

Office Memorandum •

STATE DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES

File #15 under

RECEIVED

Environmental Quality Council
TO : Subdivision Coordinator
FROM : W. O. Aikin
SUBJECT : Village Properties, Kalispell, MT

DATE: January 31, 1975
FEB 3 1975

ENVIRONMENTAL QUALITY
COUNCIL

I have recently received a familiar subdivision proposal newly identified, by name, as Village Properties, Kalispell, MT. I have also noted that you received notification of this project from the Flathead APO. To make certain that there is no misunderstanding on this project and the proper administrative procedures I would like to point out that this is the same subdivision concept which was reviewed by Draft Environmental Impact Statement (dated 9/5/72) under the name of The West Evergreen Community Development. The final impact statement was dated 12/15/72.

Personally, I feel that going through this procedure again would be a little like beating a dead horse, and I have informed the project engineer and the APO that as far as I can see the Department of Health review is already completed. Then it suddenly occurred to me that I had better get your views on this matter.

Actually it did not generate any significant controversy then, and it doesn't seem to be doing so now; primarily I would guess, because Mr. Bitney deeded so much ground to the city for an included golf course layout. If anything, he has a very large amount of local support and local commitment derived from this quid pro quo approach to the problem. The only valid question that did emerge from the proposal at anytime was:

1. Would it pose any sort of threat to the Kalispell-Lawrence Park water supply intake? The question remains now as then a reassuring no, according to all information that we were able to gather.
2. How many phases of lots can be accepted within individual sewage disposal systems before the high density portions have to go to a community collector and treatment; presumably as a contribution to the Kalispell system? This point has been pretty well fixed in my mind and the APO has concurred, however this particular point is lacking in the 1972 assessment.

If you are wondering why there has been such a long lag from the statement time to the actual review period, it has been a problem of acceptable design and configuration. The Flathead APO has spent a lot of time on this proposal and there have been a lot of work sheets on everyone's desks in the last two years. The arrangements in firming up the golf course, in particular took a considerable amount of time. The plan you now know as Village Properties has taken a lot of beating to get it into an acceptable shape.

Unless I hear something to the contrary I will assume as I have thus far, that the administrative procedure for the land use decision has been satisfied for the Village Properties project.

John W. Reuss
xxxxxxxxxxxxx

MEMORANDUM

To: W. O. Aikin, DHES Kalispell

From: Ronald J. Schleyer, EIS Coordinator, EQC

Re: VILLAGE PROPERTIES, KALISPELL, AKA WEST EVERGREEN COMMUNITY
DEVELOPMENT

Date: February 10, 1975

Regarding your decision to allow the final EIS on this project
(dated December 15, 1972) to stand, Dr. Bahls and I concur. Thanks
for your consideration in letting us know what is happening.

STATE OF MONTANA
DEPARTMENT OF FISH AND GAME
HELENA, MONTANA

Office Memorandum

TO : Wes Woodgerd Attention: Jim Posewitz DATE: September 11, 1973
FROM : Tom Hay By: Otis Robbins
SUBJECT: Proposed Master Plan --- Glacier National Park

The proposed Master Plan of Glacier National Park is, in general, well written; however, several areas of the report are vague.

The stated objective of the master plan is "to maintain esthetic experience and to preserve the resource that makes it possible". Opportunities exist in this report to delineate positive programs that would guarantee this objective, yet the report fails to outline a program that would prevent destruction of the resource. (See No's 1 and 2)

1. Page 5 --- 2nd paragraph. Two potential threats to the environment, native species and esthetic experiences, are completely disposed of in the first sentence. However, the proposed airport receives considerable discussion throughout the plan. Both cloud-seeding and fluoride emissions pose serious threats at the park environment. We believe a thorough discussion of these threats and an action program to eliminate them should be an integral part of the plan.
2. Page 13 --- 1st paragraph. The Act of May 11, 1910 allows the Bureau of Reclamation to enter upon and utilize for flowage park lands and water. Once more a very serious threat is disposed of without any discussion of potential threat to the environment of the park. Potential dam sites exist on the Middle and North Forks of the Flathead that possibly could be used by the Bureau of Reclamation. A full discussion of these very serious threats should be an integral part of the plan.
3. Page 23 --- 2nd, 3rd, 4th and 5th paragraphs. Page 4 indicates the objective of the fishery resource management plan is to protect the native fishery resource. Planting of various species, both native and non-native, have occurred in the park over at least a sixty year period. I question if there has been any serious gene changes in species during that period. Natural populations already have the necessary genetic diversity to survive. It seems to me this is a long verbal discussion to justify the elimination of stocking with some rather weak excuses. We can concur heartily in the elimination of stocking various species based on the major premise that the native species are to be emphasized in the management program.

In the second paragraph we would suggest changing the wording to read: "About 75 percent of the waters of the park have altered fish populations resulting from fish planting". In the last sentence we submit that exploitation may cause beneficial or harmful natural relationships.

In this same trend in paragraph 5 we believe that if you are going to emphasize native species then perhaps more liberal regulations aimed at non-native species may reduce the populations of competing non-natives with desired native species. Thus increased exploitation of certain species may be very desirable.

4. Page 24 ---- 2nd paragraph. This paragraph seems to be out of place in this report.
5. Page 29 ---- 2nd and 3rd paragraphs. We agree that it is very desirable to protect the goat population that uses this mineral lick. They should be given every protection. The 3rd paragraph indicates that as many as 150 goats have been on the lick at one time. This seems to be a bit much. Goats that could be killed by traffic could create very adverse reaction on the part of the public.

Otis Robbins

OR:rm

May 25, 1977

Ed Casne
Subdivision Bureau
Department of Health & Environmental Sciences
Helena, MT 59601

Dear Mr. Casne:

This is to request an extension of the comment period on the draft environmental impact statement for the proposed Golden Glacier Parklands subdivision on Duck Lake in Glacier County. The Environmental Quality Council will be meeting on June 6 and 7, and an extension will enable us to familiarize them with this subdivision proposal before we submit our comments.

Thank you for this opportunity to participate in the EIS review process.

Sincerely,

STEVEN J. PERLMUTTER
Staff Attorney

SJP/lw



United States Department of the Interior

BUREAU OF OUTDOOR RECREATION
WASHINGTON, D.C. 20240

BOE/USDI

IN REPLY REFER TO:

D6419-2188

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FEDERAL POWER
COMMISSION

SEP 28 1977

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DEC - 5 1977

ENVIRONMENTAL QUALITY
COUNCIL

Mr. Kenneth F. Plumb
Secretary
Federal Power Commission
825 North Capitol Street, N.E.
Washington, D.C. 20426

Dear Mr. Plumb:

This is in response to your letter of July 1, 1977, requesting comments on the adequacy of public access to Upper Holter Reservoir in Montana, FPC Project #2188.

Based on an inspection of the site and discussions with the Montana Department of Fish and Game and other agencies, it is our conclusion that adequate access for public outdoor recreation now exists on the upper reservoir. There also appear to be adequate National Forest and/or Montana Power Company lands to provide additional access when needed. In addition, the U.S. Forest Service is currently engaged in a land use study which will include an analysis of the need for additional access. This study is scheduled for completion in 1979, which should be timely enough to address any unforeseen public needs surfaced by their planning efforts.

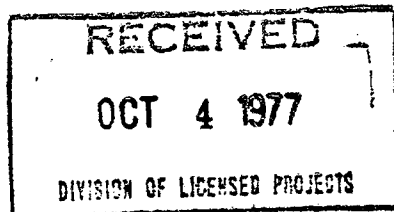
In the event providing access to the reservoir for local commercial interests is found to be a legal responsibility of the Power Company under its license, land may have to be found for this purpose. However, it would appear that these commercial interests should be expected to assume any expenses connected with building and operating an additional access point.

Thank you for the opportunity to comment.

Sincerely,

CHRIS T. DELAPORTE

Chris Therral Delaporte
Director





United States Department of the Interior

BUREAU OF LAND MANAGEMENT
222 North 32nd Street
P.O. Box 30157
Billings, Montana 59107

L-73 (943.6)
Project No. 2188

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FEDERAL POWER
COMMISSION

JUL 27 1977

P-2188

Kenneth F. Plumb, Secretary
Federal Power Commission
Washington, D.C. 20426

Dear Mr. Plumb:

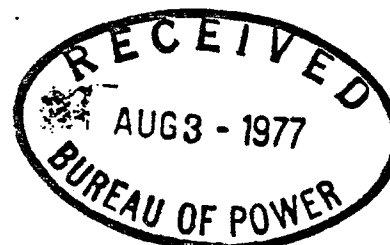
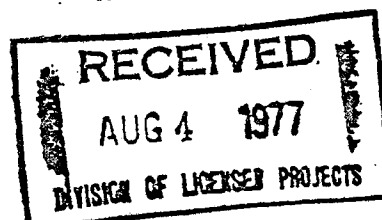
The following are our comments in response to your letter of July 1, 1977, and the July 8, 1977, FPC Notice involving public access to Upper Holter Reservoir.

The Holter Lake area includes all that area lying between Holter Dam and Hauser Dam on the Missouri River, a distance of some 27 miles. The lake is divided into two larger bodies of water, Upper and Lower Holter Lake, with a connecting segment, about 5 miles long, in the Gates of the Mountains canyon area. Boats launched anywhere on the lake can easily navigate any and all parts of the lake.

On Upper Holter Lake, the primary access for boat launching is from a commercial facility operated by the Gates of the Mountains Boat Club, Inc. This facility is available to general public use and boats can be launched for a fee of \$2.00. In 1976 more than 700 public launchings were made at this facility. In addition the boat club operates two 90-passenger tour boats that carried more than 21,000 passengers in 1976.

Three other access areas are available to the public on Upper Holter Lake. These are on lands administered by the National Forest and are located at the mouth of Beaver Creek, Cochran Gulch and at the lower end of the Gates of the Mountains Lakeshore Homes subdivision. Access to these sites is by county and Forest Service roads. The sites are suitable for launching canoes and rafts but are not suitable for power boat launching.

On Lower Holter Lake there are two commercial marinas, Robert's Roost and Indian Trail Lodge and Marina. In addition there is the Holter Lake campground administered by the Bureau of Land Management and the Juniper Bay and Log Gulch Recreation areas administered by the State Fish and Game Department. At all five of these sites, the public is permitted to launch and load their boats. The commercial facilities also rent slips for boat storage.



We do not believe additional access facilities are needed on Upper Holter Lake at this time. However, should it be determined that additional facilities are needed, potential sites are located on the west shore of Upper Holter Lake on lands owned by The Montana Power Company or on the National Forest lands which lie east of the Gates of the Mountains Boat Club's facilities.

Sincerely yours,

Kannon Richards

Kannon Richards
Acting State Director

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OCT 11 10 44 AM '77
FEDERAL POWER
COMMISSION

UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

P.O. Box 2417

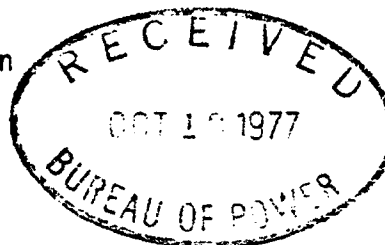
Washington, D.C. 20013

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(5400)

OCT 7 1977



Honorable Kenneth F. Plumb
Secretary, Federal Power Commission
Washington, D.C. 20426



Dear Mr. Plumb:

Your letter of July 1 (OGC -Project No. 2188, Holter Development) and Notice dated July 8 solicit comments from agencies and individuals on the matter of public access at Upper Holter Lake. In response, we submit the following information for your consideration.

Situation

Although the primary issue is limited to Upper Holter Lake, we believe that the complexity of the area and interrelationship of activities and land management require some consideration of the entire Holter Development Area. Our review includes Holter Lake, Upper Holter Lake, and that segment of the Missouri River between the lakes, a distance of about 14 miles. These waters are navigable and accessible by boats launched at any point within the described area.

Holter Lake - Public access at Holter Lake is available at six locations on the east shore, described as follows:

Roberts Roost - a privately-owned commercial facility providing public boat launching at a fee, parking, and similar public services.

Indian Trail Lodge and Marina - a privately-owned commercial facility providing docking, some public parking, and other facilities.

Holter Campground - operated by the Bureau of Land Management on a user fee basis, with boat launching, parking, and typical campground facilities.

Juniper Bay Campground - operated by the Montana Fish and Game Department with boat launching, parking, and typical campground facilities.

Log Gulch Campground - also operated by the Montana Fish and Game Department, with boat launching, parking, and campground facilities.

Another site, Departure Point, provides lake access but no boat launching (ramp) facilities. This site is also managed by the Montana Fish and Game Department.

Missouri River (between lakes) - Access to the river is provided at Willow creek; however, no boat launching facilities exist. A potential access site may exist at Cottonwood Creek.

The Forest Service maintains the 17-unit Meriwether Campground, and the 8-unit Coulter Campground. Access to both sites is by boat only, and these sites are very popular with boaters. The Meriwether site also receives considerable use from Gates of the Mountains, Inc., boat tours.

Upper Holter Lake - Public access is available at one commercial facility, and three other access points on the east shore of the lake. These are described as follows (see Exhibit A):

Gates of the Mountains Boat Club, Inc. (GMI) - a private operation located on the north end of the lake on private land. The GMI group operates two 90-passenger tour boats, and maintains a public day use boat launching facility for which a fee of \$2 is charged. GMI has limited parking space available, and does not have provisions for overnight parking, camping, etc. Public boat launching is generally available during normal boating hours, daily, during the main use season of about May 1 - October 1.

French (X), Cochran Gulch (Y), and Beaver Creek (Z) - these unimproved sites provide access to the lake and opportunities to launch those smaller boats, rafts, and canoes that can be hand-carried from vehicle to water. Terrain features provide parking space for about three vehicles at Cochran Gulch, 12-15 vehicles at Beaver Gulch, and 25 or more vehicles at French.

In addition, public access to the west shore of the lake exists via the Hilger Ranch. Persons desiring to enter must obtain permission from the Hilger Ranch to travel that portion of the access road located on ranch property to reach lake access points H, J, and K located on Montana Power Company lands. Our understanding is that although no public road right-of-way exists, the Hilger Ranch has generally given this permission. Montana Power Company is not known to have restricted use of its lands, and these access points (H, J, and K) are in regular use.

These sites are undeveloped. Parking area is limited due to terrain at site H; however, J and K offer a high potential for boating access, parking, and facility development based on favorable site, shoreline, and water conditions, in our opinion.

A tract of land on the east shore administered by the Bureau of Land Management appears to have potential for lake access development and is accessible by road.

There are no limitations on boating. The Holter development area receives considerable use by fishermen, water skiers, motorboats of all types, sailboats, canoes, and some rafts. Smaller craft may be launched at any of the sites described earlier, whereas larger motorboats can only be launched at those sites with ramps.

Accurate estimates of total recreation and boating use are not available. As an indication that public use is extensive, the GMI tour boat operation alone brings over 22,000 visitors to Mariwether Picnic Ground each year. In 1976, over 700 launchings of boats were made by the general public at the GMI facility.

Access and Landownership Situation - Upper Holter Lake - The boundaries of Upper Holter Lake are indefinite, depending upon where it is defined with respect to the river upstream. For purposes of this discussion we define Upper Holter Lake as those waters included within Sections 2, 3, 11, and 12.

The west shore of Upper Holter Lake is reached by traveling Interstate Highway No. 15, and a paved county road which extends into GMI property. The distance from Helena is about 20 miles, requiring approximately 30 minutes travel time. Other roads on the west shore are unpaved and to a lower standard not passable under all weather conditions. We know of no public road rights-of-way on roads other than the paved county road.

East side access is over a system of county roads for a distance of about 38 miles. Some sections of the road are a natural surface, single-lane road with turnouts for passing. Travel time from Helena varies with weather conditions, and is estimated at 1½ hours normally. Public rights-of-way provide access on existing roads to the lake.

Within the Upper Lake area described above, National Forest System lands are a very small minority, consisting only of a tract in the NE¼NE¼, section 2, and a narrow shoreline area in section 12.

Most of the lands contiguous to the lake are owned by Montana Power Company. Other ownerships include the GMI Property on the north end of the lake, a tract of public land managed by the Bureau of Land Management, and two parcels of National Forest System lands. All of these lands are open to public use.

The private lands in section 12 are known as the Lakeshore Homes Subdivision (Sidney D. Smith and Associates, Helena, MT). We understand these lands have been subdivided into 98 homesites with sales being actively promoted. At present there are a total of three buildings on these lots. As development and occupancy occur in the near future, effects and impacts of the subdivisions on the lake and adjoining lands will increase significantly.

The Hilger Ranch located along the west side of the lake includes no shoreline. At present it is a working ranch and is not in the recreation business. At some point in the future this may change.

With this background information, we will proceed to the issues set forth in your Public Notice dated July 8.

Issue No. 1 - Is there a need for a additional Public access facilities at Upper Holter Lake.

Our response interprets "public access" as meaning access opportunities for all members of the general public wishing to use project lands and waters for purposes not inconsistent with FPC License purposes. Lake-shore Homes Subdivision owners are considered as part of the general public but there are distinct differences in the kinds and uses of access and launching facilities which must be considered for the various types of users.

Present lake access and general public use boat launching facilities are designed for, and normally operated on, a transient use basis including day use and perhaps a length a stay of several days to a week.

In contrast, public access involving residents or summer home owners indicates a long-term (perhaps season-long period of use with a requirement for corresponding parking facilities, long-term boat docking, storage, etc. A potential of 98 residences with an estimated one boat per residence indicates the level of possible facility development to be needed in the near future.

The Forest Service believes that the present need of the general public for access to project waters at Upper Holter Lake is adequately served by existing facilities. We do recognize that future use patterns may change, such as those resulting from development of private lands, and that additional access may ultimately be required.

As indicated in the background information section, landownership is complex, involving numerous owners and opportunities for access under various conditions. Historical land use patterns are changing and public interest and use in the area is increasing. Recognizing these circumstances, and in consideration of the unique geological, archeological, historical and recreational values within the Upper Holter Lake complex, we further believe the access issue is more appropriately addressed by comprehensive, coordinated land management planning. Based on present scheduling the Forest Service will be commencing such planning for this area in 1979, with full public involvement planned.

Issue No. 2 - If there is a need for additional public access facilities: (a) What size and type should be constructed; (b) Where should such facilities be located; (c) What conditions and restrictions, if any, should be placed on public use of such facilities; and (d) Who should construct, operate, and maintain such facilities?

Comment - The solution to this issue must be developed in harmony with management decisions for the other associated values in the Upper Holter Lake area. The enclosed map, Exhibit A, and discussion herein show some of the values and interrelationships that exist within and adjacent to the area.

The major values on National Forest lands within the Upper Holter Lake complex are historical, geological, archeological, and recreational. The canyon section of this area was identified as the Gates of the Mountains by Lewis and Clark in their historic journey through this area in 1805. From the Lewis and Clark journals of July 19, 1805, Captain Meriwether Lewis writes: "This evening we entered much of the most remarkable cliffs that we have yet seen . . . from the singular appearance of this place I called it the Gates of the Rocky Mountains."

The geologic formation of this area is part of the Madison Limestone group. This formation began as limy mud on the ocean floor about 950 million years ago. The sea covering this area was warm and shallow and teemed with plant and animal life. Since then, this formation has gone through a number of geologic changes which make this area rich in geologic history. Remains of many extinct life forms are preserved as fossils.

This area also contains several Indian pictographs on the rock outcrops. Some of these are known and can be seen by the public. Other archeological values are suspected.

The canyon area is scenic and attracts visitors from all parts of the world. This area has national status from appearing in numerous publications throughout the country. It is a major attraction from the Helena area and is visited by more than 35,000 people each year. Recreational activities include camping, picnicking, hiking, water skiing, boating, nature study, and opportunities for many other outdoor activities.

Maintenance and enhancement of these values are objectives of the present management direction for the National Forest lands in the Upper Holter complex.

Adjacent to the east side of the Missouri is the 28,562-acre Gates of the Mountains Wilderness. Additional areas as shown on Exhibit A have been identified as new wilderness study areas having potential for wilderness classification. These areas are contiguous to the present wilderness boundary.

A narrow strip of land on either side of the Missouri Canyon has been designated as a game preserve by the State of Montana. Hunting is prohibited in this area. The visitors' opportunities to observe wildlife, including bighorn sheep, mountain goats, and deer, in this area have been enhanced by this designation.

Gates of the Mountains Canyon was identified for study as a possible natural landmark. A professional on-site evaluation resulted in a positive recommendation of eligibility for designation by the National Park Service. Because this proposal is one of many in a complex of adjacent and overlapping management opportunities in this area, the Forest Service has recommended that the proposal for a natural landmark not be pursued at this time, pending completion of the land management plan for the area.

The present level of use in this area is causing concern over sanitation, littering, and wildfire risk. Montana Fish and Game Department, Bureau of Land Management, Montana Power Company, and Helena National Forest personnel met on three occasions within the last year and a half to develop solutions to these concerns. During the same time period, we also met with Federal Power Commission staff members to discuss matters surfaced by the interagency and Montana Power Company meetings.

With existing resource values, the existing use situation, and the interrelationships that exist within this area, the Forest Service position stated again is that a coordinated land management plan offers the best and most logical solution to this issue. Consideration of the matter of access alone cannot resolve the issues and management situations which have created access concerns.

We note that Montana Power Company's letter of April 15 presented two access alternatives, one identified as the "Forest Service alternative," and the second identified as the "Hilger alternative." In response to the "Forest Service alternative," shown as route D-E on Exhibit A, we believe the road construction cost of \$8,000 presented by Montana Power Company is not realistic. The Forest Service estimate for constructing an 18-foot gravel running surface road, with ditches and proper drainage over the same route is \$52,000.

Construction of a road on location D-E would require crossing unfavorable terrain and necessitate a major road cut (excavation) to the detriment of visual qualities of the area. The existing county road does not extend across GMP property to the National Forest tract and the sufficiency of Montana Power Company's reserved right-of-way has not been evaluated. If insufficient, a condemnation action would be necessary to obtain this right-of-way.

Alternative routes to the Forest Service access site E are shown in Exhibit A. Road construction costs for these routes are shown below.

<u>Alternative Routes</u>	<u>Estimated Road Cost</u>
A - C - E	\$80,000
A - B - C - E	\$71,000

These roads would require obtaining a public right-of-way, probably by condemnation, through Hilger Ranch, Sieben Ranch, and GMI.

Several alternative sites for additional public access to Upper Holter Lake are identified as H, J, and K and shown in Exhibit A. Alternative routes and road construction costs for these routes to the Hilger access are shown below.

<u>Site</u>	<u>Alternative Routes</u>	<u>Length of Road</u>	<u>Estimated Road Cost</u>
H	F - G - H	1 mi.	\$16,000
*J	F - G - J	1.6 mi.	\$29,000
K	F - G - J	2 mi.	\$35,000

*This is the Hilger route proposed by MPC in its April 15 letter at a cost of \$75,000.

Existing roadways could be used although all-weather access would not be available.

Public rights-of-way would need to be acquired from the Hilger Ranch and Montana Power Company for construction of these roads.

Lands along the west shore of Upper Holter Lake present few road construction problems, and visual impacts of a road appear minimal if location is carefully considered.

As shown on Exhibit A, using the existing roads across the Hilger Ranch would impact the ranch and cause property severance problems if the road were fenced. The location of the existing road near the Hilger-MPC property boundary suggests that severance problems could be minimal, however, and could be further reduced by selection of a new route located closer to the lake on Montana Power Company lands.

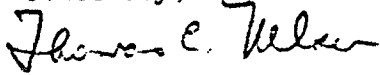
If additional access is determined to be appropriate and necessary through the land management planning process jointly involving all parties concerned and the public, an environmental assessment should include all alternative locations.

The Commission is assured that the Forest Service will cooperate fully with the public and other landowners and agencies in developing management

plans and in the development of public facilities and implementation of management programs to enhance proper use of the Upper Holter Lake area.

Thank you for the opportunity to comment on this matter.

Sincerely,

A handwritten signature in dark ink, appearing to read "Thomas C. Nelson". The signature is fluid and cursive, with the first name "Thomas" and last name "Nelson" clearly distinguishable.

THOMAS C. NELSON
DEPUTY CHIEF

Enclosure

Seben Ranch Co.

State of Montana

US

Gates of the Mountains
Wilderness Area

STANDARD

GER VELL

GATES OF THE MTS
GOAT CLUB

End existing R/W
Upper - Holler

Lake

HILGER RANCH

MPC

MPC

10

Hilger Ranch

15

WELL

American

22

EXHIBIT A

Gates of the Mtns. Game Preserve

Proposed Gates of the Mtns. Natural
Landmark

23

Foster

24

2 MPC

BLM

MPC

American

Pvt.

J

MPC

MPC

BLM

MPC

BLM

Gulch

BLM

BLM

U.S.

BM 3590

Missouri

19

U.S.

Beaver

Spring

7

+ 4432

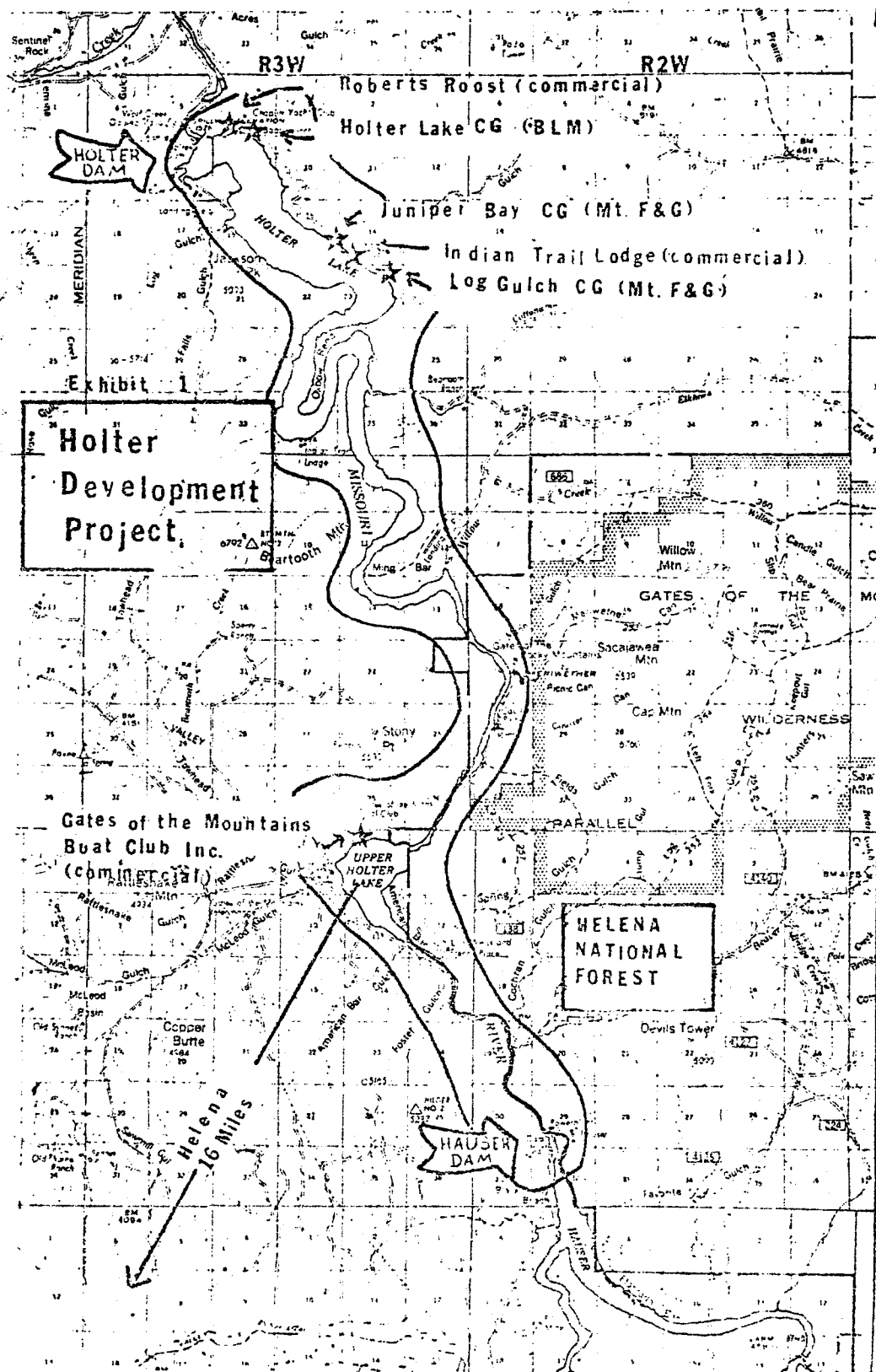
OLD WEISS AND
FRENCH PLACE

Cochran

18

U.S.

4868



[illegible]

UPPER LAKE	HOLTER- COMPLEX
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MONTANA
POWER

Public Access



THOMAS L. JUDGE
GOVERNOR

State of Montana
Office of The Governor
Helena 59601
AUG 5 10 19 AM 1977
FEDERAL POWER
COMMISSION

July 29, 1977

Mr. Kenneth Plumb
Federal Power Commission
Washington, D.C. 20426

Dear Mr. Plumb:

This is in response to your July 1 letter concerning public access to Upper Holter Reservoir, one of several developments licensed to the Montana Power Company as project No. 2188.

The State of Montana is very concerned with obtaining public access and use of our recreation resources by our citizens and guests. We have moved aggressively to acquire and develop many areas for public use through our state park system and by other means.

As you are no doubt aware, Holter Reservoir and its surrounding lands contain extremely high quality recreation opportunity and potential, a wide variety of wild-life species, considerable historic values, and outstanding scenery. Land ownership along the reservoir is mixed between state, private and federal interests.

As you might imagine, because of the quality and variety of Holter Lake resources, there is extremely keen competition from several interests for them. Public use of the reservoir is extremely important, but care and forethought must be used in determining what is in the public interests there over the long run.

I concur in your efforts to contact various public agencies and officials concerning their views on the adequacy of public facilities on the reservoir. However, because the issues raised in your letter seem vague and the area is so important to our state, I request you hold public hearings on a specific proposal or proposals concerning additional recreational access to the lake. I request that the hearings be well-publicized and held in Helena. Only in this manner will we be able to jointly weigh public reaction and sentiment concerning the reservoir's future.

I have discussed this matter with Dr. Robert Wambach, Director of the Montana Department of Fish and Game, and Mr. Ron Holliday, Administrator of the State Parks Division, concerning this matter. Please consider this letter as encompassing their views as well as mine.

Sincerely,


THOMAS L. JUDGE
Governor

cc: Mr. Robert Wambach
Mr. John Orth
Mr. Ron Holliday

FEDERAL POWER COMMISSION
DOCKETED

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DOCKET SECTION

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COMMISSION

July 14, 1977

OFFICIAL FILE COPY

TO	INIT.	DATE
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CENTRAL FILES		

Mr. Kenneth F. Plumb, Secretary
Federal Power Commission
825 North Capitol Street
Washington, D. C. 20426

Subject: OGC
Project No. 2188
Holter Development

Dear Mr. Plumb:

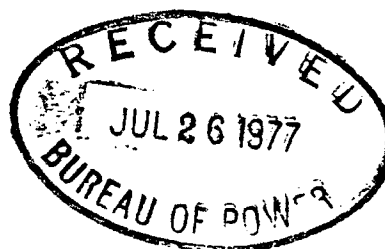
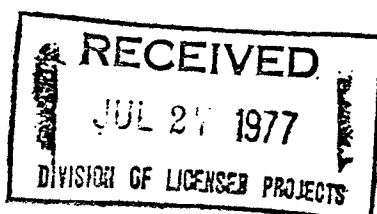
This is in response to your letter of July 1, 1977,
relative to subject project.

There is an acute need for public access at the upper
Holter Reservoir of project No. 2188. As you are aware,
there is only one access point to the project waters in the
area in question. That access point is not public. It is
under the exclusive control of the Gates of the Mountains
Yacht Club. This has been the subject of previous correspon-
dence with you concerning this matter.

The following is in response to the numbered items of your
letter referred to above:

1. It is my considered opinion that an
area of from 3 to 4 acres of comparatively
level ground would adequately accommodate
the public for boat launching and parking.
Such an area is available at the point
indicated on the attached map. It is
suggested that the area be left in its
natural state. There should be no expense
for development of the site suggested.

2. The site suggested is located and
identified on the attached map by a
red arrow.



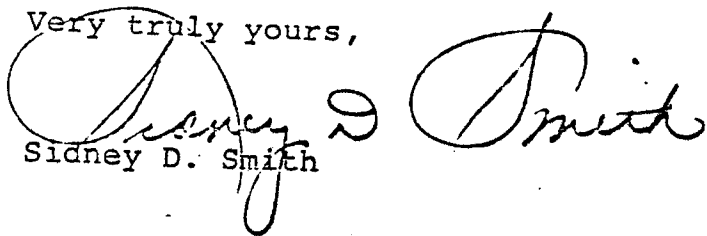
Mr. Kenneth F. Plumb
July 14, 1977
Page 2

3. There should be no conditions or restrictions upon the use of the site by the general public other than orderly and reasonable use for parking and boat launching. The site should provide free and open access to the project waters to all segments of the public on an equal basis. There should be no discrimination on the basis of economic status, or on the basis of race, creed, religion, color or otherwise. There should not be club membership requirements.

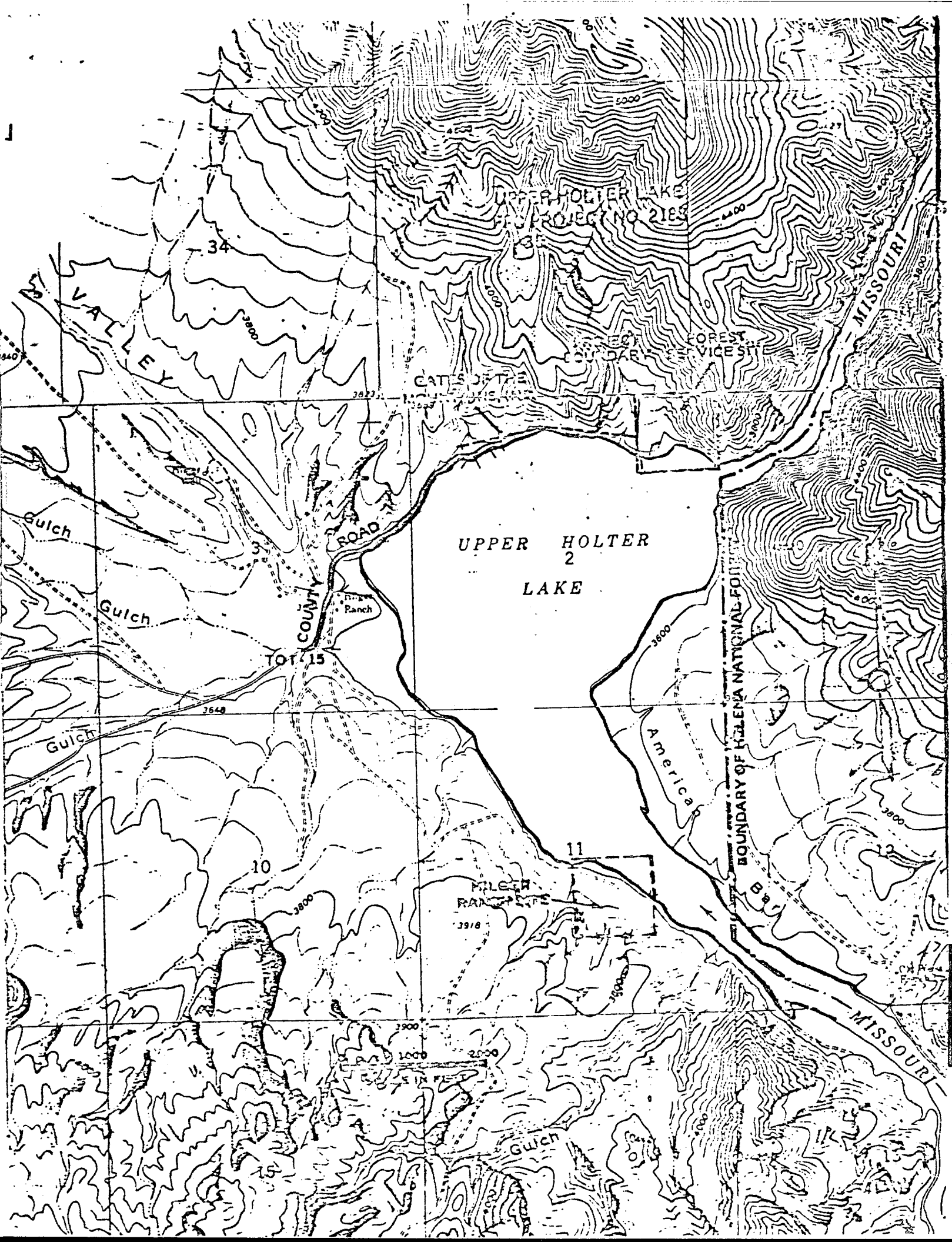
4. I suggest that the site be placed under the jurisdiction of the Montana State Parks Department of the Montana State Fish and Game Commission for policing and the promulgation of regulations governing the use of the site in accordance with the customary practice of the State Park Department.

Your continued assistance in this matter is appreciated.

Very truly yours,


Sidney D. Smith

Enclosures



Docket

Rte 3, Box 119-A
Helena, Montana 59601
September 27, 1977

Federal Power Commission
825 North Capitol St. N.E.
Washington, D.C. 20426

OCT 3 8 31 AM '77
FEDERAL POWER
COMMISSION

Ref: Project 2188
Holter Development

Dear Sirs:

I am writing to protest any development of launching or camping areas on Upper Holter Lake. I live at the Gates of the Mountains and sell the tickets for the Tours through this area. This year over 25,000 passengers enjoyed this unspoiled area. I wish you could witness the excitement and wonder of these people as they return.

This area has been protected all these years by the happenchance of history. The Hilger ranch established in 1867 when Montana was still a Territory were the first protectors. Nicholas Hilger was so impressed with this canyon that he built a raft to bring anyone brave enough to take the trip with him and share with him this spectacular area. In 1886 he obtained his first licence for a steam boat, The Rose of Helena, and so began the first official tours since Lewis and Clark travelled through here on July 19, 1805. Lewis on that day named the canyon The Gates of the Mountains.

In the late 1930's the Boat Club Corporation was formed and purchased this area and the Tour Boat from the Hilgers. At no time was this area exploited. Everyone was able to launch private boats through here and so it is today. The Gates of the Mountains Foundation was established in 1974 and now owns the land. It is a non-profit foundation dedicated to the protection of the canyon and open to the public forever. The Boat Club Inc. leases from the Foundation under the same principles. The Boat Club is not an exclusive club and anyone may apply for membership. Price of membership is minimum. There are several launching areas on Lower Holter plus the launching through the Gates. The heavy small boat traffic has already had an effect on the fragile environment.

There are so few unspoiled areas left in our country that it seems we should all work together to preserve what is left for future generations. Since the development across the river known as American Bar, promoted by Sidney Smith, has access through their own property there seems to be no further need for new openings on this side.

I want to emphasize the need for preservation. Until I moved here with my husband who is the Manager at the Gates did I really learn the true value of this area. We had been members of the Club and boated here for over 16 years enjoying the beauty and the peace but a new dimension dawned as I viewed it through visitors from all over the world. This area does not belong to the people involved locally, anymore than Grand Canyon belongs to Colorado, The Alps belong to Switzerland or the Rhine to Germany. The Gates is one of the Treasures of the world.

FEDERAL POWER COMMISSION
DOCKETED

OCT 3 1977
on
DOCKET SECTION

I have learned, too, since working here that the Lewis and Clark story is rated as one of the great adventure stories of the world. It is studied and held in wonder and excitement like the stories of Marco Polo, Magellan, Eric the Great, Columbus and all who braved the unknown and opened new worlds.

People have come from all 50 States. We have many visitors from Canada and this year they came from all the Provinces. Many of our visitors return from year to year and many new visitors come because friends have told them not to miss the Gates.

I am enclosing a list of our foreign visitors so you will know how well known the Gates are. This summer a family from France arrived when the last tour of the day was gone. Disappointed he said "I have come so far to see the Gates." We arranged for them to go down and with delight when they returned he brought me his tour book, written in French marked by him at the description of the Gates. Proof indeed that they had come a long way to see the Gates of the Mountains.

Please consider carefully the preservation of this Canyon. Long after we who are involved here in Montana and you who make the decision in Washington are gone, the Gates of the Mountains will exist. Hopefully it will remain as it is today and as it was when Merriwether Lewis arrived in 1805 and wrote "this evening we entered much the most remarkable cliffs that we have yet seen.....from the singular appearance of this place I called it the gates of the rocky mountains."

Sincerely,

Florence L. Tubbs

Copies to:

John R. McGuire U.S. Forest Service
Congressman Max Baucus, Montana
Senator Lee Metcalf, Montana
Congressman Dingle, Michigan

VISITORS FROM FOREIGN COUNTRIES TO THE GATES OF THE MOUNTAINS

1977

Algeria

7/16 Bauri

Australia

7/2 Sydney

7/12 Castlecrag

7/28 Wallinngang NSW

9/4 Sydney

9/25 Sydney

Austria

7/26 Salasburg

9/25 St. Florian

Belgium

7/13 Brussels

7/13 Kuecelled

7/20 Brussels

Brazil

7/24 Feci

8/16 Sas Paulo

Chile

7/16 Santiago

China

9/5 Hung Wang

Denmark

5/31 Jensen

6/2 Glundjerg Fyn

6/2 Bagense

6/21 Viberg

6/21 Nyborg

6/21 Azborg

6/23 Kopenhaver

Deustland

7/20 Allenburg

7/20 Kean/Nole

East Africa

8/21 Sanalia

Equador

7/15 Cresbo

England

5/21 London

5/30 Maidenhead

England

6/6 Straffordshire

6/18 Leige on Sea

6/18 Suffield

6/18 Carlisle

6/18 Manchester

6/18 Wednes

6/18 Workington

6/18 Bolton

6/18 Southport

6/30 English Lake District

7/2 Davis

7/7 Essex

7/7 Sunderland

7/7 London

7/7 High Wycombe

7/13 Buckinghamshire

8/4 Liverpool

8/5 Bedford

8/16 Mapperly

8/25 Craydan

8/28 Cambridge

9/7 Burke

9/16 Worcester

Finland

7/15 Ig

France

5/13 Cagnes Son Mer

7/10 Paris

7/13 Paris

7/26 Bagnais/Cege Gud

7/29 Nance

8/28 Paris

9/4 La Gueve on Brie

Germany

5/29 Munich

6/3 Munich

6/8 Stuttgart

6/11 West Berlin

6/13 Enlunfeu

6/18 Bolum

6/23 West Berlin

6/28 Essen

6/28 Bereneus

8/6 Wiesbaden

7/17 Tiek Kanegski

7/19 Berlin

7/20 Lambert

Germany	Phillipines	Yugoslavia
7/29 Cologne	8/3 Manila	7/30 Valjevo
7/29 Schwerke		
7/29 Berlin	Russia	
8/19 Harmann	7/26 Maunkisken	
8/28 West Berlin		
	Republic of South Africa	
Great Britain	7/26 Capetown	
Tamagamenon		
	Saudi Arabia	
Greece	7/4 Dhakron	
7/23 LaTease		
	South Wales	
Holland	7/2 Lanyberem	
7/26 Amsterdam		
7/25 Slaus Vanaal	Spain	
9/3 Schil	7/21 Madrid	
	7/24 Madrid	
Iran		
8/13 Hekust	Sweden	
	7/11 Stockholm	
Ireland	7/11 Kallhallsleden	
9/3 Kilkenny	8/11 Rejtete	
	8/11 Retalle	
Israel	8/11 Glasbleder	
7/14 Haifa		
7/16 Israeli	Sverige	
8/16 Zuri	7/12 Mejrelgalon	
	7/12 Bjekohajat	
Italy		
8/17 Rome	Switzerland	
	7/2 Vusles	
Japan	8/7 St. Bell	
6/23 Osaka		
	Tanzania	
Mexico	6/28 Mashi	
8/10 Lenavis		
	Turkey	
Netherlands	6/28 Izmir	
7/12 Gassel	8/18 Istanbul	
9/3 Veiser		
	United Kingdom	
Netherlands Antilles	7/17 Smith	
7/21 Curacas	7/19 Hamshire	
7/29 Curacas		
	Virgin Islands	
New Zealand	7/7 St. John	
8/25 Nelson	7/13 St. Croix	
	West Germany	
Newfoundland	6/3 Dusuelary	
7/23 Blackburn	7/19 Blewett	
	7/12 Crackelbeim	
Norway	7/26 Kooberg	
6/4 Ekne	8/17 Munich	
8/11 Oslo	8/19 Langfiels	

Gates of the Mountains Lakeshore Homes

832
CANYON FERRY
SECTION

Gates of the Mountain Lakeshore Homes are situated in the scenic and Historic area of the American Bar on Upper Holter Lake.

Captain Meriwether Lewis described the area in his journal, July 19, 1805:

"This evening we entered the most remarkable cliffs that we have yet seen. These cliffs rise from the water's edge on either side perpendicularly to the height of 1,200 feet—from the singular appearance of this place, I called it 'The Gates of the Mountains'."

The land also is surrounded by Helena National Forest on three sides, and Upper Holter Lake on the West. A 22-acre park—adjacent to the home sites we have for sale—was dedicated to Lewis and Clark County to preserve the Osprey nesting grounds. Valuable property such as this—in which the integrity of the land's character has been largely preserved—is becoming scarce in Montana.

Whether you wish to buy to build a permanent home, or for investment purposes, it would be wise to act now. Land such as this, with its long heritage of native beauty grows dear in price each year.

*Buy Your Own Future Heritage Now,
Before It Is To Late!*



1 to 2 1/2 Acre Lots

See for your self:

By Car—From Helena drive to York, turn left, drive 8 miles to Nelson, turn left and follow Beaver Creek Road 7 miles to Gates of the Mountains Lakeshore Homes.

By Boat—Put in at Holter Dam, come up-river, south, through the Gates of the Mountains and one mile past the Gates of the Mountains Boat Club. Property is on east shore, look for signs.

Also ask about our other property on Canyon Ferry.

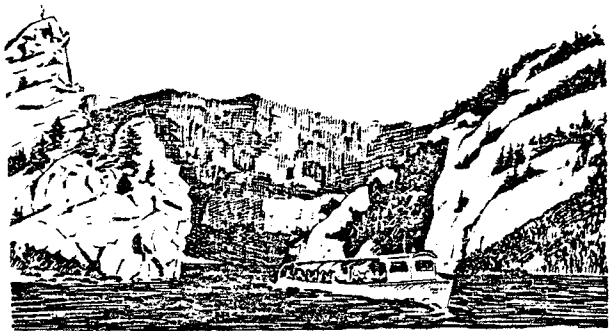
For information

write to: Sid Smith or

Call: 406-443-3145 -443-4500



Gates of the Mountains Lakeshore Homes
7212 Canyon
Helena, Mont. 59601



Gates of the Mountains, Inc.

Scenic Trips and Boating

P. O. Box 478

Helena, Montana 59601

SEP 29 1977
FEDERAL POWER
COMMISSION

September 26, 1977

Ref: Project 2188 Holter Development

Mr. Kenneth Plumb
Secretary, Federal Power Commission
825 North Capitol St. N.E.
Washington, D.C. 20426

Dear Mr. Plumb:

In direct response to your letter of July 1, 1977 we wish to advise that the board of directors of the Gates of the Mountains Boat Club strongly opposes any additional access in the upper Holter Reservoir.

The boat club has for many years tried to preserve this National Treasure that time has carved out of solid rock in a beautiful wilderness area. They have provided public boat launching, along with their members rented dock facilities, in a non discriminatory manner for all to enjoy.

Another access built with public funds will do nothing but detract from the scenic shoreline beauty and cause confusion. It will do nothing for the people with development in mind, as what they need are docks, and there simply is no room for any more. The area is completely jammed with boats and utter confusion every weekend.

Sincerely,

Charles G. Jacoby
Commodore

The Board of Directors
Gates of the Mountains Boat Club

FEDERAL POWER COMMISSION
DOCKETED

OCT 3 1977
DOCKET SECTION

July 25 1977
Helena Mont 59601Federal Power Comm.
Kenneth Plumb, Sec.

JUL 25 1977

DOCKETED

JUL 23 3 33 PM '77
FEDERAL POWER COMMISSION

Dear Sir,

No 2188 Helter Development

In reply to OGC Project

I wonder if there is need for more facilities in view of the fact that this country is ~~is~~ supposed to run out of gasoline in a short while?

The only place on our land that might be used would cut our 2 pastures in half lengthwise which is 3 miles long and make 4 small pastures, 2 of them with no water. We would have to have 3 underpasses, to get water, maybe 4.

There would have to be 6 miles of woven wire fence to keep calves off of the road and to keep dogs on the road away from stock, a woven wire fence would stop Deer and other game from the water.

About $\frac{2}{3}$ rds of the lake front is shallow water, the rest is deep water but a high cut bank, and the area is exposed to very strong north and west winds making very rough water.

A setup like that would cut down 20 to 30% on the value of our ranch if we sell some time.

The development on east side of River would like access on the west side of river

but I don't think that's needed, they have a road to their property, and access to the lake now.

Any roads and access would create problems that you can't foresee, and it would have to be open to the public.

The size and type of facilities would be hard to guess, I don't think it would be a paying proposition unless they had several acres of land and went into it on a large scale.

The other area is owned by the U.S. Forest Service; It is an ideal location, but there might be a lot of objection to that because of the Gates of the Mts. being so close.

There could be other problems that I haven't thought of.

Sincerely Yours
Hilger Hereford Ranch Co
Daniel A Hilger Treas.

Rte. 3. Box 119
Helena, Mont. 59601



FEDERAL POWER
COMMISSION

September 30, 1977

Mr. Kenneth A. Plumb
Federal Power Commission
Washington, D. C. 20426

Dear Mr. Plumb:

RE: OGC Project No. 2188 - Holter Reservoir
Concerning Public Access

After reviewing existing information and current correspondence relating to Upper Holter Reservoir's access problems, The Montana Power Company wishes to resubmit our comments of April 15, 1977 relating to said access problems.

We also wish to address the four questions calling for comments in your public notice of July 6, 1977:

1. What size and type of facilities should be constructed?

It would appear prudent to provide adequate area and construct facilities which could accommodate further growth and additional recreational pressures in the upper Holter Reservoir. Due to the changing water levels and tremendous pressures asserted by ice, it may be inadvisable to install permanent docks. Boat launching facilities could be installed which would tend to be less susceptible to water fluctuation and ice pressures. The major land use would be for parking of boat trailers and towing units.

2. Where such facilities should be located?

In Lot 1 of Section 2, Township 12 North, Range 3 West, the Forest Service alternative in Montana Power Company's April 15 report.

3. What conditions and restrictions, if any, should be placed on public use of such facilities?

- a. No overnight or on-site camping.

[illegible]

OCT 4 8 42 AM '77

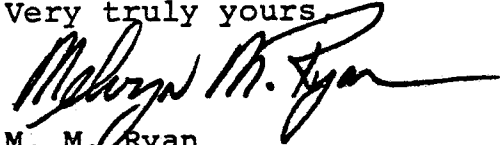
FEDERAL POWER
COMMISSION

- b. No usage of alcoholic beverages upon premises.
- c. No discharging of firearms upon premises.
- 4. Who should construct, operate, and maintain such facilities:

It is apparent that state and federal agencies own, operate and manage most public recreation facilities located in the state of Montana. It would appear logical that these agencies have the expertise and staff already functioning in park management. Therefore, it is suggested that a state or federal agency should construct, operate and maintain the boating facility.

We hope that this problem can be resolved prior to the 1978 boating season. Thank you for this opportunity to respond to the Holter Reservoir access problems.

Very truly yours,



M. M. Ryan
Vice President and
Chief Legal Counsel

TEW:gj
Attachment



THE MONTANA POWER COMPANY

GENERAL OFFICES: 40 EAST BROADWAY, BUTTE, MONTANA 59701 - TELEPHONE 406/723-5421

OCT 4 8 42 AM '77

FEDERAL POWER
COMMISSION

April 15, 1977

JOHN J. BURKE
VICE PRESIDENT

Mr. Kenneth A. Plumb
Federal Power Commission
Washington, D.C. 20426

Dear Mr. Plumb:

RE: OGC Project No. 2188 - Holter Reservoir

During the preceding six to eight months The Montana Power Company has investigated recreational access problems which exist upon the above captioned hydroelectric project. This response is submitted now pursuant to our last correspondence dated August 16, 1976.

