MINUTES

MONTANA HOUSE OF REPRESENTATIVES
51st LEGISLATURE - REGULAR SESSION

SUBCOMMITTEE ON NATURAL RESOURCES

Call to Order: By Vice Chairman Gerry Devlin, on March 6, 1989, at 11:30 a.m.

ROLL CALL

Members Present: All except Representative Spaeth

Members Excused: Representative Spaeth

Members Absent: None

Staff Present: Carl Schweitzer, LFA; Jane Hamman, OBPP; Donna Grace, Committee Secretary

HEARING ON DEPARTMENT OF FISH WILDLIFE AND PARKS

List of Proponents and Groups they Represent 72:A (001)

Gary Fritz, DNRC
Dave Mott, FWP
Ron Marcoux, FWP
Representative Betty Lou Kasten, District 28
Representative Tom Zook, District #25

Vice Chairman Devlin stated that he had called this meeting to consider a project which had come up in his district relative to the Cherry Creek Dam project which is being proposed by the Bureau of Land Management. Exhibit 1. He advised that he had not planned to bring this matter before the legislature until the next session; however, there is a possibility that the challenge grant money available from the BLM might not be available in two years. He said the local people in Miles City and Glendive and Terry areas feel that they can raise $50,000 for matching funds and the Department of Fish, Wildlife and Parks will contribute $100,000. This would provide for a study and environmental impact statement or environmental statement, whichever was necessary, and the planning. There would be no money for construction in this appropriation. The project is an approximately 4,000 acre-foot reservoir and would include a large fishery and boating reservoir.

Tom Zook, Representative from District 25 which includes Custer and Prairie Counties, stated that he wanted to indicate to the committee that this isn't just a local concern in his area. There is a lot of interest in this project from a very wide area. At the present time this water is just running on down the Yellowstone River and into North Dakota

and he said he would hope that with the positive cost/benefit ratio that this project has, together with the strong support it has received, that this committee would also give it support.

Betty Lou Kasten, Representative from District 28 said that she would stand in support of any offstream storage that they can work out in that area of the state. She said she felt that Montana was going to need that sort of facility to have the water that the state will eventually need. She said she would like to give the people of that area a chance to have a nice recreational facility as well as having some off-stream storage.

Ron Marcoux, FWP, stated that this came up about a year ago and is supported by the local people and the BLM is interested in pursuing it. He said they had done a reconnaissance study to see if there was a possibility of constructing a reservoir at this site. Exhibit 2. The survey raised some questions about sedimentation and oxygen depletion, however, there is enough potential to the project to proceed to the next step which would be the feasibility study and this is what the appropriation would be for. He said that they recognized the interest in the local community in seeking funding and one of the projects presented to the Long Range Building Committee was not approved which would free up some money that could be used for helping to fund this feasibility study. They would be using $50,000 of general license fee money and $50,000 of Dingle Johnson funds. He said he did not propose using more Dingle Johnson funds because if the project did not proceed to construction, this money would have to be paid back to the federal government.

Mr. Marcoux stated that if the local people did not provide the promised $50,000, or if for some reason the BLM did not provide $150,000 in matching funds, the FWP would not expend any of the $100,000 they were asking for.

Gary Fritz, DNRC, said that he did not have anything further to add regarding the project.

Senator Jenkins stated that he understood there was some private land involved and he wondered if there was any objection to this project from the local landowners. Senator Devlin replied that they were in favor of the project and a land swap with the BLM would be arranged.

Mr. Fritz asked who would be doing the study, the FWP or the BLM? Senator Devlin said he thought it would be the BLM. Mr. Fritz said that he didn't think that was clear and he felt that one way to do this would be to contract the study out to private consultants. However, since there were still some questions, he suggested that the committee could approve spending authority in the FWP budget for the entire amount.

MOTION: Senator Jenkins made a motion to accept the recommendation from the Department of Fish, Wildlife and Parks to provide spending authority for $100,000 of FWP money, $50,000 local contributions and $150,000 from the BLM.

VOTE: MOTION PASSED. All committee members present voted in favor of the motion.

Announcements/Discussion: None.

ADJOURNMENT

Adjournment At: 11:50 a.m.

Sen Gerry Devlin

SENATOR GERRY DEVLIN, Vice Chairman

GD/dg

5226.mina

DAILY ROLL CALL

NATURAL RESOURCES SUBCOMMITTEE

DATE 3-6-89

NAME	PRESENT	ABSENT	EXCUSED
Representative Spaeth			✓
Senator Devlin	✓		
Representative Kimberley	✓		
Representative Iverson	✓		
Representative Swift	✓		
Senator Jenkins	✓		
Senator Jergeson	✓		

Form CS-30A
Rev. 1985

EXHIBIT 1
DATE 3-6-89
HB 100

United States Department of the Interior
Bureau of Land Management
Miles City District Office
P.O. Box 940
Miles City, Montana 59301-0940

February 24, 1989

To: State Director

From: District Manager, Miles City

Subject: Cherry Creek Dam

On February 22, 1989 we held a public meeting in Terry, Montana on the preliminary appraisal for the proposed Cherry Creek Dam. The Bureau of Reclamation has given us the cost estimates for the dam and we have completed a benefit/cost analysis for the proposal. The benefit/cost ratio was favorable.

At the present time it does not appear that the State legislature will be able to appropriate the $150,000 needed for the State's 50% share of the feasibility study. This project is at the bottom of the stack of a number of preexisting projects for recreation and wildlife. There is also a great deal of concern about the State's ability to maintain the dams, parks, and other improvements it is already responsible for.

The citizens at the public meeting are very much in favor of this project and decided to form a non-profit corporation to try to build support and raise money for the project. The corporation will be called Friends for Cherry Creek Dam. The president will be Willie Day, an influential rancher and former State legislator from Prairie County.

The corporation recognizes that the possibility of State funding during this legislative session is very remote. I think their first effort will be to determine if funds can be raised from private sources, such as Ducks Unlimited and Walleyes Unlimited, to be contributed to a State agency for a feasibility study. BLM would be expected to furnish challenge grant money for the other 50%.

There is some likelihood that they will be successful and we will be asked for matching funds as early as fiscal year 1990. Last year we were told by the Washington Office that there was plenty of challenge grant money available but, in light of potential increased use of these funds because of Recreation 2000 and Wildlife 2000 initiatives, funds may not be as readily available.

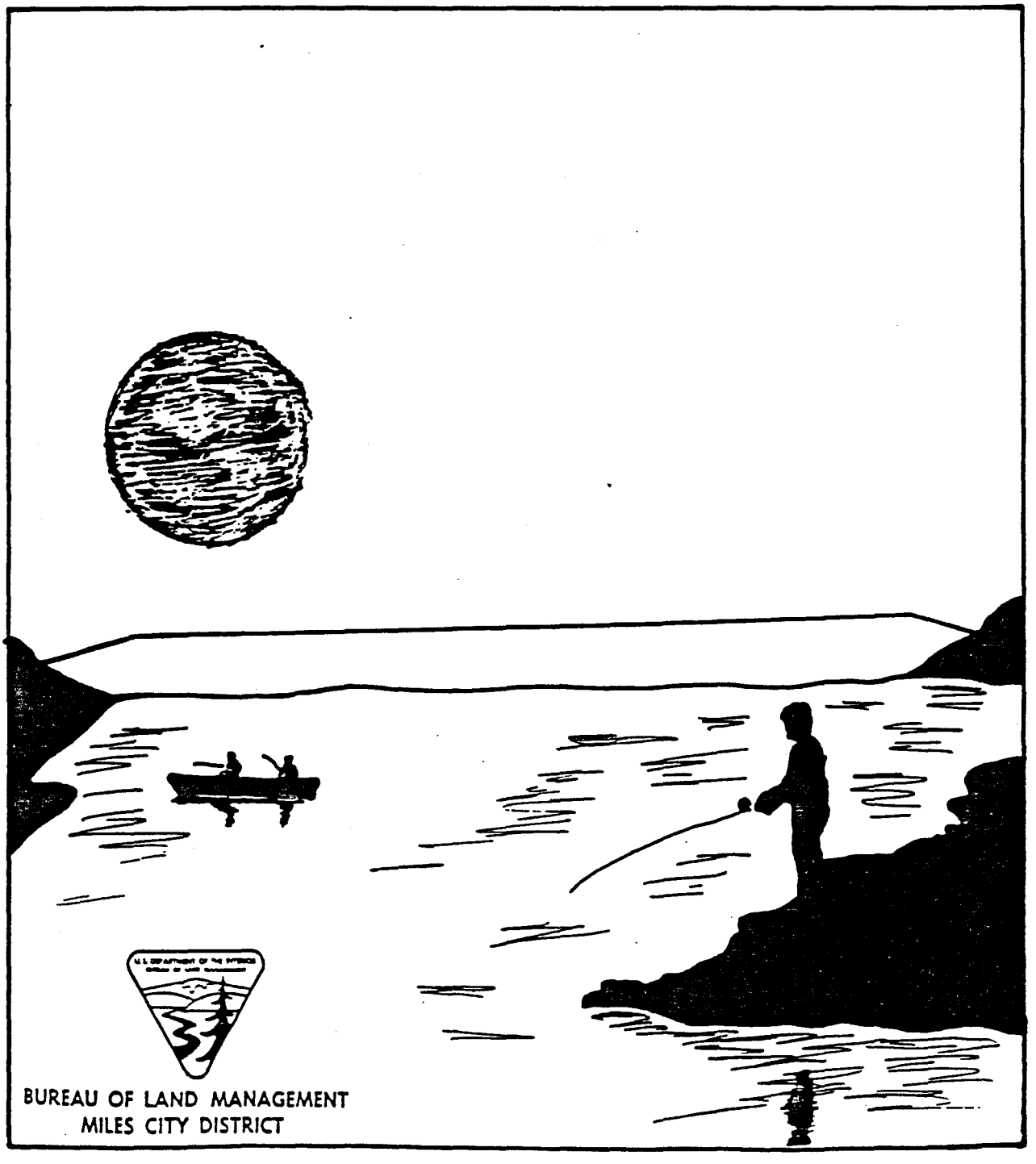
As such, I am requesting that you be sure that we will be able to get $150,000 of challenge grant funds as early as fiscal year

1990 if the matching money is raised locally. We need to do this very soon because the corporation will be moving very quickly to begin its fund raising and we need to be sure we can hold up our end of the deal.

cc: Friends for Cherry Creek Dam, Inc.
AM, Big Dry Resource Area
Senator Gerry Devlin
Norm Peterson, Fish, Wildlife, and Parks
Derwood Mercer, Bureau of Reclamation
Gary Fritz, Department of Natural Resources and Conservation

EXHIBIT 2
DATE 3-6-89
HB 108

JANUARY 1989
SUMMARY REPORT
FOR
CHERRY CREEK DAM PROPOSAL



BUREAU OF LAND MANAGEMENT
MILES CITY DISTRICT

SUMMARY OF THE CHERRY CREEK DAM PROPOSAL

JANUARY 27, 1989

Attachment 1 - January 25, 1989
Letter from Bureau of
Reclamation - Reconnaissance
Level Studies

Attachment 2 - January 10, 1989 Letter
from Bureau of Reclamation
Cherry Creek Dam

Attachment 3 - Cherry Creek Dam Proposal Paper

Attachment 4 - Rangeland Investmment Analysis Summary

SUMMARY OF THE CHERRY CREEK DAM PROPOSAL
January 27, 1989

An appraisal investigation of the proposed dam on Cherry Creek near Terry, Montana has been completed by the Bureau of Reclamation (attachments 1 & 2). The original Cherry Creek Dam proposal (attachment 3) calls for building a large fishery and boating reservoir.

