RESPONSES TO COMMENTS
TELECOPIED FROM NRC
TO ENERGY FUELS NUCLEAR
25 September 1978

DAMES & MOORE
4 October 1978

Job No. 09973-017-14

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4 October 1978

Energy Fuels Nuclear, Inc.
Executive Offices, Suite 900
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1515 Arapahoe Street
Denver, Colorado 80202

Attention: Mr. Muril D. Vincelette
Vice President, Operations

Gentlemen:

With this letter we are transmitting the 30 copies you requested of responses to NRC comments telecopied to Energy Fuels Nuclear, Inc. as Enclosures 1, 2, 3 and 4 on 25 September 1978. Responses to other questions raised by the ORNL staff are also included.

These responses have been prepared jointly by Energy Fuels Nuclear, Inc. and Dames & Moore. In responding, each comment or question has been quoted verbatim as received and is followed by the response.

If we may be of further service, please do not hesitate to contact us.

Very truly yours,

DAMES & MOORE

Kenneth R. Porter, Ph.D.
Associate
Principal-in-Charge

KRP/tlg

Enclosures

ENCLOSURE 1

QUESTIONS CONCERNING THE PROPOSED
TAILINGS MANAGEMENT PROGRAM

Question 1

Earlier designs called for an engineered embankment consisting of up and downstream shells, core wall, chimney drain and filter. Present design calls for a single component, the same material as will be used in the liner. Why was the design changed?

Response

The earliest design for the embankment is described and illustrated in the Dames & Moore report dated January 17, 1978. This report is included as an appendix to the Environmental Report dated January 30, 1978. This embankment design did not include shells, core wall, chimney drain and filter as indicated in the comment. The embankment had two zones. The inside consisted of compacted silty soil and the outside consisted of compacted sandstone (see Plate 7).

As indicated in the question, the present design generally calls for a homogeneous embankment constructed from the clayey silt soil which will also be used for the liner. However, the southernmost embankment of Cell #6 will be partially constructed from compacted sandstone. The purpose of the sandstone shell is to provide erosion protection of the exterior slopes of the embankment and added stability. (For a more complete description of the present embankment design see the Dames & Moore report "Proposed Tailing Disposal System, White Mesa Uranium Project, Blanding, Utah Prepared for Energy Fuels Nuclear, Inc." (September 20, 1978).

The design section for the retention cell dikes was modified to facilitate construction of a continuous soil liner. Seepage calculations (Dames & Moore, September 20, 1978, p. 12) indicate that it would take at least 100 years to saturate the dikes. Since water will only be present in a cell for a few years, the dikes will never fully saturate. Therefore it is unnecessary to construct internal drainage control features such as chimney drains and filters.

Question 2

The last embankment to be built (at the south end) should have a more detailed design, considering the possible need for a chimney drain, filter, and downstream erosion protection. Also, discuss the possible need for excavating to bedrock, removing residual weathered Mancos Shale beneath this embankment.

Response

See Dames & Moore report "Proposed Tailing Disposal System, White Mesa Uranium Project, Blanding, Utah Prepared for Energy Fuels Nuclear, Inc." (September 20, 1978).

Question 3

Earlier designs also called for a plastic membrane liner, whereas in your submittal dated August 11, 1978 you propose use of a liner of on-site natural materials (described as SM/ML, according to unified soil classification system). Your submittal does not present sufficient justification for concluding that a liner of compacted natural soils will mitigate impacts on the groundwater quality due to seepage of toxic materials. Please submit any additional information that may support this conclusion. In particular, information should be included as follows:

Response

The earliest design by Dames & Moore called for a membrane liner because the results of the limited field explorations performed at that time indicated that soil of low enough permeability to line the cells was not available in sufficient quantity. However, subsequent detailed field work by Chen and Associates, Inc. (report dated July 18, 1978) and analyses by Western Knapp Engineering (report dated April 28, 1978 p. 3-8) indicated that sufficient soil of low permeability is available at the site. On September 28, 1978 a meeting between NRC and Energy Fuels Nuclear agreed upon a plan whereby the first cell would be lined with a state-of-the-art artificial liner with subsequent cells lined with natural materials.

Question 3a

Provide a complete seepage analysis for the liners and embankments. Show calculations and assumptions:

Response

See Dames & Moore report "Proposed Tailing Disposal System, White Mesa Uranium Project, Blanding, Utah Prepared for Energy Fuels Nuclear, Inc." (September 20, 1978) pages 12 and 13.

Question 3b

To what extent can long term acid resistance of the liner be guaranteed? Describe the system that would be used to warn of a liner failure and steps that would be taken in the event of such a failure;

Response

At the present time, permeability tests are being performed to evaluate the acid resistance of the clayey silt soil at the site. The results are not yet available. One advantage of a natural soil liner over a synthetic liner is that it should be more resistant to acid attack and deterioration. A series of downgradient monitor wells, in accordance with NRC requirements will be sampled periodically to detect any seepage from the tailing area. These wells will be equipped with pumps to recycle back to the tailing pond any seepage which may occur.

Question 3c

Will the liner be placed directly on rock or will parts of it lie on weathered Mancos Shale or disintegrated Dakota Sandstone? Analyze the potential for failure of the liner by differential compaction. Also, discuss how the liner will be "keyed" to the floor.

Response

The 2-foot thick liner will be constructed on both weathered Mancos Shale and Dakota Sandstone, although the total depth of Mancos Shale should not exceed approximately 3 feet. Differential settlement of the liner is expected to be negligible. This is because the soil, shale and sandstone are dense, relatively incompressible materials and because of the shallow depth of tailing (about 20 feet maximum) which will be placed over the liner. Neither the shale nor sandstone will compress appreciably under a loading on the order of 2000 psf.

The liner will not need to be keyed to the floor. The floor slopes will be 2 percent or less and the liner will be quite stable on these slopes.

Question 4

How much blasting do you expect to do? Could blasting effect the seepage rate through the floor of the reservoir?

Response

See Dames & Moore report "Proposed Tailing Disposal System, White Mesa Uranium Project, Blanding, Utah Prepared for Energy Fuels Nuclear, Inc." (September 20, 1978) page 6.

Question 5

Provide a complete flood protection analysis, showing calculations and assumptions (PMF, 100 year flood, retention capacity, wave run up, etc.).

Response

The probable maximum flood (PMF) computations for the site drainage upstream of the mill were in two parts. First, the peak flow from the drainages caused by the probably maximum precipitation (PMP) was determined. The PMP from a general type storm (PMPG) and the PMP from a thunderstorm (PMT) were compared to the basin size and response time. Because of the small basin size, the PMT would clearly produce the largest peak flow. Excess rainfall was computed by subtracting infiltration from the PMT, after an appropriate sequencing of rainfall intervals, using Soil Conservation Service curve number (CN) 85. Because the basin is small, it can be assumed the intensity of rainfall excess is equal to the discharge rate. This calculation indicated the resulting flow rate might damage the mill facilities. Flood retention dikes were, therefore, proposed.

The second part of this calculation involved a determination of the required storage volume for proposed flood retention dikes in the upper parts of the basin. In this case, flood volume is the critical quantity, rather than peak discharge. The PMPG was used since the total precipitation depth is greater than that for the PMT. The total excess precipitation was computed using a SCS CN of 85. This depth multiplied by the drainage areas yielded the required storage volume for the flood retention ponds. Flood volume computations for other project site areas were computed in a similar manner.

In cases where a dam is designed to store the entire PMF, a freeboard allowance is normally not made (Design of Small Dams, p. 273). In this case, a minimum freeboard of 3 feet is planned even though the entire PMF could be stored with the outlets blocked.

Question 6

Will there by any places on the floor of the reservoir which exceed a 3:1 slope? If so, how will these be lined?

Response

There will be no places on the floor of the cells which exceed a 3:1 slope. See Dames & Moore report "Proposed Tailing Disposal System, White Mesa Uranium Project, Blanding, Utah Prepared for Energy Fuels Nuclear, Inc." (September 20, 1978).

Question 7

SM/ML soils are highly susceptible to erosion and frost heave. How do you plan to guard against these possible modes of failure for the embankments?

Response

See Dames & Moore report "Proposed Tailing Disposal System, White Mesa Uranium Project, Blanding, Utah Prepared for Energy Fuels Nuclear, Inc." (September 20, 1978).

Question 8

Consider designs that will lead to more rapid drainage of tailings. Please address the following as a minimum:

a. Horizontal belt or drum filters and their necessary tailings transport modes;

b. Installation of sub-drains between liner and tailings together with spigotting methods to achieve minimum flow path distance through the clay slimes.

Response

If the retention embankments were constructed by upstream or center-line methods rapid drainage and consolidation of the tailing would be very important. Since the retention embankments will be designed and constructed to resist the fluid pressure of the saturated tailing, rapid drainage of the tailing would not be advantageous or necessary.

Question 9

What quality control systems will be used to ensure the proper installation of liners and embankments?

Response

During construction of the tailing retention system, Energy Fuels Nucelar will have a qualified engineer supervise all installation and construction of the tailing dikes and liner. The engineer will keep a daily record showing type of material used and method applied during construction. If materials or construction specifications are not met, the engineer will have the authority to immediately stop construction and make corrections necessary to meet specifications. Refer to Energy Fuels Nuclear's Source Material License Application, September 26, 1978, Section 7.2.1, Page 7-1.

Question 10

Tables 2 and 3 (Earthwork Quantities) of the August 11, 1978 proposal indicate that a major portion of the soil materials will be borrowed. For example, Table 3 states that 7,524,000 cu yd, or approximately 50% of the silt-sand type soil will be borrowed. Only one potential borrow area of 75 acres has been identified (p. 6). It is doubtful that all of the borrow could be obtained from such a small area.

The document prepared by Chen and Associates (July 18, 1978) also suggests that soil materials are in short supply. It is indicated that a 23-year tailings disposal system or any similar scaled down plan would require a minimum average soil thickness of 12 ft (2 ft liner, 9 ft cover, 9 inches of topsoil, and dike requirements). Figures 1B and 1C indicate an average thickness of 7.1 ft. If these soil distribution trends also apply to the rest of the site, at least one acre of borrow area will be necessary for each acre of tailings impoundment. The environmental impact from such massive borrowing would be significant.

Please address the problem of soil availability from the following standpoints:

a. Define the location and extent of planned borrow areas.

Response

See Dames & Moore report "Proposed Tailing Disposal System, White Mesa Uranium Project, Blanding, Utah Prepared for Energy Fuels Nuclear, Inc." (September 20, 1978), Plate 2.

Question 10b

Prepare reclamation plans and cost estimates for such disturbed areas.

Response

See response to Question #7, Enclosure #2.

Question 10c

Where planned borrow material is substantially different from originally planned soils, define characteristics of such borrow materials and describe impacts on seepage control, slope stability, and radon control from the use of the additional borrow material.

Response

The studies by Chen and Associates (July 18, 1978) indicate that the soils at the site are relatively uniform. Therefore, no problem of encountering soils with substantially different properties from the soils evaluated originally is anticipated. Additional field investigations at the northern end of the site have been conducted and confirm this conclusion. If deposits of clay or shale would be mined for use either as liner or as cover material, a definitive analysis of these materials will be made.

Question 11, #1

Please give the basis for the estimated seepage rate of one gallon per minute per acre of free water surface. Specifically address the following:

1. Method of obtaining the coefficient of permeability "K" accounting for reported soil variations.

Response

See Dames & Moore report "Proposed Tailing Disposal System, White Mesa Uranium Project, Blanding, Utah Prepared for Energy Fuels Nuclear, Inc." (September 20, 1978). As indicated in this report on page 12, permeability of 0.32 ft/yr was used in the seepage analyses. This number is an "average" value based on the results of all permeability tests by Dames & Moore (January 30, 1978) and Chen and Associates (July 18, 1978). There are both higher and lower permeability values reported in these reports, but 0.32 ft/year is considered to be a typical average value.

Question 11, #2

2. Define the configuration (ponded surface area, average head, etc.) used in the calculation.

Response

See Dames & Moore report "Proposed Tailing Disposal System, White Mesa Uranium Project, Blanding, Utah Prepared for Energy Fuels Nuclear, Inc." (September 20, 1978), pages 12 and 13.

Question 12

The tailings radon calculation appearing on page 3-18 of the ER is not valid for use in the design of the tailings cover. Based on a permeability of 0.33 ft/yr for the liner, the tailings would drain in about 20 yrs. Assuming less than 10% retained moisture ($D_e/v = 5 \times 10^{-2}$ cm^2/sec) and infinite thickness of the tailings layer, the flux would be 367 pCi/m^2 sec. Using the equation of page 9-8 of the ER, and less than 10% moisture in the cover material, the required cover would be approximtely 21 ft. Please address this finding particularly in light of the above noted borrow material quantities. Explain in detail cover design features which will overcome such problems.

ASSUMPTIONS USED IN 12:

Dames & Moore (p. 9-9) used a diffusion coefficient of 1.0×10^{-2} cm^2/sec for the silt-sands to be used for cover material. This assumes 15% moisture. According to the soil samples taken by Chen and by Dames & Moore, the moisture content of the soils varies from 5% to 10%.

The higher moisture contents were measured at the bottom of natural depressions, suggesting that these areas receive more moisture (as run-off) than do elevated regions. Therefore, the tailings cover, which will be relatively flat but elevated above the surrounding area, will, under long-term conditions, be under 10% moisture content. In this case, a diffusion coefficient of 5×10^{-2} cm^2/sec for the tailings (and 2.2×10^{-2} cm^2/sec for the cover) is more appropriate for the long term. The radon flux can be estimated as follows:

$$\text{Source Flux } J_o = -E\, C_v\, [\lambda(D_e/v)]$$

where:

E = 0.2 emanation rate of radon-222

C_v = 564.8 pCi/cm^3; 353 pCi/gm (radium-226 concentration of the tailings, assuming 0.125% average ore grade) multiplied by 1.6 g/cm^3, the bulk density of the dried tailings.

$D_e/v = 5.0 \times 10^{-2}$ cm^2/sec for "dry" tailings, 8% moisture

$\lambda = 2.1 \times 10^{-6}$ sec^{-1} = decay constant of radon-222

$J_o = (0.2)(353)(1.6) \quad (2.1 \ 10^{-6})(5 \times 10^{-2})$

Using a background flux of 0.752 pCi/m^2sec, necessary thickness for a cover with $D_e/v = 2.2 \times 10^{-2}$ cm^2/sec is 20.6 ft.

Response

The analysis of the tailing reclamation alternatives will be amplified to consider modifications in the tailing disposal concept made in the period since the analysis was originally prepared for the Environmental Report. These modifications, which will change the thicknesses of cover required to achieve the necessary reduction in radon flux and gamma emission, primarily involve segregating the slimes and sands with the slimes being beneath the sands, rather than considering the tailing to be a homogeneous mixture.

In addition, the questions raised in Question 12 will be considered in the course of reevaluating cover thicknesses. Dames & Moore believes that additional clarification of the NRC approach (model) used to evaluate fluxes from the cover materials will be required to permit a comparison of the analytic methodologies. It is proposed that a meeting be held as soon as possible with appropriate NRC and ORNL personnel to review modelling assumptions so that an agreement of all interested parties can be reached.

Response

The tailing supply discharged from the mill will consist of sands and slimes. It was originally assumed by Dames & Moore in preparing the Environmental Report that the radium content of the tailing would be homogeneous and that there would be a concentration of the 353 pCi of radium-226 per gram of tailing. However, in practice, a separation of sands and slimes will occur when the tailing material is deposited.

This separation will result in the sands, which are the low radium fraction, covering the higher radiation slimes; thus reducing the surface radiation source term. For this reason, as well as consideration of questions raised in Comment 12, Dames & Moore is completing a revised radiological model. The results of this and proposed cover thickness will be forthcoming in the near future.

ENCLOSURE 2

QUESTIONS CONCERNING THE PROPOSED
WHITE MESA MILL

Question 1

Due to reported design changes (high efficiency thickeners, semi-autogenous grinding mill, etc.), the description in the ER (Sections 3.2.1 - 3.2.3) requires revisions. In the revision, please address the following:

Question 1a

The method for feeding ore to the mill.

Response

The ore will be fed by a front end loader through a primary grizzly to a secondary grizzly which feeds a conveyor belt to the SAG mill.

Question 1b

The operation of the secondary crushing unit or semi-autogenous mill, whichever is applicable.

Response

The grinding circuit will consist of an 18' X 6' semi-autogenous grinding (SAG) mill in closed circuit with screens. The underflow from the screens (-28 mesh) will be pumped to the three 35' diameter mechanically agitated wet slurry storage tanks. Refer to Energy Fuels Nuclear's Source Materials License Application, September 26, 1978, Section 3.2.1, Page 3-2.

Question 1c

Will the facilities for processing copper containing ores be installed as originally planned?

Response

The copper circuit will not be installed at this time.

Question 1d

What type of dryers will be used in the uranium and vanadium circuits? This should address configuration, fuel, and dusting rates (uncontrolled).

Response

The dewatered yellowcake slurry will be pumped to a 6 ft diameter oil fired multiple-hearth dryer operating at approximately 650°C.

The filtered vanadium precipitate will be pumped to a 12 ft diameter oil fired fusion furnace operating at approximately 800°C.

Both dryers will be operated using wet scrubbers for emission control. Specifications show the scrubbers to be 99+ percent effective, resulting in controlled dusting rates of approximately 0.50 lbs/hr.

Question 1e

The section should describe water usage within the mill and any measures employed for conservation purposes.

Response

Fresh water usage in the mill will consist of 402.5 gpm added to the ore in the SAG mill and another 44 gpm of make-up water added to the final CCD thickener. Raffinate from the uranium and vanadium SX circuits will be recycled to the CCD circuit for wash water, resulting in a conservation of approximately 877 gpm of water. Refer to Energy Fuels Nuclear's Source Material License Application, September 26, 1978, Table 3.1-1.

Question 1f

Please provide operating schedules and production estimates for the vanadium and copper circuits.

Response

The vanadium circuit will operate approximately 120 days per year producing approximately 27,200 pounds of V_2O_5 per day. The copper circuit will not be installed at this time.

Question 1g

Explain reason for choosing manganese dioxide over sodium chlorate as the oxidizing agent.

Response

Either manganese dioxide or sodium chlorate may be used as the oxidizing agent depending on availability and delivery.

Question 2

Please provide a revised plate 3.1-1 showing the mill complex layout.

Response

As discussed with Larry Lamonica by phone, October 2, 1978, Plate 3.1-1 is consistent with plates presented elsewhere in our reports.

Question 3

Please justify the estimated (0.1 lb/hr) hydrocarbon emission from the solvent extraction circuits either by direct calculation or by comparison with other mills.

Response

The Draft Environmental Statement for the Bear Creek Project, Rocky Mountain Energy Company, projects an organic vapor release of 0.025 lb/hr. The free surface area of Energy Fuel's uranium and vanadium solvent extraction settlers is approximately 4 times the area of Rocky Mountain Energy's, therefore, the stated estimate of 0.1 lb/hr.

Question 4

Please describe the expected conditions on the mill complex ore pads under equilibrium operating conditions and at start-up (i.e., maximum storage). Describe areal extend height, and shape of piles and ore feeding operations.

Response

Prior to start-up of the mill, there will be approximately 250,000 tons of ore stockpiled. This will cover an area of approximately 260,000 ft^2 with the stockpiles being 20-22 ft high. During operation of the mill, there will be approximately 100,000 tons of ore covering approximately the same area with the stockpiles being approximateiy 9 to 10 ft high. The ore will be fed to the mill be a front end loader.

Question 5

Due to the fact that the ore will come from numerous mines, in different formations, the radon emanation factor (0.07), given in the ER (p. 3-15), would appear to be low, given the wide spread in reported emanation factors for ore. We would recommend a more generic value of 0.2 as the emanation coefficient. Please comment.

Response

Dr. Oktay I. Oztunali, Senior Engineer with Dames & Moore, has discussed this matter with Mr. Larry Lamonica of the ORNL project team.

The reference cited on page 3-15 of the Environmental Report (Clements et al., 1978) was not appropriate. As agreed by both Messrs.

Oztunali and Lamonica, a range of radon emanation factors may be found in the literature, some being higher and some lower than the 0.07 value used by Dames & Moore. Dames & Moore's use of 0.07 was based upon data in P.M.C. Baretto's "Radon-222 emanation characteristics of rocks and minerals" and S.R. Austin's "A Laboratory study of radon emanation from domestic uranium ores;" both of these papers were published in Radon in Uranium Mining, Proceedings of a Panel, Washington, D.C. 1973. These data give consideration to type of ore and ore grade.

Question 6

On page 3-24 of Western Knapp Engineering's Alternative tailings disposal systems report and on page 15 of Dames and Moore's long-term stability report, in discussions of filtered tailings disposal alternatives, the statement is made that "...A series of small soil-lined ponds would be provided to satisfy evaporation requirements..." We need an estimate of the size, number, and location of these ponds as well as the proposed thickness of the compacted clay liner to be placed on the bottom of these impoundments.

Response

There will be 3 ponds approximately 70 acres each with a two-foot thick liner of compacted clay.

Question 7

Concerning the applicant's plans for mill decommissioning and site reclamation, please provide detailed discussions for the following:

Question 7a

A technical and financial feasibility assessment on methods and overall costs of mill decommissioning and site (including tailings area) reclamation. Note that all future costs should be discounted to present worth.

Response

The total cost for removal and burial in the tailing pond of all equipment, process piping, buildings, foundations and contaminated soil necessary to meet the NRC's Staff Technical Position on Interim Land Cleanup Criteria for Decommissioning Uranium Mill Sites, May 1978, is $2,000,000. This is assumed to include the entire processing facility except for the administration and lab building, the coal and oil fired boilers, the mine warehouse, and the process water well and storage tank. The costs are equivalent to an estimate made by an independent contractor for a similar 2000 TPD uranium mill. All costs are 1978 dollars inflated at 8 percent per year and discounted at 10 percent per year to present worth. No salvage value for equipment has been included.

The reclamation of the tailing area is included in Energy Fuels Nuclear's Source Material License Application, September 26, 1978, Appendix AA, Page 24. In addition, the attached sheet gives the reclamation costs for the individual tailing cells, topsoil, overburden and rock stockpiles and borrow areas. The total cost for the tailing area reclamation in 1978 dollars inflated at 8 percent per year and discounted at 10 percent per year to present worth is $7,831,110. The tailing reclamation begins after 2.5 years of operation and continues through the entire life of the mill with an average cost per year of $522,000. The final tailing cell has a total reclamation cost of $775,000 spread over 1.5 years.

At the end of the 5th year, 2/3 of cell no. 3, and 1/3 of cell no. 4 will require reclamation costing about $2.3 million. This cost added to the mill and stockpile reclamation costs result in a total decommissioning liability of approximately $4.3 million.