Foreward:

7
A conflict of interest has developed between certain members of the general public and members of Gates of the Mountains, Inc. concerning boating access into Upper Holter Reservoir. The Gates of the Mountains, Inc., a private boating and recreational organization, which owns, controls and operates the only boating facilities located upon Upper Holter Reservoir, has changed their eligibility to membership excluding anyone attempting to conduct commercial business upon Upper Holter Reservoir. Apparently, these membership restrictions eliminated Sidney Smith and Associates from membership and therefore, the use of the Gates of the Mountains boating facilities.

ref
It appears from Company lease and land records that Montana Power Company, in the interest of recreation development, first leased and then sold the land developed by Gates of the Mountains, Inc. However, Montana Power Company did not retain enough property rights to control the present membership rules enforced by Gates of the Mountains, Inc. Therefore, through no fault of The Montana Power Company, members of the general public having any commercial interest upon Holter Reservoir are essentially excluded from boating access to Upper Holter. There are numerous individuals who own or lease lands and have recreational cabins surrounding Upper Holter Reservoir. It also becomes apparent that if this segment of the public can be excluded from boating access, a change in the attitude of the membership of Gates of the Mountains, Inc. could exclude other interest groups from boating access to Upper Holter Reservoir. Therefore, it becomes apparent that additional public access to Upper Holter Reservoir is desirable.

It was apparent from a general membership meeting of the Gates of the Mountains, Inc., which a Montana Power representative attended, that a cure of Smith and Associates access problems is contrary to the desires and aims of said organization. Members of the Gates of the Mountains, Inc. desire to control and restrict recreational activities upon Upper Holter to their own usage and benefit. Therefore, The Montana Power Company and any other entity that becomes actively involved in solving Smith's problem is going to be criticized by members of the Gates of the Mountains, Inc.

ACCESS POSSIBILITIES:

There appear to be two viable areas, located on the westerly side of Upper Holter Reservoir, which could be developed for boating access. The following is a description and summary of the problems inherent in access development for said sites;

Hilger Alternative

Montana Power Company owns lands which are suitable for boating access development in the NW $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 11, Township 12 North, Range 3 West or the southwesterly part of Upper Holter Reservoir. Development of this land would require the construction of an access road which would be about one and one-half miles long. This road would bisect a working-cattle ranch which has been operated by the same family since 1879. The Hilgers, as operators of said ranch, are highly concerned about the economic effect and increased managerial problems brought about through the construction of a roadway across their ranch. They are also strongly opposed to the assumed influx of numerous vehicles, boats, and people into the center of their ranching operation. Montana Power Real Estate officials have formerly appraised rights-of-way for The Montana Department of Highways, including many ranching severance problems, and are therefore, cognizant of the economic ramifications inherent in a ranching severance of this magnitude. The Hilgers assert that they will need a stockpass, the roadway paved and right-of-way fenced. It is apparent that construction costs alone would exceed \$75,000.00. Therefore, it is obvious that the Hilger alternative, while viable as an access cure, is not an economically viable solution.

Forest Service Alternative:

The Forest Service administers the land located adjacent and easterly from the Gates of the Mountains, Inc. property and known as Lot 1 of Section 2, Township 12 North, Range 3 West. This land contains an

area which is suitable for development of boating access to Upper Holter Reservoir. This land is designated by the Federal government as Federal Power Withdrawal land. Apparently, the Forest Service contends that it has complete management control over those lands which are located above the Holter Reservoir Project boundary. The Forest Service offers little or no assurance of cooperation in developing these lands for recreational usage prior to the completion of a land-use study scheduled to be completed in 1979. (See Appendix A - U.S. Forest Service letter of January 17, 1977).

The Forest Service site also has an access problem which has to be cured prior to development. The Montana Power Company received a cost estimate in the amount of \$8,000.00 from Reilly Construction of Jefferson City, Montana to construct such access roadway. The Montana Power Company reserved the right to construct and operate a roadway across the Gates of the Mountains, Inc. property while deeding the land to their predecessors in interest. Said conveyance recites the following reservation, "FURTHER EXCEPTING AND RESERVING unto the party of the first part, its successors and assigns the perpetual right of ingress and egress for all lawful purposes..."

From the foregoing it appears obvious that the logical solution to Smith and Associates' access problem is to promote development of the Forest Service site. It is not at all certain that the Forest Service has complete managerial control of any lands designated as Federal Power Withdrawal lands. Perhaps the Federal Power Commission could shed some light upon this legal question and resolve the apparent conflict within the federal government regarding this land. The Forest Service also asserted that they would desire to administer any recreational development upon their lands. It may be relevant that the Forest Service expressed concern about recreational benefits when Montana Power Company applied for the license for Project No. 2188. The Montana Fish and Game Department has also expressed a verbal interest in administering recreational facilities in the Holter area.

In conclusion, we propose that the Federal Power Commission either provide assistance in determining authority over the "Federal Power Withdrawal" lands or persuade the Forest Service to render the site available for this purpose in the near future.

Page -4-
4/15/77

I hope this report or letter answers the questions relating to the Smith access problems and that a cure can be affected for said problem.

Very truly yours,

J. J. Burke
for J. J. Burke

JJB:gj

Attachments

cc: Chuck Klinkenburg
Federal Power Commission
Regional Office
31st Floor - Federal Building
230 South Dearborn Street
Chicago, IL 60604

Sidney Smith
Airport Way Building, Suite 1
1300 Cedar Street
Helena, MT 59601

FOREST SERVICE
Helena National Forest
616 Helena Avenue
Helena, Montana 59601

JAN 18 1977

REPLY TO: 2770 Licenses

January 17, 1977

SUBJECT: Holter Reservoir Project



TO: The Montana Power Company
Attn: Mr. Tom Williams
40 E. Broadway
Butte, Montana 59701

Lot 4, Section 1 and Lot 1, Section 2, T12N, R3W is land within the Helena National Forest. It is also within the project boundary of F.P.C. License No. 2188 to The Montana Power Company for the Holter Reservoir Project.

On December 21, 1976 Tom Williams of The Montana Power Company asked William Taliaferro of this office, if the Montana Power Company, through the F.P.C. License, could develop road access and public boat docks on the property above described.

We have reviewed the F.P.C. License and, based on legal advice concerning all F.P.C. licenses, have come to the following conclusions:

1. The license conditions control the authority and responsibility of The Montana Power Company and the Forest Service. The license does not speak in terms of the rights conveyed to the licensee. It identifies the lands within the project boundary and conveys "interests in such lands necessary or appropriate for the purposes of the project,---being more specifically shown and described by certain exhibits which formed part of the application for license and which are designated and described as follows:"

This list includes items 2188-20 to 23 inclusive - Holter Development, Detailed Land Maps.

The license goes on to describe the Holter project as follows:

- "(6) The constructed Holter development, located 43 miles north of Helena, Montana on Missouri River, consists of a concrete gravity dam, 1,364 feet long, comprised of a spillway section of which 10 bays are gated and the balance equipped with semi-permanent flashboards; an intake section and abutment sections, a reservoir 27 miles long with a full pool elevation at 3,564 feet providing usable storage

of 82,000 acre feet; four penstocks; a powerhouse integral with the dam with four 16,500-horsepower turbines, each connected to a 12,000-kva generator, installed therein; a substation; and appurtenant mechanical and electrical facilities."

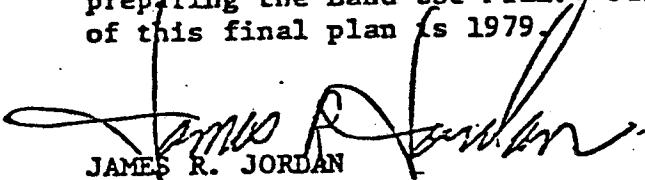
The license does not provide for construction of any recreation facilities or for construction of roads for public recreation.

2. It has been interpreted by our Office of General Counsel that the Forest Service retains jurisdiction of the land and may take such actions as are necessary for management and protection, provided such actions do not affect the rights of the licensee.

Based on the terms and conditions of the F.P.C. License issued for construction and operation of the Holter power development project, and a recent opinion from our Office of General Counsel other development is not authorized on National Forest land under terms of F.P.C. Project No. 2188.

Because of the complexity of the area we believe it is necessary that the Land Use Plan for the Gates of the Mountain-Dry Range Planning Unit be completed before the Forest Service makes further commitments in the area.

We will give consideration to the desire for public access in preparing the Land Use Plan. Our present target date for completion of this final plan is 1979.



JAMES R. JORDAN
Forest Supervisor

DEC 15 1976

Reilly Construction
P. O. Box 50
Jefferson City
Montana 59658
December 13, 1976

Bid for construction of approximately .3 (three tenths) mile
of road on Hauser Lake:

Roadway to be 18' (eighteen feet) wide with 1' (one foot)
ditch. Back slope to vary according to the depth of cut
section, in order to stay within right-of-way.

3 (three) metal Pipe:
2 (two) - 18" x 24'
1 (one) - 24" x 24'

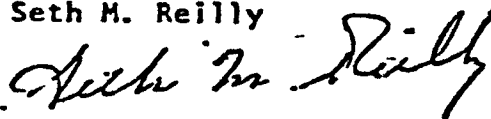
If additional pipe will be needed, it will be over and
above the bid price.

TOTAL BID

\$8,000.00

Respectfully submitted,

Seth M. Reilly



RECEIVED
OFFICE OF THE
SECRETARY

SEP 23 12 45 PM '77

SEP 26 11 30 AM '77 Date: Sept 16, 1977

FEDERAL
POWER COMMISSION
Secretary, Federal Power Commission
825 North Capitol St. NE
Washington, D.C. 20426

ref: Project 2188
Holter Development

Dear Sir:

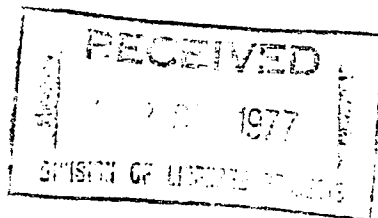
As a concerned citizen I am responding to the request for input on Project 2188, Upper Holter access. I am unqualifiedly opposed to additional public access to Upper Holter Lake. Initially, I am convinced that such planning is being promoted for the benefit of private land development in the area, with no thought for the harmful potential involved. In this regard, I am opposed to the use of public funds to enhance land development by private enterprise, especially when sincere interest in access to public campgrounds is lacking.

In addition, I feel that expansion of access to the area is totally unnecessary since present access is more than adequate. Expansion would only impose further on the natural terrain, that needs preservation rather than exploitation. The Forest Service Campgrounds in the area have exceptionally high traffic at present, indicating that additional access would only serve to bring greater pressure on them.

Finally, considering the extraordinary significance of the Gates of the Mountains area for its natural beauty and historical value, it seems imperative that public access be controlled and limited to aid in preserving the natural conditions, ultimately for everyone's benefit.

The whole region of Upper Holter Lake is so unique, and has more than adequate access that it should not be allowed to be exploited by private land developers; therefore, I am unequivocally opposed to increased access on Upper Holter Lake.

Sincerely,



Rosemary B Zion
1205 Highland Ave.
Helena, Mont. 59601

P.S. I know this is a gain

George R. SNYDER
Name

1805 JOSELYN #204
Street

Helena MONTANA 59601
City State Zip

Mr. Kenneth Plumb
Federal Power Commission
Washington, D.C. 20426

Dear Mr. Plumb:

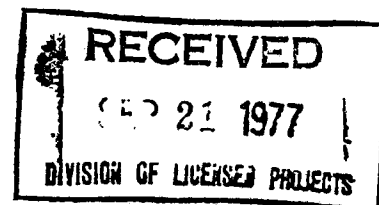
The only access on the west side of Upper Holter Lake is through a private yacht club in which membership is restricted and the activities are controlled by the yacht club.

All citizens should have free access to these public waters.

Your recommendation that public access be made available will be most appreciated.

Very truly yours,

George R. Snyder



Kenneth R. Brady

969 Ave C NW

Wash DC 20001

JUL 23 2 50 PM '77
FEDERAL POWER
COMMISSION

Mr. Kenneth H. Plant, Secretary,

Federal Power Commission

825 North Capitol Street

Washington, D.C. 20426

Re: Boat launching site

Project No. 2188

Water Development.

Dear Mr. Plant:

This is to relate to you my feelings concerning the lack of adequate public access to the upper portion of Holston Reservoir. I understand your connection, this matter at this time. More public access are badly needed.

Sincerely,
Ken Brady

FEDERAL POWER COMMISSION
DOCKETED

JUL 25 1977

DOCKETED

LAW OFFICES

Keller, Reynolds and Drake

PAUL T. KELLER
MELVIN E. MAGNUSON (1911-1967)
PAUL F. REYNOLDS
GLEN L. DRAKE
P. KEITH KELLER

MICHAEL T. MCCABE
OF COUNSEL
HERBERT H. GEORGE

JUL 27 10 16 AM '77
FEDERAL POWER
COMMISSION

SOUTH ANNEX, POWER BLOCK
HELENA, MONTANA 59601
TELEPHONE (406) 442-0230

July 22, 1977

Mr. Kenneth F. Plumb, Secretary
Federal Power Commission
825 North Capitol Street
Washington, D.C. 20426

Re: Your Public Notice in
the Independent Record,
relative to Project No.
2188, Holter Development

OFFICIAL FILE COPY		
TO	INIT.	DATE
DOCKET		
CENTRAL FILES		

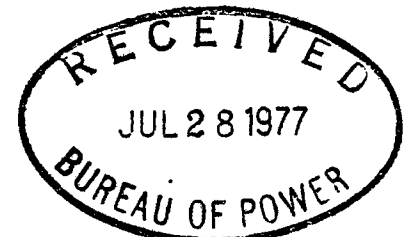
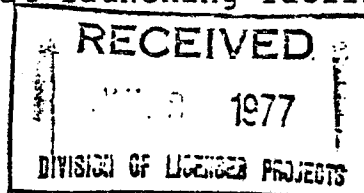
Dear Mr. Plumb:

This is to express my concern relative to the limited public access to the upper Holter Lake area. You may be aware of the fact that there is only access point to the project waters in the area under discussion. That access point is controlled by the Gates of the Mountains Yacht Club, which is a privately operated club with a membership requirement with access to the public available only upon payment of a stipulated fee.

I have been informed that the Gates of the Mountains Yacht Club looks with considerable disfavor upon the use of the yacht club facilities for launching boats by persons who may have property which they own on the opposite side of the river from the facility which they operate and control.

The following is in response to the numbered items appearing in your public notice:

1. A comparatively small area is all that would be required to accommodate members of the public for a boat launching and parking area. There is an area just east of the Gates of the Mountains Yacht Club facility which would be an ideal site for such a boat launching site. It is my opinion that there should be very little, if any, expense involved in the utilization of this site for a boat launching facility.



Mr. Kenneth F. Plumb, Secretary
Federal Power Commission
July 22, 1977
Page 2

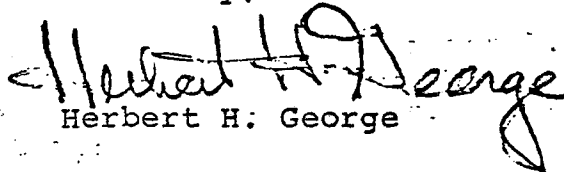
2. The site suggested is approximately 3/10ths of a mile easterly of the Gates of the Mountains Yacht Club facility which would require the extension of the County road for about 3/10ths of a mile over the flood easement which is under the jurisdiction of the Federal Power Commission.

3. It is my opinion that this site should be opened to the general public and should not be restricted in any way except for its use as a boat launching area. There should be no discrimination against persons because of race, creed, color or religion, or otherwise, and it should not be operated on a membership basis.

4. Since the Montana State Parks Department of the State Fish and Game Commission for the State of Montana have jurisdiction over recreational areas in the state, I would suggest that this proposed facility be placed under the jurisdiction of that department.

I urge that you do whatever you can to cause this site to become a reality since it is badly needed for the public in this area.

Sincerely,


Herbert H. George

HHG:ps

912 Broad way
Helena, Montana.

Fri. July 29, 1977

To whom it may Concern: P-5188

In regard to the future of the
Gates of the Mountains, I would
like to say this leave, the gates just
as they are! If people like Sid
Smith keeps getting their way there
Won't be anything left of our Gates.

Leave them the way they are.
Knowing Sid Smith & what he has
done in the past. I know the only
reason ~~for~~ he is doing this is for
his own personal gain!! STOP HIM!!

The gates are the Only place left
that is exactly the way Lewis & Clark
Saw it.

AUG 1 2 1977
FEDERAL POWER
COMMISSION

FEDERAL POWER COMMISSION
AUG 1 1977
DOCKET SECTION

There are Indian Paintings still visible on the Canyon Walls. Abundant Wildlife such as deer, elk, big horn sheep, mountain goats, etc.

If Sid Smith and his followers get their way all will be destroyed.

Mr. Tubbs as he is affectionately called has been ~~working~~ for the past 30 years been fighting to keep the gates as they are.

The Gates Can't be developed any more - we are running out of these kinds of areas every day.

PLEASE, NO MORE DEVELOPING
OF THE "GATES OF THE
MOUNTAINS"

As Lewis & Clark named them over 100 yrs. ago.

Sincerely -
Wayne W. Kinkel

Aug 2 9 31 AM '77
FEDERAL POWER
COMMISSION

1302 Highland
Helena, Montana 59601
July 30, 1977

P-2118

Holter Reservoir Project 2188
Federal Power Commission
Washington, D. C. 20426

Gentlemen:

During 1972-73-74 I guided nearly 50,000 tourists through the Gates of the Mountains, first for Chuck Nahrgang who managed the Gates Boat Club for years, and later for the current manager, Bob Tubbs. Without the public tours offered by the boat club, the historical Gates area would be a private domain for owners of power boats and for those few individuals who can afford to buy lakeshore property. How interesting that the federal government would even consider building an additional public facility in this small area, a facility which would not only duplicate an existing one but which would serve the selfish interests of private land developers.

I urge you to visit the beautiful Gates of the Mountains. By interviewing the elderly Hilger family you would obtain an historical perspective on public use of the Gates. The Hilger's established a ranch in the 1860's on the shores of the Missouri River, near what is now Holter Lake, and began public tours through the Gates canyon before the turn of the century. The Gates are threatened today by Mr. Sidney Smith and his fellow land developers who will develop their lakeshore home area adjacent to the fragile Gates with or without federal assistance. I urge you not to serve the special interests of an elite group. Please leave the area as it is. The Gates Foundation is dedicated to the preservation of the area and does provide access to the area for more than 20,000 people a year.

I would be happy to provide additional testimony although I am disappointed that you have given enough credence to the complaints of Mr. Smith to even solicit it.

Sincerely,

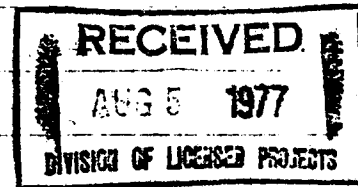
G. Patrick Feeley
G. Patrick Feeley

FEDERAL POWER COMMISSION
DOCKETED

AUG 2 1977
DOCKET SECTION

1 AUG 77

GENTLEMEN



I WOULD LIKE TO GO ON
RECORD IN OPPOSITION TO THE
PROPOSED HOLLER RESERVOIR PROJECT
2188.

AT THIS TIME AN ADEQUATE
PUBLIC BOAT RAMP IS AVAILABLE
AT THE "GATES" WHICH PROVIDES
ACCESS TO THE AREA. I HAVE
NEVER SEEN THIS RAMP UTILIZED
AT ITS MAXIMUM CAPACITY & I
FREQUENT THE AREA WEEKLY TO
LAUNCH.

IN ADDITION TO NO REAL NEED
FOR A NEW LAUNCH AREA I BELIEVE
THAT FURTHER DEVELOPMENT IN
THE WHOLE "GATES" AREA WILL BE
DETRIMENTAL TO THE WILDERNESS AREA
AS IT NOW EXISTS. EVIDENCE IS
MOST READILY AVAILABLE TO SUGGEST
THAT WITH THE RECENT DEVELOPMENT
AT MILLVIEW BLVD. WHICH IS DIRECTLY
SOUTH EAST OF THE WILDERNESS AREA
& JUST ACROSS THE RIVER FROM THE
PROPOSED PROJECT IS E OF THE AREA.

BY ILLEGAL & IMPROPER USE OF 4-WHEEL
VEHICLES & INCREASED FOOT TRAFFIC WITH
RESULTANT GARBAGE IS ON THE
INCREASE.

ONE LAST NOTE - THE DEVELOPERS
OF AMERICAN BAR KNEW ACCESS TO
THE AREA WAS LIMITED PRIOR TO THE
SALE OF THE LAND. THERE IS NO REASON
NOW TO USE PUBLIC FUNDS TO OBLIGE
THE DEVELOPER OUT OF HIS POCKET.

BEING A REALIST I KNOW THAT
MONEY TELLS THE STORY & THAT DESPITE
PUBLIC PROTEST & LACK OF JUSTIFICATION
FOR THE PROJECT IT WILL BE BUILT
ANYWAY. SO I SUGGEST THAT IF
BACK SPACE FOR OVERWINTER & PROLONGED
MOORAGE IS PROPOSED THAT THIS BE
DONE ON A LOTTERY BASIS TO
INSURE THAT THE DEVELOPER & OWNERS
OF PROPERTY AT AMERICAN BAR DO
NOT HAVE SOLE USE OF THE FACILITY.

THANK YOU

Donald J. Miller

717 S. CALIFORNIA
HELENA, MT. 59601

AUG 5 10 33 AM '77
FEDERAL POWER
COMMISSION

222 Wallace
Helena, Montana 59601
August 2, 1977

Federal Power Commission
Holter Reservoir Project 2188
Washington, D.C. 20426

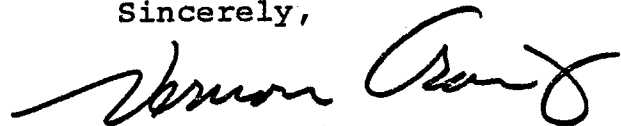
P-2188

Dear Sirs:

Gates of the Mountains Boat Club has dominated access to upper Holter Lake for many years, even to selection of who will and who will not park in the boat launching area. There is no other parking area or launching site on the upper west side.

I do not feel that a private organization should monopolize such a vast area of outdoor recreation potential. I would certainly recommend providing some real public access there even if a user fee were involved.

Sincerely,


Vernon Craig

VC/gk

FEDERAL POWER COMMISSION
DOCKETED

AUG 5 1977
DOCKET SECTION

DRS. BURGESS, BOSSLER, LITTLE & CRICHTON

820 NORTH MONTANA AVENUE
HELENA, MONTANA 59601

August 11, 1977

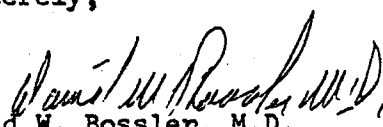
Federal Power Commission
Washington, D.C.

Dear Sirs:

Several years ago I had occasion to put my canoe in at the Gates of the Mountains. There was a boat club there and we simply unloaded the canoe and attempted to launch it from the boat club's pad. A caretaker immediately ran out and tried to charge me a couple of dollars for the service of launching my canoe on his dock. I was a bit upset about this matter and promptly took the canoe out of the water and launched it through the weeds on one of my patient's property.

It is my feeling that public access in this area is most desirable.

Sincerely,


David W. Bossler, M.D.

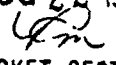
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FEDERAL POWER
COMMISSION

AUG 22 1 11 PM '77

RECEIVED

FEDERAL POWER COMMISSION
DOCKETED

AUG 22 1977

DOCKET SECTION

1317- Ninth Ave.
Helena, MT 59601

Kenneth F. Plumb, Secretary
Federal Power Commission
Washington, D. C. 20426

AUG 12 8 40 AM '77

Dear Secretary Plumb:

FEDERAL POWER
COMMISSION

Re: Public access to the Upper Holter Lake reservoir
Project #2188

As a former Montana Historical Society librarian and a current Gates of the Mountains Foundation trustee, I am intensely concerned about the Federal Power Commission's pending consideration of whether existing facilities for public access to the Upper Holter Reservoir are adequate to meet the public needs.

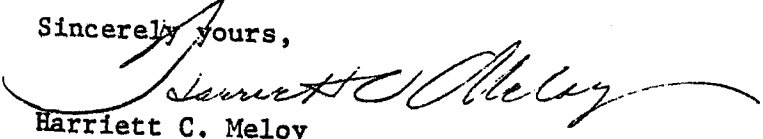
The Gates of the Mountains, named by Lewis & Clark in 1805, is essentially the same as the scenery viewed by the explorers one hundred and seventy-two years ago. For several decades, excursions by boat have thrilled thousands of visitors to the area. Besides enjoying the historical significance of the site, tourists have examined flora and fauna, archaeological data and artifacts found only in this special locale.

Since becoming a member of the Gates of the Mountains Foundation, I have been acutely aware of the boat launching and parking activity already disturbing the sensitive area; therefore, learning that developers are petitioning to allow boat docking, parking and camping for at least ninety-five families who will build homes on the east shore is extremely alarming. Additional boats, cars and camping equipment could lead to disastrous commercialization, land and water pollution and other problems. And the large question is, WHY?

According to information from Forest Service personnel, four accesses other than the Gates of the Mountains boat dock are available to the east shore subdividers at this moment. My understanding is that private automobile parking, garbage disposal and boat parking could be established well out of sight of canyon visitors.

The subdivision developers must be urged to use these other accesses to the east shore in order to assist the Gates of the Mountains Foundation in its effort to preserve the historic site. Please give your most serious consideration to conservation of values remaining at the Gates of the Mountains--scenery, history, animals, vegetation, and archaeological data-- so that tourists, historians--the public in general--can benefit from visiting the historic Missouri River canyon, the Gates of the Mountains, for years to come.

Sincerely yours,


Harriett C. Meloy

cc to: President Jimmy Carter
The Honorable Lee Metcalf
The Honorable John Melcher
The Honorable Max Baucus

Robert H. Torkeim, Regional Forester
James Jordan, Supervisor Helena Forest
Environmental Infor. Center, Helena
FEDERAL POWER COMMISSION
DOCKETED

AUG 12 1977


AUG 15 1 42 PM '77

FEDERAL POWER COMMISSION
546 E. 6th Avenue
Helena, Montana 59601
August 12, 1977

Federal Power Commission
Holter Reservoir Project 2188
Washington, D.C. 20426

Gentlemen:

My letter is in regard to the current controversy over boat docking facilities on the Missouri River at Gates of the Mountains, Montana. I am writing as a private citizen and am expressing my own opinions; I do not know either Mr. Sidney Smith or Mr. Robert Tubbs, principals in the controversy, and I am not a member of any group which espouses the viewpoints of these persons.

Personally, I do not believe that Mr. Smith's advocacy for a public dock at Gates of the Mountains stems from any altruistic concern for the general public's "free recreation access rights" to the River. Rather, it is evident from Smith's involvement in property development on the River's eastern shore (see attached) that his efforts are motivated by a great deal of self-interest.

Mr. Tubbs' desire to maintain sole control over docking facilities at Gates of the Mountains is also obviously prompted by self-interest, but it seems to be a different type of self-interest than Smith's. Tubbs has an interest in the natural beauty of the area, and has a justifiable desire to see his environment remain free of the presence of a second-home community and all of the disadvantages that such a development brings.

I earnestly hope that the Federal Power Commission will refuse to permit the construction of any additional boat docks or other commercial/recreational facilities at Gates of the Mountains. That site has both historical and scenic significance and should remain as free from development as possible. Unfortunately, Smith and his cohorts have received clearance from local authorities to establish their development, but they should not be given further assistance from the government in their quest for personal profit.

Yours truly,

David R. Martin
David R. Martin

Mr. & Mrs. David R. Martin
546 East Sixth Avenue
Helena, MT 59601

FEDERAL POWER COMMISSION
DOCKETED

AUG 15 1977

LM
DOCKET SECTION

707 N. Warren
Helena, Mt.
Aug. 30, 1977

RECEIVED
FEDERAL POWER
COMMISSION
SEP 8 1977
Washington D.C. P 2188
Federal Power Commission

Dear Sir,

I'm very concerned about preserving our widely known and visited Historic Gates of the Mountains. It is known that any one can launch his boat for a fee if one does not belong to their club. This is a natural, National place because Lewis & Clarke made it so. The Hilger Ranch also an Historic Landmark as it was established in 1865, now operated by Hilger grandchildren. It seems that they are a natural part of the Gates of the Mountains.

I hope you can help us keep the Gates of the Mountains the beautiful area that it is. I'm not in favor of homes, cabins, trailers, boats, pets, etc., being in that area where we often see wild animals.

Sincerely, Mrs. Carl Anderson

SEP 2 8 49 AM '77
FEDERAL POWER
COMMISSION

August 30, 1977
500 Raymond
Helena, Montana 59601

Holter Project 2188
Secretary Federal Power Commission
825 N. Capitol St. N.E.
Washington D.C. 20426

P-2188

Dear Sirs:

It would be a terrible misuse of Federal Funds in my opinion to spend them to make another access to Holter Lake.

I have been boating Holter Lake for more than twenty years and access has never been a problem presently or prior to the Gates of the Mountains Boat Club.

The Launching fee is very nominal for anyone that wants to launch a boat and to use Federal Funds to assist a development that detracts from the scenic, ~~mm~~ wilderness and historical values of the area looks to me like a misuse of taxpayers money.

Yours truly

Robert S. Raundal

cc.
Senator Metcalf
Senator Melcher
Representative Baucus

FEDERAL POWER COMMISSION
DOCKETED

SEP 2 1977

DOCKET SECTION

Frank D. Neill
320 North Warren, Apt. 3
Helena, Montana 59601
September 2, 1977

RECEIVED
SEP 6 1 43 PM '77

Secretary, Federal Power Commission
825 N. Capitol
Washington D.C. 20426

P 2188

Gentlemen:

Myself and family are opposed to any further development of Upper Holter Lake, either by roads, trails or boat landings. I have been acquainted with and been a part of that area for more than 60 years. My Dad used to do his deer hunting in the Beartooth area (now called Sleeping Giant.) I took my first boat trip through the Gates of the Mountains about 1924 on the Sacajawea #1. Mr. Hilger was owner and pilot.

In 1960 I had my own boat at the Gates up until 1966. Every time we have visitors from out of town, the large passenger boat trip was and still is our No. 1 choice of entertainment, so I have been able to observe the operation and maintenance of those docks and that area from every angle for a long time.

In all that time, around 60 years, I have never seen nor heard of anyone being refused docking or landing permission except for misconduct. There always seemed to be some unused permanent berths for both large and small boats, with worth while expansion continuing when needed.

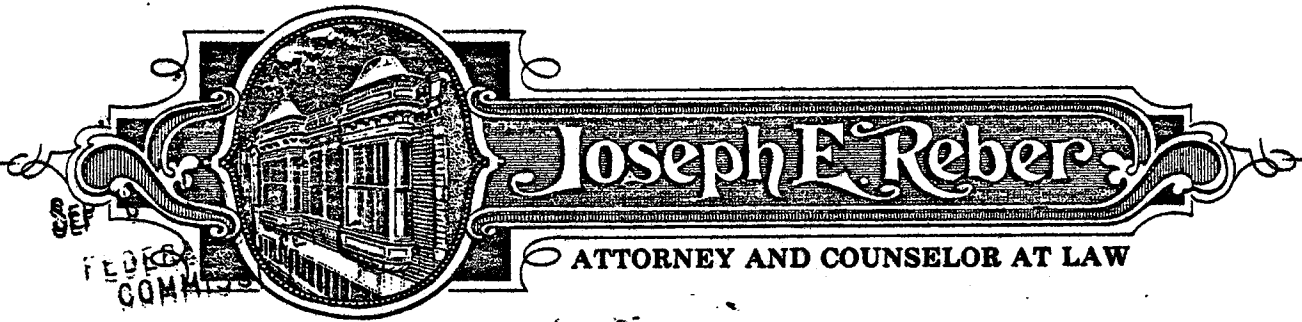
It is a properly run Boat Club, owned by an Association dedicated to preserving the beauties of the Gates and for the Public forever. Other docking area is not needed.

Perhaps the attached clippings will help in your decisions.

It may be that the ways of enjoying boating are naturally dividing themselves. Those for speed, water skiing, skylarking etc., in one area and those for relaxing, viewing, fishing etc., in another.

Yours truly

Frank D. Neill



September 2, 1977

Holter Project 2188
Secretary
Federal Power Commission
825 North Capitol St. N.E.
Washington, D.C. 20426

Dear Mr. Secretary,

This letter is in support of the government allowing additional docks on Holter Lake, for access to upper Holter Lake, and the Gates of the Mountains area on the Missouri River.

It is unfair and unreasonable, I believe, for a self-interested group of private individuals to discriminate against persons who wish to use their club facilities for reasons the club does not agree with. This allows private parties to limit access to public waters.

Additional docks should be allowed to be constructed to allow more of the public to have access to the Gates of the Mountains area, and to their private homes in the area, if they so wish.

Government policy should promote public use of waterways, and not support or favor private clubs which seek to deny access to rivers and lakes to people whom they disagree with.

Sincerely,

JOSEPH E. REBER
Attorney at Law

JER/mv

Sept., 29, 197

SEP 29 1977
POWER
COMMISSION

P-2188

Dear Mr. Plumb,

I am a member of the Gates of the Mountain
Yacht Club.

I feel the landowners across the lake
have been unjustly harrassed. I know many
of the people who are trying to develop the
land (and I do think they are doing it with
sincere thought) and I find them to be good
people.

Access should be made available to them.
They don't need all that many spaces.

Bob Tubbs has made the club a lucrative
one, but honestly it isn't as much fun as it
use to be in the days of Chuck Mangane. There
is much inter-trouble because of this matter and
several others caused by Bob.

You will recieve thousands of letters
from the Tubbs side. I signed 25 of them myself!
They truly don't represent the citizens of Montana
because of the way they have been acquired, and I
guess I'm feeling some guilt pangs. Others in the
group are feeling the same pangs by the way.

I don't approve of the somewhat dishonest ways
Bob has used to discredit the people and their attempt
to develop their own private land.

For legal reasons (future law suit from other side)?

I withhold my name, Member of Yacht Club.

POWER
COMMISSION

OCT 1 1977

OFFICE OF THE
SECRETARY

FEDERAL POWER COMMISSION
DOCKETED

OCT 3 1977
DOCKET SECTION

912 North Jackson St

SIDNEY O. SMITH
ATTORNEY AT LAW
HELENA, MONTANA
59601

OCT 4 5 26 AM '77

September 30, 1977

FEDERAL POWER COMMISSION
812 N. JACKSON STREET
PHONE 406/442-4482

Federal Power Commission,
825 N. Capitol St., N.E.
Washington, D. C. 20426

Attention: Secretary:
re: Helter Project 2188.
Helena, Montana, 59601

Gentlemen:

The Independent Record, Wednesday, September 28, 1977, page 7
reads:

"DEADLINE NEAR FOR "GATES" COMMENT. (copy attached)

Enclosed is "Figure 8 Route map by Helena National Forest, Helena, Montana, showing "Hilger Landing" on west shore of Helter Lake (Missouri River) and on the east shore is "Gates of The Mountains Wild area just east across the lake from the "Gates" clubhouse and boat docks and floating dock for loading and unloading of passengers; each launch cruiser carries in excess of 100 persons and safety precautions for the passengers are paramount.

1. The Mountains Boat Club dock offers sufficient access to the lake for public boat access and for cruise excursions now provided for the public by the Club.
2. The safety of the passengers transported by the cruisers will definitely be endangered by congestion of boat traffic in the area operating in the lake area from east shore to west shore and vice versa.
3. The observations of the undersigned are set forth herein by reason actual use this past summer of the passenger cruiser tour facilities for the entertainment of visitors from Ontario, Canada, who were relatives and many times commented that the "Gates of the Mountains" cruise was the highlight of their 2,000 mile traveling to Montana.
4. It is my opinion that after considering the economic aspects of the short seasonal operations and the non-profit purpose of the Gates of the Mountains Foundation dedicated to functioning as a conservation group of local citizens which strives to protect the scenic and historic "Gates" canyon from commercial exploitation, that the Honorable Members of the Federal Power Commission will realize and conclude that no private, local, state or federal agencies will provide and maintain the facilities as presently existing, and which should not be changed in any manner and that there are many other miles of lakeshore available without creating congestion of boat traffic in the area involved herein.

ss/m enclosures.

Sincerely,
Sidney O. Smith
SIDNEY O. SMITH

FEDERAL POWER COMMISSION
DOCKETED
OCT 4 1977
DOCKET SECTION

Doc/66

OCT 7 6 54 AM '77
FEDERAL POWER
COMMISSION

1836 Floweres
Helena, Montana 59601
October 2, 1977

P-2188

Secretary
Federal Power Commission
825 North Capitol Street, N.E.
Washington, D.C. 20426

Dear Secretary, Members, and Staff of the Federal Power Commission,

My wife and I are deeply concerned about the implications of granting land developers access to the Gates of the Mountains area on Upper Holter Lake, here in Montana. The Gates of the Mountains is of great significance to both Montana and the nation. There are few who do not know at least part of the Lewis and Clark Expedition's Gates of the Mountains story. In addition to its historical value, the area is one of the most aesthetically pleasing panoramas in the entire state. Without question, the Gates has a special place in the heart of every visitor who has ever been there.

In a world of rapid environmental degradation, the Gates has been a badly needed constant. It is still incomparably beautiful. It has not yet been spoiled by the carelessness of man. It is one of the few areas where Lewis and Clark can still come alive. Our imaginations do not have to screen out numerous waterskiers, overflowing garbage cans, campers and trailers, portable radios, and other trapping of concentrated recreational "civilization."

But lately, another entity has entered the picture. A handful of land developers and speculators have seen the potential of the Gates area to make a quick profit. They have pushed through one large subdivision (other may follow). Now, they are challenging the area's present conservation policies by petitioning the Federal Power Commission for unlimited access. One of the developers (Sid Smith) has requested the F.P.C. to build the boat launching and docking facilities which would expedite river access to and from his American Bar Subdivision (also called Gates of the Mountains Lakeshore Homes).

I hope the Federal Power Commission sees the real issues at hand. The land developers are waving the flag of "public access" and are chastizing the Gates of the Mountains Foundation for being a selfish few who want the lake all for their own private use. That argument makes good press, but it does not hold up under close scrutinization. The Gates of the Mountains Foundation has always been reasonable regarding access. They are a non-profit foundation, they charge only minimal access fees, and in general have been most equitable in their stewardship of the area. They operate a highly commendable excursion boat trip which grants far more access into the area with far less degradation than would ever be done, were those people to enter by individual private boats. Tourists and visitors have the benefits

FEDERAL POWER COMMISSION
DOCKETED
OCT 6 1977
DOCKET SECTION

of everyone being able to see the canyon, without suffering the liabilities of over-use and deterioration.

Those of us who are not members of the Boat Club have anything but harsh feelings towards them. They have been judiciously caring for an area that we all love and do not want to lose. It is regrettable they have been attacked with such vengeance by the land developers.

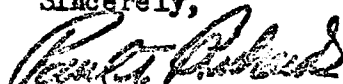
When I was a State Representative (1975-1977), I had several encounters with the Gates of the Mountains developers as they promoted their development, attempted to get a powerline corridor through National Forest land, and pressed for increased "public" access. I had many constituents who were concerned with the pending development of the Gates area. I tried my best to represent their concerns at public hearings and through writing letters. The more I became involved, the more I learned of the developers and their tactics.

Perhaps the most distasteful incident was when Sidney Smith (the applicant for F.P.C. docking facilities) used my name in several Gates of the Mountains Lakeshore Homes promotional advertisements without my permission. He quoted me in relation to the historical significance of the area and prominently displayed my name in the advertisements. The implication, of course, was that I endorsed their development. No implication could be further from the truth. This sort of deceitful tactic does not convince me of the developer's credibility or of his honest intentions.

Although I have since chosen to withdraw from the legislature and politics, I have not lost my interest and love for Montanans and Montana. That is why I write this letter. The people of this state will not benefit by the expenditure of their public dollars to subsidize land developers. There can be little doubt should the developers be granted these facilities, the entire Gates area would suffer irreparable harm. The area is still special because we have thusfar been able to avoid its commercial exploitation. It would be most regrettable should our own government take the first large step towards making that commercial exploitation possible.

Thank you for an opportunity to express my concerns. I hope you will notify me of your decision. If you would like any additional information from me, do not hesitate to write or call (406/442-0032).

Sincerely,


Paul T. Richards

STATE OF MONTANA
DEPARTMENT OF FISH AND GAME
HELENA, MONTANA

11/30/77
RECEIVED
DEC 11 1977
ENVIRON. RESOURCES

Office Memorandum

TO : Robert F. Wambach

Attn: Jim Posewitz

DATE: December 9, 1977

FROM : Tom Hay

SUBJECT: Glacier Park Flood Damage Control Environmental Impact Statement

We suggest that major flood damage areas be reviewed by a specialist in stream hydraulics and stream mechanics with the idea of incorporating the specialist's recommendations into a long range management plan. Repeated flood damage is most often the result of channel clearing above or below structures or of the faulty design of the structure itself. Historic sites, such as rock bridges, that create repeated flood damage problems are not an asset to Glacier National Park.


Tom Hay

TRH:ns
Encls:

January 27, 1978

Dr. Robert Wambach
Director
Department of Fish & Game
Helena, Montana

Attention: Mr. Ron Holliday, Administrator
Parks Division

Dear Dr. Wambach:

This will acknowledge receipt of the draft environmental
impact statement for Placid Lake State Recreation Area.

We appreciate the opportunity to review the above document
and have no comment at this time.

Sincerely,

TERRENCE D. CARMODY
Executive Director

TDC/mb

STATE OF MONTANA
DEPARTMENT OF FISH AND GAME
HELENA, MONTANA

Office Memorandum

TO : Bob Wambach, Attn: Jim Posewitz

DATE: 1/30/78

FROM : Region 4 Game Management

SUBJECT: Colorado-Unionville-Travis Planning Unit

The selected management plan for the Colorado-Unionville-Travis Planning Unit, Helena National Forest is an attempt at a middle-of-the-road policy between extreme commodity output and physical development on the one hand (Alternative I), and low commodity output and maintenance of an undeveloped environment on the other (Alternatives II and IV). Because of the large amount of private lands within this planning unit and the intensive uses these private lands and the closely associated national forest lands are receiving, we feel this area is already overdeveloped and overused for optimum wildlife populations. The selected management plan calls for even more development and use than the current situation.

The proposal to connect Lazyman Trail #320 with Colorado Gulch Trail #314.1 and to eventually consider these trails for possible motor vehicle travel, does not recognize the importance of this area as elk winter range. This proposal could establish a loop road through one of the major elk wintering areas within the planning unit. Since 72 percent of the present recreational use within this planning unit is already associated with mechanized motor travel (page 40), the need for additional roads, particularly roads through valuable wildlife areas, must be questioned.

We are encouraged by the stated objective to improve all range to good condition; however, we view proposals to initiate intensive grazing systems in this area with some apprehension for the following reasons:

1. Establishing intensive grazing systems is extremely costly. At present livestock grazing rates, we question whether these costs can be justified.

2. When these costs are shared by the permittee, the investment in either time or money encourages the permittee to assume he has a vested "right" to graze his livestock on public lands.

3. Intensive grazing systems require increased road and trail development and human activity. Development of this nature would be especially detrimental in Management Unit C₂ which is basically roadless and which could eventually be considered for wilderness designation.

4. Intensive grazing systems tend to concentrate domestic livestock. These concentration areas are often shunned by some wildlife species - e.g., elk.

5. Establishing intensive grazing systems for the purpose of providing additional forage for increased numbers of domestic livestock is single-purpose management which ignores the needs of wildlife.

Because of these considerations, we recommend reducing the numbers of permitted domestic livestock to the level necessary to allow for range recovery.

We question the need for a proposed firearms hunting closure in Management Unit B. Firearms hunting seasons and nonconsumptive uses of wildlife can exist harmoniously. If safety is a factor, the private landowner has the option of closing his land to hunting. National forest lands should be available to the hunting public.

The national forest land within this planning unit falls within Fish and Game Hunting District 435. In 1975 this hunting district provided 5,013 and 3,518 deer and elk hunter days respectively, and harvests of 139 and 40 deer and elk respectively, according to hunter questionnaire data. The Montana Department of Fish and Game is recommending more restrictive bag limits in an effort to increase populations of deer and elk in this area. As deer and elk populations respond to management, they will require additional forage and space to live. Management alternatives II and IV would best provide for these needs.

It appears to us that because of the low average annual precipitation (page 56) in this planning unit, timber production would be marginal at best.

In summary, we recommend adoption of Management Alternatives II or IV. Since the rather large amount of private land interspersed within the national forest is being developed and used to a maximum degree, we feel national forest lands should retain as much of their primitive nature as possible to balance this situation. It appears to us that the need for recreational opportunity outshadows what little commodity output the area is capable of producing.

March 24, 1978

Dr. Arthur C. Knight
Director
Department of Health and
Environmental Sciences
Helena, Montana

Attention: Mr. Edward W. Casne, Chief
Subdivision Bureau

Dear Dr. Knight:

The Cook-Hensler Ranch subdivision will encompass over three sections of land which will eliminate agricultural production and drastically reduce wildlife habitat. The PER written for the subdivision has virtually no planning scheme. Once these lands are divided and dwellings built, the land use will change and the impact will be highly significant.

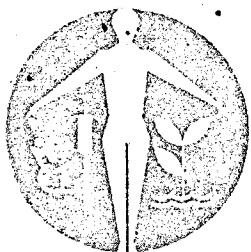
The PER as it is written is inadequate and an EIS should be in order.

Thank you for the opportunity to comment.

Sincerely,

TERRENCE D. CARMODY
Executive Director

TDC/mb



Department of Health and Environmental Sciences

STATE OF MONTANA HELENA, MONTANA 59601

ENVIRONMENTAL SCIENCES DIVISION ----- Phone: 449-3946

March 15, 1978

A. C. Knight, M.D., F.C.C.P.

Director

RECEIVED
MAR 16 1978
ENVIRONMENTAL QUALITY
COUNCIL

Dr. Ray Gold, Institute of Social Research, U of M, Missoula, MT 59801
Department of Sociology, U of M, Missoula, Missoula, MT 59801
Ravalli County Planning Board, Courthouse, Hamilton, MT 59840
State Department of Revenue, Property Assessment Div., Real Property Bureau, Helena, MT 59601
Ravalli County Extension Service, 205 Bedford, Hamilton, MT 59840
Soil Conservation Service, 111 Old Corvallis Road, Hamilton, MT 59840
Bitterroot Chamber of Commerce, 105 E. Main, Hamilton, MT 59840
Department of Community Affairs, Planning Division, Helena, MT 59601
Department of Community Affairs, Human Resources Division, Helena, MT 59601
Ravalli County Sanitarian, Courthouse, Box 5019, Hamilton, MT 59840
Department of Fish & Game, Ecological Services Division, Helena, MT 59601
U.S.F.S., Bitterroot National Forest, 316 North 3rd, Hamilton, MT 59840
Department of Labor & Industry, Employment Security Division, Helena, MT 59601
Florence - Carlton School Board, Florence, MT 59833
Montana Power Company, 104 Main, Hamilton, MT 59840
Mountain Bell, 201 North 3rd, Hamilton, MT 59840
Ravalli County Sheriff, 205 Bedford, Hamilton, MT 59840
Florence Volunteer Fire Department, Florence, MT 59833
Department of Highways, Engineering Division, Helena, MT 59601
Department of Natural Resources, Water Resources Division, Helena, MT 59601
Department of Natural Resources, Floodway Management Section, Helena, MT 59601
Montana Bureau of Mines & Geology, c/o Montana Tech, W. Park, St., Butte, MT 59701
Department of Community Affairs, Research and Information Systems Division, Helena, MT 59601
Department of Geology, U of M, Missoula, MT 59801
Department of Health & Environmental Sciences, Air Quality Bureau, Helena, MT 59601
Department of State Lands, Helena, MT 59601
Department of Anthropology, U of M, Missoula, MT 59801
Environmental Information Center, Box 12, Helena, MT 59601
Doris Milner, Montana Wilderness Association, Route 1, Box 1410, Hamilton, MT 59840
North Rockies Action Group, 9 Placer Street, Helena, MT 59601
Concerned Citizens for a Quality Environment, c/o Ron Erickson, U of M, Missoula, MT 59801
Montana Wildlife Federation, Box 4373, Missoula, MT 59801
Montana Power Company, Attn: Carl Anderson, 40 E. Broadway, Butte, MT 59701
Resource Education Foundation, Inc. Box 1148, Helena, MT 59601
Defenders of Wildlife, Attn: Hank Fischer, 947 Rimini Court, Missoula, MT 59801
Montana Wilderness Association, 4000 - 4th Avenue North, Great Falls, MT 59401
Sierra Club, 509 Hill, Missoula, MT 59801
Trout Unlimited, Attn: Jim Handley, Box 140, Manhattan, MT 59741
Rick Applegate, 427 N. Tracy, Bozeman, MT 59715
Bitterroot Sanitation, c/o Charles Mann, P.O. Box 247, Victor, MT 59875
Stevensville Public Schools, School District #2, S. Park, Stevensville, MT 59870
Stevensville Public Schools, School District #13, Lone Rock NE of Stevensville, Stevensville, MT 59870
Stevensville City Fire Department, Stevensville, MT 59870
Stevensville Rural Three Mile Fire Department, Stevensville, MT 59870
Stevensville Volunteer Ambulance Service, Stevensville, MT 59870
Ravalli County Ambulance Service, Hamilton, MT 59840
Ravalli County Commissioners Office, 205 Bedford, Hamilton, MT 59840
Wes Woodgerd, Route 1, Box 143F, Stevensville, MT 59870
Environmental Quality Council, Helena, MT 59601

EEO/AFFIRMATIVE ACTION AGENCY

January 16, 1979

**U. S. Geological Survey
Box 1135
Billings, MT 59103**

ATTN: Sherry Tennyson

Gentlemen:

As you requested, enclosed is an original of the letter to the director of the U. S. Geological Survey in Reston, Virginia, dated September 19, 1978, regarding the Spring Creek Mine Environmental Impact Statement.

If you have any questions, please advise.

Sincerely,

**TERRENCE D. CARMODY
Executive Director**

**TDC:lc
Enclosure**

September 19, 1978

Director
U.S. Geological Survey
National Center, Mail Stop 108
Reston, Virginia 22092

Dear Sir:

The Spring Creek Mines Environmental Impact Statement is one of the most adequate assessments, environmentally speaking, that I have had the opportunity to read. Although there are some areas of question, the statement presents the pertinent problems and honestly predicts the impacts that will occur. It is now up to the lead agency to review this document in detail and to realize the implications of the impending impacts and the precedent that may be set however the direction of its decision.

The major environmental impact concerns are the predominately saline sodic soils, the establishment of a diversified vegetative mosaic over these soils and the wildlife or domestic stock utilization of the area. The EIS explains the severity of the saline sodic soils on page III-10 and further states on page III-12 that unless highly technical and expensive reclamation efforts are utilized that a combination of saline and sodic spoils will render reclamation efforts ineffective. On page V-1 it is stated that the "sodic condition of the soil further increases the instability of the land surface and that the combination of sodic and saline spoils would impede reclamation unless intensive management were undertaken." On page VIII-38 there is a statement that says, "estimates to insure the integrity of the reclaimed surface so that it can be demonstrated that the area is as stable as adjacent areas, and can be used in the same manner may range from decades to centuries."

The EIS specifically points out the intensive use of the area by wildlife. These animals will be greatly reduced by the mining and will remain in a reduced condition until the land is returned to similar previous conditions.

Domestic livestock use of the land will also be impeded for the duration of time that it takes for complete reclamation.

Other impacts that will probably occur over a long period of time due to slow soil stabilization are wind and water erosion, stream sedimentation which will reduce water quality, and reduced air quality generated from dust.

U.S. Geological Survey
September 19, 1978
page two

As I have previously stated the decision promulgated from this EIS is important. If the lead agency decides to grant the permit I hope it is specified in the decision the importance of a full and complete reclamation effort, no matter the expense. If this effort is not insured in the decision this mining permit and other permits may be issued with the land suffering in the end. When the land suffers so does animal life and eventually the human community.

I have one comment that deals with the content of the EIS. On subjects where an unknown amount of impact is generated a "worst case analysis" should be utilized. Specific examples where the "worst case" could be applied are on page III-1, the second paragraph under "Topography and Geomorphology"; page III-2, the second and third paragraphs on the page under the above topic; page III-2, the third paragraph under "Paleontology"; page III-3, the first paragraph under "Surface Water"; and on page III-5 the first paragraph. These are some examples of where the analysis could be used. I would like to see this analysis applied wherever there is an unknown impact involved.

Thank you for this opportunity to comment.

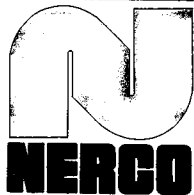
Sincerely,

TERRENCE D. CARMODY
Executive Director

By _____
Duane Noel
Ecology Researcher

TDC/DN/mb

SPRING CREEK
COAL COMPANY
529 S.W. THIRD AVE.
PORTLAND OR. 97204



October 26, 1978

04
JW
1978

ENVIRONMENTAL QUALITY

Mr. Duane Noel
Montana Environmental Quality Council
531 Broadway Street
Helena, Montana 59601

Dear Mr. Noel:

As an officer of Spring Creek Coal Company, a wholly-owned subsidiary of NERCO, Inc., I want to express my personal appreciation for your comments at the draft Environmental Impact Statement hearings, held September 20, 1978 in Decker, Montana. In particular, your comments concerning the need to preserve the soils, vegetation and wildlife of the area were useful.

