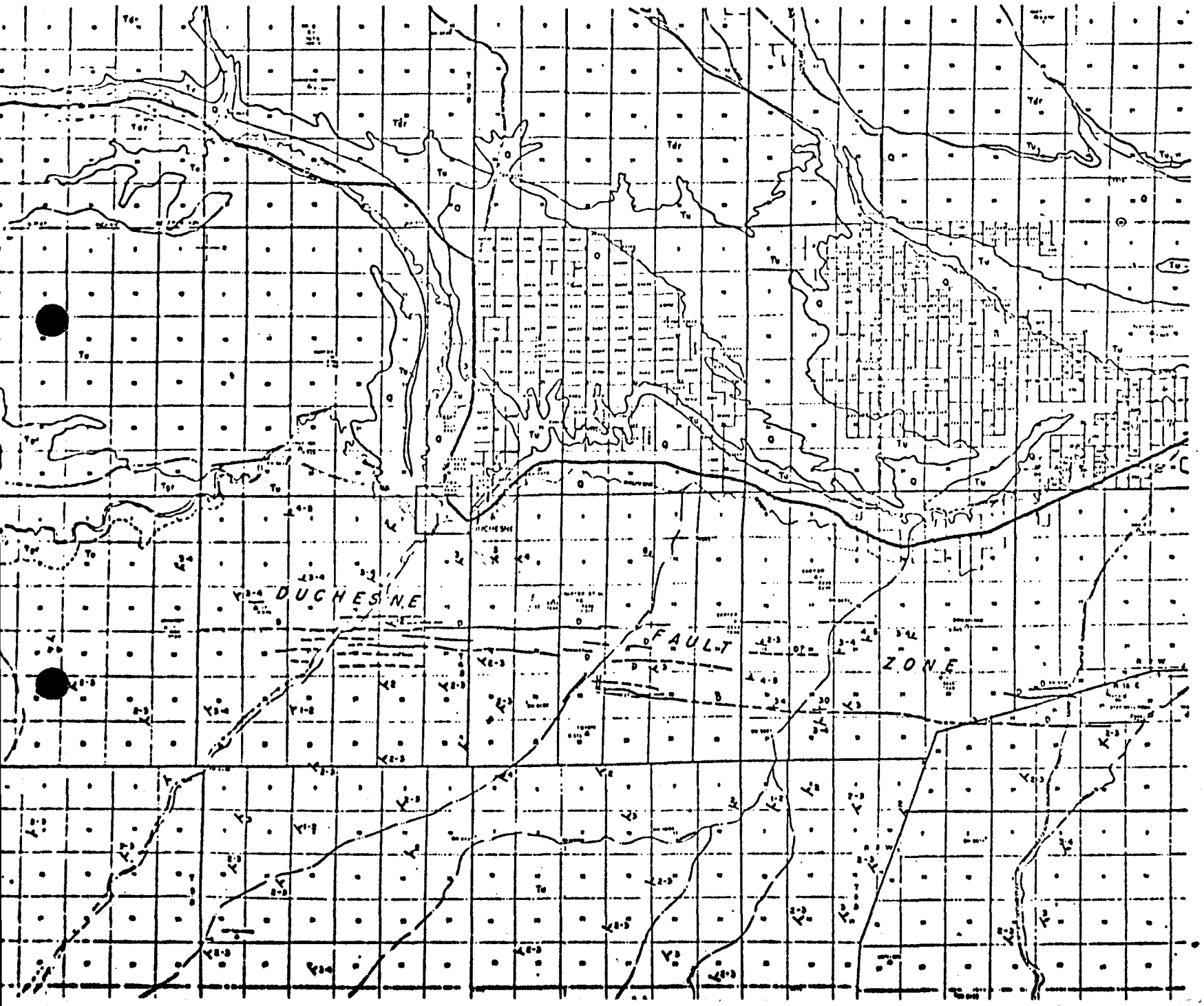
Geologic contact, dashed where questionable.

U.S.G.S. measured strike and dip

U.S.G.S. photo strike and dip

U.S.G.S. dip component

Figure 3.- Geologic map Duchesne region including application area



TERTIARY
- Q Quaternary
- Tvn Volcanics and conglome
- T Tertiary undivided
- Tb Bishop conglomerate
- Tbp Browns Park formation
- Tdr Duchesne River formati
- Tbr Bridger formation
- Tu Uinta formation
- Tgr Green River formation
- Tw Wasatch formation
- TKn North Horn formation

CRETACEOUS
- K Cretaceous undivided
- Kcc Current Creek formation
- Kmv Mesaverde group
- Kpr Price River formation
- Kbh Blackhawk formation
- Ksp Star Point sandstone
- Kmc Mancos shale
- Kd Dakota sandstone

JURASSIC
- J Jurassic undivided
- Jm Morrison formation
- Jo Older Jurassic undivided
- Jc Curtis formation
- Je Entrada sandstone
- Jca Carmel formation
- Jtc Twin Creek limestone
- Jn Navajo sandstone

- Location
- Dry hole
- Oil well
- Abandoned oil well
- Oil and gas well
- Abandoned oil and gas w

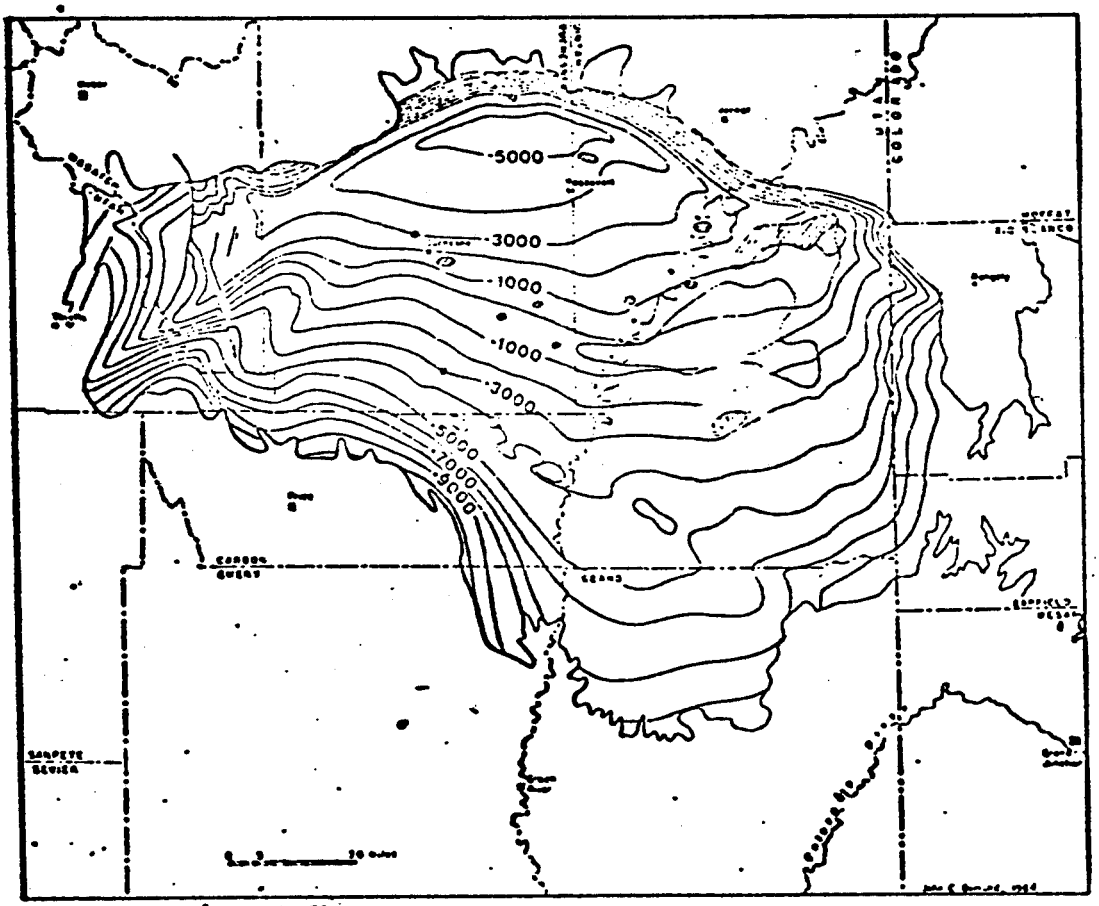


Figure 4 - Structure contour map on top of Wasatch Formation in the Uintah Basin including the application area

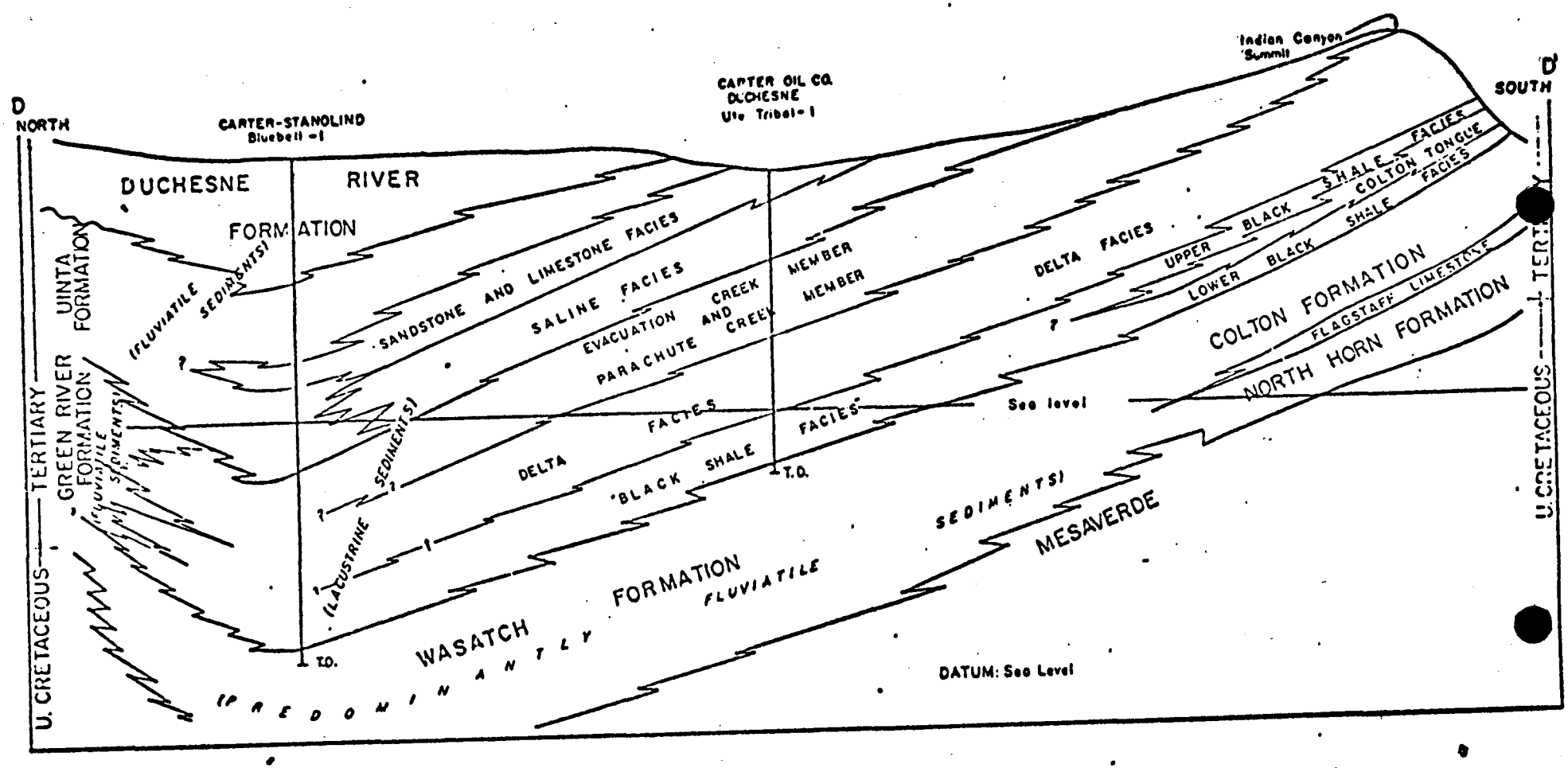


Figure 5.- View east of cross section of Uinta Basin showing stratigraphy and intertonguing of Tertiary rocks. Ute Tribal-1 (in section) is located about 8 miles southeast of the application area .

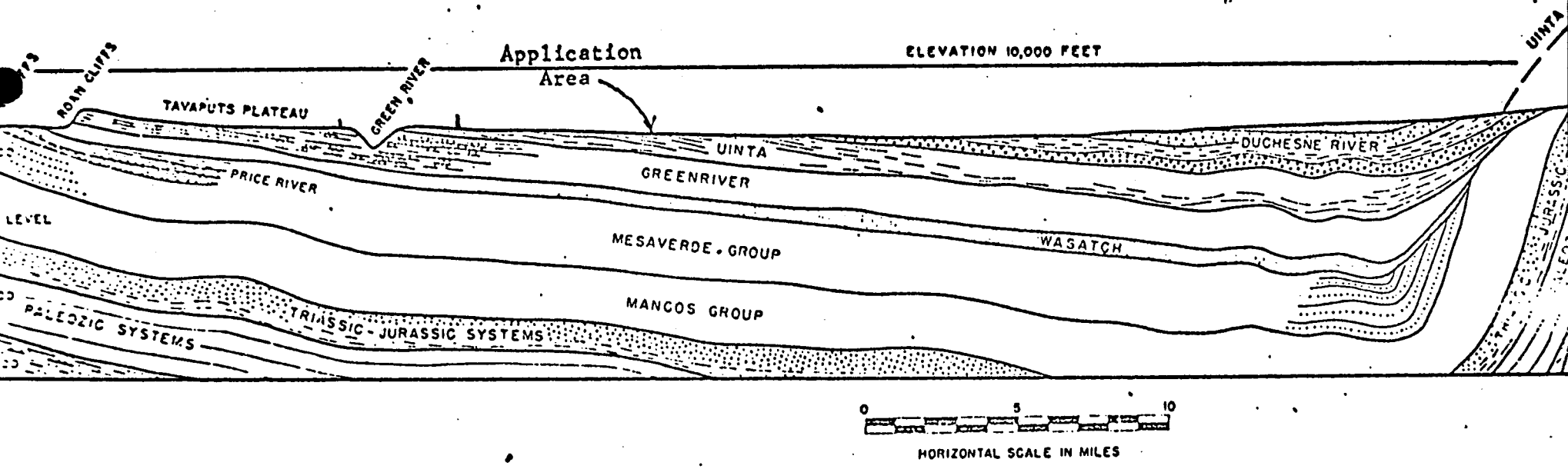
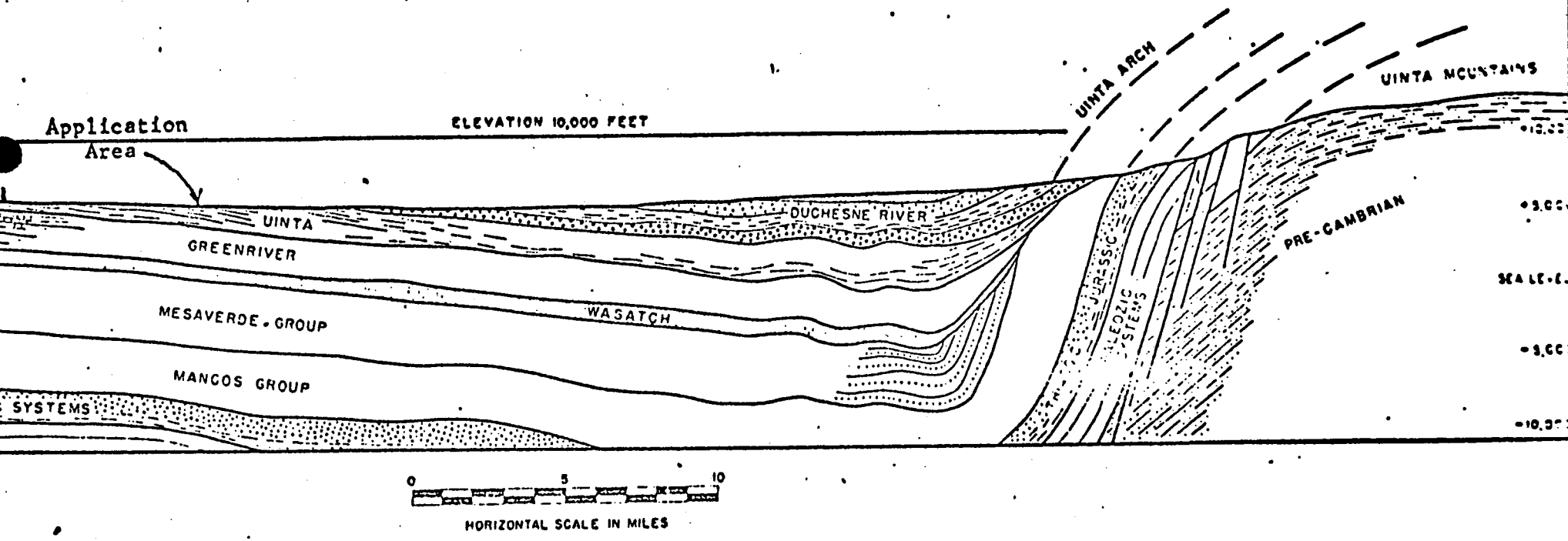


Figure 5a- Cross-section of the Uinta Basin generallizing the stratigraphic and structural framework of the rock section of interest in the application area.



a- Cross-section of the Uinta Basin generallizing the stratigraphic and structural framework of the rock section of interest in the application area.

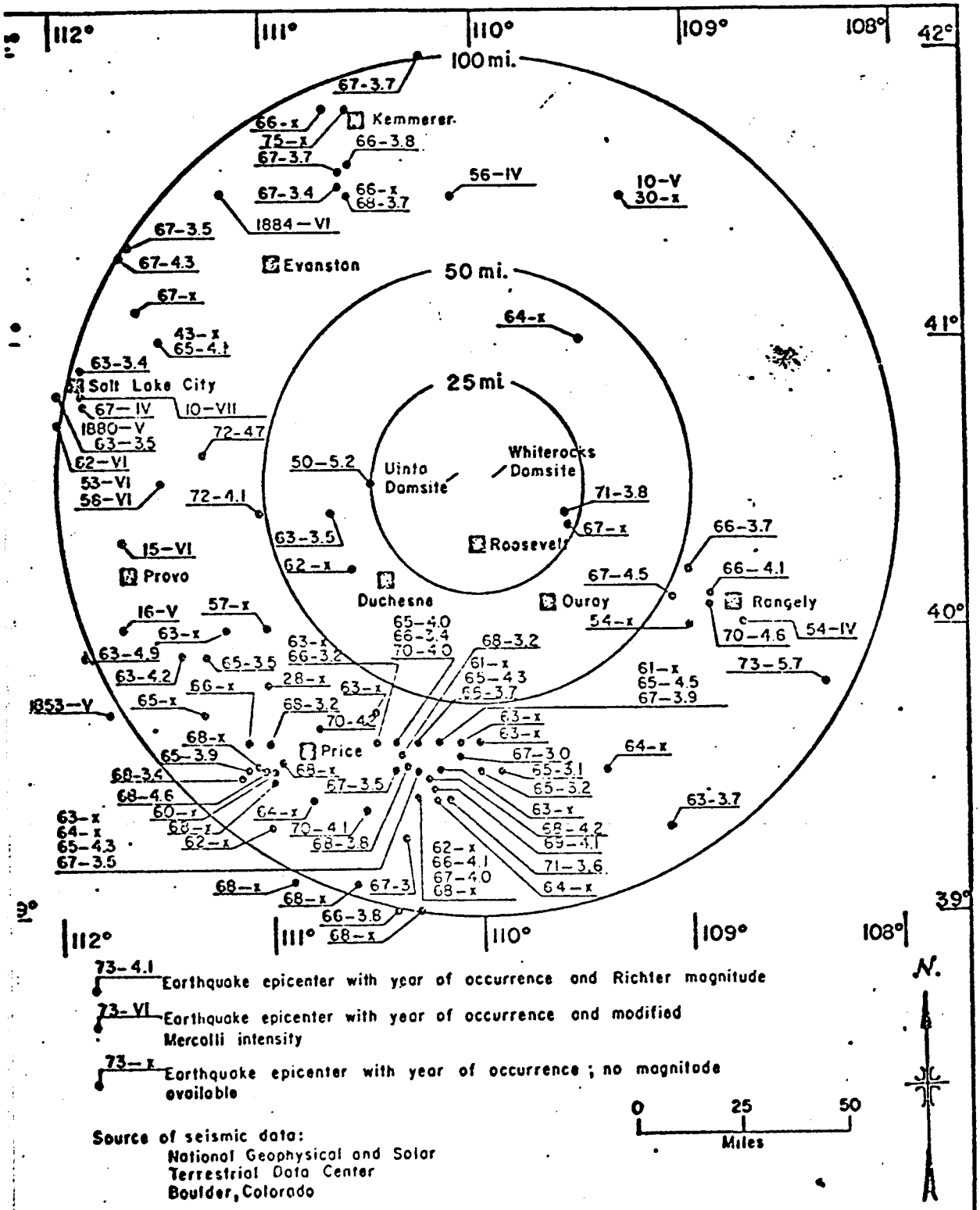


Figure 6. - Siesmic History, western Uintah Basin and surroundings

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Water Plate No. 1

.--Summarized records of stream discharge at gaging stations--Continued

09288180 Strawberry River near Duchesne, Utah

LOCATION.--Lat 40°09'17", long 110°33'15", in SE¼SW¼SW¼ sec.3, T.4 S., R.6 W., Uintah meridian, Duchesne County, on right bank 150 ft (46 m) downstream from County Road bridge, 2,000 ft (610 m) upstream from maximum high-water line of Starvation Reservoir, and 7.5 miles (12.1 km) west of Duchesne.

DRAINAGE AREA.--770 sq mi (1,990 km^2), approximately (includes approximately 170 sq mi or 440 km^2 tributary to Strawberry Reservoir).

PERIOD OF RECORD.--May 1968 to September 1973.

GAGE.--Water-stage recorder. Datum of gage is 5,722 ft (1,744 m) above mean sea level (Rabbit Gulch Quadrangle which gives bridge elevation).

AVERAGE DISCHARGE.--5 years, 150 ft^3/s (4.248 m^3/s), 108,700 acre-ft/yr (134 hm^3/yr).

EXTREMES.--Maximum discharge, 1,310 ft^3/s (37.1 m^3/s) May 18, 1973 (gage height, 6.30 ft or 1.920 m); minimum daily discharge, 40 ft^3/s (1.13 m^3/s) Feb. 27, 1971.

REMARKS.--Records good except those for winter periods, which are poor. Several diversions above station for irrigation, including transmountain diversions to The Great Basin. Storage in Strawberry Reservoir began July 14, 1912; water diverted to reservoir from headwaters of Currant Creek feeder canal since 1936. Diversions from reservoir through Strawberry tunnel to Spanish Fork drainage and from tributaries above reservoir through Hobble Creek ditch and Strawberry River and Willow Creek ditch to Provo River drainage. New Soldier Creek Dam, 7 miles (11 km) below Strawberry Reservoir, completed fall 1972, and began storage spring 1973.

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Year
Monthly and yearly mean discharge, in cubic feet per second													
1968	-	-	-	-	-	-	-	486	430	158	152	98.1	-
1969	114	91.7	87.6	97.4	88.9	84.3	325	827	335	178	130	110	207
1970	118	101	88.3	62.5	72.9	79.8	107	357	219	108	81.5	86.4	124
1971	84.8	80.3	65.6	72.1	48.5	82.2	173	361	220	103	82.2	74.8	121
1972	78.9	80.7	54.1	68.2	80.3	138	208	327	193	86.9	67.3	73.1	121
1973	91.6	83.1	68.9	64.0	66.6	96.0	208	827	334	115	71.5	89.2	177
Monthly and yearly runoff, in acre-feet													
1968	-	-	-	-	-	-	-	29,730	25,580	9,700	9,330	5,840	-
1969	7,020	5,460	5,390	5,990	4,940	5,180	19,320	50,880	19,930	10,920	7,980	6,560	149,600
1970	7,240	6,030	5,430	3,840	4,050	4,910	6,340	21,950	13,020	6,670	5,010	5,140	89,620
1971	5,220	4,780	4,030	4,430	2,690	5,050	10,270	22,220	13,100	6,360	5,060	4,650	87,670
1972	4,850	4,800	3,320	4,200	4,620	8,500	12,380	20,100	11,510	5,340	4,140	4,350	88,110
1973	5,630	4,950	4,230	3,940	3,700	5,900	12,350	50,850	19,850	7,060	4,400	5,310	128,200

Water Plate No. 2

—Summarized records of stream discharge at gaging stations—Continued

09288500 Strawberry River at Duchesne, Utah

LOCATION.--Lat 40°09'40", long 110°24'40", in SW¼NE¼ sec.2, T.4 S., R.5 W., Uintah meridian, on right bank 0.8 mile (1.3 km) west of Duchesne and 1.5 miles (2.4 km) upstream from mouth.