The Bureau of Reclamation's appraisal answered some critical questions. It was determined that the drainage should provide more than adequate water for the proposed 5,000 to 7,000 acre-foot reservoir. Siltation is an issue which must be addressed in a feasibility study. However, optional developments, such as the silt trap waterfowl marsh suggested in the original proposal, may solve that problem.

The water quality of the proposed reservoir would be typical of most of the smaller fishing reservoirs throughout southeastern Montana. These currently provide a variety of good warm water and trout fishing opportunities for the public. As proposed, this reservoir would be best suited to development as a warm water fishery.

The original and revised cost estimates for the project are shown in Table 1.

TABLE 1

Original Cost Estimate	Dam	2.5 million
	Spillway	1.0 million
Appraisal Cost Estimate	Dam	2.5 million
	Spillway	2.5 million

The appraisal recommends construction of a larger spillway which would accommodate all floods. This increases the estimated cost of the project from 3.5 million dollars to 5 million dollars.

A benefit/cost analysis (attachment 4) utilizing the 'SAGERAM' computer program was run with a 5 million dollar cost estimate and a 50 year use projection. With full development, projected use would include annually:

10,000 angler days (angler/boating)
2,000 developed recreation site days (picnicking)
400 dispersed user days
Increased hunting opportunities (especially for waterfowl)

The estimated benefit/cost ratio for the project is 1.4:1 for all costs and 2.9:1 for the BLM share of the costs.

A $300,000 feasibility report would provide the engineering design for the project, construction cost estimates and the environmental analysis. The original proposal called for 50/50 cost sharing between BLM and the State of Montana with additional funding and assistance expected from other interest groups. This proposal still holds with each agency contributing matching shares as each step progresses through the feasibility study and construction. The feasibility report would cost $500,000 if the Bureau of Reclamation were to assume the lead on the project.

ATTACHMENT 1

United States Department of the Interior
BUREAU OF RECLAMATION
Great Plains Region
P.O. Box 36900
Billings, Montana 59107-6900

TAKE PRIDE IN AMERICA

IN REPLY
REFER TO
GP-700

JAN 25 1989

Mr. Gary Fritz
Administrator, Water Resources
Montana Department of Natural Resources
and Conservation
1520 East Sixth Avenue
Helena MT 59620

Subject: Reconnaissance Level Studies, Cherry Creek Dam Near Terry, Montana (Dam)

Dear Gary Fritz:

As requested in your letter of November 28, 1988, enclosed are the results of our reconnaissance level water supply yield and probable maximum flood studies for the above subject. In addition, an estimate of potential sediment yield was calculated as well as identification of potential water quality concerns.

The water supply yield studies would indicate that approximately an 8,000 acre-feet conservation pool could be maintained using a period of record from 1973-1985. Based on the limited information available, however, the sediment yield could reduce that storage space to 2,800 acre-feet within 50 years from the beginning of operation.

A probable maximum flood discharge of 182,300 feet^3/second was estimated that would require a spillway having a crest length of 1,600 feet and a head of 10 feet. A rough estimate to construct such a spillway would be about $2.5 million.

If we can be of further assistance or provide additional information, please do not hesitate to call.

Sincerely,

Roger K. Patterson
Acting Regional Director

Enclosure

cc: Mr. Liter Spence
Montana Department of Fish,
Wildlife, and Parks
1420 East Sixth Avenue
Helena MT 59620

District Manager
Bureau of Land Management
P.O. Box 940
Miles City MT 59601

RECONNAISSANCE LEVEL STUDIES
CHERRY CREEK DAM NEAR TERRY, MONTANA

Water Supply and Reservoir Analysis

No long term streamflow station records were available in the study area. The historic flow estimates that were made for use in the reservoir operation studies were made through the use of limited streamflow data in a very short period of time. The estimated damsite flows are considered to be rough estimates and may not resemble flows that actually occurred historically. These flows do, however, correlate well with discharges measured on nearby tributaries and should be fairly representative of the yield from the Cherry Creek watershed. The flows developed for this study were at a sub-reconnaissance level. The period of record for which flows were estimated is short and does not include a long-term drought. There is a risk that significant drawdown could occur during an extended drought.

Historic monthly flows and evaporation were estimated for water years 1973 through 1985 for simulation of reservoir operations. During the study period the reservoir water surface remained above the minimum pool. During short periods of drought (approximately 1-year duration), the reservoir did not draw down more than 2 feet. The water supply studies show that approximately 8,000 acre-feet would be available over the period of record used in this study. The size of the reservoir would be approximately 410 acres.

Sediment Yield

A reconnaissance level review of available data for determining sediment yield for eastern Montana was made to evaluate potential sediment inflow to Cherry Creek Reservoir.

The annual sediment inflow for the 383 mi^2 Cherry Creek basin is estimated to be 104 acre-feet with 50- and 100-year accumulations of 5,200 and 10,400 acre-feet. This appears to be a major problem for the reservoir site being considered. Based on this information, sediment would impact the reservoir after 20 years. A specific sediment study for the Cherry Creek drainage basin needs to be conducted as part of a feasibility study.

Reservoir Water Quality

Preliminary review of the proposed reservoir noted the following water quality concerns:

1. High surface water temperatures will be well mixed by frequent winds.

2. Algal blooms will deplete bottom oxygen.

3. A cold water fishery may not withstand high temperatures and low dissolved oxygen in a shallow reservoir.

4. Flashy intermittent inflows may cause turbidity problems.

5. Winter fish survival requires adequate depth and oxygen to carry them through the ice cover period.

Based on these concerns, water recreation may be hampered by algae, and fishing may be restricted to a put and take situation.

Also, an assumption of this sub-reconnaissance level study was that no demand was placed on the reservoir. In other words, the water would stay in the reservoir and tend to concentrate the mineral constituents to the extent they could become harmful to the recreation or fishery use of the reservoir. Any releases from the reservoir to relieve the situation would impact its use for recreation and fishing.

Probable Maximum Flood

The hydrologic parameters used in developing the PMF were estimated solely by inspection of U.S. Geological Survey topographic maps and earlier studies in eastern Montana. The basin was not visited. The probable maximum precipitation was determined using methods of Hydrometeorological Report No. 55A with optimal storm sizing and orientation by computer program COE-HMR52. The PMF was computed by rainfall-runoff computations using Reclamation computer program FEAR.

The all-season 72-hour general storm produced a PMF peak discharge of 182,300 ft^3/second and a volume of 254,000 acre-feet. The peak unit discharge for the 383 mi^2 basin was 476 ft^3/second per square mile. No snow cover was assumed present. Because of the relatively small reservoir storage capacity, design of the spillway would be more sensitive to high peak discharges than a longer duration-greater volume flood that included runoff from snowmelt.

A spillway to pass the PMF would have a crest length of 1,600 feet and a head of 10 feet. A preliminary cost estimate using roller compacted concrete for a spillway on the face of the dam was estimated at a construction cost of 2.5 million dollars.

Further studies would be required to determine the best location of the spillway. Also, the spillway for the PMF could be combined with the spillway to pass high runoff flows which may reduce the cost. Risk analysis studies that would be done during feasibility studies may indicate that the best alternative to passing the flood would be to let the dam fail.

ATTACHMENT 2

United States Department of the Interior
BUREAU OF RECLAMATION
Great Plains Region
P.O. Box 36900
Billings, Montana 59107-6900

TAKE PRIDE IN AMERICA

IN REPLY
REFER TO:
GP-700

JAN 10 1989

Mr. Gary Fritz
Administrator, Water Resources
Montana Department of Natural
Resources and Conservation
1520 East Sixth Avenue
Helena MT 59620

Subject: Cherry Creek Dam Near Terry, Montana (Dam)

Dear Mr. Fritz:

As requested by your letter of November 28, 1988, we have started our studies to evaluate the water supply as to firm yield and the Probable Maximum Flood (PMF) on Cherry Creek.

It is our understanding that this information is to be used in conjunction with other information developed by the Bureau of Land Management (BLM) to determine if additional more detailed investigation may be warranted. We have been asked by the BLM as to what a feasibility study and Environmental Assessment may cost if it was found that further study was warranted.

In large part, the cost and length of time to conduct such a study is dependent upon who you are developing the document for. If the purpose was to have a document that could be processed by the Bureau of Reclamation (Reclamation) for Federal authorization as a Reclamation Project, it would require a Regional Director's Planning Report/Final Environmental Statement (RDPR/FES). The process to reach an RDPR/FES is outlined in the Water Resources Council's "Principles and Guidelines." Requirements in the process are for a Preliminary Findings Memorandum (PFM) and a Plan Formulation Working Document (PFWD) to be written. Using appraisal level estimates, the PFM would present the studies as to the potential feasibility for a project at a specific site. The PFWD would then evaluate alternative dam sites on Cherry Creek as well as alternatives to a dam on Cherry Creek and selects the preferred plan. More detailed studies including an Environmental Assessment most likely requiring the development of an Environmental Statement (ES) would come next.

Upon completion of an RDPR/FES, the document could be used by Reclamation for further processing to Congress in an effort to seek Federal authorization. Experience has shown that such an effort could take

3 years at an estimated study cost of about $500,000. Fifty percent non-Federal cost sharing of the study would be required, and the earliest that Reclamation could propose budgeting such funds would be fiscal year 1991.

Another approach would be to do an engineering study and an environmental analysis as a special report. This special report would not meet Reclamation requirements to support Federal authorization as a Reclamation Project or meet the National Environmental Policy Act (NEPA) requirements. The engineering study would be technically adequate to support a feasibility cost estimate and the Environmental Analysis would identify environmental issues, potential impacts, methods of mitigation, and cultural and social considerations. The report could be used by the project sponsors for seeking construction funding as well as a basis for developing an Environmental Statement at a later date should construction proceed. The estimated cost for a special study would be about $300,000 and the same cost sharing requirements as previously stated would be required if Reclamation was involved in developing the report.

If we can be of further assistance or provide additional information, please don't hesitate to call upon us.

Sincerely,

FOR D. S. Louver
Roger K. Patterson
Acting Regional Director

cc: Mr. Liter Spence
Montana Department of Fish,
Wildlife, and Parks
1420 East Sixth Avenue
Helena MT 59620

Honorable Jerry Devlin
Montana Senate
Helena MT 59620

District Manager
Bureau of Land Management
P.O. Box 940
Miles City MT 59601

ATTACHMENT 3

CHERRY CREEK DAM
TERRY, MONTANA

Proposal Paper

Bureau of Land Management
Miles City District Office
Miles City, Montana

INTRODUCTION

The Wallop-Breaux Sport Fishing and Boating Enhancement Act has put millions of dollars into State fisheries programs. In Montana, one suggested outlet for this influx of money is to build fisheries and boating reservoirs on public lands in cooperation with the BLM.

Sites for good fisheries reservoirs on public lands in southeastern Montana are limited by geology, access, watershed size, water quality, and conflicting water rights. The proposed Cherry Creek Dam site (Map 1) is a very good site by these criteria.

PROPOSED ACTION & ALTERNATIVES

This proposal is to cost share with the Montana Department of Fish, Wildlife & Parks to build a large fishery and boating reservoir on public land three miles northeast of Terry, Montana (Map 1). The site has year round access from the county road in Section 2, T. 12 N., R. 51 E., (Map 2). Construction would consist of a 50 foot high compacted fill ontop of an excavated impervious core, a large drop tube, and a concrete or rock spillway and dam face. A very rough initial cost estimate is for 3.5 million dollars total.

Because of the size of the drainage, a smaller structure is not an acceptable alternative.

The cost of the project requires cost sharing between agencies. Neither of the two agencies is likely to take on the entire cost of the project.