Question 7b

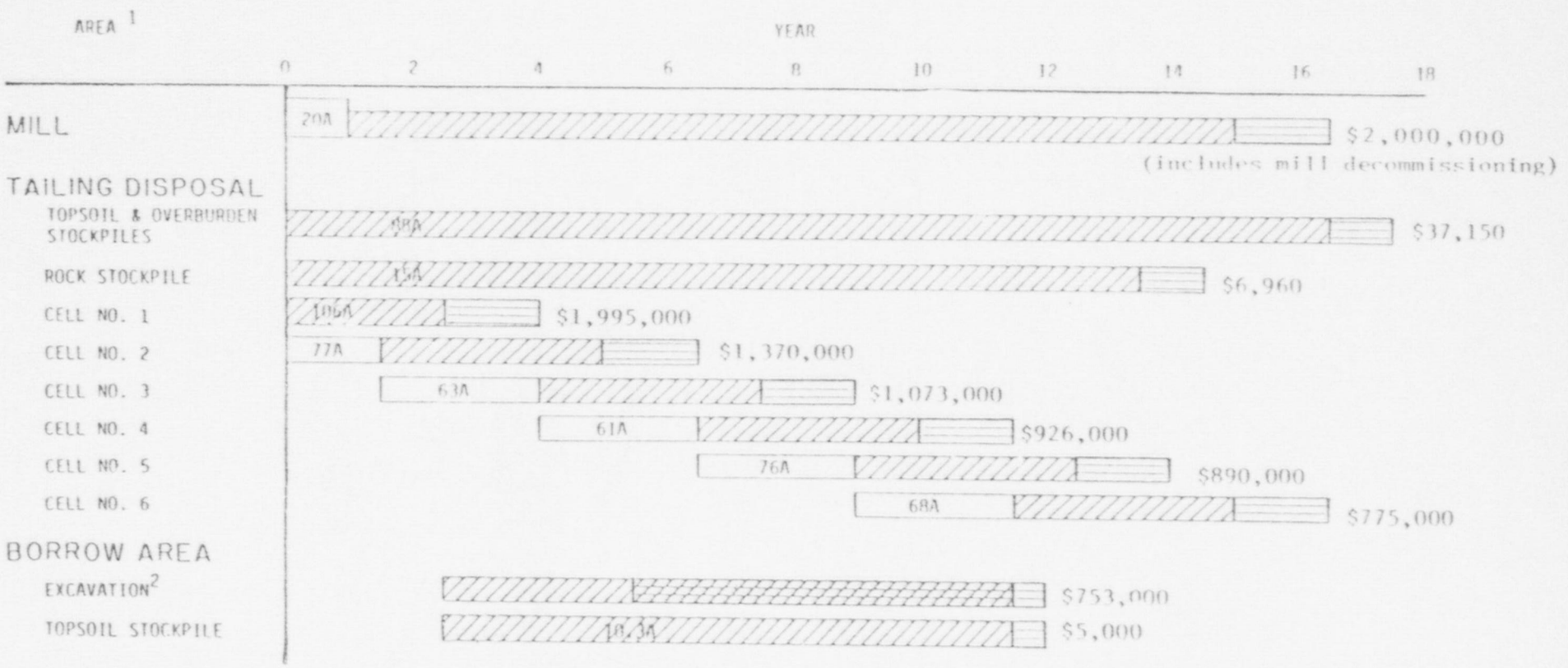
Financial arrangements to be made (such as bonding arrangements, etc.) to ensure that adequate funds will be available for mill decommissioning, site reclamation, and restoration when operations are concluded.

Response

In a telephone conversation with NRC on October 4, 1978 Energy Fuels Nuclear discussed financial arrangements, either by bonding or escrow. It was recommended by Mr. Gene Trager that financial arrangements be made for the first five years of operation, taking into account the salvage value of structures and equipment on the site.

As discussed in Response #7a, Energy Fuels Nuclear's decommissioning costs at the end of year 5 will be approximately $4.3 million. To cover this cost, a bond acceptable to the Utah Division of Oil, Gas and Mining will be posted at time of licensing. The bond will be structured such that as equity becomes available in the mill to secure the decommissioning obligations the amount of the bond will be correspondingly reduced. By the end of the 5th year of operation the bond should be retired, leaving the salvage value of buildings and equipment as the sole security for decommissioning costs. The salvage value of such buildings and equipment is estimated to be at least $5 million throughout the life of the milling operation.

RECLAMATION SCHEDULE and COSTS[3]



NOTES:

(1) ACREAGES SHOWN ARE MAXIMUM AREAS DISTURBED.

(2) TOTAL BORROW AREA EXCAVATION IS 274 ACRES, WITH A MAXIMUM AREA EXPOSED OF 80 ACRES AT ANY GIVEN TIME.

(3) ALL COSTS ARE INFLATED 1978 DOLLARS DISCOUNTED TO PRESENT WORTH.

DAMES & MOORE

ENCLOSURE 3

Question 1

Please provide a vegetation map of all lands that will be affected by project activities as modified by your most recent tailings management system proposal. If any community types are different than those discussed in the environmental report, please provide a comparable discussion of those types.

Response

Construction and operation of the 6-cell tailing disposal system for 15 years of operation will involve disruption and a long term commitment of approximately 128 acres of vegetation not mapped previously in the Environmental Report. Of this total, cell #1 will disturb approximately 17 acres of the controlled Big Sagebrush community outside of the original project boundaries and cell #6 an additional 111 acres of the Big Sagebrush community.

Both of these community types occur elsewhere on the project area and the additional affected areas do not appear to differ significantly in structure and composition from the same communities described in the Environmental Report. The accompanying vegetation map (Plate 2.8-2) includes the additional areas.

Question 2

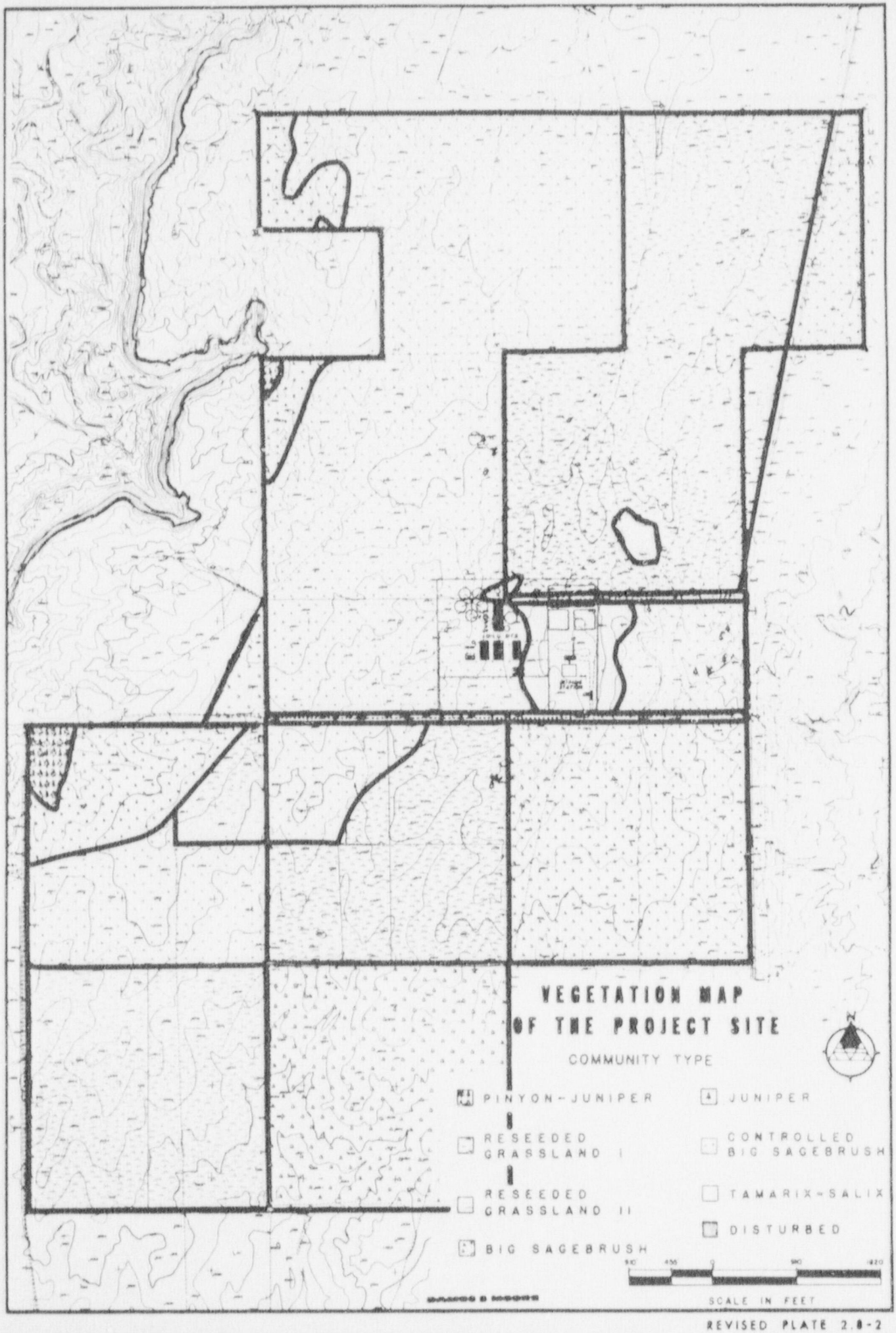
Please list the wildlife that may try to use the tailing disposal ponds. Please describe the type of fence to be erected around the proposed tailing disposal system. Will it keep deer out? You should consult the Utah Division of Wildlife Resources, S.E. Regional Office, with regard to the probability of deer trying to use the pond and also with regard to the type of fence that would be required to keep deer out. How long will the fence be left in place? When will the land be allowed to be used for other purposes?

Response

The only big game species occurring in the vicinity of the Blanding site is the Mule Deer (see Environmental Report).

The type of fence constructed around the tailing disposal area will be defined through consultation with the Utah Division of Wildlife and will give consideration to the negative impact of fencing upon migratory movements as well as the positive effect of minimizing risk to the deer.

The tailing retention area would remain fenced until released from its status as a restricted area. As long as it is a restricted area, the area will not be used for any other purpose than tailing stabilization and reclamation.



REVISED PLATE 2.8-2

Question 3

In terms of animal unit months per acre, what is the grazing capacity of the lands on and within the vicinity of the project site.

Response

The following grazing capacity in animal units per acre of range site in the vicinity of the project site are based upon vegetative production discussed on pages 2-238 through 2-241 of the Environmental Report.

Range Site	Vegetative Production lbs/acre Fair Condition Median Year	Pounds/Acre Usable under Management	Acres per AUM	AUM per acre
Semidesert Upland Stony Hills (Pinyon-juniper)	900	450	2	0.5
Semidesert Loam	500	250	3.6	0.28

Requirement for Range Forage = 900 lbs/month/animal unit

The above calculations are based on an expected total annual yield in an average year. It is assumed that grazing management will control the utilization to removal of no more than 50 percent of the annual growth by weight. Grazing studies in Utah by Dr. C.W. Cook have determined that 26 pounds of forage are used per animal unit per day on rangeland. A certain allowance (10 percent) should be given for wastage in grazing. Therefore, about 30 pounds per animal unit per day should be the rate of forage removed. The total requirement per animal unit per month equals 30 x 30 or 900. This (900) divided into the pounds produced equals animal unit months per acre.

Question 4

Please state the distance and direction to the nearest cultivated cropland (not pasture or rangeland) and to the nearest garden plot.

Response

The nearest cultivated cropland (alfalfa) occurs 1.5 miles due north of the millsite boundaries (2.5 miles from the mill). The nearest garden plot occurs approximately one mile north of the millsite boundaries (2.0 miles north of the mill).

Questions 5, 6 and 7

More overburden and topsoil will be required for reclamation of the tailing disposal system than will be stored. Where will the borrow area be located? How many acres will it cover? Will the topsoil of this area be stockpiled? If so, where?

Only a small protion (about 5%) of the excavated rock will be used in the cells and drainage ditches. Where will the remaining rock be disposed of at termination of the project?

Will the drainage ditches be reclaimed? If so, when?

Response (to 5, 6 and 7)

See Dames & Moore report "Proposed Tailing Disposal System, White Mesa Uranium Project, Blanding, Utah Prepared for Energy Fuels Nuclear, Inc." (September 20, 1978).

Question 8

A powerline presently traverses some of the proposed cells. Will the powerline be relocated? If so, where will it be placed?

Response

The present powerline will be relocated when necessary to accommodate tailing cell expansion and will not traverse such cells.

Question 9

Do the reclamation plans as outlined in the environmental report apply to the recently received proposed tailing disposal system (Dames and Moore Job No. 09973-017-14)? If not or if they have been modified, Please provide a reclaimation plan for the tailing disposal system.

Response

As discussed in the September 7, 1978 meeting reclamation plans remain essentially unchanged for the newly proposed tailing disposal system with the exception that reclamation will occur at an earlier time in the life of the mill due to the smaller size of individual cells (see Dames & Moore report "Proposed Tailing Disposal System, White Mesa Uranium Project, Blanding, Utah Prepared for Energy Fuels Nuclear, Inc." (September 20, 1978).

Question 10

What evidence do you have that application of nitrogen prior to seeding will not be beneficial to long-term successful reclamation of the disturbed areas.

Response

Application of nitrogen prior to seeding will be of doubtful benefit to long-term successful reclamation of disturbed areas in an arid climate. In more humid climates, fertilizers applied immediately prior to seeding of adapted vegetation will facilitate rapid establishment. Documentation of this effect is scarce (EPA July 1975).[1]

The effectiveness of nitrogen fertilizer is clearly related to soil moisture. Heavy applications may be detrimental under arid conditions Box et al. (1974).[2]

Nitrogen fertilization frequently results in an invasion of annual weeds that seriously retard establishment of the seeded species.

Question 11

Discuss the advantages and disadvantages of applying mulch. Explain your rationale for not applying mulch.

Response

Mulching is highly beneficial in revegetation of disturbed lands. A number of authors have described the benefits of applying effective mulches Box et al. (1974).[2] Mulches increase infiltration while reducing erosion, soil movement and evaporation. The impact of raindrops is lessened; soils are sheltered from wind erosion. The practice of mulching is specified in the Environmental Report for Hanksville while at the Blanding project the topsoil is of favorable quality and can be revegetated without mulching. Evidence of successful reseeding in the Blanding vicinity in the form of crested wheatgrass on nearby rangelands would support the omission of mulching. The harsh-arid site at Hanksville on the other hand will benefit from mulching.

Question 12

Broadcast seeding has definite limitations in a semi-arid climate, especially if the soil crusts before seeding (EPA-440/9-75-006). What is

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[1] Methods of Quickly Vegetating Soils of Low Productivity, Constructing Activities. Office of Water Planning and Standards Washington, D.C.

[2] Box, T.W. et al. 1974. Rehabilitation Potential of Western Coal National Academy of Science.

your rationale for applying seed by the broadcast method? Discuss the feasibility of preparing the soil with a chain harrow prior to seeding, or using some other method of seeding, such as drilling, which will allow the seed to be in closer contact to the soil.

Response

The use of a special rangeland drill is almost always superior to broadcast seeding. Plummer et al. (1968)[1] and many other workers in rangeland revegetation have emphasized the value and advantages of seeding with a suitable drill. Broadcasting is recommended only when a drill cannot negotiate the soil or terrain. As stated on page 9-20 of the Environmental Report, Energy Fuels Nuclear, Inc. will use a rangeland drill wherever possible.

Question 13

In terms of animal unit months per acre, what is the grazing capacity of the land on and within the vicinity of the Hanksville site?

Response

The grazing capacity in animal unit months per acre of the lands in the vicinity of the Hanksville site are (p. 2-280 in Environmental Report).

Range Site	Pounds/Acre Fair Condition	AUM/Acre
Desert Loam	360 (180)	.20
Desert Sand	500 (250)	.27

The above calculations are based on an expected total annual yield in an average year. The same assumptions were made in calculations as for response to Question 3 of this enclosure.

Question 14

Please state the distance and direction to the nearest cultivated cropland (not pasture or rangeland) and to the nearest garden plot.

Response

The nearest such locality is the Fairview Ranch, about 4 miles southwest of the Hanksville ore buying station.

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[1] Plummer, A.P. et al. 1968. Restoring Big Game Range in Utah. Publ. No. 68. Utah Div. of Fish and Game and USDA Forest Service Ephraim, UT.

Question 15

Section 9.4.2.2 of the ER indicates that the seeding mixture for reclaimation of the Hanksville site will contain various grasses, forbs, and shrubs. However, seeding rates (p. 9-19) were not provided for the forbs or two of the shrubs that were duscussed in the paragraph on seeding depths (p. 9-20). This information must be provided.

Response

The seeding rate per acre for the forbs and shrubs listed on page 9-20 but omitted in the table on the preceding page should be as follows:

Forbs:	Palmer Penstemon	0.25 lbs
	Yellow Clover	1.0 lbs
Shrubs:	Spreading Rabbitbrush	0.25 lbs
	Big Sagebrush	0.10 lbs

Question 16

Please provide the seeding mixture and rate of seeding used on the old runway area at the Hanksville site.

Response

The old runway seeding rates per acre were as follows:

2 lbs sand drop seed (Sporabolus cryptandrus)
2 lbs Galleta grass (Hilaria jamesii)
1/2 lb 4-wing saltbush (Atriplex canescens occidentalis)

The seedbed was prepared by light dragging and seeded via broadcasting. Reseeding occurred February 13, 1978.

Question 17

Please provide precipitation data from February 13 through June 20, 1978, at the Hanksville site.

Response

Data are provided in the Meteorology/Air Quality Supplemental Report up to February 1978 which completes one year's data at the Hanksville location.

ENCLOSURE 4

Question 1

(Section 2, The Site) Project boundaries as indicated in Plates 2.1-3, 2.3-1, 2.10-1 and Plate 4, Appendix H, are inconsistent. Indicate project boundaries (i.e., Energy Fuels Nuclear, Inc. property) on these plates.

Response

Refer to June 20, 1978 Responses to Comments. Revised Plates 2.3-1 and 2.10-1 are attached.

Question 2

(Section 2.1, Site Location and Layout) "The project site includes all of Section 28 and..." (ER, 2-4, line 6). This statement does not agree with the project boundary map in Plate 2.1-3. Please clarify.

Response

Refer to June 20, 1978 Responses to Comments.

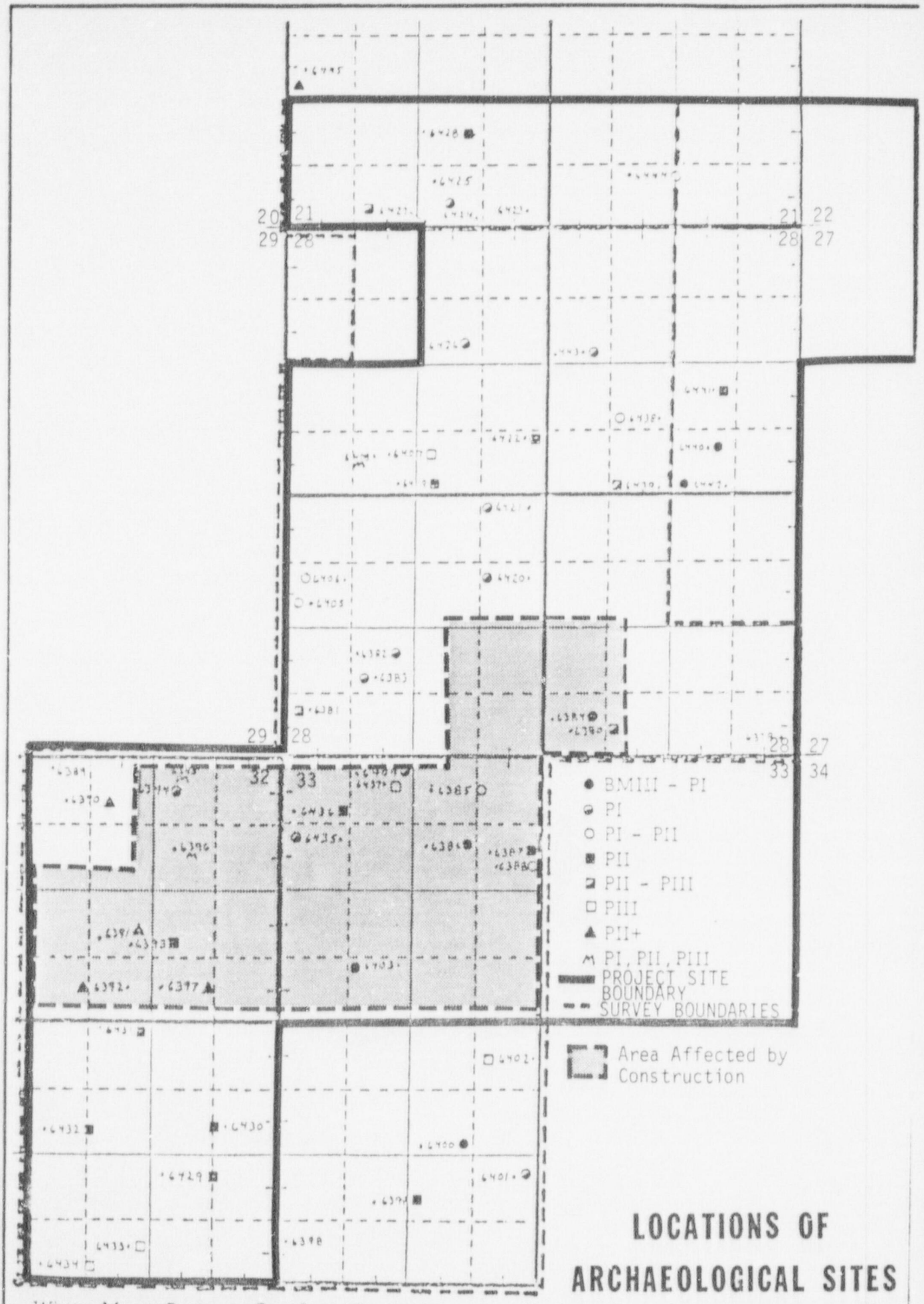
Question 3

(Section 2.6.3 Regional Occurrence and Drainage of Surface Water) If stream flow records are not available, qualitatively define the water flow in Corral and Westwater Creeks. During what season and/or precipitation conditions will they carry water? What is the approximate duration of fill at these times?

Response

Flow only occurs in Corral and Westwater creeks during and following rapid snowmelt or relatively high-intensity precipitation. Where ground water discharge does occur, the flow is normally consumed by vegetation prior to reaching these stream channels. Based on observation of Blanding precipitation records, together with the discharge records of Cottonwood Wash, it appears that flow is most likely during the months of April, August and October. During April, rapid snowmelt causes flow and this can also occur in March or May; April being the month in which it most commonly occurs. Flows during August and sometimes July occur during and after thunderstorms. October flows are probably caused by more general storms.