DRAINAGE AREA.--950 sq mi (2,460 km^2), approximately (includes approximately 170 sq mi or 440 km^2 tributary to Strawberry Reservoir).

PERIOD OF RECORD.--June 1908 to November 1910 (no winter records), March 1914 to September 1968. Published as "at Theodore" 1908-10.

GAGE.--Water-stage recorder. Datum of gage is 5,512.4 ft (1,680.18 m) above mean sea level, adjustment of 1927. Prior to Oct. 26, 1948, chain or staff gages near present site at various datums. Oct. 26, 1948, to Aug. 12, 1952, water-stage recorder at site 60 ft (18 m) upstream at datum 1.99 ft (0.607 m) higher. Aug. 13, 1952, to Aug. 2, 1960, at same site at datum 0.70 ft (0.213 m) higher. Since Apr. 2, 1962, auxiliary water-stage recorder on left bank.

AVERAGE DISCHARGE.--54 years (1914-68), 151 ft^3/s (4.28 m^3/s), 109,300 acre-ft/yr (135 hm^3/yr).

EXTREMES.--Maximum discharge, 3,490 ft^3/s (98.8 m^3/s) May 7, 1952 (gage height, 5.34 ft or 1.628 m, datum then in use); maximum gage height, 5.49 ft (1.673 m) Mar. 11, 1966 (backwater from ice); minimum discharge observed, 1 ft^3/s (0.028 m^3/s) for several days in July 1931.

REMARKS.--Records good except those for periods of no gage-height record, which are fair. Several diversions above station for irrigation, including transmountain diversions to The Great Basin. Storage in Strawberry Reservoir began July 14, 1912; water diverted to reservoir from headwaters of Currant Creek through Currant Creek feeder canal since 1936. Diversions from reservoir through Strawberry tunnel to Spanish Fork drainage (see station 09282000) and from tributaries above reservoir through Hobble Creek ditch and Strawberry River and Willow Creek ditch to Provo River drainage.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Year
1908	-	-	-	-	-	-	-	-	-	179	153	123	-
1909	135	136	100	-	-	-	451	2,080	1,950	541	365	335	-
1910	212	216	-	-	-	-	1,090	1,020	379	219	165	163	-
1911	165	142	-	-	-	-	-	-	-	-	-	-	-
1914	-	-	-	-	-	-	637	1,020	519	241	160	118	-
1915	138	93.5	76.5	77	83	112	209	305	244	102	68.5	83.2	133
1916	86.2	103	71.7	66.0	85.0	305	463	1,110	521	239	182	102	279
1917	172	90.7	88.5	45.0	85.0	175	301	886	1,200	359	176	170	313
1918	146	135	137	70.3	95.0	132	156	248	211	132	63.5	79.9	134
1919	104	78.5	49.7	46.0	70.0	130	219	495	176	82.7	97.2	107	138
1920	91.7	83.8	63.6	75.0	80.0	98.9	146	926	584	198	248	128	228
1921	113	108	87.5	90	137	212	277	962	970	271	332	167	311
1922	133	121	126	84.6	99.3	202	227	1,790	1,280	317	261	169	402
1923	148	149	120	100	90	118	298	1,190	742	298	202	144	301
1924	142	128	104	100	110	111	189	206	80.4	55.8	44.1	44.1	109
1925	60.2	70.5	54.7	60.0	65.0	93.2	136	142	116	123	81.8	56.1	88.3
1926	79.1	72.5	65.4	60	70	100	215	268	96.7	73.5	121	38.5	105
1927	46.5	55.8	44.7	35	38.1	72.2	140	715	292	204	116	247	168
1928	111	133	93.8	70	70	150	340	1,140	339	123	89.6	53.6	227
1929	110	92.6	75.7	75	75	109	138	615	319	196	168	139	177
1930	91.6	87.2	75	70	90	74.6	206	252	121	70.9	91.0	69.7	108
1931	70.7	60.4	50	50	60	69.4	84.9	90.7	44.8	34.5	41.6	23.7	56.2
1932	36.5	49.7	60	70	80	91.6	147	503	260	87.8	97.6	56.1	129
1933	53.8	57.0	47.6	55	50	67.2	85.1	250	343	99.8	57.1	45.6	101
1934	36.5	48.6	48.1	50	52.1	46.3	35.4	16.5	7.6	11.3	18.0	8.0	31.4
1935	21.5	35.9	35	35	35	55.5	75.3	202	201	46.2	49.3	22.1	67.9
1936	32.5	41.8	48.9	55	60	64.3	232	567	248	189	124	92.3	147
1937	63.5	83.3	85	80	80	100	221	838	369	196	163	169	205
1938	95.1	94.5	96.2	70.2	102	103	304	521	242	104	69.1	136	161
1939	83.6	76.1	84.9	65	55	169	192	209	93.6	42.7	39.2	54.9	97.3
1940	56.3	61.0	69.8	60	60	81.2	101	127	47.9	27.5	20.9	97.0	67.4
1941	50.8	52.9	55.6	45	55	76.2	123	648	337	140	108	61.9	147
1942	104	123	99.3	85.0	86.4	107	344	397	210	99.8	62.6	59.6	148
1943	67.1	80.1	74.2	66.1	92.7	96.3	382	372	219	96.0	110	51.7	142
1944	77.6	77.1	74.9	60	70	99.6	166	643	360	137	70.2	65.0	159
1945	85.1	90.9	79.4	85.2	91.8	92.9	102	328	192	108	136	66.7	122
1946	71.3	72.8	60.2	60	75	103	279	279	105	71.0	67.4	52.2	108
1947	69.5	81.1	75.5	66.8	107	119	206	480	176	78.5	83.7	68.3	135
1948	68.2	74.6	69.1	65	69.4	106	124	274	118	50.6	29.5	29.2	89.9
1949	52.8	61.6	56	50	56.4	117	374	763	366	161	86.7	72.3	185
1950	102	97.2	69.7	60.0	65.9	112	340	604	373	153	88.6	88.6	180
1951	90.8	97.7	91.0	84.0	91.7	91.6	172	415	246	111	124	63.4	140
1952	84.0	81.6	78.5	80	85	97.6	565	2,155	827	305	264	200	403
1953	163	132	110	100	95	114	140	181	199	94.8	97.7	61.1	124
1954	77.4	86.1	79.7	75	84.9	93.2	148	150	77.1	61.9	55.2	82.9	89.2
1955	72.6	72.8	63.0	58	55	62.6	138	313	131	65.0	104	56.7	99.7
1956	52.0	59.6	77.0	76.6	91.4	124	198	425	179	81.1	56.7	39.2	122
1957	62.5	71.5	84.4	85.0	84.6	90.0	104	429	454	140	105	78.1	149
1958	82.7	102	104	87.9	100	103	182	740	256	89.5	60.0	77.5	166
1959	61.2	65.4	61.9	52.6	60.9	74.0	81.1	78.6	41.5	29.3	31.9	31.2	55.7
1960	52.9	51.0	44.2	44.2	45	62.6	89.6	136	49.9	19.8	12.1	21.3	52.6
1961	42.6	49.6	43.6	40.0	45.0	55.2	66.5	43.0	13.2	5.89	25.1	67.5	41.3
1962	47.2	49.7	39.0	36.1	78.9	117	454	638	253	101	54.9	54.9	161
1963	99.7	75.9	57.2	40.2	80.3	65.7	101	263	117	39.6	97.0	81.2	93.3
1964	51.9	65.9	42.6	40.2	50.0	59.7	118	426	228	85.4	58.5	45.6	106
1965	91.0	60.4	53.5	59.4	60.7	75.0	172	672	527	218	158	127	187
1966	109	114	86.1	74.1	77.7	122	261	284	129	73.6	54.5	73.7	122
1967	81.4	77.6	62.3	57.4	71.0	100	128	449	559	234	143	118	174
1968	101	92.9	78.5	83.4	90.6	114	141	506	436	159	157	103	172

Water Plate No. 2

—Summarized records of stream discharge at gaging stations—Continued

09288500 Strawberry River at Duchesne, Utah--Continued

Monthly and yearly runoff, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Year
1908	-	-	-	-	-	-	-	-	-	11,000	9,410	7,320	-
1909	8,300	8,090	6,150	-	-	-	26,800	128,000	116,000	33,300	22,400	19,900	-
1910	13,000	12,700	-	-	-	-	64,900	62,700	22,600	13,500	10,100	9,700	-
1911	10,100	8,450	-	-	-	-	-	-	-	-	-	-	-
1914	-	-	-	-	-	-	26,000	62,700	3,900	14,800	9,840	7,020	-
1915	8,480	5,560	4,700	4,730	4,610	6,890	12,400	18,800	14,500	6,270	4,210	4,950	96,100
1916	5,300	6,130	4,410	4,060	4,890	18,800	27,600	68,200	31,000	14,700	11,200	6,070	202,000
1917	10,600	5,400	5,440	2,770	4,720	10,800	17,900	54,500	71,400	22,100	10,800	10,100	227,000
1918	8,980	8,030	8,420	4,320	5,280	8,120	9,280	15,200	12,600	8,120	3,900	4,750	97,000
1919	6,400	4,670	3,060	2,830	3,890	7,990	13,000	30,400	10,500	5,080	5,980	6,370	100,000
1920	5,640	4,990	3,910	4,610	4,600	6,080	8,690	56,900	34,800	12,200	15,200	7,620	165,000
1921	6,950	6,430	5,380	5,530	7,610	13,000	16,500	59,200	57,700	16,700	20,400	9,940	225,000
1922	8,180	7,200	7,750	5,190	5,510	12,400	13,500	110,000	76,200	19,500	16,000	10,100	292,000
1923	9,100	8,870	7,380	6,150	5,000	7,260	17,700	73,200	44,200	18,300	12,400	8,570	218,000
1924	8,730	7,620	6,400	6,150	6,330	6,820	11,250	12,700	4,780	3,430	2,710	2,620	79,500
1925	3,700	4,200	3,360	3,690	3,610	5,730	8,090	8,730	6,900	7,560	5,030	3,340	63,900
1926	4,860	4,310	4,020	3,690	3,890	6,150	12,800	16,500	5,750	4,520	7,440	2,290	76,200
1927	2,860	3,320	2,750	2,150	2,120	4,440	8,330	44,000	17,400	12,500	7,130	16,700	122,000
1928	6,820	7,910	5,770	4,300	4,030	9,220	20,200	70,100	20,200	7,560	5,500	3,190	165,000
1929	6,760	5,510	4,650	4,610	4,170	6,700	8,210	37,800	19,000	12,100	10,300	8,270	128,000
1930	5,630	5,190	4,610	4,300	5,000	4,590	12,300	15,500	7,200	4,360	5,600	4,150	78,400
1931	4,350	3,590	3,070	3,070	3,330	4,270	5,050	5,580	2,670	2,120	2,560	1,410	41,100
1932	2,240	2,960	3,690	4,300	4,600	5,620	8,750	30,900	15,500	5,400	6,000	3,340	92,300
1933	3,310	3,390	2,930	3,380	2,780	4,130	5,060	15,400	20,400	6,140	3,510	2,710	73,100
1934	2,250	2,880	2,960	3,070	2,890	2,840	2,100	1,010	454	696	1,110	478	22,740
1935	1,320	2,130	2,150	2,150	1,940	3,410	4,480	12,430	11,950	2,840	3,030	1,310	49,140
1936	2,000	2,490	3,010	3,380	3,450	3,950	13,800	34,850	16,740	11,630	7,600	5,490	106,400
1937	3,900	4,950	5,230	4,920	4,440	6,150	13,130	51,540	21,970	12,050	10,010	10,080	148,400
1938	5,850	5,620	5,790	4,310	5,670	6,310	18,080	32,010	14,380	6,380	4,250	8,060	116,700
1939	5,140	4,530	5,220	4,000	3,050	10,390	11,400	12,840	5,570	2,630	2,410	3,270	70,450
1940	3,460	3,630	4,290	3,690	3,450	4,990	6,010	7,790	2,850	1,690	1,290	5,770	48,910
1941	3,120	3,150	3,420	2,770	3,050	4,690	7,320	39,850	20,030	8,630	6,650	3,680	106,400
1942	6,420	7,300	6,110	5,230	4,800	6,580	20,470	24,430	12,490	6,140	3,840	3,540	107,400
1943	4,130	4,770	4,560	4,070	5,150	5,920	22,750	22,870	13,020	5,900	6,760	3,070	103,000
1944	4,760	4,590	4,600	3,690	4,030	6,120	9,880	39,520	21,450	8,400	4,320	3,870	115,200
1945	5,230	5,410	4,880	5,240	5,100	5,710	6,060	20,150	11,400	6,610	8,360	3,970	88,120
1946	4,380	4,330	3,700	3,690	4,170	6,320	16,600	17,140	6,270	4,360	4,140	3,110	78,210
1947	4,270	4,830	4,650	4,110	5,950	7,310	12,270	29,520	10,500	4,820	5,150	4,060	97,440
1948	4,190	4,440	4,250	4,000	3,990	6,510	7,400	16,830	6,990	3,110	1,810	1,740	65,260
1949	3,250	3,660	3,440	3,070	3,130	7,220	22,220	46,910	21,770	9,900	5,330	4,300	134,200
1950	6,270	5,790	4,280	3,690	3,660	6,870	20,250	37,130	22,180	9,380	5,430	5,260	130,200
1951	5,580	5,810	5,600	5,170	5,090	5,640	10,230	25,550	14,640	6,810	7,630	3,770	101,500
1952	5,160	4,860	4,830	4,920	4,890	6,000	33,640	132,500	49,180	18,730	16,210	11,900	292,800
1953	10,010	7,860	6,760	6,150	5,280	7,030	8,360	11,120	11,860	5,830	6,010	3,640	89,910
1954	4,760	5,120	4,900	4,610	4,710	5,730	8,820	9,220	4,590	3,810	3,390	4,930	64,590
1955	4,460	4,330	3,880	3,570	3,050	3,850	6,230	19,260	7,800	4,000	6,390	3,370	72,190
1956	3,200	3,550	4,740	4,700	5,260	7,610	11,780	26,150	10,670	4,990	3,490	2,330	88,670
1957	3,840	4,250	5,190	5,230	4,700	5,540	6,220	26,360	27,020	8,640	6,440	4,650	108,100
1958	5,090	6,050	6,370	5,400	5,570	6,300	10,830	45,470	15,210	5,500	3,690	4,610	120,100
1959	3,760	3,890	3,810	3,230	3,380	4,550	4,820	4,820	2,470	1,800	1,960	1,860	40,350
1960	3,250	3,040	2,720	2,720	2,590	3,850	5,330	8,360	2,970	1,220	745	1,270	38,060
1961	2,620	2,950	2,680	2,460	2,500	3,390	3,960	2,640	785	362	1,540	4,020	29,910
1962	2,900	2,960	2,400	2,220	4,380	7,190	27,010	39,220	15,070	6,220	3,380	3,270	116,200
1963	6,130	4,510	3,520	2,470	4,460	4,040	6,020	16,150	6,980	2,440	5,970	4,830	67,520
1964	3,190	3,920	2,610	2,470	2,880	3,670	7,050	26,200	13,590	5,250	3,590	2,700	77,120
1965	3,140	3,590	3,290	3,650	3,370	4,610	10,250	41,310	31,330	13,390	9,700	7,580	135,200
1966	6,670	6,770	5,290	4,550	4,320	7,530	15,530	17,450	7,680	4,530	3,350	4,390	88,070
1967	5,010	4,620	3,830	3,530	3,940	6,170	7,640	27,610	33,280	14,410	8,800	7,040	125,900
1968	6,230	5,530	4,830	5,130	5,210	7,000	8,420	31,130	25,920	9,750	9,660	6,140	124,900

Water Plate No. 3

.—Chemical analyses of water

STATION NUMBER	DATE OF SAMPLE	TIME	TEMPERATURE (DEG C)	DISCHARGE (FT^3/S)	DISSOLVED SILICA (SiO_2) (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	DISSOLVED SODIUM PLUS POTASSIUM (MG/L)	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO_3) (MG/L)	CARBONATE (CO_3) (MG/L)	DISSOLVED SULFATE (SO_4) (MG/L)
09288100	71-10-14	0910	5.0	28	--	--	--	--	--	--	--	--	--
	71-11-17	1355	1.0	48	--	--	--	--	--	--	--	--	--
	71-12-14	1000	.0	2.2	--	--	--	--	--	--	--	--	--
	72-01-11	1500	5.0	29	--	--	--	--	--	--	--	--	--
	72-02-16	1315	1.0	39	--	--	--	--	--	--	--	--	--
	72-03-22	1205	6.0	67	--	--	--	--	--	--	--	--	--
	72-04-12	1500	8.0	126	--	--	--	--	--	--	--	--	--
	72-05-16	1530	13.0	146	--	--	--	--	--	--	--	--	--
	72-06-15	1230	14.0	58	--	--	--	--	--	--	--	--	--
	72-07-18	1400	16.0	26	--	--	--	--	--	--	--	--	--
	72-08-16	1440	21.0	25	--	--	--	--	--	--	--	--	--
	72-09-15	0900	9.0	26	--	--	--	--	--	--	--	--	--
	72-11-08	1500	4.0	39	--	--	--	--	--	--	--	--	--
	73-01-15	1155	--	23	--	--	--	--	--	--	--	--	--
	73-02-26	1305	3.0	35	--	--	--	--	--	--	--	--	--
	73-03-26	1055	1.0	37	11	58	33	97	--	2.2	304	0	90
	73-04-26	1005	6.0	93	--	--	--	--	--	--	--	--	--
	73-05-07	1320	8.0	195	--	--	--	--	--	--	--	--	--
	73-05-10	1040	8.0	260	--	--	--	--	--	--	--	--	--
	73-05-14	1145	11.0	380	--	--	--	--	--	--	--	--	--
	73-05-21	--	11.5	325	4.8	44	11	9.8	--	1.4	181	0	14
	73-06-12	1415	15.0	79	--	--	--	--	--	--	--	--	--
	73-07-11	1620	23.0	38	--	--	--	--	--	--	--	--	--
	73-07-25	1250	16.0	35	13	53	28	44	--	2.0	308	0	49
	73-08-17	1020	16.0	35	13	52	33	65	--	3.0	351	0	63
	73-08-23	1110	15.0	35	13	52	32	61	--	2.4	348	0	55
	73-09-10	1320	14.0	38	--	--	--	--	--	--	--	--	--
	73-10-25	1540	9.0	36	12	57	28	37	--	1.6	312	0	38
	73-11-15	1325	.5	32	--	--	--	--	--	--	--	--	--
	74-01-08	1255	.0	40	--	--	--	--	--	--	--	--	--
	74-02-13	1535	1.5	35	--	--	--	--	--	--	--	--	--
	74-04-02	1540	8.0	48	--	--	--	--	--	--	--	--	--
	74-05-08	1205	10.0	305	--	--	--	--	--	--	--	--	--
	74-06-05	1230	12.0	61	--	--	--	--	--	--	--	--	--
	74-06-26	1640	24.0	30	--	--	--	--	--	--	--	--	--
09288150	71-09-08	1150	9.5	4.0	--	--	--	--	--	--	--	--	--
	71-11-17	1000	.0	2.0	--	--	--	--	--	--	--	--	--
	72-01-11	1045	.5	2.2	--	--	--	--	--	--	--	--	--
	72-02-16	0930	.5	2.1	--	--	--	--	--	--	--	--	--
	72-03-22	0900	2.0	14	--	--	--	--	--	--	--	--	--
	72-04-12	1030	6.0	19	--	--	--	--	--	--	--	--	--
	72-05-16	1145	9.5	53	--	--	--	--	--	--	--	--	--
	72-06-01	0800	6.0	48	--	--	--	--	--	--	--	--	--
	72-07-18	1000	11.0	8.6	--	--	--	--	--	--	--	--	--
	72-08-16	1030	12.0	3.6	--	--	--	--	--	--	--	--	--
	72-09-13	0900	6.0	3.3	--	--	--	--	--	--	--	--	--
	72-11-08	1125	4.0	4.0	--	--	--	--	--	--	--	--	--
	73-02-27	1320	3.0	2.2	--	--	--	--	--	--	--	--	--
	73-04-05	0930	3.0	6.6	22	46	29	66	--	2.1	358	0	65
	73-04-26	0750	1.0	54	--	--	--	--	--	--	--	--	--
	73-05-07	1015	5.0	147	--	--	--	--	--	--	--	--	--
	73-05-09	0815	3.0	193	--	--	--	--	--	--	--	--	--
	73-05-11	0855	5.0	273	--	--	--	--	--	--	--	--	--
	73-05-25	1110	9.0	190	24	47	26	27	--	1.4	317	0	28
	73-06-12	1100	12.0	59	--	--	--	--	--	--	--	--	--
	73-07-12	0935	11.0	17	--	--	--	--	--	--	--	--	--
	73-08-17	0800	9.0	5.8	23	52	32	45	--	1.5	360	0	44
	73-09-18	1100	9.0	3.7	--	--	--	--	--	--	--	--	--
	73-10-25	1730	9.0	3.0	--	--	--	--	--	--	--	--	--
	73-11-15	1045	.0	3.0	--	--	--	--	--	--	--	--	--
	74-02-13	1220	.0	2.0	--	--	--	--	--	--	--	--	--
	74-04-02	1130	7.0	5.0	--	--	--	--	--	--	--	--	--
	74-05-08	0810	5.0	39	--	--	--	--	--	--	--	--	--
	74-06-05	1040	8.0	22	--	--	--	--	--	--	--	--	--
	74-06-26	1510	17.0	11	--	--	--	--	--	--	--	--	--
09288180													
STRAWBERRY RIVER NEAR DUCHESNE	48-06-09	1235	--	--	21	--	--	--	--	--	348	0	--
	49-04-07	1045	9.0	--	--	--	--	--	--	--	338	0	--
	49-10-14	1255	11.0	--	--	50	36	--	68	--	379	0	93
	50-11-06	1305	9.5	--	19	57	33	--	68	--	376	0	84
	51-09-07	0745	14.0	--	--	--	--	--	--	--	--	--	--
	56-08-14	--	--	50	--	47	34	86	--	2.0	373	5	104
	56-11-07	--	--	40	--	49	32	83	--	2.0	361	9	90

Water Plate No. 3

from sites at gaging stations—Continued

DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED NITRATE (NO3) (MG/L)	PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180°C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	SODIUM AD-SORP-TION RATIO	PH (UNITS)	AGENCY ANA-LYZING SAMPLE
--	--	--	--	--	--	--	--	--	570	--	--	--	--	
--	--	--	--	--	--	--	--	--	520	--	--	--	--	
--	--	--	--	--	--	--	--	--	540	--	--	--	--	
--	--	--	--	--	--	--	--	--	580	--	--	--	--	
--	--	--	--	--	--	--	--	--	525	--	--	--	--	
--	--	--	--	--	--	--	--	--	470	--	--	--	--	
--	--	--	--	--	--	--	--	--	406	--	--	--	--	
--	--	--	--	--	--	--	--	--	360	--	--	--	--	
--	--	--	--	--	--	--	--	--	530	--	--	--	--	
--	--	--	--	--	--	--	--	--	530	--	--	--	--	
--	--	--	--	--	--	--	--	--	620	--	--	--	--	
--	--	--	--	--	--	--	--	--	590	--	--	--	--	
--	--	--	--	--	--	--	--	--	650	--	--	--	--	
--	--	--	--	--	--	--	--	--	430	--	--	--	--	
--	--	--	--	--	--	--	--	--	498	--	--	--	--	
100	--	--	--	--	--	--	--	541	840	280	31	2.5	7.8	
--	--	--	--	--	--	--	--	--	550	--	--	--	--	
--	--	--	--	--	--	--	--	--	408	--	--	--	--	
--	--	--	--	--	--	--	--	--	360	--	--	--	--	
--	--	--	--	--	--	--	--	--	310	--	--	--	--	
6.3	--	--	--	--	--	--	--	188	319	160	7	.3	7.6	
--	--	--	--	--	--	--	--	--	500	--	--	--	--	
--	--	--	--	--	--	--	--	--	560	--	--	--	--	
31	.00	--	.00	.00	.4	180	--	372	622	250	0	1.2	8.3	
47	--	--	--	--	--	--	--	449	772	270	0	1.7	8.2	
43	.04	--	.03	.03	.3	160	--	431	720	260	0	1.6	8.3	
--	--	--	--	--	--	--	--	--	640	--	--	--	--	
22	--	--	--	--	--	--	--	349	660	260	2	1.8	8.2	
--	--	--	--	--	--	--	--	--	670	--	--	--	--	
--	--	--	--	--	--	--	--	--	550	--	--	--	--	
--	--	--	--	--	--	--	--	--	550	--	--	--	--	
--	--	--	--	--	--	--	--	--	630	--	--	--	--	
--	--	--	--	--	--	--	--	--	320	--	--	--	--	
--	--	--	--	--	--	--	--	--	450	--	--	--	--	
--	--	--	--	--	--	--	--	--	550	--	--	--	--	
--	--	--	--	--	--	--	--	--	495	--	--	--	--	
--	--	--	--	--	--	--	--	--	590	--	--	--	--	
--	--	--	--	--	--	--	--	--	560	--	--	--	--	
--	--	--	--	--	--	--	--	--	580	--	--	--	--	
--	--	--	--	--	--	--	--	--	540	--	--	--	--	
--	--	--	--	--	--	--	--	--	525	--	--	--	--	
--	--	--	--	--	--	--	--	--	470	--	--	--	--	
--	--	--	--	--	--	--	--	--	425	--	--	--	--	
--	--	--	--	--	--	--	--	--	418	--	--	--	--	
--	--	--	--	--	--	--	--	--	510	--	--	--	--	
--	--	--	--	--	--	--	--	--	520	--	--	--	--	
--	--	--	--	--	--	--	--	--	510	--	--	--	--	
--	--	--	--	--	--	--	--	--	560	--	--	--	--	
5.9	--	--	--	--	--	--	--	413	644	230	0	1.9	7.4	
--	--	--	--	--	--	--	--	--	560	--	--	--	--	
--	--	--	--	--	--	--	--	--	570	--	--	--	--	
--	--	--	--	--	--	--	--	--	480	--	--	--	--	
--	--	--	--	--	--	--	--	--	490	--	--	--	--	
6.5	--	--	--	--	--	--	--	316	508	220	0	.8	7.4	
--	--	--	--	--	--	--	--	--	520	--	--	--	--	
--	--	--	--	--	--	--	--	--	550	--	--	--	--	
10	--	--	--	--	--	--	--	385	641	260	0	1.2	8.3	
--	--	--	--	--	--	--	--	--	610	--	--	--	--	
--	--	--	--	--	--	--	--	--	630	--	--	--	--	
--	--	--	--	--	--	--	--	--	600	--	--	--	--	
--	--	--	--	--	--	--	--	--	600	--	--	--	--	
--	--	--	--	--	--	--	--	--	610	--	--	--	--	
--	--	--	--	--	--	--	--	--	480	--	--	--	--	
--	--	--	--	--	--	--	--	--	500	--	--	--	--	
--	--	--	--	--	--	--	--	--	520	--	--	--	--	
--	--	--	--	--	--	--	--	--	649	--	--	--	--	
76	--	--	--	--	--	--	--	--	922	--	--	--	--	
9.0	--	--	--	--	--	--	--	--	764	271	0	1.8	--	
21	--	.50	--	--	--	--	468	--	731	278	0	1.8	--	
--	--	--	--	--	--	--	--	--	680	--	--	--	--	
23	--	--	--	--	--	450	495	--	810	254	0	2.3	--	BR
23	--	--	--	--	--	390	496	--	783	259	0	2.2	8.3	BR