We believe that low-sulfur coal produced by the proposed Spring Creek Mine will serve the nation's growing need for domestic energy alternatives to imported oil, as well as provide a fuel which is both environmentally and economically attractive. In addition, the most rigorous environmental and reclamation standards will be maintained throughout the mine's development and production phases.

The mine's development presents challenges and opportunities for Sheridan and Big Horn Counties. Spring Creek Coal Company is committed to working with local officials in the area to ensure that residents benefit significantly from the increased economic activity and employment possibilities. Along with other industrial members of the WYO-MONT Industrial Association, we are anxious to assist community leaders in preparing for positive growth and development.

Again, thank you for taking time to appear at the hearing. While we may not agree on every issue, your participation helps us, along with the state and federal regulatory agencies, make responsible, objective decisions. We are looking forward to working with you as fellow residents of the Sheridan/Big Horn County area.

Sincerely yours,

W. W. Lyons
Vice President-Administration

WWL/LAL/pdg



STATE OF MONTANA
ENVIRONMENTAL QUALITY COUNCIL
CAPITOL STATION
Helena, Montana 59601

8

Telephone (406) 449-3742

Terrence D. Carmody, Executive Director

GOV. THOMAS L. JUDGE or
Designated Representative
Lt. Gov. Ted Schwinden

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Frank Dunkie
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Dennis G. Nattie
Arthur H. Sheldon

APPOINTED MEMBERS
G.W. Deschamps
Charles Doherty
Richard D. Klinger
William D. Spilker

September 19, 1978

Director
U.S. Geological Survey
National Center, Mail Stop 108
Reston, Virginia 22092

Dear Sir:

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The major environmental impact concerns are the predominately saline sodic soils, the establishment of a diversified vegetative mosaic over these soils and the wildlife or domestic stock utilization of the area. The EIS explains the severity of the saline sodic soils on page III-10 and further states on page III-12 that unless highly technical and expensive reclamation efforts are utilized that a combination of saline and sodic spoils will render reclamation efforts ineffective. On page V-1 it is stated that the "sodic condition of the soil further increases the instability of the land surface and that the combination of sodic and saline spoils would impede reclamation unless intensive management were undertaken." On page VIII-38 there is a statement that says, "estimates to insure the integrity of the reclaimed surface so that it can be demonstrated that the area is as stable as adjacent areas, and can be used in the same manner may range from decades to centuries."

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U.S. Geological Survey
September 19, 1978
page two

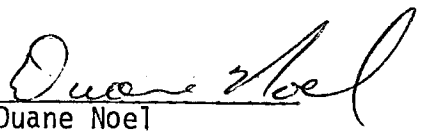
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Thank you for this opportunity to comment.

Sincerely,

TERRENCE D. CARMODY
Executive Director

By 
Duane Noel
Ecology Researcher

TDC/DN/mb

2
January 25, 1979

Ralph Driear, Environmental Administrator
Department of State Lands
Capitol Station
Helena, MT 59601

Dear Ralph:

Thank you for the opportunity to comment on the draft Environmental Impact Statement for Western Vermiculite's proposed vermiculite mine. Generally, the draft is adequate and its conclusions regarding impacts appear sound.

However, I would like to offer several suggestions. It might be appropriate to explore and discuss the feasibility of bussing the workers between the mill and mine sites and the Hamilton area. Bussing makes sense both as an energy conservation measure, and as a response to the concern raised in the draft EIS about the effects of increased traffic on wildlife, particularly on the winter range in Charleys Gulch. Your department pointed out the advantages of bussing in its EIS on ASARCO's Troy Project. On brief review, bussing seems equally appropriate and feasible for the western vermiculite proposal.

Additionally, the EIS fails to fully discuss the likelihood of future expansion of the project. The discussion is limited to several lines on page 82, where the prospect of expansion at the rate of "20 acres per year for 9 years plus any long term plans" is raised. Although the draft EIS gives no clues, it seems quite possible that expansion of the project to the extent suggested by page 82 may have the potential to greatly magnify the project's impact.

The possibility of a greatly expanded project places the existing proposal in a different light. Because the existing proposal is a necessary first step to any future expansion, no environmental review of it is complete unless it includes a discussion of the impacts of a fully expanded project as well. At the

Ralph Driear
Page 2
January 25, 1979

very least, the allusion to future expansion on page 82 requires further elaboration. Without it this EIS is not really complying with the Montana Environmental Policy Act's goal of avoiding piecemeal review and fragmented decision making.

Thanks again for the opportunity to comment.

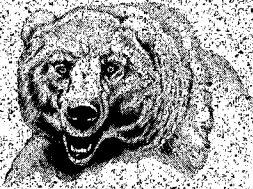
Sincerely,

TERRENCE D. CARMODY
Executive Director

By John Westenberg
Ecology Researcher

TDC/JW/1s

STATE OF MONTANA



DEPARTMENT OF FISH AND GAME



Helena, MT 59601
January 23, 1979

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Dy
Ruh

RECEIVED

JAN 25 1979

ENVIRONMENTAL QUALITY
COUNCIL

Mr. Ralph Driear, Environmental Administrator
Department of State Lands
Helena, MT 59601

Dear Ralph:

As requested, we have reviewed the draft environmental impact statement and environmental assessment for the Western Vermiculite Company's ABM Ridge project in Ravalli County.

This review was conducted by personnel from our regional office in Missoula, and a copy of their comments is enclosed for your use.

We would like to thank you for the opportunity to review this proposal, and hope our comments can be incorporated into the planning for this project.

Sincerely,

James A. Posewitz, Administrator
Ecological Services Division

sd
Enc

cc: ✓ Environmental Quality Council
Roger Rabe, Bitterroot National Forest
Earl Sherron
Jim Ford

STATE OF MONTANA
DEPARTMENT OF FISH AND GAME
HELENA, MONTANA

RECEIVED
JAN 23 1979
ENVIRON. RESOURCES

Office Memorandum

TO : Bob Wambach, Attn: Jim Posewitz

DATE: January 22, 1979

FROM : Jim Ford, By: John Firebaugh

SUBJECT: Western Vermiculite - Draft EIS

The Draft EIS of Western Vermiculite's ABM Ridge Project has been reviewed and the following comments concern the wildlife resource in the project area. Most of the department's previous comments concerning wildlife and potential impacts from the mining project are included. However, there are some important points which were left out and should be included.

The life expectancy of the proposed mining program according to the Draft EIS is seven years. However, preliminary meetings indicated the potential exists for a much longer, expanded program than seven years and 30 acres. Considerable habitat can be destroyed if the 58 claims on some 1,200 acres are eventually developed. The disturbance and/or destroying of this 1,200 acres of habitat would have a considerable impact on wildlife. Through habitat destruction and mining activity, it is possible, if these 1,200 acres or a portion of them are developed, that elk, mule deer, and possibly mountain goat use will be eliminated for a period of time. Animals would be displaced into habitat already occupied, creating competition for space and forage, possible social stress, etc. The result of this displacement would have a negative impact on the wildlife populations through a reduction of the carrying capacity of the summer range. These potential long term activities should be addressed in the EIS.

There is no mention of the Charleys Gulch road remaining open for hunter access. Because of the amount of land closed to hunting in this area and the need for a good annual elk harvest, it is important that this road remain open to hunters. The road provides access between the Skalkaho Game Preserve and the Bitterroot Stock Farm, both closed to hunting. Access between these two areas is needed, because with good snow conditions during the hunting season, a considerable portion of the elk harvest in Hunting District 261 is taken here.

Reasonable reclamation at this high elevation with a short growing season is questionable. The possibility of reclamation failing and the impact this would have on wildlife habitat should be discussed.

JF/pm



STATE OF MONTANA

DEPARTMENT OF STATE LANDS

JW

MAILING ADDRESS: CAPITOL STATION
OFFICE: 1625 11TH AVENUE

HELENA 59601

(406) 449-2074

STATE BOARD OF LAND COMMISSIONERS

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SUPT. OF PUBLIC INSTRUCTION

FRANK MURRAY
SECRETARY OF STATE

MIKE GREELY
ATTORNEY GENERAL

E. V. "SONNY" OMHOLT
AUDITOR

LEO BERRY, JR.
COMMISSIONER

February 22, 1979

RECEIVED

FEB 27 1979

ENVIRONMENTAL QUALITY
COUNCIL

John Westenberg
Ecology Researcher
Environmental Quality Council
Capitol Station
Helena, MT 59601

Dear John:

Thank you for the Environmental Quality Council's comments on the draft Environmental Impact Statement (EIS) for the Western Vermiculite Company's proposed mining project near Hamilton, Montana. The responses to the Council's comments are presented below.

Comment:

Bussing of workers between the mine site and the Hamilton area seems appropriate and feasible.

Response:

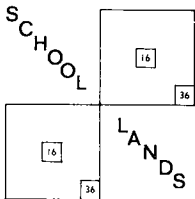
Bussing of workers to the mine site would reduce the potential for impact upon the area's wildlife, particularly from vehicle encounters and harassment. The mining company officials have been contacted regarding this manner of employee transport and they have indicated that a bussing system will be considered; however, at this time they are primarily considering bussing of employees to the mine site during the winter months. The Department of State Lands has no authority to require the establishment of a bussing system by the mining company.

Comment:

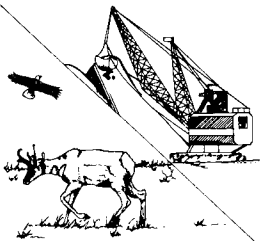
The EIS fails to fully discuss the likelihood of future expansion of the project.

Response:

Western Vermiculite Company has indicated in their application to the Department for a hard rock operating permit that approximately 189 acres could be disturbed during the "life of the operation."



MINING



RECLAMATION

John Westenberg
Page Two
February 22, 1979

This acreage amount is based upon the area encompassing all of the known, easily identifiable outcrops of vermiculite in the vicinity of the proposed mine. The extent that economically minable vermiculite deposits lie under the entire 189 acres is not known. The Company has indicated that because of this, it is impossible to determine whether any future mining would represent an expansion of the proposed mine site. It is thought most probable at this time that should future expansion occur, it would be in the form of additional mine sites at the location of the vermiculite outcrops. As with all mining operations, the likelihood of future expansion is linked closely with mineral markets and the results of future exploration projects designed to identify the extent of the mineral occurrence. Western Vermiculite Company at this time has developed no plans for future expansion.

The reference to expansion at the rate of "20 acres per year for 9 years plus any long-term plans" that appeared on page 82 of the DEIS was inappropriate and not based upon any substantially quantifiable information regarding the extent of the vermiculite deposit. This quoted rate of expansion was advanced by a consulting firm working for the mining company early in the development stages of the mining proposal and did not represent an accurate indication of the company's plans for future expansion for the reasons discussed in the previous paragraphs.

Comment:

Because the existing proposal is a necessary first step to any future expansion, no environmental review of it is complete unless it includes a discussion of the impacts of a fully expanded project as well.

Response:

The draft EIS for the proposed vermiculite mine considered the cumulative impact of the total project proposed by the Company. For the reasons discussed earlier, quantifiable information necessary to develop the specifics of a "full expanded project" and therefore the ability to conduct an expanded environmental review is not available. Additionally, it is not within the province of state and federal agencies to require the Western Vermiculite Company or other claim owners to reveal the total project "contemplated." To base impact projections upon what the authors consider to be the "contemplated" project without a project proposal would be speculation and of little value to the objective EIS process.

Sincerely,



Ralph E. Driear
Environmental Administrator



DEPARTMENT OF STATE LANDS

MAILING ADDRESS: CAPITOL STATION
OFFICE: 1625 11TH AVENUE

HELENA 59601

(406) 449-2074

February 23, 1979

The Honorable Thomas Judge
Governor of Montana
Capitol Station
Helena, MT 59601

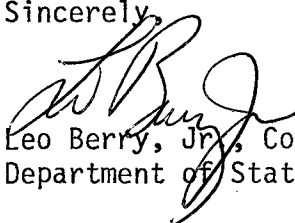
Terrance Carmody
Director
Environmental Quality Council
Capitol Station
Helena, MT 59601

Gentlemen:

Attached are the comments received by the Department of State Lands and the Bitterroot National Forest on the Draft Environmental Impact Statement and Environmental Analysis Report for the proposed Western Vermiculite Company's vermiculite mine near Hamilton, Montana. Also attached are the responses to the comments prepared by the Department and the Bitterroot National Forest.

The Department of State Lands has determined that it will not be necessary to compile a final environmental impact statement as provided for by MAC 26-2.2(18)-P290 (Rule V)(2)(a) and (b). Pursuant to this rule, the Department plans to make its decision on the application by the Western Vermiculite Company not less than fifteen (15) days after sending copies of this document to the Governor of Montana, the Montana Environmental Quality Council, and the Western Vermiculite Company.

Sincerely,

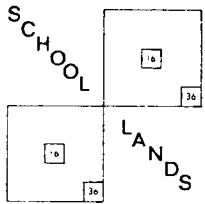

Leo Berry, Jr., Commissioner
Department of State Lands

RD/sk

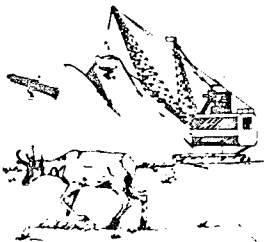
Attachments

STATE BOARD OF
LAND COMMISSIONERS
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GOVERNOR
GEORGIA RICE
SUPT. OF PUBLIC INSTRUCTION
FRANK MURRAY
SECRETARY OF STATE
MIKE GREELY
ATTORNEY GENERAL
E. V. "SONNY" OMHOLT
AUDITOR

LEO BERRY, JR.
COMMISSIONER



MINING



RECLAMATION



DEPARTMENT OF STATE LANDS

MAILING ADDRESS: CAPITOL STATION
OFFICE: 1625 11TH AVENUE

HELENA 59601

(406) 449-2074

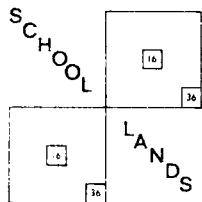
February 23, 1979

Attached are the comments received by the Department of State Lands and the Bitterroot National Forest on the Draft Environmental Impact Statement and Environmental Analysis Report for the proposed Western Vermiculite Company's vermiculite mine near Hamilton, Montana. Also attached are the responses to the comments prepared by the Department and the Bitterroot National Forest.

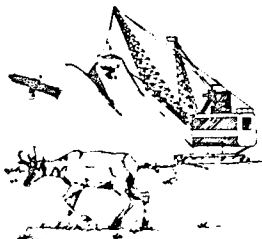
The Department of State Lands has determined that it will not be necessary to compile a final environmental impact statement as provided for by MAC 26-2.2(18)-P290 (Rule V)(2)(a) and (b). Pursuant to this rule, the Department plans to make its decision on the application by the Western Vermiculite Company not less than fifteen (15) days after sending copies of this document to the Governor of Montana, the Montana Environmental Quality Council, and the Western Vermiculite Company. To assure compliance with the requirements of the Hard Rock Law, the operation will be inspected by the Department three to four times annually. A \$30,000 reclamation bond has been supplied to the Department by Western Vermiculite Company to assure reclamation of the mine site.

The Bitterroot National Forest will take action on approval of the Environmental Analysis Report for the proposed mining operation following granting of the operating permit to Western Vermiculite Company by the Department of State Lands. Both agencies will continue to cooperate in assuring that the requirements of the law are met by the mining company and that reclamation at the project is carried out in accordance with the company's reclamation plan.

Attachments



MINING



RECLAMATION



STATE OF MONTANA
ENVIRONMENTAL QUALITY COUNCIL

CAPITOL STATION

Helena, Montana 59601

Terrence D. Carmody, Executive Director

Telephone (406) 449-3742

GOV. THOMAS L. JUDGE or
Designated Representative:
Lt. Gov. Ted Schwinden

SENATE MEMBERS
Terry Murphy, Chairman
Frank Dunkle
Joe R. Roberts
George F. Roskie

HOUSE MEMBERS
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Mike Meloy
Dennis G. Nathe
Arthur H. Shelden

APPOINTED MEMBERS
G.W. Deschamps
Charles Doherty
Richard D. Klinger
William D. Spilker

January 25, 1979

Ralph Driear, Environmental Administrator
Department of State Lands
Capitol Station
Helena, MT 59601

Dear Ralph:

Thank you for the opportunity to comment on the draft Environmental Impact Statement for Western Vermiculite's proposed vermiculite mine. Generally, the draft is adequate and its conclusions regarding impacts appear sound.

However, I would like to offer several suggestions. It might be appropriate to explore and discuss the feasibility of bussing the workers between the mill and mine sites and the Hamilton area. Bussing makes sense both as an energy conservation measure, and as a response to the concern raised in the draft EIS about the effects of increased traffic on wildlife, particularly on the winter range in Charleys Gulch. Your department pointed out the advantages of bussing in its EIS on ASARCO's Troy Project. On brief review, bussing seems equally appropriate and feasible for the western vermiculite proposal.

Additionally, the EIS fails to fully discuss the likelihood of future expansion of the project. The discussion is limited to several lines on page 82, where the prospect of expansion at the rate of "20 acres per year for 9 years plus any long term plans" is raised. Although the draft EIS gives no clues, it seems quite possible that expansion of the project to the extent suggested by page 82 may have the potential to greatly magnify the project's impact.

The possibility of a greatly expanded project places the existing proposal in a different light. Because the existing proposal is a necessary first step to any future expansion, no environmental review of it is complete unless it includes a discussion of the impacts of a fully expanded project as well. At the

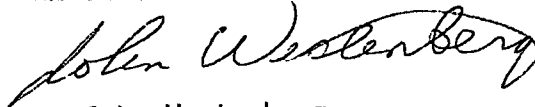
Ralph Driear
Page 2
January 25, 1979

very least, the allusion to future expansion on page 82 requires further elaboration. Without it this EIS is not really complying with the Montana Environmental Policy Act's goal of avoiding piecemeal review and fragmented decision making.

Thanks again for the opportunity to comment.

Sincerely,

TERRENCE D. CARMODY
Executive Director

A handwritten signature in cursive script, reading "John Westenberg". The signature is written in dark ink and is positioned above the typed name and title.

By John Westenberg
Ecology Researcher

TDC/JW/1s



DEPARTMENT OF STATE LANDS

MAILING ADDRESS: CAPITOL STATION
OFFICE: 1625 11TH AVENUE

HELENA 59601

(406) 449-2074

STATE BOARD OF
LAND COMMISSIONERSTHOMAS L. JUDGE
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SECRETARY OF STATEMIKE GREELY
ATTORNEY GENERALE. V. "SONNY" OMHOLT
AUDITORLEO BERRY, JR.
COMMISSIONER

February 22, 1979

John Westenberg
Ecology Researcher
Environmental Quality Council
Capitol Station
Helena, MT 59601

Dear John:

Thank you for the Environmental Quality Council's comments on the draft Environmental Impact Statement (EIS) for the Western Vermiculite Company's proposed mining project near Hamilton, Montana. The responses to the Council's comments are presented below.

Comment:

Bussing of workers between the mine site and the Hamilton area seems appropriate and feasible.

Response:

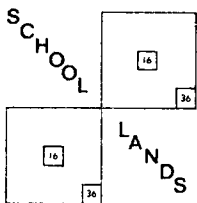
Bussing of workers to the mine site would reduce the potential for impact upon the area's wildlife, particularly from vehicle encounters and harassment. The mining company officials have been contacted regarding this manner of employee transport and they have indicated that a bussing system will be considered; however, at this time they are primarily considering bussing of employees to the mine site during the winter months. The Department of State Lands has no authority to require the establishment of a bussing system by the mining company.

Comment:

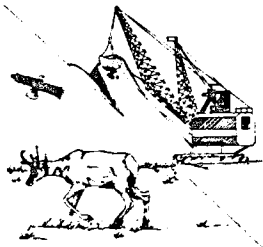
The EIS fails to fully discuss the likelihood of future expansion of the project.

Response:

Western Vermiculite Company has indicated in their application to the Department for a hard rock operating permit that approximately 189 acres could be disturbed during the "life of the operation."



MINING



RECLAMATION

John Westenberg
Page Two
February 22, 1979

This acreage amount is based upon the area encompassing all of the known, easily identifiable outcrops of vermiculite in the vicinity of the proposed mine. The extent that economically minable vermiculite deposits lie under the entire 189 acres is not known. The Company has indicated that because of this, it is impossible to determine whether any future mining would represent an expansion of the proposed mine site. It is thought most probable at this time that should future expansion occur, it would be in the form of additional mine sites at the location of the vermiculite outcrops. As with all mining operations, the likelihood of future expansion is linked closely with mineral markets and the results of future exploration projects designed to identify the extent of the mineral occurrence. Western Vermiculite Company at this time has developed no plans for future expansion.

The reference to expansion at the rate of "20 acres per year for 9 years plus any long-term plans" that appeared on page 82 of the DEIS was inappropriate and not based upon any substantially quantifiable information regarding the extent of the vermiculite deposit. This quoted rate of expansion was advanced by a consulting firm working for the mining company early in the development stages of the mining proposal and did not represent an accurate indication of the company's plans for future expansion for the reasons discussed in the previous paragraphs.

Comment:

Because the existing proposal is a necessary first step to any future expansion, no environmental review of it is complete unless it includes a discussion of the impacts of a fully expanded project as well.

Response:

The draft EIS for the proposed vermiculite mine considered the cumulative impact of the total project proposed by the Company. For the reasons discussed earlier, quantifiable information necessary to develop the specifics of a "full expanded project" and therefore the ability to conduct an expanded environmental review is not available. Additionally, it is not within the province of state and federal agencies to require the Western Vermiculite Company or other claim owners to reveal the total project "contemplated." To base impact projections upon what the authors consider to be the "contemplated" project without a project proposal would be speculation and of little value to the objective EIS process.

Sincerely,



Ralph E. Driear
Environmental Administrator

STATE OF MONTANA



DEPARTMENT OF

FISH AND GAME

Helena, MT 59601
January 23, 1979

Mr. Ralph Driear, Environmental Administrator
Department of State Lands
Helena, MT 59601

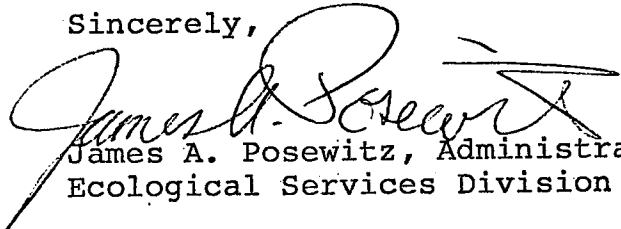
Dear Ralph:

As requested, we have reviewed the draft environmental impact statement and environmental assessment for the Western Vermiculite Company's ABM Ridge project in Ravalli County.

This review was conducted by personnel from our regional office in Missoula, and a copy of their comments is enclosed for your use.

We would like to thank you for the opportunity to review this proposal, and hope our comments can be incorporated into the planning for this project.

Sincerely,


James A. Posewitz, Administrator
Ecological Services Division

sd
Enc

cc: Environmental Quality Council
Roger Rabe, Bitterroot National Forest
Earl Sherron
Jim Ford

STATE OF MONTANA
DEPARTMENT OF FISH AND GAME
HELENA, MONTANA

RECEIVED
JAN 23 1979
ENVIRON. RESOURCES

Office Memorandum

TO : Bob Wambach, Attn: Jim Posewitz

DATE: January 22, 1979

FROM : Jim Ford, By: John Firebaugh

SUBJECT: Western Vermiculite - Draft EIS

The Draft EIS of Western Vermiculite's ABM Ridge Project has been reviewed and the following comments concern the wildlife resource in the project area. Most of the department's previous comments concerning wildlife and potential impacts from the mining project are included. However, there are some important points which were left out and should be included.

The life expectancy of the proposed mining program according to the Draft EIS is seven years. However, preliminary meetings indicated the potential exists for a much longer, expanded program than seven years and 30 acres. Considerable habitat can be destroyed if the 58 claims on some 1,200 acres are eventually developed. The disturbance and/or destroying of this 1,200 acres of habitat would have a considerable impact on wildlife. Through habitat destruction and mining activity, it is possible, if these 1,200 acres or a portion of them are developed, that elk, mule deer, and possibly mountain goat use will be eliminated for a period of time. Animals would be displaced into habitat already occupied, creating competition for space and forage, possible social stress, etc. The result of this displacement would have a negative impact on the wildlife populations through a reduction of the carrying capacity of the summer range. These potential long term activities should be addressed in the EIS.

There is no mention of the Charleys Gulch road remaining open for hunter access. Because of the amount of land closed to hunting in this area and the need for a good annual elk harvest, it is important that this road remain open to hunters. The road provides access between the Skalkaho Game Preserve and the Bitterroot Stock Farm, both closed to hunting. Access between these two areas is needed, because with good snow conditions during the hunting season, a considerable portion of the elk harvest in Hunting District 261 is taken here.

Reasonable reclamation at this high elevation with a short growing season is questionable. The possibility of reclamation failing and the impact this would have on wildlife habitat should be discussed.

JF/pm



DEPARTMENT OF STATE LANDS

MAILING ADDRESS: CAPITOL STATION
OFFICE: 1625 11TH AVENUE

HELENA 59601

(406) 449-2074

STATE BOARD OF
LAND COMMISSIONERSTHOMAS L. JUDGE
GOVERNORGEORGIA RICE
SUPT. OF PUBLIC INSTRUCTIONFRANK MURRAY
SECRETARY OF STATEMIKE GREELY
ATTORNEY GENERALE. V. "SONNY" OMHOLT
AUDITOR

February 23, 1979

James Posewitz, Administrator
Ecological Services Division
Department of Fish and Game
Helena, MT 59601

Dear Jim:

Thank you for the comments from your personnel in the regional office in Missoula regarding the draft Environmental Impact Statement for the Western Vermiculite Company's proposed mining project near Hamilton, Montana. The responses to those comments are presented below. I have attached a copy of the Department's responses to the Environmental Quality Council's comments, since there are several concerns that are common to both letters.

Comment:

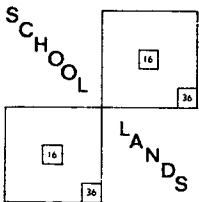
Considerable habitat can be destroyed if the 58 claims on some 1,200 acres are eventually developed . . . These potential long-term activities should be addressed in the EIS.

Response:

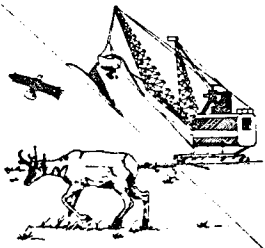
As discussed in the response to the Environmental Quality Council's comments, the information necessary to accurately determine the potential for future expansion has not been adequately developed. The 58 claims do not all represent vermiculite claims, as a portion of the claims involve other mineral values. Data as a result of limited exploration on these claims is regarded as confidential by the claim's owners and is not made available to the public or state and federal agencies. A certain amount of this information becomes available to state and federal agencies and is public record only when notice is given to develop a mine or an application for patent on a mining property if filed.

Comment:

There is no mention of the Charleys Gulch road remaining open for hunter access. Because of the amount of land closed to hunting in this area and the need for a good annual elk harvest, it is important that this road remain open to hunters.



MINING



RECLAMATION

James Posewitz
Page Two
February 23, 1979

Response:

Western Vermiculite Company has a road agreement with the private landowners in the area. There is currently no public access on the Charleys Gulch road. The Department does not have authority to require that the road be opened to public access. Since public access is presently the prerogative of the landowners, it is suggested that the Department of Fish and Game negotiate with owners to arrive at a possible agreement regarding the importance of opening the road to seasonal public access.

Comment:

The possibility of reclamation failing and the impact this would have on wildlife habitat should be discussed.

Response:

It is true that the growing season is short, and the soils of the area are generally low in productivity. Soil and vegetation specialists from the Bitterroot National Forest and the Department of State Lands, however, have concluded that the proposed reclamation plan of the company has a reasonable chance for success. In addition, since the reclamation plan provides for reclamation concurrent with the mining operations, it is highly unlikely that a significantly large area of disturbed land would be threatened with reclamation failure at any one time. Initial reclamation attempts for those lands disturbed during the development stage should reveal any significant reclamation problems before larger areas of land are disturbed during the proposed or future mining programs.

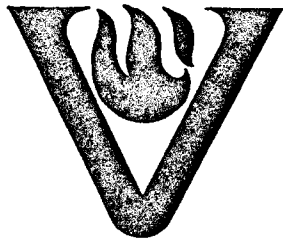
Sincerely,



Ralph E. Driear
Environmental Administrator

sk

Attachment



WESTERN VERMICULITE COMPANY

February 9, 1979

State of Montana
Department of State Lands
Capitol Station
Helena, Montana 59601

Attention: Ralph Driear
Environmental Coordinator

Dear Ralph:

We feel the Draft Environmental Impact Statement addresses the matter of future expansion accurately. Therefore, we waive our response rights to the State of Montana Department of Fish and Game letter dated January 23, 1979 and the Environmental Quality Council letter dated January 25, 1979.

Very truly yours,

W. J. Ensslin
General Manager

WJE/le
xc: Jim Patton

May 16, 1979

To: Mr. John E. Velehradsky, P. E.
U. S. Army Engineer District
6014 U. S. Post Office & Courthouse
Omaha, Nebraska 68102

From: Concerned Citizens of the Sun River
Jack O. Paulson, Chairman
200 10th Ave. S. W.
Great Falls, Montana 59404

Re: Review and Assessment of the Environmental Impact Statement for the
Sun River Flood Protection Project in Great Falls, Montana dated February 1979

RECEIVED
MAY 18 1979
ENVIRONMENTAL QUALITY
COUNCIL
JW
Dish

Point 1.01 (e)

"The Great Falls Flood Control Project authorization is subject to the condition that the local interests give assurance to the Secretary of the Army that they would zone the unleveed portion of the floodway through the damage area to preserve its capacity and to prevent further encroachments." We would like to know who gives the local 'interest' or 'sponsor' the authority to do this? Does this mean the area on the right or south bank of the Sun River such as the Country Club, Robinson area, and Manchester area will be subject to flood plain regulations similar to those now imposed on the West Great Falls Flood Plain District limiting any future development? Does this mean that these areas which are not now flood plains will become flood plains due to the north bank levee?

Point 1.16

Contradictory statements are made here regarding the lake that is created at a borrow site. You state in the EIS, "The quality of the water within the lake is uncertain at this time" and in the same paragraph you state "In spite of the probable alkaline conditions, the lake should be marginally suitable for either a cold-water or warm-water "put and take" fishery depending upon maximum water temperatures." We feel that this 'man-made lake' is a very important issue aesthetically in terms of Man's environment as well as important to man's health and safety here in Great Falls.

Montana Fish and Game Department Personnel have stated that the PH factor appears to be unsuitable for a fishery. We want more specific facts regarding the PH factor--what are your facts and figures? State them so that the people who are affected in Great Falls can study them and be assured of a productive lake and not have to rely on contradictory statements! Note address above.

Point 1.19 versus Point 6.02

In point 1.19 you state the total estimated cost of the project (a north bank levee) will be \$10,122,000. Yet in point 6.02 you state the estimated cost of all five (5) levees of the authorized project is now \$14,898,000. In other words, you are stating that for only an additional \$4,776,000 you can build 4 more levees--far less that you can build the first one?! Explain your figuring, please! It looks as though you are trying to justify your cost-benefit ratio when you do your figuring!

Point 2.31

The EIS states that there are no Wetlands on project land or any adjacent territory. This is not true! There are Wetlands and they provide homes for ducks, beaver, muskrat, migrating geese and other wildlife.

The Wetlands consist of Horseshoe Lake approximately 40 acres; Briggs and Myer Slough approximately 25 acres; and the McIver Wetlands approximately 35 acres. This is a total of nearly 100 acres of Wetlands that are not even considered as the Executive Order of the President 11990 states!

Point 4.26

The EIS states that there will not be a significant loss of aesthetics. How can the loss of a natural seven (7) mile river bank with trees, brush, and animals removed and replaced only with a wall of dirt averaging 15' in height not be a significant loss of aesthetics?

In addition, you state in the reply to the Fish and Game Department that there will only be mowing after July 15th. In other words, the levee is to become covered with weeds (which will surely be quite healthy by this time) and this is better than the lawns you will be destroying, natural trees and brush that you will be removing by constructing a 15' high levee on the land along the river? The trees, lawns, and natural brush removed are a significant loss of aesthetics!

In your reply to the City-County Planning Board you replied to their question about use of the 220 acres of land permanently committed to the levee being used privately or publicly to be made by the West Great Falls Flood Control District. Does this mean land owners who have the levee in their 'back yards' will not be able to control who will be in their back yards?

Point 9.05

You stated that 350 people attended the hearing May 24, 1978. 26 people spoke against the project; 11 in favor, and you further stated that 122 written statements in favor of the project were received, but you did not state that over 30 were letters written by children of people in the Flood District; plus letters written by relatives outside of the District. Furthermore, you did not state in the EIS that you received a petition of nearly 600 signatures of People Adversely Affected by the levee at this hearing presented by myself, Jack Paulson. Check with the hearing recorder. Enclosed is another copy, too, signed by 600 adults.

BRIDGES?

Nowhere in the EIS does it mention that the Fourteenth Street Southwest Bridge across the Sun River is to be either torn down or rebuilt about a dozen feet higher at the supports to avoid flooding as stated Tuesday, December 19, 1978 to Great Falls City Commissioners and other officials by the West Great Falls Flood Control and Drainage District officials. This is an enormous expense. Was this not mentioned, too, because of justifying your cost-benefit ratio?

No mention is made of the bridge in Wadsworth Park that will be affected

by the levee either. What happens to it? Another cost not mentioned!

SUMMARY

We, the Concerned Citizens of the Sun River feel that there are many unanswered questions that adversely affect people both within the West Great Falls Flood Control District and people who boundary the proposed levee. We feel, too, that facts and figures have been deleted in order for the project to have a justifiable cost-benefit ratio. Furthermore, we request that these questions be answered before any implementation of commitments to the proposed project are made.

COPIES SENT TO:

Tom Harrison, Attorney for the Concerned Citizens of the Sun River
L. Morris Ormseth, Attorney for the Concerned Country Club Citizens
Great Falls City Commission and Mayor
Great Falls City-County Planning Board
Great Falls Chamber of Commerce
Great Falls Park and Recreation Department
West Great Falls Flood Control and Drainage District
Great Falls Tribune
Cascade County Conservation District
Cascade County Commissioners
Senator John Stennis
Senator Max Baucus
Senator John Melcher
Congressman Ron Marlenee
Congressman Pat Williams
Office of the Governor of Montana
Montana Department of Fish and Game
Montana Department of Natural Resources and Conservation
Montana Department of State Lands
Montana Environmental Quality Council
Montana State Department of Health and Environmental Sciences
Montana Recreation and Parks Division
Montana Wildlife Federation
U.S. Office of Management and Budget
U.S. Department of Transportation
U.S. Environmental Protection Agency
U. S. Department of the Interior
Missouri River Basin Commission
Department of Housing and Urban Development

RECEIVED

MAY 25 1979

RR 1 West, Box 120
Great Falls, Montana 59401
May 15, 1979

ENVIRONMENTAL QUALITY
COUNCIL

RECEIVED

MAY 23 1979

U. S. Army Engineers
Attn: John E. Velehradsky, P.E.
6014 U. S. Post Office and Courthouse
Omaha, Nebraska 68102

AMES
Environmental Sciences Div.

Dear Sirs:

After reviewing the subject matter I have the following comments:

Page 4 Project Description:

1.14 There are many other places throughout the entire length of the proposed levee that have been rip-rapped and stabilized. With the levee in place flows and velocities will change, causing need for much more additional rip-rapping. You have not addressed this problem in the EIS.
1.16 Creating a lake sounds good but this will not be the case. It will be an unmanageable, dangerous Mud Hole or Slough. Excavation should never be allowed. The Flood District should be held responsible for filling it back up with soil if the lake is unsuitable.

Page 12 Wetlands:

2.31 You have stated in the EIS that there are no wetlands in the project area. This is not so: there is the McIver Slough, Briggs and Mieres Slough, and Horse Show Lake, which are nesting places for ducks, migrating geese and ducks and abound in beaver and muskrat.

Page 15 Induced Flooding:

4.05, 4.06 Your figures for additional damages caused by a levee on the left bank don't make sense. Our additional damages because of the levees would be many times your estimate.

Page 32 Coordination of Executive Order 11988:

9.09 In reviewing your levee design, the levee could be placed much further from the river bank starting approximately from 27th Street West which would change the water levels during floods very little, eliminating unnecessary damage to people and property on the right bank and upstream from the levee. It doesn't make sense to flood out people and property on the right side and upstream to protect undeveloped land on the left side. The way you have designed the levee by Crescent Drive bears out this would be possible.

Sincerely,



Joe Hepp

COPIES SENT TO:

Tom Harrison, Attorney for the Concerned Citizens of the Sun River
L. Morris Ormseth, Attorney for the Concerned Country Club Citizens

Great Falls City Commission and Mayor
Great Falls City-County Planning Board
Great Falls Chamber of Commerce
Great Falls Park and Recreation Department
West Great Falls Flood Control and Drainage District
Great Falls Tribune
Cascade County Conservation District
Cascade County Commissioners
Senator John Stennis
Senator Max Baucus
Senator John Melcher
Congressman Ron Marlenee
Congressman Pat Williams
Office of the Governor of Montana
Montana Department of Fish and Game
Montana Department of Natural Resources and Conservation
Montana Department of State Lands
Montana Environmental Quality Council
Montana State Department of Health and Environmental Sciences
Montana Recreation and Parks Division
Montana Wildlife Federation
U. S. Office of Management and Budget
U. S. Department of Transportation
U. S. Environmental Protection Agency
U. S. Department of the Interior
Missouri River Basin Commission
Department of Housing and Urban Development

May 22, 1979

RECEIVED

MAY 25 1979

ENVIRONMENTAL QUALITY
COUNCIL

*JW gah
Feng*

To: Mr. John E. Velehradsky, P. E.
U. S. Army Engineer District
6014 U. S. Post Office & Courthouse
Omaha, Nebraska 68102

From: Concerned Citizens of the Sun River
Ron Hepp
Route 1 West Box 120
Great Falls, Montana 59401

Re: Review and Assessment of the Environmental Impact Statement for the
Sun River Flood Protection Project in Great Falls, Montana dated February 1979

Point 1.01 (b)

Due to the role the U. S. Army Engineer District has enacted in the formation of the Sun River Flood Protection Project it is a misconception that the local sponsors could hold and save the United States free from damages due to the construction works. After review of this document it is found that the Corps of Engineers have not acted in good faith in producing factual findings. On the contrary the opposite has occurred. This document is plainly filled with contradictions, inconsistencies, omissions, and outright ridiculous errors. These untruths are used by the Corps of Engineers to justify the project. As they are responsible for this document, technical data, and levee design. The Corps of Engineers is also a responsible and liable party for damages resulting from said project.

Point 1.01 (e)

The West Great Falls Flood Control and Drainage District has no authority to make zone changes in the unleveed portion of the floodway or in any other area. A hearing process on any zone changes would have to be implemented by the proper government bodies which has jurisdiction over the areas in question.

Point 1.03

In point 1.03 it is stated the West Great Falls Flood Control and Drainage District abandoned all efforts to act as a sponsor in January 1975. Then this in effect means that after the flood of 1975 a new district was formed. Also, excluding the Country Club area resulted in this project being a new and different project than the project that was approved by Congress. Making this new project subject to state regulation.

Point 1.07

It is noted that the levee units which were placed in an inactive status was done so because of the overwhelming opposition to these levee units that existed in the respective levee unit areas. Also these areas maintain opposition to the remaining left bank levee. Within the left bank levee are two areas that seek to be released from the West Great Falls Flood Control and Drainage District. One area is the homes in the proximity of 34th Street NW and 5th Avenue NW. This area has never received flood damages and has a clear roadway access during peak flood periods by use

of the 34th Street NW overpass. Therefore this area should be excluded from the project. The other area lies between the Great Northern Railroad Track and 6th Street. Benefits to this area are negligible and there exists multiple clear access routes during peak flood periods. The Great Northern Railroad track would meet the requirements for tying off the levee at this point. Residents in this area express opposition to the project and should be excluded from the project. The West Great Falls Flood Control and Drainage District retains these two areas to receive the assessment payments to keep the assessments to individual property owners within the district lower. Thus making the project seem more favorable to the assessed property owners. With these two areas included within the project boundaries the West Great Falls Flood Control and Drainage District is able to add this property to increase the total area of property protected and attain a higher benefit-cost ratio. When in fact the property owners in these two areas derive no benefit from the project.

Point 1.08, 4.10, & 9.09

After studying the levee location it is evident there has been no attempt to allow maximum preservation of the natural flood plain nor to reduce the induced flooding in the unprotected areas. The Corps of Engineers in coordination with the West Great Falls Flood Control and Drainage District have designed the levee location in the Wadsworth Park area, lying West of 34th Street NW and North of Central Ave West, the upstream end of the project, only to include as much land as possible within the project. This action serves only to make the project appear more favorable and to satisfy property owners and the City of Great Falls which owns Wadsworth Park. These lands contain no improvements and at the present are used as marginal pasture for horses. Discussion that a park and a fishery may be developed in this area at a later date should be taken lightly. The borrow site where the fishery would be developed is in an alkali seep and high water temperatures at best make this area only marginally suitable for a fishery. Placement of the levee close to the river channel as designed causes unnecessary restrictions of the floodway. This results in a greater degree of induced flooding and subsequently much higher damages to areas outside of levee protection. Water velocities will increase greatly causing an acceleration of river bank erosion, erosion of Montana's best prime farmland, and river rechannelization through this prime farmland. Correction of these adverse effects alone will cost millions of dollars. After the 1975 flood rip-rapping was placed in erosion areas in this area to stabilize both banks of the river safeguarding water quality, roads, prime farmland, and residents at a cost of \$376,000. John Kelly, Corps of Engineers Chief of Levee Design, has attested to the fore mentioned findings. Furthermore John Kelly states that to the concern of the Corps of Engineers there exists no problems in locating the levee further from the river to allow a larger flood plain. A larger flood plain would lessen induced damages to the adversely affected areas.

Point 1.09

All individuals, groups, and local city, County, State, and Federal Governments that provide assistance towards the development of this project will be held liable for damages resulting from the project.

Point 1.12

It is noted that in the Draft Supplemental Environmental Statement that the levee will average 15 feet in height and will cause increased

of the 34th Street NW overpass. Therefore this area should be excluded from the project. The other area lies between the Great Northern Railroad Track and 6th Street. Benefits to this area are negligible and there exists multiple clear access routes during peak flood periods. The Great Northern Railroad track would meet the requirements for tying off the levee at this point. Residents in this area express opposition to the project and should be excluded from the project. The West Great Falls Flood Control and Drainage District retains these two areas to receive the assessment payments to keep the assessments to individual property owners within the district lower. Thus making the project seem more favorable to the assessed property owners. With these two areas included within the project boundaries the West Great Falls Flood Control and Drainage District is able to add this property to increase the total area of property protected and attain a higher benefit-cost ratio. When in fact the property owners in these two areas derive no benefit from the project.

Point 1.08, 4.10, & 9.09

After studying the levee location it is evident there has been no attempt to allow maximum preservation of the natural flood plain nor to reduce the induced flooding in the unprotected areas. The Corps of Engineers in coordination with the West Great Falls Flood Control and Drainage District have designed the levee location in the Wadsworth Park area, lying West of 34th Street NW and North of Central Ave West, the upstream end of the project, only to include as much land as possible within the project. This action serves only to make the project appear more favorable and to satisfy property owners and the City of Great Falls which owns Wadsworth Park. These lands contain no improvements and at the present are used as marginal pasture for horses. Discussion that a park and a fishery may be developed in this area at a later date should be taken lightly. The borrow site where the fishery would be developed is in an alkali seep and high water temperatures at best make this area only marginally suitable for a fishery. Placement of the levee close to the river channel as designed causes unnecessary restrictions of the floodway. This results in a greater degree of induced flooding and subsequently much higher damages to areas outside of levee protection. Water velocities will increase greatly causing an acceleration of river bank erosion, erosion of Montana's best prime farmland, and river rechannelization through this prime farmland. Correction of these adverse effects alone will cost millions of dollars. After the 1975 flood rip-rapping was placed in erosion areas in this area to stabilize both banks of the river safeguarding water quality, roads, prime farmland, and residents at a cost of \$376,000. John Kelly, Corps of Engineers Chief of Levee Design, has attested to the fore mentioned findings. Furthermore John Kelly states that to the concern of the Corps of Engineers there exists no problems in locating the levee further from the river to allow a larger flood plain. A larger flood plain would lessen induced damages to the adversely affected areas.

Point 1.09

All individuals, groups, and local city, County, State, and Federal Governments that provide assistance towards the development of this project will be held liable for damages resulting from the project.

Point 1.12

It is noted that in the Draft Supplemental Environmental Statement that the levee will average 15 feet in height and will cause increased

Flood stages of about 5 feet at the upstream end of the levee. This fact is again reaffirmed in the Public Information Fact Sheet, published May 1978. Now in direct contradiction to the Corps of Engineers own facts this document states the increased flood stage at the upstream end of the project has been reduced to 3.5 feet. For this same reason the average height of the levee would no longer need to be 15 feet and should be considerably less. However the Corps of Engineers have raised the average height of the levee to 15.5 feet. Can one ascertain from the Corps of Engineers actions that the real fact is that increased flood stages at the upstream end of the levee will not be 3.5 feet but even greater than the 5 feet increased flood stage figure the Corps of Engineers promulgated until the issuance of this document? Can one trust the validity of the Corps of Engineers figures as the Corps of Engineers can make the figures do what they want the figures to do?

Point 1.14

As brought out by the Cascade County Soil Conservation District, an agency that has made on site evaluations and has sponsored, engineered, and supervised many improvement projects in this area along the Sun River, there exist certain areas along the Sun River that have severe erosion problems. Making reference to the Cascade County Soil Conservation Districts comments to the Draft Supplemental Environmental Statement (see appendix B) the Conservation District states that rip-rap should be installed to protect both banks of the Sun River. The Corps of Engineers only does a poor job of evading this very pertinent fact by referring to plate 1. Study plate 1 and it is shown that rip-rap will be placed only in the area of Interstate 15 bridge, the new channel alignment, where the river bends on the right bank, and three down stream bridges. However the Conservation District further states that after the flood of 1975 this Conservation District monitored rip-rapping under flood restoration project "216" to control erosion at a cost of \$376,000. If the Corps of Engineers would have done a detailed and intensive study of the project area they would be hard put not to observe that the "216" rip-rap was all placed at a considerable distance upstream in the project area than what is shown in plate 1. Without rip-rapping both banks of the Sun River in the project area with the levee in place as designed water depth increases and a much faster velocity of the water during flood stages river rechannelization and severe erosion will occur. Resulting in a man-made excessive continual turbid water condition and complete destruction of Montana's best prime farmland. To rectify this condition, rip-rap both banks of the river upstream from Interstate 15 and restore the land to its present condition, will cost millions of dollars. This is the reason water velocities have not been shown in this document for the public's review as the damages done by increased water velocities are far greater than the ridiculous \$2,000 annual induced damage cost the Corps of Engineers states in paragraph 4.06. The damages done by increased water velocities alone give this project an unfavorable benefit-cost ratio.

Point 1.15, 4.13

Talk of using the borrow site in Wadsworth Park for recreational purposes is no more than another Corps of Engineers larks. What forms of recreation does the Corps of Engineers purport for a so called lake that will have a mean depth of only 12 feet? Boating can not be considered as the actual water surface area would be less than 33 acres. Would one want to risk swimming in a still, shallow water body located in an "alkali seep" that makes for poor water quality?

Point 2.31, 4.19

To avoid the guidelines of Executive Order of the President 11990, Protection of Wetlands the Corps of Engineers must have taken extreme pains to survey around 3 separate wetlands in the vicinity of the project. The 3 wetlands, McKiver, Horseshoe, and Briggs-Myers Slough total approximately 100 acres. These wetlands provide necessary refuge and wildlife habitat for wildlife.

Point 3.01, 3.02, 4.11

Present economic and development indications in Great Falls do not show a need for additional residential lots. This impact will be insignificant. The many new large housing developments outside of and within Great Falls and the approximate 1200 homes listed for sale within Great Falls show that there is an already overburden of available housing. The recent closure of 4 schools due to dramatically reduced enrollments may indicate that the population is decreasing. Large curtailments of operations at Malmstrom Air Force Base as planned by the government will also result in economic, labor, and population losses to Great Falls.

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Point 1.16

Use of the borrow site in Wadsworth Park for a fishery is equally absurd. This site is in an "alkali seep" making for poor water quality and also water temperatures will be high. What will be the rate of water exchange and where will the contaminated water drain? Saying that at best this borrow site would be marginally suitable for a fishery is an exaggeration. Investing money in this site for a fishery would be a waste of resources when there exists so many sites in Montana that would be more adaptable. Stagnant and health hazardous mosquito breeding pond better describes this borrow site.

Point 1.18, 4.26

The planting of a few trees in Wadsworth Park to replace an existing stand of tall, thick tree stands and dense brush can hardly be called project beautification. This is only a camouflaged attempt by the Corps of Engineers to avoid stating that the levee will actually be an eyesore.

Point 1.19

Non-Federal cost or costs to project sponsor are computed to be \$2,052,000. The financial capability of the West Great Falls Flood Control and Drainage District is certainly questionable. At this time the West Great Falls Flood Control and Drainage District is in the financial position of having to be dependant on the hopes of receiveing Community Block Grant Development money to offset costs of the assessments levied on low income people living in the project area. These grants have to be applied for each year and the amount of money to be granted would certainly vary from year to year. What effects will financial hardships be on these people when grant applications are rejected? Liabilities for damages resulting from project induced flooding will greatly increase costs to the sponsor. The Corps of Engineers allows only \$7,500 for maintenance of the entire left bank Sun River levee and Watson Coulee project. Considering equipment, equipment maintenance, material needed for structural repair, fuel, and labor costs, \$7,500 is very unrealistic.

Point 1.20, 9.06, 9.07

The mood and interests of the peoples of Montana and the nation is one of resource and water conservation. They are opposed to projects such as the West Great Falls Flood Protection Project that cause severe erosion, river rechannelization, induced flooding to others, and just let the flood waters rempage down stream causing damages and flooding to the next town. This project would create more damages than it prevents. Water conservation bills were the main issue in the Montana Legislature. If the Corps of Engineers are allowed to implement projects such as this how are the nation's water channels going to be fishable and swimmable by 1983?

Point 2.02

Acreages given are extremely low and should be corrected. Irrigated prime farmland that would receive induced flooding is approximately 2,200 acres. Cascade County Conservation District comments (see appendix B) describe this prime farmland as the best in Cascade County and have documented proof of production.

Point 2.31, 4.19

To avoid the guidelines of Executive Order of the President 11990, Protection of Wetlands the Corps of Engineers must have taken extreme pains to survey around 3 separate wetlands in the vicinity of the project. The 3 wetlands, McKiver, Horseshoe, and Briggs-Myers Slough total approximately 100 acres. These wetlands provide necessary refuge and wildlife habitat for wildlife.

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Supplement No. 4, Economic Re-evaluation to Design Memorandum No MGF-1, Flood Project, revised May 1979 in the discussion on structural values it states that Sun River flooding was not evaluated for Study area 4, the Country Club area. Consider the impact of a few inches of water in the Country Club area could be devastating. Increased water velocities are a pertinent factor requiring further study. Water velocities during floods under design conditions will cause severe erosion, permanent water quality degradation, and river rechannelization. Repair of damages attributed to increased water velocities will cost millions of dollars.

SUMMARY

In conclusion it is most evident by the Corps of Engineers findings that little if any diligent research has been presented on the impact of the proposed project. It would seem that the very integrity of the Corps of Engineers function is in jeopardy by the negligent omissions and distortions presented in this document. It is necessitated that these discrepancies be answered to before any action is taken.