The No Action Alternative, that is to build no dam, would save money. But, the saved money, especially the State portion, is dedicated to fisheries developments, it is going to be spent for fisheries development at some location within the state.

EXISTING ENVIRONMENT

Lands

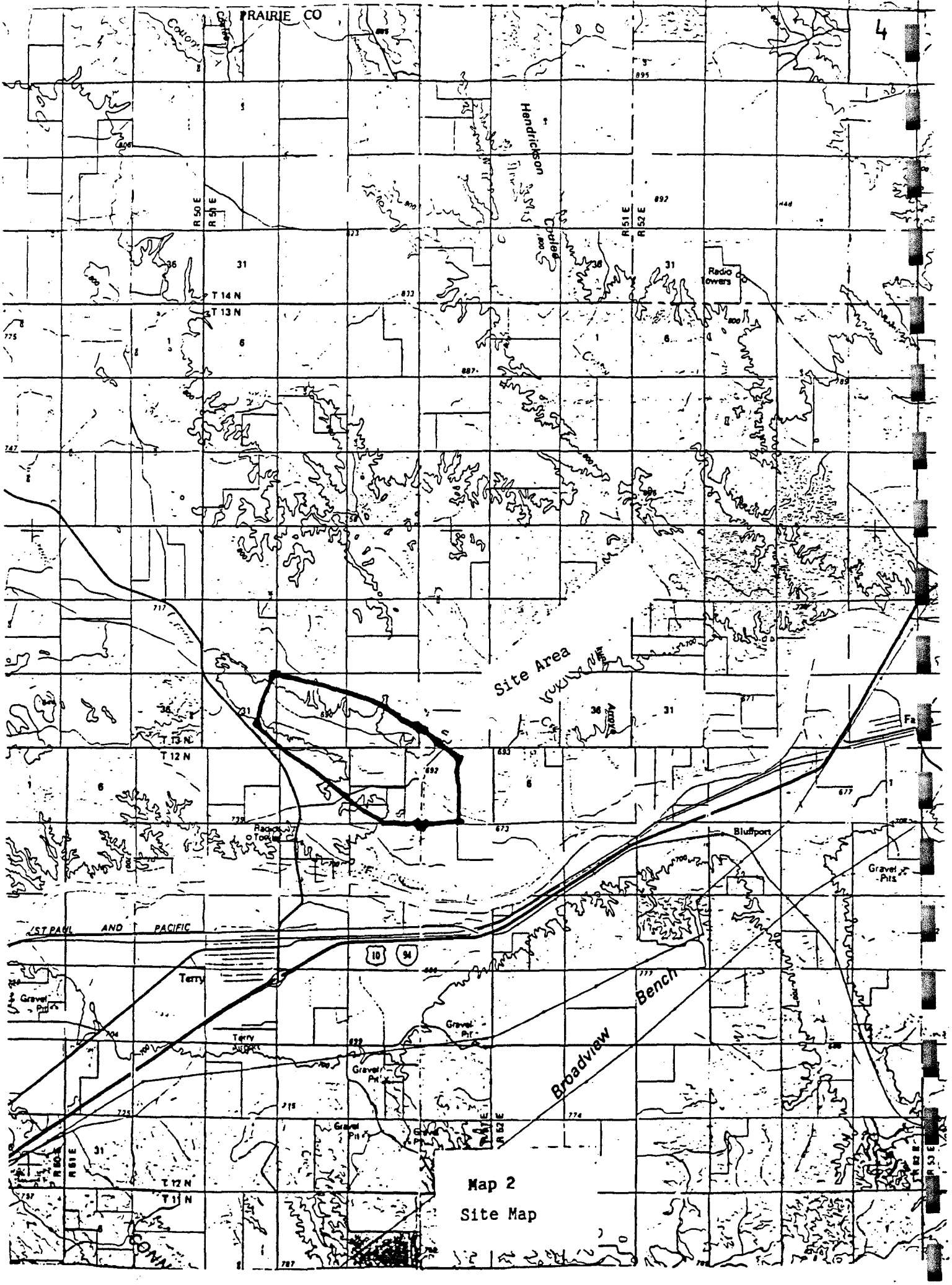
Map 2 shows the ownership of the proposed site and of the surrounding sections. Section 32 and part of the S½ of Section 2 are privately owned. The project could be developed with that ownership pattern. However, it would be advantageous for the BLM to own all the land likely to be impacted by the proposal. There is currently an opportunity for a land exchange with one of the two landowners involved. Another option would be to use some challenge grant money to purchase part or all of the necessary acreage, or to acquire an easement for use where needed.

Depending on the placement of the dam, one or two grazing leases would be impacted by the reservoir.

Soils

The soils in the area are derived from the Tongue River Member of the Fort Union Formation. Occurring within the creek channel is the Rivra soil complex, consisting of gravelly and coarse textured soils. The Rivra complex

Map 1



Map 2

Site Map

has the potential to produce approximately 400 to 1200 lbs./ac./yr. of vegetation. Occurring on the terrace immediately above the channel are moderately deep and deep silt loam and fine sandy loam soils (Yamac, Lonna and Ryell series.) The Yamac soil has agricultural potential and has a land capability classification of IIIe. The Lonna and Ryell soils have a land capability classification of IVe, rating them as very productive range soils. These terrace soils are among the most productive in the area, with the potential to produce upwards of 1100 to 1800 lbs./acre/yr. of vegetation.

Hydrology

Cherry Creek drains approximately 384 square miles of Northern Prairie County. The exposed geologic formation throughout most of the drainage is the Tongue River Member of the Fort Union Formation. It is made up of mostly light colored sandstone separated by light colored silts and is marine in origin. There are also coal beds at random through out the member. Clinker bed are also present where the coal beds have burned.

The presents of the sands and clinker on the surface forms into light texture soils which increases infiltration and also increases vegetative production and in most cases decreases sediment production.

The infiltration and interbedded silts and clays creates perched water tables and in turn springs. It also lengthens the period of discharge from the uplands to the creek, prolonging the stream flow of Cherry Creek following a precipitation event.

Late summer recharge to Cherry Creek is coming from subsurface storage in the uplands. This recharge appears only as persistent instream pools. The majority stays in the alluvium and moves down stream as subsurface flow.

The subsurface flow in the alluvium can not be easily measured nor estimated. It is certain that a quantity of runoff is carried out of the drainage by this means.

A stream gage was operated by USGS on Cherry Creek during the years of 1980 and 1981. The measured runoff was 1324 acre-feet and 500 acre-feet respectively. The runoff for these years was probably lower than normal because the precipitation for that time period was less than the 15 year average.

The use of channel geometry as designed by Omang and Parrett USGS indicates the approximate runoff to be 3000 acre-feet per year.

Runoff estimates can be made by many other methods. All give a range of runoff a great deal higher than the 2 years of measurements. It is easy to understand the runoff form a semi-arid region and an intermittent stream will vary a great deal from year to year. A safe range of estimation for the runoff would be from 500 acre-feet to 4000 acre-feet.

Water quality of the stream flow is related to the marine origin of Tongue River member. Low flows which are derived from the subsurface waters that have been exposed to the marine environment range in specific conductance between 2000 and 3500 micromhos.

High flows that are a direct result of excess precipitation and do not penetrate the soil are of the best quality. Specific conductance for high flows range between 500 and 2000 micromhos. In both cases the water is a sodium sulfate type with a ph of 7.9 to 8.3.

The sediment yield is generally not as great as other drainages because the sands are less erosive than finer textured soils and will absorb more of the runoff. Suspended sediment during low flows have been recorded as low as 6 mg/l. High flows produce a greater quantity of suspended sediments that varies by time of year and type of runoff. The single measured quantity was 2730 mg/l.

The Cherry Creek stream channel throughout the lower 1/4 of its reach is unstable. The lack of stream bank vegetation is the major contributor to the problem. High flows go unchecked by the bank vegetation and cause extensive channel movement across the valley. Many areas of the channel are 50 yards or greater in width, low flows are not carried in one channel but in several. High flows are spread over wide areas with active bank and channel erosion.

Areas along the channel where the vegetation consists of woody species that are well anchored, the channel is stable. Low flows are contained in one channel, high flows spread out on a developed floodplain, the banks do not erode and suspended sediment drops out among the vegetation. The floodplains are developing along a defined channel. The vegetative production is improving and is already several times greater than the uncontrolled channel.

A potential potable water source exists in the SWNW Section 2, T. 12 N., R. 51 E. A flowing well at this location is presently providing approximately 4 gpm of water for livestock use. The specific conductance of the water is 1200 micromhos. This water appears to be adequate for human consumption. Further water quality tests need to be done before the water is put to use.

Geology:

The surface geologic formation through out most of the drainage is the Tongue River Member of the Fort Union Formation. The Lebo Member is on the surface near the mouth of the drainage.

The Tongue River Member is mostly light colored sandstone interbedded with light colored shale and coal beds of varying thickness. Clinker beds are common throughout the member which are formed from burning coal.

The surface formation at the reservoir site is the Lebo Member of the Fort Union Formation. The member is characterized by gray to dark-gray shale and carbonaceous shale with lenses of sandy shale of lighter color. Thin beds of lignite may also be present but the occurrence or thickness can not be predicted.

Much of the area near the mouth of the drainage and at the reservoir site is covered with Holocene gravels that were deposited as a result of the meanderings of the Yellowstone River or Cherry Creek itself.

Three dam sites were investigated within the area, attached. The investigations were to sample the geology of the area and to give a depth to the mapping done by Roger Colton, USGS, map 3.

A clay shale was found to underlie the entire site area. The total thickness was found to vary from 20 feet to 30 feet. This shale is very tight and was proven to be impervious.

Centered more or less in the clay shale is a 6 to 7 foot seam of lignite. In many areas the clay shale above the lignite has been eroded away and replaced with stream deposited sands and gravels.

Under the clay shale is a silt shale that varies in texture from a silt shale to a very fine sandy shale that is very soft and is saturated. The overlying clay shale does act as an aquiclude confining the water in the sandy shale. The piezometric surface was found to be 1 to 5 feet above the top of the sandy shale seam.

Gravels, sands and silts of terrace deposits and alluvium or colluvium from these two deposits overlie the clay shale. The material has been deposited, eroded and redeposited making the mapping of the subsurface very complex.

When considered for this project, all the material above the clay shale can be considered as permeable. This permeable material varies in thickness from a few feet in the stream bottom to as much as 25 feet on the surrounding benches.

Site 1

Location: T. 12 N., R. 51 E., Sec. 1 & 2

All figures are approximations

Structures: 2500 foot fill length
20 to 25 foot deep core

Reservoir: 309 surface acres
40 foot depth
5000 to 6000 acre feet capacity

At (A), see Illustration 1 and Map 3 and 4, the terrace deposits were approximately 35 feet thick with the lower 10 feet of this deposit being made up of silty clay. Below the terrace deposits was a silty clay shale that appeared to change with depth to more silts. The southeast portion of the small finger on which (A) was drilled is made up of terrace gravels to a depth greater than 40 feet.