Water Plate No. 3

.—Chemical analyses of water

STATION NUMBER	DATE OF SAMPLE	TIME	TEMPERATURE (DEG C)	DISCHARGE (FT^3/S)	DISSOLVED SILICA (SiO_2) (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	DISSOLVED SODIUM PLUS POTASSIUM (MG/L)	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO_3) (MG/L)	CARBONATE (CO_3) (MG/L)	DISSOLVED SULFATE (SO_4) (MG/L)
09248100 — CONT.	57-06-26	--	--	222	--	--	--	--	--	--	--	--	--
	64-04-02	--	--	100	--	47	24	81	--	2.8	304	0	84
	64-04-29	--	--	200	--	37	18	37	--	2.4	231	0	36
	64-06-01	--	--	415	--	53	23	35	--	1.6	291	0	48
	64-06-29	--	--	175	--	57	29	72	--	2.8	314	13	89
	64-08-03	--	--	78	--	31	37	148	--	3.9	354	30	161
	64-09-01	--	--	48	--	46	38	130	--	3.1	398	22	133
	64-09-30	--	--	58	--	46	37	103	--	2.4	353	27	113
	64-11-18	--	--	90	--	29	34	104	--	2.4	304	33	90
	65-02-01	--	--	65	--	35	18	85	--	4.3	206	5	86
	69-11-03	--	--	109	--	45	34	67	--	2.4	314	7	94
	70-03-04	--	--	75	--	44	36	82	--	2.4	294	22	90
	70-04-07	--	--	103	--	49	30	67	--	4.3	325	4	83
	70-09-04	--	--	79	--	49	39	87	--	3.7	354	8	107
	71-07-14	--	--	97	--	43	33	61	--	1.8	313	0	81
	71-09-23	--	--	114	--	53	28	69	--	7.3	328	0	79
	71-10-06	--	--	71	--	55	35	75	--	3.0	364	14	88
	71-11-17	--	--	70	--	49	35	79	--	3.7	328	0	79
	71-11-18	0915	.0	50	--	--	--	--	--	--	--	--	--
	71-12-16	--	.0	32	--	--	--	--	--	--	--	--	--
	72-01-10	1500	--	66	--	--	--	--	--	--	--	--	--
	72-02-15	1415	.0	77	--	--	--	--	--	--	--	--	--
	72-03-17	0900	5.0	139	--	--	--	--	--	--	--	--	--
	72-04-06	--	--	162	--	--	--	--	--	--	--	--	--
	72-04-13	1610	6.0	206	--	55	26	45	--	2.4	299	12	59
	72-05-12	--	--	340	--	--	--	--	--	--	--	--	--
	72-05-17	0830	10.0	344	--	44	28	33	--	1.8	262	0	43
	72-06-14	--	13.0	179	--	--	--	--	--	--	--	--	--
	72-06-28	--	--	133	--	--	--	--	--	--	--	--	--
	72-07-17	--	22.0	91	--	46	30	56	--	2.4	325	0	66
	72-07-26	--	--	78	--	--	--	--	--	--	--	--	--
	72-08-16	0820	13.0	53	--	29	32	77	--	2.4	276	20	87
	72-09-24	--	--	59	--	--	--	--	--	--	--	--	--
	72-09-11	--	13.0	74	--	43	36	88	--	3.7	356	12	102
	72-09-19	--	--	73	--	--	--	--	--	--	--	--	--
	72-10-13	--	--	--	--	28	32	86	--	3.7	290	18	98
	72-11-09	0930	2.0	89	--	52	33	70	--	3.0	374	0	80
	73-01-22	1410	--	56	--	--	--	--	--	--	--	--	--
	73-02-27	1155	3.0	44	--	--	--	--	--	--	--	--	--
	73-03-23	1010	4.0	97	15	52	37	130	--	2.0	405	0	120
	73-04-16	1545	9.0	191	--	--	--	--	--	--	--	--	--
	73-05-09	0920	8.0	744	--	--	--	--	--	--	--	--	--
	73-05-10	0835	8.0	905	--	--	--	--	--	--	--	--	--
	73-05-11	1145	9.0	1040	--	--	--	--	--	--	--	--	--
	73-05-14	0840	7.5	1200	--	--	--	--	--	--	--	--	--
	73-05-19	1005	10.0	1250	--	--	--	--	--	--	--	--	--
	73-05-20	--	10.0	250	18	47	24	26	--	2.0	271	0	43
	73-05-25	--	--	--	--	36	24	28	--	3.0	236	0	44
	73-06-06	1900	16.0	560	--	--	--	--	--	--	--	--	--
	73-07-11	1650	16.5	100	--	--	--	--	--	--	--	--	--
	73-07-25	0930	15.0	95	18	52	35	75	--	2.0	375	0	99
	73-08-06	--	--	--	--	46	37	94	--	4.3	405	0	102
	73-08-15	1520	21.0	70	18	48	38	94	--	2.4	389	16	110
	73-08-16	1640	21.0	57	--	--	--	--	--	--	--	--	--
	73-09-06	--	--	--	--	19	35	85	--	3.7	257	14	99
	73-09-13	0930	11.0	93	--	--	--	--	--	--	--	--	--
	73-10-25	1140	5.5	76	15	57	36	80	--	2.0	363	8	93
	73-10-25	1150	5.5	76	--	--	--	--	--	--	--	--	--
	73-11-15	1535	1.0	68	--	--	--	--	--	--	--	--	--
	74-01-09	1330	.0	49	--	--	--	--	--	--	--	--	--
	74-02-14	1600	.0	48	--	--	--	--	--	--	--	--	--
	74-03-18	1640	5.0	115	--	--	--	--	--	--	--	--	--
	74-05-31	0920	9.0	138	--	--	--	--	--	--	--	--	--
	74-05-07	1640	15.0	341	--	--	--	--	--	--	--	--	--
	74-06-03	1710	16.0	154	--	--	--	--	--	--	--	--	--
	74-06-24	1545	23.0	49	--	--	--	--	--	--	--	--	--
09248500	41-04-19	--	--	110	17	54	31	80	--	--	--	--	--
STRAWBERRY RIVER AT DUCHESNE	41-05-18	--	--	740	15	47	24	33	--	.0	342	22	92
	44-07-31	--	--	59	--	48	35	--	66	.0	295	0	50
	47-03-20	1535	--	132	--	46	21	--	77	--	334	0	125
	47-05-11	1155	--	640	--	48	22	--	19	--	260	0	36
	47-06-22	1430	--	177	--	54	30	--	56	--	354	0	63
	47-09-20	1125	--	78	22	59	34	--	67	--	380	0	79
	48-06-09	1225	--	151	23	51	29	--	61	--	344	0	69

Water Plate No. 3

from sites at gaging stations—Continued

DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED NITRATE (NO3) (MG/L)	PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180°C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	SODIUM AD-SORP-TION RATIO	PH (UNITS)	AGENCY ANA-LYZING SAMPLE
--	--	--	--	--	--	--	365	--	606	--	--	--	--	BR
44	--	--	--	--	--	--	436	--	732	220	0	2.4	7.9	
15	--	--	--	--	--	--	287	--	453	170	0	1.2	7.7	
12	--	--	--	--	--	--	319	--	533	230	0	1.8	7.9	
34	--	--	--	--	--	--	439	--	736	260	0	1.9	8.3	
35	--	--	--	--	--	--	610	--	951	230	0	4.2	8.7	
47	--	--	--	--	--	--	606	--	975	270	0	3.4	8.4	
32	--	--	--	--	--	--	520	--	863	270	0	2.7	8.4	
32	--	--	--	--	--	--	482	--	785	210	0	3.1	8.7	
60	--	--	--	--	--	--	407	--	691	160	0	2.9	8.7	
22	--	--	--	--	--	--	429	--	674	250	0	1.8	8.3	BR
46	--	--	--	--	--	--	464	--	771	260	0	2.2	8.3	BR
22	--	--	--	--	--	--	422	--	681	250	0	1.8	8.3	BR
28	--	--	--	--	--	--	505	--	782	280	0	2.3	8.4	BR
19	--	--	--	--	--	--	408	--	656	240	0	1.7	8.0	BR
35	--	--	--	--	--	--	442	--	714	250	0	1.9	7.9	BR
26	--	--	--	--	--	--	485	--	770	280	0	2.8	8.5	BR
35	--	--	--	--	--	--	473	--	750	270	0	2.1	8.3	BR
--	--	--	--	--	--	--	--	--	900	--	--	--	--	
--	--	--	--	--	--	--	--	--	830	--	--	--	--	
--	--	--	--	--	--	--	--	--	800	--	--	--	--	
--	--	--	--	--	--	--	--	--	650	--	--	--	--	
--	--	--	--	--	--	--	--	--	640	--	--	--	--	
15	--	--	--	--	--	--	372	--	598	240	0	1.2	8.5	BR
--	--	--	--	--	--	--	--	--	530	--	--	--	--	
9.9	--	--	--	--	--	--	314	--	508	230	0	.9	8.2	BR
--	--	--	--	--	--	--	--	--	485	--	--	--	--	
--	--	--	--	--	--	--	--	--	560	--	--	--	--	
17	--	--	--	--	--	--	389	--	646	240	0	1.6	8.1	BR
--	--	--	--	--	--	--	--	--	660	--	--	--	--	
23	--	--	--	--	--	--	392	--	673	200	0	2.3	8.4	BR
--	--	--	--	--	--	--	--	--	730	--	--	--	--	
27	--	--	--	--	--	--	486	--	811	260	0	2.4	8.3	BR
--	--	--	--	--	--	--	--	--	765	--	--	--	--	
25	--	--	--	--	--	--	411	--	695	200	0	2.7	8.6	BR
23	--	--	--	--	--	--	458	--	759	270	0	1.9	8.1	BR
--	--	--	--	--	--	--	--	--	760	--	--	--	--	
--	--	--	--	--	--	--	--	--	650	--	--	--	--	
--	--	--	--	--	--	--	--	--	680	--	--	--	--	
65	--	--	--	--	--	--	--	622	962	280	0	3.4	8.2	
--	--	--	--	--	--	--	--	--	770	--	--	--	--	
--	--	--	--	--	--	--	--	--	510	--	--	--	--	
--	--	--	--	--	--	--	--	--	580	--	--	--	--	
--	--	--	--	--	--	--	--	--	500	--	--	--	--	
--	--	--	--	--	--	--	--	--	488	--	--	--	--	
--	--	--	--	--	--	--	--	--	460	--	--	--	--	
7.2	--	--	--	--	--	--	--	301	501	220	0	.8	8.1	
6.7	--	--	--	--	--	--	271	--	468	190	0	.9	7.7	BR
--	--	--	--	--	--	--	--	--	590	--	--	--	--	
--	--	--	--	--	--	--	--	--	720	--	--	--	--	
26	.00	--	.03	.03	.6	500	--	493	792	270	0	2.0	8.3	
34	--	--	--	--	--	--	538	--	876	270	0	2.6	8.0	BR
28	.13	--	.12	.12	.6	710	--	548	873	280	0	2.5	8.5	
--	--	--	--	--	--	--	--	--	800	--	--	--	--	
31	--	--	--	--	--	--	442	--	704	190	0	2.6	8.5	BR
--	--	--	--	--	--	--	--	--	760	--	--	--	--	
25	--	--	--	--	--	--	--	495	806	290	0	2.0	8.4	
--	--	--	--	--	--	--	--	--	810	--	--	--	--	
--	--	--	--	--	--	--	--	--	850	--	--	--	--	
--	--	--	--	--	--	--	--	--	800	--	--	--	--	
--	--	--	--	--	--	--	--	--	830	--	--	--	--	
--	--	--	--	--	--	--	--	--	750	--	--	--	--	
--	--	--	--	--	--	--	--	--	560	--	--	--	--	
--	--	--	--	--	--	--	--	--	430	--	--	--	--	
--	--	--	--	--	--	--	--	--	610	--	--	--	--	
--	--	--	--	--	--	--	--	--	770	--	--	--	--	
20	--	1.2	--	--	--	500	--	580	785	263	0	2.1	8.2	SL
7.1	--	3.7	--	--	--	280	--	383	540	234	0	.9	--	SL
17	--	.80	--	--	--	--	--	430	722	264	0	1.8	--	
10	--	1.1	--	--	--	--	--	--	671	251	0	2.1	--	
6.0	--	2.9	--	--	--	--	--	--	455	235	22	--	--	
16	--	.40	--	--	--	--	--	--	647	258	0	1.5	--	
20	--	.90	--	--	--	--	--	--	712	287	0	1.4	--	
17	--	.50	--	--	--	--	--	--	652	246	0	1.7	--	

Water Plate No. 3

—Chemical analyses of water

STATION NUMBER	DATE OF SAMPLE	TIME	TEMPERATURE (DEG C)	DISCHARGE (FT^3/S)	DISSOLVED SILICA (SiO_2) (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	DISSOLVED SODIUM PLUS POTASSIUM (MG/L)	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO_3) (MG/L)	CARBONATE (CO_3) (MG/L)	DISSOLVED SULFATE (SO_4) (MG/L)
092A0500— CONT.	48-09-29	1615	--	38	21	51	39	--	86	--	369	16	110
	49-04-07	1055	9.5	146	--	--	--	--	--	--	342	0	--
	49-04-07	1300	11.5	--	--	--	--	--	--	--	344	0	--
	49-07-02	--	--	181	--	37	29	52	--	3.9	223	22	78
	49-09-10	--	--	94	--	40	27	78	--	5.9	338	7	107
	49-10-14	1300	11.5	105	--	--	--	--	--	--	345	19	86
	50-06-04	1650	13.0	611	17	54	23	--	26	--	283	0	39
	50-11-06	1330	9.5	93	19	59	34	--	67	--	377	0	88
	54-08-26	1245	19.0	38	18	52	37	130	--	--	404	16	149
	55-10-19	1315	13.5	47	21	51	36	113	--	--	416	0	129
	57-03-28	1800	9.5	85	--	--	--	--	85	--	396	0	96
	57-07-26	1510	21.0	132	19	54	29	--	62	--	348	0	73
	57-10-22	--	--	96	--	43	37	98	--	--	394	0	92
	58-04-07	--	--	910	16	44	21	--	30	--	254	0	41
	58-04-23	--	--	1000	16	45	21	--	25	--	258	0	33
	58-05-07	--	--	910	16	44	21	--	30	--	254	0	41
	58-05-23	--	--	1000	16	45	21	--	25	--	258	0	33
	58-08-22	--	--	69	18	55	31	--	94	--	392	0	109
	62-04-05	--	--	348	--	33	19	70	--	4.7	211	7	75
	62-04-17	--	--	379	--	43	25	57	--	2.7	229	16	94
	62-05-16	--	--	344	--	44	24	33	--	1.6	239	7	62
	62-06-16	--	--	218	--	55	31	55	--	2.0	326	0	90
	62-07-11	--	--	99	--	20	35	76	--	1.6	214	15	129
	62-08-01	--	--	76	--	47	40	97	--	2.0	356	9	144
	62-08-16	--	--	44	--	43	43	120	--	2.0	368	9	183
	62-09-05	--	--	42	--	26	43	122	--	2.4	312	17	172
	62-09-18	--	--	44	--	45	42	122	--	2.4	409	3	142
	62-10-14	--	--	100	--	60	35	72	--	2.4	367	6	108
	62-12-03	--	--	70	--	56	35	86	--	1.6	400	0	107
	63-02-06	--	--	100	--	42	26	80	--	2.7	300	21	71
	63-04-11	--	--	100	--	32	27	79	--	2.0	247	18	96
	63-04-24	--	--	120	--	22	32	105	--	1.6	260	20	114
	63-05-22	--	--	310	--	49	23	40	--	1.4	275	9	49
	63-06-25	--	--	85	--	29	32	94	--	2.4	268	15	98
	63-07-17	--	--	25	--	37	39	130	--	2.0	385	15	144
	63-08-13	--	--	95	--	61	35	88	--	4.3	409	0	100
	63-09-18	--	--	85	--	24	32	79	--	2.0	268	16	82
	63-10-10	--	--	40	--	25	35	112	--	2.0	312	15	114
	63-11-07	--	--	75	--	38	34	101	--	2.0	346	8	94
	64-02-17	--	--	40	--	62	35	110	--	2.0	430	12	118
	65-02-01	--	--	65	--	41	21	86	--	3.5	215	10	140
	65-02-16	--	--	45	--	35	35	121	--	1.6	324	28	117
	65-03-02	--	--	55	--	19	33	122	--	3.9	295	39	125
	65-03-18	--	--	65	--	25	31	99	--	2.7	256	19	111
	65-03-23	--	--	90	--	49	31	93	--	3.5	323	26	98
	65-04-07	--	--	140	--	46	35	102	--	2.7	331	23	107
	65-04-20	--	--	130	--	40	28	88	--	3.1	246	25	96
	65-05-03	--	--	640	--	26	24	29	--	2.7	250	0	60
	65-05-17	--	--	610	--	46	24	34	--	1.6	276	0	49
	65-06-01	--	--	775	--	31	22	30	--	1.6	184	16	46
	65-06-14	--	--	510	--	51	24	37	--	1.6	290	0	55
	65-06-28	--	--	360	--	38	26	44	--	2.0	204	13	66
	65-07-09	--	--	230	--	50	30	51	--	2.0	313	0	81
	65-07-19	--	--	205	--	53	35	59	--	3.9	312	17	92
	65-08-03	--	--	200	--	48	32	83	--	4.7	361	0	81
	65-08-17	--	--	150	--	--	--	76	--	3.1	287	16	95
	65-08-30	--	--	120	--	--	--	16	--	1.6	176	6	57
	65-09-27	--	--	115	--	36	33	73	--	2.0	297	6	93
	65-11-01	--	--	110	--	--	--	83	--	2.0	296	7	101
	66-01-04	--	--	95	--	--	--	131	--	2.8	411	0	147
	66-03-14	--	--	170	--	--	--	86	--	4.7	271	0	97
	66-04-14	--	--	210	--	--	--	50	--	2.0	279	21	61
	66-05-05	--	--	310	--	--	--	42	--	1.6	241	5	76
	66-05-31	--	--	160	--	48	31	62	--	2.4	337	0	75
	66-06-28	--	--	100	--	54	34	84	--	2.4	342	0	98
	66-07-26	--	--	75	--	55	35	109	--	2.8	400	0	112
	66-09-10	--	--	40	--	38	39	128	--	2.8	404	9	141
	66-10-28	--	--	40	--	62	36	89	--	2.4	317	19	158
	67-02-16	--	--	55	--	48	35	106	--	2.4	341	8	114
	67-02-23	--	--	80	--	60	27	111	--	1.6	386	11	109

Water Plate No. 3

Green cities at gaging stations—Continued

DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED NITRATE (NO3) (MG/L)	PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180°C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	SODIUM AD-SORP-TION RATIO	PH (UNITS)	AGENCY ANA-LYZING SAMPLE
22	—	.60	—	—	—	—	—	—	812	288	0	2.2	—	
56	—	—	—	—	—	—	—	—	671	—	—	—	—	
50	—	—	—	—	—	—	—	—	887	—	—	—	—	
14	—	.20	—	—	—	290	—	346	680	212	0	1.6	—	IH
20	—	.02	—	—	—	560	—	451	884	211	0	2.3	—	IH
19	—	—	—	—	—	—	—	—	772	—	—	—	—	
9.8	—	1.8	—	—	—	—	—	—	519	229	0	.8	—	
22	—	.60	—	—	—	—	—	—	717	287	0	1.7	—	
20	—	.20	—	—	—	—	—	629	980	283	0	3.4	8.4	
31	—	.50	—	—	—	—	—	586	923	274	0	3.0	8.1	
20	—	.90	—	—	—	—	—	—	814	280	0	2.2	7.8	
38	—	.60	—	—	—	—	—	—	694	252	0	1.7	7.3	
—	—	24	—	—	—	—	—	—	820	260	0	2.4	8.0	
7.5	—	1.0	—	—	—	—	—	—	472	197	0	.9	8.0	
5.8	—	.40	—	—	—	—	—	—	459	200	0	.8	7.9	
7.5	—	1.0	—	—	—	—	288	—	472	197	0	.9	8.0	
5.8	—	.40	—	—	—	—	271	—	459	200	0	.9	7.9	
24	—	.70	—	—	—	—	510	—	819	264	0	2.5	8.2	
41	—	—	—	—	—	250	383	—	613	166	0	2.4	8.7	
17	—	—	—	—	—	350	360	—	582	210	0	1.7	8.9	
7.8	—	—	—	—	—	—	313	—	510	210	1	1.1	8.3	
17	—	—	—	—	—	180	403	—	681	270	0	1.5	8.2	
19	—	—	—	—	—	—	383	—	659	199	0	2.4	8.4	
24	—	—	—	—	—	650	543	—	879	280	0	2.5	8.2	
29	—	—	—	—	—	—	578	—	961	289	0	3.1	8.2	
32	—	—	—	—	—	—	539	—	921	240	0	3.4	8.4	
33	—	—	—	—	—	850	594	—	997	290	0	3.2	—	
22	—	—	—	—	—	—	453	—	791	290	0	1.8	—	
24	—	—	—	—	—	—	495	—	834	280	0	2.2	7.4	
26	—	—	—	—	—	460	432	—	715	210	0	2.4	8.5	
23	—	—	—	—	—	—	408	—	656	190	0	2.5	8.5	
34	—	—	—	—	—	—	454	—	754	190	0	3.3	8.6	
9.9	—	—	—	—	—	300	334	—	551	220	0	1.2	8.6	
25	—	—	—	—	—	—	429	—	683	200	0	2.6	8.2	
33	—	—	—	—	—	—	592	—	936	259	0	3.5	8.2	
38	—	—	—	—	—	—	492	—	879	300	0	2.2	7.5	
25	—	—	—	—	—	—	462	—	783	190	0	2.5	8.2	
33	—	—	—	—	—	—	462	—	814	210	0	3.4	8.5	
44	—	—	—	—	—	—	470	—	832	240	0	2.9	8.2	
33	—	—	—	—	—	—	565	—	936	300	0	2.8	8.6	
50	—	—	—	—	—	—	407	—	703	190	0	2.9	8.5	
42	—	—	—	—	—	—	543	—	910	230	0	3.5	8.4	
44	—	—	—	—	—	—	514	—	935	180	0	3.9	8.8	
35	—	—	—	—	—	—	450	—	742	190	0	3.1	8.8	
31	—	—	—	—	—	—	497	—	820	250	0	2.6	8.6	
47	—	—	—	—	—	—	541	—	863	260	0	2.7	8.5	
26	—	—	—	—	—	—	479	—	758	220	0	2.6	8.4	
8.9	—	—	—	—	—	—	304	—	490	160	0	.9	8.1	
9.2	—	—	—	—	—	—	314	—	502	210	0	1.0	8.2	
7.4	—	—	—	—	—	—	267	—	420	170	0	.8	8.6	
9.2	—	—	—	—	—	—	330	—	540	230	0	1.1	7.9	
15	—	—	—	—	—	—	312	—	499	180	0	1.1	8.4	
14	—	—	—	—	—	—	397	—	635	250	0	1.4	7.7	
20	—	—	—	—	—	—	450	—	692	240	0	1.6	8.4	
41	—	—	—	—	—	—	500	—	728	250	0	2.3	7.5	
24	—	—	—	—	—	—	445	—	686	—	—	2.2	8.6	
6.0	—	—	—	—	—	—	262	—	414	—	—	.5	8.4	
25	—	—	—	—	—	—	421	—	673	230	0	2.1	8.4	
28	—	—	—	—	—	—	420	—	714	—	—	2.5	8.4	
42	—	—	—	—	—	—	604	—	980	—	—	3.5	8.1	
43	—	—	—	—	—	—	440	—	790	—	—	2.5	7.6	
19	—	—	—	—	—	—	382	—	636	—	—	1.4	8.3	
12	—	—	—	—	—	—	345	—	549	—	—	1.2	8.3	
21	—	—	—	—	—	—	429	—	684	250	0	1.7	8.0	
26	—	—	—	—	—	—	499	—	809	280	0	2.2	8.2	
14	—	—	—	—	—	—	531	—	865	280	0	2.5	8.1	
40	—	—	—	—	—	—	600	—	977	260	0	3.5	8.3	
32	—	—	—	—	—	—	514	—	812	300	11	2.2	8.5	
36	—	—	—	—	—	—	547	—	893	260	0	4.0	8.5	
41	—	—	—	—	—	—	558	—	892	260	0	3.0	8.4	