Ron Hepp



COPIES SENT TO:

Tom Harrison, Attorney for the Concerned Citizens of the Sun River
L. Morris Ormseth, Attorney for the Concerned Country Club Citizens
Great Falls City Commission and Mayor
Great Falls City-County Planning Board
Great Falls Chamber of Commerce
Great Falls Park and Recreation Department
West Great Falls Flood Control and Drainage District
Great Falls Tribune
Cascade County Conservation District
Cascade County Commissioners
Senator John Stennis
Senator Max Baucus
Senator John Melcher
Congressman Ron Marlenee
Congressman Pat Williams
Office of the Governor of Montana
Montana Department of Fish and Game
Montana Department of Natural Resources and Conservation
Montana Department of State Lands
Montana Environmental Quality Council
Montana State Department of Health and Environmental Sciences
Montana Recreation and Parks Division
Montana Wildlife Federation
U.S. Office of Management and Budget
U.S. Department of Transportation
U.S. Environmental Protection Agency
U.S. Department of the Interior
Missouri River Basin Commission
Department of Housing and Urban Development
Concerned Citizens of the Sun River
Concerned Country Club Citizens

April 12, 1978

RECEIVED

APR 14 1978

To: Montana Environmental Quality Council
Helena
Montana 59601

Re: Booklet #2 from Army Corp of Engineers entitled; Economic Reevaluation, Design Memorandum No. MGF-1
Sun River Flood Protection Project, Great Falls, Montana

ENVIRONMENTAL QUALITY
COUNCIL

Comments by: Concerned Citizens of the Sun River; Jack Paulson, Chairman
200 10th Avenue Southwest, Great Falls, Montana 59404

Our group, The Concerned Citizens of the Sun River has just acquired another booklet from the Army Corp of Engineers that came with the Environmental Impact Statement that came out in January 1978. This booklet has a DETAILED COST ESTIMATE. On page A-6 under the heading Non-Federal Cost (which means that the Corp will not bear the expenses, but the West Great Falls Flood Control and Drainage District will) they have the following costs:

Right-of-way 221 Acre \$172,000

1st Comment: \$778.00 per acre is allowed for right-of-way for the dike!

2nd Comment: Lots are being sold along the Sun River for over \$10,000. Local realtors and residents can verify this.

3rd Comment: Does it sound reasonable that people along the river are going to sell their land for the dike right-of-way for \$778 per acre?

4th Comment: What will the result be? Law suits! Remember old Tribune headlines!

"RIGHT-OF-WAY KEY TO LEVEE"

"LEVEE PROJECT HINGES ON COST OF RIGHT-OF-WAY"

"LAND-VALUE ESTIMATES CONTINUE WIDE VARIATION" ("Land-value estimates by a private appraiser continued to show wide contrast with estimates by the West Great Falls Flood Control District..")

"RIVERFRONT LAND LOSS CITED AT FLOOD HEARING"

"JUDGE TAKES APPRAISAL FOR STUDY"

"JUDGE DENIES MOTION TO DISALLOW FORMULA FOR PAYMENT TO OWNERS" OF DIKE-TAKEN LAND"

"APPRAISER: \$308 LAND WORTH \$8,000!"

5th Comment: At the above estimated cost for right-of-way land, what will the new Tribune headlines say?

Utility poles relocated 36 each at \$600 Total \$21,600

Comment: We ask you, is it possible to relocate a utility pole for \$600.00?

Fences removed 8,300 lineal ft. \$1.25 Total \$10,375

Comment: Is it possible to rebuild a fence for \$1.25 a lineal foot? a 2 x 4 stud may cost \$1.25 or more by itself!

Buildings

Residential removals

9

\$195,000 equals \$21,666 each!

1st Comment: Have the residential buildings to be removed been appraised at today's market price?

2nd Comment: The average home in the Great Falls area in 1976-1977 sold in excess of \$35,000 according to the Multiple Listing Service.

Sheds removed

27

\$19,000

equals \$704 each!

1st Comment: What does "sheds" include? Does it mean the garages, the barns...

2nd Comment: There are barns along the dike's path of which one or two would be worth \$19,000 by themselves.

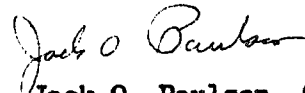
We, the Concerned Citizens of the Sun River, are asking you to consider the feasibility of the proposed levee. Have you seen the booklet "Economic Reevaluation, Design Memorandum No. MGF-1 and made your comments to the Army Corp of Engineers by their deadline date of March 20, 1978? Are the cost estimates made by the Corp realistic? We say they are not, and that if they were to make a new and up-to-date cost estimate, the proposed levee project would be unfeasible!

Under direct examination during the hearing on June 23, 1976, James F. Kelley, Chief of Design Section, Army Corp of Engineers stated that "...if we were starting out from scratch now, to formulate this project, we probably couldn't justify it ..primarily because the interest rates have gone up so much; this hurts in our project justification."

We know that if this project is endorsed or commenced in any way, the costs would prove much higher than estimated and that the West Great Falls Flood Control and Drainage District members would not be able to assume the added financial burden!

Your time and consideration to the comments made in this letter and in our letter of March 14, 1978 regarding the Army Corp of Engineers statements would be greatly appreciated.

Sincerely,



Jack O. Paulson, Chairman
Concerned Citizens of the Sun River
200 10th Avenue Southwest
Great Falls, Montana 59404

Cc: Great Falls Chamber of Commerce
Governor Tom Judge of Montana
Office of Management and Budget, Washington, D.C.
Great Falls City-County Planning Board
Cascade County Commissioners
Montana Department of Fish & Game
Montana Department of Natural Resources & Conservation
Montana Environmental Quality Council
Montana State Department of Health & Environmental Sciences
Montana Recreation & Parks Division
Montana Association of Conservation
Congressman Ron Marlenee
Congressman Max Baucus
Senator Paul Hatfield

Senator John Melcher
Gt. Falls Park & Recreation Dept.

Received from 4/10/78

DNRC

Draft

Supplemental

Environmental

Statement

on EIS list CE/DNRC



Cascade County Conservation District

4930 9TH AVENUE SOUTH GREAT FALLS, MONTANA 59405 PHONE (406) 454-3446

March 16, 1978

RECEIVED

MAR 20 1978

ENVIRONMENTAL QUALITY
COUNCIL

Board of Supervisors

DALE MARXER, Chm.
Millegan Route

JOE HEPP, V-Chm.
Route 1 W, Box 120

EINAR HOVLAND, Treas.
Route 1, Box 207

LOUIS MUNDT
Belt

TED NEUMAN
Vaughn

Department of the Army
Omaha District, Corps of Engineers
6014 U.S. Post Office & Courthouse
Omaha NE 68102

TO WHOM IT MAY CONCERN:

The Board of Supervisors at their monthly meeting, March 14, 1978, completed review of the "Supplemental Environmental Statement" for the Sun River Flood Protection Project (Diking), Great Falls, Montana.

A motion was made and carried at this meeting that per the review of the environmental statement that further impact study is necessary and recommended by this Board. Attached is the board's reasoning on this suggestion and questions asked at the meeting for your consideration.

jf
Encl.

Dale Marxer, Chairman and Board of
Supervisors, Cascade County
Conservation District

CASCADE COUNTY CONSERVATION DISTRICT'S COMMENTS - Sun River Flood Protection Project, Great Falls, Montana - Draft, Supplemental Environmental Statement

Page ii - 3.b., Adverse Environmental Effects -

The levee will cause or increase in potential damage to unprotected areas on the right bank of the Sun River.

No mention is made of adverse damage that could be expected to irrigation pumps, earthen and concrete irrigation ditches, drainage ways, and leveled fields that have been developed in this area at the costs of thousands of dollars.

Page 5, Project Description -

1.15 - Certain areas along the Sun River have severe erosion problems. Erosion in these areas must be controlled to provide protection for the new levee structure. During 1976 and 1977, several reaches on both the north bank and south bank of the Sun River were protected by rock rip-rap. If the levee is installed as designed, rip-rap should be installed to protect both banks of the Sun River.

Page 7, Geology and Soils, 2.02 -

Reference statement, line 5, "...there are no prime or unique farmlands in the project area."

There are some of the best farmland in Cascade County located within and adjacent to the project area. We have documented proof of this statement. (See attached copies of news clippings on sugarbeet production; and dairy industry (which still is a productive business in this lower Sun River valley and livelihood of farmers.)

Page 22, Detrimental Impacts Discussed, 4.15 -

"Increased Flood Stages," reference line six, "During a flood equal to that which the levee is designed, the water just upstream of the Interstate would be approximately 1 foot deeper than under existing conditions. At the upstream end of the levee the water would be approximately 5 feet deeper, and about 5 miles upstream the effects of the levee would be negligible...Flood damages in this unprotected area are expected to be approximately \$4,200 greater with the levee than under existing conditions." At the present time, no Environmental Impact Statement has been prepared in detail on this area. Request shall be made to the West Great Falls Flood Control and Drainage District, and herewith, to the U.S. Army Corps of Engineers, that a study in detail be made. Suggest again, that potential for a dam be also, studied.

Some flood control measure needs to be developed that will help ALL people. The diking may not be a solution to a problem, but may in fact cause just another flooding problem somewhere else. What effect will the water coming down at flood stage along the Sun River along dikes cause when it hits the already also swollen waters of the Missouri River? This water would be like hitting a stone wall--and either would back up the Sun River to cause flooding upstream--or could cause the Missouri River to flood the City Water Works of Great Falls, perhaps, and/or residential areas along the Missouri. What about Donovan Park area and the Country Club residential areas--these areas and items should be considered. Item 1.11

page 4, Project Description, lines 9 and 10, speaks of diverting water from Watson Coulee into two 84-inch conduits to carry flow into the Sun River. That does not make sense--to run more water into an already swollen stream!

Page 28, Increased Flood Stage -

We feel the proposed left bank levee on the Sun River will cause a large increase in flood stages during major flood events upstream of Interstate 15, and to the inlet end of said levee.

Deterimental damage will occur to cropland in this area. The Sun River stream-banks along the project area are stabilized at the present time. If this north bank levee is installed proper streambank management would be impossible. During 1976 and 1977, \$376,599 was spent by the federal government under allocation to the Soil Conservation Service, and monitored through this conservation district for flood restoration project "216" for rock rip-rapping on streambanks of the lower Sun River to help control further erosion commenced by flood waters of June 1975. It is felt that homes not flooded before, would be flooded out in this area if dikes are installed in the proposed project area.

We request that these items be taken into serious consideration before any firm decision is made for dikes.

CC:

Montana Association of Conservation Districts
West Great Falls Flood Control & Drainage District
U.S. Department of Interior, Office of the Secretary
City of Great Falls - Commissioners
Cascade County Commissioners
Chamber of Commerce, Great Falls, Montana
Montana Dept. of Natural Resources and Conservation
Montana Environmental Quality Council
U.S. Environmental Protection Agency
Sen. John Melcher
Sen. Paul Hatfield
Rep. Max Baucus
Rep. Ron Marlenee
Gov. Tom Judge

H. Hepp Wins Sugar Beet Production Award

Best Display Entered by Same Man

Many Growers Awarded Prizes During Annual Falls Chamber Event

Cash awards of \$219 and more than \$200 in merchandise, donated by local merchants, went to the best farmers of this area Saturday at the annual sugar beet field day sponsored by the Great Falls Chamber of Commerce.

High award winner of the day was Herman Hepp, beetgrower operating just west of the Great Falls city limits, who took first place in the display of 12 large sugar beets, and who also was winner of the award going to the grower with the largest per-acre tonnage grown on plots of 25 acres or larger.

Hepp took the latter prize with a record of an average of 23.59 tons per acre on a 27-acre plot. Officials of the Utah-Idaho Sugar Co. said his record would exceed that of any grower in the Chinook factory district.

Other winners in this division, the acreage in beets cultivated by them and their per-acre average yields were as follows:

Second place, Vern Tjaden, Fairfield, 37.8 acres, 15,995 tons; third, George Barlow, Simms, 25.7 acres, 14,392 tons; fourth, Herman Lenz, Great Falls, 28.9 acres, 13,988 tons and fourth, Lloyd Campbell, Valier, 39.2 acres, 13,069 tons.

Weight 124 Pounds

To win the cash award for displaying the 12 largest sugar beets, Hepp displayed a dozen whose total weight was 124 pounds. Other winners in this division, in order, and the weight of the beets shown by them, was as follows:

C. A. Willits, Simms, 95 pounds; Fred Kirby, Simms, 89 pounds; Leo Keel, Simms, 82 pounds, and Ted Lee, Vaughn, 80 pounds.

Lower Sun River Farmer Wins



HERMAN HEPP

With the highest yield per acre on 25 acres or more, Hepp was awarded first prize in the annual sugar beet field day conducted Saturday at the Hotel Rainbow by the Chamber of Commerce. It was the second consecutive year that Hepp, beetgrower and dairyman of lower Sun river, won the prize. In addition, he was awarded first place for displaying the 12 largest sugar beets.

Man With Farm in Suburbs Wins 'Biggest Beet' Award

Herman Hepp Tops List of Individual Winners With 12 Beets Weighing a Total of 166 Pounds, Grown Just Across Sun River From City

Great Falls business men joined with farmers of this area Saturday in observance of the fourth annual sugar beet field day sponsored by the Great Falls Chamber of Commerce, with more than 175 in attendance at the event.

In addition to receiving cash and merchandise awards for their records as best growers, farmers and their families who attended were guests at an informal supper which brought the event to a close, with a menu duplicating that given diners at Chamber "mixers."

Topping the list of individual prize winners in attendance at the affair was Herman Hepp, whose farm lies just west of the bridge across Sun river, at Wadsworth park. Hepp got \$10 in cash for displaying the 12 largest beets, weighing 166 pounds. He also was awarded \$20 in cash for his feat in growing an average of 25.30 tons to the acre on more than 40 acres, and was also given a merchandise award for the 10th best display of 12 beets for type.

Has Area's Top Yield

Hepp, whose beet yield this year will be more than 1,000 tons, produced at least six tons an acre more than any of the other farmers in this region.

Valier, \$10. Merchandise winners in this division were S. Bloom, Simms; J. A. Shoquist, Fairfield; E. C. Lee, Vaughn; C. L. Ward, Conrad; Leo Keel, Simms; Kirk Hoover, Conrad, and Charles DeBoo, Valier.

Another Prize for Hepp

Highest yield on 40 acres or over, first, Hepp, \$20; second, H. R. Lenz, Manchester, \$15, and third, R. H. Birdeau, Fairfield, \$10. Merchandise awards in this division went to Oscar Sundbakken, Conrad; William F. Nigg, Conrad; Lloyd Campbell, Valier; Vern Tjaden, Fairfield; Charles W. Sill, Valier; J. J. Jensen, Conrad; Blaine Warnick, Simms, and Oscar Harmon, Fairfield.

In the division for the best display of 12 beets for type, Sam Lenz, Manchester, won the top award of \$10. Second place, with cash award of \$8, went to Fred L. Kirby of Simms. Merchandise awards in this division went to Claire Willets Jr., Simms; E. C. Lee, Vaughn; Leroy Kirby, Simms; E. I. Porter, Sun River; Glenn Crawford, Vaughn; J. C. Nielsen, Vaughn, and Hepp.

Those who placed in the contest for displaying the 12 largest beets, in addition to Hepp who took first cash prize of \$10, were Lillian S. Lucke of Simms, who got \$8 cash for her display of 12 beets weighing 157 pounds, and the following who were given merchandise cer-

Dairy Champs Of 4-H Clubs Are Selected

H. Hepp Wins Sugar Beet Production Award

Best Display Entered by Same Man

Many Growers Awarded Prizes During Annual Falls Chamber Event

Cash awards of \$219 and more than \$200 in merchandise, donated by local merchants, went to the best farmers of this area Saturday at the annual sugar beet field day sponsored by the Great Falls Chamber of Commerce.

High award winner of the day was Herman Hepp, beetgrower operating just west of the Great Falls city limits, who took first place in the display of 12 large sugar beets, and who also was winner of the award going to the grower with the largest per-acre tonnage grown on plots of 25 acres or larger.

Hepp took the latter prize with a record of an average of 23.59 tons per acre on a 27-acre plot. Officials of the Utah-Idaho Sugar Co. said his record would exceed that of any grower in the Chinook factory district.

Other winners in this division, the acreage in beets cultivated by them and their per-acre average yields were as follows:

Second place, Vern Tjaden, Fairfield, 37.8 acres, 15,995 tons; third, George Barlow, Simms, 25.7 acres, 14,392 tons; fourth, Herman Lenz, Great Falls, 28.9 acres, 13,988 tons and fourth, Lloyd Campbell, Valier, 39.2 acres, 13,069 tons.

Weight 124 Pounds

To win the cash award for displaying the 12 largest sugar beets, Hepp displayed a dozen whose total weight was 124 pounds. Other winners in this division, in order, and the weight of the beets shown by them, was as follows:

C. A. Willits, Simms, 95 pounds; Fred Kirby, Simms, 89 pounds; Leo Keel, Simms, 82 pounds, and Ted Lee, Vaughn, 80 pounds.

Lower Sun River Farmer Wins



HERMAN HEPP

With the highest yield per acre on 25 acres or more, Hepp was awarded first prize in the annual sugar beet field day conducted Saturday at the Hotel Rainbow by the Chamber of Commerce. It was the second consecutive year that Hepp, beetgrower and dairyman of lower Sun river, won the prize. In addition, he was awarded first place for displaying the 12 largest sugar beets.

Man With Farm in Suburbs Wins 'Biggest Beet' Award

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Another Prize for Hepp

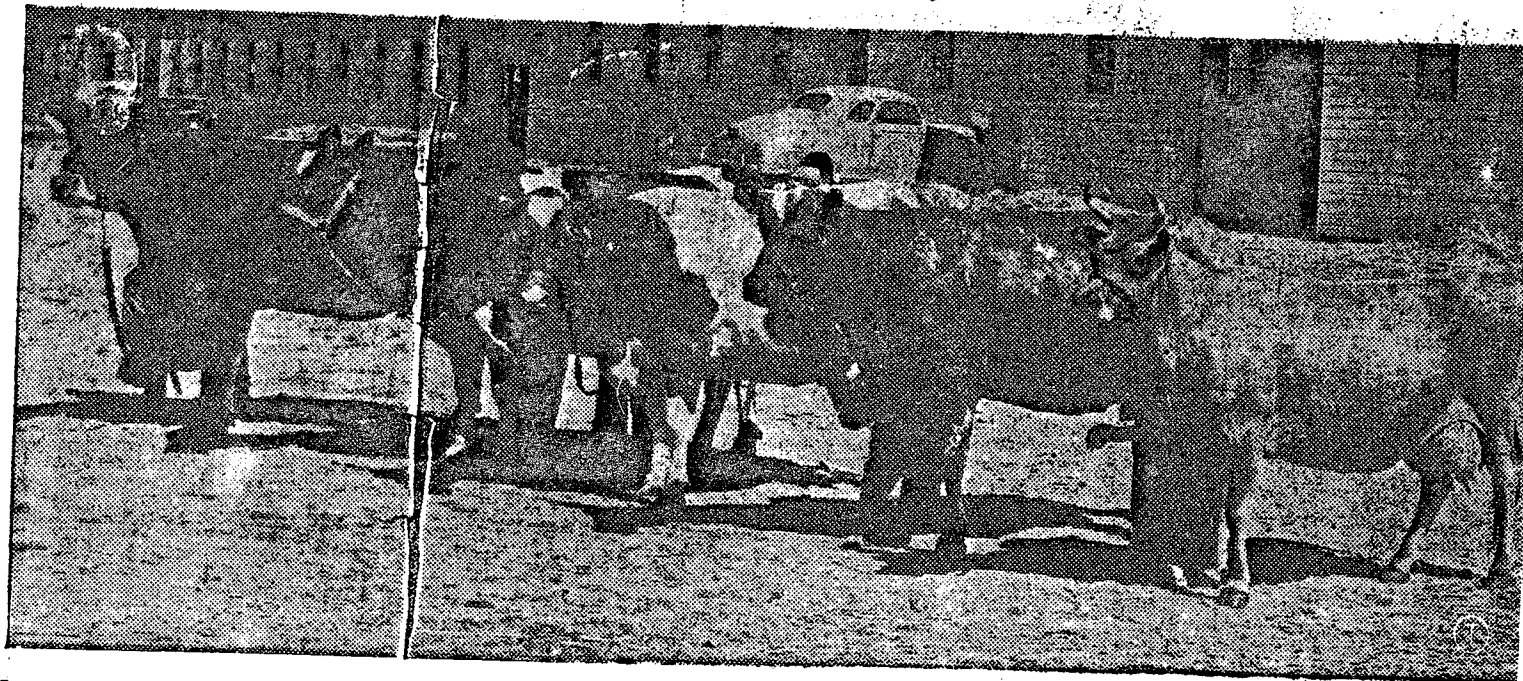
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Dairy Champs Of 4-H Clubs Are Selected

Queens of Montana Dairy Industry Named at Fair Here



Queens of Montana's dairy industry are the animals shown above, selected at the North Montana State fair this week. These cows, selected for their milk production record, rank as the "dairymen's dream" and won

Hepp Elected President of Dairy Group

Herman Hepp of Great Falls was elected president of the Cascade County Dairy Herd Improvement association at the re-organization

RECEIVED

MAR 17 1978

March 14, 1978

ENVIRONMENTAL QUALITY
COUNCIL

To: Montana Environmental Quality Council
State Capitol Building
Helena, Montana 59601

Re: Supplemental Environmental Statement, Sun River Flood
Protection Project, Great Falls, Montana, January 1978.

Comments by: The Concerned Citizens of the Sun River, a group, 200
10th Avenue Southwest, Great Falls, Montana 59404, Jack
Paulson, Chairman.

Enclosed please find a letter to the U.S. Army Engineer District, Omaha Corps of Engineers, Omaha, Nebraska from our group, the Concerned Citizens of the Sun River. The Corps has asked for comments by the 20th of March, and we would appreciate very much if you would read over our letter to them and read for yourself the matters of great concern to us.

Our group advocates flood control by means of an upstream storage reservoir. We feel that more people will benefit from this. The proposed levee creates a problem for every problem it solves. In fact, it transfers the problem from the north side of the Sun River to the south side of the Sun River where many property values are higher. We feel that there are great cost discrepancies in the Environmental Statement, and that more study is needed including all land areas affected by the flood waters of the Sun River!

There is a drawback to the project that the city, county, and state should be aware of. In providing local sponsorship for the project, they can be held liable for damage resulting from a Corps project. On page 2, Point 1.05 (b) the Environmental Statement states that authorization is subject to the condition that no expenditures would be made until local interests gave assurances to the satisfaction of the Secretary of the Army that they would hold and save the United States free from damages due to the construction works.

Your consideration to these matters will be greatly appreciated by the Concerned Citizens of the Sun River.

Sincerely,

Jack O. Paulson
Jack O. Paulson
Chairman

March 14, 1978

U.S. Army Engineer District
Omaha Corps of Engineers
Omaha, Nebraska

Subject: Supplemental Environmental Statement, Sun River Flood
Protection Project, Great Falls, Montana, January 1978.

Comments by: The Concerned Citizens of the Sun River, group, 200 10th
Avenue Southwest, Great Falls, Montana 59404, Jack Paulson,
Chairman.

Comments:

On point 3.a. the EIS states that the levee will provide protection for a large portion of West Great Falls, Montana. We, as Concerned Citizens feel that more than a 'portion' of West Great Falls should be considered. People in the Country Club, the entire south bank of the Sun River in Gt. Falls, plus the communities of Manchester, Vaughn, Sun River, Simms, and the entire Sun River Valley would be adversely affected if the levee was built. We wish to point out that there hasn't even been an adequate study to point out all the potential damages on the south bank to homes and land. We further request that an up-to-date study be made.

Point 4 states that the flood control reservoir alternative was not selected because it was not economically justifiable. What year was this decided--1964 as much of the data is based on? With the energy crisis of the last couple of years, the drought in the West, the need for more recreational areas, we feel that there is new and vital criteria that make a reservoir alternative economically feasible. Plus, it would protect approximately 30 miles of property and lives during a design flood, rather than 3 miles of property and lives.

The Sun River is a precious natural resource that should be studied and preserved for the good of the many, not a few. A levee system does not provide for such consideration, and Montana's water flows into the Missouri River where it is reserved for other states. There is no storage facility on the Sun River and, therefore, more study is needed in regard to preserving water for Montana.

Point 1.05 (a) states that local interests provide without cost to the United States all lands, easements, and rights-of-way necessary for construction of the project, including lands necessary for ponding of interior drainage. When figuring the cost-benefit ratio of this project, were the land owners along the Sun River consulted about giving up their land for the levee? Did you know that over 50% of those owning land along the Sun River do not want the levee and intend to take whatever legal means they can to stop the levee? This will be expensive, but will also be expensive for the local sponsor. We have signed petitions on file proving the basis for this statement. Copies of petitions are enclosed.

Point 1.16 talks about potential borrow areas. One potential site in Wadsworth Park (inside the left-bank levee on the upstream end) may be used for deep borrow. If this borrow area is used, a lake with a mean depth about 8 to 10 feet will be provided. Point 4.08 states that if excavated to a sufficient depth, the lake could be suitable for a salmonoid fishery. After talking to a fisheries expert from the Montana State Fish and Game Dept., we found that there is not enough information to back the fact that the lake could be suitable for a salmonoid fishery. Will the water be free-flowing, will it be the right

temperature, what type of bottom will the lake have, what kind of plant and animal life will there be, and where is the source of water? The Sun River cannot be pumped in and out, surely? Doesn't this mean, we would most likely have a lake 8 to 10 feet deep that is stagnant and a potential hazard for our neighborhood? Perhaps even a mosquito breeding ground and a death trap for youngsters?

Point 4.05 states that the levees built on the Sun River flood plain will provide flood protection to areas that are now part of the "floodway" under flood plain zoning regulations. No further construction is currently allowed in the greatest portion of the flood plain. There is a need for study to determine the property loss and future development loss on the south bank of the Sun River due to the building of the levee on the north and creating new "floodways" and "floodplains" on the south. It seems to us, the Concerned Citizens of the Sun River, that the problems on the north side of the Sun River are being transferred to the south side.

Point 4.15 states that during the designed flood, the water upstream of the Interstate would be approximately 1 foot deeper and at the upstream end of the levee the water would be approximately 5 feet deeper and extend five miles upstream and would cause only \$2,200 in increased damages. \$2,200 is an unrealistic figure and must be one from 1964 statistics! There are approximately 70 families along the Sun River in the valley alone; many new houses have been built in the city limits of Great Falls on the south side of the Sun River and 5 feet of water during a design flood would affect them. A milking parlor worth over \$100,000 would be flooded and an inch or two in greater depth of water would affect homes in the Country Club seriously. \$2,200 isn't even realistic, it is ridiculous!

Irrigation systems, concrete ditches, pipelines would also be damaged by additional water and higher velocities of water.

Point 5.09 states the loss of \$490.00 in tax revenue due to construction of the levee. Here is another unrealistic figure when there will be (taken from point 4.09) approximately 220 acres of land permanently committed to the project. Eight families relocated and 27 acres of cropland and 125 acres of pastureland taken out of production. Approximately 87 acres of land will be required for borrow. Is \$490.00 a realistic figure for tax revenue lost when it involves all this property? One man owns five acres that is in our group, Concerned Citizens of the Sun River, and pays over a \$100 a year in taxes for that alone!

Point 1.17 includes \$8,700 annual operation and maintenance costs. And point 4.03 states that one, possibly two permanent jobs may be created for maintenance of the project. Is it realistic to think that one, let alone two permanent jobs, plus the mowing and grading of the levee can be done for \$8,700 annually. That calculates to be \$4,350 salary per job and less if you take off for equipment, repairs, and gasoline. \$8,700 is another ridiculous figure.

We the Concerned Citizens of the Sun River advocate flood control of the Sun River with upstream storage (reservoir), and request a more up-to-date environmental impact study including all land areas affected by the floodwaters of the Sun River.

Sincerely,



The Concerned Citizens of the Sun River
Jack O. Paulson, Chairman

Encl

Petitions

(1) Sun River Dam Petition

We have over 160 signatures and just started this past week. We intend to continue until we can show that a dam is wanted most of all!

(2) A petition signed by those who will be adversely affected by the levee, protest the levee, and request an up-to-date study of all land areas affected by the Sun River in light of present economic, social, and technological conditions. This will be circulated further, too. There are over 100 signatures on this petition to date.

(3) Petitions of property owners within the West Great Falls Flood Control and Drainage District petitioning to have their properties deleted from the District stating that the dike system does not benefit their properties and will assume no liability for damages that may be incurred by the District. Over 200 have signed and more are signing.

Cc: Great Falls Chamber of Commerce

Governor Tom Judge of Montana

Office of Management and Budget in Washington, D. C.

Great Falls City Commissioners and Mayor and City Manager

Cascade County Commissioners

Montana Department of Fish and Game

Montana Department of Natural Resources and Conservation

Montana Environmental Quality Council

Montana State Department of Health and Environmental Sciences

Montana Recreation and Parks Division

Montana Association of Conservation

Congressman Ron Marlenee

Senator Paul Hatfield

Senator John Melcher

Congressman Max Baucus

Great Falls Park and Recreation Dept.

West Great Falls Flood Control and Drainage District



STATE OF MONTANA

DEPARTMENT OF STATE LANDS

MAILING ADDRESS: CAPITOL STATION
OFFICE: 1625 11TH AVENUE

HELENA 59601

(406) 449-2074

STATE BOARD OF
LAND COMMISSIONERS

THOMAS L. JUDGE
GOVERNOR

GEORGIA RICE
SUPT. OF PUBLIC INSTRUCTION

FRANK MURRAY
SECRETARY OF STATE

MIKE GREELY
ATTORNEY GENERAL

E. V. "SONNY" OMHOLT
AUDITOR

May 17, 1979

Office of the Governor
Capitol Station
Helena, Montana 59601

Environmental Quality Council
Capitol Station
Helena, Montana 59601

All other commenting or consulting parties

RECEIVED
MAY 18 1979
ENVIRONMENTAL QUALITY
COUNCIL

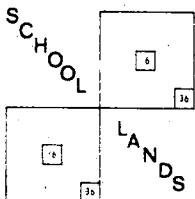
LEO BERRY, JR.
COMMISSIONER

Attached are the comments received by the Department of State Lands on the Draft Environmental Impact Statement for the proposed Zortman and Landusky Mining Companies mines and heap leaching operations near Zortman and Landusky Montana. Also Attached are the comment responses prepared by the Department.

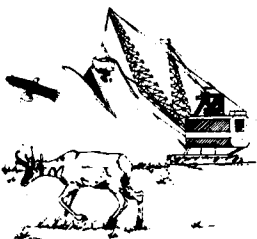
A review and consideration by the Department of the comments received, and additional data available since the issuance of the draft EIS has not altered significantly the results and conclusions reached regarding the significance and magnitude of the potential impacts identified in the draft EIS. Because of this, the Department of State Lands has determined that it will not be necessary to compile a final environmental impact statement as provided for by MAC 26-2.2(18)-p290 (Rule V)(2)(a) and (b). Pursuant to this rule, the Department plans to make its decision on the applications by the Zortman and Landusky mining companies not less than fifteen (15) days after sending copies of this document to the Governor of Montana, the Montana Environmental Quality Council, the mining companies, and all other commenting or consulting parties. To assure compliance with the requirements of the Hard Rock Law, the operation, if approved, will be inspected by the Department four times annually. A \$530,000 bond is being required by the Department (\$256,000 - Landusky Mining Company) (\$274,000 - Zortman Mining Company) to assure reclamation of the mines and processing sites.

Attachments

cc: Zortman Mining Company Inc.
Landusky Mining Company Inc.



MINING



RECLAMATION



MONTANA HISTORICAL SOCIETY

Founded 1865

Historic Preservation Office

225 N. ROBERTS

PHONE (406) 449-2004

HELENA, MONTANA 59601

March 15, 1979

Ralph Drier, Environmental Administrator
Department of State Lands
Helena, MT 59601

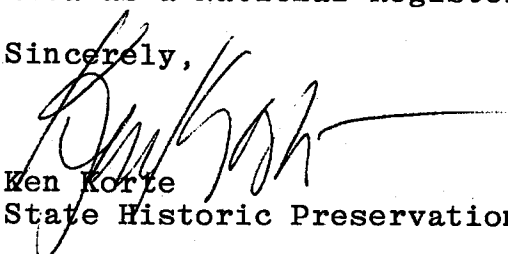
RE: Zortman/Landusky
draft EIS

Dear Ralph:

Thank you for consulting with this office regarding the treatment of cultural resources in the above EIS. The draft statement adequately addresses the known cultural resources in the study area, and I would concur with the proposed mitigating measures outlined on pages 119-120.

At this time, the Zortman/Landusky area does not appear to meet the National Register criteria for nomination as a Historic District, but future historical and archaeological studies may provide additional documentation to justify considering the mining area as a National Register Historic District.

Sincerely,


Ken Korte
State Historic Preservation Officer

KK:PB:pb



STATE OF MONTANA
DEPARTMENT OF AGRICULTURE

PESTICIDE DIVISION

AIRPORT WAY BUILDING WEST
1200 CEDAR STREET

HELENA, MONTANA 59601

TELEPHONE 464-1111

W. GORDON MCOMBER
DIRECTOR

March 23, 1979

Bob Spinney
Department of State Lands
Capitol Station
1626 11th Avenue
Helena, MT 59601

Dear Bob:

Regarding the DEIS on the Zortman and Landusky Mines, a through search of our literature has revealed little toxicological data concerning the effects of cyanide on vegetation. It is my feeling that the proposed operation, in terms of cyanide usage, represents a minimal hazard to vegetation and animal life under normal operating and expected environmental conditions.

Thank you for the opportunity to comment on this DEIS.

Sincerely,

A handwritten signature in cursive script, reading "Greg Pallister".

Greg Pallister
Technical Services Bureau

LAZY 69 CATTLE CO.

Henry Nesbit
Grace A. Nesbit

Box 836
Malta, Montana 59538
(406) 673-4150 4385
Zortman, MT
59546

Terry Nesbit
JoAnn Nesbit

Ralph Arisari
Environmental Administrator
Deph. of State Lands
Capitol Station
Helena, MT 59601

Dear Sir,

I would like to correct two statements and add a comment concerning the DEIS on the proposed plans of mining for Zortman area. We are residents of Zortman, own the Buckhorn store & cabins and a ranch 35 east in Phillips Co.

A 1. Page 65 b. Enrollments. 2nd paragraph:
Enrollment in the Malta Elementary School is 345 — 24 students per teacher.

B 2. Page 65 b. Enrollments last paragraph:
Malta's high school..... averages 17. high school & Jr. Hi. students per teacher, an enrollment of 380.

C Also we did not see any mention of the post office in Zortman, which we feel is very important to the community. Information can be obtained by calling 673-4382, Rick Tuttle, Officer in Charge.
yours truly,
Mrs. Henry Nesbit

Response to Grace Nesbit Letter

A. The office of the Phillips County Superintendent of Schools was again contacted regarding elementary school enrollment. The office reaffirmed official elementary school enrollment to be 307 pupils. The office, however, indicated that unofficial enrollment was higher.

B. The disparity between the high school enrollment figure of 278 used in the draft EIS, and the 380 students referred to in Mrs. Nesbit's letter can be explained by the 97 intermediate school students not included in the high school enrollment figures.

C. The Zortman Post Office is located in the Buckhorn Store within the townsite. Postal service information was obtained from Rick and Mavis Tuttle and was one of the methods used to estimate the current population of the Zortman area. In small communities, a post office often serves an important social function, providing a focal point for exchange of local news and other communications. Projected population growth in the Zortman area is not expected to substantially change the character of postal service in Zortman.

Since the issuance of the draft EIS for the proposed Zortman and Landusky mining projects, however, additional updated information pertaining to population increase anticipated in the general area as a result of other developments has become available. Employment in the American Colloid bentonite operation near Malta is now expected to be significantly higher and occur more rapidly than predicted in the draft EIS. Additionally, employment in natural gas fields in the northeastern portion of Phillips County is expected to increase. As a result, Table III-1 on page 88 of the draft EIS containing population projections for Phillips County, 1970-2000, has been updated to reflect the additional population increases and is presented below. Additional changes in the text as a result of the new projections are also listed below. The increase in population and impacts as a result of the proposed mining projects remains as discussed in the draft EIS.

Table III-1. Population Projections-Phillips County, Montana
1970-2000 (John Short and Associates, 1979).

	1970	1978	1980	1985	1990	1995	2000
Scenario 1							
Permits Denied	5386	5500	5683	6180	6319	6461	6607
Scenario 2	5386	5500	5701	6208	6328	6479	6616
Mining 1000 TPD*							
Scenario 3	5386	5500	5701	6265	6406	6505	6698
Mining 3000 TPD*							
Scenario 4	5386	5500	5701	6322	6551	6619	6759
Mining 500 TPD*							

* at each
operation

Page 89:

Previous: "In the Malta area competition for labor is likely to be great, as American Colloid Company will be filling 110 jobs by the early 1980's".

Revised: "In the Malta area competition for labor is likely to be great, as American Colloid Company will be filling 150 jobs by the early 1980's".

Page 99:

Previous: "Bentonite mining could add as many as 75 additional students to the systems".

Revised: "Bentonite mining could add as many as 196 additional students to the systems".

Previous: "The Malta Elementary Schools could experience a cumulative enrollment increase of 47 students".

Revised: "The Malta Elementary Schools could experience a cumulative enrollment increase of 96 students".

Previous: "The High School would have 51 new students".

Revised: "The High school would have 150 new students".



United States Department of the Interior

1793

BUREAU OF LAND MANAGEMENT

Phillips Resource Area
Box B
Malta, Montana 59538

March 19, 1979

Mr. Ralph Driear
Environmental Administrator
Department of State Lands
Capitol Station
Helena, Montana 59601

Dear Mr. Driear:

Our review of the Draft Environmental Impact Statement for the proposed mining plan of Zortman and Landusky Mining Operation was made with a primary view toward impacts that would affect the public lands adjacent to the patented mining lands. Our comments are referenced by page number.

A Page 35. b. Surface Water Quality

Error: Acid mine drainage problem in Montana Gulch and Rock Creek should more correctly be identified as arsenic. Table II-3 on page 37, indicates that the Gold Bug Adit Discharge has a PH factor of 6.7 which is nearly neutral and a PH of above 8 at two points on Rock Creek. Our studies indicate high concentration of arsenic flowing from the Gold Bug Adit present at Montana Gulch Campground.

B Page 36. c. Groundwater Quality

Comment: Arsenic in the surface water is believed to be affecting the groundwater quality of a well drilled at Montana Gulch Campground. Analysis of water from this well revealed high concentrations of arsenic than health standards allow for human consumption. The recreational value of the Montana Gulch Campground is severely limited due to the lack of potable water. The water discharged from the Gold Bug Adit, with its high concentration of arsenic, has an extremely negative impact on the Montana Gulch Campground and all landowners downstream from the mining area.

Page 47. 2. Fish

Suggested Addition: There are brook trout in Beaver Creek.

Page 49. c. Mammals

Omission: There is a large colony of hibernating bats in caves in the Little Rocky Mountains. Information is available on these bats.



Page 51. (d) Bighorn Sheep

Comment: Bighorn sheep could be affected by the mining operation, however, little is presently known about the herd. The Montana Fish and Game Department plans to study the sheep herd in the summer of 1979. They may present further recommendations on the management of the herd, especially if the mining area is expanded onto public lands.

Page 59. (2) Zortman and Landusky Area

Error: A statement is made that the Zortman townsite is plotted into many small irregular shaped lots totaling approximately 80 acres and most of this land is vacant. Approximately 29 acres of land in Zortman is privately owned, the remainder is in public ownership administered by the BLM. These public lands are not open for development due to the Ruby Gulch floodplain.

An omitted problem is the periodic flooding caused by high intensity rainstorms which also wash mine tailings into Zortman. Past mining activities resulted in tailings which presently choke two drainages in the mountains and these tailings are being moved by water from the patented mining claims to adjacent public and private lands. This is a residual negative impact on water quality, recreation, the Zortman townsite and a visual intrusion.

Page 72. 14. Recreation

Omission: Fishing for brook trout in Beaver Creek should be added. There is no mention of proposed road closures by the mining company. Road closures would have a negative impact on recreation. Traditional uses of roads in the area include hunting and fishing access, sightseeing, driving for pleasure, rock hounding and bike and horse riding. Road closures could create a defacto wilderness area leaving access to much of the Little Rockies only from the Fort Belknap side of the mountains. Proposed road closures along with public safety considerations due to the lack of closures are impacts that need to be addressed.

Page 72. 15. Visual Resources

Omission: Apart from the area disturbed by mining activities the Little Rockies has a class II Scenic rating which is the highest rating found in Phillips County. The natural beauty of the mountains is an important aspect on which mining activities has and will continue to have an extremely negative impact. Other natural phenomena omitted that add to the visual resource of the mountains include rock needles, spires and hole-in-the wall.

Page 72. 16. Wilderness Values

This section omitted. Comment: At the present time the Bureau of Land Management is conducting an inventory of all public lands for wilderness considerations. There are three wilderness inventory units identified for study within the Little Rockies.

Page 80. Groundwater

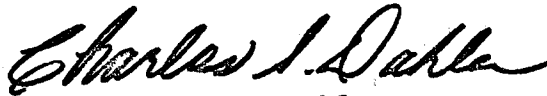
D Comment: The BLM maintains a forest fire station and crew at Zortman during the fire season and is dependent on the local water source for their purpose. Based upon the statement that no feasibility study has been conducted to determine if adequate groundwater exists for use by both the proposed operations and the residents of Zortman and Landusky, such a determination needs to be made for possible impact on the station, crew, and continued availability for fire protection.

Page 116. 8. Terrestrial Fauna (3)

Comment: Hunting inside the permit boundary can be controlled by the mining company. Hunting on public lands outside the boundary is controlled by the Bureau of Land Management. It would be necessary to petition the BLM for closure on areas outside the permit boundary.

We certainly appreciate the opportunity to comment on the draft EIS and trust our suggestions will be given due consideration in the final EIS.

Sincerely yours,



Charles S. Dahlen
Area Manager

Response to Bureau of Land Management Letter

A. The term acid mine drainage was used as defined by the EPA (Scott and Hays, 1975, EPA Report 440/g-75-007). The Gold Bug adit effluent has some characteristics of an acid drainage (high sulfate, iron and zinc and pH less than 7.0) but it also could be considered a poor quality groundwater with a high arsenic concentration. The pH of Rock Creek reflects a significant dilution of upper Rock Creek water by high quality water from springs on the Kolczak Ranch and is not characteristic of the Montana Gulch water.

B. The proposed mining activity would divert a small amount of effluent from the Gold Bug adit for use in the leaching process, thus causing a slight reduction in flow in Montana Gulch. The proposed mining operation is anticipated to have no other impacts on either, the quantity or quality of water in Rock Creek. Arsenic values present in the adit discharge are thought to be possibly originating from previous mining contact with the sulfide ore zone, as arsenic is a mobil ion associated primarily with sulfide mineralized zones.

The two ranchers on Rock Creek downstream from Landusky were contacted concerning existing impacts of Gold Bug adit discharge on their property. Both these ranchers stated there were no significant impacts on their land from this water (F. Kolczak, telephone communication, April 5, 1978 and Larry Kipp, telephone communication, April 6, 1978).

C. The Zortman and Landusky Mining Companies are presently negotiating with the Phillips County commissioners and the BLM regarding the development of road construction, road closures, and public access routing through the mining properties. Following a finalization of these plans, an open meeting will be held by these parties to receive public input to the proposals regardless of the potential plans for any road closures, the mining companies have indicated that alternate access into the public lands will be provided to the extent that it exists presently, i.e. access to public lands would be neither reduced nor increased as a direct result of road closures for the mining projects (Hank Scholz, pers. comm.).

D. The infiltration gallery water system in Alder Gulch supplied the previous mine and mill complex near Zortman and provided water to an estimated 50 to 60 families in Zortman. No shortages of water occurred in Zortman during this activity. Water demands from this previous mining and milling operation were greater than proposed in the current mining program and the community population is anticipated to be less. Based on this information it can be reasonably expected that all water requirements can be met by available groundwater supplies without adversely affecting other users. The planned water use from the Alder Gulch source will take advantage of an existing groundwater appropriation for mining at that site. Other existing water rights such as the existing appropriation that provides domestic water to the BLM fire station and some Zortman residents are protected from additional groundwater appropriations for mining by Montana water rights laws (Ed Scholz, pers. comm.).

Office Memorandum •

STATE DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES

TO : Ralph Driear, Dept. of State Lands **DATE:** March 26, 1979
FROM : Fred Shewman, Water Quality Bureau *Fred Shewman*
SUBJECT : Landusky-Zortman Draft EIS Comments

A | Page 77 says the pregnant and barren ponds may receive runoff from disturbed lands peripheral to the ponds. We think it is very important to design these chemical-containing ponds so they don't collect any more runoff water than the direct precipitation on the ponds and leach pad.

I am not too clear on what storm event the chemical ponds are designed to contain without overflow. I feel the chemical ponds ought to contain the 100-year precipitation event at a minimum. Even that has an 18% chance of being exceeded at least once in 20 years, and the 10-year event has an 88% chance.

The EPA is proposing hazardous waste regulations which may require special disposal considerations for sludges or residues from the chemical ponds.

wa

Response to Fred Shewman, Water Quality Bureau, letter

A. In addition to the construction of the leach pads and ponds, the disturbance of a small area adjacent these facilities is necessary to provide material to construct the ponds and make berms to divert runoff from undisturbed lands. To protect the small drainage downstream from the ponds and pads, runoff from the disturbed areas is diverted to the ponds. The ponds will be designed and operated to contain a 100 year, 24 hour precipitation event, from all disturbed areas, and facilities (rip-rapped bypass, spillway, or emergency storage pond) will be provided to handle larger precipitation events without causing pond damage (Max Botz, per. Comm.).



March 27, 1979

Mr. Ralph Driear
Environmental Administrator
Department of State Lands
Capitol Station
Helena, Montana 59601

Dear Ralph:

We have reviewed the draft environmental impact statement for the gold and silver mines proposed near Landusky and Zortman. It seems apparent that the potential social and economic impacts of the projects cannot be precisely described because of some of the key variables cannot be accurately forecasted at this time. The most important of these is the number of workers that will be hired from the adjoining area. The EIS indicates that the companies would prefer to hire as many local people as possible. However, it points out that this goal may not be realistic because the local labor pool is small and its potential for filling mining-related positions has nearly been exhausted by the American Colloid bentonite development near Malta. Without the ability to establish the approximate number of local workers hired it becomes extremely difficult to effectively predict the need for housing, the location of residential development and the associated water and sewage facilities.

A The statement's conclusion that Zortman is probably the most viable option for settlement (page 93) is reasonable, though the suitability of Zortman is constrained by its inadequate water supply. The EIS does not make clear, however, how this conclusion meshes with the mining companies' plans to locate five homes on land they own in Landusky. The EIS states that "further land acquisition is anticipated." (Page 10) Would this be in Landusky or in Zortman? Table III-4, "Projected Settlement Distribution," (page 93) allocates 70 persons and 27 dwelling units to Zortman and 40 persons and 15 dwelling units to Landusky. The only basis for this allocation seems to be that "if Zortman can improve its water supply it will logically attract the majority of new settlement." The "if" in this case is a critical unknown. Because of the uncertainties involving the number of local workers

hired and the location of residences for the workers, it appears that the county will have to assume a reactive posture in dealing with the mining development until more accurate information regarding these issues becomes available. If the Landusky and Zortman mining applications are approved we would be willing to assist the Phillips County Commissioners and area residents in investigating the feasibility of providing an improved water supply for Zortman.

The EIS suggests, as a mitigating measure for school impacts, that the school districts in Phillips County be reorganized so that the districts which experience increased enrollments will also receive increased revenue. Based on the information provided in the EIS, this seems to be the most equitable and rational means of dealing with this problem. Since the Landusky students do not appear to have reasonable access to the Dodson High School throughout the school year it would seem to make sense to redraw the district boundaries so that the taxes paid by local families go to the schools their children actually attend. The same problem seems to exist for students in the Malta elementary school district who attend Robinson School. Only the local authorities can determine whether a boundary realignment is politically feasible but if it is to be done it should be done before the school districts become dependent upon the increased revenue from the mining operations.

B According to the EIS "perhaps the major adverse impact that cannot be avoided is the potential threat of the introduction to the area's surface and groundwater system of potentially hazardous substances...." The final EIS should clearly articulate those measures which will be taken to minimize this potential threat. Because Zortman is proposed as the "most viable" site for residential development for mine workers and their families, and because groundwater in the Zortman area is unusable for domestic purposes (page 64), it is imperative that adequate measures be taken to assure that surface drainage from the mining operation be provided in such a manner as to prevent hazardous substances from affecting any potential source of potable water. Pages 76-79 of the text indicate that the concern about chemical contamination of the area's surface and groundwater is legitimate. On page 197, the EIS states that, "If a spill or seepage of process reagents or residues were to result in the contamination of the groundwater supplies currently used for human consumption in Landusky and Zortman, the commitment of this resource may be considered irreversible and irretrievable...." The statement on page thirteen that "Adequate storage will be available to store runoff from disturbed areas for the 10-year 24-hour precipitation event." does not provide a basis for great confidence when the reader encounters a statement later on page 70 which refers to "a period of disastrous rainstorms (which) closed mining operations

C

Mr. Ralph Driear
March 27, 1979
Page 3

during much of the 1920's." We hope that any permits granted for the mining operations will include requirements for utilizing all reasonable safeguards to prevent "irreversible and irretrievable" degradation of the quality of local water resources.

Sincerely,



David Cole, Chief
State Land Use Planning Bureau
DCA/Planning Division
(406) 449-3757

DC/ke

cc: Sherman Doucettee
Ms. Dolores Hughes

Response to David Cole, Department of Community Affairs letter

A. The further acquisition of land by the mining companies is currently proceeding at both locations. As land becomes available for sale in either the Zortman or Landusky areas, it is reviewed by mining company management personnel for possible purchase. It is therefore possible that land may be purchased at both sites, although, as the EIS discusses, the Zortman area is probably the most viable option for settlement.

B. As the draft EIS points out, (page 109) before approval of the proposed projects can occur, the plans of mining and reclamation must provide protective measures required by local, state, or federal law, regulations, or executive orders. The draft EIS contains those protective measures proposed by the mining companies as part of their mining and reclamation plans designed to meet the requirements of these laws. The draft EIS, in Chapter IV, also contains those additional protective or mitigative measures generally thought to have merit by the Department. It is further stated in Chapter IV that by the attachment of stipulations, these other measures may be required as part of the companies' reclamation plans in those instances where the permitting State or Federal agencies have the authority to do so. These additional measures, therefore, are presented in the EIS for consideration by the various decision makers. The Department's rules and regulations adopted pursuant to the Montana Environmental Policy Act provide for a minimum 15 day waiting period following issuance of the final EIS before Departmental action on the proposed permit can occur. At that time, those measures identified in Chapter IV, or through public input during the comment period that the Department determines should be required in addition to those measures proposed by the mining companies, will be included as stipulations on any permit granted. The final EIS, therefore, does not contain a formal determination of the entire program of protective measures that may eventually become a portion of any permit granted.

C. See response to comments U and V contained in the Charles Plumage Letter. Only the settling ponds at the mine pit sites would be designed to contain a 10 year, 24 hour precipitation event. These ponds would receive surface runoff from disturbed areas adjacent to the mine pits. In addition, the draft EIS states the following (page 75):

Both mine areas, however, are located very close to drainage divides and are not expected to intercept substantial amounts of runoff from undisturbed areas above the pits.

STATE OF MONTANA
DEPARTMENT OF FISH AND GAME
HELENA, MONTANA

Office Memorandum

TO : Bob Martinka
FROM : Dick Johnson
SUBJECT: Zortman-Landusky EIS

DATE: 3/28/79

We have reviewed the above-mentioned EIS and have the following comments:

A Bighorn sheep are more common in the Little Rockies than this report indicates. The minimum population level is 50 animals. This herd is reproducing and seems to have become established in the area.

The increased population associated with the proposed operation may be expected to increase poaching losses on bighorns, turkeys and elk. Each of these species is especially vulnerable to illegal harvest, and each is struggling to gain a foothold in the area. The overall increase in human activity and disturbance could have a similar effect.

Impact on Flora, Page 82: Past mining has caused considerable destruction of high meadow vegetation (balsam root-grassland). This type provides important nesting and brood-rearing habitat for blue grouse as well as feeding areas for all big game species.

Forty-five additional dwelling units will be built to house employees. These, and associated roads, could destroy additional habitat unless confined to the Zortman and Landusky townsites.

DJ/sd

cc: Dick Johnson

Response to Dick Johnson, Dept. of Fish and Game Letter

A. See response to Bob Martinka letter. Additional bighorn sheep population information was recently made available by the Department of Fish and Game and the Bureau of Land Management and is included in the supplemental winter wildlife report submitted to the Department by WESTECH Inc., Helena, MT.

STATE OF MONTANA
DEPARTMENT OF FISH AND GAME
HELENA, MONTANA

Office Memorandum

TO : Bob Martinka
FROM : Ken Knudson
SUBJECT: Landusky-Zortman EIS

DATE: 3/28/79

The potential exists at both mining sites for the development of acid-mine waste problems since:

- (1) Gold in the Little Rocky Mountains is often associated with pyrite (page 25),
- (2) The sulfide ore body is located beneath the oxide ore body proposed to be mined (page 36),
- (3) Past mining operations have encountered water at various levels and times (page 36), and
- (4) The groundwater system of the area is complex and not fully understood (page 79).