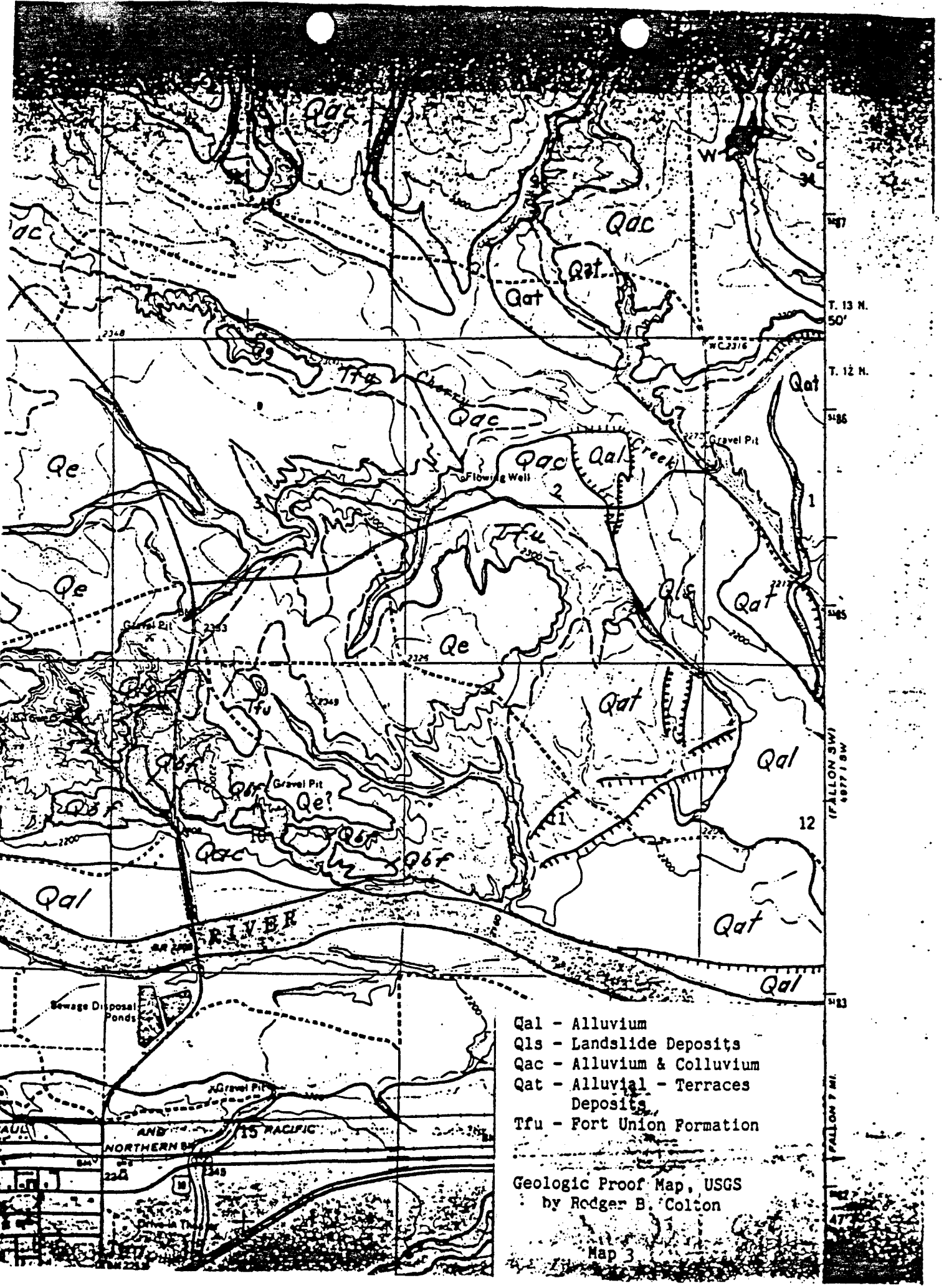
At (B) there was 23 feet of terrace gravels and colluvium which was made up of mostly sands and gravels with the bottom three feet being mostly silts and clays. Below the colluvium was a clay shale that was drilled for 12 feet without a noted change.

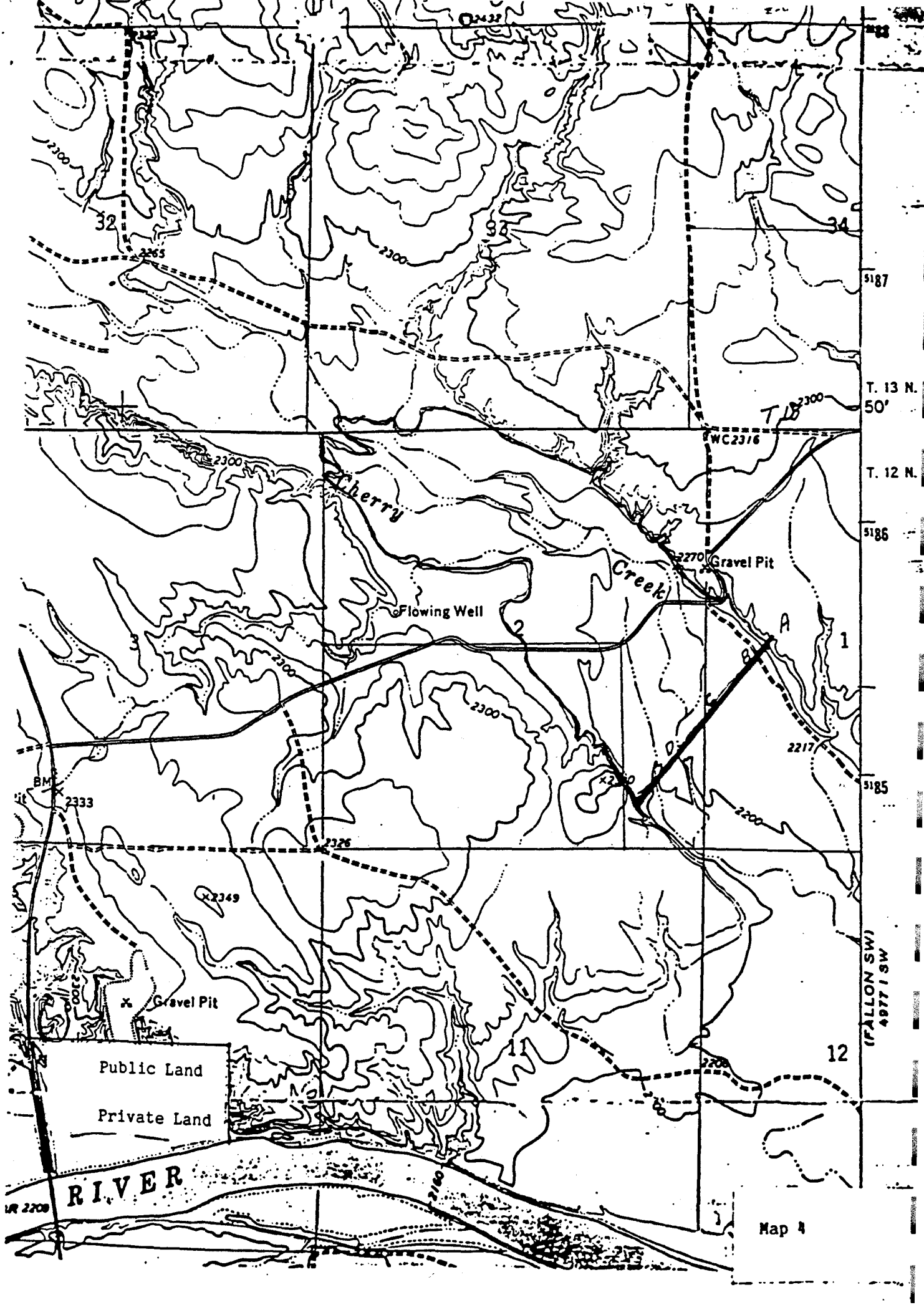
Hole (C) was drilled on the floodplain well back from the creek. The first 7 feet was alluvium that was sands and gravels with a high percentage of silts. Below the alluvium was 8 feet of clay shale that was dry which was notable because underlying it was a very fine sandy shale that was saturated. The sand appeared to become more dominate with depth and the strata also became very soft. This strata has been found elsewhere but appears to vary in the quantity of sands present. However, in all cases it was saturated if adequate quantities of sand were present. The piezometric surface of the water was somewhat above the top of the strata.

The bench to the southeast of C was also sampled and found to be made up of terrace gravels with large cobbles which prevented drilling below 18 feet.

Hole (D) was drilled in the stream channel and penetrated a total of 15 feet. The alluvial gravel was only 3.0 feet thick, below it was a silty clay grading to a lighter color. The colors were very similar to hole (C) but it did not contain the sand and it was not saturated.

The south end of the fill appeared to be colluvium underlain by mostly shales. The exact materials are not known because no holes were drilled at this location.


Qac
Qat
Tfu
Qe
Qal
Qls
Qbf
Qe?
Gravel Pit
Flowing Well
Creek
RIVER
Sewage Disposal Ponds
AND NORTHERN
PACIFIC
T. 13 N.
T. 12 N.
(FALLON SW)
FALLON 7 MI.
Qal - Alluvium
Qls - Landslide Deposits
Qac - Alluvium & Colluvium
Qat - Alluvial - Terraces Deposits
Tfu - Fort Union Formation
Geologic Proof Map, USGS
by Rodger B. Colton
Map 3


32
33
34
1
12
T. 13 N.
T. 12 N.
50'
5187
5186
5185
2300
2365
2333
2326
2349
2270
2217
WC2316
Cherry
Creek
Flowing Well
Gravel Pit
Gravel Pit
BM
Public Land
Private Land
RIVER
(FALLON SW)
4977 I SW
Map 4

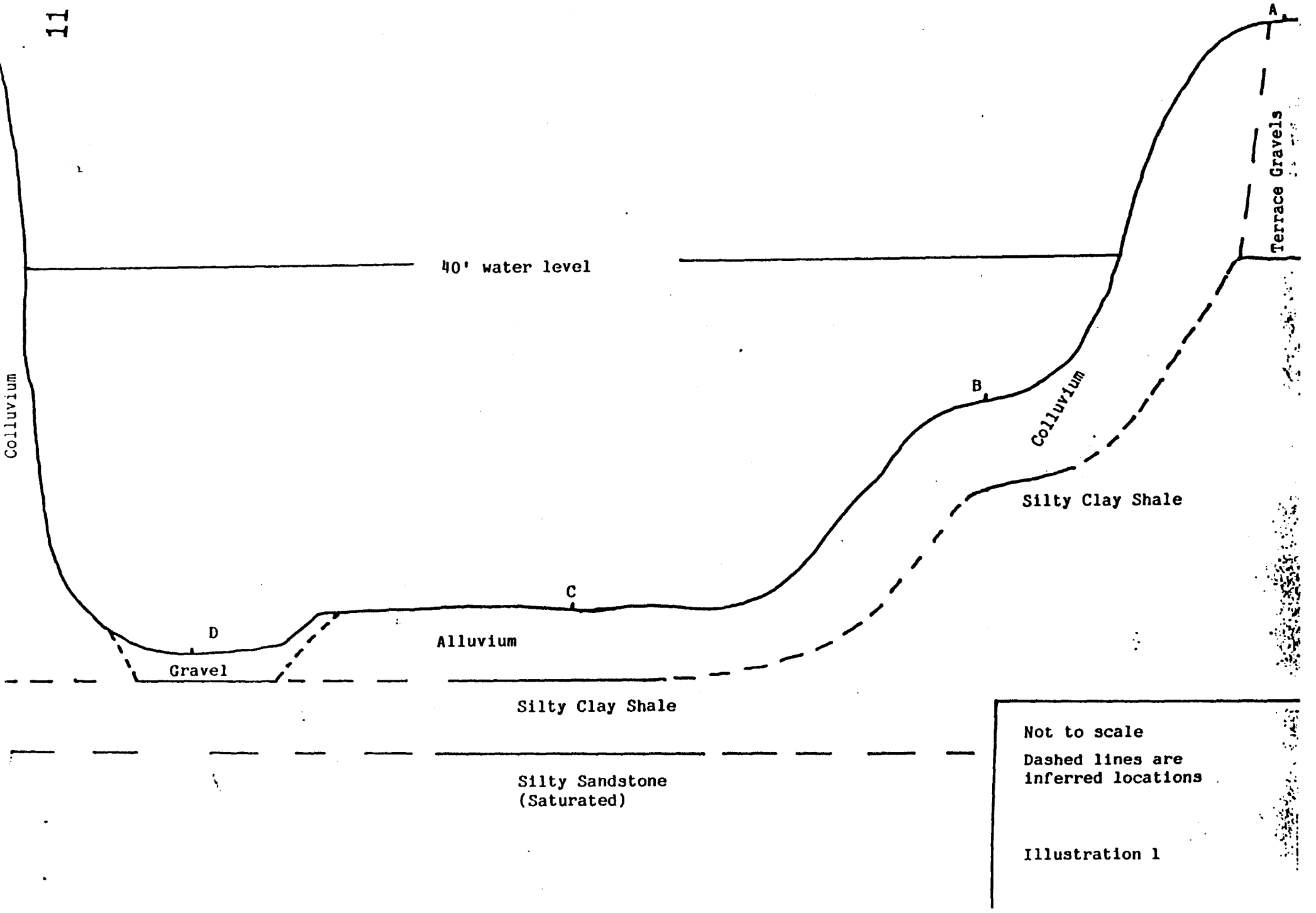


Illustration 1

Site 2

Location: T. 12 N., R. 51 E., Sec. 2

All figures are approximations

Structures: 50 foot high compacted fill dam
2900 foot fill length
20 to 25 foot deep core