Water plate No. 3

—Chemical analyses of water

STATION NUMBER	DATE OF SAMPLE	TIME	TEMPERATURE (DEG C)	DISCHARGE (FT³/S)	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	DISSOLVED SODIUM PLUS POTASSIUM (MG/L)	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)
09288500— CONT.	67-04-03	--	--	95	--	53	38	102	--	2.0	172	10	176
	67-05-15	--	--	245	--	57	27	45	--	1.6	114	3	71
	67-06-16	--	--	700	--	48	26	37	--	2.4	279	0	71
	67-07-14	--	--	240	--	51	33	48	--	1.6	313	0	88
	67-09-14	--	--	110	--	47	36	75	--	1.6	336	8	107
	67-11-09	--	--	95	--	56	34	74	--	2.4	347	16	100
	68-02-08	--	--	95	--	59	36	80	--	1.6	373	7	110
	68-03-26	--	--	110	--	50	35	81	--	2.0	337	11	107
	68-05-16	--	--	460	--	53	28	38	--	1.4	275	9	75
	68-06-20	--	--	315	--	52	37	43	--	1.6	293	4	101
	73-03-27	--	4.0	--	--	--	--	--	--	--	--	--	--
	73-05-23	--	11.0	190	14	56	32	78	--	2.5	249	0	160
	73-09-21	1400	13.5	140	13	58	35	73	--	2.5	252	24	170
	74-03-25	--	--	95	--	--	--	--	--	--	--	--	--
	71-09-17	0945	4.5	.70	--	--	--	--	--	--	--	--	--
	71-10-13	0908	3.0	1.0	--	--	--	--	--	--	--	--	--
	71-11-08	0955	.5	.80	--	--	--	--	--	--	--	--	--
	71-12-16	1050	.0	1.5	--	--	--	--	--	--	--	--	--
	72-01-12	1110	.0	1.3	--	--	--	--	--	--	--	--	--
	72-02-16	0940	1.0	.80	--	--	--	--	--	--	--	--	--
	72-03-23	1325	8.0	1.7	--	--	--	--	--	--	--	--	--
	72-05-01	0940	5.5	4.0	--	--	--	--	--	--	--	--	--
	72-06-02	1015	12.0	1.8	--	--	--	--	--	--	--	--	--
	72-06-21	1535	22.0	1.5	--	--	--	--	--	--	--	--	--
	72-08-01	1015	13.0	1.7	--	--	--	--	--	--	--	--	--
	72-09-29	1010	9.5	1.7	--	--	--	--	--	--	--	--	--
	72-09-11	1540	16.0	1.6	--	--	--	--	--	--	--	--	--
	72-10-06	0935	6.0	1.6	--	--	--	--	--	--	--	--	--
	72-11-09	0930	.0	.50	--	--	--	--	--	--	--	--	--
	72-12-06	1502	.0	1.5	--	--	--	--	--	--	--	--	--
	73-03-21	1115	3.0	1.3	--	88	74	100	--	7.3	458	0	320
	73-04-11	1420	10.0	4.1	--	--	--	--	--	--	--	--	--
	73-05-14	1615	15.0	42	38	75	56	63	--	5.6	403	0	190
	73-06-12	1100	11.0	26	39	84	74	95	--	5.3	442	0	310
	73-07-13	1030	14.0	12	36	82	74	100	--	4.7	429	0	320
	73-07-13	1050	14.0	12	--	--	--	--	--	--	--	--	--
	73-04-15	1155	14.0	7.3	40	85	79	94	--	4.9	434	0	350
	74-02-12	1040	3.0	1.4	--	--	--	--	--	--	--	--	--
	74-03-25	1430	8.0	4.0	--	--	--	--	--	--	--	--	--
	74-04-22	1410	15.5	1.9	--	--	--	--	--	--	--	--	--
09289050	41-07-31	--	--	--	34	127	177	256	--	9.4	178	18	1140
	49-07-02	--	--	--	--	128	173	368	--	20	275	34	1420
	49-09-10	--	--	--	--	53	26	60	--	5.9	206	2	150
09289500	71-08-04	0830	9.0	97	--	--	--	--	--	--	--	--	--
	71-09-09	0930	7.0	49	--	--	--	--	--	--	--	--	--
	71-10-04	0915	3.0	42	--	--	--	--	--	--	--	--	--
	72-03-22	0740	1.0	39	--	--	--	--	--	--	--	--	--
	72-05-02	1100	3.0	47	--	--	--	--	--	--	--	--	--
	72-06-15	--	--	742	--	--	--	--	--	--	--	--	--
	72-07-14	--	--	96	--	--	--	--	--	--	--	--	--
	72-08-16	1155	11.0	63	--	--	--	--	--	--	--	--	--
	72-09-12	1106	12.0	50	--	--	--	--	--	--	--	--	--
	72-10-05	1045	6.0	51	--	--	--	--	--	--	--	--	--
	73-04-04	0910	.0	25	--	--	--	--	--	--	--	--	--
	73-05-31	1206	4.0	410	--	--	--	--	--	--	--	--	--
	73-06-20	--	5.0	172	3.1	3.5	.9	3.5	--	.6	11	0	7.0
	73-06-30	1206	4.0	410	3.1	2.3	.6	1.0	--	.4	8	0	3.4
	73-07-12	1300	19.0	230	--	1.9	.5	--	--	--	13	0	--
	73-07-17	1130	19.0	230	--	--	--	--	--	--	--	--	--
	73-08-16	1300	.0	97	--	--	--	--	--	--	--	--	--
	74-04-15	1100	.0	22	--	--	--	--	--	--	--	--	--
09291000	58-05-21	--	--	324	3.1	4.4	.2	--	2.3	--	15	0	3.1
	58-09-26	--	--	156	3.0	4.0	.7	--	1.5	--	14	0	3.7
	61-09-24	1200	16.5	16	4.1	7.2	.8	--	2.3	--	22	0	2.9
	71-08-04	1145	10.0	331	--	--	--	--	--	--	--	--	--
	71-09-09	1230	13.5	--	--	--	--	--	--	--	--	--	--
	71-10-04	1210	7.0	69	--	--	--	--	--	--	--	--	--
	71-11-03	--	--	.00	--	--	--	--	--	--	--	--	--
	71-12-03	0900	--	.00	--	--	--	--	--	--	--	--	--
	72-04-28	1055	4.5	94	--	--	--	--	--	--	--	--	--
	72-06-06	--	7.5	171	--	--	--	--	--	--	--	--	--
	72-07-19	--	--	247	--	--	--	--	--	--	--	--	--
	72-08-16	1605	13.5	319	--	--	--	--	--	--	--	--	--
	72-09-12	1500	11.0	168	--	--	--	--	--	--	--	--	--
	72-10-05	1455	10.0	25	--	--	--	--	--	--	--	--	--

Water Plate No. 3

from sites at gaging stations—Continued

DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED NITRATE (NO3) (MG/L)	PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180°C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	SODIUM AD-SORP-TION RATIO	PH (UNITS)	AGENCY ANA-LYZING SAMPLE
42	--	--	--	--	--	--	540	--	874	290	0	2.6	8.5	
14	--	--	--	--	--	--	366	--	546	250	0	1.2	8.3	
15	--	--	--	--	--	--	325	--	521	230	0	1.3	8.1	
15	--	--	--	--	--	--	383	--	611	260	6	1.3	8.2	
22	--	--	--	--	--	--	439	--	732	270	0	2.0	8.3	
20	--	--	--	--	--	--	477	--	764	280	0	1.9	8.3	
26	--	--	--	--	--	--	502	--	784	300	0	2.0	8.3	
27	--	--	--	--	--	--	487	--	751	270	0	2.2	8.4	
8.5	--	--	--	--	--	--	344	--	541	250	6	1.1	8.3	
17	--	--	--	--	--	--	362	--	585	280	34	1.1	8.3	
--	--	--	--	--	--	--	--	--	820	--	--	--	--	
23	.24	--	.03	--	.4	320	--	482	795	270	67	1.8	8.2	
22	.17	--	--	.12	.5	370	--	525	820	290	39	1.9	8.5	
--	--	--	--	--	--	--	--	--	760	--	--	--	--	
--	--	--	--	--	--	--	--	--	1160	--	--	--	--	
--	--	--	--	--	--	--	--	--	1190	--	--	--	--	
--	--	--	--	--	--	--	--	--	1219	--	--	--	--	
--	--	--	--	--	--	--	--	--	880	--	--	--	--	
--	--	--	--	--	--	--	--	--	1170	--	--	--	--	
--	--	--	--	--	--	--	--	--	1215	--	--	--	--	
--	--	--	--	--	--	--	--	--	1150	--	--	--	--	
--	--	--	--	--	--	--	--	--	1350	--	--	--	--	
--	--	--	--	--	--	--	--	--	1060	--	--	--	--	
--	--	--	--	--	--	--	--	--	1150	--	--	--	--	
--	--	--	--	--	--	--	--	--	1200	--	--	--	--	
--	--	--	--	--	--	--	--	--	1150	--	--	--	--	
--	--	--	--	--	--	--	--	--	1125	--	--	--	--	
--	--	--	--	--	--	--	--	--	1125	--	--	--	--	
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12	.45	--	.25	--	--	--	870	--	1260	520	150	1.9	8.1	
--	--	--	--	--	--	--	--	--	1010	--	--	--	--	
9.1	--	--	--	--	--	--	--	635	974	420	87	1.3	7.7	
12	--	--	--	--	--	--	--	837	1210	510	150	1.8	8.1	
13	.75	--	--	.09	1.8	2600	--	849	1200	510	160	1.9	8.2	
--	--	--	--	--	--	--	--	--	1160	--	--	--	--	
12	--	--	--	--	--	--	--	879	1230	540	180	1.8	8.1	
--	--	--	--	--	--	--	--	--	1200	--	--	--	--	
--	--	--	--	--	--	--	--	--	1180	--	--	--	--	
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62	--	2.5	--	--	--	4200	--	2020	2590	1050	705	3.4	8.3	
70	--	.80	--	--	--	5650	--	--	3150	1030	745	5.0	--	
15	--	.20	--	--	--	430	--	--	779	239	1	1.7	--	
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5.5	--	--	--	--	--	--	--	30	21	12	3	.4	6.7	
1.0	--	--	--	--	--	--	--	16	19	8	2	.2	6.5	
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.8	--	.30	--	--	--	--	--	23	33	12	0	--	7.4	
.5	--	.30	--	--	--	--	--	26	32	13	2	--	7.0	
1.0	--	.80	--	--	--	--	--	29	38	18	0	--	7.1	
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Water Plate No. 4

Chemical analyses of water from

SITE NUMBER ON PLATE 2A OR 2B	SITE	LATITUDE	LONGITUDE	DATE OF SAMPLE	TIME	TEMPERATURE (DEG C)	DISCHARGE (FT³/S)	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	DISSOLVED SODIUM PLUS POTASSIUM (MG/L)
47	INDIAN CREEK DIVERSION CANAL NR MOUTH	40 08 28	111 08 39	73-09-21	1710	16.0	20	19	61	20	14	--
48	DRAIN BELOW PLEASANT VALLEY CANAL AT STATE ROAD 216	40 08 34	110 05 32	72-04-27	--	22.0	--	--	--	--	--	--
49	ANTELOPE CREEK AT U(C-4-3)10CDD	40 08 37	110 12 34	72-03-13	--	11.0	3.8	26	280	270	450	--
50	GREY MTN CANAL AT GRAVEL PITS NR MYTON	40 08 47	110 10 44	72-05-02	0915	9.0	--	--	--	--	--	--
51	PLEASANT VALLEY WASH BELOW COUNTY ROAD	40 08 52	110 02 50	73-07-25	1400	19.0	9.0	16	130	47	580	--
				73-08-22	1550	22.0	20	14	93	46	400	--
				74-07-14	--	19.0	11	15	110	53	450	--
52	PLEASANT VALLEY WASH AT COUNTY ROAD	40 08 52	110 02 57	72-04-28	1010	11.0	E1	--	--	--	--	--
				72-08-28	1525	20.0	E10	--	110	53	470	--
53	ANTELOPE CREEK AT US HIGHWAY 40 NR MOUTH	40 09 17	110 12 23	41-07-31	--	--	--	34	127	177	256	--
				49-07-02	--	--	--	--	128	173	348	--
				61-08-31	--	--	1.0	--	137	128	381	--
				73-03-07	--	.0	3.8	--	170	210	340	--
				73-07-11	--	--	8.0	--	196	184	421	--
				73-07-23	--	--	5.0	--	134	180	423	--
				73-07-25	0900	10.0	8.0	27	180	190	420	--
				73-08-07	--	--	5.0	--	160	153	393	--
				73-08-20	--	--	8.0	--	152	143	421	--
				73-08-23	1100	15.5	6.0	23	160	150	370	--
				73-09-04	--	--	4.0	--	152	146	382	--
				74-07-18	--	12.0	10	22	240	170	360	--
54	INDIAN CREEK AT MOUTH AT DUCHESNE	40 09 26	110 24 14	41-05-18	--	--	--	35	47	52	109	--
				41-07-31	--	--	--	27	34	130	448	--
				47-05-14	1025	--	--	--	52	53	--	115
				48-06-09	1215	--	--	45	28	91	--	283
				49-07-02	--	--	--	--	35	85	228	--
				49-09-10	--	--	--	--	28	92	400	--
				57-10-21	--	--	2.3	--	34	117	374	--
				58-05-07	--	--	12	34	50	59	--	149
				58-07-28	--	--	1.0	19	56	141	--	515
				60-02-20	1300	.5	1.5	20	46	137	--	418
				60-02-20	1315	.5	1.5	28	68	126	--	380
				60-02-20	1330	.5	1.5	18	52	124	--	344
				60-02-20	1345	.5	1.5	24	52	131	--	372
				60-02-20	1410	.5	1.0	20	48	136	--	437
				61-08-31	--	--	.50	--	22	145	548	--
				73-03-27	--	6.0	--	--	--	--	--	--
				74-05-20	--	10.0	35	35	52	58	140	--
56	STRAWBERRY RIVER AT MOUTH	40 09 39	110 23 14	54-06-26	0900	18.5	--	15	39	46	--	153
				60-08-30	1400	25.0	30	27	22	41	--	94
				61-08-24	1435	21.0	--	19	42	40	--	160
				72-05-02	1900	13.0	--	--	--	--	--	--
				72-08-02	--	10.5	--	--	--	--	--	--
				72-11-15	--	10.0	--	--	--	--	--	--
				73-03-07	--	4.5	50	--	64	38	95	--
				73-03-07	1435	5.0	--	--	--	--	--	--
				73-05-20	--	9.5	160	13	59	38	83	--
				73-06-13	1200	14.0	--	--	--	--	--	--
				73-07-25	1425	18.0	105	14	51	40	108	--
				73-08-23	0910	11.5	200	14	57	35	94	--
				73-09-21	1355	15.0	160	14	59	38	85	--
				73-11-05	--	4.0	35	--	--	--	--	--
				74-02-21	1100	2.0	75	13	58	38	93	--
				74-03-25	--	--	180	--	--	--	--	--
57	DUCHESNE RIVER AT STATE ROAD 86 AT BRIDGELAND	40 09 44	110 13 57	47-03-20	--	--	--	--	58	26	--	40
				47-05-11	--	--	--	--	35	13	--	12
				47-06-22	--	--	--	--	26	12	--	19
				47-09-20	--	--	--	12	68	34	--	65
				48-06-09	--	--	--	8.3	28	12	--	19
				48-09-29	--	--	--	12	89	57	--	146
				49-04-07	--	--	--	--	--	--	--	--
				49-10-14	--	--	--	--	--	--	--	--
				50-06-04	--	--	--	--	--	--	--	11
				50-11-06	--	--	--	13	65	38	--	58
				51-09-07	--	--	--	--	--	--	--	--
				54-08-26	--	--	--	10	84	47	133	--
				73-07-25	1140	--	135	7.6	49	24	41	--
				73-08-23	0900	18.5	170	10	58	20	62	--
58	DUCHESNE RIVER BELOW STRAWBERRY RESERVOIR	40 09 47	110 23 03	73-07-25	1430	19.0	450	6.2	39	16	18	--
				73-09-23	0910	14.0	475	10	51	19	59	--
				73-09-21	1410	15.0	325	11	55	21	53	--
				74-02-21	1050	1.5	220	11	62	31	59	--
				74-03-25	--	--	200	--	--	--	--	--
				74-05-01	1700	12.0	500	10	51	28	48	--
				74-05-22	0905	8.0	1000	--	--	--	--	--
59	DUCHESNE RIVER AT GREY MTN CANAL	40 09 50	110 16 33	72-04-21	1555	12.0	--	--	--	--	--	--

Water Plate No. 4

Miscellaneous sites on streams--Continued

DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED NITRATE (NO3) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180°C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	HARD-NESS (CA+MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	SODIUM AD-SORP-TION RATIO	PH (UNITS)	AGENCY ANA-LYZING SAMPLE	
1.8	278	0	56	3.2	.02	--	.12	.0	50	--	323	520	270	44	.6	8.0	GS	
--	--	--	--	--	--	--	--	--	--	--	--	2000	--	--	--	--	GS	
11	573	0	2000	97	1.6	--	.06	2.0	7800	--	3350	4170	1600	1100	4.9	7.9	GS	
--	--	--	--	--	--	--	--	--	--	--	--	510	--	--	--	--	GS	
8.9	395	0	1380	140	2.6	--	.09	.0	1100	--	2440	3090	600	280	10	8.3	GS	
4.2	393	0	850	82	.81	--	...09	.7	990	--	1690	2280	420	99	6.5	8.1	GS	
3.3	421	0	950	110	1.1	--	.18	.6	1100	--	1910	2710	500	150	6.8	8.0	GS	
--	--	--	--	--	--	--	--	--	--	--	--	4080	--	--	--	--	GS	
2.2	426	0	980	100	--	--	--	--	--	--	--	2800	490	140	4.2	8.3	GS	
0.4	370	18	1140	62	--	2.5	--	--	4200	--	2260	2590	1050	705	3.4	8.3	SL	
28	275	34	1420	70	--	.80	--	--	5600	--	2350	3150	1030	734	5.0	--	SL	
5.9	494	9	1150	65	--	--	--	--	5320	2340	--	2880	870	450	5.6	8.2		
7.9	562	0	1500	66	1.1	--	.06	--	--	--	2610	3080	1300	830	4.4	7.9	GS	
7.8	522	0	1580	81	--	--	--	--	--	3100	--	3460	1200	820	5.2	8.1		
7.8	480	0	1530	76	--	--	--	--	--	2880	--	3270	1100	750	5.6	8.1		
6.8	564	0	1500	72	1.3	--	.89	2.4	6600	--	2690	3170	1200	770	5.2	7.8	GS	
7.4	484	0	1340	66	--	--	--	--	--	2610	--	3050	1000	630	5.3	8.0		
6.6	474	0	1460	75	--	--	--	--	--	2810	--	3200	1130	860	5.6	8.1		
7.3	420	0	1400	62	--	--	--	--	--	--	2380	2940	1300	670	5.1	7.9	GS	
7.4	494	0	1300	72	--	--	--	--	--	2560	--	3020	960	580	5.3	8.0		
15	470	0	1600	80	1.6	--	.12	1.8	5200	--	2740	3350	1300	920	4.3	7.3	GS	
4.7	442	12	160	12	--	4.3	--	--	1800	684	651	1000	332	0	2.6	8.2	SL	
8.8	660	61	835	55	--	.60	--	--	8600	1960	1930	2670	418	0	7.8	8.3	SL	
--	494	0	166	12	--	3.1	--	--	--	--	644	1010	348	0	2.7	--	GS	
--	540	35	484	30	--	.20	--	--	--	--	1260	1770	439	0	5.9	--	GS	
15	480	67	449	24	--	.20	--	--	4600	--	1140	1770	437	0	4.7	--	SU	
22	574	56	744	45	--	.20	--	--	9400	--	1670	2400	428	0	8.4	--	SL	
9.3	712	34	648	40	--	1.4	--	--	--	--	1610	2300	564	0	6.8	8.4	GS	
--	524	0	226	14	--	2.6	--	--	2700	806	--	1180	365	0	3.4	8.1	GS	
--	815	30	981	62	--	.30	--	--	9100	2250	--	2960	720	0	8.3	8.5	GS	
--	862	26	743	44	--	2.2	--	--	7600	--	--	2580	678	0	7.0	8.4	GS	
--	824	51	653	36	--	2.1	--	--	6200	--	--	2400	648	0	6.4	8.6	GS	
--	804	20	621	33	--	1.4	--	--	6600	--	--	2250	638	0	5.9	8.4	GS	
--	844	35	651	36	--	1.3	--	--	6800	--	--	2380	670	0	6.3	8.5	GS	
--	814	43	789	46	--	2.6	--	--	7600	--	--	2630	678	0	7.3	8.3	GS	
11	783	58	979	69	--	--	--	--	10000	2260	--	3084	650	0	9.3	8.6		
--	--	--	--	--	--	--	--	--	--	--	--	1680	--	--	--	--	GS	
2.1	504	0	210	16	--	--	--	--	--	--	773	1170	380	0	3.1	8.1	GS	
--	484	0	161	38	--	1.5	--	--	--	--	--	993	296	0	3.9	8.2	GS	
--	450	30	164	42	--	.90	--	--	--	--	--	1120	224	0	5.7	8.6	GS	
--	506	0	143	38	--	1.2	--	--	--	--	--	1080	270	0	4.2	8.1	GS	
--	--	--	--	--	--	--	--	--	--	--	--	880	--	--	--	--	GS	
--	--	--	--	--	--	--	--	--	--	--	--	840	--	--	--	--	GS	
--	--	--	--	--	--	--	--	--	--	--	--	635	--	--	--	--	GS	
2.6	319	7	220	28	.88	--	33	--	--	--	425	940	320	44	2.3	8.4	GS	
--	--	--	--	--	--	--	--	--	--	--	--	940	--	--	--	--	GS	
2.8	324	0	160	25	--	--	--	--	--	--	541	847	300	38	2.1	8.1	GS	
--	--	--	--	--	--	--	--	--	--	--	--	1360	--	--	--	--	GS	
3.0	321	0	200	24	.84	--	.06	.6	950	--	592	919	240	29	2.5	8.3	GS	
2.8	265	6	180	23	.26	--	.03	.5	590	--	535	869	240	59	2.2	8.4	GS	
2.8	290	11	180	23	.18	--	.12	.5	620	--	558	880	300	46	2.1	8.4	GS	
--	--	--	--	--	--	--	--	--	--	--	--	500	--	--	--	--	GS	
2.9	326	5	180	25	.06	--	.06	.5	580	--	564	876	300	30	2.1	8.4	GS	
--	--	--	--	--	--	--	--	--	--	--	--	790	--	--	--	--	GS	
--	249	0	105	14	--	2.4	--	--	--	--	370	618	252	48	1.1	--	GS	
--	140	0	44	4.0	--	1.3	--	--	--	--	178	307	141	26	--	--	GS	
--	121	0	45	6.0	--	.50	--	--	--	--	168	289	114	16	--	--	GS	
--	295	9	181	20	--	.60	--	--	--	--	428	803	318	75	1.6	--	GS	
--	132	0	44	4.0	--	.60	--	--	--	--	181	291	120	12	--	--	GS	
--	294	9	440	39	--	.10	--	--	--	--	940	1340	456	195	3.0	--	GS	
--	293	0	--	33	--	--	--	--	--	--	--	752	--	--	--	--	GS	
--	287	0	--	15	--	--	--	--	--	--	--	744	--	--	--	--	GS	
--	168	0	30	3.0	--	--	--	--	--	--	--	335	147	11	--	--	GS	
--	304	0	151	18	--	.40	--	--	--	--	493	756	310	54	1.4	--	GS	
--	--	--	--	--	--	--	--	--	--	--	--	689	--	--	--	--	GS	
--	337	0	389	35	--	.00	--	--	--	--	874	1320	446	168	2.7	8.1	GS	
1.7	184	11	120	11	.00	--	.04	.3	310	--	358	574	220	50	1.2	8.6	GS	
2.0	234	0	140	16	.03	--	.03	.4	350	--	427	711	230	32	1.6	8.2	GS	
1.3	172	0	58	5.9	.01	--	.00	.3	160	--	230	385	160	22	.6	8.0	GS	
2.2	215	0	130	14	.13	--	.03	.3	330	--	383	646	210	29	1.5	8.3	GS	
2.3	247	0	130	16	.08	--	.06	.4	330	--	421	680	270	62	1.4	8.3	GS	
2.2	285	0	130	19	.12	--	.06	.4	350	--	456	726	280	49	1.5	8.3	GS	
--	--	--	--	--	--	--	--	--	--	--	--	650	--	--	--	--	GS	
2.1	251	8	120	18	.00	--	.00	.3	310	--	422	679	240	23	1.7	8.4	GS	
--	--	--	--	--	--	--	--	--	190	265	--	424	--	--	--	--	GS	
--	--	--	--	--	--	--	--	--	--	--	--	605	--	--	--	--	GS	