All flows probably begin within two hours after the ground surface becomes saturated by snowmelt or precipitation. Peak flows from thunderstorm precipitation are probably much larger than peak flows from snow-

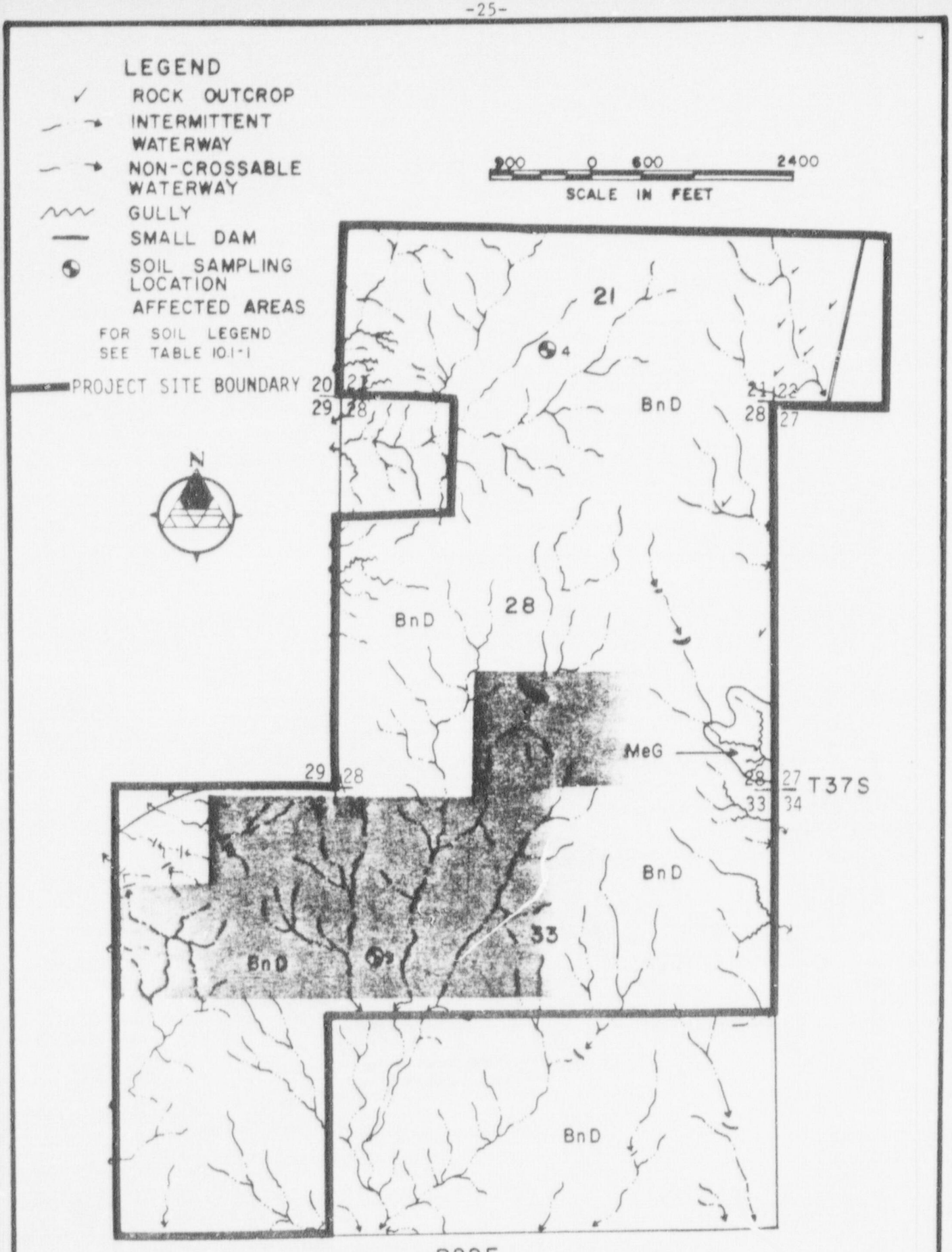


LOCATIONS OF ARCHAEOLOGICAL SITES

White Mesa Project, San Juan Co., Utah
Secs. 21, 28, 32, and 33, T37S, R22E SLM

DAMES & MOORE

PLATE 2.3-1



SOIL SURVEY MAP- PROJECT SITE

SOURCE USDA SOIL CONSERVATION SERVICE

DAMES & MOORE

PLATE 2.10-1

9973-015

melt or general storms. Once precipitation or snowmelt ends, flow probably continues for 6 to 48 hours, depending on the size of the basin and the duration and magnitude of the precipitation.

Question 4

(Section 2.8.2.1, Vegetation) If either of the two "stock" ponds on the White Mesa site are to be used to hold well water for construction purposes, give the expected duration of fill and use.

Response

Refer to June 20th responses to comments. Use of the pond is expected to last 6 months.

Question 5

Discuss the desirability and feasibility of construction a low containment wall (2' high) downgradient from the OBS ore stock-piles to contain runoff at both the Hanksville and White Mesa OBS.

Response

It is neither desirable nor necessary to construct such structures at either facility. At Blanding, all runoff will flow towards and be contained in the tailing area. At Hanksville, no ore stockpile runoff is expected outside the restricted area. If runoff is shown to be a problem, peripheral drainage control ditches could be constructed.

Question 6

What is the predicted chemical composition of rainfall runoff from the ore stockpiles? Include quantitative analysis of the material transported as particulates and material transported in solution.

Response

Ore stockpile leachate tests are currently being run. Results of these analyses will be forthcoming shortly.

Question 7

Estimate the extent of runoff transport of ore material downgradient of the Ore Buying Stations during usual and PMP (Probably Maximum Precipitation) conditions. What is the probability of ore stockpile runoff reaching Westwater or Corral Creek at Blanding or local drainages at Hanksville?

Response

Under usual meteorologic conditions, essentially no runoff transport will occur at either site. Several factors contribute to very low sediment (ore) transport rates including: 1) ore is very coarse; 2) fine materials in the ore are protected by coarse materials; 3) the ore stockpiles have very high infiltration rates because of the high percentage of coarse material so runoff from the stockpiles will be near zero; 4) slopes, and, therefore, flow velocities, are very low in the area surrounding the ore stockpiles; 5) annual precipitation is very low; 6) at Blanding a tailing retention pond will prevent transported materials from reaching stream co[illegible]. PMP conditions at Blanding would not result in any contamination outside the restricted area since all flow is directed towards the tailing area. The probability of runoff reaching local drainages at Hanksville is essentially nil.

Question 8

Define the location of the drainage divide between Corral Creek and Westwater Creek as it relates to the present White Mesa Ore Buying Station. Where does rainfall runoff from the OBS drain to?

Response

As mentioned previously, runoff at the Blanding OBS drains into the tailing area. The drainage divides are indicated on the plot plan in the Dames & Moore report "Proposed Tailing Disposal System, White Mesa Uranium Project, Blanding, Utah Prepared for Energy Fuels Nuclear, Inc." (September 20, 1978).

Question 9

If stream flow records are not available, qualitatively define the water flow in Halfway Wash near the Hanksville OBS. During what season and/or precipitation conditions will it carry water? What is the approximate duration of fill at these times?

Response

The flow characteristics in Halfway Wash are expected to be approximately the same as those of Corral and Westwater creeks. However, the discharge volume and rate per unit area are probably less due to slightly lower precipitaiton and to a lower basin gradient.

Question 10

Provide stream flow data for the Dirty Devil River.

Response

USGS streamflow data for the Dirty Devil River for the period 1948 through 1976 are attached.

Question 11

Provide water quality data for Dirty Devil River, if available.

Response

Miscellaneous USGS water quality data for the Dirty Devil River are attached.

Question 12

Provide surface water utilization for the Hanksvi le region.

Response

Mr. Rex Larson of the Utah Department of Natural Resources, Water Rights Division, was contacted in order to identify the surface water rights near and downstream of the Hanksville OBS (Record of Telephone Conversation attached). Although an exhaustive search for all water rights in the Hanksville region was not done, Mr. Larson stated that no registered water rights exist on Halfway Wash. A small reservoir on Halfway Wash, Meadow Gulch Reservoir, is shown on the USGS 15' quad approximately five miles North of the Hanksville OBS. It is not known if this reservoir still exists or if it is still used. This reservoir is probably a stock pond designed to capture and store runoff whenever it occurs.

Question 13

How soon after filling can the cells be reclaimed?

Response

See Dames & Moore report "Proposed Tailing isposal System, White Mesa Uranium Project, Blanding, Utah Prepared for Energy Fuels Nuclear, Inc." (September 20, 1978).

Question 14

Please describe your plans to stabilize the overburden and topsoil storage stockpiles.

Response

The overburden and topsoil storage stockpiles will be stabilized by seeding them with cereal rye and yellow blossom sweetclover. Sunflowers, Russian thistle and other annual plants will also become established and will aid in preventing erosion of the stockpiles.

Question 15

Quantitatively estimate increased sediment transfer to local streams due to erosion of disturbed soils during construction of the mill and

RECORD OF TELEPHONE CONVERSATION

~~TELEPHONE~~ INFORMATION ONLY

DATE Sept 14 1978 JOB NO: ~~84~~ 9773-017

RECORDED BY: Mike Brown OWNER/CLIENT: Energy Fuels Wate Use

TALKED WITH: Ray Lawson OF UTAH DEPT. OF NAT. RES. WATER RIGHTS DIV. WAYNE CO

NATURE OF CALL: INCOMING ☐ OUTGOING ☒

ROUTE TO: INFORMATION ACTION

MAIN SUBJECT OF CALL: Surface Water Use?

ITEMS DISCUSSED:

I asked Mr. Lawson if there were any surface water rights on Halfway Wash south of Fremont. He said call Bob at Loa. When he said he had finished his search.

Loa. Called Bob - Mr. Lawson said I couldn't find anything. He asked for T&R & I told him I'd check. I said T29S-R14E He made a final check and said still found nothing. I mentioned Under Ground Reservoir & he said he hadn't found anything.

DAMES & MOORE

117-1 (12/73)

DAMES & MOOR

tailings retention facility under varying meteorological conditions and during various phases of construction.

Response

The average sediment yield of western rivers in similar climates is usually 0.5 to 3 tons/acre/year (Paskett, Table 2). The river basins involved are mostly large (greater than 1000 sq mi), and diverse with respect to soil type, slope and man-induced changes such as farming and dams. The sediment delivery ratio for basins of this size has been estimated at about 10 percent (Sedimentation Engineering, Fig. 4.13). The sediment transfer rates within these basins is, therefore, about 5 to 30 tons/acre/year. Thus, the natural overland sediment transfer at the project site is estimated to be on the order of 10 tons/acre/year. The Universal Soil Loss Equation (Sedimentation Engineering, pg. 442) when used with a reasonable selection of parameters will also produce estimated sediment yield of 10 tons/acre/year.

The Universal Soil Loss Equation (USLE) must be used with caution in the western states because it is intended for use only in the eastern states. Lacking any other estimating techniques, we have elected to use it here to estimate approximate changes in sediment transfer rates.

Phase I of the mill and tailing facility construction will consist of the simultaneous construction of the mill facilities and cells 1 and 2 of the tailing retention facilities. All mill facilities are located upstream of one of the two tailing cells. The tailing cells themselves are excavations which will tend to trap all runoff. The main portion of the Phase I construction will tend to reduce the quantity of sediment transfer from the site although the sediment transfer within the site will increase.

Also, during Phase I, the temporary overburden stockpile will be constructed. This will be a pile of relatively loose material covering approximately 75 acres with a flat top surface and steep side slopes. Although the top of this surface will have little runoff, the steep side slopes, area about 5 acres, will have much higher sediment yield than the natural ground. Using the USLE with parameters for slope, slope length and soil erodibility adjusted appropriately, we estimate the sediment yield from these stockpile slopes will be 500 tons/acre/year. So the net effect of Phase I construction will be as shown on the table included.

As construction progresses, additional cells will be constructed which will further reduce sediment transfer from the project site. These reductions will be counter-balanced by the increases in sediment production caused by disturbance of the stockpile areas for recovery of materials.

These calculations of the USLE are based on parameters which are assumed long-term averages. For example, the rainfall erosivity factor,

Effect of Phase I Construction

Location	Area (acres)	Sediment Production to Local Streams During and After Construction Phase I (tons/acre/year)	Net Change Per Acre (tons/acre/year)	Total Change (tons/year)
Borrow Area	30	0	-10	-300
Topsoil Stockpile Slopes	1	500	+490	490
Overburden Stockpile Slopes	5	500	+490	2,450
Topsoil Central Stockpile	9.3	0	-10	-93
Overburden Central Stockpile	70	0	-10	-700
Tailing Cell #1	106	0	-10	-1,060
Tailing Cell #2	77	0	-10	-770
Mill Site Drainage	280	0	-10	-2,800

1. Paskett, Curtis John; Sediment Yield of Selected Watersheds West of the Great Plains, M.S. Thesis, University of Arizona, 1974, unpublished.

2. Sedimentation Engineering, ASCE Manual No. 54, Vito Vanoni Ed., 1975, Am. Soc. of Civil Engr., NY.

R, is assumed to be 30 for the Blanding area. The results in tons per acre are proportional to R. This is probably a reasonable estimate of R; however, over several years R may vary from, say zero to 300 because of varying thunderstorm intensities. The actual change in sediment transfer from the project site is extremely sensitive to the amount of thunderstorm activity occurring during and immediately after construction.

Question 16

Provide the estimated non-radiological chemical composition of the tailings material which will pass through the tailings pond liner and enter the underlying aquifer.

Response

Because of complex geochemistry, it is very difficult to project water quality impacts from tailing retention seepage.

In September 1975, an EPA Publication entitled "Water Quality Impacts of Uranium Mining and Milling Activities in the Grants Mineral Belt" discussed ground water contamination from uranium activities. In particular, it was noted that the Anaconda Bluewater Mill lost approximately 1/3 of its unlined tailing water to underground seepage (after evaporation).

"To evaluate groundwater quality trends, available nitrate, TDS, Chloride, and Sulfate data were plotted to determine changes in groundwater quality with respect to distance from the tailings ponds and with time. These data show that there is a general lack of marked deterioration in groundwater quality with time. Concentrations of nitrates and chloride, in particular, are not markedly different today (1975) than in the base period from 1953 to 1956."

Up to 37.8 gallons/minute/acre of seepage was experienced at Bluewater or nearly 40 times as high as that expected at White Mesa. In view of the substantially lower seepage rates to the encountered and the lack of contamination evidence found at other, less well designed sites, the estimated chemical composition of ground water within one km of the tailing should be nearly indistinguishable from background.

Question 17

Quantitatively estimate the total amount of the tailings liquor (as defined in the above question) which will pass through the tailings pond liner on a daily basis during normal operation and after reclamation (under usual meteorological conditions).

Response

Dames & Moore estimates that for the 15-year tailing disposal plan, the average seepage rate through the tailing pond liner during normal

operation will be approximately 70 gallons per minute or 100,800 gallons per day. After reclamation, Dames & Moore expects that seepage through the tailing disposal area will stabilize at a rate equal to or less than the average rate of infiltration for the White Mesa area. Infiltration through the cover materials should be similar to that which occurs through the undisturbed native material in adjacent areas, although mixing and compaction could reduce the infiltration rate. It is anticipated that infiltration or seepage through the entire tailing disposal area (six cells) will not exceed 3 to 4 gpm or approximately 5000 gallons per day after reclamation is completed.

Seepage rates would potentially be affected by changes in liner material.

Question 18

Estimate the probability of tailings material which penetrates the tailings cell liners being transported by groundwater movement to local streams. Quantitatively and qualitatively estimate the composition of such transported material, the surface waters to be affected, and provide a timetable for such transport. Provide estimates under operating and reclaimed conditions.

Response

Considering the stratigraphic section of White Mesa, with Dakota and Burro Canyon sandstone underlain by bentonitic shales of the Morrison Formation, and the fact that the sandstone cap is breached around the entire perimeter of the mesa, Dames & Moore believes there is a high probability that some of the seepage from the tailing disposal area will eventually exit the canyon walls and enter local streams. However, Dames & Moore estimates that a period of approximately 30 years or more after operations begin may be required for seepage to reach the canyon walls and Dames & Moore expects that a dramatic improvement in the quality of this seepage will occur before it exits the walls. The improvement in quality will occur as a result of a combination of chemical reaction with the native soil and bedrock and dilution with the natural ground water. A minmum dilution ratio of 4 to 5 parts natural ground water to 1 part tailing area seepage is expected for any flow exiting the canyon walls. Under reclaimed conditions, the minimum dilution ratio is expected to eventually increase to 25 to 30 parts natural ground water to 1 part tailing area seepage.

Water exiting the canyon walls to the east and south of the tailing disposal area will enter Corral Creek which flows intermittently into Recapture Creek. It is anticipated that surface runoff would dilute any flows from Corral Creek into Recapture Creek. However, if the improbable worst case condition of undiluted seepage flow directly from the east side of White Mesa into Recapture Creek were assumed, the concentration of seepage from the tailing disposal area in the average minimum flow in

the creek could reach a maximum on the order of 10 percent. This hypothetical maximum concentration would eventually decrease to approximately 1 percent for reclaimed conditions in the tailing disposal area.

Westwater Creek and Cottonwood Wash would receive seepage flows exiting the canyon walls to the west and south of the tailing disposal area. Assuming the improbable worst case condition of undiluted seepage flows directly from the walls into Cottonwood Wash during average minimum low flow, it is estimated that the maximum concentration of seepage stemming from the tailing disposal area could be on the order of 4 percent. An eventual decrease of this hypothetical maximum concentration to less than 1/2 percent would occur under reclaimed conditions for the tailing disposal area.

ADDITIONAL INFORMATION REQUESTED BY
ORNL STAFF DURING MEETING OF
7 SEPTEMBER 1978

Comment

Update the list and status of permits and approvals which Energy Fuels Nuclear, Inc. must obtain prior to initiating construction on the White Mesa Uranium Project.

Response

The present list is set forth in Section 12 of the Dames & Moore Environmental Report dated January 30, 1978. We have reviewed the enumeration of permits and approvals in that section and, with one exception, find it properly sets forth the permits and approvals required by Energy Fuels prior to initiating such construction. The one exception is a possible permit from the United States Environmental Protection Agency with respect to the prevention of significant deterioration of air quality in and around the Blanding mill site.

In all other respects, the enumeration of permits and approvals set forth in Section 12 remains as stated. All such permits and approvals will be obtained as necessary to begin construction of the mill.

Meetings will be scheduled with all concerned state and federal agencies to insure that all permits, licenses and approvals are obtained.

Comment

Discuss land ownership of project site.

Response

The tailing disposal plan proposed by Energy Fuels Nuclear, Inc. ("Energy Fuels") in conjunction with its construction of a uranium mill on White Mesa approximately six miles south of Blanding, Utah, consists of a series of cells as described in the Dames & Moore report "Proposed Tailing Disposal System, White Mesa Uranium Project, Blanding, Utah Prepared for Energy Fuels Nuclear, Inc." (September 20, 1978). Each cell would hold about 2.5 years of mill tailing. At the present time, Energy Fuels projects that it has sufficient ore reserves to operate the mill for approximately fifteen years. The cells required to handle tailing from the operation of the mill for this period are shown on the plot plan as cells numbers 1 through 6. If additional ore reserves are located, additional cells would be located as shown in the shaded area on the map.

During the first ten years of mill opeartion, tailing will, with the exception of approximately six acres included within cell no. 1, be disposed of on land owned in fee simple by Energy Fuels. If required,

the design of cell no. 1 can be adjusted so that the disposal of tailing takes place entirely on fee land; however, as more particularly explained below, restricting the boundaries of cell no. 1 to accomplish this is not required.

After the first ten years and through the fifteenth year of mill operation, tailing will be disposed of on both land owned by Energy Fuels in fee simple and contiguous land presently under the control of the United States Bureau of Land Management ("BLM"). However, the fact that such contiguous land is not owned by Energy Fuels in fee simple is not a bar to its possession and use by Energy Fuels for the disposal of tailing.

Under the Mineral Location Law of 1872, the owner of a lode mining claim may locate up to a five acre tract of non-mineral ground for "mining and milling purposes." 30 U.S.C. §§21-54 (1970). Such purposes include, but are not limited to, use for buildings, shops, offices, storage of ore, depositing of tailing and dumping of wastes. Possessory title for such purposes is established by distinctly marking on the ground the physical boundaries of the claim and by posting within the perimeters of the claim a notice of location designating, among other things, the name of the claim, the name of the locator, the date of location and the size and legal description of the claim. Mill site claims may not exceed five acres in size, but there is no limit to the number of mill site claims a person can locate so long as the person owns sufficient lode mining claims such that for every mill site claim there is a lode mining claim. Within thirty (30) days after the date of posting the location notice, the locator must record the claim with the County Recorder. Within ninety (90) days after the date of posting, the claim must be filed with the appropriate office of the BLM.

Energy Fuels, as the owner of numerous lode mining claims in the Blanding area, has acquired possessory title to areas shown on the map including the portions of cells 5 and 6 which infringe on BLM land through the location of five acre mill site claims. The location of these claims gives Energy Fuels possessory title to the ground and allows it to use the cross-hatched area for the disposal of mill tailing. Numerous other companies involved in the milling of uranium ore have established title in a similar manner for the disposal of their mill tailing. For example, mill site claims form the basis of Western Nuclear's possession and use of land adjacent to its Jeffrey City mill.

Without doing anything more than locating mill site claims, Energy Fuels is entitled to possess and use the cross-hatched areas shown on the map for the disposal of mill tailing -- both for the five or six acres associated with cell no. 1 and for cells used after the tenth year of mill operation. Nevertheless, because Energy Fuels would prefer to own the land covered by the mill site claims outright, Energy Fuels is attempting to acquire, in fee simple, the BLM land as well as other lands

contiguous to the lands Energy Fuels presently owns in fee. The acquisition will be accomplished through an exchange of certain private properties presently owned by Energy Fuels in other parts of Utah for approximately 3000 acres presently held by the BLM as shown by the dashed line on the map. The exchange proposed is governed by Section 206 of the Federal Land Policy and Management Act of 1976 ("FLPMA"). 43 U.S.C.A. §1716 (Supp. 1977). Pursuant to that section, the United States Bureau of Land Management is authorized to enter into land exchanges if it concludes that the exchange is in the public interest. Energy Fuels and the BLM are presently cooperating in performing the necessary environmental and background work needed to make that determination and consummate the exchange. It is anticipated that the exchange can be accomplished in less than one year from the date of this letter. If so, Energy Fuels will be able to dispose of tailing during the fifteen year life of the mill and beyond on property owned by Energy Fuels in fee. However, if the exchange is never consummated, the ability of Energy Fuels to dispose of tailing in portions of cells 1, 5 and 6 will not be jeopardized since it continues to have possessory title to such lands through the location of mill site claims.

Comment

Has an archaeological clearance been received yet?

Response

A letter granting an archaeological clearance will be transmitted under separate cover.

Comment

How much uranium will be in the vanadium circuit?

Response

Less than 0.005 percent U_3O_8 will be contained in the vanadium product. At any one time, about 10 lbs maximum of U_3O_8 will be in the circuit at concentration of about 0.0005 g/l.

DISCHARGE DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

JUNE to SEPTEMBER, 1948

DIRTY DEVIL RIVER BASIN

Dirty Devil River near Hite, Utah

Location.--Lat 37°54'40", long 110°03'30" (unsurveyed), on right bank 0.6 mile up to m from mouth and 7.0 miles northeast of Hite.

Records available.--June 1948 to September 1957.

Gage.--Water-stage recorder. Altitude of gage is 3,470 ft (from river-profile map).

Average discharge.--9 years, 100 cfs (73,840 acre-ft per year).