With these indicators in mind, I would suggest that the company submit rather complete plans outlining how they would properly treat an acid-mine waste discharge. Also, reclamation of acid-mine waste problems is difficult and costly; I therefore further suggest that the department consider this expense when setting the reclamation bond for both of these mining operations.

The sampling locations that are suggested for surface and groundwater quality monitoring appear to be adequate. I feel, however, that the sampling frequency of certain stations needs to be increased. The discussion of the fisheries resources of the area (a total of four sentences) was wholly inadequate. The discussion of the toxic potentials of cyanide solutions (pages 78 and 79) was very good and should be reproduced in any ensuing discussions of cyanide leach operations.

KK/sd

Response to Ken Knudson, Montana Dept. of Fish & Game Letter

A. The association of pyrite with gold ore in the Little Rockies occurs primarily in the sulfide ore bodies. Very little pyrite occurs in the oxide ore bodies proposed to be mined at Zortman and Landusky sites. Gold ore containing significant pyrite amounts does not generally provide a suitable heap leaching medium and is therefore not being proposed for mining.

The location of the sulfide ore body below the oxide ore body should not significantly increase the potential for acid mine drainage. Water will continue to percolate downward through the sulfide ore body, oxidizing it, continuing the existing process that has resulted in the creation of the oxidized ore body proposed for mining. The additional oxidation is not anticipated to adversely influence present groundwater quality because of the relatively small area that would be affected by the proposed mine pits.

As discussed on pages 36 and 79 of the draft EIS, the groundwater system of the area is complex and not fully understood. Basic groundwater flow from the mining area is thought to presently be exiting from the Gold Bug Adit (page 36, draft EIS). The proposed mining will occur above the levels drained by the Gold Bug Adit and is therefore not anticipated to significantly alter the base groundwater flow from the area. Exploratory drilling by the mining companies has encountered areas of limited groundwater in the levels above the adit discharge, however, none have been substantial enough to be considered a groundwater body (Max Botz, pers. comm.).

B. The Department has determined that based upon present information, the proposed mining project is not likely to result in the creation of acid mine drainage. Because of this, the mining projects are not required to comply with section 82-4-336(5) of the Hard Rock Law which requires the applicant to include in the reclamation plan provisions for the prevention and treatment of acid mine waters. Section 82-4-337(3) of the Hard Rock Law states the following:

(3) The operating permit shall provide that the reclamation plan may be modified by the board, upon proper application of the permittee or department, after timely notice and opportunity for hearing, at any time during the term of the permit and for any of the following reasons:

(a) to modify the requirements so they will not conflict with existing laws;

(b) when the previously adopted reclamation plan is impossible or impracticable to implement and maintain;

(c) when significant environmental problem situations are revealed by field inspection.

In accordance with these requirements, if the mining operation were

to result in the creation of acid mine waters. The Department could require a modification of the existing reclamation plan to include proper treatment facilities for the acid mine waters.

C. As explained in the draft EIS, the fisheries of the Little Rocky Mountains area is limited. Existing information regarding the condition of the fishery in those streams containing fish is not available. The Montana Department of Fish and Game, Fisheries Division, however, has indicated that the fisheries resource of the area is scheduled for an inventory in the near future. See response to comment D in Charles Plumage letter.

D. In addition to recent information that the Department has compiled regarding cyanide heap leaching and the potential for adverse resource impacts, other information regarding additional literature sources has been made available to the Department by interested individuals. The Department is continuing to compile information pertinent to the use of cyanide in mining operations.

STATE OF MONTANA



DEPARTMENT OF

FISH AND GAME

Helena, MT 59601
March 28, 1979

Mr. Ralph Driear, Environmental Administrator
Department of State Lands
Helena, MT 59601

Dear Ralph:

The draft EIS on the Proposed Plan of Mining and Reclamation, Zortman and Landusky Mining Companies, has been reviewed by our region 6 personnel at Glasgow and our Pollution Control Biologist, Ken Knudson. I have enclosed their comments for your consideration.

A My only comment pertains to the fact that the wildlife section does not contain a four-season wildlife survey, the winter season not being included. As I understand the situation, some winter wildlife data for the area have recently been collected by a consulting firm. However, the months of March and April will not be included. This does not seem to fit your requirements that a four-season wildlife survey be conducted on development sites such as this. Please correct me if my interpretation of this situation is incorrect.

Thank you for the opportunity to review this EIS and granting a portion of the time extension we requested.

Sincerely,

A handwritten signature in cursive script, appearing to read "Bob".

Robert R. Martinka, Chief
Bureau of Baseline Studies

RRM/sd
Enc

Response to Bob Martinka, Department of Fish and Game letter

A. Although neither the Hard Rock Law nor the Montana Environmental Policy Act require a four-season wildlife survey, the Department attempts to include all of the pertinent wildlife data possible within the draft EIS. Statutory time limitations within which the Department must take action upon a hard rock operating permit application (425 days) do not normally allow time to complete a full four-season wildlife survey and include the results in the draft EIS. In the instance of the Zortman and Landusky draft EIS, the draft EIS was able to include the results of a spring, summer, and autumn wildlife survey of the Little Rockies study area. The draft EIS (page 47) explained that a four-season survey was being completed, although only the results from the 3 seasons were able to be presented in the draft EIS.

Since the issuance of the draft EIS, the winter season wildlife survey has been completed. The winter informational supplement completes a four-season terrestrial wildlife survey for part of the Little Rocky Mountains (Phillips County, Montana) as conducted by WESTECH Inc., Helena, Montana. In addition, ungulate data for March, 1979 gathered by the Bureau of Land Management is included in this supplement.

A copy of the full wildlife survey reports prepared by WESTECH Inc. for the spring-autumn, and winter seasons is on file in the Departments' Helena Office. A total of 116 field days were included in the four-season study. The following is a summary of pertinent information regarding wintering wildlife observations obtained from the report.

Methods were described in detail in the three-season report (Scow, 1978). Data for the winter supplement was collected from aerial surveys, vehicle and pedestrian routes. There were three flights (one per month) over the study area during winter. Vehicle routes were limited to those roads where snow was removed to permit access, so that much of the routes described in the three-season report were inaccessible. Pedestrian routes were maintained, but were limited by deep snows, cold temperatures and short days.

1. Mule Deer

In the initial three-season report (Scow, 1978), it was hypothesized that mule deer would "migrate to the foothills and prairie surrounding the Little Rocky Mountains (to the south of the study area) where snow depths are not as severe, browse is more readily available, and solar radiation provides warmth: Open habitat types on south slopes (such as Gold Bug Butte at the Landusky site) are probably used if snow accumulations are not too great to impede mobility or limit browse availability."

"The mouths of major drainages (including Camp Creek, Goslin Gulch, Grouse Gulch, and Dry Gulch) are also used extensively. Rock Creek and Ruby/Alder Gulch probably receive less use because of their proximity and accessibility to Landusky and Zortman, respectively."

These suppositions proved generally true during the 1978-79 winter, although there were some exceptions. Direct observations of mule deer, as well as evidence (tracks and beds), indicated that some mule deer remained at higher than expected elevations during lengthy periods of subzero (°F) temperatures and despite two to three feet of snow. These areas included Gold Bug Butte (except the north aspect), the mid-upper reaches of Grouse Gulch, and both the east and west ridges above Ruby Gulch (Scow, 1979). However, most mule deer observations were from lower south-facing slopes and gulches along the mountains' southern perimeter.

Information obtained on the number of mule deer group sightings in various vegetation community types in the Little Rocky Mountain study area during the four-season wildlife study indicates that there were more winter sightings of mule deer from Ponderosa pine community types than from any other major habitat. The Ponderosa pine types accounted for eight of 14 (57 percent) winter sightings; this predominance of sightings is attributed to the fact that most Ponderosa pine types are at lower elevations.

Four of 13 (28.6 percent) winter sightings were from the lodgepole pine/mixed shrub community. These were the sightings from higher elevations discussed above, and it is believed that mule deer use of this community was influenced by the availability of browse in this type.

Two winter sightings were from the grassland community. These were the only grassland sightings during the study, and probably do not reflect the actual trend in year-round use of this type.

Mule deer distribution and habitat use data for March (John Grensten, pers. comm.) show no appreciable change from winter months. The animals were clustered at the southern periphery of the Little Rockies, despite a warming trend and rapid melt on south-facing slopes.

Information obtained on the average and median group sizes of mule deer observed during the study indicated that; in comparison with earlier seasons, group sizes generally increased through winter months as expected. The small number (10) of individuals observed in January did not accurately reflect average group sizes for that month. Larger groups of mule deer were undoubtedly missed during January. Caughley, Sinclair and Scott-Kemmis (1976) indicated that aerial surveys produce underestimates of animal density, depending on methods (speed, height above ground and transect width), terrain and vegetation. They suggested that such data may be better regarded as density indices rather than as density estimates. The greatest number of mule deer observed on the study area in any one day was 41 during an aerial survey in late February.

2. White-tailed Deer

The only white-tailed deer observations in the study area occurred

in December, with two sightings in the Pipo(Potr)/Syoc community type and one in the Pipo/grass type. During winter, white-tailed deer may be expected to frequent the dense cover of drainages at lower elevations, which is essentially their year-round habitat in the study area. Those observed in December followed this expectation with the largest group of ten venturing no higher than a foothill of about 4400 feet elevation in the Pipo/grass community type (Scow, 1979).

3. Elk

One observation (John Kalal, pers. Comm.) of two elk was reported in early February, in a lodgepole pine/mixed shrub community type on a south-facing slope immediately north of Gold Bug Butte (Scow, 1979). This was the only reported elk sighting during the entire four-season study, suggesting that elk numbers in the Little Rocky Mountains are not high.

4. Bighorn Sheep

Throughout winter, bighorns in the study area were observed most often in the mouth of Dry Gulch (Scow, 1979). They frequented an open Ponderosa pine/kinnikinnick type, where cliffs afforded protection to the south as did the steep drainage of Dry Gulch to the north. Smaller groups of mule deer shared the area in January and February. During aerial surveys, 13 bighorns were observed at that location in December, and 29 (including at least five large rams) in January. Twenty-one sheep were sighted at the same site from the air in February. It was impossible to satisfactorily determine age and sex of the sheep without imposing undue harrassment. Faded red neck collars were occasionally seen on survivors from the 1972 and 1974 introductions. Also in February, two additional groups of sheep were spotted in the Pico/ mixed shrub and Pico/scree types on Saddle Butte (Scow, 1979).

In March, with warmer weather and snowmelt on south-facing slopes, big-horns dispersed along the southern perimeter of the mountains (John Grensten, pers. comm.), similar to mule deer.

5. Predators

Coyotes (or their evidence) were most frequently encountered on lowland plains and foothill areas during the winter months. However, one coyote was observed in lodgepole pine/mixed shrub habitat type near the summit of Gold Bug Butte on December 30 (Scow, 1979).

A ranch resident revealed that a female bobcat and two kittens inhabited the south flank of Thornhill Butte (a large solitary butte two to three miles southwest of the Little Rockies) during 1978 (Scow, 1979).

6. Additions to the 1978 Bird Species List

Two separate sightings of rough-legged hawks (Buteo lagopus) were

made in January on the prairie portion of the southeastern corner of the study area. A small group of five to six common redpolls (Acanthis flammea) were seen with mountain chickadees in Ponderosa pine near Zortman on February 13. Other bird species present in the Little Rockies study area over the winter (which were listed in the three-season report) were black-billed magpies, mountain chickadees and red crossbills, with more sporadic sightings of golden eagles, Clark's nutcrackers, black-capped chickadees and red-breasted nuthatches (Scow, 1979).

7. Impacts

The following discussion of impacts, as modified from that contained in the draft EIS, pertains to ungulates only. Impacts to non-ungulates are not expected to differ from those discussed in the draft EIS.

The proposed Zortman permit area does not appear to be winter range for any of the four ungulate species observed in the study area. The proposed Landusky permit area is winter range (for at least part of the season) for mule deer, and was used less commonly by bighorn sheep and elk. Gold Bug Butte may be used throughout the season during mild winters by all three species. However, due to its higher elevation, past and present degree of disturbance, and proximity/accessibility to Landusky, Gold Bug Butte does not seem to represent critical winter range, i.e., important to the continued survival of any or all four species in the mountain range (Scow, 1979).

Critical white-tailed deer winter range is the riparian/shrubby bottoms of draws, particularly in the southern perimeter of the study area, as well as beyond the study area boundary onto the prairie. As suggested in the three-season report (Scow, 1978), the entire southern perimeter of the Little Rocky Mountains is important winter range for mule deer and bighorn sheep. In particular, the southerly aspect of Sugarloaf Butte, the lower reach of Dry Gulch, and the west and southerly slopes of Silver Peak were used in the most severe part of the past winter. As winter mollified, Saddle Butte/Grouse Gulch provided some sightings (Scow, 1979).

Based on these observations, the impact of habitat loss within the two proposed permit areas is expected to be small. Impacts other than habitat loss to mining discussed in the draft EIS have the potential to affect ungulate populations of the area more than mining. Most important (and the most difficult to control) will be the location of the necessary additional housing units. The draft EIS states that, at full mine operation, there may be a need for approximately 45 new housing units. If the placement of these housing units were to occur on the winter range indicated in this report, it would be expected to have a negative impact to the ungulate populations.

8. Literature Cited

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(404) 353-2205
P.O. Box 249
Fort Belknap Agency
Harlem, Montana 59526

Fort Belknap Indian Community
A TRIBAL GOVERNMENT
Fort Belknap Indian Community
(Elected to administer the affairs of the community
and to represent the Assiniboine and the Gros
Ventre Tribes of the Fort Belknap Indian
Reservation)

April 3, 1979
DATE

Mr. Leo Berry, Commissioner
Department of State Lands
Capitol Station Office
1625 11th Ave.
Helena, Montana 59601

Mr. Berry:

Your letter of March 28, 1979 concerning the comment period on the Draft Environmental Impact Statement for the Landusky-Zortman Mining proposal indicates that every effort will be made to include our comments if sent by April 4, 1979.

The phone conversation between LT. Governor Schwinden and you, Mr. Delmar Bigby and myself was to the effect that you would accept our comments if they were sent by April 4, 1979, and would be made a part of the record.

The Fort Belknap Indian Tribal Government is opposed to the re-opening of the Zortman-Landusky Mining operations. In order to supply the public with the necessary information we submit the following questions for response because the Draft Environmental Impact Statement does not adequately address the issues, and is grossly in-adequate in many areas.

A

1. Why wasn't a base-line study of the existing chemicals present in the Kings Creek area and Hays area conducted? The Fort Belknap Indian Tribal Government has been monitoring the stream and well water in Hays and has evidence of harmful chemicals in excess of the allowable standards.

B

2. Why are there no base-line studies of the volume and source of the ground-water done? The Fort Belknap Indian Community, by the Supreme Court Decision under Winters, owns "All waters rising upon, flowing through the Fort Belknap Indian Reservation. Failure to determine the volume and source of the ground-water is a violation of the rights of the Fort Belknap Indian Community.

C

3. Why aren't measures for the "Wild-Fire" protection covered? The Little Rocky Mountains has a history of forest fires and the D.E.I.S. does not address the very real possibility of wild-fire in the

mountains.

- D** | 4. Why was no comprehensive study of the affect of the mining operation conducted on the fish population in the Little Rocky Mountains? Reference is made to a limited fish population in the Little Rocky Mountains but no study was conducted on why there is a limited population of fish.
- E** | 5. Why wasn't the impact of the Little Rocky Mountain Mining Operation on the surrounding communities of Hays and Lodgepole not fully addressed? These communities are definitely affected by the proposed mining operations.
- F** | 6. Why wasn't the off-road vehicle use not adequately addressed? What is the impact on the wild-life in the Mountains by the increased off-vehicle travel in the mountains?
- G** | 7. What is the impact of the mining operations on the existing and on-going pollution from the mine tailings of the Little Ben and August Mines in Section 15, T.25N-R.24E in the Little Rocky Mountains? No reclamation of past mining operations has been done.
- H** | 8. The effect of the mining operations on the C.M. Russell Wildlife Refuge has to be addressed because of the effect on the waters flowing south into this refuge.

Sincerely,


Charles D. Plumage, Chairman
Fort Belknap Indian Community

cc: Cecil Andruss
Secretary of the Interior
Washington, D. C. 20245

Thomas L. Judge, Governor
Room 204, State Capitol
Helena, Montana 59601

Arthur C. Knight, M.D., Director
Department of Health and
Environmental Sciences
Room 200, Cogswell Building
Helena, Montana 59601

REPLY TO DRAFT ENVIRONMENTAL IMPACT STATEMENT

ZORIMAN-LANDUSKY MINING OPERATION

BY: FORT BELKNAP INDIAN COMMUNITY

INTRODUCTION

The Little Rockies have been called "The Island Mountains" by our Indian people. This beautiful and isolated range is an oasis in the midst of hundreds of square miles of dry high plains and breaks.

In the Draft EIS (p. 72), the researchers claim that:

"The natural and aesthetic resources of the Little Rocky Mountains have been heavily influenced by mining activities. The large amount of road construction, exploration, and mining disturbance, and tailing piles have reduced the visual resources of much of the area. The old townsites, mill sites, and other remnants of the mining history of the area, however, may offer an aesthetic visual appeal to those persons who enjoy these features."

We find this statement to be misleading and ironic in several ways. Such a statement in an EIS is an attempt to give the public the impression that, "it is already ruined, so why not continue to ruin it." We see the mountains in a different light. The greater portion of the land in the Little Rockies is in a primitive state. Spectacular limestone cliffs, window arches, steep canyon walls, hidden valley meadows--These are the visual resources of much of the range. To say that old mine remnants, etc. may be the only redeeming visual features of this country is not only quite warped, but also highly disrespectful.

We feel that our lives are profoundly connected to these mountains. There are sacred grounds up there. Our young men went to the higher

peaks on their vision quests. Our elders still make seasonal trips into the mountains to collect medicinal plants, or to participate in important ceremonies. Our young people need what wild country they can still find as a source of pride in their home land.

The re-opening of the mines would be very untimely for our people. There is a cultural renaissance taking place among our youth. Most of our population is young, and sees these mountains as a key place to go to to understand our cultural heritage. These young people need pure water to drink, fish and game without toxic chemicals in their flesh, and a quiet place to go, free from the dynamite and bulldozers. These mountains are not a large range, and pit mining will have a proportionately great affect on the country. It is only several miles away from our communities and an isolated eco-system such as this is subject to more severe disruption than larger wild areas.

MEPA requires an approach that takes into account the long range and sociological effects that any proposed activity will have on an area and its people. The Draft EIS fails to grapple with this aspect of the law.

The following list gives some quotes by our people concerning the proposed mining:

"I don't see how any mining in our mountains could benefit the people here."

"When a lot of miners come into our mountains and run around in them, it will be like the old days when they came and raised Cain with our home. Next thing you know they will be trying to take all of our mountains and will leave nothing for us."

"Why can't the white man leave us alone with what little we have left. First they take our families then our

THE DRAFT EIS FOR THE PROPOSED PLAN OF MINING AND RECLAMATION
IN THE LITTLE ROCKY MOUNTAINS

is severely inadequate and the described mining operations are totally unacceptable to the people of the Fort Belknap Indian Reservation. A complete revision of this EIS will be necessary if the public is to be properly informed of the consequences of the proposed mining operation. The draft EIS is in violation of MEPA, and much of the study process must be repeated in a competent and unbiased manner before the public can respond to the statement. The following areas represent deficiencies in the draft statement and in the proposed mining plan:

1. Inadequate and incompetent testing and sampling.

Stream and well-water samples were taken only once during the entire 1978 study period. One sampling of these usable waters in the Zortman-Landusky areas does not allow anyone to understand the baseline chemistry of the water supply system. King Creek, the major north-flowing drainage from the Landusky mining area, was somehow overlooked. Yet there are more people affected by this particular drainage than any other in the study area. The toxic substances which are most critical to the public are, unfortunately, omitted from the list of one-time test results. When arsenic appears in the table (page 37), it is shown at .19, an unsafe level according to U.S. government standards. The only reading for arsenic appears at the Gold Bug Adit Discharge. No other readings can be found on that page, and only four are shown in the following page. Cyanide, a key substance in question here, is also omitted in half the study cites, especially those draining onto Indian

land. Lead and cadmium were not even listed, yet a recent study shows that lead in Little Peoples Creek exceeds the maximum for safe drinking water by one thousand two hundred times! See Appendix "A".

K The study concludes that "no significant impact is anticipated to occur to the areas fishing, because of the general lack of a fishery in the area of the proposed operation." Little Peoples Creek was a major fishery prior to cyanide poisoning by the last mining operations. The stream was and still is an important source of food and recreation for the Indian community. The stream's system was once a thriving aquatic community and has been re-established as a fishery in the Little Rockies. The circumstances surrounding fishing in Peoples Creek should be included in the final EIS. In addition, the status of the aquatic insect life must be examined in all of these areas. Since acid mine waste could occur, it is necessary to discuss the effects of the mining on King Creek and Little Peoples Creek. The sampling and testing did not take into account the stream flow areas which we at Fort Belknap consider to be of prime concern.

2. Lack of proper baseline study.

L The information presented as a "Baseline Study" is not scientifically valid. While there is a checklist (laundry list) of vegetation and animal species present in the two mining areas, there is no baseline study for chemical analysis of any plant or animal specie. Therefore, when an impact occurs from the mining or leaching operation, the causal effect relationship, will be difficult, if not impossible to establish. Ground water flow is unknown, and there is no idea of the availability

of ground water for the demands by both mining operations and the increased domestic consumption by the mining communities. The theory explained in the EIS, Page 36, states that the ground water "generally follows the land surface towards the stream bottom", and that the destruction by mining has probably altered the flow into and through the mine adits.

M Considering the locations of the mines, we contend that the ground water use by the mines will affect the water supply of Hays and Lodgepole. In a dry region such as ours, any greatly increased water consumption by the mines will, at best, reduce our legally protected water supply; and at worst, both pollute and reduce our water. A serious baseline study of the ground water is imperative before any renewed mining activity is allowed in the area. The EIS further states (page 80, second paragraph) no feasibility study has been conducted to determine if adequate ground water exists for use by both the proposed operations and the residents of Zortman and Landusky." The researchers never even considered the possible impact on the Indian community's water. It is inconceivable that such a drastic use is being planned for a water supply whose source, direction, and ultimate volume, is admittedly unknown. A proper wildlife **N** baseline study must be conducted during all four seasons, yet the researchers fail to include a winter study. It looks to us as if the mining company is in too much of a hurry to get under way and profit at the expense of our wildlife and environment.

3. Failure to cite literature on important ecological problems.

O There is a total lack of adequate research of scientific literature on the potential environmental hazards of cyanide and the cyanide leaching

process as it relates to environmental impacts to all terrestrial ecosystems. See Appendix "B". For example, in the literature cited section of the EIS, pages 131 to 133, there are only three references dealing with the toxicity of cyanides and related compounds. Each of these three papers is by the same major author and each only addresses cyanide toxicity to fish. Even a brief search in scientific literature discloses that cyanide and some of its compounds were used extensively as non-selective herbicides and insecticides. Nowhere in the draft EIS is there any information on these subjects. Furthermore, in 1976, the U.S. Department of Health, Education and Welfare published a 191 page criteria document on recommended standard occupational exposure to hydrogen cyanide and cyanide salts. This document adequately covers the real and potential problems of cyanide poisoning associated with individuals utilizing cyanide compounds. Since at each of the two proposed mining sites approximately 500,000 pounds (250 tons) of cyanide will be present in the leaching ponds, it is imperative that this aspect of human health be examined. It should have been covered in the EIS by either personnel of Montana Department of Health and Environmental Sciences or the Department of State Lands, but was not. In addition, there have been nine annual project reports on the U.S. Fish and Wildlife Service's fishery management program in this specific area as well as throughout the entire reservation. These bound reports have always been available to the public, yet no mention was made of them in the DEIS.

We challenge the validity of the research literature cited in this

EIS. For example, page 80 "U.S. Bureau of Mines" states that "heavy metals, cyanide salts are known to persist for several years, but residual free cyanide in abandoned heaps is believed to exist no more than one month." Our own tests show very high levels of cyanide and heavy metals such as lead in both abandoned tailings and surface run off streams thirty years after heaps were abandoned. See Appendix "A".

4. Proposed safeguards are insufficient.

- A) No continuous monitoring is proposed for the leach-pad cite-- leakage would have to be "recognized" (page 78 EIS) by the mine employees.
- B) Ground water monitoring is impossible, since flow is unknown.
- C) Proposed frequency of monitoring is unacceptable; the water in most areas, could be polluted for up to a year before the problem was even detected. (see EIS appendix A) Monitoring of King Creek and Lodgepole Creek is not included as part of the monitoring program.
- D) Shallow five to eight foot holes dug with a backhoe do not constitute a ground water monitoring well.
- E) A requested discharge permit pre-empts the positive arguments for a closed system. Also, who would determine "an emergency" necessitating a discharge?
- F) Page 77, last paragraph explains, in effect, that a torrential summer rain storm (not uncommon in our country) could create an uncontrollable pollution problem.

5. Reclamation information is vague.

W

A two page summary concerning the reclamation of this complex mountain terrain is insufficient for use by the public as an evaluation tool. There has been no reclamation of previous mine cites, and it should be noted that the old tailings and heap areas have failed to hold vegetative cover even after thirty years. There is no proof that the area can in fact be reclaimed, and concrete evidence should be required before allowing the mines to reopen. Montana Code Annotated (M.C.A. 1978) 82-4-336(1) states: "(1) The reclamation plan shall provide that reclamation activities, particularly those relating to control of erosion, to the extent feasible, shall be conducted simultaneously with mining . . .". "To extent fesible" in ^{the} immediate case must be interpreted to mean simultaneously. There are existing heap areas that can be used immediately to test any reclamation activities that are proposed for some later date. The reclamation plan on page 16 of this DEIS therefor does not meet the requirements set forth in the Hard Rock Act M.C.A. 824 336(1) (1978). If the area is not reclaimed the long term affects on our Indian land, and people, and adjoining C.M. Russel Wildlife Refuge, will be serious and we insist on evidence that the area can be reclaimed. If a normal plant community is not re-established in the pit mine areas, there will be continued erosion and pollution of our country.

X

6. No explanation of the effects of toxic substances.

Y

Cyanide is mentioned as a potential hazardous substance associated with the mining. But lead, cadmium, or other harmful elements are not mentioned in the EIS. Proper research would have indicated that there is a serious problem with lead and arsenic in this area, and its direct

connection with the mining should be made clear to the public in an EIS.

7. No air quality survey.

AA Z An air quality survey is an important component of a true baseline study. Although the most serious form of pollution would likely be water and soil disruption, the wind-carried cyanide could have an effect on the local environment. We know that cyanide in this vaporized form can be used both as a non-specific herbicide as well as an insecticide. Serious problems with pollination and vegetation dependant on pollination could occur. Research indicates that within a two to three mile area of Zortman there are five honey bee yards (Apiaries), with forty to fifty colonies per apiary. Honey bees are extremely sensitive to cyanides and are excellent bio-indicates of this poison.

8. No alternative mining methods proposed.

AA The methods mentioned in the context of Section C page 125 "Alternative Technology" are not alternative methods, since none of the three alternatives listed would be acceptable to the mining companies. The mining companies're saying in effect: "It is either cyanide leach pit mining, or no mining at all." The one half page of supposed alternatives is only giving lip service to MEPA's requirements, and to the public's concern.

9. Failure to assess total social impacts.

It is quite inappropriate for the writer(s) of the DEIS to intimate that our people's reaction to mining is merely a result of misinformation or lack of information (see page 67). For years we have had to face the degradation from the previous operators. The supposed reclamation plan

offers no specific alternatives to what we have had to deal with in the past. In fact there are admissions that the yet unexplained reclamation efforts might not be successful. We still have good reason to be suspicious. The DEIS writer's flippant comments about our tendency to lump all mining companies in a negative stereotype was not an honest appraisal of our expressed concern.

BB

The researcher(s) went to length to discuss the impacts on the Phillips County. Concern over school facilities for miners' children, etc., represented a careful evaluation of the social and economic impacts on Phillips County. But the researcher(s) failed to take this study to its logical conclusion: To evaluate the impact on the Indian community which is so obviously affected by these mining areas. A look at a map of Montana will illustrate this point.

CONCLUSION

A non-essential resource is not worth risking the health and well-being of our Indian people. Degradation of Indian lands by profit seeking non-Indians must stop somewhere. The land and water of the Little Rocky Mountains are all our people have left. Please understand that we must cherish and protect our home. Do not allow the Zortman and Landusky mines to re-open.

Response to Charles Plumage Letter

A. Water from King Creek was sampled above and below the tailings and at the Fort Belknap Indian Reservation Boundary. The results of these samples are presented in Table II-3 of the Draft EIS, and in the hydrology technical report prepared by WESTECH Inc. No additional impact on the existing quantity or quality of water in King Creek is expected from the proposed mining operation. Any surface water discharged from the mining operation will be regulated by the Montana Pollutant Discharge Elimination System which prohibits pollution of any waters of the State of Montana.

B. Based on present geologic and drilling information the proposed mining should have no adverse impact on the quantity or quality of groundwater rising upon or flowing through the Fort Belknap Indian Reservation. Water supplies will be taken from the Gold Bug adit effluent and from Alder Gulch. Both these water sources are far from the Indian Reservation and the possibility of impacting the groundwater on the reservation while it cannot be ruled out, is considered remote.

The groundwater and geologic systems of the area are complex and not well known. A comprehensive study of the volume and source of groundwater designed to yield comprehensive results would both be extremely time consuming and costly. Statutory financial and time limitations inherent in the EIS process did not allow for conducting a comprehensive study of this nature.

C. A discussion of the potential for, and mitigation of wildfire can be found on pages 83, 115, and 17 of the Draft EIS. Page 83 states the following:

Increased fire hazard may be significant. The Little Rockies are susceptible to fire and have a definite fire history. Large scale conflagrations would likely cause more environmental impacts than the proposed mining and leaching operations.

D. The relation of the areas containing the limited fish populations to that portion of the mining operations having the greatest risk to the fisheries (the leaching facilities) is such that a detailed study of the condition of the existing fisheries was not considered pertinent. In discussing the potential threat to fish that a spill or leakage of toxic substances would pose, the draft EIS states the following on page 79:

The relation of pH levels to the dissociation and toxicity of the metalocyanide complexes to fish and other aquatic life is very important. The influence of snowmelt in the area of the proposed leaching facilities could be reasonably expected to seasonally lower the pH levels of the ephemeral surface waters to 6.5 or lower. Should a spill of the process waters containing the metalocyanide complexes occur at such a time, there would be an increased potential for an adverse

toxic impact to any aquatic life found in the waters receiving the spill or discharge. It must be remembered, however, that free cyanide in water converts to the much less harmful cyanate within a short distance of its introduction. The lack of any perennial surface waters in close proximity of the proposed leaching facilities, and the further lack of any substantial fisheries in these waters, make the potential for a significant toxic event to the areas surface water systems slight.

Undoubtedly, should an unanticipated spill, discharge, or seepage of toxic substances involved in the mining project enter waters containing fish and result in fish mortalities, or chronic impacts to the fisheries, the existing limited characteristic of the fisheries would add significantly to the magnitude of the impact.

E. The impact statement does not attempt to differentiate between the reservation and other lands when discussing the potential for impact to natural systems. The impacts are discussed in the context of total systems, as the functioning of natural systems does not recognize political boundaries.

Zortman, Landusky, and Malta are those local communities that will experience an influx of additional residents, and therefore the greatest impacts related to the proposed projects. The primary discussion for social and economic impacts in the draft EIS, therefore, focuses on these communities. Reservation lands were not considered open for an influx of a mining related population. However, specific references to potential social or economic impacts to reservation communities can be found on pages 89, 92, 93, 94, and 101 of the draft EIS. In addition, the general discussion of impacts for the surrounding area, found throughout the remaining draft EIS discussion, can be applied to adjacent reservation lands in most cases.

The consulting firm of John Short and Associates, Inc. which prepared the social and economic analysis used by the Department in the preparation of the draft EIS states the following:

Regarding impacts on Hays and Lodgepole, although the communities could potentially experience natural systems effects, the likelihood of any significant social or economic effects due to the mining activities is remote. Firstly, maximum possible employment of local labor would only extend to some thirty persons. Secondly, it was our distinct impression that no great magnitude of interaction takes place between the communities of Hays-Lodgepole and Zortman-Landusky.

F. A discussion of off-road vehicle use can be found on pages 83, 86, and 101 of the Draft EIS.

G. The proposed mining plan will not add to, nor benefit the existing conditions that may be present as a result of past mining activities.

toxic impact to any aquatic life found in the waters receiving the spill or discharge. It must be remembered, however, that free cyanide in water converts to the much less harmful cyanate within a short distance of its introduction. The lack of any perennial surface waters in close proximity of the proposed leaching facilities, and the further lack of any substantial fisheries in these waters, make the potential for a significant toxic event to the areas surface water systems slight.

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F. A discussion of off-road vehicle use can be found on pages 83, 86, and 101 of the Draft EIS.

G. The proposed mining plan will not add to, nor benefit the existing conditions that may be present as a result of past mining activities.

H. No impacts from mining or processing are anticipated in any streams flowing south to the C. M. Russell Wildlife Refuge. Existing streams, Ruby Gulch and Rock Creek, are intermittent streams and are over 10 miles from the refuge.

I. A discussion of the "long range and sociological effects" can be found on pages 90, 100, 101, 102, 105, and 119 of the draft EIS.

J. Table II-3 in the draft EIS represents typical water quality from the area. Complete water quality data representing additional sample episodes for several stream sites and wells is contained in the preliminary report entitled "Water Resources of the Zortman-Landusky Mining Areas" prepared by WESTECH Inc., and on file in the Department's Helena office. Emphasis on an increased sampling frequency and additional chemical parameters was placed on those areas with the greatest risk to be directly affected by the proposed projects, i.e. those areas adjacent the proposed processing facilities. Indian lands are not adjacent these facilities and therefore were not as intensively sampled. King Creek was sampled at the spring site in the upper tailings, and at the reservation boundary, and again at the road crossing. Results of these samplings are found on page 39 of the Draft EIS.

K. See responses to comments by Ken Knudson, Montana Department of Fish and Game.

L. The major threat for impacts to the area's plant and animal species is not from chemical contamination, but rather physical disruption or destruction caused by the construction and operation of the proposed mining project, as well as the threat for wildlife harassment by increased human presence in the area. Because of this, and the statutory time and financial limitations present in the EIS process, a baseline study of the chemical analysis of area plant and animal species was not considered the best use of the resources available.

M. Without additional detailed hydrologic data, the potential for an influence upon the water supply of Hays and Lodgepole as a result of water consumption by the mining proposals cannot be completely ruled out. All existing hydrologic data, however, indicates that the risk is remote. The well water use by the Zortman mining operation would utilize an existing well water appropriation at the site of the old Ruby Mill well.

N. See response to comments by Bob Martinka, Montana Department of Fish and Game.

O. See response to comment L. A review of the literature contained in "Appendix B" indicates very little in the way of useful information pertinent to the proposed operations and terrestrial ecosystems.

P. A review of the literature indicates that application of cyanide compounds formerly used as herbicides and insecticides normally required

specialized conditions and in amounts greater than would be potentially encountered in the proposed mining operations. In response to a request by this Department for additional information regarding the potential for cyanide impacts on vegetation and wildlife, the Pesticide Division of the Montana Department of Agriculture supplied the following reply (3/23/79):

Regarding the DEIS on the Zortman and Landusky Mines, a thorough search of our literature has revealed little toxicological data concerning the effects of cyanide on vegetation. It is my feeling that the proposed operation, in terms of cyanide usage, represents a minimal hazard to vegetation and animal life under normal operating and expected environmental conditions.

Q. A discussion of the hazards to employees of the operation from cyanide are discussed on pages 73 and 74 of the draft EIS. Cyanide volume in the pregnant process water pond at each operation would be about 500 pounds while about 166 pounds would be present in the barren solution pond at any one time, not 500,000 pounds.

R. The results of your tests confirm the U.S. Bureau of mines statement that "heavy metals, (and) cyanide salts are known to persist for several years". The test results by EERC for cyanide in the mine tailings and Little Peoples Creek submitted as Appendix "A" do not represent "free cyanide", and therefore do not conflict with the U.S. Bureau of Mines statement that "free cyanide in abandoned heaps is believed to exist no more than one month". The tests for cyanide completed by EERC were done using a standard "Cyanide Distillation" method which involves the use of acid solutions in the laboratory. The results therefore represent the amount of cyanide freed under laboratory conditions from complexed cyanide, and not the amount of free cyanide present in the tailings or stream (John Murray, EERC, pers. comm.). Some complexed cyanides, however, are thought to be potentially, and partially soluble under variable natural conditions. It is therefore possible that a very small (insignificant) portion of the measured cyanide can be "free cyanide". As discussed on page 78 of the draft EIS:

Cyanide, to remain as cyanide in the solution, requires a pH of 10 or greater. Below a pH of 10 the cyanide is converted to cyanate, considered to be about 1/1000th as toxic as cyanide. . . Cyanates may persist in water for a long time but are subject to hydrolysis yielding ammonium and carbonate ions.

S. The schedule for monitoring of ground wells at the proposed heap Teach sites is contained in appendix A of the draft EIS. Shallow monitoring wells would be checked weekly for water levels. If water were present, it would be sampled for a complete analysis plus cyanide. The Montana Hard Rock Law has no provisions for requiring either the operator or the Department to determine groundwater flows or conduct groundwater monitoring

before, during, or after operation of the proposed facilities.

T. See reply to comment S. The emphasis in monitoring of the area's water resource is placed upon the monitoring well systems proposed at each facility. If the frequent monitoring of these wells reveal a potential seepage problem, the area's surface water systems will be sampled more frequently.

U. The draft EIS erred in stating that "since the capacities of the Teaching solution ponds and emergency storage ponds are designed to hold a 10 year 24 hour precipitation event, MPDES permits will be applied for. . ." the designed capacity of the process and emergency storage ponds is to contain a 100 year, 24 hour precipitation event, and MPDES permits are not being applied for for these facilities. MPDES permits will be applied for only for the sedimentation ponds at the facilities and mines which are designed to hold a 10 year, 24 hour precipitation event. Although a discharge permit is required, (an "emergency") a discharge resulting from a precipitation event greater than a 10-year, 24 hour event would not be subject to effluent limitations. Determination of whether the discharge was a result of a precipitation event of that magnitude would rest with the Water Quality Bureau, Department of Health and Environmental Sciences.

V. The rules and regulations promulgated pursuant to the Hard Rock Act require that the process water ponds be equipped with spillways or other devices which will protect the impoundment structure against washouts during a 100 year flood. Since the process water ponds are designed to accomodate a 100 year, 24 hour precipitation event, as well as withstand a 100 year flood, only events greater than these, or the occurrence of several major precipitation events in close sequence would result in a discharge from these ponds. If the discharge were to be eminent, the addition of calicum hypochlorite or other appropriate oxidizing agent, as discussed on page 7B of the draft EIS, would be an effective means of reducing the toxicity of the discharge. In addition, to prevent a discharge during this type of event, the emergency storage ponds were designed to receive pumped flow from the process water ponds, thereby increasing the effective storage capacity of the ponds containing the process waters.

W. No reclamation has been attempted on the existing mining disturbances in the Little Rockies. A comparison between the lack of reclamation on existing areas that were not subjected to reclamation techniques and management, with the potential for reclamation success at the proposed facilities is not pertinent. Pursuant to section 82-4-351 of the Hard Rock Law, the Department, in taking action upon the permit applications, must determine if the proposed reclamation plan provides an acceptable method for accomplishment of reclamation as required by the law.

X. Rule 5, Section I of the Department's rules and regulations adopted pursuant to the Hard Rock Law sates the following:

Reclamation shall be as concurrent with development or mining operations as feasible and must be completed within a specified reasonable length of time. Revegetation must be accomplished in the first appropriate season after necessary grading, in accordance with accepted agricultural or reforestation practices.

Unlike coal strip mining, hard rock open-pit mining is generally not conducive to any significant amount of reclamation activities during the active mining operation.

Y. Cyanide is the major chemical contaminant of concern in the proposed operations. Although lead and cadmium were not specifically addressed, they are considered as a portion of the "metals" contamination potential for the proposed projects. Since the ore body being utilized is the oxide ore body, the potential for "metals" contamination is considered significantly less than present for the sulfide ore body. Post mining of portions of the sulfide ore body may be contributing to the presence of increased amounts of these metals in the areas water resources. There is no connection between the proposed operations and the extent to which existing chemical contaminants may be affecting the environment of the area. A discussion of the potential impacts to the water resources of the area, including cyanide, heavy metals, and cyanometallic complex contamination can be found on pages 76 through 81 of the draft EIS.

Z. Literature indicates that honey bees are excellent bio-indicators of free cyanide contamination. The office of the State Apiculturist had indicated that commercial honey bee hive sites are currently located in several areas near the Little Rocky Mountains. The nearest of these hives is approximately 6 miles from the proposed cyanide leaching sites. The office stated that although honey bees may have a forage range of 3-5 miles during unfavorable blossom years, the risk of adverse effects to the existing hive locations from the cyanide leaching operations would be insignificant (Willard Kissinger, State Apiculturist pers. comm.). Should the honey bees forage in the area of the proposed facilities, the greatest risk for adverse effects on the bees would be caused by the process water ponds containing cyanide. Contact with this water would probably result in mortality to the honey bees, as well as other members of the wild bee family using the areas for foraging.

AA. Section C, page 125 of the draft EIS adequately discusses the alternative methods of mining and processing available to the mining company. Mining operations, as with any commercial venture, cannot operate with methodologies that are not economically feasible to implement. The proposed mining operations are especially limited in this regard because of the geological structure of the oxide ore body, and the low grade ore present in the ore body. The EIS points out that it is because of these factors that alternative mining or processing methodologies that may be feasible in other mining ventures are not economically feasible for the proposed operations.

BB. See response to comment E.



University of Montana
Missoula, Montana 59812

M E M O R A N D U M

DATE: March 28, 1979

TO: Leo Berry, Commissioner of State Lands

FROM: C. C. Gordon, Professor of Botany

RE: Draft Environmental Impact Statement on Proposed Plan of Mining for the Zortman and Landusky Mining Companies in Phillips County, Montana

This draft is basically a totally deficient document in relating to the citizens of Montana the serious environmental problems associated with proposed mining and the cyanide leaching process. It does not contain either an adequate literature review of scientific knowledge on the problems of cyanide leaching nor baseline studies on existing toxic elements and compounds currently existing in the water supplies of the Fort Belknap Indian Reservation and the Charles Russell Refuge. I, therefore, request that the following information be gathered by personnel of the Department of State Lands and presented in the final Environmental Impact Statement.

- A** 1. In addition to gold and silver, what other trace elements in the mined ore of the Zortman and Landusky operations are leached by the cyanide processes?
- B** 2. What are the current concentrations of lead, arsenic, cadmium, and cyanide in all running waters originating in the immediate vicinity (3 miles) of the two proposed mines which flow either north to and/or through the Fort Belknap Indian Reservation or south to the Charles Russell Refuge?
- C** 3. What are the current concentrations of lead, arsenic, cadmium, and cyanide in the tailings of all former mining efforts of this area which can be leached by precipitation with a pH of 3.5?
- D** 4. What are the current concentrations of lead, arsenic, cadmium, and cyanide in the bottom sediment, aquatic insects, aquatic vegetation, and fish of all running waters originating in the immediate vicinity (3 miles) of the two proposed mining areas?

- E** 5. Are these concentrations of lead, arsenic, and cadmium in fish at levels which allow them to be consumed for human consumption according to all federal and state laws?
- F** 6. Was a literature search made by personnel of the Department of State Lands for the current available scientific knowledge on the environmental problems originating from the excess of available lead, arsenic, cadmium, and cyanide in either aquatic or terrestrial ecosystems?
- G** 7. Did this literature search also include a search for the past problems of the cyanide leaching process in the U.S., Canada, and Europe?
- H** 8. What are the names, academic training, and experience of all individuals participating in the preparation of this EIS?
- I** 9. What are the total amounts of cyanide to be utilized by each mine leaching process if the mining activities were to continue for 2, 4, 8, 16, 32, and 64 years?
- J** 10. Since the amount and origin of ground waters in the vicinity of the Zortman and Landusky mining areas are not known, according to the draft EIS, how do personnel of any state agency allow for any further use for the mining process and still protect the current users?
- K** 11. What safeguards and monitoring processes are contemplated by state agency personnel to ascertain the problems of cyanide spillage contamination if and when the mining process is started?
- L** 12. What are the benefits to society if gold is or is not removed?
- M** 13. What are all of the alternative methodologies which could be utilized in extracting gold and silver from the ore bodies of the area?
- N** 14. Please list the requirements of the Hard Rock Mining Act and MEPA which were and were not fulfilled in this draft EIS.

CCG/kb

Response to C.C. Gordon, Professor of Botany, University of Montana
letter

A. Chemical characteristics of water contained in the barren and pregnant ponds are listed in the draft EIS (Table II-3). Leaching with cyanide involves addition of lime to maintain the leach solution at a pH above 10. Under these conditions a number of hydroxide and cyanide compounds can occur in the leachate. For this reason the leach solutions are isolated from natural waters to prevent water quality problems. The oxide ore that is leached contains many minerals and trace elements including small quantities of gold. Some trace elements and compounds are removed from the heaps during leaching but are subsequently redeposited in the leach either as particulates or as insoluble compounds. Many metals including iron, copper, lead, and cadmium commonly are relatively insoluble in high pH solutions whereas others are soluble. As discussed in the draft EIS, the amounts and form in which trace elements may be leached during the heap leaching process is not well understood and is just recently being subjected to further scrutiny. This is primarily because past knowledge on leachate composition has been based on precious metal recovery, not trace elements or their complexes. Future monitoring of the leach system by the mining companies to refine and improve the efficiency of the recovery process would yield further information on trace elements in the barren and pregnant pond waters, however, containment emphasis would continue to be on cyanide and zinc which are known toxic substances of major concern.

B. See response to comment H and J in the Charles Plumage Letter. In addition, the mining companies will be adding lead and cadmium to the list of chemical parameters to be tested during the spring 1979 water quality monitoring program.

C. A number of areas contain mine tailings in the Little Rocky Mountains with King Creek and Ruby Gulch being sites of major historic tailing accumulation. The proposed mining plan does not involve disturbance of any of these tailings. No tests using precipitation with a pH of 3.5 or other leaching tests were conducted on these tailings.

D. See response to comment L in the Charles Plumage letter.

E. See response above D.

F. See response above and response to comment D in the Ken Knudson Letter. Yes, however, excess lead, cadmium, and arsenic were not considered to be a potentially significant threat as a result of the proposed mining operation as these elements are not thought to be present in the oxide portion of the ore body in significant amounts.

G. Yes, for those recent operations with comparable technology.

H. The following list contains the names and qualifications of those individuals who participated in the preparation of the draft EIS for the proposed operations of the Zortman and Landusky mining companies.

Department of State Lands, Helena, Montana

Ralph Driear, Environmental Administrator
Bob Spinney, Assistant Environmental Coordinator
Steve Anderson, Hard Rock Mining Inspector
John Herrin, Environmental Coordinator

WESTECH Inc., Helena, Montana

Bob Rudio, Geologist
Patrick Farmer, Wildlife Biologist
Dean Culwell, Range & Forest Ecologist
Dwight Bergeron, Wildlife Biologist
Ken Scow, Wildlife Biologist
Mark Rudio, Vegetation Specialist
J. Art Olsen, Soil Scientist
Connie Cole, Researcher
Ambry Gartner, Hydrologist
Max Botz, Hydrologist/Engineer
Tom Wing, Engineer
Dick Krott, Draftsman

John Short and Associates, Helena, Montana

Lisa Anderson, Sociologist/Economist
Jim Boyer, Sociologist/Economist

Mineral Research Center, Butte, Montana

Lynn B. Fredlund, Principle Investigator, Research Archeologist
Bonnie Hogan, Project Director
Tim McGinnis, Field Assistant
Jill Thompson, Field Assistant

Western Interpretive Services

Robert Murray, Historical Consultant
Larry Hoffman, Historical Mining Engineer, Consultant

Additional participation and assistance were obtained from many sources. Zortman and Landusky Mine Companies provided data and information on their proposed activities, as well as numerous visual aids. Comments of residents of the area and others were especially helpful in the preparation of this document.

I. Cyanide consumption for the proposed operations has been estimated to be approximately one-half pound of cyanide per ton of ore leached. The annual consumption of cyanide, therefore, for the combined operations, using the long term goal sustained average annual amount of ore leached would be approximately 500 tons (Hank Scholz, pers. comm.).

J. See response to comment D in the Bureau of Land Management letter.

K. In addition to the water quality monitoring program proposed for the monitoring well systems at both mining projects and the area's surface waters (Appendix A, draft EIS), Department inspectors would inspect the mining properties a minimum of 4 times annually. During inspections, Department personnel would be checking for evidence of past, present, or imminent spillage of cyanide, or other reagents and process waters. They would also be observing the storage, handling, and use of the cyanide and other chemicals. If the inspectors felt it necessary to take additional water samples, they have been trained in the proper sampling techniques. A discussion of the federal and state regulations regarding the disposal of hazardous wastes, such as might be required in the event of a spill can be found on page 112 of the draft EIS.

L. Gold, in addition to its value in the economic system of the U.S. is today widely used in home appliances, precision instrumentation, and aircraft, as well as an important contributor to the space program. If the gold were not mined, those natural and social amenities currently present in the area that have been identified as having the potential to be significantly adversely affected should mining occur as proposed, would retain a status quo (assuming developments other than mining also did not occur in the area).

M. A discussion of alternative technologies available to the mining companies is discussed in pages 125 and 126 of the draft EIS. The available alternative processing methods for the proposed operation are limited by 1) the low grade ores involved, and hence the economic feasibility, 2) the occurrence of silver which is a significant value in the ore to be mined, and 3) the topography of the area.

N. The Hard Rock Law does not require that a draft EIS be written for the proposed mining operations. A list of those individuals involved in the preparation of the draft EIS was inadvertently omitted from the EIS and can be found in response to comment H of this letter. All other environmental analysis requirements of MEPA have been fulfilled in the draft EIS.

Fort Belknap Community Council

SAVE



(406) 353-2205
P.O. Box 249
Fort Belknap Agency
Harlem, Montana 59526

Fort Belknap Indian Community
A TRIBAL GOVERNMENT
Fort Belknap Indian Community
(Elected to administer the affairs of the community
and to represent the Assiniboine and the Gros
Ventre Tribes of the Fort Belknap Indian
Reservation)

RECEIVED

APR 06 1979

April 3, 1979
DATE

Mr. Leo Berry, Commissioner **ENVIRONMENTAL QUALITY**
Department of State Lands **COUNCIL**
Capitol Station Office
1625 11th Ave.
Helena, Montana 59601

Sh
D1
pu

Mr. Berry:

Your letter of March 28, 1979 concerning the comment period on the Draft Environmental Impact Statement for the Landusky-Zortman Mining proposal indicates that every effort will be made to include our comments if sent by April 4, 1979.

The phone conversation between LT. Governor Schwinden and you, Mr. Delmar Bigby and myself was to the effect that you would accept our comments if they were sent by April 4, 1979, and would be made a part of the record.

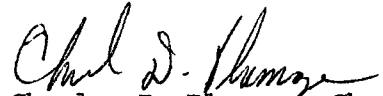
The Fort Belknap Indian Tribal Government is opposed to the re-opening of the Zortman-Landusky Mining operations. In order to supply the public with the necessary information we submit the following questions for response because the Draft Environmental Impact Statement does not adequately address the issues, and is grossly in-adequate in many areas.

1. Why wasn't a base-line study of the existing chemicals present in the Kings Creek area and Hays area conducted? The Fort Belknap Indian Tribal Government has been monitoring the stream and well water in Hays and has evidence of harmful chemicals in excess of the allowable standards.
2. Why are there no base-line studies of the volume and source of the ground-water done? The Fort Belknap Indian Community, by the Supreme Court Decision under Winters, owns "All waters rising upon, flowing through the Fort Belknap Indian Reservation. Failure to determine the volume and source of the ground-water is a violation of the rights of the Fort Belknap Indian Community.
3. Why aren't measures for the "Wild-Fire" protection covered? The Little Rocky Mountains has a history of forest fires and the D.E.I.S. does not address the very real possibility of wild-fire in the

mountains.

4. Why was no comprehensive study of the affect of the mining operation conducted on the fish population in the Little Rocky Mountains? Reference is made to a limited fish population in the Little Rocky Mountains but no study was conducted on why there is a limited population of fish.
5. Why wasn't the impact of the Little Rocky Mountain Mining Operation on the surrounding communities of Hays and Lodgepole not fully addressed? These communities are definitely affected by the proposed mining operations.
6. Why wasn't the off-road vehicle use not adequately addressed? What is the impact on the wild-life in the Mountains by the increased off-vehicle travel in the mountains?
7. What is the impact of the mining operations on the existing and on-going pollution from the mine tailings of the Little Ben and August Mines in Section 15, T.25N-R.24E in the Little Rocky Mountains? No reclamation of past mining operations has been done.
8. The effect of the mining operations on the C.M. Russell Wildlife Refuge has to be addressed because of the effect on the waters flowing south into this refuge.