Reservoir: 290 surface acres
43 foot depth pool level

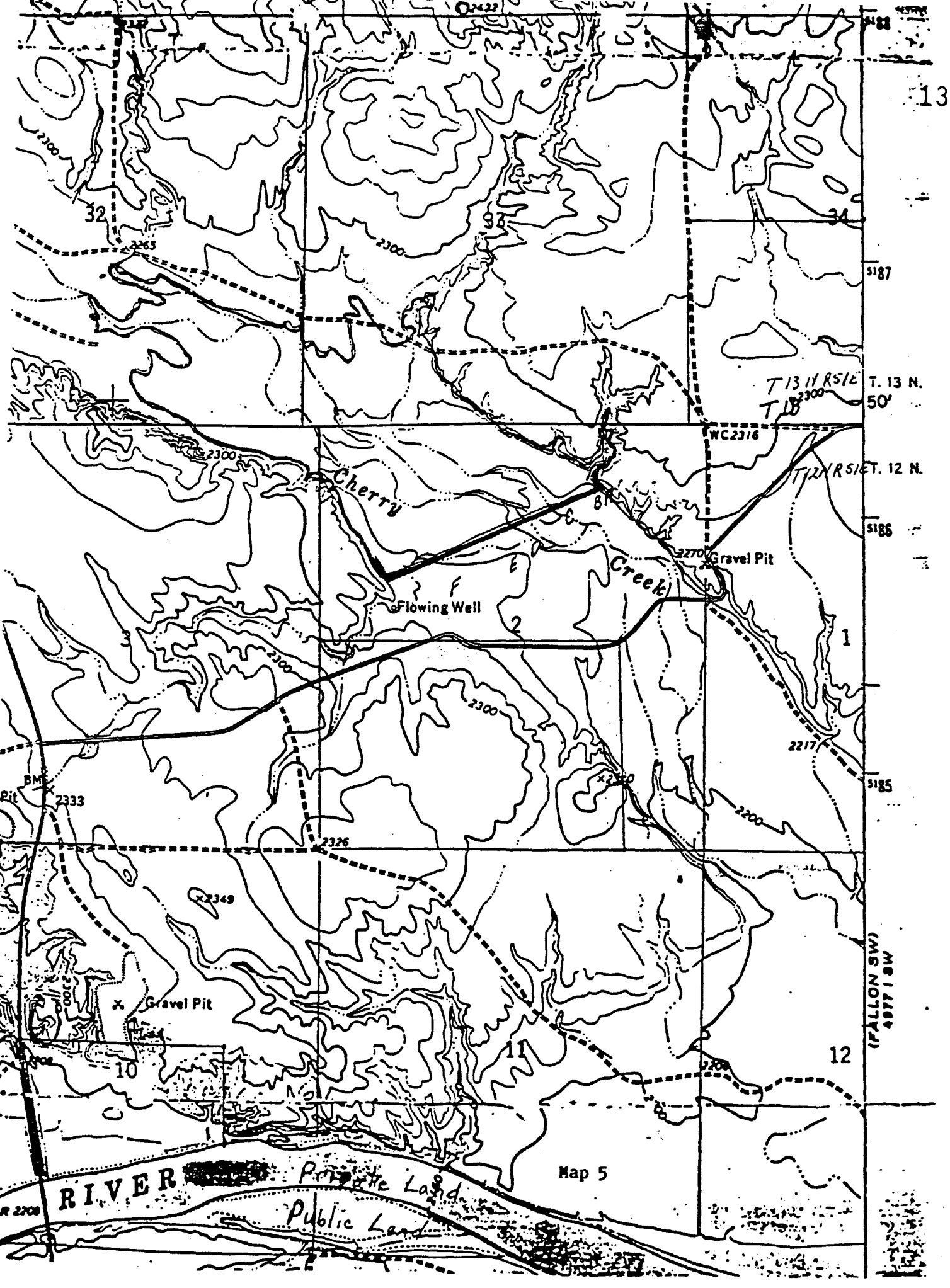
Northeast end of the fill (A), see map 3 and 5, also Illustration 2, will be cut into a vertical wall. From top to bottom, the materials are terrace gravels, silty very fine sandstone, 6 foot lignite seam, with clay at the base. At the base of the cliff (B) a 22 foot sample hole was drilled, material found was 5 feet of gravel over 2 feet of coal and 15 feet of clay shale.

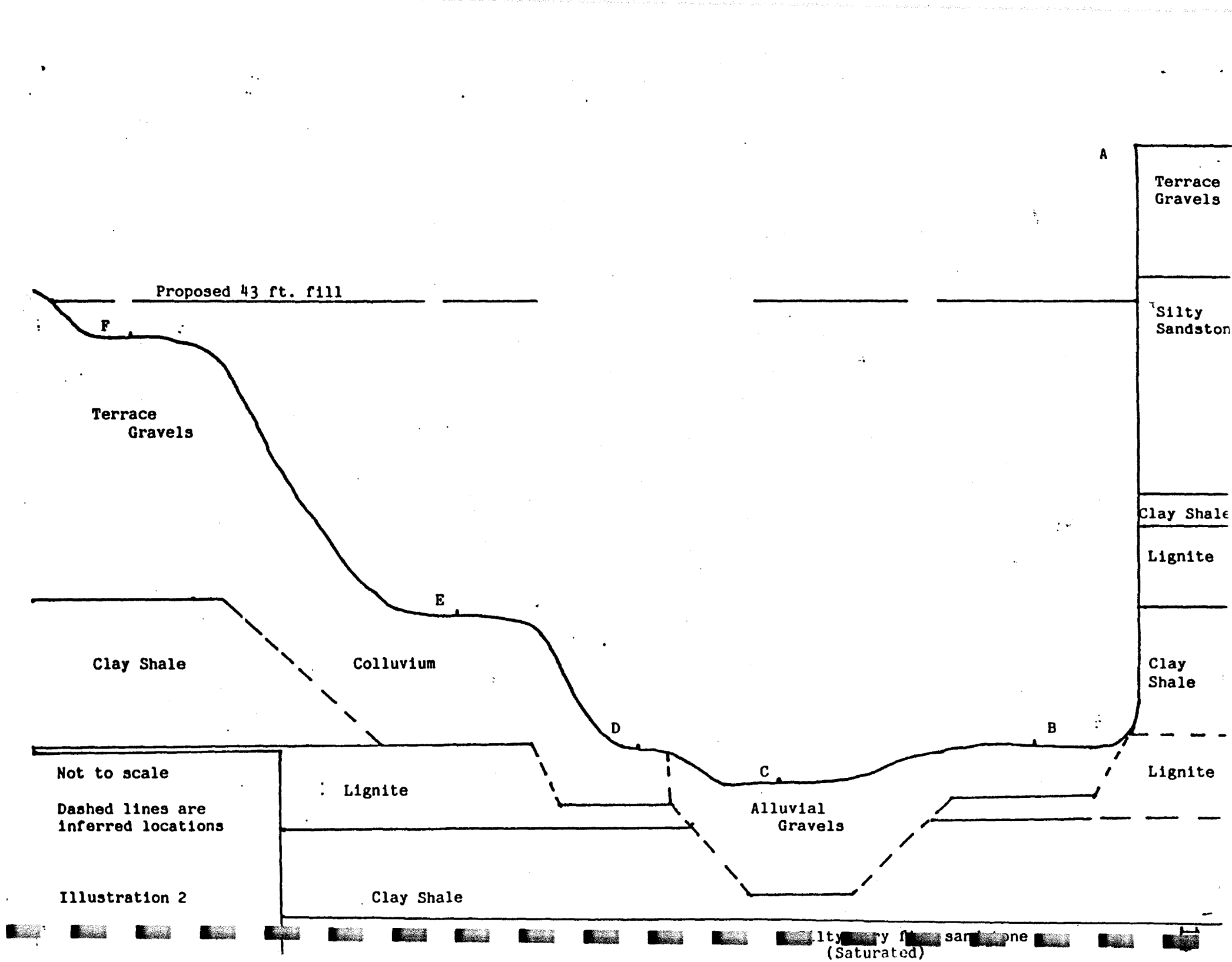
The creek bottom (C) contains 11 feet of alluvial gravel overlying a clay shale. Ground water was at 3 feet below the surface at this location.

The floodplain on the southwest side (D) of the drainage had 5 feet of alluvial gravel in contact with a 2 foot seam of coal which appears to be a remnant of a 6 to 8 foot seam. Under the coal was a clay shale. The clay shale would make an excellent borrow for the core of the dam.

The southwest side of the creek at (E) there is 12 feet of alluvium - colluvium which is in contact with a 7 foot coal seam that is underlain by 6 to 10 feet of clay shale. Under the clay shale is a blue gray to gray very fine sandy shale that is soft and saturated, in places. It appears from the limited data that this strata varies from a silty shale which appears only as damp to the sandy shale that is saturated. The water in the sandy shale appears to have a static head greater than the strata level, indicating the clay shale below the coal is an aquiclude

Near the southwest end (F) there was 25 feet of terrace gravels, 14 feet of clay shale, 7 feet of coal over clay shale.


T 13 N R 31 E
T. 13 N.
T 12 N R 31 E
T. 12 N.
Cherry Creek
Flowing Well
Gravel Pit
Gravel Pit
WC 2316
Map 5
Private Land
Public Land
RIVER
(FALLON SW)
(FALLON SW)


A
Terrace Gravels
Proposed 43 ft. fill
F
Silty Sandston
Terrace Gravels
Clay Shale
Lignite
E
Clay Shale
Colluvium
Clay Shale
D
B
C
Lignite
Not to scale
Dashed lines are inferred locations
Lignite
Alluvial Gravels
Illustration 2
Clay Shale
(Saturated)

Site 3

Location: T. 13 N., R. 51 E., Sec. 32 and 33

All figures are approximations

Structures: 4185 foot fill length
20 to 25 foot deep core

Reservoir: 354 surface acres
40 foot depth
5000 to 7000 acre feet capacity

The fill, see map 3 and 6, plus illustration 3 was located in the tributary channel way because the upland to the southeast of A, is made up of Terrace gravels which is at least 20 feet deep and contains very large cobbles. Further investigations may show that the gray shale underlying the gravels are of sufficient altitude to make borrowing out the gravels and placement of core material cheaper than constructing the proposed fill.