Extremes.--Maximum and minimum discharges for the water years 1948-57 are contained in the following table:

Water year	Maximum			Minimum	
	Date	Discharge (cfs)	Gage height (feet)	Date	Discharge
1948*	Aug. 5, 1948	8,680	16.26	July 14, 1948	0.2
1949	July 6, 1949	2,100	7.57	Aug. 21, 1949	1.0
1950	July 8, 1950	11,000	21.26	(a)	1
1951	Aug. 4, 1951	10,800	18.75	July 1-6, 11, 1951	1
1952	Sept. 20, 1952	8,870	16.79	July 25, 1952	1
1953	Aug. 20, 1953	6,390	10.60	(a)	1
1954	Sept. 14, 1954	2,690	6.72	(a)	0
1955	Oct. 6, 1954	3,400	7.93	(a)	0
1956	July 11, 1956	6,060	11.68	(a)	1
1957	Aug. 31, 1957	11,400	20.4	Oct. 1, 1956	7.6

* Period June to September.
(a) Several days.

1948-57: Maximum discharge, 18,800 cfs Aug. 4, 1951 (gage height, 25.71 ft), from flow (on many days in 1954-55).

Remarks.--Records good except those for period of no effect of (gage-height record), which are poor, and those above 1,000 cfs, which are fair. Low-flow measurements generally made about once a week.

Discharge, in cubic feet per second, June to September 1948

Day	June	July	Aug.	Sept.
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
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23				
24				
25				
26				
27				
28				
29				
30				
31	.....	.....	.....	.....
Total				
Mean				
Ac-ft				

Calendar year	: Max	Min	Mean	Ac-ft
Water year	: Max	Min	Mean	Ac-ft

Peak discharge (base, 5,700 cfs).--Aug. 5 (4:15 a.m.) 8,680 cfs (16.26 ft); Aug. 6 (9 a.m.) 5,580 cfs (11.10 ft).

DISCHARGE DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEARS 1949 and 1950

DIRTY DEVIL RIVER BASIN

Dirty Devil River near Hite, Utah--Continued

Discharge, in cubic feet per second, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	43	152	65	b20		652	612	145	48	56	10	26
2	40	172	158	b20		592	[illegible]	138	41	26	8.6	26
3	57	135	158			606	[illegible]	105	60	23	5.5	24
4	54	109	107	a20		592	379	72	77	227	4.0	19
5	51	90	78		a40	590	262	82	512	1,300	7.9	32
6	47	85	69			516	285	112	364	324	5.0	15
7	52	83	55			503	296	169	226	232	3.1	21
8	53	90	52	a30		401	292	155	271	166	40	26
9	53	90	70		a45	345	258	158	177	125	62	34
10	53	98	107			258	219	114	112	145	88	44
11	49	92	132			213	189	114	107	125	96	47
12	43	130	183			243	180	121	116	105	44	50
13	55	121	195		a50	256	172	125	288	88	26	56
14	56	114	195			225	171	105	302	58	17	59
15	54	105	198		a60	198	183	86	180	43	12	60
16	55	126	147		a80	196	177	77	140	35	6.9	66
17	58	123	118		a110	207	175	60	116	a20	6.2	51
18	62	110	114		a130	229	172	65	140	a12	5.5	43
19	77	101	116		a150	235	210	80	242	6.0	1.4	47
20	86	96	109		a170	201	288	88	586	3.8	1.3	49
21	66	96	90		a190	198	299	66	285	6.2	4.0	44
22	65	114	135		a220	189	296	42	180	7.9	4.0	47
23	66	107	189		255	186	295	33	103	7.6	7.2	47
24	65	109	150		245	192	278	30	275	6.6	11	41
25	62	125	85		310	180	306	27	324	5.8	169	37
26	60	152			345	152	315	24	145	9.5	379	34
27	59	121	a20		401	136	265	27	82	16	227	33
28	617	a90			696	175	262	21	55	19	66	35
29	804	a68	a75		-	275	235	15	43	18	49	245
30	175	445	75		-------	447	177	12	36	12	34	1,050
31	180	-------	125		-------	578	-------	10	-------	10	29	-------
Total	2,944	3,233	3,181	1,090	3,957	9,935	8,887	2,521	5,656	3,210.4	1,480.4	2,581
Mean	82.1	108	103	35.2	141	320	296	81.3	188	104	47.8	79.5
Ac-ft	5,840	6,410	6,310	2,160	7,850	19,710	17,630	5,000	11,220	6,370	2,940	4,750

Calendar year 1948: Max - Min - Mean - Ac-ft -
Water year 1948-49: Max 1,300 Min 1.5 Mean 132 Ac-ft 95,580

Peak discharge (base, 2,700 cfs).--July 5 (6:30 a.m.) 3,120 cfs (7.57 ft).
a No gage-height record; discharge estimated on basis of 5 discharge measurements, weather records and records for nearby stations.
b Stage-discharge relation affected by ice.

Discharge, in cubic feet per second, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	282	114	142	b78	a200	a200	86	24	7.2	0.2	a60	13
2	142	121	136	b82	a180	201	85	25	6.2	.2	a45	16
3	101	125	135	b65	a180	177	77	16	7.9	.2	a35	14
4	90	125	128		a185	156	69	16	4.5	.2	a15	6.6
5	76	123	125		a190	152	62	15	2.1	.2	a9.0	7.6
6	67	114	125	a60	a195	a140	77	14	1.8	.2	a6.0	7.9
7	65	112	121		a200	a130	67	15	1.1	1.5	5.0	7.2
8	85	118	128		a300	a120	59	21	.5	939	6.6	6.3
9	105	112	135		324	105	54	26	.4	5,440	5.6	137
10	252	114	155		229	121	56	24	.3	648	4.7	85
11	135	114	161		195	114	70	19	.3	463	6.2	59
12	121	114	140		261	112	59	16	.2	364	6.2	79
13	109	118	62	a70	216	121	52	16	.2	a250	4.7	62
14	107	118	24		175	107	41	14	.2	a150	4.5	49
15	118	125	12		166	125	54	14	.2	a120	0.2	41
16	113	138	25		225	142	51	14	.2	a105	55	36
17	112	142	66	b100	a220	140	29	13	.2	a100	55	33
18	101	135	92	b150	a210	135	32	12	.1	a110	26	35
19	926	140	192	183	a200	125	27	7.2	.1	324	a20	114
20	1,100	140	517	166	a190	125	22	4.0	.2	210	a14	a100
21	282	145	229	213	198	130	21	4.3	.2	a150	a12	96
22	177	145	132	226		125	24	6.2	.2	a130	a10	66
23	140	135	78	235		142	19	4.7	.2	a110	a9.0	54
24	135	130	52	420		a120	15	5.0	.2	a100	11	49
25	128	140	55	499		a100	15	7.9	.2	a90	16	49
26	121	142	123	a400	a200	86	26	4.3	.2	a90	15	59
27	114	142	85	a300		92	80	5.0	.2	a90	a13	62
28	116	145	75	a200		99	23	4.5	.2	a95	a12	63
29	118	142	80	a220	-	82	18	6.9	.2	a100	a11	59
30	114	142	b65	a250	-------	80	20	7.2	.2	101	a10	56
31	112	-------	b77	a270	-------	82	-------	6.9	-------	73	14	-------
Total	5,734	3,873	3,492	4,905	5,928	3,886	1,281	386.1	36.1	8,584.7	469.4	1,502.5
Mean	185	129	113	158	212	125	42.7	12.5	1.20	277	15.1	50.1
Ac-ft	11,370	7,680	6,930	9,730	11,760	7,710	2,540	766	72	17,030	931	2,980

Calendar year 1949: Max 1,500 Min 1.5 Mean 145 Ac-ft 103,600
Water year 1949-50: Max 3,440 Min 0.2 Mean 110 Ac-ft 79,500

Peak discharge (base, 2,700 cfs).--Oct. 19 (7:30 p.m.) 2,710 [illegible] (6.84 ft); July 9 (8 a.m.) 11,500 cfs (20.25 ft).
a No gage-height record; discharge estimated on basis of 4 discharge measurements, weather records and records for nearby stations.

DISCHARGE DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEARS 1951 and 1952

DIRTY DEVIL RIVER BASIN

Dirty Devil River near Hite, Utah--Continued

Discharge, in cubic feet per second, water year October 1950 to September 1951

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	89	92	108	b150	a170	112	56	a25	a40	6.4	a60	a120
2	86	85	109	b110	a160	105	66	a25	a39	.1	91	93
3		66	105	890	a110	105	67	26	a35	.1	135	63
4		66	109	73	a150	109	52	28	21	.1	7,140	44
5		69	99	112	a160	109	50	20	21	.1	4,300	35
	a45											
6		72	105	150	a190	107	44	17	18	.1	a1,000	24
7		73	107	114	a250	109	43	17	16	.2	a500	19
8		77	a105		268	116	54	15	12	.2	a200	19
9	42	77	a100		310	118	46	16	a9.0	.2	a140	16
10	43	a70	a98	a110	282	112	40	12	a5.0	.2	99	19
11	48	a60			252	109	35	9.5	a5.0	.1	55	19
12	50	a68		a125	219	101	35	13	a2.0	.2	38	18
13	50	a74		a140	193	93	37	9.5	1.4	.2	a30	22
14	49	85			172	86	37	8.0	1.4	.3	24	23
15	47	86		b150	150	86	35	18	5.6	.3	10	21
16	46	88			137	82	34	168	5.8	.3		26
17	46	96		a150	151	a70	33	204	6.0	.3		21
18	46	98		a155	152	a60	29	112	5.8	.3	.4	18
19	36	103		b165	127	a50	27	69	4.7	.2	2.5	19
20	36	118		b170	140	54	26	56	5.8	1.6	9.0	21
21	38	116	a95	145	137	56	24	54	5.9	.9	26	29
22	37	132		125	125	60	24	101	10	36	101	25
23	38			a135	127	66	27	134	7.9	156	401	26
24	40			147	127	58	25	96	6.9	72	212	25
25	41	a100		165	132	54	22	80	4.3	a50	178	26
26	40			165	119	52		65	2.8	a30	120	25
27	44			165	115	53	a21	48	2.1	a20	50	27
28	46			180	120	50		42	a1.5	a15	29	33
29	46	a110		232	-	48		a40	a1.0	207	74	47
30	44			277		45	a22	a41	.1	97	438	55
31	43			a150		42		42		a70	a170	
Total	1,580	2,646	3,041	4,446	4,599	2,477	1,068	1,600.0	287.1	756.1	13,612.0	991
Mean	44.5	88.2	98.1	143	164	79.9	35.6	51.6	9.57	24.5	439	33.0
Ac-ft	3,740	5,250	6,030	8,820	9,120	4,910	2,120	3,175	570	1,500	27,010	1,970

Calendar year 1950: Max 3,440 Min 0.2 Mean 95.5 Ac-ft 67,540
Water year 1950-51: Max 7,540 Min 0.1 Mean 101 Ac-ft 73,210

Peak discharge (base, 2,700 cfs).--Aug. 4 (9:15 a.m.) 12,800 cfs (14.75 ft).

a No gage-height record; discharge estimated on basis of 7 discharge measurements, weather records, and records for nearby stations.

b Stage-discharge relation affected by ice.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	88	96	151		161	152	248	356	204	a66	49	a73
2	133	86	145		163	195	239	219	229	a50	47	a60
3	70	80	145		182	198	198	286	262	44	33	a50
4	54	82	138		148	177	172	343	1,010	42	22	44
5	50	80	128		145	140	155	409	1,210	38	16	41
				40								
6	65	85	138		140	140	148	432	595	34	11	59
7	82	83	140		142	142	145	463	447	283	77	56
8	77	83	83		158	142	126	431	413	377	90	58
9	62	85	45		149	148	138	397	371	92	178	58
10	59	92			142	140	150	349	324	65	134	58
11	55	90			145	163	152	313	288	81	118	56
12	52	90			150	207	135	365	262	60	65	41
13	59	94		45	142	177	140	317	248	54	60	59
14	57	98			130	145	121	342	239	44	4	44
15	54	99			105	142	98	335	198	38	1,650	53
16	36	96			125	130	94	394	195	33	317	36
17	40	88			125	145	101	345	180	28	a100	41
18	62	80		50	130	145	85	285	175	18	a50	51
19	63	69			130	145	77	229	155	10	a45	43
20	60	54			116	145	83	186	116	5.0	a40	41
			60									
21	58	105		51	121	136	150	183	96	2.5	59	497
22	58	125		52	125	150	152	175	90	1.2	51	3,610
23	58	125		54	142	121	148	262	85	.6	67	577
24	58	110		44	140	112	161	183	78	.4	51	253
25	63	90		38	150	135	142	169	72	1.0	a28	145
26	398	84		46	112	135	142	136	65	.5	a20	121
27	a1,700	116		66	118	142	169	121	57	.2	1,280	411
28	a550	96		96	138	201	320	143	77	.1	1,110	a99
29	a150	142		77	132	201	420	166	92	176	a600	a 92
30	a110	148		148	------	204	409	186	92	262	a970	a 36
31	a100	------		165	------	229	------	201	------	a90	a110	------
Total	4,152	2,889	2,440	1,730	3,941	4,861	5,014	8,624	8,202	1,824.1	7,655	6,610
Mean	134	96.3	78.7	55.8	136	157	167	278	273	58.8	247	220
Ac-ft	8,240	5,730	4,840	3,430	7,820	9,640	9,940	17,110	16,270	3,620	15,180	13,110

Calendar year 1951: Max 7,540 Min 0.1 Mean 108 Ac-ft 78,000
Water year 1951-52: Max 3,610 Min 0.1 Mean 158 Ac-ft 114,900

Peak discharge (base, 2,700 cfs).--Oct. 26 (12 p.m.) 4,530 cfs (9.75 ft); Aug. 15 (4:30 a.m.) 5,100 cfs (10.60 ft); Aug. 27 (5:30 a.m.) 3,410 cfs (8.34 ft); Sept. 22 (8 a.m.) 8,870 cfs (16.75 ft).

a No gage-height record; discharge estimated on basis of records for nearby stations.

Note.--Stage-discharge relation affected by ice Nov. 23-26, Dec. 9 to Jan. 22 (no gage-height record Dec. 9-16, Dec. 20 to Jan. 16; discharge estimated on basis of 2 discharge measurements, weather records, and records for nearby stations).

DISCHARGE DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEARS 1953 and 1954

Dirty Devil River near Hite, Utah--Continued

Discharge, in cubic feet per second, water year October 1952 to September 1953

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	86	88	a90	135	155	177	98	21	0.6	0.2	826	70
2	82	94	a90	142	158	185	97	19	.2	.1	4,460	59
3	77	94	94	165	158	183	82	17	.2	.1	745	a50
4	69	98	112	a146	161	148	73	15	.2	.2	406	
5	59	101	85	a155	165	142	72	16	.2	.2		
6	54	103	90	125	166	140	65	17	.2	.2		a20
7	55	101	78	118	161	152	69	20	.2	.2	a80	
8	58	105	174	128	161	150	80	19	.2	.2		
9	58	105	128	142	210	148	73	16	.2	.1		
10	58	108	138	175	189	148	a65	14	.2	.1		20
11	66	107	101	169	172	142	58	12	.2	.2	301	20
12	59	107	101	166	155	138	56	8.6	.3	.2	139	26
13	65	107	112	172	135	130	59	10	.3	.2	53	28
14	62	114	140	172	145	130	60	16	.2	33	36	22
15	62	120	152	198	142	125	63	14	.1	20	66	19
16	62	148	140	175	140	123	62	15	.1	36	125	22
17	62	164	152	150	140	121	60	17	.1	24	92	21
18	67	172	182	148	138	116	59	19	.1	33	a55	24
19	70	177	177	156	130	112	54	22	.1	33	55	21
20	75	140	177	176		99	55	31	.1	67	24	26
21	75	132	166	177	a130	94	50	31	.2	a30	19	32
22	73	130	155	175		92	47	25	.2	16	1,120	31
23	85	123	142	166	130	92	43	21	.2	9.6	a150	26
24	-	121	123	155	132	88	35	14	.2	4.5	a50	27
25	96	112	101	146	145	90	31	7.2	.1	2.0	a30	29
26	88	92	90	166	138	92	26	4.7	.1	1.1	a21	28
27	86		98	172	142	92	23	4.5	.1	.7	a20	29
28	90		152	169	155	85	19	4.5	.1	.6	a700	31
29	94	a90	161	156	-	87	17	5.0	.1	.6	a250	34
30	87		140	150	-------	88	19	2.1	.2	.32	a170	31
31	90	-------	116	158	-------	92	-------	----	-------	194	107	-------
Total	2,237	3,402	3,890	4,996	4,211	3,786	1,670	456.5	5.5	656.2	6,818	827
Mean	72.2	113	125	155	150	122	55.7	14.8	0.18	17.3	220	27.6
Ac-ft	4,440	6,750	7,720	9,910	8,350	7,510	3,310	939	11	1,040	13,520	1,640

Calendar year 1952: Max 3,870 Min 0.1 Mean 156 Ac-ft 113,000
Water year 1952-53: Max 1,460 Min 0.1 Mean 89.7 Ac-ft 64,930

Peak discharge (base, 2,700 cfs).--Aug. 2 (12 m.) 5,160 cfs (10.94 ft); Aug. 22 (9 a.m.) 6,330 cfs (11.60 ft).

a No gage-height record; discharge estimated on basis of weather records and records for nearby stations.

Discharge, in cubic feet per second, water year October 1953 to September 1954

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	34	91	a120	b40	150	103	98	31	0.7	a0	a1.6	0.2
2	33	90	a116	b47	148	96	96	36	.2	0	a1.5	.1
3	32	98	112	b45	148	97	55	104	.2	.1	1.4	.1
4	31	94	116	b50	148	98	56	77	.1	.1	1.4	.1
5	33	98	106		148	94	53	38	0	.1	16	254
6	41	90	107	b60	145	96	52	30	0	.2	32	125
7	41	88	90		145	105	43	24	.1	.8	78	48
8	43	86	78		150	107	43	21	.1	.2	17	40
9	47	90	88	b80		101	43	18	.1	.1	13	75
10	45	85	72			95	43	15	0	.1	a4.0	66
11	58	90	42	b70	a140	83	53	a15	0	.2	a2.0	42
12	292	88	a40			85	60	a11	.1	.2	.8	47
13	400	83	a40	b90		88	48	a9.0	.1	.2	.3	31
14	277	86	b40	106		94	41	a7.7	.1	.1	.1	222
15	105	85	66	109	a132	88	40	6.9	.1	.9	.1	360
16	a95	80	80	168	a125	105	41	4.3	.1	1.2	5.3	a40
17	a92	78	128	159	a120	103	34	2.6	.1	.6	11	a27
18		277	112	152	118	101	31	1.8	.2	.2	9.1	a21
19		185	112	160	116	101	29	2.3	.2	.1	3.8	a16
20	a90	112	128	216	109	88	24	1.4	.2	0	1.5	16
21		88	142	198	107	85	19	.6	.1	28	.8	.14
22	138	96	131	177	118	82	21	.2	.1	14	.4	233
23	121	103	103	226	a120	121	16	.2	.1	6.9	a.2	127
24	103	101	66	185	a121	706	10	.1	.1	3.5	a.1	229
25	116	112	59	273	123	375	7.6	.1	.1	1.7	.1	296
26	93	121	37	288	118	182	5.2	.1	.1	403	.1	89
27	90	132		223	107	105	3.3	21	.1	451	0	81
28	80	138		186	101	85	2.4	16	.1	a10	.1	65
29	96	132	b40	161	-	a72	2.1	7.6	0	a3.0	.2	42
30	94	128		166	-------	a63	18	5.6	0	a2.1	.2	a30
31	86	-------		161	-------	56	-------	1.4	-------	a1.8	.2	-------
Total	3,055	3,181	2,534	4,049	3,856	5,861	1,027.8	479.9	3.5	909.6	143.5	3,071.6
Mean	98.5	106	81.7	131	131	125	34.3	15.5	0.12	29.3	4.62	108
Ac-ft	6,060	6,310	5,030	8,030	7,250	7,660	2,040	952	6.9	1,600	284	6,090

Calendar year 1953: Max 1,460 Min 0.1 Mean 87.6 Ac-ft 63,420
Water year 1953-54: Max 985 Min 0 Mean 71.1 Ac-ft 51,510

Peak discharge (base, 2,700 cfs).--No peak above base.

a No gage-height record; discharge estimated on basis of weather records and records for nearby stations.

b Stage-discharge relation affected by ice.