Water Plate No. 5

--Chemical analyses of water from

SITE NUMBER ON PLATE 2A OR 2B	SITE	LAT-I-TUDE	LONG-I-TUDE	DATE OF SAMPLE	TIME	TEMPERATURE (DEG C)	DIS-CHARGE (FT^3/S)	DIS-SOLVED SILICA (SiO_2) (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	DIS-SOLVED SODIUM PLUS POTAS-SIUM (MG/L)
66	DUCHESNE RIVER ABOVE DUCHESNE FEEDER CANAL--CONT.	40 10 16	110 14 11	69-05-15	--	--	1000	--	52	27	36	--
				64-06-20	--	--	3500	--	27	8.7	8.7	--
				69-10-03	--	--	800	--	59	24	40	--
				69-02-19	--	--	200	--	64	30	46	--
				69-04-08	--	--	450	--	57	25	44	--
				64-08-07	--	--	80	--	54	31	47	--
				69-10-14	--	--	450	--	62	34	58	--
				64-11-05	--	--	80	--	61	27	30	--
				70-03-04	--	--	15	--	85	47	200	--
				70-04-09	--	--	100	--	59	29	35	--
				70-05-08	--	--	300	--	53	25	44	--
				70-09-03	--	--	300	--	55	33	53	--
				70-11-14	--	--	--	--	65	27	27	--
				71-04-29	--	--	300	--	57	26	39	--
				71-07-14	--	--	100	--	42	18	23	--
				71-08-23	--	--	--	--	64	29	47	--
				71-10-07	--	--	--	--	70	33	51	--
				71-11-17	--	--	--	--	63	24	39	--
				72-04-06	--	--	--	--	56	24	25	--
				72-05-12	--	--	600	--	48	20	30	--
				72-06-29	--	--	--	--	35	13	18	--
				72-07-25	--	--	--	--	52	21	31	--
				72-04-19	--	--	--	--	63	34	51	--
				72-10-13	--	--	--	--	61	28	40	--
				73-05-24	--	--	--	--	32	13	25	--
				73-07-11	--	--	800	--	44	22	36	--
				73-07-23	--	--	700	--	47	21	33	--
				73-09-04	--	--	--	--	49	24	46	--
67	MYTON TOWNSITE CANAL BELOW GREY MTN CANAL	40 10 19	110 02 50	71-04-07	--	--	90	--	45	23	51	--
				71-07-11	--	--	87	--	80	54	116	--
				73-07-25	--	--	30	--	58	33	61	--
				73-08-07	--	--	42	--	65	47	133	--
				73-08-20	--	--	75	--	64	34	83	--
				73-08-22	--	24.0	45	13	90	53	110	--
				73-09-04	--	--	--	--	75	49	107	--
68	STRAWBERRY RIVER BELOW STARVATION RESERVOIR	40 10 25	110 25 44	73-09-19	--	--	36	--	63	47	105	--
				64-11-03	--	--	--	--	50	36	81	--
				70-03-04	--	--	1.0	--	83	43	209	--
				70-04-07	--	--	3.0	--	69	49	137	--
				70-09-04	--	--	50	--	63	37	44	--
				71-07-14	--	--	50	--	58	31	44	--
				71-08-23	--	--	--	--	70	33	73	--
				71-10-04	--	--	--	--	70	36	74	--
				71-11-17	--	--	--	--	59	34	69	--
				72-04-06	--	--	--	--	70	44	109	--
				72-05-12	--	--	100	--	59	33	74	--
				72-05-28	--	--	--	--	63	39	63	--
				72-07-24	--	--	--	--	54	34	77	--
				72-09-19	--	--	--	--	63	36	79	--
				72-10-13	--	--	--	--	69	37	80	--
				73-05-25	--	--	--	--	46	33	77	--
				73-07-25	1410	17.0	75	12	50	33	67	--
				73-08-09	--	--	--	--	57	33	76	--
				73-08-21	0945	18.5	190	13	55	33	44	--
				73-09-04	--	--	--	--	58	33	73	--
				74-09-21	1435	13.0	145	14	58	34	70	--
				74-02-21	1015	2.0	70	13	61	34	81	--
				74-03-25	--	--	95	--	--	--	--	--
				74-05-01	1730	8.0	350	12	51	34	71	--
				74-05-22	0940	10.0	350	--	--	--	--	--
69	DRAIN RETURN TO GREY MTN CANAL NR MYTON	40 10 28	110 03 56	72-05-03	1705	15.0	61	--	--	--	--	--
70	GREY MTN CANAL AT MOUTH	40 10 29	110 03 28	74-08-22	1430	20.0	8.0	15	100	46	120	--
71	GREY MTN CANAL AT COUNTY ROAD	40 10 32	110 03 58	72-05-03	1700	22.5	6.5	--	--	--	--	--
				72-05-04	1030	11.0	65	--	--	--	--	--
				72-10-04	1015	11.5	--	--	--	--	--	--
72	BRYANTS FORK AT BRYANTS FORK GUARD STATION	40 10 32	111 11 14	73-04-12	1600	12.0	6.5	--	--	--	--	--
73	DUCHESNE FEEDER CANAL AT DIVERSION NR BRIDGELAND	40 10 33	110 17 55	73-09-21	1700	14.5	2.0	6.3	52	29	3.2	--
74	DRAIN RETURN TO GREY MTN CANAL NR MYTON	40 10 41	110 04 04	73-08-23	--	14.0	90	11	52	19	51	--
75	MYTON TOWNSITE CANAL NR SAND PASS	40 10 42	109 58 05	72-05-04	1005	13.0	--	--	--	--	--	--
				74-09-05	--	--	--	--	91	55	145	--
76	LAKE BOREHAM OUTFLOW NR MYTON	40 10 43	110 09 55	73-07-25	1350	18.0	35	8.1	62	26	94	--
				73-09-23	0805	20.5	45	9.7	78	30	110	--
				74-07-18	1120	17.0	53	9.2	59	26	74	--
77	DRAIN INTO GREY MTN CANAL AT STATE ROAD 53 NR MYTON	40 10 45	110 05 56	74-07-11	--	--	2.0	--	114	45	130	--
				74-07-25	--	--	.05	--	188	72	244	--
				74-08-07	--	--	1.0	--	142	58	179	--
				73-08-20	--	--	4.0	--	146	61	186	--
				74-09-04	--	--	1.0	--	123	55	142	--
78	ROCKY POINT CANAL AT STATE ROAD 87 AT DUCHESNE	40 10 46	110 23 54	72-04-02	1720	9.5	--	--	--	--	--	--
				72-05-31	--	10.0	--	--	--	--	--	--

Water Plate No. 5

Miscellaneous sites on stream—Continued

DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED NITRATE (NO3) (MG/L)	DIS-SOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED SOLIDS (RESIDUE AT 180°C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	SPECIFIC CONDUCTANCE (MICROMHOS)	HARDNESS (CA,MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	SODIUM ADSORPTION RATIO	PH (UNITS)	AGENCY ANALYZING SAMPLE
1.2	267	0	87	11	--	--	--	--	--	322	--	512	240	38	.9	8.2	
62	185	0	30	2.5	--	--	--	--	--	144	--	226	100	15	.4	7.9	
2.8	253	6	103	13	--	--	--	--	--	375	--	583	250	36	1.1	8.3	
1.6	262	20	123	17	--	--	--	--	--	419	--	644	280	51	1.2	8.4	
1.8	265	0	97	17	--	--	--	--	--	378	--	576	250	28	1.2	8.1	
2.0	272	2	116	13	--	--	--	--	--	401	--	633	260	36	1.3	8.3	
2.0	325	0	121	21	--	--	--	--	--	481	--	739	300	27	1.5	8.3	
1.0	245	0	111	9.6	--	--	--	--	--	378	--	576	260	62	.9	8.2	
3.5	371	0	617	44	--	--	--	--	--	1280	--	1660	570	270	3.7	8.1	
2.0	215	5	138	12	--	--	--	--	--	400	--	587	270	82	.9	8.3	
2.0	243	0	110	16	--	--	--	--	80	374	--	587	240	36	1.2	8.2	
2.0	242	0	161	17	--	--	--	--	--	451	--	664	270	75	1.4	8.2	
1.8	222	6	122	12	--	--	--	--	--	391	--	586	270	81	.7	8.3	
1.8	205	6	122	14	--	--	--	--	--	380	--	594	250	72	1.1	8.4	
1.2	170	0	76	9.2	--	--	--	--	--	262	--	430	180	40	.6	8.2	
2.0	234	0	143	12	--	--	--	--	--	441	--	674	280	73	1.2	8.3	
2.0	256	7	163	18	--	--	--	--	--	491	--	734	310	90	1.3	8.3	
2.0	217	13	125	16	--	--	--	--	--	404	--	624	270	73	1.0	8.3	
1.8	195	7	100	11	--	--	--	--	0	345	--	522	240	47	.7	8.3	
2.0	193	0	88	11	--	--	--	--	--	313	--	479	200	46	.9	8.0	
1.2	144	0	54	6.0	--	--	--	--	--	283	--	345	140	23	.7	7.9	
1.8	221	0	93	12	--	--	--	--	--	326	--	533	220	35	.9	8.2	
2.7	276	0	183	20	--	--	--	--	--	504	--	780	300	74	1.5	8.2	
2.0	253	0	128	14	--	--	--	--	--	414	--	603	270	40	1.1	8.1	
1.8	143	0	56	8.5	--	--	--	--	--	220	--	366	130	16	.9	7.7	
2.0	204	0	96	11	--	--	--	--	--	340	--	548	210	36	1.1	7.9	
2.0	201	0	92	11	--	--	--	--	--	328	--	519	200	34	1.0	8.0	
2.4	217	4	136	15	--	--	--	--	--	420	--	628	230	44	1.3	8.3	
1.6	195	0	142	15	--	--	--	--	--	384	--	616	210	51	1.6	8.1	
3.1	232	10	413	27	--	--	--	--	--	884	--	1220	420	220	2.4	8.3	
2.4	185	18	202	19	--	--	--	--	--	518	--	772	280	46	1.6	8.5	
3.1	196	16	451	29	--	--	--	--	--	930	--	1270	400	210	2.9	8.3	
24	254	0	259	23	--	--	--	--	--	639	--	928	320	110	2.0	8.2	
4.9	294	0	420	25	.25	--	.06	.7	1000	--	866	1220	440	200	2.3	8.1	GS
3.1	276	0	359	28	--	--	--	--	--	828	--	1140	390	160	2.4	8.0	
3.1	251	0	323	27	--	--	--	--	--	728	--	1040	350	150	2.4	8.2	
1.6	337	6	120	26	--	--	--	--	--	488	--	769	270	0	2.2	8.3	
2.7	436	0	540	61	--	--	--	--	--	1250	--	1660	540	190	3.9	8.2	
2.7	374	0	297	40	--	--	--	--	470	789	--	1160	370	66	3.1	8.2	
2.4	270	9	193	21	--	--	--	--	--	507	--	747	290	52	1.8	8.4	
1.8	261	0	166	21	--	--	--	--	--	483	--	737	270	58	1.7	8.1	
4.7	253	18	195	25	--	--	--	--	--	560	--	854	310	73	1.8	8.3	
2.4	290	0	215	23	--	--	--	--	--	606	--	892	350	130	1.4	8.2	
3.1	264	0	179	26	--	--	--	--	--	512	--	780	290	70	1.8	8.2	
2.7	308	0	278	35	--	--	--	--	400	710	--	1040	360	100	2.5	8.2	
2.4	273	0	180	24	--	--	--	--	--	522	--	791	280	59	1.9	8.1	
2.0	231	0	144	21	--	--	--	--	--	420	--	681	230	37	1.8	8.2	
2.0	264	0	186	28	--	--	--	--	--	533	--	803	280	55	2.0	8.2	
2.7	193	13	206	24	--	--	--	--	--	516	--	767	240	74	2.2	8.4	
2.7	301	0	210	28	--	--	--	--	--	593	--	912	330	78	1.9	8.1	
2.4	267	0	163	27	--	--	--	--	--	482	--	771	250	27	2.7	8.2	
2.2	272	8	150	22	.03	--	.03	.5	360	--	479	755	260	24	1.9	8.4	GS
2.7	302	0	165	24	--	--	--	--	--	503	--	808	280	30	2.0	8.1	
2.3	256	0	160	22	.22	--	.06	.5	320	--	478	788	270	48	1.8	8.3	GS
2.7	257	9	154	21	--	--	--	--	--	488	--	757	260	35	2.0	8.4	
2.5	301	0	160	22	.20	--	.12	.5	340	--	511	810	280	34	1.8	8.3	GS
2.7	314	3	160	24	.08	--	.09	.3	400	--	535	836	290	30	2.1	8.4	GS
--	--	--	--	--	--	--	--	--	--	--	--	755	--	--	--	--	GS
2.6	289	6	140	22	.01	--	.06	.4	380	--	482	771	270	20	1.9	8.4	GS
--	--	--	--	--	--	--	--	--	380	440	--	760	--	--	--	--	GS
--	--	--	--	--	--	--	--	--	--	--	--	3400	--	--	--	--	GS
5.2	314	0	400	30	--	--	--	--	--	--	873	1290	440	180	2.5	7.9	GS
--	--	--	--	--	--	--	--	--	--	--	--	2200	--	--	--	--	GS
--	--	--	--	--	--	--	--	--	--	--	--	950	--	--	--	--	GS
--	--	--	--	--	--	--	--	--	--	--	--	820	--	--	--	--	GS
--	--	--	--	--	--	--	--	--	--	--	--	2600	--	--	--	--	GS
1.4	264	0	8.3	2.5	.12	--	.03	.2	20	--	236	430	250	29	.1	8.2	GS
2.4	216	8	130	15	--	--	--	--	--	--	387	662	210	31	1.5	8.1	GS
--	--	--	--	--	--	--	--	--	--	--	--	3100	--	--	--	--	GS
3.9	254	0	509	34	--	--	--	--	--	1050	--	1400	450	240	3.0	8.2	
2.2	216	0	260	18	.00	--	.00	.4	360	--	579	882	260	83	2.5	8.1	GS
3.2	203	0	350	30	.13	--	.03	.5	430	--	712	1040	320	150	2.7	8.0	GS
2.2	234	0	190	17	.04	--	.00	.3	350	--	494	782	260	63	2.0	8.1	GS
2.7	304	0	451	35	--	--	--	--	--	1000	--	1340	470	220	2.5	8.1	
1.8	340	0	869	61	--	--	--	--	--	1820	--	2230	770	490	3.8	8.0	
3.1	367	0	605	51	--	--	--	--	--	1310	--	1710	590	300	3.2	8.0	
2.4	348	17	648	56	--	--	--	--	--	1410	--	1800	620	300	3.3	8.3	
4.7	317	0	542	56	--	--	--	--	--	1200	--	1610	530	270	3.1	7.9	
--	--	--	--	--	--	--	--	--	--	--	--	345	--	--	--	--	GS
--	--	--	--	--	--	--	--	--	--	--	--	135	--	--	--	--	GS

Water Plate No. 6

.--Chemical analyses of water

Geologic source: Qay, unconsolidated deposits; Tu, Uinta Formation; Tgp, Parachute Creek Member, Green River Formation; Tgu, Green River Formation, undivided; Tw, Wasatch Formation; KTnh, North Horn Formation.
Sodium: Where no value is reported for potassium, Na + K has been calculated and is reported as sodium.

Location	Name or owner	Geologic source	Date of collection	Temperature (°C)	Milligrams: Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)
(D-9-17)21dca-1	U.S. Bureau of Land Management	Tu	9- 3-71	-	11	20	16	510	2.2	467	0	720
(D-10-17)12baa-S1	Unknown	Tu	3-16-72	11.0	14	60	27	980	5.1	571	0	1,600
(D-10-20)35bbc-1	U.S. Bureau of Land Management	Tgu	7-24-64	-	15	.0	7.3	859		1,420	189	9.1
(D-11-15)15dbb-S1	Unknown	Tgp	3-16-72	-	37	32	29	810	5.6	983	0	980
32dcd-1	Preston-Nutter Corp.	-	4-11-72	-	22	75	100	170	2.8	726	0	360
(D-11-17)20aca-S1	Unknown	Tgp	3-16-72	-	-	75	63	1,000	-	690	-	-
(D-11-18)20cba-S1	do	Tgp	3-16-72	8.0	29	78	73	1,000	6.2	809	0	1,800
(D-11-21)31bdd-1	Golden Hatch	Tgu	8-31-71	16.0	15	.7	.7	370	.9	562	65	220
(D-11-24)6dbc-1	U.S. Bureau of Land Management	Tgu	8-26-65	-	12	3.2	.5	438		644	0	334
7cac-1	do	Tgu	8-26-65	-	12	3.2	.5	418		691	0	310
(D-12-21)19bdd-S1	Sulphur Spring	Tgp	8-30-71	-	15	1.6	.6	230	.8	353	32	150
(D-13-16)24adb-S1	Pan American Oil Corp.	Tgp	7-15-66	-	-	73	31	25	1.0	415	0	15
24dba-1	do	Tgp	7-15-66	-	-	59	29	30	1.0	366	0	20
(D-13-23)27acd-S1	Unknown	Tgp	4-12-72	10.5	17	160	200	410	7.3	576	0	1,500
(D-13-25)29bab-S1	Indian Spring	Tgp	9- 1-71	-	24	150	110	140	.7	308	0	850
(D-14-14)4abd-S1	Pan American Oil Corp.	Tgp	7-15-66	-	-	36	60	37	1.0	293	0	153
(D-14-19)33aad-S1	Charlie Brown Spring	Tgp	9- 2-71	-	28	84	61	93	1.3	438	0	300
(D-14-22)25cac-S1	Pine Spring	Tgp	4-12-72	8.0	19	63	86	92	1.9	506	0	240
(D-14-24)21ccc-S1	Unknown	Tgp	9-13-72	10.0	21	130	72	76	1.2	319	0	500
(D-15-19)4bba-S1	Secret Spring	Tgp	9- 2-71	-	-	81	-	130	-	370	-	390
(D-15-20)15bbd-S1	Flat Rock Spring	Tgp	8-31-71	17.0	16	57	16	24	.4	242	0	57
(D-15-23)36ddd-S1	FR Spring	Tgp	9-17-64	8.5	17	65	36	17		302	0	96
(D-15-25)7bcc-S1	Unknown	Tgp	9-12-72	10.5	16	74	48	36	.5	275	0	200
(D-16-16)32dda-S1	Waldo Wilcox	Tw	4-11-72	11.0	23	58	52	66	1.0	449	0	120
(D-16-17)3c-S1	Camel Rock Spring	Tw	9-25-48	-	26	70	41	73		321	0	220
(D-16-18)24bcd-S1	Pinto Springs	Tgp	8-31-71	-	22	58	17	10	.6	268	0	33
(D-17-16)10cac-S1	Waldo Wilcox	KTnh	4-11-72	-	23	58	54	100	1.2	483	0	190
10cca-S1												
(D-17-17)20ccc-S1	Unknown	KTnh	9-25-48	-	18	10	5.7	250		492	0	176
(D-17-19)28bab-S1	Seeley Spring	Tgp	8-31-71	6.0	15	57	16	6.6	.4	267	0	13
(D-18-19)25cbb-S1	Unknown	Tgp	8-31-71	5.0	11	60	24	2.7	.7	297	0	29
(D-18-20)7bad-S1	Marble Spring	Tgp	8-31-71	5.0	8.3	49	10	3.3	.3	193	0	16
U(C-3-5)31dcd-1	D. T. Jones	Tu	3-30-72	10.0	18	4.6	6.4	450	1.4	496	52	310
U(C-4-2)5bba-2	Lamar Neilson	Qay	5-22-72	11.5	23	400	230	620	3.9	414	0	2,900
13daa-2	Alden Kynaston	Tu	5- 7-72	14.0	23	95	34	110	3.7	411	0	280
U(C-4-3)9bbd-1	Latter-day Saints Church	Tu	5- 7-72	-	8.6	18	6.2	380	2.6	281	0	530
10cbb-1	Willis Shepard	Qay	5- 3-72	-	17	150	87	460	2.6	278	0	1,400
12cab-1	Wallace Pitt	-	5- 7-72	-	18	66	36	87	1.8	384	0	160
U(C-4-6)17cdc-S1	M. N. McKinnon	Tu	9- 3-71	11.0	13	25	140	790	7.3	761	0	1,200
			5-15-60	13.5	11	23	126	865		1,290	106	1,000
U(C-4-7)14acc-S1	Stinking Spring	Tu	5-18-41	-	10	1.0	6.1	1,760	2.3	1,470	1,060	110
14bcd-S1	do	Tu	5-18-41	-	12	5.6	5.5	3,220	7.0	1,990	2,580	188
14bdd-S1	do	Tu	5-15-60	16.5	36	0	0	3,110		1,380	2,800	11
21daa-S1	Unknown	Tu	4-10-72	8.0	23	32	120	420	4.9	803	17	670
22ccb-S1	do	Tu	4-10-72	5.0	28	140	160	170	4.0	424	0	940
U(C-4-9)35add-S1	do	Tu	4-10-72	5.0	23	86	59	23	2.0	370	0	190
U(C-5-5)34bdd-?	W. C. Foy	-	4-13-72	8.5	30	140	100	100	4.4	474	0	570
U(C-5-6)1caa-S1	Unknown	Tu	5-15-60	10.5	22	61	125	420		988	0	682
1caa-S2	do	Tu	5-15-60	9.5	23	63	118	437		1,020	0	670
U(C-5-7)12cda-S1	do	Tu	5-15-60	10.0	6.3	37	131	779		1,200	144	887
18acd-S1	do	Tu	4-10-72	4.0	45	160	180	21	5.6	467	0	780
U(C-5-10)10dcb-S1	Big Beaver Spring	Tu	9-11-72	7.5	13	77	33	3.4	.8	348	0	52
U(C-7-8)1acd-S1	Ross Station Spring	Tgp	8- 9-71	9.0	47	57	45	62	3.6	475	0	33
U(C-7-3)9dcd-S1	Horse Ridge Spring(?)	Tgp	7-18-60	12.5	12	42	17	3.8		211	0	7.8