Exposed in the cut bank along the drainage way at A, is a sandy silt shale over a clay shale. The depth of the alluvium at A in the tributary creek bottom is not known but is thought to be quite shallow.

At B is a silty clay 6 feet in depth that has been deposited along the north side of the drainage by tributary streams. The material has been derived from the Fort Union formation, Lebo Member and does not contain a great deal of sand or gravel. This material could be used in the fill but not as core material. Below the silty clay was 10 feet of alluvium and colluvium consisting of mostly sands and gravels. Underlying the alluvium and in contact with it was 3 to 5 feet of lignite. Under the lignite was a clay shale that was drilled to a depth of 8 feet without a change in texture.

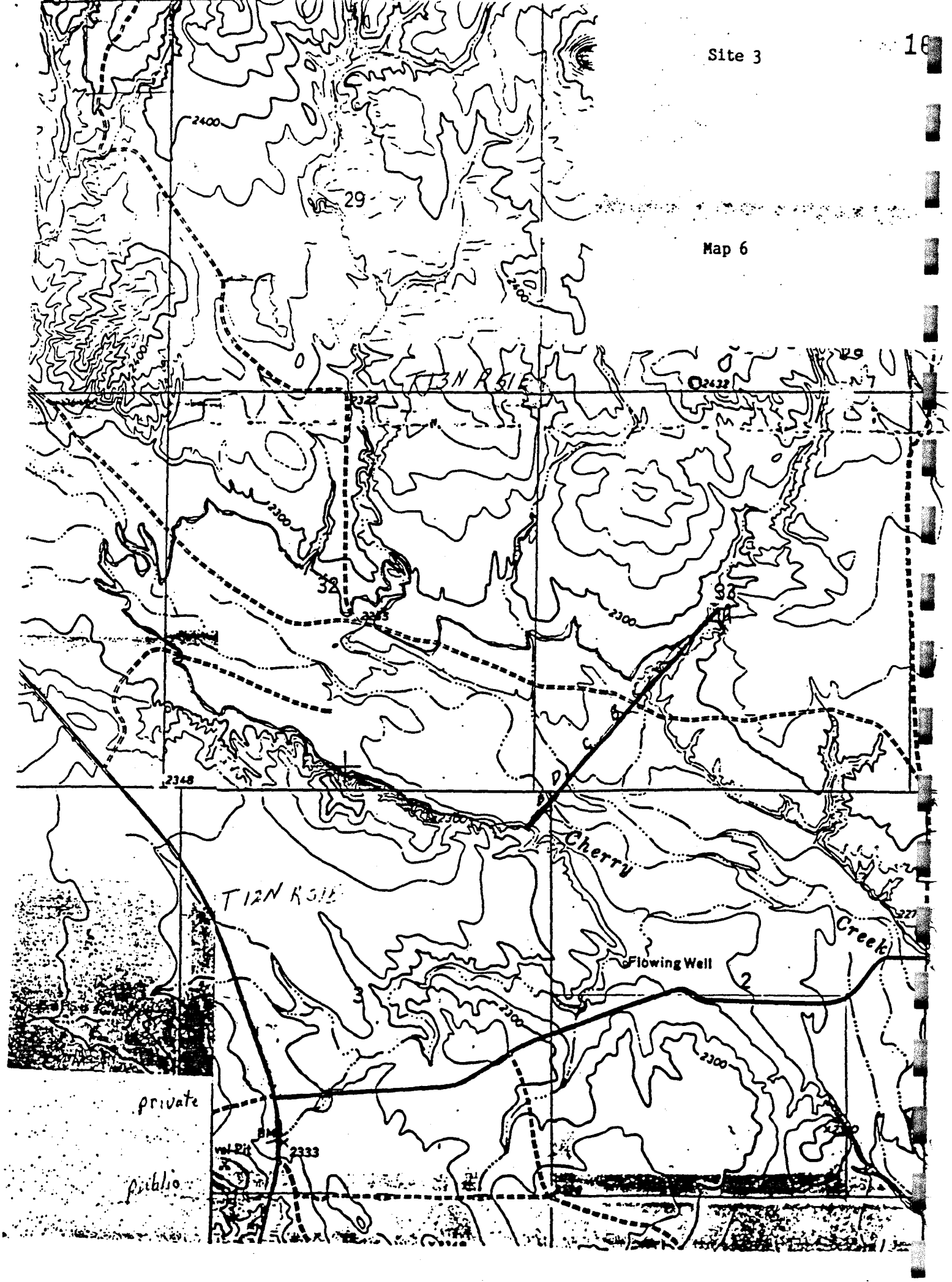
Similar material to "B" was found at "C" except there was more sand and gravel present, which made this material unusable for any part of the fill. As in "B" the alluvium - colluvium was in contact with the lignite. Under the lignite and 28 feet from the surface was the clay shale.

The hole at "D" did not have a great deal of alluvium on the surface. There was 6 feet of gravel overlying a clay shale. However there was only 5 feet of clay shale over a 6 to 7 foot thick lignite seam. Clay shale was under the lignite.

The gravel at E was only 4 feet thick and was separated from the underlying coal by 1 to 2 feet of clay shale. The clay shale explains why the lignite was not saturated by the water from the creek channel. Under the lignite was a thin layer of clay shale which quickly changed to a very soft sandy shale that was 5 feet thick and saturated. A clay shale was under the sandy shale. Water level in the open hole was at 14 feet indicating the water was confined in the sand shale by the surrounding clay shale.

Site 3

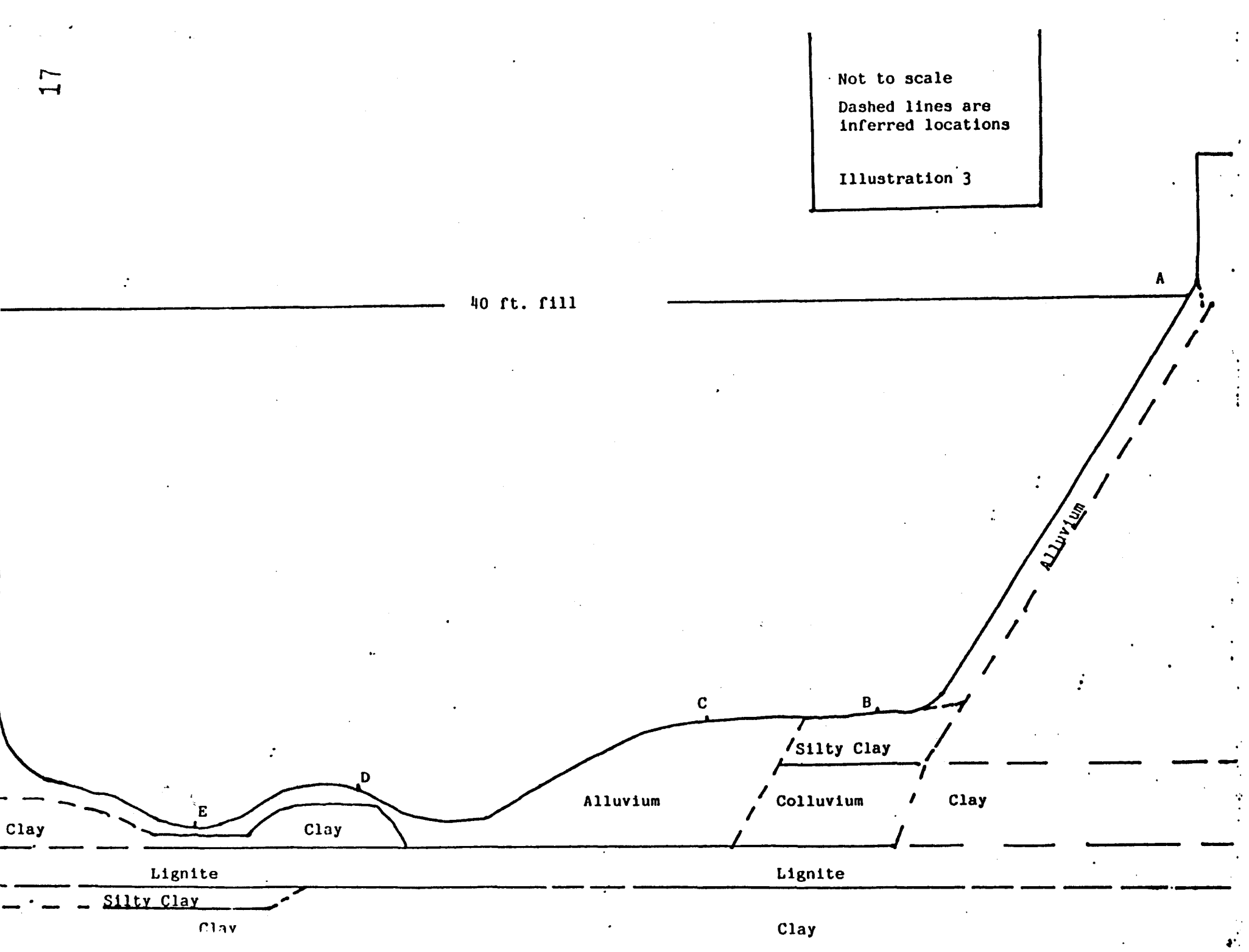
Map 6


T12N R5E
T12N R5E
29
32
32
2400
2300
2348
2333
Cherry
Creek
Flowing Well
private
public

Not to scale

Dashed lines are inferred locations

Illustration 3



Animals - Terrestrial

The area of the proposed project is grazed by livestock from two allotments. Some mule deer, antelope and a few whitetailed deer use the creek bottom and the uplands boardering the drainage. Sage grouse, sharptailed grouse and a few Hungarian partridge are found in the area. Golden eagles and various other raptors hunt throughout the area. Jackrabbits and cottontails are the main prey species. Bald eagles winter on the Yellowstone River within two miles of the proposed development. No other threatened or endangered species are known to occur in the project area. Ducks, geese and sandhill cranes migrate through the area in both fall and spring. The lack of significant standing water and the lack of significant vegetative cover throughout the proposed project area results in no significant use by any wildlife species.

Animals - Aquatic

The following fish species are known to occur in the streams in the Cherry Creek drainage:

Common Name	Scientific Name
Creek Chub	Semotilus atromaculatus
Flathead Chub	Hybopsis gracilis
Lake Chub	Couesius plumbeus
Sand Shiner	Notropis stramineus
Brassy Minnow	Hybognathus hankinsoni
Plains Minnow	Hybognathus placitus
Silvery Minnow	Hybognathus nuchalis
Fathead Minnow	Pimephales promelas
Longnose Dace	Rhinichthys cataractae
White Sucker	Catostomus commersoni
Plains Killifish	Fundulus kansae
Green Sunfish	Lepomis cyanellus

The following fish species are known to have been planted in ponds in the Cherry Creek drainage:

Common Name	Scientific Name
Rainbow Trout	Salmo gairdneri
Northern Pike	Esox lucius
Black Bullhead	Ictalurus melas
Smallmouth Bass	Micropterus dolomieui
Largemouth Bass	Micropterus salmoides
White Crappie	Pomoxis annularis
Black Crappie	Pomoxis nigromaculatus
Walleye	Stizostedion vitreum
Saugeye	Stizostedion canadense/vitreum

Yellow perch (Perca flavescens) were illegally introduced into two ponds in the drainage, but are no thought to be absent.

CULTURAL

There has been a very limited amount of cultural resource inventory in the immediate area of the proposed project. There are two known sites in the general area; both need to be evaluated as to their eligibility for the National Register. Any other sites located in the area are unknown. Site potential for the area is high for lithic scatters, bison kills, occupations and historic sites. Complete cultural inventories would have to be conducted throughout the project area.