DISCHARGE DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEARS 1955 and 1956

DIRTY DEVIL RIVER BASIN

Dirty Devil River near Hite, Utah--Continued

Discharge, in cubic feet per second, water year October 1954 to September 1955

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a28	56	99			317	107	21	0.8	0	9.1	15
2	26	55	80			586	199	18	.2	.1	2.3	8.3
3	27	62	86		b80	382	103	16	.2	.1	.9	6.8
4	29	63	99			455	93	14	.2	.1	.07	4.8
5	64	65	123			618	98	19	.2	.1	11	2.8
				b80								
6	76	63	158			490	98	16	.2	.1	6.2	1.1
7	50	66	114			299	92	17	.2	.1	135	1.4
8	876	66	107		a80	242	92	15	.1	0	247	1.4
9	573	70	106			238	88	10	.1	0	140	1.0
10	152	70	101	88	b80	239	85	7.6	.1	0	45	3.1
11	150	69	98	90		242	82	7.6	.1	0	23	5.0
12	76	70	116	73		242	78	6.9	.1	0	17	5.1
13	54	75	114	b11	a80	255	70	11	.1	.1	15	5.4
14	48	76	107	b80		242	75	13	.1	.1	80	5.9
15	42	72	114			210	75	9.1	.2	.1	277	5.5
16	46	70	109			185	62	6.3	.2	.1	122	3.3
17	49	75	98		b100	165	56	5.5	.1	.1	94	3.6
18	49	77	b35	b78		149	54	3.8	.1	.1	31	3.1
19	49	77	b20			126	44	2.3	.1	.1	113	15
20	53	75	b8.0			125	47	2.0	.1	.1	98	11
21	55	73	b9.0		a100	128	46	5.0	.1	.1	49	19
22	54	73	b9.5			118	46	5.0	.1	0	32	15
23	52	74	b25			118	48	4.5	.1	0	94	13
24	52	82	b40	a79		116	47	4.5	.1	0	18	14
25	56	82	b45			123	39	5.2	.1	.1	11	17
					a130							
26	58	80	b50			121	51	5.1	.1	407	77	24
27	59	82	b40		161	112	84	8.4	0	777	554	44
28	58	80			201	116	111	11	.1	186	109	14
29	61	80	a40	b80	494	116	82	4	.1	67	43	11
30	59	94			------	116	77	1	0	30	24	10
31	59	------	b40		------	109	------	1	------	18	18	------
Total	3,149	2,179	2,986.5	3,581	2,794	7,905	3,836	310.9	5.31	1,018.17	1,159.27	260.12
Mean	102	72.6	73.9	76.6	98.5	223	64.5	6.19	0.101	32.6	109	8.67
Ac-ft	6,250	4,320	4,500	4,720	5,460	11,700	3,840	604	7.2	2,020	2,300	516

Calendar year 1954: Max 993, Min 0, Mean 67.9, Ac-ft 49,180
Water year 1954-55: Max 876, Min 0, Mean 76.8, Ac-ft 55,570

Peak discharge (base, 2,700 cfs) --Oct. 8 (4:45 p.m.) 3,420 cfs (1.86 ft); Aug. 14 (10:15 a.m.) 2,910 cfs (1.49 ft).

a No gage-height record; discharge estimated on basis of 4 discharge measurements, weather records and records for nearby stations.
b Stage-discharge relation affected by ice.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13	41	107	107	80	96	43	1.5	2.7	1,110	107	1.1
2	16	37	99	109	a80	92	39	.6	.4	11	7	1.1
3	13	31	90	103	a83	87	33	0.4	.2	262	24	1.1
4	11	47	81	94	92	96	32	15	.1	108	8	1.0
5	10	53	65	107	a100	94	32	9.0	.1	a25	2	1.0
6	14	53	57	81	a110	86	34	5.0	.1	a5.0	1.3	11
7	14	56	47	77	5120	74	35	1.5	.1	a3.0	0.7	11
8	22	86	111	123	1777	73	47	.9	.1	a3.0	0.7	11
9	22	56	92	777	5106	96	77	.2	.1	a3.0	1.3	11
10	27	89	47	105	103	86	21	.4	.1	110	11	11
11	28	56	56	98	94	86	16	.1	.1	1.3	.3	7.3
12	24	60	70	94	101	80	14	.1	.1	1.3	.3	4.5
13	22	56	71	98	109	80	20	.1	.1	.4	.3	2.1
14	14	59	86	101	109	92	25	.1	.1	4	20	2.1
15	19	60	98	105	107	90	24	.1	.1	13	10	2.1
16	24	70	71	111	107	83	22	.1	.1	31	41	1.1
17	28	59	88	113	103	88	19	.1	.1	10	6	1.1
18	24	56	81	109	94	89	23	.1	.1	11	3	.9
19	27	67	115	101	78	86	46	.1	.1	5.1	14	.7
20	28	105	170	94	68	80	43	.2	.2	2.1	12	.4
21	30	92	123	105	90	75	30	.2	.2	1.1	4.1	.2
22	33	88	109	107	101	70	26	57	.4	.1	2.1	.2
23	31	83	101	109	98	71	18	90	.6	.1	2.1	.2
24	32	81	109	107	99	71	15	37	.6	.2	2.1	.2
25	39	83	121	101	105	66	13	10	1.2	.2	15	.2
26	38	86	125	111	107	58	11	11	1.2	.2	11	.3
27	36	86	123	109	92	50	8.1	6.4	1.1	.2	3.6	.2
28	33	99	121	111	81	46	6.8	10	1.2	.2	4.3	.2
29	35	99	115	107	83	51	4.0	16	1.2	8.8	2.9	3.7
30	48	105	115	105	------	58	2.5	11	1.2	105	1.4	5.2
31	47	------	113	88	------	52	------	7.2	------	120	1.2	------
Total	794.6	2,047	2,946	3,213	2,819	2,415	762.2	294.0	14.2	2,425.0	458.1	121.1
Mean	25.6	68.2	95.0	104	97.2	77.9	25.4	9.50	0.47	77	14.8	4.04
Ac-ft	1,560	4,060	5,840	6,370	5,590	4,790	1,510	584	28	4,770	1,760	24

Calendar year 1955: Max 660, Min 0, Mean 67.6, Ac-ft 48,980
Water year 1955-56: Max 1,130, Min 0.1, Mean 51.1, Ac-ft 37,120

Peak discharge (base, 2,700 cfs) --July 1 (12 m.) 6,360 cfs (12.82 ft).

a No gage-height record; discharge estimated on basis of 1 discharge measurement, weather records, and records for nearby stations.
b Stage-discharge relation affected by ice.

DISCHARGE DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEAR 1957

Dirty Devil River near Hite, Utah--Continued

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.6	73	81	99	47	99	58	387	53	58	58	720
2	8.1	a60	83	116	75	103	167	151	76	56	a30	147
3	27	a50	81	107	125	96	192	81	102	58	20	115
4	25	a45	81	120	104	94	a80	53	149	52	14	101
5	17	40	90	141	86	88	51	42	170	51	9.0	94
6	18	59	98	143	85	88	50	35	208	47	1,690	86
7	22	68	94	133	81	86	59	39	227	40	794	76
8	22	73	86		73	86	103	601	211	37	170	70
9	19	71	a10		119	83	66	170	195	39	185	61
10	21	74	a11		125	76	44	81	235	136	94	55
11	22	70	a11		135	71	37	62	555	119	41	50
12	19	68	12		135	62	35	81	693	68	27	45
13	17	a75	15		127	64	32	a70	a300	178	20	44
14	a20	a70	80	a100	141	59	27	a50	a250	101	14	39
15	22	a60	155		121	60	25	a60	a200	a35	11	39
16	24	a60	117		129	64	23	a60	182	27	10	[illegible]
17	25	a56	96		131	64	21	125	143	27	37	40
18	26	a52	85		129	65	20	168	119	47	55	[illegible]
19	28	a50	85		129	65	17	107	103	1,300	33	41
20	27	56	81	a110	131	66	13	92	81	537	24	41
21	26	65	81	a110	130	68	11	a80	56	336	75	47
22	29	35	71	111	129	66	51	a70	50	a110	4,240	[illegible]
23	32	27	65	100	121	64	108	85	51	a70	967	52
24	34	71	59	82	109	60	204	96	62	a90	143	52
25	58	99	38	101	113	62	121	516	56	a80	151	52
26	73	109	36	101	107	65	83	254	58	a40	127	52
27	47	101	42	119	101	64	71	109	55	242	413	50
28	40	90	37	103	103	62	66	a70	52	137	628	[illegible]
29	50	86	81	88	-	60	58	a50	59	98	479	[illegible]
30	437	88	98	56	-------	58	75	a40	59	56	308	45
31	127	-------	99	82	-------	48	-------	a35	-------	92	5,790	-------
Total	1,367.7	1,996	2,157	3,201	3,155	2,214	1,966	3,940	4,792	4,724	16,677.0	2,44[illegible]
Mean	44.1	66.5	69.6	103	113	71.4	65.6	127	160	152	538	61.[illegible]
Ac-ft	2,710	3,960	4,280	6,350	6,260	4,390	3,900	7,810	9,500	9,370	33,080	4,8[illegible]

Calendar year 1956: Max 1,130 Min 0.1 Mean 50.4 Ac-ft 36,590
Water year 1956-57: Max 5,790 Min 7.6 Mean 133 Ac-ft 96,460

Peak discharge (base, 2,700 cfs).--May 8 (7 a.m.) 2,930 cfs (7.35 ft); July 19 (7:30 a.m.) 3,350 cfs (7.98 ft); Aug. 6 (11 a.m.) 5,110 cfs (10.75 ft); Aug. 22 (1:30 p.m.) 10,800 cfs (20.5 ft); Aug. 31 (6:30 a.m.) 11,400 cfs (20.4 ft).

a No gage-height record; discharge estimated on basis of weather records and records for nearby stations.

DISCHARGE DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEAR 1958

DIRTY DEVIL RIVER BASIN

Dirty Devil River near Hite, Utah

Location.--Lat 37°54'47", long 110°23'10" (Hanksville), in right bank 2.6 miles upstream from mouth and 5.7 miles northeast of Hite.

Drainage area.--4,360 sq mi, approximately.

Records available.--June 1948 to September 1958.

Gage.--Water-stage recorder. Altitude of gage is 3,470 ft (from river-profile map). Prior to Nov. 5, 1957, at datum 0.9 ft lower.

Average discharge.--11 years, 111 cfs (80,360 acre-ft per year).

Extremes.--1957-58: Maximum discharge during water year, in excess of 85,000 cfs Nov. 4 (gage height, 28.1 ft, from floodmarks, datum then in use), no flow for part of each day Aug. 6, 7.
1956-57: Maximum discharge during water year, 9,830 cfs Aug. 13 (gage height, 9.57 ft); no flow for several days.
1948-58: Maximum discharge, that of Nov. 4, 1957; no flow at times in 1954-55, 1956-57.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Discharge measurements generally made once a week prior to October 1956 and twice a month thereafter. Many diversions for irrigation above station. Records for the water year 1958, not previously published, are given herein.

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	48	211	88		144	150	136	219	680	5.4	2.0	21
2	44	285	88		150	160	130	204	897	5.3	1.0	15
3	48	2,000	90		150	156	161	555	193	2.3	.6	12
4	50	14,200	94		177	110	150	935	165	1.7	.4	11
5	47	4,000	111		190	117	147	266	180	1.2	.2	10
6	45	3,000	120		226	122	139	326	206	1.2	.1	28
7	49	1,500	150		210	122	127	578	245	1.0	.1	54
8	48	800	130		185	116	112	549	248	.8	.1	56
9	48	500	128		174	136	332	564	219	.6	.1	28
10	48	340	155		160	155	107	289	195	.4	.1	24
11	55	210	170		185	160	100	265	171	.4	.1	18
12	2,980	190	1	27	162	114	97	435	153	.4	.1	42
13	1,900	180	1		144	122	97	475	144	.2	.1	246
14	255	170	1		132	139	100	526	122	.4	.1	626
15	170	160	120		147	155	104	228	101	.2	.1	185
16	250	150	125		144	120	100	259	95	.2	.1	105
17	170	147	121		150	147	148	265	84	.2	.2	73
18	200	140	118		150	144	257	206	69	.2	.2	66
19	177	135	115		150	180	435	250	66	.2	.2	51
20	215	129	115		156	144	634	256	60	.2	.2	43
21	5,580	123	130		160	14	861	271	56	.2	.2	38
22	5,480	118	142		162	139	904	190	50	.2	.2	35
23	1,160	112	122		250	177	674	185	43	.2	.1	51
24	294	106	100	50	370	224	551	170	36	.2	110	36
25	199	103	80	90	420	267	664	92	35	27	44	40
26	177	100	62	150	541	212	434	241	32	30	30	66
27	115	96	63	154	210	211	269	241	26	7.2	30	63
28	175	92	66	150	140	210	269	340	22	7.2	30	50
29	165	89	65	155	-	165	-	258	14	6.9	16	40
30	186	86	65	154	-------	166	---	265	8.8	5.4	15	39
31	195	----	54	156	-------	147	---	292	-----	5.0	18	----
Total	20,637	31,772	3,235	1,756	5,546	4,736	9,067	8,678	3,565.8	96.9	341.5	2,105
Mean	666	1,059	104	56.6	193	153	302	280	119	3.15	11.0	70.1
Ac-ft	40,950	63,020	6,420	3,440	10,600	9,520	17,980	17,210	7,070	192	677	4,170

Calendar year 1957: Max 14,000 Min 9.0 Mean 271 Ac-ft 195,900
Water year 1957-58: Max 14,000 Min 0.1 Mean 250 Ac-ft 181,200

Peak discharge (base, 2,700 cfs).--Oct. 12 (5 p.m.) 10,200 cfs (18.34 ft); Oct. 22 (8 a.m.) 10,500 cfs (18.88 ft); Nov. 4 (time unknown) in excess of 25,000 cfs (28.1 ft).

Note.--No gage-height record Nov. 3 to Jan. 24, Feb. 16 to Mar. 5; discharge estimated on basis of 14 discharge measurements and weather records.

DISCHARGE DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEAR 1959

Discharge, in cubic feet per second, water year October 1958 to September 1959

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	45	75		61	139	112	43	11	0.6	0.2	9.5	11
2	40	73		61	117	100	41	10	3.4	.2	95	8.5
3	43	73		a40	105		41	10	.4	.1	3	6.7
4	43	69		a40	136	107	43	7.8	1.3	.1	81	5.8
5	41	71		a35	141		39	7.2	1.2	6.0	46	5.4
			a30									
6	40	79		a35	154	114	41	10	.8	4.1	100	6.7
7	40	78		a38	155	100	40	11	.8	5.8	80	14
8	40	77		39	140	114	40	7.6	.6	2.6	174	14
9	42	77		41	150	107	38	9.4	.8	2.4	50	12
10	38	77		107	159	104	38	12	.8	1.2	10	11
11	35	75		190	125	97	34	10	.6	1.0	10	11
12	35	76		136	110	90	30	8.3	.6	1.0	2.0	7.2
13	35	79		125	133	95	28	7.8	.6	1.0	5.4	14
14	33	107	a80	150	125	95	24	6.5	.4	1.2	118	14
15	42	117		150	117	90	24	5.4	.2	1.2	110	20
16	45	a90	84	126	110	68	22	3.0	.2	.2	39	188
17	50	75	71	142	150	58	19	.4	.2	.1	a20	140
18	43	62	83	150	150	60	17	1.0	.2	.1	a5.0	120
19	42		117	159	155	95	16	.5	.1	0	a4.0	110
20	48		210	165	150	88	20	.2	.1	0	a2.0	66
21	48		120	117	150	79	21	.2	.1	0	a35	43
22	48		104	90	150	71	18	.1	.1	0	a80	31
23	54		125	87	155	64	25	.1	.1	0	a15	24
24	45		111	73	140	62	23	0	.1	.1	410	23
25	66	a90	117	117	139	43	20	.2	.1	.1	47.0	23
26	75		95	150	155	40	16	.2	.1	.1	34	23
27	90		86	180	125	56	17	.1	.1	.1	91	23
28	84		110	111	114	51	16	0	.1	.1	16	23
29	84		120	187	-	53	14	0	1.2	.2	24	21
30	79		93	144	------	51	11	0	.9	4.5	20	18
31	75	------	82	144	------	48	---	0	------	1.2	14	------
Total	1,589	2,556	2,952	5,252	5,672	2,640	806	144.1	20.5	55.9	2,095.5	1,257.4
Mean	51.3	84.5	95.2	108	181	85.2	26.9	4.65	0.68	1.09	67.6	41.9
Ac-ft	3,150	5,050	5,860	6,450	7,180	5,240	1,600	286	41	67	4,150	2,490

Calendar year 1958: Max 974 Min 0.1 Mean 117 Ac-ft 84,880
Water year 1958-59: Max 512 Min 0 Mean 57.5 Ac-ft 41,640

Peak discharge (base, 2,700 cfs).--Aug. 15 (10:30 a.m.) 3,850 cfs (2.87 ft).

a No gage-height record; discharge estimated on basis of 2 discharge measurements and weather records.

DISCHARGE DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEAR 1960

DIRTY DEVIL RIVER BASIN

9335. Dirty Devil River near Hite, Utah

Location.--Lat 37°54'40", long 110°03'30" (unsurveyed), on right bank 2.6 miles upstream from mouth and 7.7 miles northeast of Hite.

Drainage area.--4,360 sq mi, approximately.

Records available.--June 1948 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 3,470 ft (from river-profile map). Prior to Nov. 6, 1957, at datum 0.9 ft lower.

Average discharge.--12 years, 107 cfs (77,460 acre-ft per year).

Extremes.--Maximum discharge during year, 975 cfs Nov. 3 (gage height, 3.96 ft); no flow for several days in July and August.
1948-60: Maximum discharge, in excess of 25,000 cfs Nov. 4, 1957 (gage height, 28.1 ft, from floodmarks, datum then in use); no flow on times in 1954-55, 1959-60.

Remarks.--Records good except those for periods of fragmentary or no gage-height record, which are fair. Many diversions for irrigation above station.

Rating table, water year 1959-60 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Dec. 26)

0.0	0	0.5	15	1.6	195
.1	1.4	.7	27	2.0	309
.2	5.6	.9	47	2.4	459
.3	8.6	1.2	98	2.8	585

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	100	78	a150	f169	107	95	16	0.5	0	0.2	0.1
2	32	111	86	a100	f222	125	82	20	.5	0	.2	.1
3	31	f493	88		f259	*142	76	22	.2	0	*.2	.1
4	31	f419	86		f222	154	75	26	.5	0	.2	.1
5	32	f208	82		f200	125	73	*31	.5	0	.1	.1
6	32	f159	*70	a90	f195	122	70	26	.5	0	.1	.1
7	31	f125	54		f174	142	70	76	.5	0	.1	.1
8	*26	f118	57		f198	144	65	47	*.5	0	.1	98
9	25	f122	78	a95	f242	221	61	28	.2	0	.2	108
10	20	f105	63	a100	f417	f595	60	24	.2	0	.1	50
11	20	f92	80	a110	f259	244	54	20	.4	0	.1	15
12	24	f94	116	a130	*f146	195	58	15	2.9	0	.1	8.8
13	26	*f94	100	*222	125	169	61	11	4.4	0	.2	7.0
14	29	92	86	219	116	174	*60	7.0	2.9	*.1	.2	6.2
15	29	88	78	198	118	166	a80	4.6	2.5	.1	.2	5.0
16	30	84	70	177	113	136	a35	4.1	1.8	.1	.2	5.5
17	28	86	70	205	107	125	30	a4.0	1.2	.1	**.1	5.3
18	26	90	71	169	107	120	27	a5.3	.6	.1	0	5.6
19	26	86	75	127	107	120	25	f5.8	.6	0	0	*a57
20	31	88	78	109	111	125	17	f5.6	.2	0	.1	a12
21	32	88	211	127	170	125	14	a2.7	.1	0	0	a8.0
22	35	88	90	98	*120	125	11	a2.1	.1	0	.1	a7.5
23	36	84	88	142	f105	152	8.0	*f1.4	.1	0	.4	a7.2
24	36	82	84	86	100	130	10	1.0	.1	0	.8	a7.0
25	36	80	118	165	96	*120	8.4	.8	.1	.1	.4	a7.0
26	34	92	130	144	f116	116	6.2	.4	.1	.1	.2	*f7.0
27	*34	78	a110	179	122	100	4.6	.3	.1	.1	.1	7.5
28	35	73	a100	*104	f115	94	8.4	.3	.1	.1	.1	5.9
29	35	64	a95	169	109	94	13	.2	*.1	.2	.1	5.9
30	46	71	a95	f185	------	94	.15	.1	.1	.8	.1	5.0
31	76	------	a100	f187	------	96	------	.2	------	.2	*.1	------
Total	980	3,652	2,753	4,283	4,583	4,481	1,043.0	596.5	21.2	1.5	5.1	425.7
Mean	31.6	122	88.8	138	158	145	41.5	12.9	0.71	0.05	0.16	14.2
Ac-ft	1,950	7,240	5,460	8,510	9,090	8,890	2,470	786	42	3.0	10	844

Calendar year 1959: Max 512, Min 0, Mean 58.4, Ac-ft 42,250
Water year 1959-60: Max 498, Min 0, Mean 62.4, Ac-ft 45,500

Peak discharge (base, 2,700 cfs).--No peak above base.

* Discharge measurement made on this day.
** Field estimate made on this day.
a No gage-height record; discharge estimated on basis of 1 discharge measurement, weather records, and trend of flow.
f Fragmentary gage-height record; discharge computed from partly estimated gage heights.

DISCHARGE DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEAR 1961

DIRTY DEVIL RIVER BASIN

9-3335. Dirty Devil River near Hite, Utah

Location.--Lat 38°05'50", long 110°04'05" (unsurveyed), on right bank 1.0 mile upstream from Poison Spring Wash and 20 miles north of Hite.

Drainage area.--4,170 sq mi, approximately. Area at site used prior to July 15, 1964, 4,360 sq mi, approximately.

Records available.--June 1948 to September 1965.

Gage.--Water-stage recorder and mercury manometer. Altitude of gage is 3,860 ft (from topographic map). Prior to July 15, 1964, at site 28 miles downstream at different datum.

Average discharge.--17 years, 103 cfs (74,670 acre-ft per year).

Extremes.--Maximums and minimums (discharge in cubic feet per second, gage height in feet).

Annual maximum discharge (*) and peak discharges above base (2,700 cfs), water years 1961-65

Date	Time	Discharge	Gage height	Date	Time	Discharge	Gage height	Date	Time	Discharge	Gage height
Oct. 10, 1960	0730	6,810	11.16	Sept.21, 1962	1900	* 2,810	6.5	July 18, 1965	2000	6,060	9.66
Aug. 4, 1961	1430	4,500	8.65	Aug. 28, 1963	0830	7,760	11.98	Aug. 5, 1965	1330	5,700	9.70
Aug. 5, 1961	2100	3,470	7.59	Sept. 1, 1963	1015	* 12,200	15.41	Aug. 17, 1965	2300	* 10,700	12.83
Aug. 19, 1961	0645	2,980	6.75	Sept. 6, 1963	1500	8,130	9.36				
Aug. 26, 1961	1230	6,510	10.60	Sept.19, 1963	1630	5,960	8.0				
Sept. 9, 1961	0830	* 21,000	20.68								
Sept.18, 1961	1700	4,250	8.56	Oct. 21, 1963	0200	* 1,720	4.94				

Annual minimum discharge, water years 1961-65

Water year	Date	Discharge	Water year	Date	Discharge
1961	June 16 to July 21, July 28-30	* 0.10	1964	Part of several days	0
1962	Many days	* .10	1965	Oct. 2, 1964	* 2
1963	July 30, 31, Aug. 1-5	0			

* Minimum daily.

1948-65: Maximum discharge, about 35,000 cfs Nov. 4, 1957 (gage height, 28.1 ft, from flood-marks, site and datum then in use), from rating curve extended above 9,000 cfs on basis of slope-area measurement at gage height 20.68 ft; no flow at times in 1954-55, 1959-60, 1963-64.

Remarks.--Records good except those for periods of no gage-height record and those for winter periods, which are poor. Many diversions for irrigation above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1960 TO SEPTEMBER 1961

DAY	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.
1	4.8	61	81		113	101	55	25	.40	.40	7.	142
2	3.6	66	84		142	95	50	24	.40	.10	15	181
3	2.2	67	88		152	117	45	28	.40	.00	36	89
4	1.8	69	93	65	142	141	42	30	.40	.10	1,067	58
5	1.5	84	93		129	137	77	31	.30	.14	1,270	46
6	1.4	67	85		119	128	308	48	.30	.14	1,160	33
7	1.3	101	6.		115	120	474	46	.30	.14	273	30
8	3.4	230	54		122	120	422	44	.30	.12	495	273
9	22	154	51		144	98	240	37	.30	.14	86	1,230
10	2,040	83	99	50	144	103	130	33	.20	.10	50	6,740
11	1,280	86	115		150	104	150	28	.20	.10	41	740
12	370	74	101		140	92	92	25	.20	.44	54	134
13	160	74	91	70	129	109	71	20	.20	.16	341	81
14	93	74	85		126	122	60	13	.20	.10	455	65
15	73	74	82		117	104	49	7.8	.20	.12	99	
16	62	74	81		109	115	62	24	.10	.10	644	60
17	71	73	78		112	122	44	10	.10	.10	268	
18	96	73	78		113	129	43	4.0	.10	.10	127	1,280
19	338	73		80	113	117	44	4.0	.10	.10	174	960
20	260	77			109	107	40	2.0	.10	.10	34	340
21	135	77			102	96	94		.10	.10	23	184
22	93	80			104	98	124	1.0	.10	.30	14	130
23	81	77			103	82	10		.10	.40	24	465
24	78	77	55		99	65	61		.10	.30	24	465
25	74	78		100	99	65	58		.10	.20	81	93
26	69	80			101	92	49		.10	.20	1,150	93
27	68	82		120	114	105	41	.50	.10	.21	494	74
28	66	85		130	107	77	36		.10	.11	130	74
29	64	84		107	------	71	31		.10	.10	283	121
30	61	85	50	102	------	61	27		.10	.10	264	80
31	59	------		100	------	60	------		------	26	83	------
TOTAL	5,740.0	2,496	2,208	2,329	3,376	3,117	3,160	490.80	5.80	30.00	5,195	19,037
MEAN	185	83.2	71.2	75.1	121	101	105	15.8	.19	.97	297	635
MAX	2,040	230	115	130	152	141	474	48	.40	26	1,670	7,070
MIN	1.3	61	-	-	99	60	27	-	.10	.10	12	34
AC-FT	11,390	4,950	4,380	4,620	6,700	6,180	6,270	973	12	60	10,250	37,760

CAL YR 1960: TOTAL 25,890.60 MEAN 70.7 MAX 2,040 MIN 0 AC-FT 51,350
WAT YR 1961: TOTAL 51,188.60 MEAN 140 MAX 7,070 MIN .10 AC-FT 101,900

DISCHARGE DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE").