Sec 17
T4SR6W

Water Plate No. 6

from selected springs and water wells

Chloride (Cl) per litre	Fluoride (F)	Nitrate (NO_3) + Nitrite (NO_2) as N	Nitrate (NO_3)	Phosphate (PO_4)	Boron (B)	Iron (Fe)	Manganese (Mn)	Dissolved solids (calculated)	Hardness as $CaCO_3$	Noncarbonate hardness as $CaCO_3$	Specific conductance (micromhos/cm at 25°C)	Sodium-adsorption ratio	pH
91	0.2	0.46	-	0.12	0.71	-	-	1,600	120	0	2,350	21	8.3
210	2.1	.65	-	.21	4.90	0.04	0.00	3,190	260	0	4,170	26	7.9
290	-	-	0.3	-	-	-	-	2,070	30	0	3,340	68	9.0
4*	3.8	.01	-	.4	11.0	.20	.00	2,640	200	0	3,410	25	8.1
1*	-	-	-	-	-	-	-	1,100	600	3	1,620	3.0	7.4
-	-	-	-	-	-	-	-	3,580	450	0	-	21	-
36	4.0	3.*0	-	.25	15.0	.02	.00	3,480	490	0	4,580	20	7.8
9.3	.9	.07	-	.06	.29	.03	.02	959	5	0	1,490	75	8.7
60	-	-	1.	-	-	-	-	1,170	10	0	1,800	60	8.2
21	-	-	1.6	-	-	-	-	1,110	10	0	1,720	58	8.2
*.3	.2	.01	-	.04	.15	.02	.00	613	6	0	968	39	8.5
6.0	-	-	-	-	-	-	-	356	310	-	550	.6	7.9
8.0	-	-	-	-	-	-	-	327	266	-	499	.8	8.2
160	-	-	-	-	-	-	-	2,720	1,200	750	3,850	5.1	7.8
33	.1	.01	-	.06	.06	.00	.02	1,460	830	570	1,980	2.1	7.7
14	-	-	-	-	-	-	-	445	337	-	688	.9	8.4
18	.2	.13	-	.06	.16	.04	.00	802	460	100	1,160	1.9	7.9
29	1.4	.42	-	.03	.13	.03	.01	783	510	96	1,220	1.8	7.9
13	.3	1.60	-	.0*	.07	.02	.00	976	620	360	1,340	1.3	7.6
-	-	-	-	-	-	-	-	-	-	-	1,270	-	7.8
7.9	.1	.68	-	.09	.07	.01	.00	301	210	10	478	.7	7.6
2.8	-	-	.5	-	-	-	-	381	312	64	606	.4	7.7
14	-	-	-	-	-	-	-	524	380	160	851	.8	7.5
7.9	.3	.24	-	.09	.06	.00	.00	550	360	0	876	1.5	7.4
7	-	-	.7	-	-	-	-	596	340	80	842	1.7	-
2.1	.1	1.2	-	.28	.02	.08	.02	270	210	11	443	.3	7.4
11	.4	.17	-	.09	.08	.00	.00	676	370	0	1,050	2.3	7.5
5	-	-	.1	-	-	-	-	707	48	0	1,060	16	-
1.6	.0	.36	-	.21	.00	.01	.01	242	210	0	405	.2	7.7
1.6	.0	.18	-	.03	.01	.00	.04	276	250	5	459	.1	7.7
1.9	.0	2.30	-	.03	.01	.02	.00	194	160	5	326	.1	7.8
140	1.2	.03	-	.12	2.70	.02	.00	1,230	38	0	1,950	32	8.9
84	2.3	.06	-	.03	9.0	1.6	.53	4,480	1,900	1,600	6,700	6.1	7.0
21	-	-	-	-	-	-	-	769	380	40	1,200	2.5	7.7
82	1.4	.17	-	.00	.82	.02	-	1,170	70	0	1,820	20	8.2
96	1.0	3.40	-	.00	.97	.05	.01	2,360	730	500	3,110	7.4	7.7
14	-	-	-	-	-	-	-	572	310	0	926	2.1	7.7
140	.6	7.10	-	2.60	8.20	.01	.00	2,730	640	15	4,300	14	8.1
128	-	-	2.2	-	7.7	-	-	2,910	576	0	3,980	16	8.5
594	-	-	.6	-	12.8	-	-	4,270	28	0	6,790	148	9.3
704	-	-	1.2	-	22.6	-	-	7,702	37	0	11,380	232	9.6
668	-	-	1.3	-	20.0	-	-	7,320	0	0	10,700	-	10.1
92	-	-	-	-	-	-	-	1,770	570	0	2,500	7.6	8.5
52	-	-	-	-	-	-	-	1,700	1,000	660	2,230	2.3	7.9
10	-	-	-	-	-	-	-	575	460	150	884	.5	7.5
26	1.9	.04	-	.12	2.7	.10	.09	1,210	760	370	1,680	1.6	7.3
41	-	-	.9	-	6.3	-	-	1,840	666	0	2,520	7.1	8.0
41	-	-	1.2	-	6.5	-	-	1,860	642	0	2,590	7.5	8.1
124	-	-	4.1	-	4.6	-	-	2,710	632	0	3,690	13	8.8
18	2.9	.08	-	.00	.23	.03	.00	1,440	1,100	760	1,820	.3	8.1
1.6	.4	.12	-	.03	.02	.01	.00	353	330	43	606	.1	7.4
35	.8	1.70	-	.09	.51	.01	.00	525	330	0	800	1.5	7.9
2.8	-	-	.6	-	-	-	-	190	177	4	332	.1	7.3

Water Plate No. 7

Chemical analyses of water

Geologic source: Tgu, Green River Formation, undivided; Tw, Wasatch Formation; Kmv, Mesaverde Group; Km, Mancos Shale; Jm, Morrison Formation; Je, Entrada Sandstone; Jn, Navajo Sandstone, M, Mississippian rocks, undivided.
Interval sampled: Depth below land surface.
Source of sample: CP, circulation pit; DST, drill-stem test; F, natural flow; PW, water produced with oil or gas; RL, return line; ST, swab test; Tr, treater; WT, wash tank; numbers in parentheses are reported or estimated water yields, in gallons per minute, at time sample was collected.
Date of collection; P, concentrations are in parts per million (conversion to milligrams per liter not possible because data for density were not available).
Sodium: Where no value is reported for potassium, Na + K has been calculated and is reported as sodium.
Specific conductance: Determined in analyses by U.S. Geological Survey, otherwise calculated from determined specific resistivity.
Source of analysis: CL, Chemical and Geological Laboratories; GS, U.S. Geological Survey; OL, operator or lessee; RME, Rocky Mountain Engineering Co.; UC, Utah State Chemist.

Location	Operator or lessee	Geologic source	Interval sampled (ft)	Source of sample	Date of collection	Milligrams per litre				
						Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)
(D-9-16)5ddb-1	Diamond Shamrock Corp.	Tgu	4,602- 5,747	WT	3-20-68	-	-	-	-	-
15cbb-1	do	Tgu	4,440- 5,180	DST	3-20-68	-	-	-	-	-
(D-9-20)22ccb-1	Continental Oil Co.	Jn	17,350-17,851	DST	6-20-72	-	910	120	13,000	-
		M	19,350-20,053	DST	6-19-72	-	7,300	1,300	33,000	4,300
27aac-1	De Kalb Agricultural Association	Tgu	2,726- 2,780	F	4- 2-64	-	-	-	-	-
			3,970- 4,005							
36ddc-1	Western Oil Shale Corp.	Tgu	1,900- 2,822	DST	7-31-69	9.2	2.8	.8	28,500	102
		Tgu	1,900- 2,959	DST	7-29-69	9.2	4.1	1.2	28,000	104
		Tgu	1,900- 3,234	DST	7-30-69	8.6	4.1	1.2	14,600	53
		Tgu	1,900- 3,234	DST	7-31-69	12	2.0	1.2	16,600	62
(D-10-16)11acd-1	Mountain Fuel Supply Co.	Tgu	4,289- 4,321	DST	10- 1-64	-	139	67	11,561	118
16dac-1	do	Tgu	3,616- 3,646	DST	4- -63	-	395	78	2,029	105
(D-10-17)30bbd-1	Miami Oil Producers Inc.	Tgu	3,777- 3,789	DST	8-10-67	-	783	33	4,023	33
		Tgu	4,071- 4,116	DST	8-10-67	-	864	295	19,675	80
(D-10-18)13cdb-1	Mountain Fuel Supply Co.	Tgu	4,045- 4,080	DST	P11-14-61	-	2,057	269	23,639	
14cbd-1	do	Tgu	2,162- 2,282	DST	3-26-61	-	10	3.0	2,613	
		Tgu	3,681- 3,746	DST	P 4- 1-61	-	592	308	28,667	
		Tgu	3,877- 3,915	DST	P 4- 2-61	-	987	274	26,780	
		Tgu	4,231- 4,310	DST	P 4- 4-61	-	1,918	359	21,560	
(D-10-19)1cbd-1	do	Tgu	2,850- 2,875	F	10-15-63	-	11	10	3,449	28
(D-10-20)4ccb-1	do	Tgu	2,900- 3,000	F(120)	7- -63	-	6.0	2.0	1,977	5.0
7cdb-1	do	Tgu	2,070- 2,096	DST	P10-16-60	-	11	8.0	39,367	
		Tgu	3,102- 3,142	DST	10-21-60	-	11	1.0	812	
8cab-1	do	Tgu	3,310- 3,337	DST	7-10-62	-	6.0	-	928	
		Tgu	3,488- 3,514	DST	7-12-62	-	272	92	10,506	
(D-10-21)16add-1	Tenneco Oil Corp.	Tgu	1,900- 3,520	F(125)	4- 2-64	13	.0	2.4	785	
(D-10-23)24bba-1	Consolidated Oil and Gas Co.	Tgu	At 3,066	RL	10-15-61	-	2.0	1.0	572	
(D-10-24)28dcd-1	El Paso Natural Gas Co.	Kmv	5,295- 5,305	ST	6-11-59	-	1,929	82	5,210	
32ca-1	Shell Oil Co.	Tw	4,390- 4,497	DST	P 1-21-62	-	21	11	3,068	
		Kmv	5,230- 5,303	DST	P 1-28-62	-	304	63	10,580	
		Kmv	6,187- 6,494	PW(1)	P 4-30-62	-	648	238	7,917	
		Kmv	6,570- 6,947	ST	P 3-22-62	-	1,040	298	6,323	
(D-11-12)14baa-1	McCarthy Oil Co.	Tgu	635- 650	F(0.5)	7-22-65	9.8	6.6	4.4	221	
(D-11-15)2ccc-1	Miami Oil Producers Inc.	Tgu-Tw	4,148- 4,163	DST	10- 3-67	-	559	426	11,704	30
(D-11-16)3bbc-1	do	Tgu	4,119- 4,170	DST	9-11-67	-	27	10	2,619	16
		Tgu	4,197- 4,218	DST	9-11-67	-	10	-	1,200	6.0
(D-11-24)8caa-1	Diamond Shamrock Corp.	Tgu	At 1,275	F(70)	9- 6-61	13	3.6	1.5	637	1.6
(D-11-25)22cda-1	Continental Oil Co.	Km	At 6,225	RL	8- 1-61	-	49	78	1,500	62
(D-12-14)13acb-1	Carter Oil Co.	Kmv	8,505- 8,617	DST	P 6-27-52	-	350	64	8,198	
		Kmv	8,604- 8,789	DST	P 7- 9-52	-	139	26	4,596	
(D-13-23)26acd-1	Skyline Oil Co.	Tgu	At 2,000	-	6-15-60	40.5	10.4	7.1	261	
(D-14-20)7adb-1	Phillips Petroleum Co.	Kmv	7,080- 7,180	DST	9-17-62	-	8.0	2.0	1,672	
30ac	Niko Bell Mining and Oil Co.	Tw	3,790- 3,820	F(<1)	7-13-65	23	625	93	12,114	
30bab	do	Tgu	1,883- 1,910	SI	7-22-63	-	10	7.0	274	13
(D-15-21)22dcc-1	Atlantic Refining Co.	Tw	3,134- 3,142	DST	9-26-63	-	20	36	664	
		Tw	3,466- 3,480	DST	9-28-63	-	80	36	3,766	
		Kmv	5,518- 5,541	DST	10-12-63	-	600	109	11,643	
(D-15-22)36dac-1	Texaco Inc.	Je	9,232- 9,349	ST(3)	P 4- -60	-	5,115	534	28,237	
(D-15½-23)33dca-1	do	Jm-Je	8,630- 8,716	-	P 9- -61	-	5,789	454	34,077	
U(C-4-1)13dad-1	Gulf Oil Co.	Tgu	4,020- 4,080	DST	4-10-69	-	17	-	23,836	151
		Tgu	5,140- 5,306	DST	4-10-69	-	22	20	17,264	174
U(C-4-4)13dda-1	Carter Oil Co.	Tgu	3,281- 3,569	DST	2-23-52	-	-	-	1,117	
		Tgu	5,871- 5,935	DST	P 4-11-52	-	16	7.0	4,287	
16aca-1	Frier Oil Co.	Tgu	2,770- 3,350	Tr	P 3- -62	-	8.0	3.0	72,820	
17aca-1	do	Tgu	2,438- 3,582	WT	P 6- 7-62	-	37	-	15,908	
17bcd-1	do	Tgu	2,410- 3,408	RL	11-30-64	-	.0	87	49,139	
U(C-4-5)8bdd-1	Gulf Oil Co.	Tw	7,366- 8,122	PW	1-12-67	22	56	17	2,750	27
					5- 7-70	-	75	9	2,594	32
Sec 10bdd-1	Brinkerhoff Drilling Co.	Tgu	6,335- 6,483	DST	1- 4-72	-	20	16	3,015	24
Sec14dca-1	Frier Oil Co.	Tu	At 915	CP(30)	P 4-19-62	-	10	Trace	9,868	
U(C-6-6)35bdd-1	Humble Oil and Refining Co.	Tgu	3,190- 3,260	DST	11- -61	-	32	8.0	3,979	

Sec 8 T4S RSW

Water Plate No. 7

collected from oil and gas wells and tests

(parts per million where P precedes date of collection)

Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Dissolved solids: Determined	Dissolved solids: Sum of constituents	Hardness as $CaCO_3$	Noncarbonate hardness	Sodium-adsorption ratio	Specific conductance (micromhos/cm at 25°C)	pH	Source of analysis
-	-	-	49,128	-	-	-	-	-	-	131,000	-	GS
-	-	-	6,961	-	-	-	-	-	-	21,600	-	GS
-	-	3,300	14,000	-	-	-	280	-	108	-	6.8	GS
-	-	630	76,000	-	-	-	24,000	-	94	-	6.6	GS
-	-	-	4,000	-	-	-	-	-	-	55,900	-	GS
5,910	1,230	464	37,500	0.1	72,700	-	12	0	-	85,000	8.9	GS
5,710	832	917	37,100	.1	72,200	-	16	0	-	82,000	8.8	GS
3,830	856	35	18,600	.1	37,000	-	16	0	-	48,000	8.9	GS
5,940	319	400	21,500	.1	41,800	-	11	0	-	56,000	8.6	GS
561	-	216	17,900	-	-	30,278	8,000	-	-	-	8.2	CGL
488	-	5,100	120	-	-	8,068	-	-	-	-	7.8	CGL
305	-	2,900	5,400	-	-	13,322	-	-	-	-	7.2	CGL
1,110	0	7,000	27,000	-	-	55,461	-	-	-	-	7.6	CGL
425	-	3,580	38,000	-	67,720	67,756	-	-	-	-	7.9	CGL
1,342	600	26	2,549	-	6,840	6,462	-	-	-	-	8.6	CGL
627	36	11,827	37,152	-	-	78,792	-	-	-	-	8.4	CGL
878	-	2,798	41,280	-	-	72,551	-	-	-	98,200	8.1	CGL
647	-	3,728	34,572	-	-	62,456	-	-	-	83,300	8.1	CGL
2,452	72	1,600	2,700	-	-	9,078	-	-	-	12,960	8.4	CGL
2,721	180	130	1,190	-	-	4,832	-	-	-	7,430	8.9	CGL
9,150	8,520	525	45,000	-	98,250	97,937	-	-	-	108,840	9.7	CGL
1,379	216	107	140	-	2,032	1,966	-	-	-	4,000	8.7	CGL
1,440	228	54	296	-	2,486	2,221	-	-	-	3,330	8.8	CGL
1,720	-	3,870	13,100	-	30,480	28,449	-	-	-	40,290	8.0	CGL
1,480	128	14	195	.7	-	1,870	10	0	99	3,080	8.8	GS
1,074	48	145	99	-	1,367	1,941	8	-	68	-	8.9	OL
19	-	481	11,284	-	20,561	19,595	-	-	-	-	4.8	RME
1,220	72	620	3,550	-	7,950	8,562	96	-	-	-	8.7	OL
1,244	0	770	15,762	-	29,410	28,723	1,020	-	-	-	7.8	OL
903	0	308	13,312	-	25,266	23,326	2,600	-	-	-	6.6	OL
464	0	470	11,857	-	23,996	20,452	3,825	-	-	-	6.2	OL
392	0	179	5.1	.1	603	619	34	0	16	942	7.8	GS
2,769	-	10,576	10,900	-	-	35,559	-	-	-	-	7.9	CGL
2,440	300	2,262	380	-	-	6,616	-	-	-	-	8.7	CGL
2,428	300	10	100	-	-	2,822	-	-	-	-	8.9	CGL
606	12	422	4.0	.6	-	1,200	15	0	49	1,820	8.5	GS
375	-	2,900	186	-	-	5,800	-	-	-	-	7.6	OL
1,815	-	2,523	11,000	-	-	26,630	-	-	-	-	6.9	CGL
915	60	1,638	5,600	-	-	12,511	-	-	-	-	-	CGL
311	-	623	17	-	-	1,086	-	-	-	-	7.6	UC
964	264	2,150	140	-	4,714	4,711	-	-	-	-	9.3	CGL
539	0	1,517	18,625	25	33,899	-	1,944	1,496	119	48,900	7.3	GS
366	12	290	32	-	-	818	-	-	-	-	8.7	CGL
169	12	3.0	1,065	-	-	1,966	-	-	-	-	8.4	OL
156	14	7,579	355	-	-	11,986	-	-	-	-	8.6	OL
107	0	9,813	14,981	-	-	33,253	-	-	-	-	7.3	OL
190	-	72	54,000	-	91,800	88,052	-	-	-	-	7.3	CGL
207	-	16	64,000	-	106,800	104,438	-	-	-	-	6.3	CGL
4,355	276	102	34,000	-	-	60,527	-	-	-	-	8.3	CGL
2,086	204	584	25,000	-	-	44,295	-	-	-	-	8.4	CGL
1,550	271	164	380	-	2,758	2,695	-	-	-	-	9.0	OL
1,730	251	79	5,300	-	10,618	10,792	-	-	-	-	8.5	OL
51,240	13,800	347	66,000	-	188,830	178,213	-	-	-	-	9.7	CGL
4,758	7,680	228	12,600	-	39,220	38,796	-	-	-	-	9.6	CGL
23,326	23,217	744	34,553	22	142,790	119,246	360	0	-	-	9.6	GS
1,000	-	1,990	2,390	4.4	-	7,770	209	0	83	11,200	7.8	CGL
1,000	-	1,774	2,300	-	-	7,276	-	-	-	-	7.8	GS
3,221	228	72	2,560	-	-	7,521	-	-	-	-	8.7	CGL
0	9,015	77	3,400	-	22,961	22,915	-	-	-	-	10.2	CGL
5,120	675	58	2,400	-	9,632	9,674	-	-	-	-	8.8	CGL

Socio-economic Plat 1

Recreation and Wildl[illegible] Summary of Reservoir Use for [illegible]77 in Upper Colorado Area of Most of Utah, U. S Bureau of Reclamation

	Arizona Utah	Utah													Starvation Reservoir	
	Glen Canyon (Lake Powell) Colorado River Storage Project	Causey Reservoir Weber Basin Project	Deer Creek Reservoir Provo River Project	East Canyon Reservoir Weber Basin Project	Echo Reservoir Weber River Project	Huntington No. Res. Emery County Project	Hyrum Reservoir Hyrum Project	Joes Valley Reservoir Emery County Project	Lost Creek Reservoir Weber Basin Project	Moon Lake Reservoir Moon Lake Project	Newton Reservoir Newton Project	Pineview Reservoir Weber Basin Project	Rockport Reservoir Weber Basin Project	Scofield Reservoir Scofield Project	Starvation Reservoir	Steinaker Reservoir Central Utah Project
General Information																
2. Physical features																
2a. Total area (fee & withdrawn) (acres)																
Land	1,976,180	407	3,250	377	395	198	991	1,575	723	1,963	202	710	771	366	3,520	2,608
Water	162,700	140	2,681	684	1,870	842	475	1,170	365	773	268	2,870	1,080	2,810	3,435	620
2b. Area available for recreation (acres)																
Land	1,976,380	407	3,226	367	395	312	252	1,553	693	1,963	202	470	950	312	3,310	2,283
Water	162,628	140	2,435	681	1,470	837	497	1,160	365	773	268	2,709	1,030	2,830	3,445	795
2c. Flowage easement land (acres)	0	10	47	0	0	0	0	0	0	0	0	0	0	1,178	269	0
2d. Shoreline length (miles)	1,960	5	39	10	13	3	5	7	9	8	10	25	30	17	23	8
2e. MCP elevation	3,700	5,690	5,417	5,705	5,560	5,838	4,672	6,990	5,998	8,137	4,774	4,900	6,037	7,617	5,712	5,517.8
3. Management Practices																
3a. Recreation O&M (man-years)	95.6	0.4	5.5	4.5	3.0	2.0	3.5	1.4	1.0	1.2	0.1	21.0	4.0	1.5	3.0	2.0
3b. Fees																
(1) Parking-amount	0	0	[illegible]	0	[illegible]	0	[illegible]	0	0	0	0	0	[illegible]	[illegible]	[illegible]	[illegible]
(2) Camping-amount	1/	0	[illegible]	[illegible]	[illegible]	0	[illegible]	1/	0	1/	0	1/	[illegible]	[illegible]	[illegible]	[illegible]
(3) Picnicking-amount	0	0	[illegible]	[illegible]	[illegible]	0	[illegible]	0	0	0	0	0	[illegible]	[illegible]	[illegible]	[illegible]
(4) Boat launching-amount	0	0	[illegible]	[illegible]	[illegible]	0	[illegible]	0	0	0	0	0	[illegible]	[illegible]	[illegible]	[illegible]
(5) Cabin-site rental-amount	0	0	0	0	0	0	[illegible]	0	0	0	0	1/	[illegible]	[illegible]	[illegible]	[illegible]
(6) Other-amount	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]	0	0	0
Recreation Facilities Inventory																
4. Access roads (No.)	7	1	4	3	8	2	0	3	1	1	2	6	2	1	6	1
5. Interior roads (miles)	148	1	3	8	2	1	1	8	4	2	1	2	6	1	30	2
6. Parking (car spaces)	3,300	35	450	800	50	60	180	460	40	301	50	1,045	600	140	126	100
7. Campgrounds (No.)	7	0	1	1	2	1	0	2	1	1	1	2	3	1	1	1
7a. Tent spaces (No. in campground)	577	0	24	30	30	30	0	78	0	63	30	243	80	40	76	22
7b. Trailer spaces (No. in campground)	2/	0	2/	2/	2/	2/	0	2/	0	2/	2/	2/	2/	2/	2/	2/
8. Picnic areas (No.)	3	1	3	2	1	2	2	1	0	0	1	1	3	1	2	1
9. Picnic tables (No.)	76	10	24	30	14	15	15	54	10	56	6	157	140	8	83	70
10. Picnic shelters (No.)	17	0	0	11	1	4	0	0	0	0	1	1	7	0	0	2
11. Toilets (No.)	126	6	50	18	10	0	5	24	4	29	2	92	35	4	23	12
12. Drinking water outlets (No.)	21	0	22	7	11	1	24	20	0	11	1	38	35	1	18	25
13. Swimming beaches (No.)	2	0	0	1	0	1	2	0	0	0	0	1	0	0	1	1
14. Boat launching ramps (No.)	7	0	1	1	0	1	1	1	1	0	1	8	1	1	1	1
15. Boat docks (capacity)	395	0	44	8	36	0	6	20	0	0	4	130	40	6	12	6
16. Cabin sites (No.)																
16a. Total	0	0	7	0	0	0	0	0	0	0	0	0	6	36	0	0
16b. Cabins built	0	0	7	0	0	0	0	0	0	0	0	0	6	36	0	0
16c. Cabins leased	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17. Organized camps																
17a. Total No.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
17b. Kind and capacity	0	0	0	0	0	0	0	0	0	0	0	[illegible]/ 150	0	0	0	0
18. Concessions																
18a. Total No.	5	0	3	1	1	0	0	1	0	1	0	1	1	1	0	0
18b. Lodging capacity	720	0	50	0	0	0	0	0	0	76	0	0	40	0	0	0
18c. Rental boats (No.)	250	0	70	6	0	0	0	10	0	10	0	0	10	10	0	0
18d. Cafes (No.)	3	0	3	1	1	0	0	1	0	1	0	1	1	0	0	0
18e. Other (No.)	0	0	0	0	0	0	0	0	0	9/ 1	0	0	0	0	0	0
Visitation																
29. Sightseeing	383,758	8,916	30,468	14,365	4,617	23,561	31,378	25,500	3,130	36,000	860	22,000	20,708	4,370	10,096	2,566
30. Picnicking	19,300	2,100	201	10,653	6,926	20,600	24,312	8,430	1,070	15,300	340	45,600	20,907	1,746	3,370	24,356
31. Camping	1,239,363	1,055	50,104	24,493	9,237	2,950	13,207	20,000	5,620	15,300	175	30,200	97,408	13,356	30,262	[illegible]
32. Swimming	45,070	230	11,117	2,554	2,431	9,600	18,601	25	250	3,000	398	90,200	8,000	1,150	[illegible]	1,509
33. Waterskiing	169,644	0	37,445	4,502	4,573	11,100	20,513	25	150	600	615	33,852	30,256	1,075	2,350	4,157
34. Boating	217,979	2,250	117,118	22,654	19,493	12,300	14,620	9,200	3,520	6,400	580	46,400	47,975	23,020	26,722	[illegible]
35. Fishing	245,440	7,385	147,555	59,138	150	10,100	13,251	66,000	3,460	13,600	320	50,430	67,753	24,226	37,064	12,[illegible]
36. Hunting	1,732	380	1,771	2,065	0	1,700	265	4,600	2,000	250	156	1,500	3,558	1,920	[illegible]	[illegible]
37. Other	7,327	0	260	620	2	100	23,148	1,200	251	1,500	216	8,300	4,053	517	1,368	2,[illegible]
29. Total visitation	2,227,614	22,311	426,290	141,645	47,729	90,011	160,195	237,950	20,383	91,550	3,660	326,600	293,506	70,329	106,151	[illegible]
30. Peak day (No. of visitors)	27,577	460	6,556	11,380	3,252	1,554	4,883	17,000	438	2,700	142	35,500	6,956	1,600	2,615	1,[illegible]
31. Cars in area (total No.)	591,163	3,594	65,220	30,320	11,626	20,839	44,630	26,000	6,294	9,200	715	120,000	52,052	17,405	17,932	16,247
31. Distribution of visitation (%)																
31a. Local	7	90	95	95	95	90	95	60	97	60	80	85	95	95	93	76
31b. Other	93	10	5	5	5	10	5	40	3	40	20	15	5	5	7	24
Watercraft Use																
32. Boat days (total)	217,639	1,183	29,952	7,507	5,400	4,901	12,881	4,600	1,554	1,100	580	12,278	11,360	9,403	5,445	3,252
32a. Powerboats	215,463	230	25,645	6,663	4,750	4,043	7,527	4,500	1,317	500	520	9,898	9,440	8,456	5,13[illegible]	2,978
32b. Rowboats & Sailboats	2,176	953	4,307	844	650	458	5,054	100	237	600	60	2,400	1,920	915	313	275
33. Peak day use (No. of boats; total	3,416	100	887	530	300	65	361	85	36	45	40	585	642	997	251	154
33a. Powerboats	3,384	20	793	463	250	50	304	75	30	20	30	525	604	918	199	137
33b. Rowboats & Sailboats	32	80	94	67	50	15	57	10	6	25	10	60	38	79	62	17
Fish and Wildlife																
34. Fish - sport catch	750,000	10,000	140,000	70,150	250	8,000	10,900	90,000	12,600	12,000	700	45,300	19,600	200,000	14,200	5,967
35. Big game—a. Total use days (No.)	375,000	10,000	170,000	75,000	115,000	30,000	70,000	325,000	40,000	40,000	50,000	40,000	75,000	175,000	75,000	150,000
b. Season take	110	60	650	190	0	100	300	60	120	0	75	300	600	150	200	275
36. Small game—a. Total use days (No.)	65,000	2,000	5,000	5,000	1,200	3,000	10,000	2,000	10,000	4,700	2,000	18,000	10,000	5,000	10,000	2,500
b. Season take	10	0	50	15	0	5	50	0	10	0	25	20	15	15	15	[illegible]
37. Public hunting grounds (acres)	1,236,488	547	5,941	948	0	348	709	2,713	1,038	2,736	490	3,580	1,580	3,116	6,696	3,278
38. Refuge areas (acres)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Value of Public Use Facilities & O&M Costs																
39. USBR—a. Total value	2,330,043	94,800	92,656	99,230	0	98,500	100,000	0	36,188	0	0	804,355	463,332	72,197	518,102	299,[illegible]
b. Value added this year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
c. O&M Costs this year	500	100	200	270	100	100	400	100	100	200	100	300	200	200	290	2[illegible]
40. Administering agency—a. Total Value	6,473,942	30,000	1,000,824	197,968	0	3,537	223,090	343,601	678	142,160	31,000	67,500	255,645	103,720	1,135,266	62,[illegible]
b. Value added this year	4,5[illegible]	0	76,715	14,601	0	0	1,445	0	0	0	0	46,000	0	14,043	25,5[illegible]	1,[illegible]
c. O&M Costs this year	1,906,150	2,000	55,203	39,725	0	17,327	44,858	20,000	14,048	12,000	1,200	60,000	62,279	22,524	49,737	26,[illegible]
41. Concessioners—a. Total value	6,743,399	0	18,000	4,173	106,900	0	0	17,200	0	100,000	0	53,500	152,788	3,500	0	0
b. Value added this year	175,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
c. O&M Costs this year	2,730,000	0	8,000	5,845	92,000	0	0	5,000	0	4,500	0	3,000	2,389	0	0	0
42. Organized camps—a. Total value	0	0	0	0	0	0	0	0	0	0	0				0	0
b. Value added this year	0	0	0	0	0	0	0	0	0	0	0	73,500	0	0	0	0
c. O&M costs this year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43. Private cabins—a. Total value	0	0	0	0	0	0	0	0	0	0	0	8,000	0	30,000	0	0
b. Total added this year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Notes