RECREATION

Recreational use in the project area consists of big game and upland game hunting and rock hounding, mainly looking for agates and petrified wood. Hunting is mainly drive through road hunting. The lack of any concentration of game animals in the area accounts for the minimum of use that the area gets. The area does get limited but regular summer use by rock hounds.

SOCIOECONOMIC

Within a 60 mile radius of the proposed reservoir there is a population of about 33,000 people, covering the towns of Terry, Glendive, Miles City, Baker, Wibaux, and Circle.

There are approximately 5,600 fishing license holders in that population base; that does not include youngsters and people fishing on just a conservation license.

Projecting a maximum depth of approximately 40 feet, this reservoir would be the largest and deepest reservoir within 70 airmiles of Terry, 80 from Glendive and 90 from Miles City. Both Glendive and Miles City are 39 miles on Interstate 94 from Terry.

Clark Reservoir, 40 acre trout pond about 30 miles northwest of Terry receives an average of 1500 angler day trips a year. Castle Rock Lake, outside of Colstrip, is 165 acres and averages 5,000 angler day trips a year.

ENVIRONMENTAL CONSEQUENCES

Lands

Some private lands would be impacted by inundation, construction and recreational use if the dam were built. Construction of the project and use of the reservoir would be least complicated if the entire land base were owned by BLM. Options for this goal are described in the earlier lands section.

Grazing lands will be lost to the structure, the impoundment and to some fencing. Grazing lease adjustments will be necessary in at least one and possibly two pastures, affecting one or two leasees. Fencing design and stock watering sites must be worked out with the leasees by BLM.

Soils

Some soils will be lost to upland vegetative production due to inundation. These same soils have the potential to produce aquatic vegetation. Other soils within the construction zone will be subject to short-term compaction and displacement during the dam construction phase. Also it is anticipated that some short-term stockpiling of soil materials will occur, subjecting these soils and other soils left without a vegetative cover, to water and wind erosion. Reseeding of these disturbed areas (excluding the inundated zone) during the immediately after construction would accelerate recovery of ground cover values and help mitigate erosive impacts to soils.

Hydrology

The presence of a reservoir at the proposed site will have little effect on the watershed above the site. The reservoir will check the present down cutting of the stream channel stabilizing the stream channel gradient at the spillway elevation. This will prevent a downward adjustment of the gradient from advancing through the drainage.

The greatest benefit will be derived below the reservoir. The control of high flows will help to stabilize the present channel erosion providing an opportunity for the bank vegetation to become established. The vegetative production would increase several times and provide a long term stablization of the stream channel.

The water discharged from the reservoir will be of better quality than the present water. This should increase the number of vegetative species along the channel and increase the vigor of those present. The water discharged to the Yellowstone River will also be improved as to the quantity of total dissolved solids and suspended sediments.

It is uncertain at this time if the drainage would provide adequate quantities of water to sustain 4000 to 7000 acre-foot reservoir. It would most likely sustain a 4000 acre-foot reservoir but one of 7000 acre-foot may be too large. Further investigations into the water yield of the drainage is necessary to determine the maximum size the drainage could support. The yield of the drainage should determine the reservoir size as there is a potential for a 12,000 acre foot reservoir at this location.

The reservoir should be protected from intensive grazing to promote maximum growth of vegetation at the water line to protect the shore from wave erosion. This is especially important on the dam face.

The potential potable water source needs to be further evaluated before being utilized. It would also require periodic checking if developed, to be certain it is not a health hazard.

Geology

Further investigations need to be accomplished to establish that the terrace and alluvial deposits can be adequately cored to prevent seepage. The lignite beds also need to be investigated to determine what affect they will have on the feasibility of the site.

Animals - Terrestrial

Grazing allotment leases on two allotments would have to be adjusted as noted in the Lands Section.

Although various wildlife species would be displaced during construction and by the new reservoir, none of the area is critical or of high value to any resident or transient species. Once the reservoir is filled, it will have significant positive impacts on both resident and migrating wildlife. The vegetative response to additional available moisture and to the protection from grazing within the fenced areas, should be rapid and substantial. Ground cover should increase significantly; tree and shrub growth should provide a diversity not found currently in the area. Transient waterfowl can be expected to use the new reservoir each fall and spring. Although some waterfowl will nest in the habitats provided, they will have conflicts with recreational users in the spring. Minimal waterfowl production is expected on the fishery reservoir.

Animals - Aquatic

Because of the presence of a wide variety of fish species in the drainage and the expectation that some of them will find their way into the reservoir, a warmwater fishery with large predators is preferrable over a trout fishery which would eventually need to be rehabilitated to reduce rough fish. To allow initial plants of game fish and forage species in the new reservoir to develop without severe competition from undesirable species, about 70 miles of intermittant streams in the Cherry Creek drainage should be rehabilitated prior to the filling of the reservoir. Using Rotenone, a fish toxicant, in standing pools during summer months, a four person crew could do the work in about a week.

Most fish species below impoundments in the headwaters of the drainage, down to the mouth of the creek would be killed. The mouth of the creek would be reinhabited by species from the Yellowstone River within one year of the poisoning.

As soon as the reservoir starts to fill, the dam would be planted with fathead minnows and crayfish as a forage base. Over the next few years in succession, crappie fry, walleye fry, smallmouth bass fingerlings and walleye fingerlings would be planted. This should allow a progressive development of both forage and predator species. The management of the fish species in the reservoir would be a cooperative effort of the BLM and the Montana Department of Fish, Wildlife and Parks.

Cultural

Any cultural sites within the body of the reservoir would be inundated. They could be surveyed and/or removed prior to filling of the reservoir. Cultural sites near the project would be subjected to increased human activity; protective measures could be required.

Recreation

Recreation in the project area and throughout eastern Montana is primarily extensive in nature. Construction of a substantial reservoir will create an intensive use site. The following are some of the activities which can be expected to be associated with this project:

Fishing
Hunting - big game, upland game, waterfowl
Rock hounding
Driving for pleasure
Winter sports - ice fishing, snow machines, cross county skiing
Overnight camping
Day use activities - picnic, education, photography, bird watching, etc.
Events - derbys, parties, group camping
Water sports - boatings, canoeing, skiing

The following development ideas need to be considered to protect the existing resource values and enhance the recreational experience of the expected users:

Initiate a wasp (safety) inspection
Establish where the main extrance will be
Zone the shoreline to define areas of non-development
Locate boat ramp
Identify intensive use and development areas
Define fencelines to separate recreationists from livestock
Create vegetative landscape plan
Initiate an ORV plan and sign area
Develop MOU or COOP agreement with other agencies to define management obligations.

Socioeconomic

The proposed construction of a 3.5 million dollar dam will involve about 2,500,000 cubic yards of fill and 2,800 cubic yards of concrete. Approximately 60 to 80 man-years of direct on-site employment would be associated with the dam. This estimate is based on engineering considerations and the work force for a similar dam construction in Colstrip in 1987. This estimate will change due to specific design considerations such as the length of haul for fill.

There are approximately 1,000 construction workers in the six-county area, with 90% of them in Custer and Dawson County. If the dam were constructed in just one year, it might involve 8% of the six-county construction force.

Regional income is difficult to estimate at this stage in the project. However, direct income associated with the construction workers may be 1/2 of the project cost. Indirect employment and income may be almost as high, but will be determined by the spending patterns of the construction workers. These patterns will be largely determined by the residence of the construction workers.

Prairie county would receive the property tax revenues associated with construction equipment.

Once the reservoir is an established fishery, the economic effects will involve the retail trade sector. If we assume that 1/3 of the 7,500 annual fishing days are simply transferred from other regional fisheries, there would be 5,000 additional fishing days annually in the region. The effect on the retail trade sector will be determined by the spending patterns associated with these visitor days. If all 5,000 fishing day were associated with visitors from outside Prairie County and these people spent $25 per day, then there would be $125,000 additional annual expenditures in the county, primarily in Terry. These retail sales could be absorbed by the existing 85 employees associated with restaurants, gas stations and other retail sale establishments in Prairie County.

The effects on regional economic activity would be small enough so as not to change the economic structure of the 6 county area, but would cause a significant increase in regional income. The economic effect of the fishery would be noticeable, but not so large as to create new business establishments in the area. However, some new services related specifically to fishing and boating might be added to established businesses.

A significant benefit not quantified economically is the creation of a major fishery that is not currently available to the 30,000 people of the region.

MANAGEMENT STRATEGIES

Construction Phase

The construction phase will be used to enhance the reservoir as a fishery. The ground cover throughout much of the reservoir would be removed to expose shale materials which will be needed for construction. That will consist of 5 to 25 feet of overburden to be stockpiled.

Erodable bluffs against which waves will break can be sculptured, and stockpiled gravels can be used to cover and protect the slopes.

Where possible, shallow areas along the shores should be minimized by excavation to deepen the near-shoreline and reduce the subsequent growth of aquatic vegetation.

Stockpiled gravels can be used to cover shorelines and "wave-break" areas in order to provide potential spawning sites.

Stockpiles gravels can also be used as riprap on the finished enbankment or as filler for gabions used to provide a wave break for the dam.

Excess stockpiled overburden materials can be used to construct a reef in the reservoir for fish habitat. The material could also be used to construct one or two strategically placed islands which would breakup wave activity in the reservoir.

Late in the construction phase but before the reservoir starts to fill, there would be an opportunity to develop some fish habitat structures on the bottom of the reservoir. These structures could include stakebeds, trees in concrete, tires in concrete or other innovative structures. This type of project would be coordinated with some public interest group such as Walleyes Unlimited or the Boy Scouts.

Complimentary Activities

Depending on the placement of the dam, there may be an opportunity to build a waterfowl enhancement structure in Section 31, upstream from the fisheries dam. The cost and construction for that structure would be left entirely to an organization such as Ducks Unlimited. It would be a lowhead dam designed to catch heavy flows, acting as a silt trap. It would allow seepage and overflow to come into the fisheries reservoir. It would be a waterfowl marsh with nesting islands. It would compliment the open water waterfowl habitat on the fishery reservoir.