Sincerely,



Charles D. Plumage, Chairman
Fort Belknap Indian Community

cc: Cecil Andruss
Secretary of the Interior
Washington, D. C. 20245

Thomas L. Judge, Governor
Room 204, State Capitol
Helena, Montana 59601

Arthur C. Knight, M.D., Director
Department of Health and
Environmental Sciences
Room 200, Cogswell Building
Helena, Montana 59601

cc: Larry C. Peterson
Fishery Management Biologist
U.S. Fish and Wildlife Service
P.O. Box 567
Kalispell, Montana 59901

Terrance D. Carmody, Executive Director
Environmental Quality Council
1228 Eleventh Avenue
Helena, Montana 59601

Robert E. Wambach, Director
Department of Fish and Game
1420 East Sixth Avenue
Helena, Montana 59601



DEPARTMENT OF STATE LANDS

MAILING ADDRESS: CAPITOL STATION
OFFICE: 1625 11TH AVENUE

HELENA 59601

(406) 449-2074

STATE BOARD OF
LAND COMMISSIONERSTHOMAS L. JUDGE
GOVERNORGEORGIA RICE
JPT. OF PUBLIC INSTRUCTIONFRANK MURRAY
SECRETARY OF STATEMIKE GREELY
ATTORNEY GENERALE. V. "SONNY" OMHOLT
AUDITOR

March 28, 1979

RECEIVED
Date 3-29-79
Fort Belknap
Community CouncilMr. Jack Plumage
Fort Belknap Community Council
Harlem, MT 59526

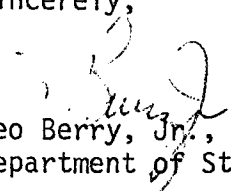
Dear Mr. Plumage:

As per our recent conversations, the comment period for the draft statement on the Zortman-Landusky mining proposal has been extended to March 28, 1979. However, as Lt. Governor Schwinden and I mentioned, every effort will be made to include your comments if sent by April 4, 1979.

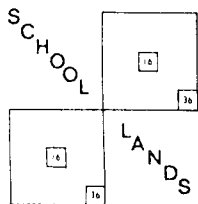
The impact statement was sent to the Tribe on February 21, 1979, and is a relatively short document. This time plus the extension should provide adequate time for review and comment. The Department received only two comments on the statement, and they were not extensive. As you know, the Department must legally respond to the applicant within a statutory time frame. That time frame must be met or the permit automatically issues. In order for that time frame to be met, it is necessary to limit the extension to March 28, 1979.

If you have any questions, please advise.

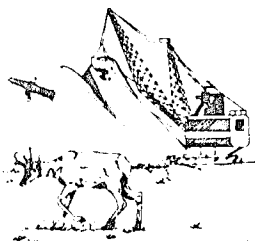
Sincerely,


Leo Berry, Jr., Commissioner
Department of State Lands

jb



MINING



RECLAMATION

REPLY TO DRAFT ENVIRONMENTAL IMPACT STATEMENT

ZORTMAN-LANDUSKY MINING OPERATION

BY: FORT BELKNAP INDIAN COMMUNITY

INTRODUCTION

The Little Rockies have been called "The Island Mountains" by our Indian people. This beautiful and isolated range is an oasis in the midst of hundreds of square miles of dry high plains and breaks.

In the Draft EIS (p. 72), the researchers claim that:

"The natural and aesthetic resources of the Little Rocky Mountains have been heavily influenced by mining activities. The large amount of road construction, exploration, and mining disturbance, and tailing piles have reduced the visual resources of much of the area. The old townsites, mill sites, and other remnants of the mining history of the area, however, may offer an aesthetic visual appeal to those persons who enjoy these features."

We find this statement to be misleading and ironic in several ways. Such a statement in an EIS is an attempt to give the public the impression that, "it is already ruined, so why not continue to ruin it." We see the mountains in a different light. The greater portion of the land in the Little Rockies is in a primitive state. Spectacular limestone cliffs, window arches, steep canyon walls, hidden valley meadows--These are the visual resources of much of the range. To say that old mine remnants, etc. may be the only redeeming visual features of this country is not only quite warped, but also highly disrespectful.

We feel that our lives are profoundly connected to these mountains. There are sacred grounds up there. Our young men went to the higher

peaks on their vision quests. Our elders still make seasonal trips into the mountains to collect medicinal plants, or to participate in important ceremonies. Our young people need what wild country they can still find as a source of pride in their home land.

The re-opening of the mines would be very untimely for our people. There is a cultural renaissance taking place among our youth. Most of our population is young, and sees these mountains as a key place to go to to understand our cultural heritage. These young people need pure water to drink, fish and game without toxic chemicals in their flesh, and a quiet place to go, free from the dynamite and bulldozers. These mountains are not a large range, and pit mining will have a proportionately great affect on the country. It is only several miles away from our communities and an isolated eco-system such as this is subject to more severe disruption than larger wild areas.

MEPA requires an approach that takes into account the long range and sociological effects that any proposed activity will have on an area and its people. The Draft EIS fails to grapple with this aspect of the law.

The following list gives some quotes by our people concerning the proposed mining:

"I don't see how any mining in our mountains could benefit the people here."

"When a lot of miners come into our mountains and run around in them, it will be like the old days when they came and raised Cain with our home. Next thing you know they will be trying to take all of our mountains and will leave nothing for us."

"Why can't the white man leave us alone with what little we have left. First they take our families then our

land and now they want to ruin what we have left. Look at what happened in Mission Canyon because of the other mines."

"When I get up in the morning I like to see the mountains and don't want to see them changed."

"Every time I look at the mountains I think about my grandfolks and how they used to tell me stories about the good times they had there."

"Whenever I get the chance, I take my family into the mountains, just to get away from everything and just relax."

"All the time the white man wants to take and never leave nothing."

THE DRAFT EIS FOR THE PROPOSED PLAN OF MINING AND RECLAMATION
IN THE LITTLE ROCKY MOUNTAINS

is severely inadequate and the described mining operations are totally unacceptable to the people of the Fort Belknap Indian Reservation. A complete revision of this EIS will be necessary if the public is to be properly informed of the consequences of the proposed mining operation. The draft EIS is in violation of MEPA, and much of the study process must be repeated in a competent and unbiased manner before the public can respond to the statement. The following areas represent deficiencies in the draft statement and in the proposed mining plan:

1. Inadequate and incompetent testing and sampling.

Stream and well-water samples were taken only once during the entire 1978 study period. One sampling of these usable waters in the Zortman-Landusky areas does not allow anyone to understand the baseline chemistry of the water supply system. King Creek, the major north-flowing drainage from the Landusky mining area, was somehow overlooked. Yet there are more people affected by this particular drainage than any other in the study area. The toxic substances which are most critical to the public are, unfortunately, omitted from the list of one-time test results. When arsenic appears in the table (page 37), it is shown at .19, an unsafe level according to U.S. government standards. The only reading for arsenic appears at the Gold Bug Adit Discharge. No other readings can be found on that page, and only four are shown in the following page. Cyanide, a key substance in question here, is also omitted in half the study cites, especially those draining onto Indian

land. Lead and cadmium were not even listed, yet a recent study shows that lead in Little Peoples Creek exceeds the maximum for safe drinking water by one thousand two hundred times! See Appendix "A".

The study concludes that "no significant impact is anticipated to occur to the areas fishing, because of the general lack of a fishery in the area of the proposed operation." Little Peoples Creek was a major fishery prior to cyanide poisoning by the last mining operations. The stream was and still is an important source of food and recreation for the Indian community. The stream's system was once a thriving aquatic community and has been re-established as a fishery in the Little Rockies. The circumstances surrounding fishing in Peoples Creek should be included in the final EIS. In addition, the status of the aquatic insect life must be examined in all of these areas. Since acid mine waste could occur, it is necessary to discuss the effects of the mining on King Creek and Little Peoples Creek. The sampling and testing did not take into account the stream flow areas which we at Fort Belknap consider to be of prime concern.

2. Lack of proper baseline study.

The information presented as a "Baseline Study" is not scientifically valid. While there is a checklist (laundry list) of vegetation and animal species present in the two mining areas, there is no baseline study for chemical analysis of any plant or animal specie. Therefore, when an impact occurs from the mining or leaching operation, the causal effect relationship, will be difficult, if not impossible to establish. Groundwater flow is unknown, and there is no idea of the availability

of ground water for the demands by both mining operations and the increased domestic consumption by the mining communities. The theory explained in the EIS, Page 36, states that the ground water "generally follows the land surface towards the stream bottom", and that the destruction by mining has probably altered the flow into and through the mine adits. Considering the locations of the mines, we contend that the ground water use by the mines will affect the water supply of Hays and Lodgepole. In a dry region such as ours, any greatly increased water consumption by the mines will, at best, reduce our legally protected water supply; and at worst, both pollute and reduce our water. A serious baseline study of the ground water is imperative before any renewed mining activity is allowed in the area. The EIS further states (page 80, second paragraph) no feasibility study has been conducted to determine if adequate ground water exists for use by both the proposed operations and the residents of Zortman and Landusky." The researchers never even considered the possible impact on the Indian community's water. It is inconceivable that such a drastic use is being planned for a water supply whose source, direction, and ultimate volume, is admittedly unknown. A proper wildlife baseline study must be conducted during all four seasons, yet the researchers fail to include a winter study. It looks to us as if the mining company is in too much of a hurry to get under way and profit at the expense of our wildlife and environment.

3. Failure to cite literature on important ecological problems.

There is a total lack of adequate research of scientific literature on the potential environmental hazards of cyanide and the cyanide leaching

process as it relates to environmental impacts to all terrestrial eco systems. See Appendix "B". For example, in the literature cited section of the EIS, pages 131 to 133, there are only three references dealing with the toxicity of cyanides and related compounds. Each of these three papers is by the same major author and each only addresses cyanide toxicity to fish. Even a brief search in scientific literature discloses that cyanide and some of its compounds were used extensively as non-selective herbicides and insecticides. Nowhere in the draft EIS is there any information on these subjects. Furthermore, in 1976, the U.S. Department of Health, Education and Welfare published a 191 page criteria document on recommended standard occupational exposure to hydrogen cyanide and cyanide salts. This document adequately covers the real and potential problems of cyanide poisoning associated with individuals utilizing cyanide compounds. Since at each of the two proposed mining cites approximately 500,000 pounds (250 tons) of cyanide will be present in the leaching ponds, it is imperative that this aspect of human health be examined. It should have been covered in the EIS by either personnel of Montana Department of Health and Environmental Sciences or the Department of State Lands, but was not. In addition, there have been nine annual project reports on the U.S. Fish and Wildlife Service's fishery management program in this specific area as well as throughout the entire reservation. These bound reports have always been available to the public, yet no mention was made of them in the DEIS.

We challenge the validity of the research literature cited in this

EIS. For example, page 80 "U.S. Bureau of Mines" states that "heavy metals, cyanide salts are known to persist for several years, but residual free cyanide in abandoned heaps is believed to exist no more than one month." Our own tests show very high levels of cyanide and heavy metals such as lead in both abandoned tailings and surface run off streams thirty years after heaps were abandoned. See Appendix "A".

4. Proposed safeguards are insufficient.

- A) No continuous monitoring is proposed for the leach-pad cite-- leakage would have to be "recognized" (page 78 EIS) by the mine employees.
- B) Ground water monitoring is impossible, since flow is unknown.
- C) Proposed frequency of monitoring is unacceptable; the water in most areas, could be polluted for up to a year before the problem was even detected. (see EIS appendix A) Monitoring of King Creek and Lodgepole Creek is not included as part of the monitoring program.
- D) Shallow five to eight foot holes dug with a backhoe do not constitute a ground water monitoring well.
- E) A requested discharge permit pre-empts the positive arguments for a closed system. Also, who would determine "an emergency" necessitating a discharge?
- F) Page 77, last paragraph explains, in effect, that a torrential summer rain storm (not uncommon in our country) could create an uncontrollable pollution problem.

5. Reclamation information is vague.

A two page summary concerning the reclamation of this complex mountain terrain is insufficient for use by the public as an evaluation tool. There has been no reclamation of previous mine sites, and it should be noted that the old tailings and heap areas have failed to hold vegetative cover even after thirty years. There is no proof that the area can in fact be reclaimed, and concrete evidence should be required before allowing the mines to reopen. Montana Code Annotated (M.C.A. 1978) 82-4-336(1) states: "The reclamation plan shall provide that reclamation activities, particularly those relating to control of erosion, to the extent feasible, shall be conducted simultaneously with mining . . ." "To the extent feasible" in the immediate case must be interpreted to mean simultaneously. There are existing heap areas that can be used immediately to test any reclamation activities that are proposed for some later date. The reclamation plan on page 16 of this DEIS therefor does not meet the requirements set forth in the Hard Rock Act M.C.A. 82-4-336(1) (1978). If the area is not reclaimed the long term affects on our Indian land and people, and the adjoining C.M. Russel Wildlife Refuge, will be serious and we insist on evidence that the area can be reclaimed. If a normal plant community is not re-established in the pit mine areas, there will be continued erosion and pollution of our country.

6. No explanation of the effects of toxic substances.

Cyanide is mentioned as a potential hazardous substance associated with the mining. But lead, cadmium, or other harmful elements are not mentioned in the EIS. Proper research would have indicated that there is a serious problem with lead and arsenic in this area, and its direct

connection with the mining should be made clear to the public in an EIS.

7. No air quality survey.

An air quality survey is an important component of a true baseline study. Although the most serious forms of pollution would likely be water and soil disruption, the wind-carried cyanide could have an effect on the local environment. We know that cyanide in this vaporized form can be used both as a non-specific herbicide as well as an insecticide. Serious problems with pollination and vegetation dependant on pollination could occur. Research indicates that within a two to three mile area of Zortman there are five honey bee yards (Apiaries), with forty to fifty colonies per apiary. Honey bees are extremely sensitive to cyanides and are excellent bio-indicators of this poison.

8. No alternative mining methods proposed.

The methods mentioned in the context of Section C page 125 "Alternative Technology" are not alternative methods, since none of the three alternatives listed would be acceptable to the mining companies. The mining companies are saying in effect: "It is either cyanide leach pit mining, or no mining at all." The one half page of supposed alternatives is only giving lip service to MEPA's requirements, and to the public's concern.

9. Failure to assess total social impacts.

It is quite inappropriate for the writer(s) of the DEIS to intimate that our people's reaction to mining is merely a result of misinformation or lack of information (see page 67). For years we have had to face the degradation from the previous operations. The supposed reclamation plan

offers no specific alternatives to what we have had to deal with in the past. In fact there are admissions that the yet unexplained reclamation efforts might not be successful. We still have good reason to be suspicious. The DEIS writer's flippant comments about our tendency to lump all mining companies in a negative stereotype was not an honest appraisal of our expressed concern.

The researcher(s) went to lengths to discuss the impacts on the Phillips County residents. The concern over school facilities for miners' children, etc., represents a careful evaluation of the social and economic impacts on Phillips County. But the researcher(s) failed to take this study to its logical conclusion: To evaluate the impact on the Indian community which is so obviously affected by these mining areas. A look at a map of Montana will illustrate this point.

CONCLUSION

A non-essential resource is not worth risking the health and well-being of our Indian people. Degradation of Indian lands by profit seeking non-Indians must stop somewhere. The land and water of the Little Rocky Mountains are all our people have left. Please understand that we must cherish and protect our home. Do not allow the Zortman and Landusky mines to re-open.



ENERGY AND ENVIRONMENTAL
RESOURCE CONSULTANTS, INC.

(Formerly YAPUNCICH, SANDERSON & BROWN LABS)

PHONE (406) 252-6325

P.O. BOX 593
BILLINGS, MONTANA 59103

13 NORTH 32ND STREET

March 20, 1979

Ms. Joan Racine
Assistant Planner
Fort Belknap Planners
P.O. Box 249
Fort Belknap Agency
Harlem, Montana 59526

Dear Ms. Racine:

In response to your letter of March 14, 1979, we will do the best we can to provide you with the information you requested.

First of all, to put the analytical information in better perspective, here is a summary of the analyses of mine tailings and water from Little People's Creek:

Mine Tailings

<u>Sample Description</u>	<u>micromgrams/gram (ppm)</u>		
	<u>Cyanide</u>	<u>Arsenic</u>	<u>Lead</u>
No. 81, 10-31-78 @ 10:45AM	0.16	36	66
No. 98, 12-12-78 @ 11:05AM	0.10	40	94
Mouth of canyon, 12-20-78 @ 10:45AM	0.01	26	94
No. 103, 12-20-78 @ 11:00AM	0.02	18	64

Little Peoples Creek

<u>Sample Description</u>	<u>milligrams/liter (ppm)</u>		
	<u>Cyanide</u>	<u>Arsenic</u>	<u>Lead</u>
Peoples Creek, Little Rocky Mtns., 8-28-78 @ 1:07PM	0.16	15	60
No. 69, 10-24-78 @ 11:05AM	0.03	29	60
No. 80, 10-31-78 @ 10:45AM	0.002	<0.002	<0.01
No. 97, 12-12-78 @ 11:00AM	<0.002	<0.002	<0.01

page two
Ms. Joan Racine
March 20, 1979

It should be noted that the arsenic and lead found in the mine tailings were measured on the solution resulting from an acid digestion of the sample. Therefore, the lead and arsenic is not necessarily immediately dissolved by water percolating through the tailings.

The only conclusion we can draw is that the mine tailings have the potential to adversely effect the quality of the water in Little Peoples Creek. We also know that on at least two occasions, August 28, 1978 and October 24, 1978, the maximum recommended concentrations for cyanide, arsenic, and lead were exceeded. Arsenic was 300 times the recommended maximum and lead was 1200 times the recommended maximum. (Maximums recommended by the EPA Safe Drinking Water Act of 1974 for public water supplies.)

I think that it would be safe to say that these levels could also be harmful to fish, wildlife, and vegetation.

It appears that more scientific data is needed to fully evaluate the problem. If we can be of further service, please let us hear from you.

Sincerely,

ENERGY & ENVIRONMENTAL RESOURCE CONSULTANTS, INC.

A handwritten signature in cursive script that reads "Richard L. Brown".

Richard L. Brown
President

2842/8
77-00267

MATHEMATICAL ANALYSIS OF THE CHEMICAL SYSTEM "CYANIDE-HEAVY METALS"
IN WATER--DETERMINATION OF COMPONENTS AND TOXICITY OF THE SYSTEM--I:
THE THEORETICAL SOLUTION.

BLAHA, J.

STATE TEXTILE RESEARCH INST., CENTRE FOR RESEARCH AND APPLICATION OF
IONIZED RADIATION, BRNO, CZECHO.

WATER RESEARCH, 10(9): 815-819, 1976 PUBL.YR: 1976

LANGUAGES: ENGLISH

DESCRIPTORS: CYANIDES; MATHEMATICAL ANALYSIS; HEAVY METALS; TOXIC
MATERIALS; WATER POLLUTANTS

IDENTIFIERS: HYDROXYL TEST

? T28/2/9-11

28/2/9

75-03521

THE EFFECTS OF TEMPERATURE UPON THE TOXICITY OF CHEMICALS TO AQUATIC
ORGANISMS.

PARKER, B.C.

VIRGINIA POLYTECHNIC INST. AND STATE UNIV., DEPT. OF BIOLOGY
BLACKSBURG, VA 24061

EFFECTS AND METHODS OF CONTROL OF THERMAL DISCHARGES: REPORT TO THE
CONGRESS BY THE ENVIRONMENTAL PROTECTION AGENCY IN ACCORDANCE WITH
SECTION 104(T) OF THE FEDERAL WATER POLLUTION CONTROL ACT AMENDMENTS OF
1972. PT. 3. U.S., CONGRESS, SENATE, COMMITTEE ON PUBLIC WORKS,
93D CONG., 1ST SESS., NOV. 1973. WASHINGTON, D.C.: GOVERNMENT PRINTING
OFFICE, 1973. 69 PP PUBL.YR: 1973

LANGUAGES: ENGLISH

DESCRIPTORS: AMMONIA; ANTIBIOTICS; AQUATIC ORGANISMS; CHLORINE;
CYANIDES; FISH; LITERATURE REVIEWS; METALS; PESTICIDES; TOXICITY

IDENTIFIERS: TEMPERATURE-TOXIN INTERACTIONS

28/2/10

74-01470

CYANIDE--AN ASSESSMENT OF ALTERNATIVES FOR WATER POLLUTION CONTROL.

HABIB, Y.H.

CLOSTER, NJ

WATER & SEWAGE WORKS INCLUDING INDUSTRIAL WASTES, REFERENCE NO.: R95,
R98-R99, R102-R104, R106-R107, APR. 30, 1973 PUBL.YR: 1973

LANGUAGES: ENGLISH

DESCRIPTORS: ANIONS; METAL FINISHING INDUSTRY WASTES; TOXICITY;
WASTE WATER DISCHARGES; WATER POLLUTION CONTROL

IDENTIFIERS: CYANIDE

28/2/11

70-00631

STUDIES ON THE POST-MORTEM IDENTIFICATION OF THE POLLUTANT IN THE
FISH KILLED BY WATER POLLUTION - IV. DETECTION OF CYANIDE IN THE FISH.

TSUDA, TSUTOMU

TOHOKU UNIV., FACULTY OF AGRICULTURE, SENDAI, JAPAN

JAPANESE SOCIETY OF SCIENTIFIC FISHERIES. BULLETIN, 33(4): 311-314,
APRIL 1967 PUBL.YR: 1967

LANGUAGES: ENGLISH

DESCRIPTORS: CYANIDE; TOXICITY; FISHES

IDENTIFIERS: PIRIZIN-PIRAZORON METHOD

? STOMLINSON/3-21/CYANIDE/B6

29

0 TOMLINSON/3-21/CYANIDE/B6

? PR26/5/1-49

PRINTED 26/5/1-49

? B6

28 42 42 11 0054834

P011

78-00428

EFFECT OF CHRONIC EXPOSURE OF BROOK TROUT TO SUBLETHAL CONCENTRATIONS OF HYDROGEN CYANIDE.

SMITH, L. L., JR.; KOENST, W. M.; BRODERIUS, S. J.

UNIV. OF MINNESOTA; DEPT. OF ENTOMOLOGY; FISHERIES; AND WILDLIFE; ST. PAUL, MN 55108

ENVIRONMENTAL SCIENCE & TECHNOLOGY 11(9), 888-887, CODEN: ESTHAG PUBL.YR: SEPT. 1977

ILLUS. REFS.

LANGUAGES: ENGLISH

DESCRIPTORS: WATER POLLUTANTS; FISH; CYANIDES; HYDROGEN COMPOUNDS; TOXICITY; REPRODUCTIVE PATHOLOGY; GROWTH; MORTALITY; TOXIC MATERIALS; INDUSTRIAL WASTES

IDENTIFIERS: HYDROGEN CYANIDE; BROOK TROUT

28/2/5

77-04160

CHRONIC EFFECTS OF HYDROGEN CYANIDE ON THE FATHEAD MINNOW.

LIND, D.T.

UNIV. OF MINNESOTA; DEPT. OF ENTOMOLOGY; FISHERIES; AND WILDLIFE; ST. PAUL, MN 55101

WATER POLLUTION CONTROL FEDERATION. JOURNAL, 49(2):262-268; FEB. 1977 PUBL.YR: 1977

LANGUAGES: ENGLISH

DESCRIPTORS: FISH; TOXICITY; WATER POLLUTION; INDUSTRIAL EFFLUENTS; CYANIDES

IDENTIFIERS: FATHEAD MINNOWS; HYDROGEN CYANIDE

28/2/6

77-03308

EVALUATION OF THE TOXIC EFFECT OF $CD-2+$ AND $CD(CN) 4-2-$ IONS ON THE GROWTH OF MIXED MICROBIAL POPULATION OF ACTIVATED SLUDGES.

MOROZZI, G.

UNIVERSITA DEGLI STUDI DI PERUGIA; FACOLTA DI SCIENCE; ISTITUTO DI IGIENE; VIA DEL GIOCHETTO, 06100 PERUGIA, ITAL.

SCIENCE OF THE TOTAL ENVIRONMENT, 7(2): 131-143; MAR. 1977 PUBL.YR: 1977

LANGUAGES: ENGLISH

DESCRIPTORS: WASTEWATER TREATMENT; MICROORGANISMS; CYANIDES; ACTIVATED SLUDGE; GROWTH; TOXICITY; CADMIUM

28/2/7

77-02211

EFFECT OF SOME POLLUTANTS ON THE FILTRATION RATE OF MYTILUS.

ABEL, P.D.

SUNDERLAND POLYTECHNIC; DEPT. OF BIOLOGY; CHESTER RD., SUNDERLAND SR4 3SD, ENG.

MARINE POLLUTION BULLETIN, 7(12): 228-231, DEC. 1976 PUBL.YR: 1976

LANGUAGES: ENGLISH

DESCRIPTORS: TOXICITY; FILTRATION; MOLLUSCA; WATER POLLUTANTS; COPPER; SULFUR COMPOUNDS; CYANIDES; MERCURY; ZINC

IDENTIFIERS: MUSSELS

28/2/8

77-00267

MATHEMATICAL ANALYSIS OF THE CHEMICAL SYSTEM "CYANIDE-HEAVY METALS" IN WATER--DETERMINATION OF COMPONENTS AND TOXICITY OF THE SYSTEM--I: THE THEORETICAL SOLUTION.

BLAHA, J.

STATE TEXTILE RESEARCH INST., CENTRE FOR RESEARCH AND APPLICATION OF IONIZED RADIATION; BRNO, CZECHO.

WATER RESEARCH, 10(9): 815-819, 1976 PUBL.YR: 1976

28/2/1
79-00429

Pollution Hk

CHRONIC TOXICITY OF HYDROGEN CYANIDE TO THE BLUEGILL.
KIMBALL, G. L.; SMITH, L. L., JR.; BRODERIUS, S. J.
UNIV. OF MINNESOTA, DEPT. OF ENTOMOLOGY, FISHERIES, AND WILDLIFE,
1980 FOLWELL AVE., ST. PAUL, MN 55108
AMERICAN FISHERIES SOCIETY. TRANSACTIONS 107(2), 341-345.
CODEN: TAFSAI PUBL.YR: MAR. 1978
ILLUS. REFS. (1 IN GER.)
LANGUAGES: ENGLISH
DOC TYPE: JOURNAL PAPER
DESCRIPTORS: FISH; HYDROGEN COMPOUNDS; TOXICITY; REPRODUCTIVE
PATHOLOGY; REPRODUCTION; CYANIDES; MORTALITY; GROWTH; EGGS; WATER
POLLUTANTS; FRESHWATER ORGANISMS
IDENTIFIERS: BLUEGILL; LEPOMIS MACROCHIRUS; HYDROGEN CYANIDE

28/2/2
78-04497

RELATIVE TOXICITY OF FREE CYANIDE AND DISSOLVED SULFIDE FORMS TO THE
FATHEAD MINNOW (PIMEPHALES PROMELAS).
BRODERIUS, S. J.; SMITH, L. L., JR.; LIND, D. T.
UNIV. OF MINNESOTA, DEPT. OF ENTOMOLOGY, FISHERIES AND WILDLIFE, ST.
PAUL, MN 55108
CANADA. FISHERIES RESEARCH BOARD. JOURNAL 34(12), 2323-2332.
CODEN: JFRBAK PUBL.YR: DEC. 1977
ILLUS. REFS.
LANGUAGES: ENGLISH
DOC TYPE: JOURNAL PAPER
DESCRIPTORS: FISH; CYANIDES; SULFUR COMPOUNDS; SULFUR; ANIONS; PH;
TOXICITY; RESPIRATORY SYSTEM; WATER POLLUTANTS; MATHEMATICAL ANALYSIS
IDENTIFIERS: FATHEAD MINNOW; PIMEPHALES PROMELAS; HYDROGEN SULFIDE;
BISULFIDE; SULFIDE; HYDROGEN CYANIDE

28/2/3
78-03188

EFFECTS OF TEMPERATURE ON AQUATIC ORGANISM SENSITIVITY TO SELECTED
CHEMICALS.
CAIRNS, J., JR.; BUIKEMA, A. L., JR.; HEATH, A. G.; ET AL.
VIRGINIA POLYTECHNIC INST. AND STATE UNIV., DEPT. OF BIOLOGY,
BLACKSBURG, VA 24061
VIRGINIA POLYTECHNIC INSTITUTE, BLACKSBURG. WATER RESOURCES RESEARCH
CENTER. BULLETIN CODEN: VWRBBY 88 PP PUBL.YR: FEB. 1978
ILLUS. NUMEROUS REFS. (SOME IN FR.; GER.)
LANGUAGES: ENGLISH
DOC TYPE: JOURNAL PAPER
DESCRIPTORS: FISH; ZOOPLANKTON; ALGAE; BENTHIC ORGANISMS;
TEMPERATURE; COPPER; ZINC; CHROMIUM COMPOUNDS; CHLORINE; ALCOHOLS;
CYANIDES; TOXICITY; WATER POLLUTANTS
IDENTIFIERS: MICROBENTHOS; MACROBENTHOS; PHENOL; CHROMATE

28/2/4
78-00428

EFFECT OF CHRONIC EXPOSURE OF BROOK TROUT TO SUBLETHAL
CONCENTRATIONS OF HYDROGEN CYANIDE.
SMITH, L. L., JR.; KOENST, W. M.; BRODERIUS, S. J.
UNIV. OF MINNESOTA, DEPT. OF ENTOMOLOGY, FISHERIES, AND WILDLIFE,
ST. PAUL, MN 55108
ENVIRONMENTAL SCIENCE & TECHNOLOGY 11(9), 883-887, CODEN:
ESTHAG PUBL.YR: SEPT. 1977
ILLUS. REFS.
LANGUAGES: ENGLISH
DESCRIPTORS: WATER POLLUTANTS; FISH; CYANIDES; HYDROGEN COMPOUNDS;

MATERIAL SHOULD BE CONSIDERED AS A CANDIDATE FOR INDUSTRIAL DISPOSAL, OR MUNICIPAL DISPOSAL.

NTIS

DESCRIPTORS: (♦WASTE DISPOSAL; INORGANIC COMPOUNDS); (♦POLLUTION; ♦HAZARDOUS MATERIALS); (♦MATERIALS HANDLING; INORGANIC COMPOUNDS); (♦INORGANIC COMPOUNDS; HAZARDOUS MATERIALS); INDUSTRIAL WASTES; INDUSTRIAL WASTE TREATMENT; MINING; SOLID WASTE DISPOSAL; LIQUID WASTE DISPOSAL; TAILINGS; BAUXITE; CARBONIUM INORGANIC COMPOUNDS; HYDRAZOTIC ACID; HYDROBROMIC ACID; HYDROGEN CYANIDE; HYDROGEN SULFIDE; LEAD INORGANIC COMPOUNDS; MANGANESE; MANGANESE INORGANIC COMPOUNDS; NICKEL INORGANIC COMPOUNDS; PHOSPHORUS; SELENIUM; ANTIMONIDES; ARSENIDES; SELENIDES; THALLIUM; PHOSPHORUS HALIDES; PHOSPHORUS SULFIDES; STRONTIUM; SODIUM INORGANIC COMPOUNDS; ZINC INORGANIC COMPOUNDS; WATER POLLUTION; TACONITE; PROFILES; MANAGEMENT PLANNING; TOXICOLOGY; RECYCLING; RECLAMATION

IDENTIFIERS: NATIONAL DISPOSAL SITES; NERC

PB-224 592/6 NTIS PRICES: PC A13/MF A01

24/5/4

REPORT ON POLLUTION AFFECTING WATER QUALITY OF THE CHEYENNE RIVER SYSTEM; WESTERN SOUTH DAKOTA

NATIONAL FIELD INVESTIGATIONS CENTER-DENVER; COLO.

C0281H3 FLD: 13B; 68D GRAI7304

SEP 71 99P

MONITOR: 18

ABSTRACT: DURING THE SUMMER OF 1970, FISH FROM THE CHEYENNE RIVER ARM OF OAKE RESERVOIR; AND OTHER AREAS THROUGHOUT WESTERN SOUTH DAKOTA WERE FOUND TO HAVE MERCURY IN THEIR FLESH EXCEEDING 0.5 PARTS PER MILLION (PPM). THE REPORT PRESENTS A FOLLOW UP STUDY TO INVESTIGATE THE EFFECTS OF NATURAL MERCURY DEPOSITS THROUGHOUT THE CHEYENNE RIVER SYSTEM IN WESTERN SOUTH DAKOTA; TO DETERMINE THE LOCATION AND EXTENT OF RESERVOIRS OF MERCURY AND OTHER TOXIC MATERIALS DUE TO PREVIOUS MINING ACTIVITY; TO DOCUMENT AND CHARACTERIZE THE DISCHARGE OF TAILINGS SOLIDS AND VARIOUS DISSOLVED TOXIC POLLUTANTS FROM THE HOMESTAKE MINING COMPANY DEADWOOD-LEAD MILL; AND TO ASCERTAIN THE MOVEMENT AND FATE OF THESE POLLUTANTS IN THE HYDROLOGIC ENVIRONMENT; AND THE EFFECT OF THESE POLLUTANTS ON THE BIOTA.

DESCRIPTORS: (♦CHEYENNE RIVER; ♦WATER POLLUTION); (♦SOUTH DAKOTA; WATER POLLUTION); RIVERS; MERCURY; METALS; WATER QUALITY; TAILINGS; HYDROLOGY; MINING; FRESH WATER FISHES; CONCENTRATION (COMPOSITION); MINING; MINERAL DEPOSITS; LEACHING; SURFACE WATER RUNOFF; ARSENIC; BENTHOS; CYANIDES; INDUSTRIAL WASTES; LAW ENFORCEMENT; INVENTORIES

IDENTIFIERS: MINE WASTES; HOMESTAKE MINING COMPANY; WASTE QUALITY DATA

PB-213 752/9 NTIS PRICES: PC A05/MF A01

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\$3.54 0.101 HRS FILE6 19 DESCRIPTORS

\$0.81 TYMNET

\$4.35 ESTIMATED TOTAL COST

LOGOFF 18:49:17

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ABSTRACT: THE PURPOSES OF THE STUDY WERE TO IDENTIFY THE PRODUCTION METHODS, IMPORTATION, EXPORTATION, USE PATTERNS, AND EXPOSURE TO MAN AND THE ENVIRONMENT OF SELECTED INORGANIC CYANIDES, INCLUDING HYDROGEN CYANIDE, FROM 1965 TO 1975. DATA FOR THE PRODUCTION METHODS INCLUDED THE SPECIFIC PROCESS, RAW MATERIALS, ANNUAL PRODUCTION QUANTITIES, MAJOR MANUFACTURERS, WASTE PRODUCTS, ENVIRONMENTAL MANAGEMENT OF PROCESS WASTES, AND OTHER PRODUCTION DATA. USE PATTERNS WERE IDENTIFIED AND ANNUAL CONSUMPTION DATA WERE COMPILED FOR EACH COMPOUND IN THE RESPECTIVE AREA OF UTILIZATION. MAJOR CONSUMERS IN EACH USE AREA WERE IDENTIFIED. VARIOUS POSSIBLE METHODS FOR THE EXPOSURE OF MAN AND THE ENVIRONMENT TO INORGANIC CYANIDES WERE DISCUSSED AND EVALUATED. FUTURE PRODUCTION QUANTITIES AND AREAS OF USAGE WERE ESTIMATED TO 1985.

DESCRIPTORS: ♦IRON CYANIDES; ♦INDUSTRIAL PLANTS; ♦HYDROGEN CYANIDE; ♦SODIUM CYANIDE; ♦POTASSIUM CYANIDES; CYANIDING (BENEFICATION); PESTICIDES; METAL FINISHING; ELECTROPLATING; PIGMENTS; MINING; CASE HARDENING; HEAT TREATMENT; PUBLIC HEALTH; POLLUTION; MANUFACTURING; INDUSTRIAL WASTES; SOIL WASTE DISPOSAL; WATER ANALYSIS; CYANIDE GARDENING; INDUSTRIAL WASTE TREATMENT; MARKET RESEARCH; UTILIZATION; SYNTHESIS (CHEMISTRY); COST ESTIMATES; PHOTOGRAPHIC PROCESSING CHEMICALS

IDENTIFIERS: ♦CALCIUM CYANIDE; ♦HEAVY METALS; ENERGY CONSUMPTION; TISEPARTS

PB-251 820/7ST NTIS Prices: PC A11/MF A01

24/5/3

RECOMMENDED METHODS OF REDUCTION, NEUTRALIZATION, RECOVERY, OR DISPOSAL OF HAZARDOUS WASTE. VOLUME XIII. INDUSTRIAL AND MUNICIPAL DISPOSAL CANDIDATE WASTE STREAM CONSTITUENT PROFILE REPORTS. INORGANIC COMPOUNDS (CONTINUED)

TRW SYSTEMS GROUP, REDONDO BEACH, CALIF. (354 595)

FINAL REPT.

AUTHOR: OTTINGER, R. S.; BLUMENTHAL, J. L.; DAL PORTO, D. F.; GRUBER, G. I.; SANTY, M. J.

C1901K4 FLD: 13B, 7A, 68, 57Y, 59B, 99B GRAI7324

AUG 73 290P

REPT NO: TRW-21485-6013-RU-00-VOL-13

CONTRACT: EPA-68-03-0089

MONITOR: EPA-670/2-73-053-M

PAPER COPY ALSO AVAILABLE FROM NTIS \$72.00/SET OF 16 REPORTS AS PB-224 579-SET.

ABSTRACT: THIS VOLUME CONTAINS SUMMARY INFORMATION AND EVALUATION OF WASTE MANAGEMENT METHODS IN THE FORM OF PROFILE REPORTS FOR INORGANIC COMPOUNDS. THESE PROFILE REPORTS WERE PREPARED FOR EITHER A PARTICULAR HAZARDOUS WASTE STREAM CONSTITUENT OR A GROUP OF RELATED CONSTITUENTS. EACH PROFILE REPORT CONTAINS A DISCUSSION OF THE GENERAL CHARACTERISTICS OF THE WASTE STREAM CONSTITUENTS, THEIR TOXICOLOGY AND OTHER ASSOCIATED HAZARDS; THE DEFINITION OF ADEQUATE MANAGEMENT FOR THE WASTE MATERIAL; AN EVALUATION OF THE CURRENT WASTE MANAGEMENT PRACTICES WITH REGARD TO THEIR ADEQUACY; AND RECOMMENDATION AS TO THE MOST APPROPRIATE PROCESSING METHODS AVAILABLE AND WHETHER THE WASTE MATERIAL SHOULD BE CONSIDERED AS A CANDIDATE FOR NATIONAL DISPOSAL, INDUSTRIAL DISPOSAL, OR MUNICIPAL DISPOSAL.

DESCRIPTORS: (♦WASTE DISPOSAL, INORGANIC COMPOUNDS); (♦POLLUTION, ♦HAZARDOUS MATERIALS); (♦MATERIALS HANDLING, INORGANIC COMPOUNDS); (

1-24/5/1

EVALUATION OF PROPOSED NPDES PERMIT LIMITATIONS FOR HOMESTAKE MINING COMPANY AND LEAD-DEADWOOD SANITARY DISTRICT NUMBER 1

NATIONAL FIELD INVESTIGATIONS CENTER-DENVER, COLO.

C7144E2 FLD: 13B, 8I, 68D, 48A GRAI7620

FE2 75 23-

REPT NO: EPA/330/2-75/002

MONITOR: 18

ABSTRACT: AN EVALUATION WAS CONDUCTED TO DETERMINE WASTEWATER PERMIT LIMITATIONS UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) FOR THE HOMESTAKE MINING COMPANY IN SOUTH DAKOTA. EPA ALSO DETERMINED WHETHER THE LEAD-DEADWOOD SANITARY DISTRICT COULD HANDLE THE COMPANY WASTEWATER EFFLUENT. FISH BIOASSAY TESTS WERE CONDUCTED ON WASTEWATER EFFLUENTS FROM BOTH FACILITIES. ANALYSES OF BIOASSAY RESULTS AND SUPPORTING CHEMICAL DATA LED TO THE CONCLUSION THAT CYANIDE WAS THE PRINCIPAL TOXIC AGENT. IN ORDER TO ESTABLISH A COLD WATER FISHERY OF WHITEWOOD CREEK (THE RECEIVING STREAM), IT WAS CONCLUDED THAT THE TOTAL CYANIDE CONCENTRATION SHOULD NOT EXCEED 0.005 MG/L, AND THAT EFFLUENTS CONTAINING CYANIDE SHOULD NOT BE COMBINED WITH ANY WASTEWATERS CONTAINING RESIDUAL CHLORINE.

DESCRIPTORS: ♦WATER POLLUTION ABATEMENT; ♦LICENSES; ♦MINE WATERS; ♦SEWAGE TREATMENT; ♦WHITEWOOD CREEK; ♦SPEARFISH CREEK; BIOASSAY; CONCENTRATION (COMPOSITION); CYANIDES; TOXICITY; FISHERIES; CHLORINE; SURVIVAL; WATER QUALITY; CHEYENNE RIVER; WASTE WATER; SOUTH DAKOTA

IDENTIFIERS: NTISEPAD

PB-255 596/9ST NTIS PRICES: PC A03/MF A01

24/5/2

STUDY ON CHEMICAL SUBSTANCES FROM INFORMATION CONCERNING THE MANUFACTURE, DISTRIBUTION, USE, DISPOSAL, ALTERNATIVES, AND MAGNITUDE OF EXPOSURE TO THE ENVIRONMENT AND MAN. TASK III. THE MANUFACTURE AND USE OF SELECTED INORGANIC CYANIDES

MIDWEST RESEARCH INST., KANSAS CITY, MO. ♦ENVIRONMENTAL PROTECTION AGENCY, WASHINGTON, D.C. OFFICE OF TOXIC SUBSTANCES. (250 350)

FINAL REPT.

AUTHOR: WILKINSON, RALPH R.; COOPER, GARY R.

C6492A4 FLD: 07A, 13B, 13H, 99B+, 946, 68 GRAI7612

2 APR 76 229P+

CONTRACT: EPA-68-01-2687

PROJECT: MRI-3955-C

MONITOR: EPA/560/6-76/012

ABSTRACT: THE PURPOSES OF THE STUDY WERE TO IDENTIFY THE PRODUCTION METHODS, IMPORTATION, EXPORTATION, USE PATTERNS, AND EXPOSURE TO MAN AND THE ENVIRONMENT OF SELECTED INORGANIC CYANIDES, INCLUDING HYDROGEN CYANIDE, FROM 1965 TO 1975. DATA FOR THE PRODUCTION METHODS INCLUDED THE SPECIFIC PROCESS, RAW MATERIALS, ANNUAL PRODUCTION QUANTITIES, MAJOR MANUFACTURERS, WASTE PRODUCTS, ENVIRONMENTAL MANAGEMENT OF PROCESS WASTES, AND OTHER PRODUCTION DATA. USE PATTERNS WERE IDENTIFIED AND ANNUAL CONSUMPTION DATA WERE COMPILED FOR EACH COMPOUND IN THE RESPECTIVE AREA OF UTILIZATION. MAJOR CONSUMERS IN EACH USE AREA WERE IDENTIFIED. VARIOUS POSSIBLE METHODS FOR THE EXPOSURE OF MAN AND THE ENVIRONMENT TO INORGANIC CYANIDES WERE DISCUSSED AND EVALUATED. FUTURE PRODUCTION QUANTITIES AND AREAS OF USAGE WERE ESTIMATED TO 1985.

Set	Items	Description
1	71	CYANIDE/DE, TI
2	59	CYANIDES/CE, TI
3	101	10R2
4	598	MINING/DE, TI
5	50	MINES/DE, TI
6	625	40R5
7	3477	WATER(W) POLLUTION
8	2988	WATER(W) QUALITY
9	1351	FISH/DE, TI
10	682	AQUATIC/DE, TI
11	218	STREAM/DE, TI
12	512	STREAMS/DE, TI
13	7900	7-12/OR
14	0	3AND6AND13
15	1	ORE(W) TREATMENT
16	0	ORES/DE
17	11317	WATER/DE, TI
18	625	6OR15OR16
19	13246	17OR13
20	0	3AND18AND19
21	3791	WASTEWATER/DE, ID, TI
22	1535	WASTE(W) WATER
23	15440	21OR22OR19
24	0	23AND3AND18
25	17	3AND13
26	49	3AND23
27	2385	TOXICITY/DE, ID, TI
28	11	26AND27
29	0	TOMLINSON/3-21/CYANIDE/BG

Print 26/5/1-49

Search Time: 0.146 Prints: 49 Descs.: 20

79-00693

Evaluation of EPA recommended treatment and control technology for blast furnace wastewater.

Wong-Chong, G. M.; Caruso, S. C.
Carnegie-Mellon Inst. of Research, 5000 Forbes Ave.,
Pittsburgh, PA 15213

AMERICAN SOCIETY OF CIVIL ENGINEERS. ENVIRONMENTAL
ENGINEERING DIVISION. JOURNAL 104(EE2), 302-321,
Codon: JEEGAV Publ.Yr: Apr. 1978

illus. refs.

Languages: ENGLISH

Doc Type: JOURNAL PAPER

An evaluation of the EPA-recommended technology for treating blast furnace wastewater, essentially SS removal and recirculation of water, found the technology inadequate to produce effluent quality in compliance with the 1977 guidelines that include ammonia (NH₃), cyanide (CN), and phenol. The evaluation examined an extensive data base consisting of responses to a questionnaire, long-term plant operation data, a field survey, and a literature review, while the EPA effluent limitation guidelines were developed from a very limited data base. Alkaline chlorination and gas-liquid mass transfer were examined for controlling NH₃, CN, and phenol. Suspended solids removal from the blast furnace scrubber and cooler wastewater can be achieved by gravity settling. Effluent SS levels of about 50 mg/l can be reliably achieved in clarifiers with the aid of a flocculant. The water usage for scrubbing and cooling blast furnace can be significantly reduced by conducting material and energy balances around the scrubber cooler system. The control of the scrubber and cooler water pH may offer a feasible and probably least costly alternative to controlling the NH₃ or CN and phenol content of the blowdown to comply with effluent limitations at some blast furnace plants. The EPA-proposed use of alkaline chlorination is effective for the removal of free CNs, but uses costly chemicals. This process will not destroy the complex iron cyanides and can create a problem by releasing chloroorganics to the receiving waters. In almost all cases, once-through systems were within the 1977 limits for all parameters except SS. (FT & SS)

Descriptors: Technology; Wastewater treatment; Water pollution control; Effluent standards; EPA; Furnaces; Cooling waters; Ammonia; Cyanides; Organic compounds; Water reuse; Chlorination; Suspended solids; Scrubbers; pH

Identifiers: phenol

Irkutsk, USSR

JOURNAL OF APPLIED CHEMISTRY OF THE U.S.S.R. 50(10),
2139-2142, Codon: JAPUAW Publ.Yr: 1977

Languages: ENGLISH

A method for purifying waste cyanide solutions by water soluble anion-exchange polyelectrolytes and certain special features of the behavior of the polyelectrolytes in the precipitation reactions were studied. An investigation was made of the relation between the polyelectrolyte concentrations and the low-molecular-weight ions. The maximum extraction of complex cyanides and normal cyanide occurs at a 20% excess of polyelectrolyte. A further increase in the quantity of polyelectrolyte added leads to an increase in the concentration of free functional groups in the solution, to an increase in the hydrophilic nature of incompletely neutralized macromolecules, and to a reduction of the extraction of cyanides in the precipitate. The precipitation effect at the optimum polyelectrolyte concentration depends on the initial solution volume. For the effective purification of waste cyanide solutions by water soluble anion-exchange polyelectrolytes, the height of the initial solution liquid column must be 030 cm, and the solution should only be agitated during the polyelectrolyte addition. Ferric chloride and aluminum sulfate cause additional polyelectrolyte precipitation and increase the removal of normal cyanide. For the purification of waste cyanide solutions, low molecular weight water soluble anion-exchange polyelectrolytes containing pyridine and trimethylamine as the active groups may be used. (SS)

Descriptors: Cyanides; Anions; Ion exchange; Precipitation; Industrial effluents; Effluent treatment; Pollutant removal; Coagulants; Metal industry wastes

Identifiers: polyelectrolytes

79-00592

Precipitation of cyanides from waste cyanide solutions by water soluble anion-exchange polyelectrolytes.

Zhurnal Prikladnoi Khimii, 50(10): 2232-2236, Oct. 1977

Berezina, A. R.; Tsarik, L. Ya.; Chikin, Yu. M.; et al.

A. A. Zhdanov Irkutsk State Univ., Inst. of Petroleum and Coal Chemical Synthesis, Polshchad Krasnogo Vosstaniya 1,

79-00591

The Sulfex heavy metal waste treatment process.
Feigenbaum, H. N.
Permutit Company, Inc., E. 49th St. and Midland Ave.,
Paramus, NJ 07652
Fifth annual industrial pollution conference Atlanta, Ga.
Apr. 19-21, 1977

Fifth annual industrial pollution conference: Proceedings.
Edited by L. Delpino and A. Krigman pp. 629-642 Publ.Yr: 1977

Publ: McLean, Va. Water and Wastewater Equipment
Manufacturers Association
illus. no refs.

Languages: ENGLISH

Doc Type: CONFERENCE PAPER

The Sulfex process removes heavy metals from solution in the form of S- precipitates. The iron sulfide (FeS) used as the source of S- is added to the system as a slurry prepared by combining ferrous sulfate, a soluble sulfide, and lime. The insoluble FeS forms a sludge blanket in a properly operated precipitator which serves as a source of excess unreacted S-. The metal residuals in the effluent are normally lower than can be obtained by the hydroxide process. The Sulfex process overcomes complexing and chelating agents. Hexavalent Cr can be reduced and removed in one step along with other metals and does not have to be segregated for pretreatment. Cost savings may be realized by not having to use alkalis to raise pH above 8-9 as is necessary for hydroxide precipitation along with additional acid to readjust the pH to acceptable discharge range. Dual media pressure filters are provided for polishing removal of SS carried over from the reactor. Cyanide bearing wastes must be pretreated. (FT)

Descriptors: Heavy metals; Precipitation; Effluent treatment;
Metal finishing industry wastes; Wastewater treatment;
Industrial effluents; Sulfur compounds; Cyanides

Identifiers: Sulfex

79-00429

Chronic toxicity of hydrogen cyanide to the bluegill.
Kimball, G. L.; Smith, L. L., Jr.; Broderius, S. J.
Univ. of Minnesota, Dept. of Entomology, Fisheries, and
Wildlife, 1980 Folwell Ave., St. Paul, MN 55108
AMERICAN FISHERIES SOCIETY. TRANSACTIONS 107(2),
341-345, Coden: TAFSAI Publ.Yr: Mar. 1978
illus. refs. (1 in Ger.)

Languages: ENGLISH

Doc Type: JOURNAL PAPER

Bluegills (*Lepomis macrochirus*) were subjected to various concentrations of hydrogen cyanide (HCN) to determine the effects on long-term survival, growth, egg production, and egg hatchability. Intermittent-flow experiments were conducted using adults, juveniles, and newly hatched eggs in separate tests. Egg production was most sensitive to HCN. The highest concentration with no adverse effect was 0.52 lg/l HCN. Fry

survival through the first 6 wk followed in sensitivity with the no-adverse-effect level occurring between 15.6 and 19.4 lg/l HCN. (AM)

Descriptors: Fish; Hydrogen compounds; Toxicity;
Reproductive pathology; Reproduction; Cyanides; Mortality;
Growth; Eggs; Water pollutants; Freshwater organisms

Identifiers: bluegill; *Lepomis macrochirus*; hydrogen cyanide

78-04497

Relative toxicity of free cyanide and dissolved sulfide forms to the fathead minnow (*Pimephales promelas*).

Broderius, S. J.; Smith, L. L., Jr.; Lind, D. T.
Univ. of Minnesota, Dept. of Entomology, Fisheries and
Wildlife, St. Paul, MN 55108

CANADA. FISHERIES RESEARCH BOARD. JOURNAL 34(12),
2323-2332, Coden: JFRBAK Publ.Yr: Dec. 1977

illus. refs.