WATER YEARS 1962 and 1963

9-3038. Dirty Devil River near Hite, Utah--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1961 TO SEPTEMBER 1962

DAY	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.
1	63	120	120		154	90	264					
2	53	180	122		164	90	293					
3	48	162	122		172	111	166		6.0		.10	
4	41	130	120		177	107	230	100				
5	63	113	122	80	182	98	331				17	
6	86	111	118		182	96	382				5.0	
7	71	109	109		182	113	422				2.0	
8	46	100	111		230	118	321	100				
9	218	135	96		312	125	273	107				
10	80	111	71		291	113	375	132				
11	62	111	60		225	109	328	139				
12	56	139	50		247	170	283	107				
13	56	135	45		270	98	217	71	5.0	.10		
14	54	98	40		305	96	198	47				
15	54	90		70	239	90	264					
16	54	88	35		185	88	359	30				
17	54	102			184	98	385					
18	54	116			172	107	395					
19	54	109	57		149	107	264					
20	54	98			137	122	230	20				
21	51	102	90		146	103	190		10			
22	45	113			139	119	203					
23	45	116		90	127	122	154					
24	45	111			125	115	118	10	5.0		.20	
25	46	118			122	108	110					
26	47	132		105	118	100	110			30		
27	48	137	80	109	120	96	120		2.0	24		
28	47	130		116	88	96				28		
29	47	125		146	------	273	110	6.0	1.0	10		
30	71	122		149	------	400			1.0	2.0		
31	125	------		152	------	320	------		------	1.0		
TOTAL	1,986	3,649	2,501	2,737	5,125	3,898	7,177	1,659.0	153.0	95.10	35.[illegible]	[illegible]
MEAN	64.1	122	80.7	87.6	183	126	239	53.5	5.10	3.08	1.13	[illegible]
MAX	218	902	122	152	312	400	422	139	-	30	.17	[illegible]
MIN	41	88	-	-	88	88	-	-	-	-	-	[illegible]
AC-FT	3,940	7,240	4,960	5,390	10,170	7,730	14,240	3,290	303	189	71	[illegible]

CAL YR 1961: TOTAL 48,886.60 MEAN 134 MAX 7,070 MIN .10 AC-FT 96,950
WAT YR 1962: TOTAL 33,417.90 MEAN 91.6 MAX 1,500 MIN - AC-FT 66,280

Note.--No gage-height record May 15 to July 25, Aug. 3 to Sept. 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1962 TO SEPTEMBER 1963

DAY	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.
1	90		103		86	90	60	7.0	.10	.10	-	[illegible]
2	60		107			86	50	13	.10	.10	-	[illegible]
3	45		102	80		92	43	9.6	.10	.10	2	[illegible]
4	42		102			100	37	7.0	.10	.10	2[illegible]	[illegible]
5	40		100			98	33	5.3	.10	.10	15[illegible]	[illegible]
6	534	75	95		101	86	28	3.8	.10	.10	10[illegible]	[illegible]
7	275		96			76	26	3.1	.10	.10	15[illegible]	[illegible]
8	156		98	80		86	22	2.5	.10	.10	10[illegible]	[illegible]
9	107		98			80		1.6	.10	.10	13[illegible]	[illegible]
10			98			88		1.2	.10	.20	20[illegible]	
11	70	78	100			83	20	.40	.20	.40	81	
12		80	98		90	94		.30	.20	3.1	113	
13		82	96	30		90		.20	.20	4.6	133	[illegible]
14		86	92			88		.20	.20	3.4	88	
15		107	88		102	98		.20	.20	2.2	61	
16		109	92		111	94		.20	.20	1.4	56	
17	80	92	96	35	111	107	15	.20	.20	.80	41	
18		96	96		111	116		.20	1.0	.40	614	
19		102	111		109	113		.20	2.7	.30	543	[illegible]
20		94	118		116	105		.10	23	.20	134	[illegible]
21		92	122	36	120	94		.10	17	.20	127	[illegible]
22		90	113	36	127	94		.10	15	.10	171	[illegible]
23		105	100	38	109	86		.10	5.0	1.0	134	[illegible]
24		98	118	40	109	118	10	.10	2.5	2.9	96	[illegible]
25		100	118	39	100	100		.10	1.4	1.0	86	[illegible]
26	70	98	94	37	98	100	9.4	.10	1.0	.40	136	[illegible]
27		98		39	100	88	11	.10	.40	.20	182	[illegible]
28		96	70	46	94	71	11	.10	.20	.10	1,230	[illegible]
29		98		48	------	54	8.8	.10	.10	.10	660	[illegible]
30		98		53	------	47	8.4	.10	.10	0	27	[illegible]
31		------		70	63	------	63	------	.10	------	0	1,[illegible]
TOTAL	2,949	2,647	3,008	1,605	2,855	2,798	602.8	57.40	66.80	23.90	7,[illegible]14	[illegible]
MEAN	95.1	88.2	97.0	51.8	102	90.3	20.1	1.85	2.23	.77	1[illegible]	[illegible]
MAX	534	109	122	-	127	118	60	13	23	4.6	1,730	[illegible]
MIN	40	-	-	-	-	47	8.4	.10	.10	0	0	-
AC-FT	5,850	5,250	5,970	3,180	5,660	5,550	1,200	114	133	47	13,980	[illegible]

CAL YR 1962: TOTAL 33,885.90 MEAN 92.8 MAX 1,500 MIN - AC-FT 67,210
WAT YR 1963: TOTAL 32,309.90 MEAN 88.5 MAX 4,210 MIN 0 AC-FT 64,090

Note.--No gage-height record Oct. 10 to Nov. 1.

DISCHARGE DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEARS 1964 and 1965

9-3035 Dirty Devil River near Hite, Utah--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1963 TO SEPTEMBER 1964

DAY	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.
1	35		75			96	80	34	58		251	6.6
2	27		75			98	82	33	57		174	
3	23	40	73			122	92	47	46		96	
4	22		72			139	94	38	40		107	
5	20		68			149	107	31	33		92	
6	17		64	50		107	86	28	26		23	.20
7	15		61		100	100	86	28	19		14	
8		50	63			94	86	27	17	1.0	11	
9	15		86			96	82	26	15		8.9	
10			45			94	76	27	12		5.3	3.6
11		60				96	66	26	10		4.9	6.6
12		63				98	58	23	9.0		5..	6.6
13		68				100	54	22	7.0		179	6.6
14	20	70			96	102	51	21	6.0		153	6.3
15		71		45	94	140	51	21	5.0		92	
16		75	65		86	98	50	24	5.0	99	71	
17	20	92		56	84	95	48	40	4.0	66	62	
18	20	82		60	94	98	57	70		32	29	4.0
19	23	75		7..	102	94	118	73	3.0	34	18	
20	138	71		80	109	94	107	71		8.6	11	
21	190	73		110	102	92	76	66		6.3	6..	
22	7.6	76		178	96	90	73	72		14	3.2	5.6
23		78		154	100	90	65	96		16	4.1	3.6
24	8.0	75		140	107	92	49	107		31	1.5	4.6
25		73		130	98	92	41	100		26	1.2	1.6
26		75	50	120	88	92	40	92	2.0	32	1.1	7.0
27	20	76		110	94	84	45	105		5.6	38	6.0
28		75		110	96	82	38	420		7.2	69	4.6
29		73		105	90	80	34	146		6.0	24	3.4
30	30	73		105	------	80	34	84		4.2	14	4.6
31		------		102	------	82	------	68	------	1.7	9.2	------
TOTAL	891.6	1,924	1,657	2,397	2,843	2,957	2,019	3,077	398.0	359.6	1,321.6	191.1
MEAN	28.8	64.1	53.5	77.3	98.1	94.7	67.3	67.0	13.3	11.6	99.1	6.37
MAX	190	92	75	178	109	149	118	420	58	39	251	-
MIN	7.6	-	-	-	84	80	34	25	-	-	1.1	-
AC-FT	1,770	3,820	3,290	4,750	5,640	5,830	4,000	6,120	789	713	2,620	379

CAL YR 1963: TOTAL 28,176.50 MEAN 77.2 MAX 4,210 MIN 0 AC-FT 55,890
WAT YR 1964: TOTAL 19,216.10 MEAN 52.5 MAX 420 MIN - AC-FT 38,120

Note.--No gage-height records June 9 to July 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1964 TO SEPTEMBER 1965

DAY	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.
1	2.0	56	103	80	138	125	107	41	23	92	83	61
2	4.0	58	103	102	125	116	103	44	36	40	123	
3	9.0	54	110	72	123	101	110	44	48	84	106	3..
4	11	52	120	83	130	103	128	42	52	88	42	34
5	14	49	112	79	112	112	178	46	50	81	93	172
6	16	46	97	89	112	110	199	43	61	82	70	122
7	16	45	98	104	121	110	140	39	74	107	5..	120
8	15	47	89	180	528	101	112	40	70	103	4..	143
9	16	50	72	200	123	99	112	39	81	84	35	92
10	20	54	112	190	123	97	107	43	142	88	28	7..
11	22	58	109	130	116	99	118	43	204	67	34	46
12	22	60	106	102	103	101	121	43	181	68	41	35
13	20	58	109	94	71	114	116	46	158	167	15	48
14	23	56	97	93	84	132	125	107	138	198	7..	46
15	28	56	92	95	116	125	184	193	125	97	40	48
16	28	54	89	103	118	130	121	172	150	70	7..	46
17	30	54	83	114	101	135	97	123	150	61	554	28
18	35	54	102	125	110	110	92	78	130	561	671	41
19	33	61	105	125	110	95	79	53	116	350	375	79
20	46	66	104	118	116	90	78	70	103	240	273	99
21	44	60	128	128	121	97	65	54	99	130	186	84
22	45	61	115	132	140	97	62	58	88	105	140	68
23	46	59	167	132	128	110	67	73	78	107	300	74
24	46	71	238	121	121	103	58	71	68	125	230	67
25	46	78	266	125	112	103	61	84	95	140	150	60
26	46	83	221	118	112	103	54	74	217	93	120	54
27	44	98	173	107	110	130	53	84	162	70	107	53
28	42	114	138	118	103	128	57	64	138	63	93	44
29	43	104	129	123	------	105	53	48	130	63	83	43
30	46	100	112	130	------	107	50	39	110	62	74	42
31	51	------	87	135	------	101	------	30	------	62	79	------
TOTAL	906.0	1,896	3,845	3,606	3,207	3,390	3,007	2,938	3,277	3,820	4,521	2,098
MEAN	29.2	63.2	124	116	115	109	100	65.7	109	123	146	69.9
MAX	51	114	266	200	140	132	199	193	217	561	671	172
MIN	2.0	40	52	72	71	90	50	30	23	61	23	34
AC-FT	1,800	3,750	7,630	7,150	6,360	6,720	5,960	4,040	6,500	7,580	8,970	4,160

CAL YR 1964: TOTAL 21,386.50 MEAN 58.4 MAX 420 MIN - AC-FT 42,420
WAT YR 1965: TOTAL 35,605.0 MEAN 97.5 MAX 671 MIN 2.0 AC-FT 70,620

DISCHARGE DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEAR 1965

DIRTY DEVIL RIVER BASIN

9-3335. Dirty Devil River near Hite, Utah

Location.--Lat 38°05'[illegible]", long 110°24'35" (unsurveyed), on right bank 1.0 mile upstream from Poison Spring Wash and 20 miles north of [illegible]. Prior to July 15, 1964, at site 20 miles downstream.

Drainage area.--4,170 sq mi, approximately.

Records available.--June 1948 to September 1965.

Gage.--Water-stage recorder and mercury manometer. Altitude of gage is 3,850 ft (from topographic map). Prior to July 15, 1964, at site 20 miles downstream at different datum.

Average discharge.--17 years, 103 cfs (74,570 acre-ft per year).

Extremes.--Maximum discharge during year, 10,700 cfs Aug. 17 (gage height, 12.63 ft); minimum daily, 2 cfs Oct. 1.
1948-65: Maximum discharge, about 35,000 cfs Nov. 4, 1957 (gage height, 28.1 ft, from floodmarks, site and datum then in use), from rating curve extended above 9,000 cfs on basis of slope-area measurement at gage height 20.65 ft; no flow at times in 1934-51, 1954-56, 1963-64.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Many diversions for irrigation above station.

Discharge, in cubic feet per second, water year October 1964 to September 1965

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a 2	a 50	103	80	138	125	107	41	23	92	a 85	a 65
2	a 4	a 58	*103	102	125	116	103	44	37	90	a 125	* 61
3	a 6	a 54	110	78	123	101	110	44	48	84	a 160	50
4	a 11	a 52	120	80	110	103	128	42	52	88	a 120	54
5	a 14	a 49	112	79	112	117	178	46	50	81	a 95	172
6	* 16	a 46	97	89	112	110	152	43	61	82	a 70	112
7	16	a 45	96	104	121	110	140	39	74	107	a 50	132
8	15	a 47	89	180	128	101	* 112	40	70	103	a 40	145
9	16	a 50	72	a 200	123	99	112	39	81	84	a 35	92
10	20	a 54	112	a 150	123	* 97	107	43	142	88	a 28	70
11	22	a 58	109	a 130	116	99	118	43	204	67	* 34	62
12	22	a 60	126	a 102	103	101	121	43	181	68	41	55
13	20	a 58	109	* 94	71	114	116	46	158	157	25	48
14	23	a 56	57	95	84	132	145	107	138	* 196	74	46
15	28	a 56	32	95	116	125	184	193	* 125	97	40	48
16	28	a 54	69	103	*118	130	121	172	150	70	79	42
17	30	a 54	62	114	101	130	97	123	150	61	* 554	38
18	30	* 54	102	125	110	110	92	78	130	561	671	41
19	33	61	165	* 125	110	95	79	* 53	116	a 350	a 375	79
20	46	60	194	118	116	90	78	70	103	a 240	a 275	97
21	44	40	126	128	121	97	65	54	99	a 150	a 180	* 8
22	45	61	138	132	140	97	62	58	88	a 105	a 140	68
23	a 46	59	167	132	128	110	67	73	78	a 107	a 300	71
24	a 46	71	*230	121	121	103	58	71	68	a 125	a 230	67
25	a 46	78	250	125	112	103	61	84	98	a 140	a 150	60
26	a 46	83	221	118	112	103	54	74	217	a 95	a 120	54
27	a 44	98	173	107	110	130	53	94	152	a 70	a 100	53
28	a 42	114	138	116	103	128	57	64	138	a 65	a 92	44
29	* 45	104	129	123	----------	105	* 53	68	130	a 63	a 85	43
30	46	100	112	130	----------	107	50	39	110	a 62	a 78	43
31	51	----------	87	135	----------	107	----------	30	----------	a 52	a 70	----------
Total	906	1,890	3,845	3,606	3,207	3,390	3,007	2,038	3,277	3,820	4,521	2,098
Mean	29.2	630	124	116	115	109	100	65.7	109	123	146	69.9
Ac-ft	1,800	3,750	7,630	7,150	6,360	6,720	5,960	4,040	6,500	7,580	8,970	4,160

Calendar year 1964: Max 420 Min - Mean 58.4 Ac-ft 42,420
Water year 1964-65: Max 671 Min 2 Mean 97.5 Ac-ft 70,820

Peak discharge (base, 2,700 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-18	2000	9.68	6,080	8-17	2300	12.63	10,700
8-1	1330	7.70	3,700				

* Discharge measurement made on this day.
a No gage-height record.

DISCHARGE DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEAR 1966

9-3335. Dirty Devil River near Hite, Utah

Location.--Lat 38°05'50", long 110°24'25" (unsurveyed), on right bank 1.0 mile upstream from Poison Spring Wash and 20 miles north of Hite.

Drainage area.--4,170 sq mi, approximately.

Records available.--June 1948 to September 1966.

Gage.--Water-stage recorder and mercury manometer. Altitude of gage is 3,850 ft (from topographic map). Prior to July 15, 1964, at site 28 miles downstream at different datum.

Average discharge.--16 years, 101 cfs (73,120 acre-ft per year).

Extremes.--Maximum discharge during year, 3,000 cfs Aug. 19 (gage height, 7.00 ft from high-water mark); no flow many days in May, June, July.

1948-66: Maximum discharge, about 35,000 cfs Nov. 4, 1957 (gage height, 28.3 ft, from floodmarks, site and datum then in use), from rating curve extended above 9,000 cfs on basis of slope-area measurement at gage height 20.65 ft; no flow at times in 1954-55, 1959-60, 1963-66.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Many diversions for irrigation above station.

Discharge, in cubic feet per second, water year October 1965 to September 1966

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	50	101	105	126	128	114	114	14	0	0	80	10
2	48	135	107	134	107	101	112	9.4	0	0	240	90
3	41	114	105	86	97	84	107	7.6	0	0	90	70
4	46	110	116	79	103	82	105	6.0	0	0	20	54
5	55	85	121	101	116	101	95	4.7	0	0	14	46
6	55	82	112	107	125	116	95	3.6	0	0	11	42
7	55	95	116	114	128	114	107	2.8	0	0	90	39
8	58	114	114	134	110	121	103	1.2	0	0	70	37
9	57	105	101	140	110	126	95	6.1	0	0	70	34
10	67	112	142	132	110	114	94	39	0	0	60	32
11	68	86	247	138	99	121	99	42	1.2	0	60	30
12	95	94	114	148	105	114	118	38	3.3	0	60	28
13	81	99	95	142	101	105	112	24	2.7	0	60	27
14	55	105	88	148	95	114	99	14	1.4	0	60	25
15	76	86	95	142	95	145	82	7.6	1.0	0	60	24
16	132	82	95	145	103	140	7	4.7	.4	0	60	23
17	238	97	92	123	103	103	64	3.2	0	0	60	22
18	103	101	90	97	107	107	62	1.6	0	150	60	21
19	71	116	78	121	112	112	67	11	0	60	350	21
20	67	110	52	110	121	128	61	.8	0	30	100	40
21	64	99	43	107	112	114	58	1	0	19	40	25
22	62	97	75	73	107	103	64	0	0	16	25	23
23	61	105	100	46	107	95	61	0	0	13	22	22
24	61	103	150	74	112	94	54	0	0	10	19	21
25	66	135	42	130	105	116	52	0	0	80	16	21
26	74	145	25	103	97	121	43	0	0	70	15	20
27	86	114	39	105	103	123	29	0	0	60	14	20
28	84	99	54	88	118	128	23	0	0	50	12	19
29	84	97	82	103	----------	114	14	0	0	50	11	19
30	81	103	482	105	----------	112	18	0	0	30	10	19
31	97	----------	476	118	----------	121	----------	0	----------	10	10	----------
Total	2348	3133	3757	3601	3040	3521	2278	231.9	10.0	3690	1540	924
Mean	75.7	104	121	116	109	114	75.9	7.48	0.33	119	37.2	30.8
Ac-ft	4,660	6,210	7,450	7,140	6,030	6,980	4,520	460	20	732	2,290	1,830

Calendar year 1965: Max 671 Min 23 Mean 105 Ac-ft 75,770
Water year 1965-66: Max 482 Min 0 Mean 66.8 Ac-ft 48,330

Peak discharge (base, 2,700 cfs).--About Aug. 19 (time unknown) 3,000 cfs (7.00 ft).

Note.--No gage-height record June 17 to July 10, July 22 to Sept. 30.

DISCHARGE DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEAR 1967

Location --Lat 38°05'50", long 110°24'25", Garfield County, on right bank 1 mile upstream from Poison Spring Wash and 20 miles northeast of Hite.

Drainage area --4,170 sq mi, approximately.

Records available --June 1948 to September 1967.

Gage --Water-stage recorder and mercury manometer. Altitude of gage is 3,650 ft (from topographic map). Prior to July 15, 1964, at site 28 miles downstream at different datum.

Average discharge --19 years, 100 cfs (72,400 acre-ft per year).

Extremes --Maximum discharge during year, 3,100 cfs Sept. 9 (gage height, 7.10 ft, from high-water mark); no flow several days in May and August.

1948-67: Maximum discharge, about 35,000 cfs Nov. 4, 1952 (gage height, 28.1 ft, from floodmarks, site and datum then in use); from rating curve extended above 9,000 cfs on basis of slope-area measurement at gage height 20.65 ft; no flow at times in 1956-58, 1959-60, 1963-67.

Remarks --Records poor. Many diversions for irrigation above station.

Discharge, in cubic feet per second, water year October 1966 to September 1967

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	19	53	70	36	85	54	23	[illegible]	254	144	15	94
2	19	54	70	74	86	55	24	[illegible]	244	135	12	70
3	19	56	73	74	88	52	23	[illegible]	247	130	10	46
4	40	57	76	94	93	54	23	[illegible]	247	130	90	25
5	36	59	80	74	85	73	[illegible]	[illegible]	254	130	80	19
6	30	60	90	107	78	85	[illegible]	[illegible]	247	130	70	14
7	100	58	140	97	150	88	[illegible]	[illegible]	244	130	65	32
8	60	5	100	85	105	76	[illegible]	14	235	130	65	24
9	50	5	90	82	118	84	[illegible]	08	232	206	60	481
10	45	60	87	79	116	94	11	45	235	205	660	200
11	45	62	84	82	102	76	12	35	234	145	370	300
12	45	65	82	85	123	101	11	80	247	125	150	60
13	47	71	84	72	105	85	94	0	250	100	90	48
14	47	77	92	78	94	85	11	21	256	107	30	42
15	47	83	92	84	84	73	13	69	280	80	20	37
16	47	85	87	90	80	73	94	55	274	70	11	35
17	48	85	79	98	40	73	11	32	256	500	70	34
18	48	85	84	105	41	76	14	16	247	100	40	33
19	48	85	87	106	52	88	22	10	289	45	20	33
20	48	85	84	95	54	98	22	60	325	35	150	33
21	48	89	86	85	41	94	17	40	328	32	40	32
22	48	84	84	79	41	92	16	30	295	28	10	32
23	48	80	87	74	41	92	14	20	250	26	0	32
24	49	73	41	92	62	76	18	10	253	25	0	32
25	49	70	80	105	50	76	11	0	224	80	0	50
26	50	70	82	78	54	96	16	0	194	40	0	100
27	50	70	112	85	41	78	15	208	187	25	0	52
28	51	7	97	84	55	83	13	154	199	50	0	45
29	51	7	18	74	[illegible]	56	66	253	195	30	0	40
30	51	7	16	62	[illegible]	21	69	262	190	25	0	37
31	52	[illegible]	19	78	[illegible]	20	[illegible]	271	[illegible]	20	94	[illegible]
Total	1429	2104	2707	2528	2046	2156	474.6	1372.10	7433	3614	1394.20	3118
Mean	46.1	70.1	73.1	81.5	73.1	69.9	15.8	44.3	248	117	45.0	70.6
Max	100	85	140	106	162	101	26	271	328	500	660	481
Min	19	53	16	30	32	20	69	0	187	20	0	14
Ac-ft	2830	4170	4800	5010	4060	4240	942	2720	14740	7170	2770	6200

Cal yr 1966: Total 20,928.4 Mean 57.3 Max 350 Min 0 Ac-ft 41,510

Wtr yr 1967: Total 28,916.20 Mean 79.2 Max 660 Min 0 Ac-ft 57,350

Peak discharge (base, 2,700 cfs) --Sept. 9 (1100) 3,100 cfs (7.10 ft).