1/ $2.00 per day.
2/ Sites are suitable for either tents or trailers.
3/ Being used for both, but do not have sewage, or electric hookups.
4/ $1 per year is charged by the State of Utah of facilities at State-administered recreation
5/ a daily charge is made for camping and launching of the annual fee.
6/ $1.50 per day.
7/ $1.00 per day.
8/ [illegible]ing $1.50 per day.
9/ [illegible]arking $2.00 per boat.
10/ [illegible] for hire.
[illegible]

11/ Cabin rental $12.00 per night.
12/ Parking $1.00 per day.
13/ Camping $[illegible] per weekend.
14/ Boat launching $[illegible] per year.
15/ Cabinsite rental, $[illegible] per year.
16/ Trailer site rental, $20.[illegible] per year.
17/ Enlarged Strawberry Reservoir is presently separated into two bodies of water by the old Strawberry Dam. After the old dam is inundated Soldier Creek and Strawberry Reservoir, reports will be combined.

18/ Acreage is that part of enlargement east of Strawberry Dam that would be available to recreation users.
19/ Water available for boating at elevation [illegible].
20/ Present elevation at [illegible].
21/ Area [illegible] capacity [illegible].
22/ Camping $[illegible] per day.
23/ A Colorado boat costing $5.00 per year or $[illegible] per day is required for entrance into and use of State-operated recreation areas.
24/ Blue Mesa Reservoir.

25/ Morrow Point Reservoir.
26/ General Merchandise Store.
27/ Cabinsite $25 per year.
28/ Wharf permits—private $15.00 per year, Commercial $3.00 minimum $.[illegible] per square foot of surface area.
29/ Boat permits — private — none. Commercial — less than 16 feet $10.00 per year — over 16 feet $15.00 per year — sailing — $10.00 per year — without $15.00 per year.
30/ Camping $2.00 per day — New Mexico portion.

Appendix No. 8

Form 9-331 C
(May 1963)

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1425.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK
DRILL [X] DEEPEN [ ] PLUG BACK [ ]

b. TYPE OF WELL
OIL WELL [X] GAS WELL [ ] OTHER SINGLE ZONE [X] MULTIPLE ZONE [ ]

2. NAME OF OPERATOR
W.A. Moncrief

3. ADDRESS OF OPERATOR
P.O. Box 2573 Casper, Wyoming 82602

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.*)
At surface
471' FNL - 1957' FEL Section 12, T4S, R6W, U.S.B.& M.
At proposed prod. zone

5. LEASE DESIGNATION AND SERIAL NO.

6. IF INDIAN, ALLOTTEE OR TRIBE NAME
Ute Indian

7. UNIT AGREEMENT NAME
14-20-H62-3455

8. FARM OR LEASE NAME
Ute Tribal

9. WELL NO.
#12-1

10. FIELD AND POOL, OR WILDCAT
Wildcat

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec 12, T4S, R6W, U.S.B. & M.

12. COUNTY OR PARISH
Duchesne

13. STATE
Utah

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*
10 Miles from Duchesne

15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. unit line, if any)

16. NO. OF ACRES IN LEASE
640

17. NO. OF ACRES ASSIGNED TO THIS WELL
640

18. DISTANCE FROM PROPOSED LOCATION* TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT.

19. PROPOSED DEPTH
8200'

20. ROTARY OR CABLE TOOLS
Rotary

21. ELEVATIONS (Show whether DF, RT, GR, etc.)
6041'

22. APPROX. DATE WORK WILL START*
January 1, 1978

CONFIDENTIAL

CONFIDENTIAL

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
14 3/4"	10 3/4"	40.5	600'	Circulate to surface
9 5/8"	7 5/8"	26.4	6200'	400 sx
6 1/2"	5 "	15#	6000-8200'	300 sx

CONFIDENTIAL

We propose to drill an 8200' Wasatch test and if commercial show of oil and gas are encountered, set casing, perforate and evaluate any productive interval.

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen or plug back, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

24.

SIGNED [signature] TITLE Representative DATE November 20, 1978

(This space for Federal or State office use)

PERMIT NO. 43-013-30179 APPROVAL DATE

APPROVED BY TITLE DATE

CONDITIONS OF APPROVAL, IF ANY:

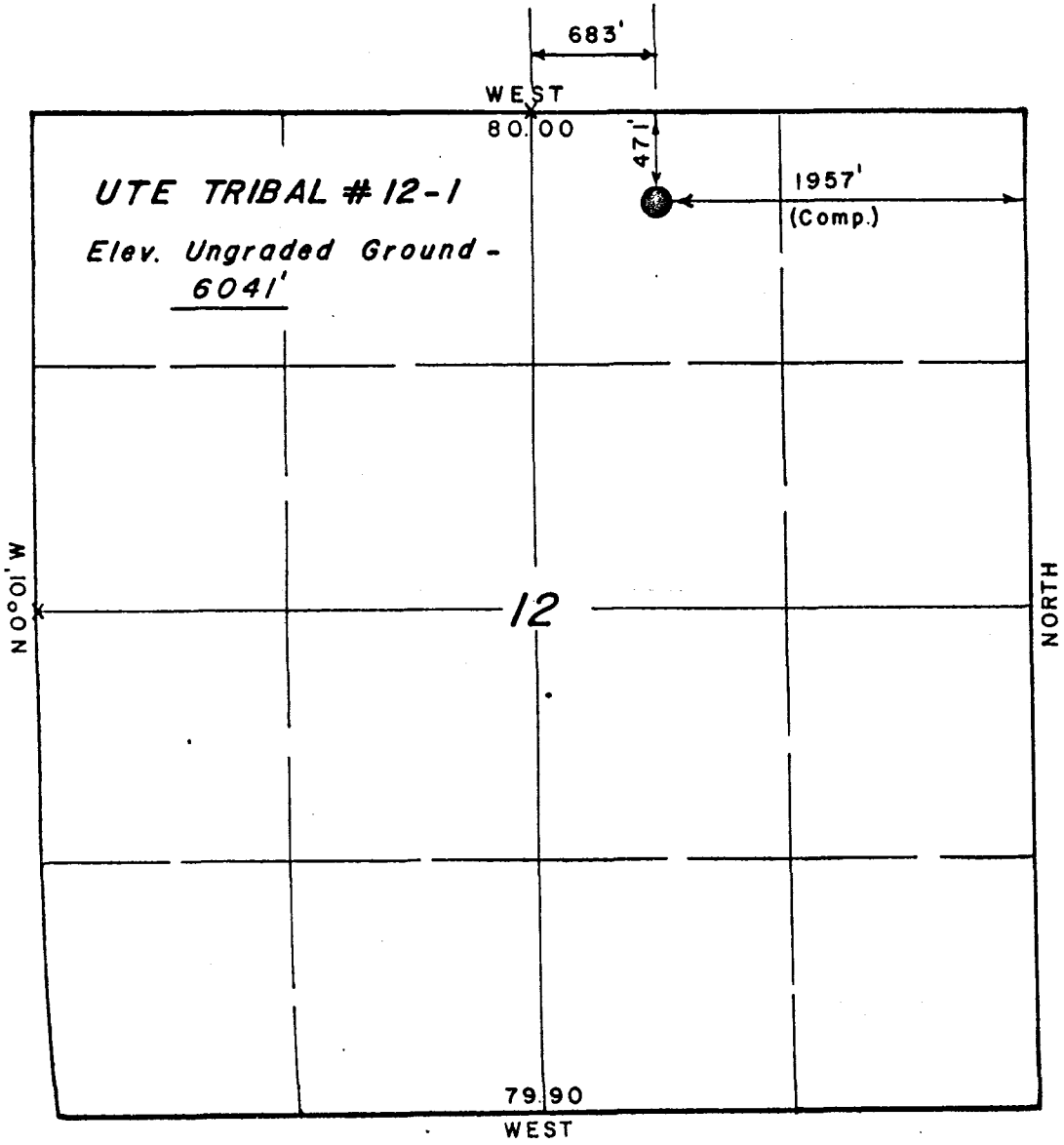
*See Instructions On Reverse Side

PROJECT

W.A. MONCRIEF

Well location, *UTE TRIBAL #12-1* located as shown in the NW 1/4 NE 1/4 Section 12, T4S, R6W, U.S.B.&M. Duchesne County, Utah.

T4S, R6W, U.S.B.&M.



X = Section Corners Located

CERTIFICATE

THIS IS TO CERTIFY THAT THE ABOVE PLAT WAS PREPARED FROM FIELD NOTES OF ACTUAL SURVEYS MADE BY ME OR UNDER MY SUPERVISION AND THAT THE SAME ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

Dave Stewart

REGISTERED LAND SURVEYOR
REGISTRATION Nº 3154
STATE OF UTAH

UINTAH ENGINEERING & LAND SURVEYING
P. O. BOX Q – 110 EAST - FIRST SOUTH
VERNAL, UTAH - 84078

SCALE 1" = 1000'	DATE 11 / 14 / 78
PARTY S.S. G.S. J.M. S.M.	REFERENCES GLO Plat
WEATHER Cool & Dry	FILE W.A. MONCRIEF

W.A. Moncrief
Ute Tribal #12-1
Section 12, T4S, R6W, U.S.B. & M.

DRILLING PLAN

1. The geologic name of the surface formation is the Tertiary Green River.

2. Estimated tops of important geologic markers are as follows:

Green River	Surface
Wasatch	6700'

3. Oil and gas may be encountered in shallow Green River sands from 3000' to 3500' and in the Wasatch (6700'). No other formations are expected to produce water, oil, gas, or other minerals in measurable quantities.

4. The proposed casing program is listed under item 23 on Form 9-331C. All casing is new and grade is K-55.

5. Operator's minimum specifications for pressure control equipment is a 10" 5000 psi double hydraulic blowout preventor. Please refer to Diagram C. Blowout preventor will be tested daily.

6. Fresh water base drilling mud will be used for the entire drilling operations and spud mud will be used for the surface hole. A dispersed mud system will be used thereon to total depth. Mud weight will be controlled by controlling drilling solids. Barite will be used for weighting material in the event abnormal pressures are encountered. Total system volume will be approximately 500 barrels, not including potential reserve pit volume.

7. Auxiliary equipment is as follows:

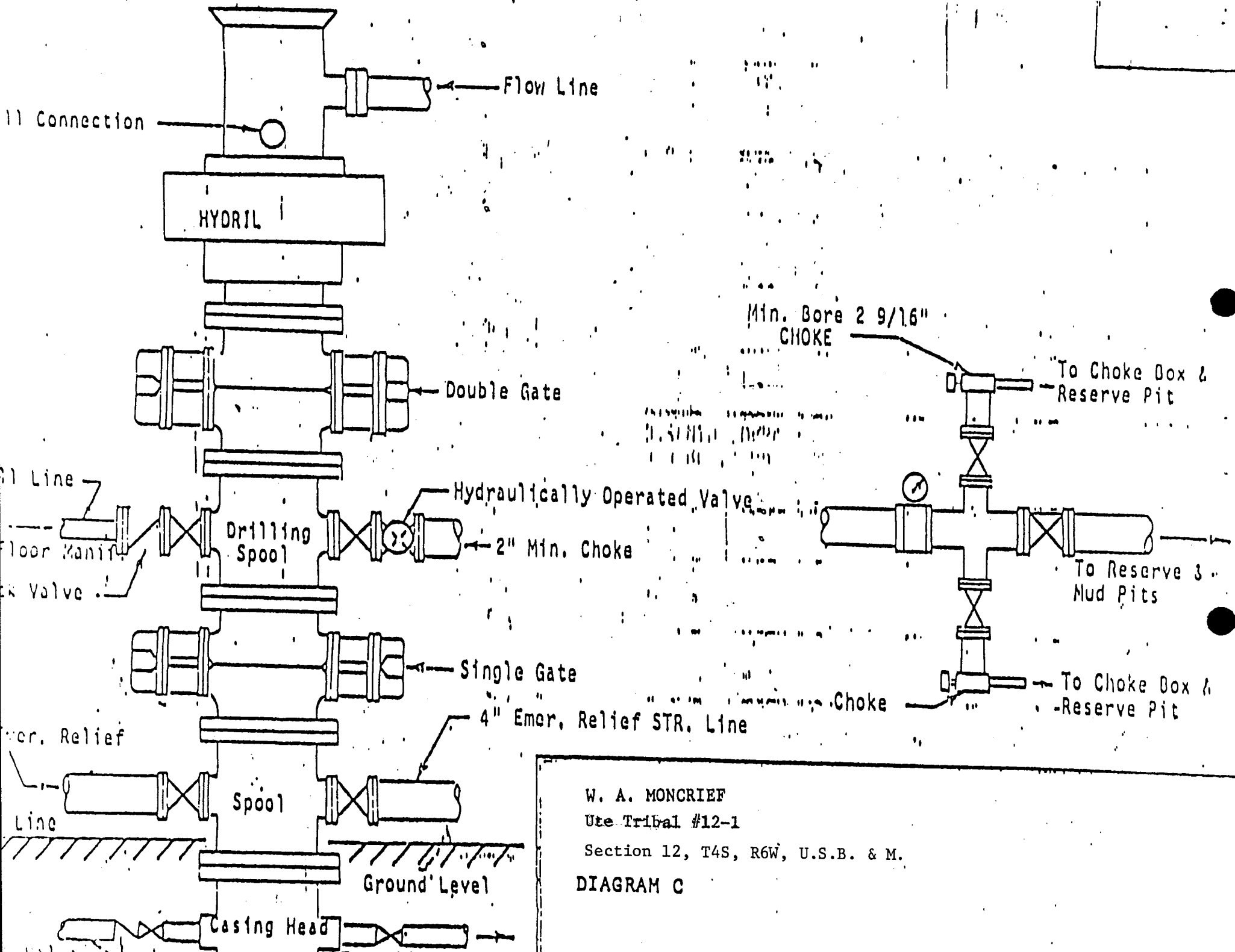
   (1) Kelly Cocks
   (2) Bit floats
   (3) A PVT and flow sensor will be used to monitor mud system. Visual checks will also be conducted.
   (4) A full opening-quick close drill pipe valve is to be located on the derrick floor at all times.

8. Commercial shows of oil and gas will be tested. We anticipate drill stem tests in the Wasatch formation. No cores are anticipated. The logging program is as follows:

   BHC-Gamma Ray Sonic W/Caliper, Integrated - TD to sones of surface casing.
   Formation Density/Compensated Neutron - Zones of interest.
   Dual Inducation Laterolog - TD to base of surface casing.

9. Bottom hole pressure is estimated at 4000 psi. No abnormal pressures, temperatures, or potential hazards, such as hydrogen sulfide gas are expected.

10. The estimated starting date is January 1, 1979 and the duration of operations will be approximately 75 days.



W. A. MONCRIEF
Ute Tribal #12-1
Section 12, T4S, R6W, U.S.B. & M.

DIAGRAM C

W.A. MONCRIEF

13 Point Surface Use Plan

for

Well Location

Ute Tribal #12-1

Located In

Section 12, T4S, R6W, U.S.B. & M.

Duchesne County, Utah

W.A. MONCRIEF
Ute Tribal #12-1
Section 12, T4S, R6W, U.S.B. & M.

1. EXISTING ROADS

See Attached Topographic Map "A".

To reach W.A. Moncrief well location, Ute Tribal #12-1, located in the NW 1/4 NE 1/4 Section 12, T4S, R6W, U.S.B. & M., from the Duchesne Utah:

Proceed Southerly from Duchesne along Utah State Highway 33 approxinately 35 miles to its junction with a road to the West; proceed Westerly along this road 6.3 miles to the point that the planned access road (to be discussed in Item #2) leaves the existing road and proceeds in a Northerly direction to the proposed location site.

There will be no anticipated construction on any of the above described roads.

The roads will be maintained and kept at the necessary standards required for and orderly flow of traffic during the drilling, and production activities of this location.

2. PLANNED ACCESS ROAD

See Topographic Map "B".

The proposed access road leaves the existing road described in Item #1, in the SE 1/4 NW 1/4 Section 12, T4S, R6W, U.S.B. & M., and proceeds in a Northerly direction approximately 0.4 miles to the proposed location site.

In order to facilitate the anticipated traffic flow necessary to drill and produce this well, the following standards will be met:

The proposed road will be an 18' crown road (9' either side of the centerline) with drain ditches along either side of the proposed road where it is determined necessary in order to handle any run-off from normal meteorological conditions that are prevalent to this area.

Back slopes along the cut areas of the road will be 1 1/2 to 1 slopes and terraced.

The road will be centerline flagged prior to the commencement of construction.

The grade of this road will vary from flat to 8%, but will not exceed this amount. The road will be constructed from native borrow materials accumulated during construction.

If deemed necessary by the local governmental agencies or their representatives, turnouts will be installed for safety purposes every 0.25 miles or on the top of ridges or at intervals and locations that will provide the greatest sight distance. These turnouts will be 200' in length and 10' in width and will be tapered from the shoulder of the road for a distance of 50' in length at both the access and outlet ends.

Any fences that are encountered along this access road will be cut and replaced with a cattleguard having a minimum width of 18' and a loading factor large enough to facilitate the heavy trucks required in the drilling and production of this well.

If cattleguards are to be located at existing gates, they will be installed with the above requirements and with a new gate installed at one end of the cattleguard.

The access from the road to the gate will be of such a nature that there will be

2. PLANNED ACCESS ROAD - continued

no impedance of traffic flow along the main access road and no difficulties encountered by traffic utilizing the gate, either leaving or entering the proposed access road.

The terrain that this road traverses is relatively rough and runs down a large ridge which separates Weeint Hollow from Skitzy Canyon, these canyons are very steep.

The vegetation along this route; consists of sagebrush, rabbitbrush, some grasses, and cacti, with sparse amounts of juniper and pinion pine.

3. LOCATION OF EXISTING WELLS

As shown on Topographic Map "B", there are other wells within a one-mile radius of the proposed well site. (See location plat for exact placement of W.A. Moncrief well location within Section 12).

4. LOCATION OF TANK BATTERIES, PRODUCTION FACILITIES, AND PRODUCTION GATHERING AND SERVICE LINES

At the present time there are no W.A. Moncrief batteries, production facilities, oil gathering lines, gas gathering lines, injection or disposal lines within a one-mile radius.

In the event that production of this well is established then the existing area of the location will be utilized for the establishment of the necessary production facilities.

The area will be built, if possible, with native material and if these materials are not available then then the necessary arrangements will be made to get them from private sources.

The total area that is needed for the production of this well will be fenced and cattleguards will be utilized for access to the facilities.

The rehabilitation of the disturbed area that is not required for the production of this well, will meet the requirements of Items #7 and #10 and these requirements and standards will be adhered to.

5. LOCATION AND TYPE OF WATER SUPPLY

Water to be used in the drilling and production of this well will be hauled from the Strawberry River at the point where the road crosses it West by Duchesne Utah, The water will be hauled by truck over existing roads a distance of approximately 10.2 miles to the proposed location site.

If this water source is not available for use then other necessary arrangements will be made at which time all concerned parties will be notified.

All regulations and guidelines will be followed in order to satisfy the anticipated water requirements.

6. SOURCE OF CONSTRUCTION MATERIAL

All construction material for this location site and access road shall be borrow material accumulated during construction of the location site and access road. No additional road gravel or pit lining material from other sources are anticipated at this time, but if they are required, the appropriate actions will be taken to acquire them from private sources.

7. METHODS FOR HANDLING DISPOSAL

See Location Layout Sheet.

The reserve pit will be approximately 8' deep and at least one-half of this depth shall be below the existing ground.

One half of the reserve pit will be used as a fresh water storage area during the drilling of this well and the other one-half will be used to store non-flammable materials such as cuttings, salts, drilling fluids, chemicals, produced fluids, etc.

If deemed necessary by the agencies concerned, to prevent contamination to surrounding areas the reserve pits will be lined with a gel.

The pits will have wire and overhead flagging installed at such time as deemed necessary to protect the water fowl, wildlife, and domestic animals.

At the onset of drilling, the reserve pit will be fenced on three sides and at the time the drilling activities are completed, it will be fenced on the fourth side and allowed to dry completely prior to the time that backfilling and reclamation activities are attempted.