Languages: ENGLISH

Doc Type: JOURNAL PAPER

The relationship between pH and acute toxicity of free cyanide (hydrogen cyanide (HCN) and cyanide (CN-)) and dissolved sulfide (hydrogen sulfide (H₂S), bisulfide (HS-), and sulfide) to the fathead minnow (*Pimephales promelas*) at 20degC was determined for pH values ranging from about 6.8 to 9.3 and 6.5 to 8.7, respectively. The 96-hr median lethal concentrations (LC50s) of free cyanide and molecular HCN were little different and fairly constant within the pH range 6.8-8.3. Beyond this, to pH 9.3, the values diverged markedly, with the free cyanide LC50s increasing and the HCN LC50s decreasing. Except for some increase with rise of pH from about 6.5 to 7.1, the 96-hr LC50 concentrations of molecular H₂S decreased linearly and by about fourfold as the pH increased from 7.1 to 8.7. The 96-hr LC50 concentrations of dissolved sulfide in corresponding equally toxic solutions increased logarithmically as pH increased from 6.5 to 8.7. Acute toxicities to fathead minnows of free cyanide and dissolved sulfide do not depend entirely on the concentration of ambient molecular HCN or H₂S. Change in toxicity of the molecular forms with pH was evaluated by 2 gill-permeability theories. The likelihood of certain chemical changes occurring at the gill surface or the possible penetration of the gill by both molecular and anionic forms present in the test solutions at different pHs was evaluated. Increased apparent toxicity of molecular HCN or H₂S with elevated test pH is believed to result from the CN- and HS- anions penetrating the gill epithelium, though less readily than do the molecular forms and enhancing the toxicities of these solutions as the pH increases. (AM)

Descriptors: Fish; Cyanides; Sulfur compounds; Sulfur;
Anions; pH; Toxicity; Respiratory system; Water pollutants;
Mathematical analysis

Identifiers: fathead minnow; *Pimephales promelas*; hydrogen sulfide; bisulfide; sulfide; hydrogen cyanide

78-03287

Voltametrische Titration von Cyanid mit Quecksilber (II)-chlorid und ihre Anwendung zur Cyanidbestimmung in Wasser und Abwasser. (Voltametric titration of cyanide with mercuric chloride and application to the determination of cyanide in water and wastewater)

Harzdorf, C.; Dorn, L.

Bayer AG, Leverkusen, Anorganisch-analytisches Laboratorium, D-5090 Leverkusen, FRG

FRESENIUS' ZEITSCHRIFT FUER ANALYTISCHE CHEMIE 284(3), 189-192. Coden: FZACBZ Publ.Yr: 1977

illus. refs.

Languages: German

Doc Type: JOURNAL PAPER

A method is described for the volumetric determination of cyanide with mercuric chloride solution. The end-point detection is carried out voltametrically using a polarized rotating palladium electrode and a calomel reference electrode. The method covers a concentration range of 40-200 ppm cyanide and is particularly suitable for cyanide determinations in stack gases, water, and wastewater. (PS)

Descriptors: Cyanides; Volumetric Analysis; Wastewaters; Water pollutants; Mercury compounds; Chlorine compounds; Pollutant detection

Identifiers: mercuric chloride; voltametry

78-03214

Analysis of cyanides in coke plant wastewater effluents.

Barton, P. J.; Hammer, C. A.; Kennedy, D. C.

Univ. of Missouri, St. Louis, MO 63121

WATER POLLUTION CONTROL FEDERATION. JOURNAL 50(2), 234-239. Coden: JWPFA5 Publ.Yr: Feb. 1978

illus. refs.

Languages: ENGLISH

Doc Type: JOURNAL PAPER

Experimental results are presented comparing various methods for the analysis of simple and complex cyanide in coke plant wastewaters. Analyses were performed on synthetic solutions containing various combinations of cyanides (CN⁻), Fe(CN)₆³⁻, and SCN⁻. Additional analyses were performed on actual coking plant wastewaters with and without standard addition. Simple and complex cyanides in these wastewaters cannot be reliably measured by either the Standard Methods or the ASTM procedures owing to the interference of sulfides produced by the decomposition of thiocyanates during the distillation step. A simple modification is demonstrated to remove sulfide interference by treating the distillate with cadmium carbonate. Additionally, the distillation procedure employing Cu₂Cl₂ as the catalyst is shown to give consistently lower results than the magnesium chloride procedure owing to air oxidation of Cu⁺ to Cu²⁺ during distillation. A simple experimental modification is demonstrated which increases the recovery of cyanide when the Cu₂Cl₂ distillation procedure is employed. (AM)

Descriptors: Wastewater treatment; Effluent treatment; Industrial effluents; Coke; Cyanides; Distillation; Chemical analysis

78-03188

Effects of temperature on aquatic organism sensitivity to selected chemicals.

Cairns, J., Jr.; Buikema, A. L., Jr.; Heath, A. G.; et al. Virginia Polytechnic Inst. and State Univ., Dept. of Biology, Blacksburg, VA 24061

VIRGINIA POLYTECHNIC INSTITUTE, BLACKSBURG. WATER RESOURCES RESEARCH CENTER. BULLETIN Coden: VWRBBY 88 pp Publ.Yr: Feb. 1978

illus. numerous refs. (Some in Fr.; Ger.)

Languages: ENGLISH

Doc Type: JOURNAL PAPER

The effect of temperature on the sensitivity of food web organisms to selected chemicals was evaluated. Test organisms included planktonic algae (*Cyclotella meneghiniana*, *Scenedesmus quadricauda*, *Chlamydomonas* sp., and *Lyngbya* sp.), zooplankton (*Daphnia pulex*, *Daphnia magna*, and *Chilomonas paramecium*), microbenthos (*Aelosoma headleyi*, *Philodina acuticornis*, and *Lepidodermella* sp.), macrobenthos (*Nitocris* sp.), and fishes (*Salmo gairdneri*, *Notemigonus crysoleucas*, *Lepomis macrochirus*, *Carassius auratus*, and *Ictalurus punctatus*). The chemicals used were Cu, Zn, chromate, Cl, cyanide, and phenol. The sensitivity of the test organisms to these chemicals was studied over a temperature range of 5degC-35degC. The specific temperatures studied varied with each species. There is considerable variation in the sensitivity of each species, and this variation depends on the chemical and the test temperature. Generally, algal responses to temperature and chemicals varied depending on thermal sensitivity of the algal species in question. The invertebrates usually exhibited the classic response of increased sensitivity to chemicals at higher temperatures. Two notable exceptions to this observation were the "reverse" response of temperature and cyanide to the oligochaete *Aelosoma* and the temperature-independent response of the invertebrates to phenol. For fish, survival was enhanced at low concentrations of chemicals and high temperatures, and at high chemical concentrations and low temperatures. Some fish species had chemical threshold concentrations which were not influenced by temperature. (AM)

Descriptors: Fish; Zooplankton; Algae; Benthic organisms; Temperature; Copper; Zinc; Chromium compounds; Chlorine; Alcohols; Cyanides; Toxicity; Water pollutants

Identifiers: microbenthos; macrobenthos; phenol; chromate

78-02560

An experience on re-use of waste water discharged from metal plating shop.

Murai, Y.; Yamadera, T.; Koike, Y.
Hitachi Plant Engineering & Construction Co., Water & Waste Water Treatment Div., Tokyo, Japan

International Congress on Desalination Tokyo, Japan Nov. 27-Dec. 3, 1977

Proceedings of the International Congress on Desalination and Water Reuse: Vols. 1 and 2. In DESALINATION 22(1-3), 97-104. Coden: DSLNAH Publ.Yr: Dec. 1977

illus. refs.

Languages: ENGLISH

Doc Type: CONFERENCE PAPER

Conventional treatment processes for metal plating wastewaters consist of oxidation, reduction, and coagulation-sedimentation for both rinsing water and used bath. Such treatment does not satisfy recent municipal regulations. A new process treats rinse water, containing the bulk of cyanide and Cr wastes, with ion exchangers; acid or alkaline wastewater is treated by chelate resin after coagulation-sedimentation. The treated water can be returned to the shop. The mixed bed exchanger consists of a strongly acid and a weakly basic anion exchange resin after an activated carbon filter, followed by a strongly basic anion exchanger. At the near neutral pH value of the wastewater made possible by this system, complex cyanides are not precipitated nor cyanide gas produced; free cyanide which passes the mixed bed exchanger is caught by the strongly basic exchanger. Regeneration water and deteriorated bath are treated with sodium hypochlorite and ferric sulfate. Chromium (III) is treated with other cations with a strongly acid exchange resin; hydrogen chromate and chromate ion are treated with other anions by weakly basic exchange resins. Wastewater containing heavy metals other than cyanide and Cr is treated by coagulation and sedimentation, sand filtration, and chelate resins which adsorb the metals selectively in series. (FT)

Descriptors: Wastewater treatment; Cyanides; Metal finishing Industry wastes; Chromium; Heavy metals; Ion exchange; Industrial effluents; Resins

78-02439

Cyanide removal from petroleum refinery wastewater using powdered activated carbon.

Huff, J. E.; Bigger, J. M.
IIT Research Inst., Chicago, IL 60606

ILLINOIS INSTITUTE FOR ENVIRONMENTAL QUALITY. IIEQ DOCUMENT
Coden: IIDOD2 100 pp. Publ.Yr: June 1977

illus. refs.

Languages: ENGLISH

Doc Type: REPORT

A 2-phase program, consisting of batch tests and continuous tests, was conducted to determine the basic chemistry and cyanide removal efficiency of the adsorption and catalytic

oxidation of cyanide by powdered activated carbon (PAC) and cupric chloride CuCl_2 . In the 1st phase, the operating variables of pH, Cu dosage, mode of Cu addition, C dosage, and type of C were investigated. A pH near neutral (pH 6-8.5) was desirable to obtain low equilibrium cyanide in the aqueous phase while maintaining a low Cu level. Cyanide removals K95% were readily achieved in the batch tests using 250 mg/l of powdered carbon and 1.0-1.5 mg/l Cu on solutions containing 0.5 mg/l iron cyanide. The most important factors in cyanide removal were the Cu concentration and C concentration in the solution. Phase II was a series of continuous tests using 2 laboratory-scale activated sludge units and actual refinery wastewater. Both C and Cu were added to the aeration basin, and organic removal and cyanide removal performances were monitored. Cyanide can be successfully removed though the addition of PAC and CuCl_2 into an activated sludge unit. The biological efficiency did not indicate any detrimental effects from the Cu addition (with the exception of the first test where the aeration basin was slug-dosed). More C is required than predicted in the batch tests due to the organics competing with cyanide for the active sites on the C. This process requires little or no capital expenditure and should provide many refineries with an economic approach for reducing effluent cyanide concentrations. (AM)

Descriptors: Cyanides; Refineries; Petroleum industry wastes; Industrial effluents; Wastewater treatment; Pollutant removal; Activated carbon; Copper compounds; Economics

Identifiers: cupric chloride; powdered activated carbon

78-01530

Studies of river water quality in the Lancashire Tame.
 Garland, J. H. N.; Rolley, H. L. J.
 Water Research Centre, Stevenage Lab., Stevenage,
 Hertfordshire SG1 1TH, Eng
 WATER POLLUTION CONTROL 76(3), 301-326, Coden:
 WPOCAH Publ.Yr: 1977

illus. refs.

Languages: ENGLISH

Doc Type: JOURNAL PAPER

The River Tame was surveyed every 2 mo. from Oct. 1973 to Oct. 1974. Simple mathematical models are fitted to the observations in an attempt to account for existing water quality and to predict changes following the achievement of an improved effluent treatment program. During each survey, a body of water was labelled with a radiotracer and sampled as it moved down the river; samples taken for chemical analysis defined the changes in water quality taking place in the body of water as it mixed with effluents and water from the tributaries. Eleven river sites, 6 sewage effluents, and 3 tributaries were sampled for DO concentration, temperature, ammoniacal N, oxidized N, soluble organic C, BOD, SS, anionic detergents, Cl⁻, total solids, Zn, Cu, Pb, conductivity, and alkalinity. Based on the different flow velocities, the surveys lasted 22-60 hr. The application of mixing parameter models to the data is discussed. A DO model is specifically applied. The DO regime in the upper reach is probably satisfactory for fish; it would become so in the lower reach following improvements in the effluent regime to commonly accepted treatment standards. Poisons, other than cyanide, are present at concentrations which can probably be tolerated by fish. Considerable improvements in the qualities of the effluents discharged into the river have occurred since the survey was completed. It is doubtful whether any quantitative approach to determining the effects of storms on water quality could be employed in this catchment. (FT)

Descriptors: England; Water quality; Rivers; Mathematical models; DO; Fish; Toxicants; Cyanides

Identifiers: Lancashire; River Tame

78-00476

"Oxyphotolysis"-process for effluent contaminants.
 Harwood, R. H.
 Ventron Technology Ltd.
 RECYCLING & WASTE DISPOSAL 2(6-7), 156-157, Coden:
 RWDIDB Publ.Yr: July-Aug. 1977

illus. no refs.

Languages: ENGLISH

A new broad-spectrum effluent treatment process has recently been introduced to the European market. This tertiary treatment process is capable of meeting projected discharge limits. Due to the energy input from UV radiation, the available oxidation energy per molecule of ozone (O₃) is increased by N35%. The Oxyphotolysis process thus makes more

efficient use of the supplied O₃. This process was originally developed as a treatment method for metal-complexed cyanide wastes from the electroplating industry. Chlorinated organics are, for the most part destroyed by the process. Organic thiophosphorus pesticides, such as malathion, are also decomposed by the treatment. This process compares favorably with that using ozone alone, in the decolorizing of unbleached kraft mill effluent. Treatment of an effluent stream of 1,000,000 gpd would require a dosage of 5,000 lb/d O₃ using O₃ alone. With Oxyphotolysis, dosage would be 1,350 lb/d O₃. The Oxyphotolysis method is also capable of treating a wide range of chemical contaminants. (from Text)

Descriptors: Effluents; Wastewater treatment; Engineering; Ozonation; Cyanides; Metal finishing industry wastes; Paper industry wastes; Tertiary treatment; Chlorinated hydrocarbon compounds; Pesticides; Photolysis

Identifiers: Oxyphotolysis

78-00428

Effect of chronic exposure of brook trout to sublethal concentrations of hydrogen cyanide.

Smith, L. L., Jr.; Koenst, W. M.; Broderius, S. J.
 Univ. of Minnesota, Dept. of Entomology, Fisheries, and Wildlife, St. Paul, MN 55108

ENVIRONMENTAL SCIENCE & TECHNOLOGY 11(9), 883-887,
 Coden: ESTHAG Publ.Yr: Sept. 1977

illus. refs.

Languages: ENGLISH

Brook trout, *Salvelinus fontinalis* (Mitchill), were exposed to various concentrations of hydrogen cyanide to determine the effects of continuous exposure on survival, growth, and reproduction. Continuous flow experiments were begun with adults 144 days prior to spawning and were continued through a 90-day growth period of the second generation. The maximum acceptable toxicant concentration of hydrogen cyanide was between 5.7 and 11.2 lg/L based on the spawning data. (AA)

Descriptors: Water pollutants; Fish; Cyanides; Hydrogen compounds; Toxicity; Reproductive pathology; Growth; Mortality; Toxic materials; Industrial wastes

Identifiers: hydrogen cyanide; brook trout

77-05334

K voprosu opredeleniya tsianidov v vode v prisutstvii nitrilov.

LURYE, YU. YU.

Moscow

Gigiena i Sanitariya, No. 3: 63-64, 1977 Publ.Yr: 1977

Languages: ENGLISH

Descriptors: PH; CYANIDES; NITROGEN COMPOUNDS; LABORATORY METHODS; POLLUTANT DETECTION; WATER SAMPLING

77-04377

Exposure of rainbow trout to sublethal levels of cyanide: effects on growth and liver tissue.

DIXON, D.G.

Concordia Univ., Dept. of Biological Sciences,
Montreal, Que., Can.

12th Canadian Symposium on Water Pollution
Research: Abstracts of Papers. In Water and Pollution
Control, 115(4): 63, Apr. 1977 Publ.Yr: 1977

Languages: ENGLISH

Descriptors: FISH; TOXICANTS; GROWTH; TISSUES; DIGESTIVE
PATHOLOGY; CYANIDES; ORGANS

Identifiers: ABSTRACT ONLY; RAINBOW TROUT; LIVER

77-04227

Determination of total cyanide: Scope and field of
application.

ANONYMOUS,

Anonymous

Effluent & Water Treatment Journal, 17(2): 77-79, Feb. 1977
Publ.Yr: 1977

Languages: ENGLISH

Descriptors: CYANIDES; WATER POLLUTANTS; LABORATORY METHODS;
CHEMICAL ANALYSIS

77-04160

Chronic effects of hydrogen cyanide on the fathead minnow.

LIND, D.T.

Univ. of Minnesota, Dept. of Entomology, Fisheries,
and Wildlife, St. Paul, MN 55101

Water Pollution Control Federation. Journal, 49(2):262-268,
Feb. 1977 Publ.Yr: 1977

Languages: ENGLISH

Descriptors: FISH; TOXICITY; WATER POLLUTION; INDUSTRIAL
EFFLUENTS; CYANIDES

Identifiers: FATHEAD MINNOWS; HYDROGEN CYANIDE

77-03308

Evaluation of the toxic effect of CD-2+ and CD(CN) 4-2- ions
on the growth of mixed microbial population of activated
sludges.

MOROZZI, G.

Universita Degli Studi di Perugia, Facolta di
Science. Istituto di Igiene, Via del Giochetto, 06100
Perugia, Ital.

Science of the Total Environment, 7(2): 131-143, Mar. 1977
Publ.Yr: 1977

Languages: ENGLISH

Descriptors: WASTEWATER TREATMENT; MICROORGANISMS; CYANIDES;
ACTIVATED SLUDGE; GROWTH; TOXICITY; CADMIUM

77-02230

Gas dialysis speeds cyanide analysis.

ANONYMOUS,

Anonymous

Environmental Science & Technology, 11(1): 30-31, Jan. 1977
Publ.Yr: 1977

Languages: ENGLISH

Descriptors: WATER POLLUTANTS; INDUSTRIAL EFFLUENTS;
CHEMICAL ANALYSIS; DIALYSIS; CYANIDES

Identifiers: GAS DIALYSIS

77-02211

Effect of some pollutants on the filtration rate of mytilus.

ABEL, P.D.

Sunderland Polytechnic, Dept. of Biology, Chester
Rd., Sunderland SR4 3SD, Eng.

Marine Pollution Bulletin, 7(12): 228-231, Dec. 1976
Publ.Yr: 1976

Languages: ENGLISH

Descriptors: TOXICITY; FILTRATION; MOLLUSCA; WATER
POLLUTANTS; COPPER; SULFUR COMPOUNDS; CYANIDES; MERCURY; ZINC

Identifiers: MUSSELS

77-01457

Wastewater and sludge control in the Canadian metal
finishing industry: Segment including chemical, electrolytic
treatment; electrochemical machining and polishing; cyanide
hardening.

BUFFA, L.

Canada Dept. of the Environment, Environmental
Protection Service, Abatement and Compliance Branch, Ottawa
Ont. K1A 0H3, Can.

Canada. Water Pollution Control Directorate. Environmental
Protection Service Report Series. Economic and Technical Review
Report EPS 3-WP-76-10, Dec. 1976. 45 pp Publ.Yr: 1976

Languages: ENGLISH

Descriptors: METAL FINISHING INDUSTRY WASTES; ECONOMICS;
CANADA; WASTEWATER DISCHARGES; SLUDGES; INDUSTRIAL EFFLUENTS

Identifiers: FISHERIES ACT; CONTROL TECHNOLOGY

77-01344

Detoxification of hardening salts by high pressure steam treatment (the terralysis process).

SALOMONSSON, G.

Terra Bona AB, Drottninggatan 25, 702 10 Örebro, Sweden

Second International Congress on Industrial Wastewater and Wastes. Edited by S. H. Jenkins. In Progress in Water Technology, 8(2-3): 163-167, 1976 Publ.Yr: 1976

Languages: ENGLISH

Descriptors: WASTEWATER TREATMENT; BARIUM COMPOUNDS; CYANIDES; METAL INDUSTRY WASTES

Identifiers: TERRALYSIS PROCESS; HARDENING SALTS

77-00267

Mathematical analysis of the chemical system "Cyanide-heavy metals" in water--determination of components and toxicity of the system--I: The theoretical solution.

BLAHA, J.

State Textile Research Inst., Centre for Research and Application of Ionized Radiation, Brno, Czechoslovakia

Water Research, 10(9): 815-819, 1976 Publ.Yr: 1976

Languages: ENGLISH

Descriptors: CYANIDES; MATHEMATICAL ANALYSIS; HEAVY METALS; TOXIC MATERIALS; WATER POLLUTANTS

Identifiers: HYDROXYL TEST

76-05299

Pollution abatement through the treatment of industrial waste water with ion exchange resins.

WAITZ, W.H., JR.

Rohm and Haas Co., Pollution Control Research Dept., 5000 Richmond St., Philadelphia, PA 19137

Institute of Environmental Sciences: 22nd Annual Technical Meeting. Mt. Prospect, Ill.: Institute of Environmental Sciences, 1976. pp. 491-495 Publ.Yr: 1976

Languages: ENGLISH

Descriptors: WASTEWATER TREATMENT; RESINS; ECONOMICS; CYANIDES; METALS; BORON; ION EXCHANGE; INDUSTRIAL EFFLUENTS

Identifiers: CHROMATES

76-04259

Instrumentation and automatic control of cyanide waste treatment.

DIGGENS, A.

Orion Research, Inc., 380 Putnam Ave., Cambridge, MA 02139

Pollution Engineering, 8(3): 43-45, Mar. 1976 Publ.Yr: 1976

Languages: ENGLISH

Descriptors: CYANIDES; INDUSTRIAL EFFLUENTS; METAL INDUSTRY WASTES; PH; POLLUTION CONTROL EQUIPMENT; WASTEWATER TREATMENT

Identifiers: METAL PLATING BATHS

76-04231

The automated determination of simple cyanides using a gas permeable membrane as a separation technique.

SALPETER, J.

Technicon Industrial Systems, 511 Benedict Ave., Tarrytown, NY 10591

1976 Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy: Abstracts. Pittsburgh, PA.: Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, (1976?). No. 71 Publ.Yr: 1976

Languages: ENGLISH

Descriptors: CYANIDES; FILTRATION; INDUSTRIAL EFFLUENTS; MEASURING METHODS; MEMBRANES; WATER POLLUTION MEASUREMENTS

Identifiers: ABSTRACT ONLY; GAS PERMEABLE MEMBRANES

76-01241

Continuous on-line determination of total cyanide in industrial effluent streams.

WHITELEY, F.R.

American Cyanamid Co., Westwego, LA 70094

Water and Wastewater Equipment Manufacturers Association: Third Annual Pollution Control Conference. Edited by V. W. Langworthy. Ann Arbor, Mich.: Ann Arbor Science Publishers, 1975. pp. 633-647 Publ.Yr: 1975

Languages: ENGLISH

Descriptors: CYANIDES; INDUSTRIAL EFFLUENTS; MONITORING INSTRUMENTS; WATER QUALITY MEASUREMENTS

Identifiers: TECHNICON MONITOR IV CONTINUOUS CYANIDE ANALYZER

75-03521

The effects of temperature upon the toxicity of chemicals to aquatic organisms.

PARKER, B.C.

Virginia Polytechnic Inst. and State Univ., Dept. of Biology
Blacksburg, VA 24061

Effects and Methods of Control of Thermal Discharges: Report to the Congress by the Environmental Protection Agency in Accordance With Section 104(t) of the Federal Water Pollution Control Act Amendments of 1972. Pt. 3. U.S., Congress, Senate, Committee on Public Works, 93d Cong., 1st Sess., Nov. 1973. Washington, D.C.: Government Printing Office, 1973. 69 pp
Publ.Yr: 1973

Languages: ENGLISH

Descriptors: AMMONIA; ANTIBIOTICS; AQUATIC ORGANISMS;
CHLORINE; CYANIDES; FISH; LITERATURE REVIEWS; METALS;
PESTICIDES; TOXICITY

Identifiers: TEMPERATURE-TOXIN INTERACTIONS

75-02266

Automated analysis for cyanide.

SALPETER, J.

Technicon Industrial Systems, 511 Benedict Ave., Tarrytown,
NY 10591

Pollution Engineering, 7(1): 36-37, Jan. 1975
Publ.Yr: 1975

Languages: ENGLISH

Descriptors: AQUATIC ENVIRONMENTS; CYANIDES; DIGESTION;
POLLUTANT ANALYSIS; WATER POLLUTION MEASUREMENTS

Identifiers: UV DIGESTION

75-01490

Source control is the key.

CHAPMAN, W.A.

City of Palo Alto, Civic Center, Palo Alto, CA 94301
Water and Wastes Engineering, 11(5): C13-C14, C16, C18-C19,
May 1974
Publ.Yr: 1974

Languages: ENGLISH

Descriptors: CALIFORNIA; CHROMIUM; CYANIDES; ECONOMICS;
ENGINEERING; INDUSTRIAL EFFLUENTS; ORGANIC WASTES; WASTE WATER
TREATMENT

Identifiers: PALO ALTO

74-01470

Cyanide--an assessment of alternatives for water pollution control.

HABIB, Y.H.

Closter, NJ

Water & Sewage Works Including Industrial Wastes, Reference
no.: R95, R98-R99, R102-R104, R106-R107, Apr.30, 1973

Publ.Yr: 1973

Languages: ENGLISH

Descriptors: ANIONS; METAL FINISHING INDUSTRY WASTES;
TOXICITY; WASTE WATER DISCHARGES; WATER POLLUTION CONTROL

Identifiers: CYANIDE

73-04203 73-5TG-00685

Determination of nanogram quantities of simple and complex cyanides in water.

BROOKSBANK, PETER

Environment Canada, Inland Waters Branch, Water Quality Div.,
Ottawa, Ont.

Analytical Chemistry. Washington, D.C., 44(11):1845-1849,
Sept. 1972
Publ.Yr: 1972

Languages: ENGLISH

Descriptors: TOXIC MATERIALS; NITROGEN COMPOUNDS; POLLUTANT
DETECTION; WATER QUALITY MEASUREMENTS

Identifiers: CYANIDE.

73-02572 73-3TI-00204

Process for detoxicating waste waters charged with organic cyanide impurities (3,715,309).

ZUMBRUNN, JEAN-PIERRE

Lyon, Fr.

U.S. Patent Office. Official Gazette: Patents. Washington,
D.C., 907(1): 177-178, Feb. 6, 1973
Publ.Yr: 1973

Languages: ENGLISH

Descriptors: PATENTS; TOXIC MATERIALS; WASTE WATER TREATMENT
; NITROGEN COMPOUNDS; CHEMICAL REACTIONS

Identifiers: NITRILES.; ASSIGNOR TO SOCIETE ANONYME POUR
L'ETUDE ET L'EXPLOITATION

73-02535 73-3TG-00494

Ultraviolet spectrophotometric determination of cyanide ion.
SCOGGINS, M.W.

Phillips Petroleum Co., Research and Development
Div., Bartlesville, OK

Analytical Chemistry. Washington, D.C., 44(7):1294-1296,
June 1972
Publ.Yr: 1972

Languages: ENGLISH

Descriptors: WASTE WATERS; SPECTROPHOTOMETRY; WATER
POLLUTANTS; IONS; POLLUTANT DETECTION; NITROGEN COMPOUNDS

Identifiers: UV SPECTROPHOTOMETRY.; CYANIDE ION

73-01045 73-1TI-00052

Cyanide removal from waste effluents (3,697,421).
LAURIA, ANDREW CARMINO
Ballwin, MO
U.S. Patent Office. Official Gazette: Patents.Washington,
D.C., 903(2): 611, Oct. 10, 1972 Publ.Yr: 1972
Languages: ENGLISH
Descriptors: PATENTS; TOXIC MATERIALS; EFFLUENT TREATMENT;
NITROGEN COMPOUNDS; WASTE WATER TREATMENT
Identifiers: ASSIGNORS TO MILES LABS., INC., ELKHART, IND.;
METAL CHELATING.; STARCH CONVERSION SYRUP; CYANIDE REMOVAL

72-07743 72-6TF-01173

Plating and cyanide wastes.
SMITH, STUART E.
Environment/One, Schenectady, NY
Water Pollution Control Federation. Wash., D.C.
Journal.44(6): 1100 - 1104, June 1972 Publ.Yr: 1972
Languages: ENGLISH
Descriptors: CYANIDE WASTES; METAL FINISHING INDUSTRY;
INDUSTRIAL WASTES; WASTEWATER TREATMENT
Identifiers: 1971; LITERATURE REVIEW; METAL PLATING

72-06935 72-5TI-00771

Integrated waste water treatment for reusage after cyanide
type plating (3,682,701).
LANCY, LESLIE E.
Ellwood City, PA
Official Gazette, U. S. Patent Office, 901(2):623-624, Aug 8,
1972 Publ.Yr: 1972
Languages: ENGLISH
Descriptors: PATENTS; CYANIDE WASTES; WASTEWATER TREATMENT
Identifiers: ASSIGNOR TO LANCY LABS. INC., ZELIENOPLE, PA.

72-05848 72-5GB-00398

Pollution.
ANONYMOUS,
UNKNOWN
British Institute of International and Comparative
Law.London. Bulletin of Legal Developments No. 8: 74, May8,
1971 Publ.Yr: 1971
Languages: ENGLISH
Descriptors: CYANIDE; JAPAN; WATER CONTAMINATION; WASTEWATER
DISCHARGE; LEGAL ACTIONS
Identifiers: SUMMARY ONLY

72-04138 72-3TI-00444

Cyanide removal (3,659,949).

RIZZO, JOSEPH LEO
Pittsburgh, PA
Official Gazette. U.S. Patent Office, 896(3): 1072, March
21, 1972 Publ.Yr: 1972
Languages: ENGLISH
Descriptors: WATER TREATMENT; PATENTS; CYANIDE
Identifiers: ASSIGNORS TO CALGON CORP., PITTSBURGH, PA.;
CYANIDE REMOVAL

72-02641 72-2TF-00586

Giving cyanide the treatment.
ANONYMOUS,
UNKNOWN
Chemical Week, 110(2): 55, 57, Jan. 12, 1972 Publ.Yr: 1972
Languages: ENGLISH
Descriptors: METAL FINISHING INDUSTRY; WASTEWATER TREATMENT;
CYANIDE; TOXIC WASTES
Identifiers: ELECTROPLATING WASTES

72-01304 72-1TI-00030

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MATHRE, OWEN BERTWELL
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Official Gazette. U.S. Patent Office, 892(1): 256, Nov.2,
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MALIN, H. MARTIN, JR.
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Languages: ENGLISH
Descriptors: CHEMICAL POLLUTANTS; WASTEWATER TREATMENT;
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Identifiers: E.I. DU PONT DE NEMOURS; KASTONE PROCESS

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LYSYJ, I.
Burlington Industries Research and Development
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Languages: ENGLISH
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OLESEN, D. E.
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Languages: ENGLISH
Descriptors: RADIATION; PHENOL; CYANIDE WASTES; PETROLEUM
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LUTIN, PHILIP A.
Hensley-Schmidt, Inc., Chattanooga, TN
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Publ.Yr: 1970
Languages: ENGLISH
Descriptors: ACTIVATED SLUDGE; CYANIDE WASTES; OXIDATION;
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KIN, STEPHEN R.

Indiana State Board of Health, Division of
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Languages: ENGLISH
Descriptors: CYANIDE; ACCIDENTS; GROUND WATER CONTAMINATION;
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70-02933

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Water Pollution Research Lab., Stevenage, Herts., Eng.
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cyanide in the fish.
TSUDA, TSUTOMU
Tohoku Univ., Faculty of Agriculture, Sendai, Japan
Japanese Society of Scientific Fisheries. Bulletin, 33(4):
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Languages: ENGLISH
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9. U.S. Environmental Protection Agency July 1977, Recent Advances in Fish Toxicology, A Symposium.

cc: Cecil Andrus
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Room 204, State Capitol
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Department of Health
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UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Northern Lights, Inc.)

Project No. 2752

NOTICE GRANTING INTERVENTIONS

(September 14, 1979)

On November 30, 1978, Northern Lights, Inc. filed an application for a major license for the proposed Kootenai River Hydroelectric Project No. 2752. The proposed project would be located on the Kootenai River in Lincoln County, near the Towns of Libby and Troy, Montana. Public notice of the application was issued on April 13, 1979.

On June 25, 1979, the Cabinet Resource Group (CRG) filed a petition to intervene. CRG states that it is a Montana non-profit corporation whose members seek to promote and protect the fish, wildlife, water and human resources of Northwest Montana. CRG further states that the proposed project may significantly disrupt the social structure of the project area.

On June 26, 1979, the Libby Rod and Gun Club (LRGC) filed a late petition to intervene in this proceeding. LRGc states that it is a Montana non-profit corporation which seeks to protect and enhance the hunting, fishing, and recreational values in the Kootenai Falls area. LRGc further states that the proposed project would have an impact on: (1) the scenic beauty of the Falls area; (2) the productivity of the Kootenai River trout fishery; (3) the sporting and aesthetic value of game and non-game animals of the Kootenai Falls area; and (4) the Mountain Bighorn Sheep which herd in the vicinity of the Kootenai Falls.

On June 26, 1979, the Save the Kootenai Association (SKA) filed a late petition to intervene in this proceeding. SKA states that it was organized in 1978 to protect the remaining free flowing Kootenai River. SKA further states that its members derive aesthetic enjoyment from Kootenai Falls as well as other values related to the fisheries, wildlife, and birds in the Kootenai Falls area.

DC-A-11

RECEIVED

SEP 25 1979

ENVIRONMENTAL QUALITY
COUNCIL

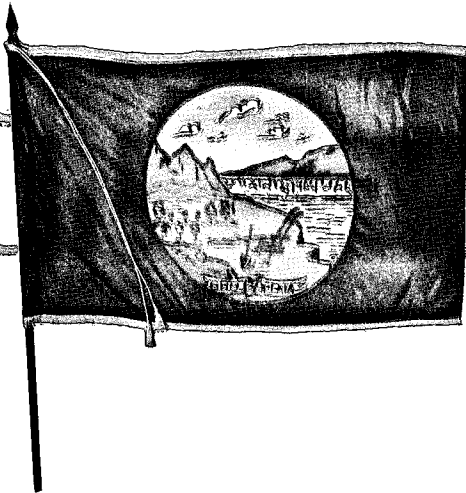
CRG and SKA express concern that the Kootenai Falls is one of the last remaining natural waterfalls on a major river which has not lost its natural condition by the construction of a water development project.

All three petitioners request an opportunity to present evidence in support of their positions. Petitioners also request a local hearing. These requests are not acted on by this notice granting interventions.

It appears to be in the public interest to allow the Cabinet Resource Group, the Libby Rod and Gun Club, and the Save the Kootenai Association to participate in this proceeding. No response to the petitions has been received.

Pursuant to Section 3.5(a) of the Commission's Rules of Practice and Procedure, 18 CFR §3.5(a)(1978), as promulgated by Federal Energy Regulatory Commission rule-making in Docket No. RM78-19 (issued August 14, 1978), 18 CFR 3.5(a)(5), the above named petitioners are permitted to intervene in this proceeding subject to the Commission's Rules and Regulations under the Federal Power Act, 16 U.S.C. §§791(a)-825(r). Participation of the Intervenor shall be limited to matters affecting asserted rights and interests specifically set forth in their petitions to intervene. The admission of the Intervenor shall not be construed as recognition by the Commission that the Intervenor might be aggrieved by any order entered in this proceeding.

Kenneth F. Plumb,
Secretary



THOMAS L. JUDGE
GOVERNOR

STATE OF MONTANA
DEPARTMENT OF HIGHWAYS

HELENA, MONTANA 59601

H. J. ANDERSON
DIRECTOR OF HIGHWAYS

October 20, 1975

32:SCK
IN REPLY REFER TO:

U.S. 191 & U.S.
191 Spur Road

*put with
4/16/1976
DEIS*

Ronda Sandquist
Research Associate
Gallatin Canyon Study
Montana State University
Bozeman, Montana 59715

Dear Ronda:

This is in regards to our meeting with you on October 2, 1975 when we reviewed your draft copy of the "Transportation Impact Analysis" focused on U.S. 191 and U.S. 191 Spur Road.

Please find enclosed a copy of a land use study recently compiled by our department. Please note that several tables were not reproduced, however if you wish to have a copy of any of these, feel free to contact us.

Very truly yours,

H. J. ANDERSON
DIRECTOR OF HIGHWAYS

By *Stephen C. Kologi*
Stephen C. Kologi, P.E., Chief -
Preconstruction Bureau

32:SCK:KFS:REW:mmm
Attachments

cc: R.E. Williams
J.P. Smith
D. Howell

GEORGE VUCANOVICH, CHAIRMAN
HELENA

Wm. M. KESSNER, VICE CHAIRMAN
BLACK EAGLE

G. R. COONEY
BUTTE

P. L. BACHELLER
BILLINGS

JAY LA LONDE
SIDNEY

BIG SKY SPUR TENTATIVE PROGRAM

I. Description of the Project and Project Area

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(1) Description and Location

(2) Purpose and Access

B. Land Form and Surrounding Natural and Cultural Features

(1) Surrounding Terrain and Features

(2) General Land Use Patterns

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B. Land Use Development of the West Fork Area including Big Sky of Montana.

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(4) West Fork and Big Sky 1975 and 1995 Total Trip Comparison

(5) Estimates of Land Use Traffic Generation Impacts on West Fork
1975 and 1995 Traffic Volumes

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- (2) Commercial
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- (4) Recreational
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- (6) Utilities
- (7) Historical and Archaeological Sites
- (8) Agricultural
- (9) Natural Resources
- (10) Other Impacts to Land Use
 - (a) Community Cohesiveness
 - (b) Land Use Activity Changes
 - (c) Development Pattern Impacts

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V. Planning Status

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- B. Land Use Planning
- C. Transportation Plans
- D. Community Facility Plans
- E. Local Regulations
 - (1) Zoning

(2) Subdivision Regulations

(3) Protective Covenants

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- B. Location Measures Recommended
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III	1995 Commercial and Service Facility Estimates
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V	West Fork and Big Sky of Montana Existing and Proposed Land Use
VI	U.S. 191 - U.S. 191 Spur Junction Actual Vehicle Counts January 13- March 24
VII	Montana Department of Highways Traffic Counts Lone Mountain Road January 1, 1975
VIII	1975 West Fork Land Use and Trip Generation Adjusted by Season
IX	West Fork and Big Sky 1975 Traffic by Trip Purpose and Internal- External Trips by Winter Season
X	West Fork and Big Sky 1975 Internal and External Trips by Winter Weekend Day
XI	Recreation Use in the Gallatin Canyon-1971
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XVIII	Impacts Upon Narrow Band Adjacent to U.S. 191 Spur Station 0+00 to 159+00
XIX	Impacts Upon Narrow Band Adjacent to U.S. 191 Spur Station 159+01 to 494+41.7

FIGURES

FIGURE

TITLE

- | | |
|---|--|
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| 2 | Existing Land Uses |
| 3 | Developable Areas Served by U.S.
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The Montana-Idaho Border |
| 4 | Reaggregated Gallatin Canyon's
Drainage Subunits |
| 5 | West Fork Traffic Count Stations |
| 6 | 1975 West Fork Adjusted Trip
Generation by Land Use Activity
Location |
| 7 | Gallatin Canyon Traffic 1974 and 1995 |
| 8 | Big Sky Proposed Land Use |
| 9 | State of Montana 1990 Highway
Functional Classification System |

I. Description of the Project and Project Area

A. Project

(1) Description and Location

The project is located in Gallatin and Madison Counties in Southwestern Montana. It begins on U.S. 191 near the mouth of the West Fork of the West Gallatin River about midway between Bozeman and West Yellowstone and extends up the West Fork drainage a distance of $9.7 \pm$ miles, to a point near the base of Lone Mountain, very near the divide between the Gallatin and Madison Rivers.

The new roadway will provide a 34 - foot paved surface with 2-12 foot driving lanes and 2-5 foot shoulders. Inslopes will have 6:1 safety slopes with a minimum ditch width of 15 feet. Cut and fill slopes will vary according to their height and the type of material encountered.

Drainage structures will be provided based on hydrologic and hydraulic studies. Except for the West Fork, the streams involved are not large enough to require bridge structures. Minor channel adjustments will be required at culvert ends.

Design standards for the project will be in accordance with the State of Montana, Department of Highways Design Standards for Primary and Secondary Highways. Maximum grades of 7% and maximum horizontal curvature of $12^{\circ} 30'$ will be used in the design. Minimum right-of-way width will be 80 feet each side of centerline. Where physical or environmental conditions indicate that exceptions to the standards are in the best interest of total design, grades in excess of 7% and curvature sharper than $12^{\circ} 30'$ may be utilized.

(2) Purpose and Access

The purpose of the U.S. 191 Spur Project is to provide primary access between Big Sky of Montana, a large year around recreational complex, adjacent West Fork drainage resort development and U.S. 191.

Big Sky of Montana, a year round resort complex consists of 10,648 acres of which 1427 is planned for development, 1282 are reserved for future expansion and the remaining portion to remain untouched except for reforestation and seeding.

An additional 415 acres of the West Fork of the Gallatin River has been plotted and is presently being developed. The proposed project would connect with U.S. 191 thereby providing access to Bozeman and Interstate 90 approximately 40 miles to the north and U.S. 287, West Yellowstone, Yellowstone National Park and the Montana-Idaho State Line approximately 50 miles to the south.

B. Land Form and Surrounding Natural and Cultural Features

(1) Surrounding Terrain and Features

The project is situated in the Madison Mountain Range of southwestern Montana. It is within the boundaries of the Gallatin National Forest about 50 miles north of Yellowstone National Park. Immediately to the north lies the Spanish Peaks Primitive Area. Lone Mountain, a dominant physical characteristic, stands by itself when viewed from the Gallatin River at the mouth of the West Fork.

The West Fork drainage contains open meadows in its lower reaches with timber covered ridges at higher elevations.

The West Fork branches into the South Fork, the Middle Fork,

and North Fork, with these streams being fed by smaller tributaries as it drops to the Gallatin Canyon floor. Ulerys Lakes lie on the Madison side of the divide adjacent to the west boundary of the Big Sky Complex. These high mountain lakes are quite scenic and provide excellent rainbow trout fishing. (Refer to Figure 1)

(2) General Land Use Patterns

The Gallatin Canyon, because of its location and mountainous terrain and its limited population, has for the most part a distinct and relatively simple land use pattern as exhibited in Figure 2. The area is predominantly forested. The Forest Service has jurisdiction over 280,300± acres, of the region. This jurisdiction includes fire protection, garbage and waste disposal, the granting of grazing and logging permits, wildlife management, visitor accommodations and control, and range and forest maintenance. A major portion of the area lies in Gallatin National Forest, including the Spanish Peaks Primitive Area.

Land Use patterns suggest five primary land use types in the Gallatin Area. Specifically, these are agriculture, residential and commercial useage; circulation routes; and those areas offering recreational opportunities. *logging*

The strongest defining features of the Canyon are the steep, heavily timbered mountain slopes and the river. The mountains constrain access, while providing ideal opportunities for recreation. The topography creates separate distinct identities for the different areas of the Canyon. Neighborhood residential enclaves are scattered throughout the area exhibiting primarily small-scale development.

Existing land uses are mixed, but they fall within the general categories of housing and supporting commercial activities, and forestry. Residential densities are for the most part low and concentrated along the U.S. Highway 191 corridor. The Big Sky development provides a relatively compact, year-round residential-recreational community.

Supporting commercial activities are located alongside Highway 191. They range from direct service facilities (food-stores, etc.) to tourist-oriented facilities (bars, restaurants, motels, antique shops, etc.). These commercial uses are not generally within walking distance of residential areas, and they are not located in compact areas. This scattering of commercial facilities presents a major problem, especially related to traffic generation along U.S. 191. In addition Big Sky also contains direct service and tourist-oriented commercial facilities as well as specialty shops.

Agricultural useage within the Canyon is limited primarily to grazing activities. There are several small farms in the area and a few large agricultural spreads. These are more accurately termed ranches, and several of these combine ranching with tourism. Most of the acreage in agricultural use produces feed for livestock. In the Canyon, this forage crop is generally used for on-site grazing practice. Both the Forst Service and private landowners issue grazing permits to allow their land to be used as pasture by others.

The U.S. Forest Service has jurisdiction over a large part of the study area. Recreational and scenic value lie in the expanse of forested areas in the Canyon. These forest lands are utilized for their primary function of producing renewable resources - timber, water, wildlife, grazing, and the other beneficial uses they help create. The open and barren or "park" land lying within the forested areas is also a significant nature in this mountainous region. Precipitation is caught by these areas signifying the natural value of these lands.

This open, park land, adjacent to forest land, is what makes the Canyon attractive.

Recreational usage in the study area is devoted to two general areas--dude ranching and general forest recreation. The U.S. Forest Service maintains several facilities within the area. Their summer attractions are oriented to fishing, hiking, and overnight camping with some trailer site provided. Winter attractions include hunting and snowmobiling. Private recreation facilities include dude ranches, resorts and cabin camps.

Big Sky, primarily a recreational development, includes recreation oriented residential units, skiing, golfing, tennis and horseback riding.

In connection with Land Use patterns recent trends indicate substantial potential for additional residential and recreational development in both the upper and lower Canyon areas as well as the West Fork.

II. Existing Land Use and Future Estimates

- A. Existing and future land use estimates were obtained from the Institute of Applied Research, Montana State University, Bozeman, Montana funded under the National Science Foundation's RANN Program (Research applied to national needs "The Impacts of Large Recreational Development Upon Semi-Primitive Environments" Ronda Sandguist and Kenneth J. Tiahrt).

The disaggregation method utilized by the Institute of Applied Research in collecting and estimating land use data roughly utilized the following sequence of actions:

1. Delineate Gallatin River Basin from Four Corners south to the Montana-Idaho State line.
2. Determine drainage sub units of the Gallatin Basin.
3. Locate land ownerships of the Basin with respect to public and private land.
4. Determine least developed areas with slopes of greater than 40 percent. .
5. Delineate Forest Service lands of less than 40 percent slope.
6. Locate potentially developable private lands on slopes of less than 40 percent presently lacking access.
7. Designate most developable areas which include private land on slopes of less than 40 percent with existing access (Refer to Figure 2)
8. Determine existing land use according to drainage sub-unit.
9. Ascertain land owner development plans.
10. From existing land use, present platted subdivision activity, land owner development plans and local development trends a potential percent of future development was estimated.

For each drainage subunit to take place within a twenty to thirty year period. For convenience within this study, drainage subunits were reaggregated as follows and exhibited in Figure 4.

North Gallatin Canyon Area

GV Gallatin Valley Unit

- 1) Four corners to Gallatin Gateway Strip
- 2) Gallatin Gateway to Gallatin Canyon Strip
- 3) Cottonwood and Little Bear Drainages
- 4) Spanish Breaks, Ruby Mountain Area

SC Spanish Creek-Cherry Creek Unit

G Gallatin Canyon Unit

- 1) Lower Gallatin Canyon

Middle North Gallatin Canyon Area

G Gallatin Canyon Unit

- 2) Middle Gallatin Canyon

Middle Gallatin Canyon Area

PC Porcupine Creek Unit

BC Beaver Creek Unit

- 1) Beaver Creek Drainage
- 2) West Fork to Red Cliff Strip

West Fork Area

JC Jack Creek Unit

WF West Fork Unit

- 1) Big Sky Land
- 2) Burlington Northern
- 3) Miscellaneous Lands

Middle South Gallatin Canyon Area

G Gallatin Canyon Unit

3) Upper Gallatin Canyon

TF Taylor's Fork Unit

South Gallatin Canyon Area

H Hebgen Lake Unit

1) North Shore

2) Horse Butte Peninsula

3) South Shore

A. Land Use Development of the North Gallatin Canyon, Middle North Gallatin Canyon, Middle Gallatin Canyon, Middle South Gallatin Canyon and South Gallatin Canyon (Excluding the West Fork and Big Sky of Montana)

(1) Existing Land Use Development

In utilizing the Institute of Applied Research, Montana State University Land Use Inventory by drainage sub-unit and aggregating this data to geographic portions of the Gallatin Canyon, (North, Middle North, Middle West Fork, Middle South, and South)

Table 1 was developed. Table 1 presents a summary of Gallatin Canyon land use activities categorized in terms of residential, commercial, industrial recreation, community facilities, and total platted and developed areas. Excluding the West Fork there are an estimated present total of 395 single family units and 143 lodging units in the Gallatin Canyon Area. Present platted lands included space for an additional 1242 single family, 840 multi family and 400 lodging units. Total platted and developed acres amounted to 3358.6 acres.

(2) Estimated 1995 Development of the Gallatin Canyon

Anticipated future residential development was estimated from the potentially and most developable areas of the Gallatin Canyon data provided by the Institute of Applied Research, Montana State University. These figures represent potential growth of the Gallatin Canyon by 1995 and do not necessarily reflect future land sales trends, energy conservation impacts, inflation and a number of other critical factors that could affect the development time frame. Table II presents potential 1995 land use development by category an estimate of support

commercial, service and community facilities required to serve this additional population. Table III provides the method used in estimating commercial and service support activities while Table IV provides estimates of 1990 recreational and community facility demands.

Excluding the West Fork and Community of West Yellowstone, and including present platted subdivisions, a potential exists by 1995 for an additional 4752 single family units, 1365 multi-family units and 450 lodging units (motel and hotel units). Total platted and developed acres would expand by 3244.6 acres, doubling the existing platted and developed area.

B. Land Use Development of the West Fork Area Including Big Sky of Montana.

West Fork and Big Sky of Montana existing and proposed land use estimates were provided by Mr. Gustav Raaum of Big Sky of Montana Inc. in a communication dated March 18, 1975. Remaining portions of the West Fork were obtained from the land use estimates provided by the Institute of Applied Research, Montana State University.

The proposed time frame for construction completion of Big Sky is somewhat less than 1995. It was originally anticipated that the major portion of the Big Sky of Montana construction program will begin to taper off by 1978 with construction completed in 1980. Due to the instability of the present national economic and energy conditions it is difficult to determine what impact will result to proposed construction schedules, recreational home real estate and recreational activity demands in general. Table V presents existing and estimated 1995 Land Use development of the West Fork area.

(1) Big Sky of Montana

(a) Meadow Village's greatest land use activity growth is

anticipated to come in the form of single family and multi-family units. Approximately 1418 new dwelling units are proposed in the Meadow Village vicinity. Few changes are proposed for commercial expansion. An additional nine holes are planned for the existing golf course along with four new tennis courts.

- (b) The private owned Medical Center is proposed for expansion from the existing 16 beds to 40 beds.
- (c) Dude Ranch lodging units are proposed for additional expansion from the present 16 units to 32 units.
- (d) Mountain Village is proposed by Big Sky to more than double it's existing size with an additional 2027 dwelling units and 588 more lodging units. Considerable expansion is also proposed in terms of commercial and recreational development. Retail and service space is planned for expansion from its present total of 28,857 sq. ft. to 71,056 sq. ft. of gross floor area. Ski facility capacity from its present capacity will enlarge at Mountain Village from the present peak skier days of 3000 to 10,000 along with the addition of 8 tennis courts.

(2) Remaining West Fork Area

- (a) Burlington Northern property presently has 17 single family dwelling units. Estimated are 250 additional single family units to be constructed in conjunction with an additional 196 multi-family units.
- (b) Miscellaneous other land holdings in the West Fork Area are anticipated to generate an extra 163 single family structures.

III. Estimated Existing and Proposed Land Use Traffic Generation

The intent of this land use traffic generation research is not to

develop a specialized in-depth traffic generation study thereby developing traffic volumes by intersection segment and deriving peak hour volumes. This research uses more of a general approach attempting to gauge potential land use development impacts within the West Fork and Gallatin Canyon as they relate to the demand for the proposed U.S. 191 Spur. Lacking an in-depth traffic generation study and an origin-destination survey potential land use development impacts were related to available traffic counts in the Gallatin Canyon and West Fork. The following describes the methods, sources and parameters used in obtaining land use-traffic volume impacts.

The Gallatin Canyon and Big Sky of Montana development, although containing a permanent population, is highly seasonal and recreation oriented. This seasonal-recreational orientation requires that a number of basic assumptions and adjustments be made to normal urban and suburban development trip generation characteristics in order to reflect Gallatin Canyon and West Fork traffic characteristics. As a starting point land use trip generation rates presented in "Trip Generation by Land Use, Maricopa Association of Government, April, 1974 were utilized. Trip generation estimates were first developed for the West Fork Area and Big Sky of Montana since (1) The U.S. 191 Spur terminated at Mountain Village in Big Sky thereby restricting through traffic movements and (2) traffic counts were available at the junction of the U.S. 191 Spur and U.S. 191 allowing for some calibration of land use trip generation to traffic volumes. The following includes procedures and basic parameters used in trip generation estimates.

Traffic Counts - In January through March 1974 motor vehicle counts were taken by Kenneth J. Tlahrt and presented in a study entitled "Motor Vehicle Traffic Big Sky Spur U.S. 191". Table VI reflects

actual vehicle counts taken from January 13 through March 24, 1974.

These counts are presented in Table IV.