Note --No gage-height record Oct. 1 to Dec. 13, July 14 to Aug. 28.

DISCHARGE DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEAR 1968

9-3335. Dirty Devil River near Hite, Utah

Location.--Lat 38°05'50", long 110°24'25" (unsurveyed), on right bank 1.0 mile upstream from Poison Spring Wash and 20 miles north of Hite.

Drainage area.--4,170 sq mi, approximately.

Records available.--June 1948 to September 1968.

Gage.--Water-stage recorder and mercury manometer. Altitude of gage is 3,850 ft (from topographic map). Prior to July 15, 1964, at site 28 miles downstream at different datum.

Average discharge.--20 years, 99.3 cfs (71,890 acre-ft per year).

Extremes.--Maximum discharge during year, 5,540 cfs July 31 (gage height, 9.26 ft); no flow several days in July.
1948-68: Maximum discharge, about 35,000 cfs Nov. 4, 1957 (gage height, 28.1 ft, from floodmarks, site and datum then in use); from rating curve extended above 9,000 cfs on basis of slope-area measurement at gage height 20.65 ft; no flow at times in 1954-55, 1959-60, 1963-68.

Remarks.--Records fair, except those for period of no gage-height record, which are poor. Many diversions for irrigation above station.

DISCHARGE, IN CFS, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	40	78	105	67	110	140	78	45	44	22	458	30
2	43	68	95	67	110	135	71	43	44	14	1,120	44
3	45	64	79	67	110	145	101	38	78	05	704	36
4	47	64	64	67	110	124	52	45	76	0	248	33
5	50	64	90	67	110	123	64	52	78	0	125	32
6	50	64	90	67	110	123	64	49	65	0	107	32
7	51	66	90	67	110	121	62	54	67	0	132	31
8	51	70	90	67	110	121	60	46	64	0	116	33
9	50	72	90	67	120	123	64	61	62	0	100	30
10	45	76	64	67	130	124	58	58	64	0	130	20
11	40	78	110	67	130	124	57	50	62	55	100	18
12	38	78	90	67	130	123	55	50	49	14	120	18
13	45	78	90	67	131	107	57	52	56	21	100	32
14	47	78	72	67	136	107	52	54	50	0	92	26
15	50	78	72	67	136	106	55	54	47	0	130	23
16	50	78	72	67	130	103	57	56	38	0	100	22
17	50	78	72	67	120	92	60	52	50	0	90	21
18	50	78	72	67	130	84	58	48	50	0	78	23
19	50	78	72	67	200	80	76	46	52	0	62	24
20	50	80	72	67	230	90	70	42	28	0	54	25
21	50	84	72	67	260	92	78	40	58	0	44	25
22	50	84	72	67	250	92	68	52	50	0	37	25
23	50	84	72	67	230	84	50	60	21	0	29	25
24	50	90	72	67	170	82	45	58	21	0	22	25
25	50	95	72	70	144	82	47	54	16	0	19	25
26	56	92	72	76	150	82	40	50	13	0	24	25
27	64	103	72	100	135	81	35	45	64	57	22	27
28	70	105	72	110	132	81	35	49	60	1,130	26	28
29	74	95	72	110	132	78	50	48	56	540	20	28
30	68	107	72	110	-----	78	35	57	35	132	43	28
31	65	-----	68	110	-----	81	-----	71	-----	1,270	37	-----
TOTAL	1,967	2,416	2,513	2,744	4,270	3,294	1,751	1,544	1,280	3,555	5,273	814
MEAN	63.4	80.5	81.0	88.5	147	106	58.4	49.8	42.7	115	170	27.1
MAX	74	107	110	130	260	145	101	71	78	1,270	1,120	44
MIN	38	64	64	67	110	78	35	35	35	0	19	18
AC-FT	3,900	4,790	4,980	5,440	8,470	6,530	3,470	3,060	2,540	7,050	10,460	1,610

CAL YR 1967 TOTAL 29,633.20 MEAN 81.2 MAX 660 MIN 0 AC-FT 58,780
WTR YR 1968 TOTAL 30,019.72 MEAN 82.0 MAX 1,270 MIN 0 AC-FT 59,540

Peak discharge (base, 2,700 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-28	1000	7.41	3,410	8-2	0800	8.20	4,240
7-31	1100	9.26	5,540				

Note.--No gage-height record Dec. 4 to Feb. 18.

DISCHARGE DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANSKVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEAR 1969

DIRTY DEVIL RIVER BASIN

9-3135. Dirty Devil River above Poison Spring Wash near Hanksville, Utah

LOCATION.--Lat 38°05'50", long 110°24'27" (unsurveyed), Garfield County, on right bank 1.0 mile upstream from Poison Spring Wash and 25.5 miles southeast of Hanksville.

DRAINAGE AREA.--4,170 sq mi, approximately.

PERIOD OF RECORD.--June 1968 to current year. Prior to October 1968 published as "near Hite."

GAGE.--Water-stage recorder and mercury manometer. Altitude of gage is 3,850 ft (from topographic map). Prior to July 15, 1964, at site 26 miles downstream at different datum.

AVERAGE DISCHARGE.--21 years, 99.2 cfs (71,870 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 3,300 cfs about June 24 (gage height, 7.30 ft from floodmark); minimum 7.2 cfs Aug. 12. Period of record: Maximum discharge, about 35,000 cfs Nov. 4, 1957 (gage height, 28.1 ft, from floodmarks, site and datum then in use), from rating curve extended above 9,000 cfs on basis of slope-area measurement at gage height 20.65 ft; no flow at times in 1954-55, 1959-60, 1963-68.

REMARKS.--Records fair except those for period of no gage-height record, which are poor. Many diversions for irrigation above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	60	70	107	71	158	158	28	101	54	35	45
2	28	60	69	103	95	158	158	39	107	52	35	42
3	28	60	67	103	121	142	155	41	101	49	80	41
4	28	60	66	112	116	140	138	41	90	47	35	41
5	28	60	65	118	78	140	125	47	78	35	34	41
6	35	70	84	121	92	165	110	58	76	30	32	41
7	35	60	55	118	162	155	97	142	70	30	34	40
8	35	60	52	123	168	132	103	666	70	30	36	40
9	35	60	97	92	129	125	101	253	70	30	29	429
10	35	60	107	95	124	128	97	172	70	30	19	278
11	40	70	130	81	118	135	90	152	70	30	10	440
12	40	70	155	61	121	155	84	142	70	30	8.7	148
13	40	70	114	84	138	142	86	135	70	40	465	440
14	40	41	99	114	135	140	90	116	70	120	107	80
15	40	41	90	135	140	132	79	108	70	50	52	60
16	40	76	103	114	140	123	74	99	70	45	62	45
17	40	76	97	123	135	132	70	92	150	40	36	43
18	40	74	97	116	132	190	62	82	70	110	25	42
19	40	81	81	121	130	259	61	74	70	60	44	41
20	40	79	84	179	160	277	60	74	70	200	123	40
21	40	74	94	266	154	161	60	92	70	600	55	40
22	40	70	84	274	152	162	46	110	75	250	34	39
23	40	68	61	196	155	160	61	99	75	73	30	38
24	40	65	47	135	148	211	66	99	1,000	55	27	37
25	40	62	73	77	150	160	58	97	250	50	17	37
26	50	62	62	97	145	130	61	88	150	45	23	36
27	50	58	82	150	179	123	46	95	130	43	23	36
28	50	55	114	175	217	138	33	105	80	40	15	36
29	50	57	116	168	------	158	28	110	60	39	15	35
30	50	56	121	123	------	160	37	112	57	37	300	35
31	50	------	97	86	------	160	------	99	------	35	75	------
TOTAL	1,215	2,276	2,647	3,863	3,801	4,911	2,491	3,684	3,520	2,322	1,922.7	2,796
MEAN	39.2	75.9	85.4	125	136	158	82.7	119	117	74.9	62.0	93.2
MAX	50	87	155	266	217	277	158	666	1,000	600	465	440
MIN	28	60	47	61	71	123	28	28	57	30	8.7	35
AC-FT	2,410	4,510	5,250	7,660	7,540	9,740	4,940	7,310	6,980	4,610	3,810	5,550

CAL YR 1968 TOTAL 29,640.72 MEAN 81.0 MAX 1,270 MIN 0 AC-FT 58,790
WTR YR 1969 TOTAL 35,468.7 MEAN 97.2 MAX 1,000 MIN 8.7 AC-FT 70,340

PEAK DISCHARGE (BASE, 2,700 CFS).--About June 24, 1969 (unknown) 3,300 cfs (7.30 ft); July 20 or 21, 1969 (unknown) 3,000 cfs (7.00 ft)

NOTE.--No gage-height record Oct. 1 to Nov. 13, July 6 to Aug. 4.

DISCHARGE DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEAR 1970

10[illegible] DIRTY DEVIL RIVER BASIN

09333500 Dirty Devil River above Poison Spring Wash near Hanksville, Utah

LOCATION.--Lat 38°05'50", long 110°24'27" (unsurveyed), Garfield County, on right bank 1.0 mile upstream from Poison Spring Wash and 25.5 miles southeast of Hanksville.

DRAINAGE AREA.--4,170 sq mi, approximately.

PERIOD OF RECORD.--June 1948 to current year. Prior to October 1968 published as "near Hite."

GAGE.--Water-stage recorder and mercury manometer. Altitude of gage is 3,850 ft (from topographic map). Prior to July 15, 1964, at site 28 miles downstream at different datum.

AVERAGE DISCHARGE.--22 years, 98.3 cfs (71,290 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 6,500 cfs about A[illegible]. 4 (gage height, 10.00 ft, from floodmark); minimum, 13 cfs Aug. 1[illegible]. Period of record: Maximum discharge, about 35,000 cfs [illegible]. 8, 1957 (gage height, 28.1 ft, from floodmarks, site and datum then in use), from rating curve extended above 9,000 cfs on basis of slope-area measurement at gage height 20.65 ft; no flow at times in 1954-55, 1959-60, 196[illegible]-68.

REMARKS.--Records fair except those for period of no gage-height record, which are poor. Many diversions for irrigation above and [illegible]

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	95	95	105	80	142	138	107	62	67	30	24	29
2	95	88	105	80	142	125	114	48	60	30	24	29
3	95	114	100	80	142	152	150	79	52	30	24	25
4	95	94	100	80	135	150	125	58	48	30	24	28
5	95	94	100	80	142	115	112	60	47	30	45	28
6	95	90	100	80	148	110	99	67	60	31	38	28
7	93	97	100	80	155	110	96	62	101	34	33	28
8	98	103	118	80	130	101	68	50	54	40	30	24
9	41	107	118	80	140	103	58	64	101	244	27	29
10	43	98	11[illegible]	80	150	97	58	69	140	40	25	29
11	33	90	113	100	145	105	60	40	223	33	24	28
12	33	90	125	110	142	128	54	41	185	32	23	28
13	34	90	123	120	155	118	90	41	71	31	25	8
14	42	90	107	130	150	110	73	58	55	30	27	8
15	41	90	124	140	142	105	60	49	50	28	26	28
16	39	90	113	148	140	105	47	47	60	27	25	27
17	65	90	155	150	128	116	97	65	41	26	25	27
18	91	90	125	158	118	110	68	78	37	26	24	27
19	54	90	142	148	110	116	66	103	31	25	30	27
20	73	90	138	175	121	140	8	118	28	25	57	27
21	73	90	150	162	121	196	121	95	34	24	45	27
22	88	90	137	168	110	148	130	76	25	24	40	27
23	132	92	130	208	121	175	82	65	30	24	31	27
24	118	92	132	217	114	150	41	50	31	24	36	26
25	90	97	138	235	105	88	32	52	30	24	34	26
26	91	97	132	217	110	95	25	46	30	24	32	24
27	92	101	110	190	112	94	19	46	30	24	31	23
28	92	103	95	175	140	90	23	48	30	24	30	31
29	92	94	80	160	------	112	35	67	40	24	30	54
30	94	100	80	138	------	155	65	57	39	24	30	51
31	95	------	80	121	------	155	------	58	------	24	29	------
TOTAL	1,966	2,840	3,559	4,170	3,744	3,787	2,117	1,919	1,801	1,186	1,706	873
MEAN	63.2	94.7	115	135	134	122	70.6	61.9	60.0	38.0	55.0	29.1
MAX	132	123	155	235	155	196	150	114	223	244	180	54
MIN	33	88	80	80	105	88	19	41	25	24	23	23
AC-FT	3,900	5,630	7,060	8,270	7,430	7,510	4,200	3,810	3,570	2,350	3,380	1,730

CAL YR 1969 TOTAL 37,615.7 MEAN 103 MAX 1,000 MIN 8.7 AC-FT 74,610
WTR YR 1970 TOTAL 29,468 MEAN 80.7 MAX 780 MIN 19 AC-FT 58,450

PEAK DISCHARGE (BASE, 2,700 CFS).--Probably occurred Aug. 4 (time unknown) 6,500 cfs (10.00 ft).

NOTE.--No gage-height record June 25 to Sept. 24

DISCHARGE DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEAR 1971

DIRTY DEVIL RIVER BASIN

09333500 Dirty Devil River above Poison Spring Wash near Hanksville, Utah

LOCATION.--Lat 38°05'50", long 110°24'22" (unsurveyed), Garfield County, on right bank 1.0 mile upstream from Poison Spring Wash and 25.5 miles southeast of Hanksville.

DRAINAGE AREA.--4,110 sq mi, approximately.

PERIOD OF RECORD.--June 1948 to current year. Prior to October 1960 published as "near Hite."

GAGE.--Water-stage recorder and mercury manometer. Altitude of gage is 3,850 ft (from topographic map). Prior to July 15, 1964, at site 28 miles downstream at different datum.

AVERAGE DISCHARGE.--23 years, 96.9 cfs (70,200 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 2,180 cfs about Aug. 31 (gage height, 6.10 ft from floodmark); minimum, no flow for many days.

Period of record: Maximum discharge, about 35,000 cfs Nov. 4, 1957 (gage height, 28.1 ft, from floodmarks, site and datum then in use), from rating curve extended above 9,000 cfs on basis of slope-area measurement at gage height 20.65 ft; no flow at times in 1954-55, 1959-60, 1967-68, 1971.

REMARKS.--Records fair. Many diversions for irrigation above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	35	74	155	110	192	81	93	15	0	0	2.4	114
2	53	77	149	111	193	83	92	11	0	0	2.5	44
3	39	82	131	90	176	89	90	7.4	0	0	2.5	27
4	57	60	93	70	162	84	89	7.6	0	0	2.7	25
5	87	78	107	50	160	137	88	5.1	0	0	2.8	
6	99	83	93	50	138	131	87	7.6	0	0	3.0	22
7	92	66	104	50	148	125	85	25	0	0	8.7	20
8	118	86	84	50	149	105	84	32	0	0	34	20
9	80	65	94	50	145	101	83	32	.65	0	26	20
10	58	57	77	50	99	128	81	36	1.7	0	16	20
11	44	57	97	50	106	171	80	28	3.5	0	6.0	20
12	45	60	103	50	109	182	80	25	3.7	0	1.6	20
13	51	77	93	50	132	194	78	24	3.0	0	.31	20
14	46	108	94	50	134	198	66	22	4.6	0	.10	20
15	46	106	88	50	162	150	54	20	6.6	0	0	20
16	44	135	94	50	137	124	51	17	8.6	0	0	20
17	48	95	120	50	86	119	44	13	8.5	0	1.7	20
18	49	94	147	50	86	83	24	11	8.6	0	.05	20
19	50	138	130	50	115	88	17	7.4	7.1	0	0	20
20	49	140	94	50	118	90	28	6.0	7.2	0	0	20
21	50	75	112	60	123	69	26	8.3	9.3	0	3.1	20
22	52	66	116	70	122	85	22	7.1	8.2	52	27	23
23	58	75	154	80	132	90	21	4.0	4.6	117	90	26
24	63	84	132	90	145	101	24	2.9	7.2	34	42	26
25	93	103	92	140	126	85	23	2.2	2.4	24	44	26
26	117	134	97	153	98	109	18	1.1	.44	14	202	28
27	70	157	169	161	86	107	16	.30	0	9.2	90	23
28	58	118	86	172	103	143	17	0	0	5.7	231	21
29	52	126	85	173	------	135	17	0	0	4.0	346	21
30	62	141	116	173	------	137	17	0	0	2.5	406	22
31	69	------	123	179	------	123	------	0	------	2.2	533	------
TOTAL	1,934	2,817	3,429	2,632	3,682	3,64	1,593	378.00	95.89	26	2,124.46	774
MEAN	62.4	93.9	111	84.9	132	1	53.1	12.2	3.20	8.	68.5	25.8
MAX	118	157	169	179	193	198	93	36	9.3	11	533	114
MIN	35	57	77	50	86	69	16	0	0	0	0	20
AC-FT	3,840	5,590	6,800	5,220	7,300	7,230	3,160	750	190	525	4,210	1,540

CAL YR 1970 TOTAL 29,383.00 MEAN 80.5 MAX 780 MIN 19 AC-FT 58,280
WTR YR 1971 TOTAL 23,370.95 MEAN 64.0 MAX 533 MIN 0 AC-FT 46,360

PEAK DISCHARGE (BASE, 2,700 CFS).--No peaks above base.

DISCHARGE DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEAR 1972

DIRTY DEVIL RIVER BASIN

09333500 Dirty Devil River above Poison Spring Wash near Hanksville, Utah

LOCATION.--Lat 38°05'50", long 110°24'22" (unsurveyed), Garfield County, on right bank 1.0 mile upstream from Poison Spring Wash and 25.5 miles southeast of Hanksville.

DRAINAGE AREA.--4,170 sq mi, approximately.

PERIOD OF RECORD.--June 1948 to current year. Prior to October 1968 published as "near Hite."

GAGE.--Water-stage recorder and mercury manometer. Altitude of gage is 3,850 ft (from topographic map). Prior to July 15, 1964, at site 28 miles downstream at different datum.

AVERAGE DISCHARGE.--24 years, 95.3 cfs (69,040 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 3,530 cfs Aug. 20 (gage height, 7.53 ft, from floodmark); no flow for many days.
Period of record: Maximum discharge, about 35,000 cfs Nov. 4, 1957 (gage height, 28.1 ft, from floodmarks, site and datum then in use), from rating curve extended above 9,000 cfs on basis of slope-area measurement at gage height 20.65 ft; no flow at times in 1954-55, 1959-60, 1963-68, 1971-72.

REMARKS.--Records poor. Many diversions for irrigation above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25	[illegible]	75	90	50	127	31	2.0	0	3.6	3.5	20
2	30	138	70	80	50	117	31	1.5	0	2.0	2.0	14
3	31	128	65	70	50	120	30	1.4	0	1.0	1.0	17
4	31	99	60	60	60	107	29	1.2	0	0	26	49
5	29	101	50	50	100	96	29	1.1	0	0	25	31
6	32	104	40	50	150	105	28	1.0	0	0	20	25
7	28	102	35	60	193	128	28	1.0	4.6	0	12	26
8	27	103	30	70	200	128	28	1.0	1.5	0	9.4	22
9	27	110	20	80	197	125	29	1.0	.18	0	4.2	17
10	28	112	15	90	178	125	30	1.0	0	0	2.0	16
11	27	113	15	100	125	123	33	1.0	0	0	2.0	14
12	26	119	15	110	103	123	32	1.2	0	0	1.0	6.0
13	27	120	15	115	129	121	34	2.0	0	0	1.0	6.0
14	26	120	15	134	158	108	34	3.0	0	0	1.0	5.6
15	27	120	35	114	155	81	35	4.0	0	0	1.0	5.0
16	28	118	43	114	151	93	37	4.5	0	0	1.0	10
17	28	110	64	114	129	78	37	5.0	0	0	1.0	194
18	34	100	105	114	136	72	27	5.0	0	0	1.0	261
19	31	100	129	114	146	68	23	2.5	0	18	2.0	92
20	28	100	121	114	150	62	20	1.0	0	238	657	66
21	26	100	114	111	149	60	15	.05	0	116	70	53
22	30	100	139	103	137	55	12	.01	.17	32	30	37
23	41	100	104	104	120	52	10	.03	3.9	16	33	32
24	54	100	131	100	123	48	8.7	0	71	9.0	22	33
25	108	100	203	100	142	46	7.0	0	65	4.7	14	33
26	361	100	180	95	155	43	6.0	0	31	14	7.8	28
27	238	100	150	90	145	41	5.0	0	18	47	4.9	28
28	238	95	125	85	145	40	4.0	0	13	55	26	37
29	160	85	110	75	143	37	3.0	0	11	24	196	37
30	135	80	100	65	------	34	2.5	0	7.2	16	64	33
31	135	------	95	50	------	33	------	0	------	7.2	31	------
TOTAL	2,096	3,214	2,488	2,821	3,869	2,596	678.2	41.49	226.55	603.5	1,271.8	1,247.6
MEAN	67.6	107	80.3	91.0	133	83.7	22.6	1.34	7.55	19.5	41.0	41.6
MAX	361	138	203	134	200	128	37	5.0	71	238	657	261
MIN	25	80	15	50	50	33	2.5	0	0	0	1.0	5.6
AC-FT	4,160	6,370	4,930	5,600	7,670	5,150	1,350	82	449	1,200	2,520	2,470

CAL YR 1971 TOTAL 22,988.95 MEAN 63.0 MAX 533 MIN 0 AC-FT 45,600
WTR YR 1972 TOTAL 21,153.14 MEAN 57.8 MAX 657 MIN 0 AC-FT 41,960

PEAK DISCHARGE (BASE, 2,700 CFS).--Aug. 20 (0200) 3,530 cfs (7.53 ft).