When the reserve pit dries and reclamation activities commence, the pits will be covered with a minimum of four feet of soil and all requirements in Item #10 will be followed.

The burn pit will be constructed and fenced on all four sides with a small mesh wire to prevent any flammable material from escaping and creating a fire hazard.

All flammable material will be burned and then buried upon completion of this well.

A portable chemical toilet will be supplied for human waste.

8. ANCILLARY FACILITIES

There are no ancillary facilities planned for at the present time and none foreseen in the near future.

9. WELL SITE LAYOUT

See attached Location Layout Sheet.

The appropriate Ute Tribal agencies will be notified before any construction begins on the proposed location site.

9. WELL SITE LAYOUT - continued

As mentioned in Item #6, the pits will unlined unless it is determined by the representatives of the agencies involved that the materials are too porous and would cause contamination to the surrounding area; then the pits will be lined with a gel and any other type materials necessary to make it safe and tight.

When drilling activities commence, all work shall proceed in a neat and orderly sequence.

10. PLANS FOR RESTORATION OF SURFACE

As there is some topsoil on the location site, it shall be stripped and stockpiled. (See Location Layout Sheet and Item #9). When all drilling and production activities have been completed, the location site and access road will be reshaped to the original contour and the stockpiled topsoils spread over the distrubed area.

Any drainages re-routed during the construction activities shall be restored to their original line of flow as near as possible. Fences around pits are to be removed upon completion of drilling activities and all waste being contained in the trash pit shall be buried with a minimum of 5' of cover.

As mentioned in Item #7, the reserve pit will be completely fenced and wired with overhead wire and flagging installed. If there is oil in the pits, it will be allowed to dry completely before covering.

Restoration activities shall begin within 90 days after completion of the well. Once completion activities have begun, they shall be completed within 30 days.

When restoration activities have been completed, the location site and access road shall be reseeded with a seed mixture recommended by the Ute Tribal District further covenants and agrees that all of said cleanup and restoration activities shall be done and performed in a diligent and most workmanlike manner and in strict conformity with the above mentioned Item #7 and #10.

11. OTHER INFORMATION

The Topography of the General Area (See Topographic Map "A").

The area is located along the Northern slope of Book Cliff Mountains forming a part of the West Tavaputs Plateau. The area is interlaced with numerous canyons, ridges, and bench lands of which the side slopes are relatively steep with ledges formed of sandstone and conglomerates being common.

The visible geologic structures of the area are the glacial outwashes of the Recent or Pleistocene Epoch (Quarternary Period) along the tops of the benches, plateaus and ridges from the Duchesne River Formation of the Eocene Epoch (Teritary Period) along the lower portions of the ridges and the canyon and draw bottom lands. The upper areas consist of light redish-brown clayey-sands with poorly graded gravels (SM-ML) to heavy sandy-clays (OL) in the bottom lands.

Outcrops of sandstone and conglomerate deposits are common in the area.

The topsoils in the area range from a sandy-clay (SM-ML) type soil with large boulders a clayey (OL) type soil.

11. OTHER INFORMATION - continued

The majority of the numerous washes and streams in the area are of a non-perennial nature flowing during the early spring run-off and heavy rain storms of long duration which are rare as the normal annual rainfall in the area is only 8".

Due to the low precipitation average, climate conditions and the marginal types of soils. The vegetation that is found in the area is common of the semi-arid region we are located in and consists of juniper and pinion forests as the primary flora with area of sagebrush, rabbitbrush, some grasses, and cacti.

The fauna of the area consists predominantly of mule deer, coyotes, rabbits, and varieties of small ground squirrels and other types of rodents.

The area is used by man for the primary purpose of grazing domestic sheep and cattle.

The birds of the area are raptors, finches, ground sparrows, magpies, crows, and jays.

The Topography of the Immediate Area (See Topographic Map "B".

Ute Tribal #12-1 sits on top of a large ridge which separates Weeint Hollow from Skitzy Canyon both of which drain to the North into the Strawberry River which drains into the Duchesne River and then into the Green River to the Southeast.

The terrain in the immediate vicinity of the location slopes to the Southwest through the location site at approximately a 4% grade.

The vegetation in the immediate area surrounding the location site is juniper and pinion trees with sagebrush, grasses and cacti.

There are no occupied dwellings or other facilities of this nature in the general area.

There are no visible archaelogical, historical, or cultural sites within any reasonable proximity of the proposed location site.

12. LESSEE'S OPERATOR'S REPRESENTATIVE

Percy G. Anderson
P.O. Box 2573
Casper, Wyoming 82602

TELE: 1-237-2541

W.A. MONCRIEF
Ute Tribal #12-1
Section 12, T4S, R6W, U.S.B. & M.

13. CERTIFICATION

I hereby certify that I, or persons under my direct supervision, have inspected the proposed drill site and access route; that I am familiar with the conditions which presently exist; that the statements made in this plan are, to the best of my knowledge true and correct; and that the work associated with the operations proposed herein will be performed by W.A. Moncrief and its contractors and sub-contractors in conformity with this plan and terms and conditions with this plan and terms and conditons under which it is approved.

November 15, 1978
Date

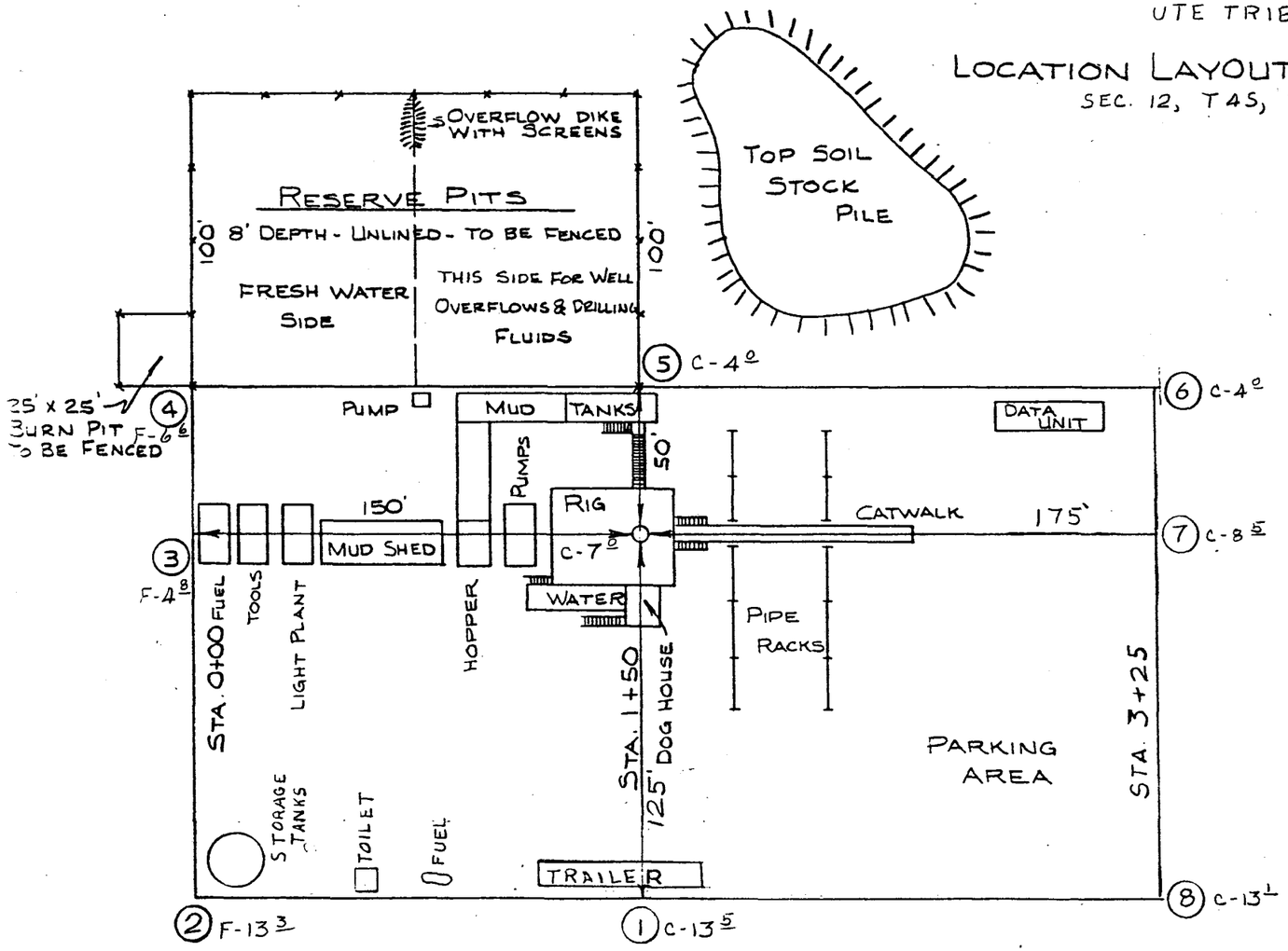
Perey G. Anderson

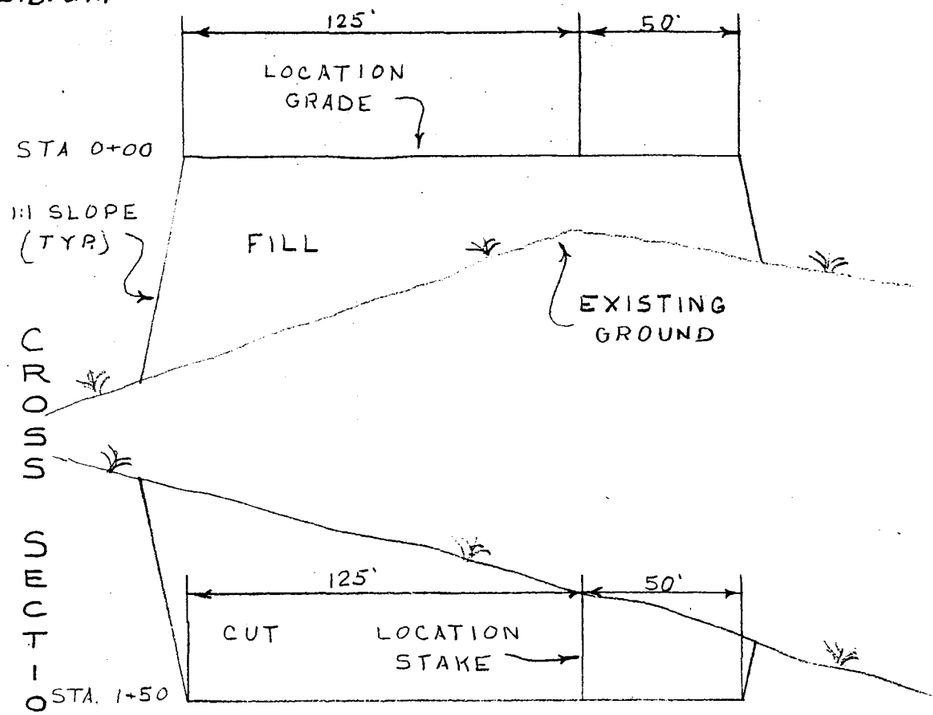
Strawberry
Cemetery
RIVER
Canyon
JEEP
TRAIL
Oil Well
4 MILES
R6W
R5W
35
36
31
5957
6350

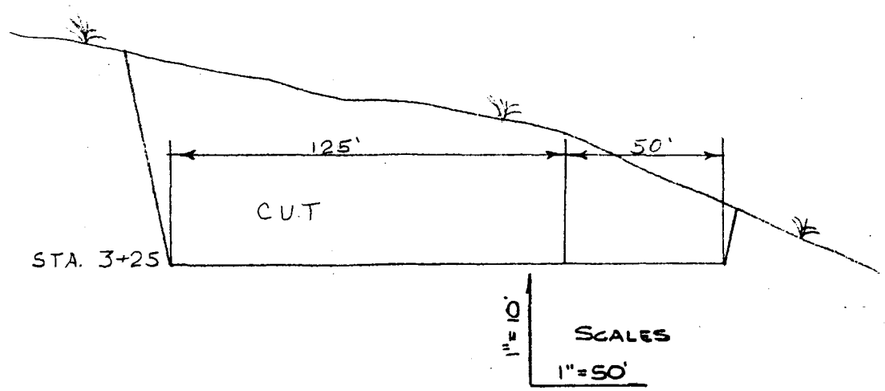

W.A. MONCRIEF
PROPOSED LOCATION
UTE TRIBAL # 12-1
TOPO. MAP "A"
SCALE 1" = 4 Mi.
PROPOSED LOCATION
STEAMBOAT MOUNTAIN
BLUE BENCH
Duchesne
Bridgeland
Arcadia
Talmage
Mt Emmons
Radio Tower
Oil Field
Zimmerman Wash
KUNTZ HOLLOW
COTTONWOOD CANYON
COYOTE CANYON
R 3 W
7000
6000
5508
5860
6400
6090
6872

W. A. MONCRIEF
UTE TRIBAL #12-1

LOCATION LAYOUT & CUT SHEET
SEC. 12, T 4S, R 6 W, U.S.B. & M

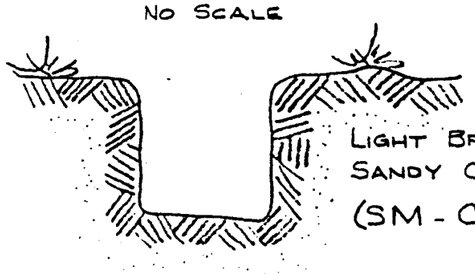


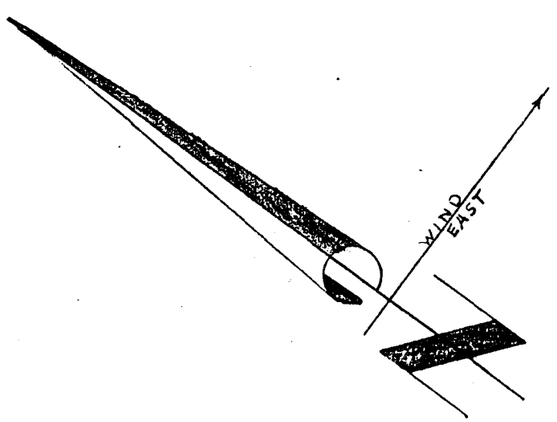




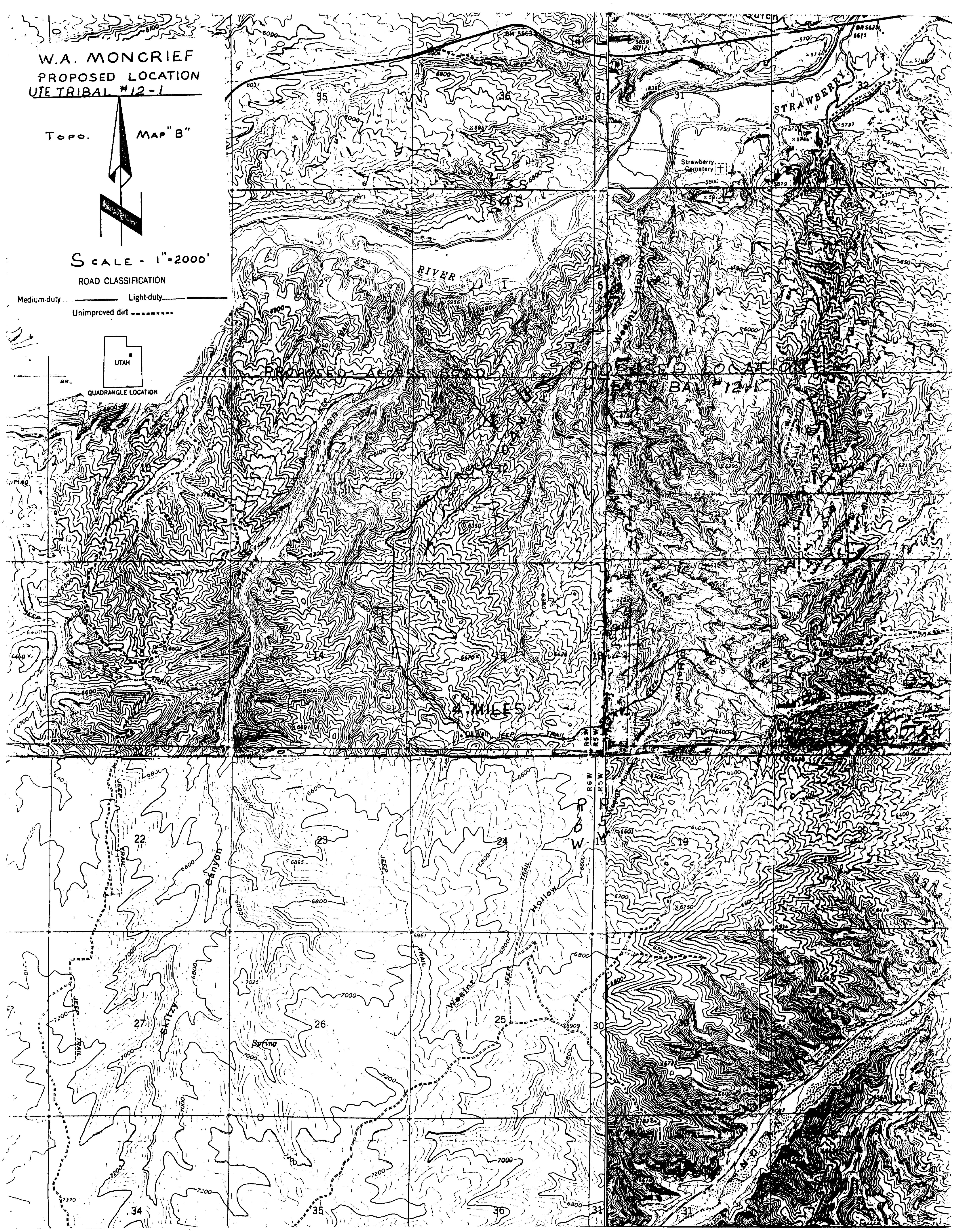
SCALE 1" = 50'

SOILS LITHOLOGY
NO SCALE





APPROX. YARDAGES
CUT 15,665 Cu. Yds
FILL 4,245 Cu Yds


W.A. MONCRIEF
PROPOSED LOCATION
UTE TRIBAL #12-1
TOPO. MAP "B"
SCALE - 1" = 2000'
ROAD CLASSIFICATION
Medium-duty
Light-duty
Unimproved dirt
UTAH
QUADRANGLE LOCATION
PROPOSED ACCESS ROAD
PROPOSED LOCATION UTE TRIBAL #12-1
4 MILES
STRAWBERRY
RIVER
Strawberry Cemetery
T4S
Oil Well
JEEP TRAIL
R6W
R5W
R 6 W
R 5 W
Canyon
Skitzy
Weeins Hollow
Spring
CANYON

Conf.

STATE OF UTAH
DIVISION OF OIL, GAS, AND MINING

** FILE NOTATIONS **

CONFIDENTIAL

Date: Dec. 4-

Operator: W.A. Moncrief

Well No: Ute Tribal 12-1

Location: Sec. 12 T. 4S R. 6W County: Duchesne

File Prepared: / / Entered on N.I.D.: / /

Card Indexed: / / Completion Sheet: / /

API Number: 43-013-30479

CHECKED BY:

Administrative Assistant: [illegible]

Remarks: No other well - Sec. 12

Petroleum Engineer: _____

Remarks:

Director: [illegible]

Remarks:

INCLUDE WITHIN APPROVAL LETTER:

Bond Required: / Oil / Survey Plat Required: / /

Order No. 139-17 Surface Casing Change / /
to _____

Rule C-3(c), Topographic exception/company owns or controls acreage within a 660' radius of proposed site / /

O.K. Rule C-3 / / O.K. In _____ Unit

Other:

topo exception

/ / Letter Written/~~Approved~~

NELSON J. MARSHALL
PHONE 789-0272

GENE STEWART
PHONE 789-1795

LAWRENCE C. KAY
PHONE 789-1125

Uintah Engineering & Land Surveying

OFFICE LOCATION
110 E. FIRST SOUTH

PHONE 789-1017

P. O. BOX Q
VERNAL, UTAH 84078

November 20, 1978

U.S. Geological Survey
8426 Federal Building
Salt Lake Ctiy, Utah 84138

ATTN: Ed Guynn

Gentlemen:

As consultants for W.A. Moncrief, Uintah Engineering & Land Surveying, respectfully requests a variance from the required 600' maximum tolerance for locating well locations. The variance is requested for topographic reasons which have prevented feasible placement within the required spacing.

Said variance is requested for the following well location:

#12-1 - NW 1/4 NE 1/4, Section 12, T4S, R6W, U.S.B. & M.

The attached topographic map show the well and their proposed placement as pertains to the apparent topography.

Very truly yours,

Gene Stewart

Gene Stewart
Vice President

GS/lm

Enclosure

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS, AND MINING
1588 West North Temple
Salt Lake City, Utah 84116
(801) 533-5771

December 7, 1978

W.A. Moncrief
P.O. Box 2573
Casper, Wyoming 82602

Re: Well No. Ute Tribal 12-1
Sec. 12, T. 4 S, R. 6 W,
Duchesne County, Utah

Gentlemen:

Insofar as this office is concerned, approval to drill the above referred to well is hereby granted in accordance with the Order issued in Cause No. 139-17.

Should you determine that it will be necessary to plug and abandon this well, you are hereby requested to immediately notify the following:

PATRICK L. DRISCOLL - Consultant
HOME: 582-7247
OFFICE: 533-5771

Enclosed please find Form OGC-8-X, which is to be completed whether or not water sands (aquifers) are encountered during drilling.

Further, it is requested that this Division be notified within 24 hours after drilling operations commence and that the drilling contractor and rig number be identified.

The API number assigned to this well is 43-013-30479.

Very truly yours,

DIVISION OF OIL, GAS, AND MINING

CLEON B. FEIGHT
Director

cc: U.S. Geological Survey

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS, AND MINING
1588 West North Temple
Salt Lake City, Utah 84116
(801) 533-5771

November 30, 1979

W. A. Moncrief
P. O. Box 2573
Casper, Wyoming 82602

Re: Well No. Ute Tribal 12-1
Sec. 12, T. 4S, R. 6W,
Duchesne County, Utah

Gentlemen:

In reference to the above mentioned well, considerable time has gone by since approval was obtained from this office.

This office has not received any notification of spudding. you do not intend to drill this well, please notify this Division. spudding or any other activity has taken place, please send necessary ms. If you plan on drilling this well at a later date, please notify as such.

Your prompt attention to the above will be greatly appreciated.

Very truly yours,

DIVISION OF OIL, GAS, AND MINING

Kathy Avila

KATHY AVILA
RECORDS CLERK

March 24, 1980

Phone # (307) 237-2541

W.A. Moncrief
P.O. Box 2573, Suite 525 1st NATL BANK BLDG
Casper, Wyoming 82602

Re: Well No. Ute Tribal 12-1
Sec. 12, T. 4S, R. 6W.
Duchesne County, Utah

Gentlemen:

In reference to above mentioned well, considerable time has gone by since approval was obtained from this office.

This office has not received any notification of spudding. If we do not hear from your company within thirty (30) days, we will assume you do not intend to drill this well and we will terminate the application.

Your prompt attention to the above will be greatly appreciated.

Very truly yours,

DIVISION OF OIL, GAS, AND MINING

JANICE TABISH
CLERK-TYPIST

9-331
1973

Form Approved.
Budget Bureau No. 42-R1424

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9-331-C for such proposals.)

1. oil well [X] gas well [ ] other

2. NAME OF OPERATOR
W. A. Moncrief

3. ADDRESS OF OPERATOR
P. O. Box 2573, Casper, WY 82602

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
AT SURFACE: NW¼NE¼
AT TOP PROD. INTERVAL: (471' FNL, 1957' FEL)
AT TOTAL DEPTH:

5. LEASE -20-H62-3455

6. IF INDIAN, ALLOTTEE OR TRIBE NAME
Ute

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME
Ute Tribal

9. WELL NO.
12-1

10. FIELD OR WILDCAT NAME
Wildcat

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
12-4S-6W

12. COUNTY OR PARISH
Duchesne

13. STATE
Utah

14. API NO.
43-013-30479

15. ELEVATIONS (SHOW DF, KDB, AND WD)
6,041 GL

16. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

REQUEST FOR APPROVAL TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF	[ ]		[ ]
FRACTURE TREAT	[ ]		[ ]
SHOOT OR ACIDIZE	[ ]		[ ]
REPAIR WELL	[ ]		[ ]
PULL OR ALTER CASING	[ ]		[ ]
MULTIPLE COMPLETE	[ ]		[ ]
CHANGE ZONES	[ ]		[ ]
ABANDON*	[ ]		[ ]
(other) Abandon Location			

(NOTE: Report results of multiple completion or zone change on Form 9-330.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

This location was abandoned on October 4, 1979 and there was no surface disturbance.

Subsurface Safety Valve: Manu. and Type _____ Set @ _____ Ft.

18. I hereby certify that the foregoing is true and correct

SIGNED _____ TITLE Production Manager DATE March 25, 1980

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

RECEIVED
MAR 31 1980
DIVISION OF
OIL, GAS & MINING