Preparers/Contributors

Lands - Brian Lynnes
Soils - Marty Griffith
Hydrology and Geology - Dex Hight
Animals - Mark Gorges
Cultural - Mary Bloom
Recreation - Ladd Coates
Socioeconomic - Chris Roholt
Initial Engineering Estimates - Ron Butler

ATTACHMENT 4

FASE ONE — RANGELAND INVESTMENT ANALYSIS — DATE:01/27/89
TIME:13.739

STATE: MT
DISTRICT: MC — ALLOT NO: 2755 — PROGRAM IDENT:E
RESOURCE AREA:BD — ALLOT NAME: KUKOWSKI — BASE YEAR:1987

DATA PREPARED BY:X — -RANGE CONS. — GORGES — -WILDLIFE BIOL.
X — -X — X — -X

EXISTING PROGRAM COST DATA

STRUCTURAL PROJECTS	UNITS		TOTAL ANNUAL MAINT. COST		
SPRINGS	0.	NO	$	0	0%BLM
RESERVOIRS	0.	NO	$	0	0%BLM
WELLS	0.	NO	$	0	0%BLM
PIPELINES	0.	MI	$	0	0%BLM
FENCES	0.	MI	$	0	0%BLM
CATTLEGUARDS	0.	NO	$	0	0%BLM

NONSTRUCTURAL PROJECTS		NUMBER OF UNITS BY AGE GROUP						LIFE SPAN (YRS)		TOTAL REPLACEMENT COST	%BLM
		1-5	6-10	11-15	16-20	21-25	+ 25				
MECH.CTRL.	AC	0	0	0	0	0	0	0	$	0	0
CHEM.CTRL.	AC	0	0	0	0	0	0	0	$	0	0
BURNING	AC	0	0	0	0	0	0	0	$	0	0
SEEDING	AC	0	0	0	0	0	0	0	$	0	0

EXISTING PROGRAM BENEFIT DATA

ANNUAL OUTPUTS	BASE LEVEL	FIRST LEVEL		SECOND LEVEL		THIRD LEVEL		FOURTH LEVEL	
		UNITS	YR	UNITS	YR	UNITS	YR	UNITS	YR
LIVESTOCK (AUMS)	40	0	0	0	0	0	0	0	0
DEER (HUNTING DAYS)	3	0	0	0	0	0	0	0	0
ELK (HDS)	0	0	0	0	0	0	0	0	0
ANTELOPE (HDS)	5	0	0	0	0	0	0	0	0
OTH.BIG GAME (HDS)	0	0	0	0	0	0	0	0	0
WATERFOWL (HDS)	0	0	0	0	0	0	0	0	0
UPLAND&SMALL GAME	2	0	0	0	0	0	0	0	0
WARM WATER (ADS)	0	0	0	0	0	0	0	0	0
COLD WATER (ADS)	0	0	0	0	0	0	0	0	0
DEVLPD SITE (RDS)	0	0	0	0	0	0	0	0	0
DISPERSE USE (RDS)	5	0	0	0	0	0	0	0	0
NONGAME WLIF (RDS)	2	0	0	0	0	0	0	0	0
SOIL AND WATER ($)	0	0	0	0	0	0	0	0	0

100% OF LIVESTOCK AUMS ARE AVAILABLE BETWEEN 1/ 1 & 12/31 AT THE FINAL LEVEL

PAGE TWO ALLOTMENT NUMBER:2755 ALLOTMENT NAME:KUKOWSKI

DATA PREPARED BY:X -RANGE CONS. SOPGEE -WILDLIFE BIOL.
X -X X -X

ALTERNATIVE PROGRAM COST DATA PROGRAM IDENT: P

STRUCTURAL PROJECTS	NEW UNITS		CONSTRUCTION COSTS BY YEAR --1--	--2--	--3--	--4--	--5--	%BLM	MAINTENANCE SEG YR	ANN COST	% BLM	REPLACEMT LIFE	REPLACEMT COST
SPRINGS	0.	NO	0	0	0	0	0	0	0	0	0	0	0
RESERVOIRS	1.0	NO	999999999999	0	0	0	50	10	200	100	50	999999	
WELLS	0.	NO	0	0	0	0	0	0	0	0	0	0	0
PIPELINES	0.	MI	0	0	0	0	0	0	0	0	0	0	0
FENCES	6.0	MI	0	0	50000	0	0	50	5	50	100	50	50000
CATTLEGUARDS	1.0	NO	0	0	5000	0	0	50	5	50	100	50	5000
RESSITE	1.0	NO	0	0	50000	0	0	25	5	100	25	50	50000

NONSTRUCTURAL PROJECTS	NEW UNITS		CONSTRUCTION COST BY YEAR --1--	--2--	--3--	--4--	--5--	%BLM	REPLACEMENT LIFE	COST	%BLM
MECH.CTRL.	0	AC	0	0	0	0	0	0	0	0	0
CHEM.CTRL.	0	AC	0	0	0	0	0	0	0	0	0
BURNING	0	AC	0	0	0	0	0	0	0	0	0
SEEDING	0	AC	0	0	0	0	0	0	0	0	0
BULLDOZE	400	AC	999999	999999	893000	0	0	50	99	0	0

MANAGEMENT COSTS:
- - - -INITIAL- - - - - - - -ANNUAL- - - -
OPERATOR 200 DAYS - $ 24000 100 DAYS - $ 12000
BLM 400 DAYS - $ 48000 100 DAYS - $ 12000

ALTERNATIVE PROGRAM BENEFIT DATA

ANNUAL OUTPUTS	BASE LEVEL	FIRST LEVEL UNITS	YR	SECOND LEVEL UNITS	YR	THIRD LEVEL UNITS	YR	FOURTH LEVEL UNITS	YR
LIVESTOCK (AUMS)	40	0	2	0	0	0	0	0	0
DEER (HUNTING DAYS)	5	70	5	0	0	0	0	0	0
ELK (HDS)	0	0	0	0	0	0	0	0	0
ANTELOPE (HDS)	5	45	5	0	0	0	0	0	0
OTH.BIG GAME (HDS)	0	0	0	0	0	0	0	0	0
WATERFOWL (HDS)	0	90	5	0	0	0	0	0	0
UPLAND&SMALL GAME	1	45	5	0	0	0	0	0	0
WARM WATER (ADS)	0	5000	3	10000	5	0	0	0	0
COLD WATER (ADS)	0	0	0	0	0	0	0	0	0
DEVLPD SITE (RDS)	0	600	3	2000	5	0	0	0	0
DISPERSE USE (RDS)	5	100	2	200	5	0	0	0	0
NONGAME WLDF (RDS)	2	100	2	200	5	0	0	0	0
SOIL AND WATER ($)	0	0	0	0	0	0	0	0	0

0% OF LIVESTOCK AUMS ARE AVAILABLE BETWEEN 1/ 1 & 12/31 AT THE FINAL LEVEL

RANGELAND INVESTMENT ANALYSIS SUMMARY

DATE:01/27/89
TIME: 13.739

STATE: MT
DISTRICT: MC
RESOURCE AREA: SD

ALLOT NO: 2755
ALLOT NAME: KUKOWSKI

PROGRAM IDENT: F
BASE YEAR: 1987

ANNUAL YIELD, UNIT VALUES, AND PRESENT VALUES (8.875%)

OUTPUT CATEGORY	UNIT	BASE YIELD	SUSTAINED YIELD W/O	SUSTAINED YIELD WITH	UNIT VALUES	PRESENT VALUE OF CHANGE
LIVESTOCK FORAGE(AVERAGE)	AUM	0	0	0	8.49	0
LIVESTOCK FORAGE (SEASONAL)	AUM	40	40	0	8.49	-3459
DEER HUNTING	HDS	3	3	70	33.30	32141
ELK HUNTING	HDS	0	0	0	66.00	0
ANTELOPE HUNTING	HDS	3	3	45	62.00	22296
OTHER BIG GAME HUNTING	HDS	0	0	0	61.00	0
WATERFOWL HUNTING	HDS	0	0	90	38.00	30748
UPLAND & SMALL GAME	HDS	2	2	45	35.00	13530
WARM WATER ANGLING	ADS	0	0	10000	70.00	2913429
COLD WATER ANGLING	ADS	0	0	0	102.00	0
DEVELOPED SITE RECREATION	RDS	0	0	2000	13.00	115682
DISPERSED USE RECREATION	RDS	5	5	200	8.00	14416
NONGAME WILDLIFE VIEWING	RDS	2	2	200	16.00	29721
SOIL AND WATER	$'S	0	0	0	1.00	0

INVESTMENT COST SUMMARY (8.875%)

PROJECTS	CONSTR.COST ACTUAL	CONSTR.COST DISCNTD	REPLCMT COST DISCNTD	MAINTENANCE ANN. COST	MAINTENANCE TOTAL DISCNTD	DISCOUNTED COST ELM	DISCOUNTED COST OTHER	DISCOUNTED COST TOTAL
STRUCTURAL PROJECTS								
SPRINGS	0	0	0	0	0	0	0	0
RESERVOIRS	1999998	1742097	13673	200	852	883737	887588	1771611
WELLS	0	0	0	0	0	0	0	0
PIPELINES	0	0	0	0	0	0	0	0
FENCES	50000	38742	669	50	303	20009	19706	39714
CATTLEGUARDS	5000	3874	67	50	303	2273	1971	4244
RESITE	50000	38742	669	100	605	10004	30013	40017
NONSTRUCTURAL PROJECTS								
MECH.CTRL.	0	0	0	0	0	0	0	0
CHEM.CTRL.	0	0	0	0	0	0	0	0
BURNING	0	0	0	0	0	0	0	0
SEEDING	0	0	0	0	0	0	0	0
BULLDOZE	2894992	2455584	0	0	0	1227792	1227792	2455584
MANAGEMENT COSTS								
INITIAL						44067	22064	66131
ANNUAL						122264	122264	244527
TOTAL	4999990	4299039	15079	400	2063	2315166	2311673	4626839

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RANGELAND INVESTMENT ANALYSIS SUMMARY

DATE:01/27/89
TIME: 13.739

STATE: MT
DISTRICT: MC
RESOURCE AREA: BD

ALLOT NO: 2755
ALLOT NAME: KUKOWSKI

PROGRAM IDENT: P
BASE YEAR: 1987

EFFICIENCY TEST RESULTS

EFFICIENCY RATIOS		DISCOUNTED VALUES			
DISCOUNT RATE	BENEFIT/ ALL COST	BENEFIT/ BLM COST	PRESENT NET VALUE(B-C)	TOTAL BENEFIT	TOTAL COST	BLM COST	OTHERS COST
4.000%	2.1 / 1	5.3 / 1	5826148	14203868	5377721	2689192	2688529
8.875%	1.4 / 1	2.9 / 1	2031843	4658687	4626839	2315166	2311673
10.000%	1.3 / 1	2.6 / 1	1290506	5805495	4514689	2259230	2255459

INTERNAL RATE OF RETURN

TOTAL COST	BLM COST	OTHER COST
12.9%	24.7%	24.1%

50-YEAR UNDISCOUNTED EXPENDITURES

	BLM	OTHER	TOTAL
EXPENDITURES:	3654273	3668823	7323096
COST/ADD AUM:	-1364.13	-1371.55	-2735.67

BLM BUDGET COSTS FOR FIRST FIVE YEARS

	NEW FACILITIES & MANAGEMENT				EXISTING FACILITIES		TOTAL
YEAR	CONST.	O. & M.	MGT.	TOTAL	O. & M.	REPLCMT.	COST
1	999999	0	48000	1047999	0	0	1047999
2	999999	0	12000	1011999	0	0	1011999
3	487500	0	12000	499500	0	0	499500
4	0	0	12000	12000	0	0	12000
5	0	0	12000	12000	0	0	12000
TOTAL	2487498	0	96000	2583498	0	0	2583498

COSTS TO OTHERS	
CONSTRUCTION TOT.:	******

AVERAGE ANNUAL COST	
OPER.&MAINTENANCE:	65
ANNUALIZED REPLMT:	10621
LIVESTOCK MANGMNT:	12240
TOTAL ANNUAL COST:	23126

DATA PREPARED BY

	EXISTING PROGRAM		ALTERNATIVE PROGRAM	
	X	-RANGE CONSV.	X	-RANGE CONSV.
	GORGES	-WILDLIFE EIS	GORGES	-WILDLIFE EIS
	X	-X	X	-X
	X	-X	X	-Y

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(NOTE: ROW AND COLUMN TOTALS MAY NOT SUM CORRECTLY DUE TO ROUNDING.)

END OF DETAILED PRINTOUT

VISITOR'S REGISTER

Natural Resources SUBCOMMITTEE

AGENCY(S) _____ DATE 3-6-89

DEPARTMENT _____

NAME	REPRESENTING	SUPPORT	OPPOSE
Gary Fritz	DNRC	✓	
Dave Hall	FWP		
Ray McCoy			
Betty Lou Hanten	Dist 58	✓	
Dave Cook	Dist. #25	✓	

IF YOU CARE TO WRITE COMMENTS, ASK SECRETARY FOR WITNESS STATEMENT.
IF YOU HAVE WRITTEN COMMENTS, PLEASE GIVE A COPY TO THE SECRETARY.

FORM CS-33A
Rev. 1985