NOTE.--No gage-height record Nov. 13 to Dec. 14, Apr. 18 to June 6.

DISCHARGE DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEAR 1973

100 DIRTY DEVIL RIVER BASIN

09333500 Dirty Devil River above Poison Spring Wash near Hanksville, Utah

LOCATION.--Lat 38°05'50", long 110°24'27" (unsurveyed), Garfield County, on right bank 1.0 mile (1.6 km) upstream from Poison Spring Wash and 25.5 miles (41.0 km) southeast of Hanksville.

DRAINAGE AREA.--4,170 sq mi (10,800 km²), approximately.

PERIOD OF RECORD.--June 1948 to current year. Prior to October 1968 published as "near Hite."

GAGE.--Water-stage recorder and mercury manometer. Altitude of gage is 3,850 ft (1,173 m) from topographic map. Prior to July 15, 1964, at site 20 miles (45 km) downstream at different datum.

AVERAGE DISCHARGE.--25 years, 97.2 ft³/s (2.753 m³/s), 70,420 acre-ft/yr (86.8 hm³/yr).

EXTREMES.--Current year: Maximum discharge, 10,200 ft³/s (289 m³/s) Oct. 19 (gage height, 12.09 ft or 3.685 m, from floodmark); minimum 20 ft³/s (0.57 m³/s) Jan. 23.

Period of record: Maximum discharge, about 35,000 ft³/s (991 m³/s) Nov. 4, 1957 (gage height, 28.1 ft or 8.56 m, from floodmarks, site and datum then in use), from rating curve extended above 9,000 ft³/s (255 m³/s) on basis of slope-area measurement at gage height 20.65 ft (6.294 m); no flow at times in 1954-55, 1959-60, 1963-66, 1971-72.

REMARKS.--Records poor. Many diversions for irrigation above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34	126	120	104	100	170	140	700	130	41	28	30
2	68	120	115	34	100	170	140	593	165	40	28	30
3	67	120	113	47	100	170	140	177	197	40	28	30
4	73	120	123	60	100	170	140	96	149	41	24	30
5	125	120	141	70	100	170	140	70	104	38	28	30
6	760	120	147	80	120	170	130	215	153	35	28	30
7	400	120	99	90	120	170	130	204	151	35	28	30
8	100	120	118	90	120	165	130	158	129	35	28	30
9	90	118	132	90	120	163	130	135	133	35	28	30
10	80	125	125	90	120	165	130	158	128	35	28	30
11	75	121	91	90	120	156	120	267	137	35	28	35
12	70	148	67	90	120	152	120	328	148	35	28	66
13	58	287	80	90	120	259	120	291	144	35	28	127
14	55	389	80	90	120	240	120	257	150	168	28	30
15	161	176	79	90	120	190	120	235	163	293	28	30
16	789	214	46	90	120	168	110	245	170	152	28	30
17	667	244	45	90	120	157	110	211	152	95	28	30
18	240	264	73	90	120	154	110	2[illegible]	135	99	24	30
19	1,800	310	106	90	120	148	110	2[illegible]	113	258	28	30
20	1,480	330	130	90	120	179	110	242	95	392	28	30
21	560	322	139	100	150	175	110	258	90	401	28	30
22	321	190	129	100	150	174	110	254	82	252	100	30
23	184	170	129	100	150	165	110	237	78	94	237	30
24	196	169	115	100	150	141	110	217	71	50	120	30
25	307	147	125	100	150	158	108	188	67	28	40	30
26	185	136	128	100	150	150	316	181	64	29	30	30
27	172	131	106	100	150	150	300	187	55	28	30	30
28	192	141	94	100	150	150	336	191	42	29	30	30
29	207	155	107	100	-------	150	492	185	39	28	30	30
30	223	125	132	100	-------	150	690	145	35	28	30	30
31	196	-------	110	100	-------	150	-------	129	-------	28	30	-------
TOTAL	11,305	5,174	3,307	2,755	3,500	5,197	5,244	7,010	3,589	2,900	1,265	1,038
MEAN	365	172	107	88.9	125	168	175	226	120	93.5	40.8	34.6
MAX	2,680	330	147	104	150	200	690	700	197	401	237	127
MIN	34	116	46	34	100	141	110	70	35	28	24	30
AC-FT	22,420	10,260	6,560	5,460	6,940	10,310	10,400	13,900	7,120	5,750	2,510	2,060

CAL YR 1972 TOTAL 33,141.14 MEAN 90.5 MAX 2,680 MIN 0 AC-FT 65,740
WTR YR 1973 TOTAL 52,292.00 MEAN 143 MAX 2,680 MIN 28 AC-FT 103,700

PEAK DISCHARGE (BASE, 2,700 CFS).--Oct. 6 (2000) 5,840 cfs (9.28 ft); Oct. 19 (2100) 10,200 cfs (12.09 ft).

DISCHARGE DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEAR 1974

DISCHARGE IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1973 TO SEPTEMBER 1974

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	30	88	152	110	134	220	150	69	20	0	0	10
2	30	88	162	98	134	264	150	69	18	0	0	2.0
3	30	89	169	88	134	281	150	67	16	0	0	0
4	30	86	144	88	140	244	150	65	14	0	0	0
5	30	108	127	87	137	196	140	65	12	0	0	0
6	30	113	123	110	144	155	130	64	11	0	0	0
7	30	113	126	133	149	141	120	61	10	0	0	0
8	30	118	135	171	150	145	110	62	9.0	0	0	30
9	50	104	135	244	144	168	110	61	8.0	0	0	20
10	170	84	143	256	143	158	110	60	7.0	0	14	10
11	100	89	154	192	136	158	134	111	6.0	0	5.0	5.0
12	70	77	157	192	135	163	139	133	5.2	0	1.5	5.0
13	60	79	160	182	133	158	127	93	4.5	0	.50	5.0
14	55	82	150	160	148	152	115	82	4.0	0	.10	5.0
15	50	97	150	162	153	169	108	80	3.5	0	.01	5.0
16	50	113	142	168	164	152	104	75	3.0	49	0	5.0
17	50	125	140	151	169	147	100	70	2.5	60	0	100
18	50	126	140	130	171	157	100	65	2.0	187	0	30
19	50	153	140	112	172	138	101	60	1.5	148	0	25
20	50	151	140	110	165	123	134	55	1.0	12	0	20
21	50	140	140	110	162	123	124	52	.70	5.0	0	10
22	54	147	140	110	170	124	99	48	.50	27	0	10
23	57	156	140	112	173	140	95	44	.30	10	0	15
24	57	144	140	110	177	155	90	41	.20	5.0	0	12
25	52	140	140	110	159	136	85	38	.10	2.0	0	11
26	51	162	141	110	155	133	80	35	0	.50	0	10
27	54	149	128	110	176	137	76	32	0	.10	0	10
28	65	142	127	110	207	132	74	29	0	0	20	1
29	67	124	120	110	-------	140	72	26	0	0	20	10
30	71	143	120	131	-------	140	70	24	0	0	5.0	10
31	74	-------	120	152	-------	145	-------	22	-------	0	1.0	-------
TOTAL	1,699	3,535	4,335	4,217	4,359	4,997	3,347	1,863	160.00	505.60	67.11	385.0
MEAN	54.8	118	140	136	156	161	112	60.1	5.33	16.3	2.16	12.8
MAX	170	162	169	256	207	281	150	133	20	187	20	100
MIN	30	68	120	88	133	123	70	22	0	0	0	0
AC-FT	3,370	7,010	8,600	8,360	8,650	9,910	6,640	3,700	317	1,000	133	764

CAL YR 1973 TOTAL 42,075.00 MEAN 115 MAX 700 MIN 28 AC-FT 83,460
WTR YR 1974 TOTAL 29,469.71 MEAN 80.7 MAX 281 MIN 0 AC-FT 58,450

PEAK DISCHARGE (BASE, 2,700 CFS). No peak above base

NOTE.--No gage-height record May 27 to July 15.

DISCHARGE DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEAR 1975

09333500 Dirty Devil River above Poison Spring Wash near Hanksville, Utah

LOCATION.--Lat 38°05'50", long 110°24'27" (unsurveyed), Garfield County, on right bank 1.0 mile (1.6 km) upstream from Poison Spring Wash and 25.5 miles (41.0 km) southeast of Hanksville.

DRAINAGE AREA.--4,170 mi^2 (10,800 km^2), approximately.

PERIOD OF RECORD.--June 1948 to current year. Prior to October 1968 published as "near Hite."

GAGE.--Water-stage recorder and mercury manometer. Altitude of gage is 3,850 ft (1,173 m) from topographic map. Prior to July 15, 1964, at site 28 miles (45 km) downstream at different datum.

AVERAGE DISCHARGE.--27 years, 96.4 ft^3/s (2,730 m^3/s), 69,840 acre-ft/yr (86.1 hm^3/yr).

EXTREMES.--Current year: Maximum daily discharge, 742 ft^3/s (21.0 m^3/s) Nov. 3; minimum recorded, 6.8 ft^3/s (0.19 m^3/s) Aug. 13, 14.
Period of record: Maximum discharge, about 35,000 ft^3/s (991 m^3/s) Nov. 4, 1957 (gage height, 28.1 ft or 8.56 m, from floodmarks, site and datum then in use), from rating curve extended above 9,000 ft^3/s (255 m^3/s) on basis of slope-area measurement at gage height 20.65 ft (6.294 m); no flow at times in 1954-55, 1959-60, 1963-68, 1971-72, 1974.

REMARKS.--Records poor. Many diversions for irrigation above station.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	73	78	26	58	150	148	109	107	77	27	11
2	15	105	78	25	60	160	169	106	67	70	22	11
3	22	742	86	22	54	160	143	106	98	65	18	11
4	41	356	74	63	57	160	128	106	154	61	24	11
5	47	140	103	23	54	160	113	106	172	57	20	11
6	60	64	90	24	45	160	107	228	144	53	22	11
7	81	60	78	25	60	160	114	207	117	50	16	12
8	74	70	75	30	86	160	116	150	154	74	14	13
9	71	128	51	25	100	160	118	107	219	111	12	20
10	64	118	47	24	99	160	118	106	250	186	11	15
11	53	94	38	24	62	160	119	106	219	148	10	18
12	60	97	54	24	82	164	153	113	172	177	7.5	18
13	53	94	66	24	77	155	214	270	178	123	7.0	15
14	53	94	50	24	68	152	195	402	150	163	11	150
15	54	112	63	27	81	147	175	198	130	126	28	80
16	62	105	60	34	56	141	136	161	130	113	20	78
17	60	101	58	42	47	159	121	154	132	105	18	60
18	62	79	54	44	60	140	122	144	172	108	16	50
19	67	76	64	47	76	124	109	155	159	80	16	46
20	78	101	58	43	80	124	104	150	150	60	12	46
21	90	74	80	41	80	137	103	150	146	40	11	44
22	101	60	56	40	80	129	104	152	130	30	11	42
23	105	67	29	43	80	149	103	150	176	25	11	40
24	307	78	25	58	90	144	111	150	146	20	11	42
25	346	70	22	79	110	131	116	150	106	15	11	45
26	142	103	27	155	140	128	129	150	86	12	11	45
27	160	94	36	100	140	141	188	150	88	12	11	45
28	178	74	39	79	140	130	208	176	89	12	11	42
29	427	82	46	46	---	124	170	228	90	10	11	37
30	268	84	36	39	---	117	118	154	86	63	11	35
31	138	---	27	52	---	114	---	126	---	40	11	---
TOTAL	3349	3635	1738	1312	2206	4510	4072	4925	4217	2366	448.5	1098
MEAN	108	121	56.1	42.3	78.8	145	136	159	141	76.3	14.5	36.5
MAX	427	742	103	155	140	169	214	402	250	186	27	150
MIN	10	60	22	22	45	114	103	106	67	10	7.0	11
AC-FT	6640	7210	3450	2600	4380	8950	8080	9770	8360	4690	890	2170

CAL YR 1974 TOTAL 28622.71 MEAN 78.4 MAX 742 MIN 0 AC-FT 56770
WTR YR 1975 TOTAL 33874.50 MEAN 92.8 MAX 742 MIN 7.0 AC-FT 67190

PEAK DISCHARGE (BASE, 2,700 CFS). no peak above base

NOTE:--No gage-height record Aug. 21 to Sept. 30.

DISCHARGE DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEAR 1976

09333500 DIRTY DEVIL RIVER ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH

LOCATION.--Lat 38°05'50", long 110°24'27" (unsurveyed), Garfield County, Hydrologic Unit 14070004, on right bank 1.0 mi (1.6 km) upstream from Poison Spring Wash and 25.5 mi (41.0 km) southeast of Hanksville.

DRAINAGE AREA.--4,170 mi² (10,800 km²), approximately.

PERIOD OF RECORD.--June 1948 to current year. Prior to October 1968 published as "near Hite."

GAGE.--Water-stage recorder and mercury manometer. Altitude of gage is 3,850 ft (1,173 m) from topographic map. Prior to July 15, 1964, at site 28 mi (45 km) downstream at different datum.

REMARKS.--Records fair. Many diversions for irrigation above station.

AVERAGE DISCHARGE.--28 years, 95.6 ft³/s (2.707 m³/s), 69,260 acre-ft/yr (85.4 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 35,000 ft³/s (991 m³/s) Nov. 4, 1957, gage height, 28.1 ft (8.56 m) from floodmarks, site and datum then in use, from rating curve extended above 9,000 ft³/s (255 m³/s) on basis of slope-area measurement at gage height 20.65 ft (6.294 m); no flow at times in 1954-55, 1959-60, 1963-68, 1971-72, 1974, 1977.

EXTREMES FOR CURRENT YEAR.--Peak above base of 2,700 ft³/s (76.5 m³/s); maximum discharge about 4,000 ft³/s (113 m³/s) May 7, gage height 7.98 ft (2.432 m); no flow on many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	36	92	43	70	112	175	95	64	12	0	9.1	0
2	36	89	126	70	100	175	92	53	36	0	107	0
3	38	85	128	70	142	82	90	43	18	0	76	0
4	33	85	130	75	256	118	88	36	13	0	32	0
5	32	85	141	82	209	92	86	43	11	0	19	0
6	35	86	126	88	106	125	83	26	9.9	0	16	0
7	35	86	142	93	189	149	80	650	9.1	0	13	5.0
8	35	84	160	86	189	126	94	300	6.9	0	8.3	17
9	40	82	175	83	202	168	82	120	6.9	0	6.0	34
10	55	85	172	106	200	139	79	100	5.2	0	0	26
11	57	87	198	96	148	71	88	80	2.9	0	0	28
12	56	67	142	155	141	60	64	70	4.4	0	0	30
13	65	76	202	131	198	101	60	66	3.5	0	0	15
14	60	55	196	80	198	106	79	58	2.3	0	0	12
15	68	56	110	99	202	72	73	40	4.4	0	0	52
16	77	64	96	126	146	99	75	31	3.9	0	0	47
17	75	74	56	148	153	98	113	26	4.4	0	0	30
18	70	88	98	138	177	128	144	74	7.9	0	0	26
19	70	93	124	194	160	160	181	45	4.4	0	0	21
20	70	88	103	130	138	130	81	43	3.3	.02	0	17
21	70	90	95	122	113	120	62	73	1.4	7.6	0	13
22	70	74	177	95	105	115	49	170	.42	8.7	0	13
23	70	72	189	84	138	115	40	146	.01	4.4	0	12
24	70	77	155	148	179	115	52	99	0	2.7	0	21
25	70	84	128	104	177	110	54	52	0	1.1	0	149
26	72	105	118	73	202	110	38	36	0	.36	0	139
27	75	98	183	72	192	110	31	31	0	48	0	82
28	80	173	204	71	243	110	43	24	0	28	0	54
29	85	134	142	109	179	105	58	18	0	19	0	30
30	92	81	120	144	---	105	64	12	0	12	0	22
31	98	---	90	153	---	100	---	10	---	17	0	---
TOTAL	1895	2615	4269	3285	4892	3589	2318	2644	171.23	148.88	286.4	896.
MEAN	61.1	87.2	138	106	169	116	77.3	85.3	5.71	4.80	9.24	29.
MAX	98	173	204	194	256	175	181	650	36	48	107	149
MIN	32	55	43	70	100	60	31	10	0	0	0	0
AC-FT	3760	5190	8470	6520	9700	7120	4600	5240	340	295	568	1780

CAL YR 1975 TOTAL 33930.50 MEAN 93.0 MAX 402 MIN 7.0 AC-FT 67300
WTR YR 1976 TOTAL 27009.51 MEAN 73.8 MAX 650 MIN 0 AC-FT 53570

WATER QUALITY DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEAR 1970

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DATE	CHLORIDE (CL) (MG/L)	DISSOLVED SOLIDS (RESIDUE DRIED AT 180 C) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	SODIUM ADSORPTION RATIO	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)
COLORADO RIVER BASIN--Continued										
DIRTY DEVIL RIVER BASIN--Continued										
09333500 DIRTY DEVIL RIVER NEAR HITE, UTAH--Continued										
OCT.										
16...	140	2130	2130	2.90	187	1130	1010	2.3	2400	7.6
APR.										
27...	194	1750	1650	2.24	97.6	834	623	3.3	2220	8.2
JULY										
28...	200	2900	--	3.94	188	--	--	--	3150	7.9

WATER QUALITY DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEAR 1972

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

SPECIFIC CONDUCTANCE AND TEMPERATURE DATA, AUGUST 1971 TO SEPTEMBER 1972

COLORADO RIVER BASIN--Continued

DIRTY DEVIL RIVER BASIN--Continued

09333500 DIRTY DEVIL RIVER ABOVE POISON SPRING WASH, NEAR HANKSVILLE, UTAH
(LAT 38 03'30", LONG 110 24'27")

DATE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	TEMPERATURE (DEG C)
AUGUST 1971			
10	1100	960	31.0
SEPTEMBER			
22	1530	62	14.5
OCTOBER			
02	1500	41	16.5
NOVEMBER			
11	1515	119	7.0
DECEMBER			
15	1410	18	2.0
JANUARY 1972			
17	1630	195	1.5
FEBRUARY			
09	1600	202	2.0
MARCH			
14	1500	98	1.5
APRIL			
11	1430	69	17.5
MAY			
09	1040	141	15.0
JUNE			
13	1110	514	20.5

84 ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

COLORADO RIVER BASIN

DIRTY DEVIL RIVER BASIN

09333500 DIRTY DEVIL RIVER NEAR HITE, UTAH (LAT 38 05'50", LONG 110 21'27")

DATE	TIME	DISCHARGE, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS/CM)	PH (UNITS)	TEMPERATURE (DEG C)	CALCIUM, DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM AD-SORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE (MG/L AS HCO3)	CARBONATE (MG/L AS CO3)	ALKALINITY, LAB (MG/L AS CACO3)	SULFATE, DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 C, DISSOLVED (MG/L)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, DISSOLVED (MG/L AS P)	PHOSPHORUS, TOTAL (MG/L AS P)	ARSENIC, DISSOLVED (UG/L AS AS)	BORON, DISSOLVED (UG/L AS B)	CADMIUM, DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY, DISSOLVED (UG/L AS HG)	SELENIUM, DISSOLVED (UG/L AS SE)	ZINC, DISSOLVED (UG/L AS ZN)
OCT.																																			
26	1500	12.5	90	8.0	10.5	9.1	1.1	7.7	1.30	0	800	87																							
JAN.																																			
17	1230	1.0	190	8.4	1.0	16.0	9.1	1.40	3.0	20.3	0	550	130																						
APR.																																			
11	1230	17.5	20	8.0	22.0	3.0	1.30	9.1	1.0	0	840	200																							

DISCHARGE DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEARS 1973 and 1974

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25°C) AND TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973

DATE	TIME	DIS-CHARGE (CFS)	TEMPER-ATURE (DEG C)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)
COLORADO RIVER BASIN--Continued				
DIRTY DEVIL RIVER BASIN--Continued				
09333500 DIRTY DEVIL RIVER ABOVE POISON SPRING WASH, NEAR HANKSVILLE, UTAH (LAT 38°05'50", LONG 110°24'27")				
OCT. 12...	1200	74	15.5	3000
NOV. 09...	1330	118	7.0	1850
DEC. 14...	1200	81	.0	1900
JAN. 11...	1130	89	.0	1700
FEB. 09...	1130	125	.0	1200
MAR. 08...	1200	165	5.5	2200
APR. 24...	1330	109	14.0	1330
MAY 18...	1300	190	20.5	1700
JUNE 20...	1130	96	17.0	2100
JULY 23...	1500	28	27.5	3000
AUG. 22...	1050	28	22.0	3600
SEP. 13...	1035	58	21.0	3600

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25°C) AND TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1973 TO SEPTEMBER 1974

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	TEMPER-ATURE (DEG C)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)
DIRTY DEVIL RIVER BASIN				
09333500 DIRTY DEVIL RIVER ABOVE POISON SPRING WASH, NEAR HANKSVILLE, UTAH (LAT 38°05'50", LONG 110°24'27")				
OCT. 26...	1120	55	4.0	2800
NOV. 15...	1330	90	6.0	1800
DEC. 05...	1345	127	2.0	1500
JAN. 16...	1130	148	.0	1400
FEB. 27...	1415	221	12.0	1700
APR. 15...	1230	109	9.0	1400
MAY 16...	1230	81	20.0	2200
JUNE 12...	1345	4.9	30.5	4000
SEP. 24...	1115	11	20.0	2500

WATER QUALITY DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEAR 1975

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25°C) AND TEMPERATURE (°C) OF WATER,
WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DIRTY DEVIL RIVER BASIN

09330500 MUDDY CREEK NEAR EMERY, UTAH (LAT 38°59'00", LONG 111°14'40")

DATE	TIME	DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)
OCT.				
30...	1240	317	14.5	2200
DEC.				
03...	1300	44	1.0	1300
JAN.				
13...	1300	35	1.0	1300
FEB.				
27...	1130	136	5.0	1500
MAR.				
17...	1330	151	10.0	1500
APR.				
29...	1335	219	13.0	1600
MAY				
09...	1310	205	19.0	2300
JUNE				
25...	1300	80	18.0	2200
JULY				
28...	1300	13	24.0	3000
AUG.				
26...	1430	11	28.5	4000
SEP.				
30...	1130	35	15.5	1600

WATER QUALITY DATA FROM USGS

DIRTY DEVIL RIVER
ABOVE POISON SPRING WASH NEAR HANKSVILLE, UTAH
(ALSO KNOWN AS "NEAR HITE")

WATER YEAR 1976

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)
09333500 DIRTY DEVIL RIVER ABOVE POISON SPRING WASH, NEAR HANKSVILLE, UT (LAT. 38°05'50", LONG. 110°24'25")				
OCT.				
28...	1255	106	12.5	1600
DEC.				
09...	1215	137	.0	1400
JAN.				
06...	1220	63	.0	1600
FEB.				
02...	1330	172	3.0	1520
MAR.				
19...	1440	151	10.0	1500
APR.				
07...	1100	91	13.5	1600
MAY				
14...	0820	57	15.0	1690
JUNE				
04...	1520	7.2	17.0	2250
AUG.				
04...	1240	28	21.0	2500
SEP.				
08...	1140	14	23.0	2500