The Montana Department of Highways used automatic counters along the proposed U.S. 191 Spur alignment from Tuesday, January 21, 1975 to Sunday, January 26, 1975. Just west of the junction of U.S. 191 and the U.S. 191 Spur average weekday counts amounted to 927 vehicles. Unfortunately due to snow plows cutting the counting hose the weekend counts for Saturday and Sunday were not able to be obtained. Table VI presents Montana Department of Highways average weekday and available weekend counts for five stations from the U.S. 191 junction to just north of Little Coyote Road at Meadow Village. (Refer to Figure 5) An estimate of Station #1 average weekend traffic by averaging the ratio difference between average weekday and weekend traffic for the 1974 Station #1 and 1975 Stations #2, #4, and #5. This estimate resulted in approximately 1200 vehicles per average weekend day traffic for Station #1 during January 1975. This estimate was derived as follows:

Percent Difference of Average Weekday Traffic To Weekend Day Traffic

1974 Station #1	.101
1975 Station #2	.287
1975 Station #4	.347
1975 Station #5	<u>.270</u>
AVERAGE	.251

$$\begin{aligned}\text{Station \#1 weekend day traffic} &= \frac{927(.251)}{.749} + 927 \\ &= \frac{232.677}{.749} + 927 \\ &= 311 + 927 = 1238\end{aligned}$$

TABLE VI

U.S. 191-U.S. 191 SPUR JUNCTION

Actual Vehicle Counts January 13-March 24

Date	Day of Week	Total Veh.	Private Veh.	Private Veh. Passengers
1-23	Wed.	864	677	1154
2-14	Thur.	816	654	1168
3-1	Fri.	840	677	1328
3-14	Thur.	766	601	1172
3-22	Fri.	946	741	1554
Midweek Sample Totals		4232	3350	6376
Midweek Sample Means		846	670	1275
1-13	Sun.	656	609	1401
2-2	Sat.	1005	915	2272
2-23	Sat.	954	848	2060
3-3	Sun.	984	922	2502
3-16	Sat.	1015	922	2285
3-23	Sat.	976	896	2204
3-24	Sun.	994	950	2476
Weekend Sample Totals		6584	6062	15200
Weekend Sample Means		941	866	2172
Adjusted Midweek Sample Means		1046	828	1576
Adjusted Weekend Sample Means		1141	1050	2633

These adjusted means were obtained by adding 200 to the total vehicle count to allow for the traffic before 8 a.m. and for that after 6:30 p.m.

Ratio difference of midweek to weekend amounts to approximately 90% mid-week-10% increase for weekend traffic.

Source: Motor Vehicle Traffic Big Sky Spur U.S. 191, Kenneth J. Tihart, 1974.

TABLE VII
MONTANA DEPARTMENT OF HIGHWAYS
TRAFFIC COUNTS LONE MOUNTAIN ROAD

January 1975

Station	Average Weekday Counts	Available Weekend Counts	Numerical Difference	Weekend Day Percent Difference
#1	927	*1238	*311	*25.1
#2	841	1180	339	28.7
#3	862	*1233	*371	*30.0
#4	630	964	334	34.7
#5	780	1068	288	27.0

* Estimated

SOURCE: Montana Department of Highways

Seasonal Adjustments - Adjustments by season were developed for the West Fork Area and Big Sky of Montana in order to reflect seasonal dwelling unit and recreational activity use. Included within a report entitled, "The Growth and Impact of the Big Sky Report Community, Montana Department of Intergovernmental Relations - January, 1974 the following seasonal increments were presented and utilized in this study.

Summer (July 1 thru August 31) 62 days

Fall (September 1 thru November 20) 81 days

Winter (November 21 thru April 10) 141 days

Spring (April 11 thru June 30) 81 days

Trip Purpose - For need of the trip purpose distribution data the Billings, Montana Urban Transportation Plan was utilized and adjusted to establish percent of trips by purpose for permanent, seasonal, lodging and camping units. These adjustments are included as follows:

<u>Trip Purpose</u>	<u>Billings Study</u>	<u>Permanent D.U.S.</u>	<u>Seasonal D.U.S.</u>	<u>Lodging & Camping Units</u>
Work	20.9%	20.9%	-----	-----
School	2.0%	2.0%	-----	-----
Shopping	24.3%	24.3%	20.0%	10.0%
Recreation	19.2%	19.2%	34.0%	32.0%
Personal Bus.	10.1%	10.1%	5.0%	2.0%
Medical Dental	1.2%	1.2%	1.0%	1.0%
Social & Meal	18.3%	18.3%	20.0%	25.0%
Other	4.0%	4.0%	20.0%	30.0%
Total	100.0%	100.0%	100.0%	100.0%

For purposes of establishing estimated trip generation rates in the West Fork further refinements and assumptions were developed to determine proportions of internal and external trips.

Land Use Trip Generation Rates - Through trial and error trip generation presented in "Trip Generation by Land Use, Maricopa Association of Governments, April, 1974, were adjusted until external traffic reflected

estimated 1975 winter-weekend traffic volumes of 1200 vehicles per day at the U.S. 191-U.S. 191 Spur junction. The following land use trip generation rates reflect these adjustments:

Residential

- (1) Single Family Permanent trip rate 6.89/unit characteristics -

These dwelling units are generally owned by the occupants.

In the West Fork the occupants would consist of older retired couples and young marrieds with a small family size employed at Big Sky or in the surrounding region and would have less of a trip making propensity than typical urban single family permanent structures. Canyon occupants would consist of typically medium sized families.

- (2) Single Family Seasonal trip rate 4.07/unit characteristics -

Seasonal single family units are usually occupied during the summer and to a less degree during the winter ski season.

Occupants consist of older couples and married with small to medium family size.

- (3) Mobile Homes trip rate 6.09/unit characteristics - The

living units are generally owned by the occupant, but the land on which they are located is generally rented or leased.

Occupants consist of marrieds with small families or no children both in the West Fork and Canyon Areas.

- (4) Multi Family Permanent and Seasonal trip rate 4.97/unit

characteristics - Due to the recreational nature, remoteness and concentrated development nature of Big Sky transient lodging units with convention facilities trip rate generation is reduced to the same as roadside traveler lodging without convention facilities and uses the Delaware DOT trip

generation rate of 3.63 trips per room unit.

- (6) Camping Units trip rate 3.63/unit Characteristics - Trip generation for camping units would be considered similar lodging units.

Commercial -

	TRIP RATE
(1) Retail	42.07/1000 G.F.A.
(2) Service and Office	10.32/1000 G.F.A.

Recreation -

(1) Golf Course	5.67 Acre
(2) Ski Area (estimated - refer to trips per skier day calculation following)	.60/skier day
(3) Tennis Courts (estimated)	16/court per day

Community Facilities -

(1) Fire Station (estimated)	3.0/employee
(2) Medical Center	5.93/staff member
(3) Day Care Center (estimated)	3.0/employee
(4) Ski Patrol and First Aid Station (estimated)	3.0/employee
(5) Boat house (estimated)	3.0/employee

Utilities -

(1) Water and Sewer (estimated)	3.0/employee
(2) Roads and Maintenance (estimated)	3.0/employee
(3) Trash pickup (estimated)	4.0/employee
(4) Power (estimated)	3.0/employee
(5) Telephone (estimated)	3.0/employee

G.F.A. - Gross Floor Area

Trips Per Skier Day Calculation

Trips per skier day for the Mountain Village facilities were estimated as follows.

(1) 3000 peak 24 hour skier days ?

(2) 2000 skier days considered average

(3) 2.51 found to be average vehicle occupancy rate for winter weekend days in Motor Vehicle Traffic Big Sky Spur U.S. 191 by Kenneth J. Tiahrt.

(4) Assume 50 percent of the 2000 skier days make two trips one into and one out of the West Fork. $\frac{1000}{2.51} = 398.4(2) = 797$

(5) Assume 50 percent of the 2000 skier days make one trip into the West Fork Lodge overnight and make one trip out the next day.

$$\frac{1000}{2.51} = 398.4(1) = 398$$

(6) Total trips per skier day $\frac{2000 \text{ skier day}}{1195 \text{ trips}} = .60 \text{ trips/skier day}$

A. West Fork And Big Sky Area

(1) West Fork and Big Sky Trips by Season

It is assumed that with the additional dwelling units, lodging units and commercial construction along with the longer period for establishment of Big Sky as a recreational center that external trips have and will continue to increase. Table VIII presents West Fork including Big Sky of Montana trip generation adjusted by seasons. Of the total single family and multi-family units twenty-five percent were estimated as permanent units and seventy-five percent seasonal. A commercial gross floor area trip generation factor (included in the occupancy rate column) was derived from the average of dwelling unit

occupancy rates since shopping particularly in the West Fork would be a function of occupancy. Table VIII primarily uses the following parameters in developing trip generation figures.

$$\text{Land Use activity units} \times \text{seasonal adjustment factor} = \text{adjusted units}$$
$$\text{adjusted units} \times \text{trip generation per unit} = \text{trip generation adjusted by season.}$$

(2) West Fork and Big Sky Traffic by Trip Purpose

The next step was to attempt to calibrate 1975 estimated trip generation in the West Fork with traffic passing through the U.S. 191-U.S. 191 Spur junction traffic counting station. In order to accomplish this objective total trips had to be further adjusted to trip purpose. Breakdowns by dwelling unit type and activity to reflect trip purpose is presented in Table IX estimating internal (within the West Fork) and external traffic (entering and leaving the West Fork.). Table X summarizes both internal and external trips for the West Fork Area for 1975 winter weekend days. It is hypothesized that:

- (1) All commercial trips are generated from dwelling, lodging and camping units within the West Fork and that commercial facilities at Big Sky do not generate outside traffic. Commercial trips are for the most part already included in dwelling unit trips or combined with one day trips using recreational facilities.
- (2) Recreational trips generated from within and using West Fork facilities are included in dwelling unit trips. Only external trips are counted.
- (3) Medical Center external trips account for 15.6 percent of total trips generated. Remaining internal trips are included in dwelling unit counts as employment or visitor trips.

(4) Sightseeing trips were estimated from Table XI - Recreation Use in Gallatin Canyon - 1971. Approximately 10 percent of the total Gallatin Canyon sightseeing trips were estimated for the West Fork Area.

(3) West Fork and Big Sky Traffic by Geographic Area

Estimates of trip generation for the West Fork during the winter season for weekend days by land use activity and geographic area is presented in Table XII. Total trip generation figures do not correspond to traffic volume counts in which vehicles are counted at specific geographic locations since many trips could take place without passing through a traffic counting station. However, trip generation figures could be used as ratios in estimating future land use development on traffic volumes.

Geographic area within the West Fork include Meadow Village, Medical Center, Big Sky Administration, Dude Ranch, Rehm's Trailer Court, Burlington Northern Property, Miscellaneous Properties, and Mountain Village. Presented in Table XII are the total number of trips generated by existing land use activities during a weekend winter day minus adjustments made for commercial and recreational duplicate counted trips. Figure 6 illustrates geographic trip generation locations.

(4) West Fork and Big Sky 1975 and 1995 Total Trip Comparison

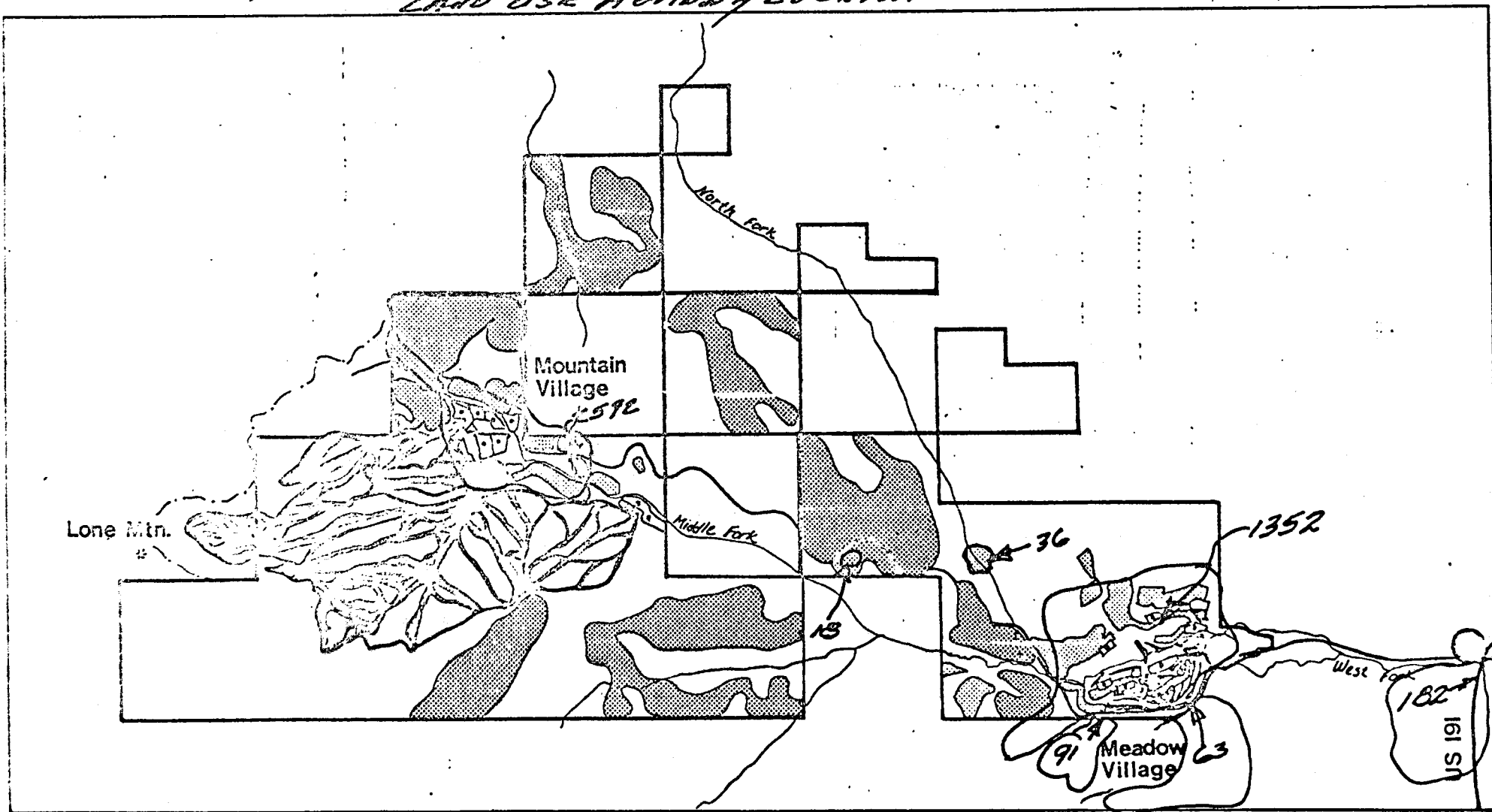
Adjusted by season Table XIII presents trip generation for the West Fork Area by land use activity and geographic area. Both 1975 and 1995 trips are presented for comparative purposes. Basic assumptions made in terms of seasonal factors, trip generation characteristics and permanent-seasonal dwelling unit distribution are the same for both 1975 and 1995. The land use trip generation rates used in the West Fork area were then used to calculate total Gallatin Canyon trip generation.

TABLE I

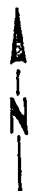
UNIT TRIPS AND LOGS, 1975 INTERNAL AND
EXTERNAL TRIPS BY WINTER WEEKEND DAY

LAND USE ACTIVITY		INTERNAL TRIPS TOTAL	EXTERNAL TRIPS TOTAL
(1) PERMANENT DWELLING UNITS	1152	309	
(2) SEASONAL DWELLING UNITS	945	332	
(3) LOGGING AND CAMPING UNITS	865	301	
(4) COMMERCIAL	(INCLUDED)	(INCLUDED)	
(5) RECREATION	(INCLUDED)	223	
(6) COMMUNITY FACILITIES	79	—	
(7) UTILITIES	139	—	
(8) MEDICAL CENTER	(INCLUDED)	3	
(9) BIG SKY ADMINISTRATION	—	77	
(10) SIGNAGE	—	14	
TOTAL	3180	1259	

1975 WEST FORK ADJUSTED TRIP GENERATION BY
LAND USE ACTIVITY LOCATION



BIG SKY
MONTANA
MASTER PLAN



- RECREATION
- ▨ RESIDENTIAL LOTS
- ◼ CONDOMINIUMS

- COMMERCIAL
- ▨ PROPOSED DEVELOPMENT
- mile —

(5) Estimates of Land Use Traffic Generation Impacts on West Fork

1975 and 1995 Traffic Volumes

As mentioned previously (West Fork and Big Sky Traffic by Geographic Area) total trip generation figures do not correspond to traffic volume counts. A method of rough estimation can be made by determining the percent of total trips generated to counts that do pass through a given station and applying this percent to 1995 trip generation figures. At this time Montana Department of Highways proposed U.S. 191 Spur traffic volume counts were only available for January and June of 1975. Table XIV presents estimated trip generation impacts to traffic counting stations #1 and #5. The estimates suggest that by 1995 should all potential development take place that traffic volumes on the proposed U.S. 191 Spur at the junction will range from 6066 vehicles per day during the ski season of 1995 down to 3274 during the spring season. The area comprising Mountain Village, the Clinic and Dude Ranch will reach 5070 vehicles per day during the winter of 1995 declining to 2373 vehicles per day during the spring.

710 222

Retrieved 1995 High Circulation Report
At Traffic Counting Stations #1 and #5

[illegible]

B. Gallatin Canyon

(1) Estimates of 1975 and 1995 Gallatin Canyon Trip Generation

Existing and proposed Gallatin Canyon Trip Generation estimates are included in Table XV. Total trip summations do not accurately reflect total trips taking place in each geographic area since a large portion of the trips taking place in each geographic area are included in the commercial, industrial, recreation and community facilities and are already included in residential trip generation figures. Aside from residential and lodging utilities only non home based trips attracted or produced and not originating or terminating at counted Gallatin Canyon dwelling or lodging units should be totaled. These non home based trips plus dwelling and lodging unit trips it would appear would more accurately reflect land use trip generation characteristics. Therefore adjusted actual trips equal residential and lodging unit trips + (10% commercial trips) + (25% industrial trips) + (100% camping trips) + (50% recreation trips) + (00% school trips) + (00% church trips) + (50% fire station trips) + (20% ski trips) + (20% golf trips) + (50% medical trips). It is assumed that the remaining percentage trips are included in dwelling and lodging unit trips.

(2) Gallatin Canyon-West Fork Trip Generation by Season and Percent of 1995 Land Use Development

Estimates of total trips in the Gallatin Canyon and West Fork Area indicate a substantial increase particularly if 100% of the 1995 estimated land use development takes place. It should be reiterated that trip generation in most cases does not reflect traffic counts unless each trip passes through a particular counting station. An example would be a shopping trip originating from a dwelling unit terminating at a corner grocery store but not utilizing U.S. 191 or the U.S. 191 Spur. However in the Gallatin Canyon due to its linear configuration this condition would be reduced with the exception of the West Fork.

Table XVI presents average 1975 and 1995 trips generated for the Gallatin Canyon and West Fork. Also included are potential trips generated by 1995 at estimated full development seventy-five percent development or fifty percent development. Since 1990 land use development estimates were made a number of national and local factors have occurred which would significantly affect the rate of development in the Gallatin Canyon and to a lesser degree in the West Fork. These factors include:

- (1) National emphasis on energy conservation.
- (2) Present national inflationary trends resulting in both depression and recession cyclical trends.
- (3) State of Montana subdivision and environmental impact review requirements included an increase in minimum lot size requirements.
- (4) Question of approval of the Ski Yellowstone Development

in the South Gallatin Canyon Area.

In light of these factors it could be hypothesized that the Gallatin Canyon development rates may be reduced to 50 percent the original 1995 estimate. The West Fork and Middle Gallatin Canyon due to the significance of Big Sky of Montana may reach between 50 and 75 percent of the original 1995 estimate within the twenty year period. Table XVII presents gross estimates of Gallatin Canyon 1990 land use - trip generation impacts on various segments of U.S. 191. Estimated through traffic (the difference between 1975 average trip generation and 1974 traffic count) was expanded by a 1995 trip generation growth factor (percent increase in total Gallatin Canyon trip generation from 1975 to 1995). Expanded 1995 through traffic plus average 1995 trip generation equals total 1995 estimated traffic. Traffic estimates were then calculated for each geographic sub area of the Gallatin Canyon.

Geographic sub areas indicating substantial gains in traffic due to potential land use development within the Gallatin Canyon appear in the North Gallatin (Near Four Corners), Middle Gallatin Canyon (junction of U.S. 191 U.S. 191 Spur), and South Gallatin Canyon (junction of U.S. 191 and U.S. 289).

With land use development estimates at 50%, traffic volumes would more than triple in the North Gallatin Canyon reaching an average daily traffic of over 10,000 vehicles. Middle Gallatin Canyon estimates in the vicinity of the West Fork would reach by 1995 close to 7000 vehicles per day with the South Gallatin Canyon increasing from an average daily traffic in 1975 of 1249 to approximately 6500 by 1995. It should be pointed out that

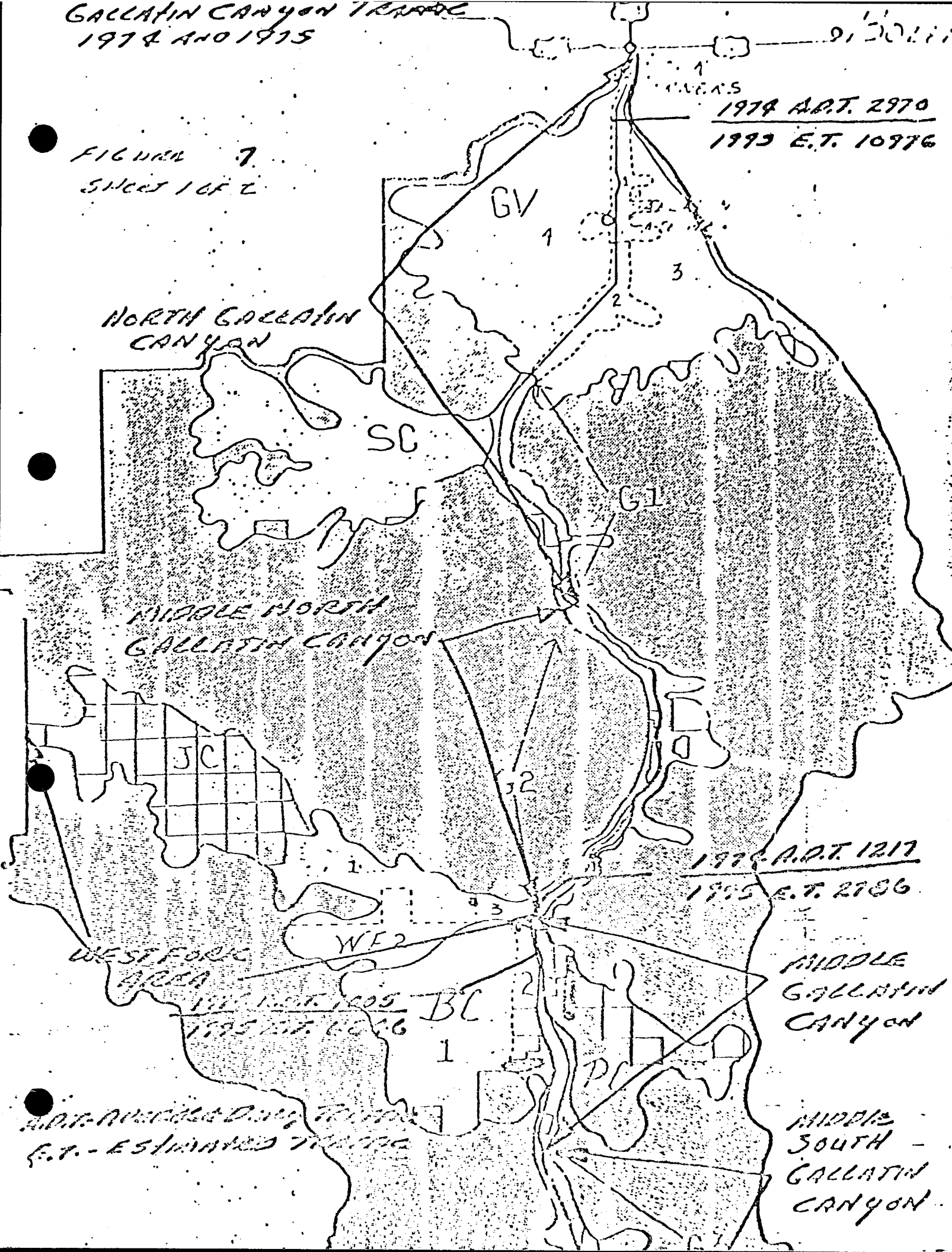
at best these figures represent crude estimates and should be used with discretion. In order to gain an understanding of the magnitude of potential development 1975 residential units consisted of approximately 675 dwellings in the Gallatin Canyon, housing a permanent and seasonal population (2.5 persons/unit) of 1700. Should 100% development be reached there could be an additional 10,678 residential units housing a total population (2.5 persons/unit) of roughly 28,000 persons. in the Gallatin Canyon and West Fork Areas. It is doubtful that 100 percent of the Gallatin Canyon potential development will be reached; however, it is even more difficult to determine what amount of development will take place by 1995 in light of the previously mentioned energy, economic and environmental factors.

GALLATIN CANYON TERRACE
1974 AND 1975

9,500 ft

FIGURE 7
SHEET 1 OF 2

1974 A.D.T. 2970
1995 E.T. 10976



NORTH GALLATIN
CANYON

SC

MIDDLE NORTH
GALLATIN CANYON

JC

GV

WEST FORK
AREA

WE2

1974 A.D.T. 1005
1995 E.T. 6646

BC

1

1974 A.D.T. 1217
1995 E.T. 2786

MIDDLE
GALLATIN
CANYON

MIDDLE
SOUTH -
GALLATIN
CANYON

A.D.T. - Actual Data
E.T. - Estimated Terrace

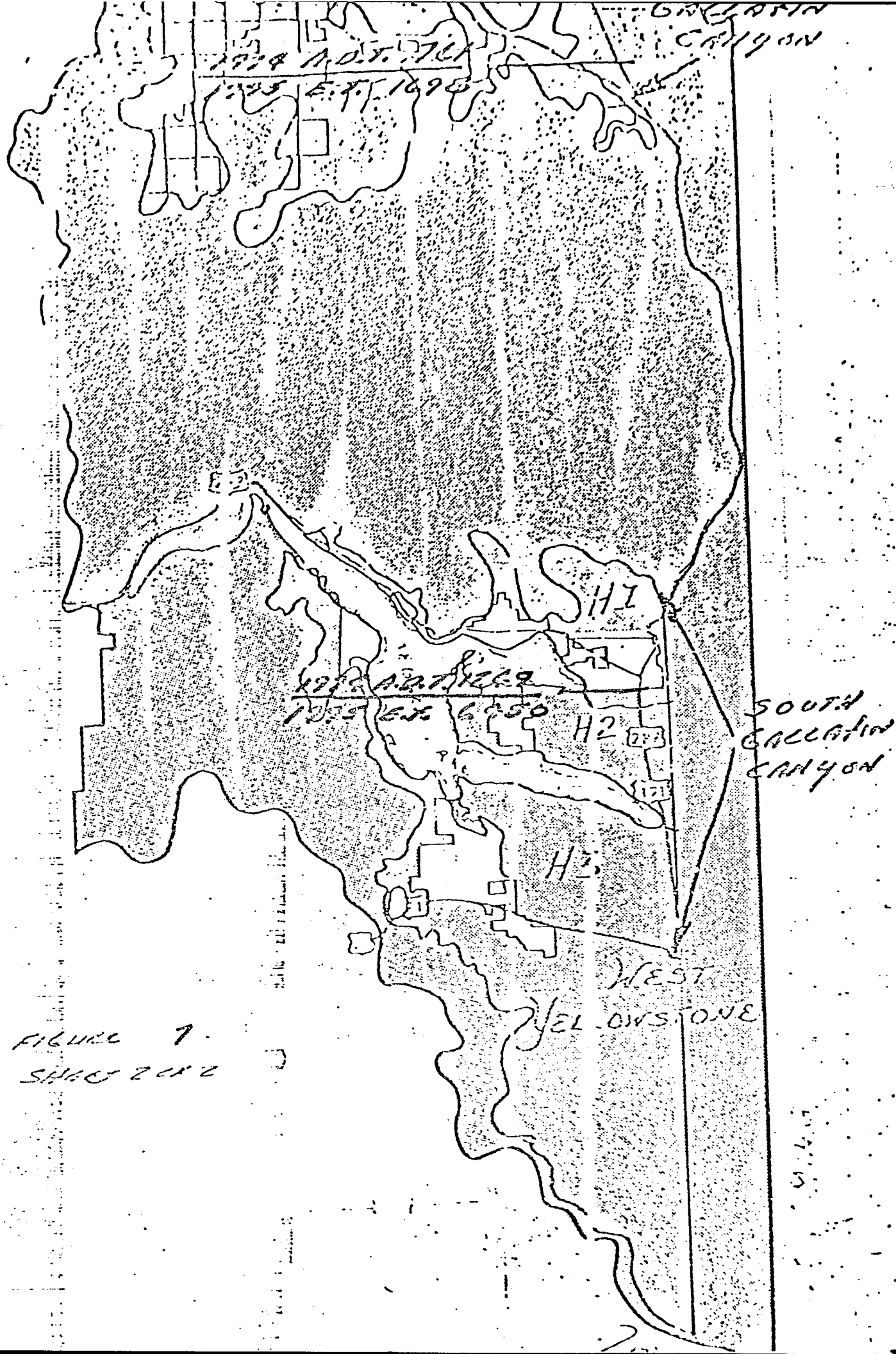


FIGURE 7
SHOOT 2012

IV. Direct Impacts Upon The Narrow Band Adjacent to the Highway

A. Primary Impacts

The following describes both primary and possible secondary land use impacts resulting from construction of the U.S. 191 Spur. The review of primary and secondary impacts is separated into two parts. The first section of the U.S. 191 Spur includes from the U.S. 191-U.S. 191 Spur Junction to Meadow Village (Station 0+00 to 159+00). The second section includes from Meadow Village to Mountain Village (Station 159+01 to 494+41.7).

Determination of significant impacts is relative and in large part depends on the individual completing the study, the local citizen affected, or each reviewer. In this study all obvious impacts pertaining to land use are described.

TABLE XVIII

IMPACTS UPON NARROW BAND ADJACENT TO U.S. 191 SPUR

U.S. 191 TO MEADOW VILLAGE STATION. 0+00 TO 159+00

34 foot paved surface
 2-12 ft. driving lanes
 2-25 ft. shoulders,
 120 ft. lower minimum
 160 ft. minimum right
 of way.

Existing
 Use Description

Impacts Described

A. Primary Impacts

1. Residential

a. Neighborhood and housing impacts

Between station 0+00 and 80+00 residential development consists of interspersed permanent and seasonal dwellings of low density (less than one (1) dwelling per 5 acres). Nine residential structures appear along the mile and one half proposed highway construction length. Five of these residences are located within 200 ft. of the proposed center line of the U.S. 191 Spur.

Dwelling units within the area are presently at low density. The proposed alignment through the area primarily follows the existing Big Sky Road facility alignment. Relocation of housing would not be required by the proposed highway construction. It is possible that as traffic increases adjacent residential structures would experience a raise in noise and activity levels thereby causing a reduction in recreational qualities. For the most part these impacts would not be considered significant in terms of numbers and comparison to benefits received relative to lower dust levels, improved access to community facilities etc. Future subdivision development if permitted could be designed utilizing natural features to reduce highway impacts and utilize the U.S. 191 Spur as an arterial system. Access to the U.S. 191 Spur and land use activities adjacent to the proposed road facility should be controlled through subdivision regulations, some form of zoning controls and road access restrictions.

TABLE XVIII cont.

U.S. 191 TO MEADOW VILLAGE STATION 0+00 TO 159+00

Existing Land
Use Description

Impacts Described

Station 80+01 to 159+00 falls principally within the Big Sky of Montana development area consisting of Sections 35, 36 and the south half sections 25 and 26. To the north of the proposed U.S. 191 Spur alignment is located Meadow Village principally consisting of a grocery store, bar-restaurant combination, convention center, hostels and condominiums developed around an 18 hole golf course and tennis recreational facilities. An access road connects with the proposed U.S. 191 Spur alignment at Station 130+00 providing access to 17 intermixed permanent and seasonal residential units located to the south of Meadow Village along with a 20 unit mobile home court. A residential access street junctions with the proposed alignment at station 154+00. Residential development within the Meadow Village area is substantially more concentrated ranging from one dwelling unit per acre in the Sweet Grass Hills subdivision to over 20 units per acre in Meadow Village proper. Total dwelling units in the Meadow Village area amount to 319.

The proposed U.S. 191 Spur alignment follows primarily the existing road alignment constructed by Big Sky of Montana. With the exception of additional right of way present land use activities particularly residential units would not be encroached upon. Land use activities of a high traffic generation nature such as commercial area, convention center, restaurant-bar, golf course, hostels and condominiums are located in the vicinity of the proposed new alignment and would be little affected by existing or future traffic volumes. Access to the proposed U.S. 191 Spur will be restricted by Big Sky of Montana on both sides of the alignment to a pre-planned street system. Present Big Sky Master Plan land use designations immediately adjacent to the alignment include open space. It is recommended that a formal no access agreement be stipulated in this area. Existing residential development for the most part has been developed in light of the location of the proposed alignment. There doesn't appear to be any significant impacts to the Meadow Village neighborhood area or residences either existing or proposed.

2. Commercial

Present Commercial and service facilities are located adjacent to station 0+00 and

It is doubtful that commercial and service facilities at Big Sky would serve more of a trade

TABLE XVIII cont.

U.S. 191 TO MEADOW VILLAGE STATION 0+00 to 159+00

Existing Land
Use Description

Impacts Described

include a gas station, Big Sky Administration Office and Information Center and would require access to the proposed U.S. 191 Spur alignment. The Meadow Village Commercial Center containing a total gross floor area of 16,584 sq. ft. adjoins Little Coyote Road, a collector street, gaining access to the proposed Spur alignment at station 104+00.

area than residents and guests of the West Fork. Present commercial facilities at stations 0+00 and 104+00 would be unaffected in terms of right of way requirements. Through increased traffic volumes, improved access, and proposed intersection improvements to accommodate turning movements at the intersection of the U.S. 191 Spur and Little Coyote Road positive impacts would result to the Meadow Village Commercial Center. In the Big Sky of Montana Master Plan note is taken that the commercial center abuts the proposed alignment for approximately 400 feet along with an additional 400 ft. designated as employee housing. Additional access to the U.S. 191 Spur should not be permitted at present or at a later date due to the close proximity of the intersection at station 104+00.

3. Industrial

There do not appear to be any land uses of industrial nature located between stations 0+00 to 159+00.

Significant impacts either of a positive or negative nature would result to industrial land use activities.

4. Recreational

From Station 0+00 to 80+00 there aren't any known designated recreational activities. Undesignated recreational activities through this area consist mainly of scenic and wildlife viewing from passing motorists. Station 80+01 to 159+00 consists of designated open space and the Big Sky of Montana Meadow Village Golf Course.

The two lane proposed highway facility from 0+00 to 80+00 should not interfere with undesignated recreational activities. Since the proposed alignment principally follows the recently constructed road by Big Sky of Montana large amounts of land for right of way purposes will not be required. It is possible that during the construction phase additional noise may push wildlife back from being viewed. A study should be completed reviewing wildlife impacts. Additional right of way requirements from station 80+01 to 159+00 would not substantially affect the open space or Golf Course at Meadow Village.

TABLE XVIII cont.

U.S. 191 MEADOW VILLAGE STATION 0+00 TO 159+00

	Existing Land Use Description	Impacts Described
5. Public Facilities	The only public facilities near the U.S. 191 Spur alignment appear to be the church facility (soldiers chapel) located near station 0+00. A fire station is located just north of the commercial center in Meadow Village.	The chapel located between station 0+00 and 10+00 is located 400+ feet south of the alignment and has access to U.S. 191. Minimum noise impacts to the facility are anticipated, however, additional access to the U.S. 191 Spur may be requested at approximately station 10+00. Improved access to the church facility from the West Fork area is considered a positive impact. This same positive impact from improved access and convenience of travel would also result for school children of the West Fork area and improved response time to West Fork dwellings from the fire station located at Meadow Village. Future plans are being considered to relocate the Meadow Village fire station to a site between the two villages.
6. Utilities	With the exception of power and telephone the only utilities are located at Meadow Village consisting of a central water well and sewage treatment ponds. Remaining development in the West Fork area utilizes individual wells and cisterns for water supply and septic tank wastes.	Meadow Village utility systems were pre-planned anticipating location of an arterial system which is being followed by the alignment of the U.S. 191 Spur. Major modifications are not anticipated from station 0+00 to 159+00 to utility systems.
7. Historical and Archaeological Sites	An archaeological survey in the West Fork Area has been conducted by Montana State University Scientists. Their investigation yielded 7 archaeological sites which were open, seasonal campsites on glacial till or local colluvium and alluvium. None of the sites were characterized by lengthy cultural and/or depositional histories. No visible surface, cairns, tipi rings or rock lines were found	Disturbances to significant historical and archaeological sites are not anticipated. The Montana Department of Highways has a continuing agreement with the University of Montana which provides for investigation and preservation of any artifacts discovered during construction.

TABLE XVIII cont.

U.S. 191 MEADOW VILLAGE STATION 0+00 TO 159+00

Existing Land
Use Description

Impacts Described

8. Agricultural

Previous to the Big Sky development the West Fork was primarily used for ranching and logging. Since this time Big Sky of Montana constructed, except for surfacing, a road from U.S. 191 to the Meadow Village which basically meets the specifications of the Montana Department of Highways in terms of alignment and grade.

From station 0+00 to 60+00 the proposed alignment clears the West Fork drainage bottom land which would be considered prime grazing land. Combination timber-grazing land utilized through this area for the U.S. 191 Spur right of way amount to 16.5 acres. Of this amount approximately 8 acres was previously used for road purposes. A net impact of 8 acres would result for this portion of the road. From Station 60+00 to 80+00 the proposed U.S. 191 Spur alignment crosses a large Meadow area requiring approximately 5.5 acres of agricultural land. The remaining portion to station 159+00 is included in the Big Sky of Montana development comprising of approximately 21.8 acres.

9. Natural Resources

From station 0+00 to 159+00 the West Fork of the Gallatin River is crossed at station 10+00 and 57+00 by the proposed alignment. Scattered forest cover was located between station 10+00 and 60+00 previous to construction by Big Sky of Montana.

Two adequate stream crossing structures have been placed along the U.S. 191 Spur alignment using pipe culverts. Channel changes were confined to minor modifications at the inlets and outlets of the culverts. Minor forest and scrub removal was required between station 10+00 and 60+00 approximately 14 acres, during construction of the road bed by Big Sky of Montana.

10. Other Impacts to
Land Use

a. Community
Cohesiveness

Present development in the West Fork Area from station 0+00 to 159+00 other than Big Sky is minimal, low density, somewhat isolated with social patterns individualistic in character. The Big Sky Meadow Village on the other hand is a more urban oriented, concentrated, service requiring, recreational oriented development designed around the proposed U.S. 191 Spur alignment. The proposed alignment would not appear to have divisive or disruptive effect on the Meadow Village or adjacent residents but would allow more convenient access to surrounding educational, governmental, religious, shopping facilities and transportation facilities at Bozeman and West Yellowstone.

TABLE XVIII cont.

U.S. 191 MEADOW VILLAGE STATION 0+00 TO 159+00

Existing Land
Use Description

Impacts Described

b. Land Use Activity
Changes

Substantial pressures for land use activity changes are and will continue to takeplace in the West Fork area due in large part to Big Sky of Montana. Lands owned and operated by Big Sky of Montana Station 80+00 to 159+00 will for the most part be controlled through private land restrictions. However review of these restrictions should be undertaken to insure adequate land restrictions. However review of these restrictions should be undertaken to insure adequate access control is provided particularly from station 0+00 to 9+00. From station 30+00 to 80+00 all land holdings adjacent to the proposed U.S. 191 Spur alignment are in private ownership. With the proposed new U.S. 191 Spur and higher traffic volumes the section of the highway will be subjected to considerable pressure for highway related commercial facilities and residential development as well as south of stations 80+00 through 159+00. Subdivision regulations are in effect for Gallatin County. Study should be made as to their effectiveness in regulating land use and providing some form of access control. If not effective the Montana Department of Highways should investigate access control measures.

c. Development Pattern
Impacts

The proposed U.S. 191 Spur will have a tendency to cause future development particularly from station 0+00 to 80+00 to substantially concentrate along the alignment. This is due in large part from surrounding severe topography, the close proximity of Big Sky, the higher cost of living accommodations at Big Sky, and the existence of a new improved surfaced highway facility.

d. Accessibility

Substantial benefits will result from construction of the U.S. 191 Spur in terms of easier access, greater convenience, time savings, reduced vehicle maintenance costs, and safety will result to West Fork Residents and Big Sky guests from construction of the proposed highway facility. This improved accessibility provides advantages in terms of improved travel to work, year around use of their recreation dwelling unit investment, access to regional shopping facilities, air and rail transportation, improved advantages of the increased accessibility will be a lowering of the natural qualities formerly enjoyed by West Fork residents. Through increased population numbers, increased residential, commercial and recreational development, higher traffic volumes and a substantially greater increase in activity.

TABLE XVIII

U.S. 191 MEADOW VILLAGE STATION 0+00 TO 159+00

Existing Land
Use Description

Impacts Described

B. Secondary Impacts

More Rapid Land Development

The proposed U.S. 191 Spur will stimulate other actions. The proposed highway facility will accommodate greater traffic volumes thereby inducing more rapid land development at Big Sky and particularly on private land holdings which were previously inaccessible during the winter months. Improved travel and greater traffic volumes will provide an attraction for development of commercial and transient related facilities along its alignment.

Changed Patterns of Social and Economic Activities

Present low density agricultural oriented rural individualism will change to a more urban oriented service demanding pattern of social and economic activities. Increasing densities will require needs for larger utility systems, fire and police protection, and expanded school facilities. The local Ophir School was expanded in 1973 to accommodate Big Sky of Montana growth as additional development takes place ultimately a new elementary school facility may be required in the West Fork within the next twenty years. High school expansion is taking place in Bozeman to accommodate additional student populations. These student populations to a large degree are the result of Big Sky employee families however as additional service supporting facilities evolve additional student populations will be generated. Property values have and will increase as will the tax base. However increased tax revenues to Gallatin and Madison County will build slow in comparison to the immediate demand for services.

TABLE XIX

IMPACTS UPON NARROW BAND ADJACENT TO U.S. 191 SPUR

MEADOW VILLAGE STATION 159+01 TO MOUNTAIN VILLAGE STATION 494+41.7

Existing Land Use Description	Impacts Described
A. Primary Impacts	
1. Residential- Neighborhood and Housing Impacts.	Station 159+01 to station 200+00 of the U.S. 191 Spur provides a proposed alignment around Big Sky's Meadow Village, which to the north and east includes mainly small platted single family lots 4 to 5 units per acre and a small 5 acre area designated for possible future development. These lots were platted in conformance with an originally proposed alignment appearing to the east of the Montana Department of Highways U.S. 191 Spur proposed alignment. Little Coyote Road, collector street, encompassing the north side of the Golf Course and providing collector service for approximately 90 large lots, 120 small lots, 4 multi family lots and 42 hostel units connects with the Meadow Village Commercial Center. To the west of the proposed U.S. 191 Spur alignment are located two possible development area designated for residential lots comprising of approximately 60 acres and 35 acres. Andesite road, collector road, intersecting the proposed alignment at station 178+)) would serve these two designated areas plus an existing 40 pad mobile home park and existing 172 pad camper village. The Dude Ranch road serving 16 cabin units intersects the proposed For the most part impacts to the Meadow Village neighborhood or community will not be significant since any existing residential development that has taken place is located approximately 1000+ feet back from the proposed U.S. 191 Spur alignment. Both existing and proposed residential development has been either located or proposed with the U.S. 191 Spur alignment located approximately as proposed. The proposed alignment will service local access roads and collectors as designed in the Big Sky of Montana Master Plan. The proposed U.S. 191 Spur alignment in Meadow Village vicinity will act to separate and reduce possible residential land use activity conflicts such as camper village, mobile home village, low density residential structures, medium density residential structures, and high density lease and unit type facilities. Modifications required in the U.S. 191 Spur alignment to meet required highway design standards which deviate from the proposed Big Sky Master Plan arterial design are not significant but will require some minor alteration of residential tracts and some areas designated as possible development. The following describes impacts in the Meadow Village vicinity from station 160+00 to 210+00. (1) Station 160+00 to 178+00 right of way will require approximately 6 acres of open space designated area. (2) Station 178+00 to 183+01 right of way will require approximately 500 feet or 2 acres of land designated for possible development.

TABLE XIX cont.

MEADOW VILLAGE STATION 159+01 TO MOUNTAIN VILLAGE STATION 494+41.7

Existing Land Use Description	Impacts Described
U.S. 191 Spur alignment at station 202+00.	(3) Special intersection design consideration should be given the West intersection of Little Coyote Road and the U.S. 191 Spur at station 190+00.
From station 200+00 to station 235+00 the proposed U.S. 191 Spur alignment passes through and 85+ acre area designated for possible residential lot development.	(4) Station 192+00 to 199+00 alignment shift would require modification of 3 designated residential lots. This modification may have already taken place by Big Sky of Montana.
Another 45+ acre area designated for possible future residential development occurs north and east of the proposed alignment between stations 200+00 and 245+00.	(5) Station 200+00 to 235+00 alignment change would require approximately 13 acres of right of way in an area designated as possible residential development.
Station 275+00 access is provided section 34 owned by Burlington Northern.	(6) Remaining alignment shifts to station 260+00 take place in an area designated as open space.
Station 260+00 to 330+00 north side of the proposed alignment is bounded by a possible development area of 300 acres.	Impacts Station 260+01 to 400+00 (1) At station 275+00 access provided the Burlington Northern property will be open section 34 in addition to Andesite Road to further development.
Station 280+00 to 318+00 on the south side of the proposed alignment is bounded by a possible development area of 45 acres.	(2) From station 280+00 to 318+00 the U.S. 191 Spur alignment alters from the Big Sky Master Plan proposed alignment due to a slide area. This modification in alignment would require approximately 12 acres of new right of way through an area designated for residential development consisting of 500 future lots.
Approaching the Mountain Village area an access road to proposed, but undeveloped single and multi family residential development junctions the proposed alignment at station 399+00.	(3) Station 235+00 to 395+00 crossing section 28 is under the ownership of Burlington Northern opening up another possible 140 acres to recreational development in addition to 200 acres of Big Sky of Montana land designated for possible development.
Two small proposed residential lot areas	Impacts station 400+01 to 494+41.7 Station 420+00 to 435+00 has been altered in the proposed Spur alignment requiring approximately

TABLE XIX cont.

MEADOW VILLAGE STATION 159+01 TO MOUNTAIN VILLAGE STATION 494+41.7

Existing Land Use Description	Impacts Described
occur adjacent to the proposed alignment one area at station 440+00 consists of 10 lots. The other area at station 450+00 consists of 8 lots with access to the lots using the old road alignment.	6 acres of open space designated land. The shift of alignment could allow the existing right of way to be utilized as a turnout or converted back to open space. Station 443+00 considerable land fill and timber removal would be required to cross the 600 foot wide drainage at Beehive Creek. The crossing aside from reducing the recreational environment would call for substantial modification of the proposed lots in the Beehive Creek drainage to the north. Station 460+00 to 480+00 leaves the existing roadway requiring approximately 1 acre of area designated for possible development, 1.5 acres of open space, 1.5 acres of undeveloped multi family tracts, and 2 acres of area designated for later possible development. This tract designated for possible development would be split by the proposed spur alignment leaving approximately one acre on each side of the right of way. It is possible that two platted lots would have to be modified slightly in order to gain adequate right of way at station 430+00. . Special intersection consideration should be given the two Mountain Village collector systems at station 465+00 and at 475+00.
Station 452+00 to station 465+00 includes a possible development area consisting of 14+ acres.	
At station 467+00 the alignment leaves the original proposed alignment intersecting between station 470+00 and 475+00 a portion of a multi-dwelling tract and between stations 475+00 and 480+00 a small tract of 5 acres for possible development.	
The main collector street to Mountain Village intersects the proposed Spur alignment at station 475_00.	
Undeveloped residential lots bound both sides of the proposed Spur alignment along with intersecting access streets between station 477+00 and 485+00.	Except for minor modification of proposed residential areas impacts to existing and proposed residential areas would be minimal. Relocation of housing either permanent or seasonal would be required by the proposed U.S. 191 Spur alignment
Station 486+00 to station 494+41.7 is bounded to the south of the proposed Spur alignment by proposed residential lots and to the north by designated open space.	

TABLE XIX cont.

MEADOW VILLAGE STATION 159+01 TO MOUNTAIN VILLAGE STATION 494+41.7

Existing Land
Use Description

Impacts Described

2. Commercial

Commercial activities along the station 159+01 to 494+41.7 segment of the U.S. 191 Spur are limited to Big Sky's Mountain Village. These commercial facilities consist of a convention center, hostels, a hotel, and within the commercial core, cafeterias, liquor store, restaurants, real estate offices, delicatessen, two lounges, drugstore, two gift shops and sporting goods store.

Commercial facilities at Mountain Village are concentrated in two areas, the commercial core-hotel area and in a high density multi family area. Both areas are located an approximate distance of 1000 ft. from the proposed Spur alignment. Present commercial gross floor space amounts to almost 30,000 square feet meeting existing resident and guest demands at Mountain Village. The highway improvement will create a positive impact to commercial facilities by increasing accessibility for residents and guests thereby increasing retail sales and service receipts. As more of the Big Sky Complex is developed an additional 40,000 square feet of gross commercial floor area is proposed. Considerable study should be given to intersection design at Stations 465+00 and 475+00. Traffic volumes have been estimated in Section III. It appears that Mountain Village businesses would benefit as well as the local economy.

3. Industrial

Aside from construction and maintenance material and equipment land use classified as industrial does not appear along the proposed U.S. 191 Spur alignment from station 159+01 to station 494+41.7.

With the absence of industrial land use activities neither positive or negative impacts result from the proposed alignment.

TABLE XIX cont.

MEADOW VILLAGE STATION 159+01 TO MOUNTAIN VILLAGE STATION 494+41.7

4. Recreational	Existing Land Use Description	Impacts Described		
	The entire West Fork and Gallatin Canyon are utilized for recreational purposes. Primary activities of a recreational nature taking place within the West Fork include recreational cabins, camping, snowmobiling, hunting, fishing, ski touring, hiking, alpine skiing, tennis, boating, golf, horseback riding, and sight seeing. Increased accessibility caused by the construction of the U.S. 191 Spur will have different impacts depending on the type of recreational activity.	General * assumptions could be made concerning impacts to recreational activities as a result of increase accessibility, more users, and recreation conflicts. (A Progress Report submitted to the National Science Foundation RANN Program, Montana State University, Bozeman, Montana, May, 1972.)		
		Recreational <u>Activity</u>	<u>Impact</u>	<u>Reason</u>
		Recreational cabins	Positive	Easier access summer & winter
		Camping	Positive	More convenient access
		Snowmobiling	Positive	Easier access during winter
		Hunting	Negative	More population and development reduces wildlife habitat and hunter success
		Fishing	Negative	Increased fishing pressure and possibly of stream pollution.
		Alpine Skiing	Positive	Easier access
		Tennis	Positive	Easier access
		Hiking	Both Positive & Negative	Easier access but reduces natural experience
		Golf	Positive	Easier access

TABLE XIX cont.

MEADOW VILLAGE STATION 159+01 TO MOUNTAIN VILLAGE STATION 494+41.7

Existing Land
Use Description

Impacts Described

<u>Recreational Activity</u>	<u>Impact</u>	<u>Reason</u>
Horseback Riding	Both Positive & Negative	Easier access but reduces natural ex- perience
Sightseeing Wildlife Viewing	Positive Negative	Easier access Access and development would tend to push back wildlife from viewing
Cross Country Skiing	Both Positive & Negative	Easier access but reduces natural ex- perience and creates man made barrier.

* Assumptions are based on the major portion of recreational users in each activity.

The proposed Spur alignment other than increasing accessibility and requiring a small amount of land will not encroach upon designated recreational land use activity areas existing or proposed. Remaining portions of the existing Lone Mountain Road could be converted back into open space or in areas designated for future development incorporated in subdivision design.

MEADOW VILLAGE STATION 159+01 TO MOUNTAIN VILLAGE STATION 494+41.7

Existing Land
Use Description

Impacts Described

5. Public Facilities	The only facilities of a public nature in the upper portion of the U.S. 191 Spur appear to be the Day Care Center operated by Big Sky of Montana at Mountain Village and the Medical Center Station 300+00.	The Day Care Center is a semi-public facility under the supervision of Big Sky of Montana and reflects guest and user attendance at Mountain Village consisting of 2000 square feet and two employees. The Medical Center, privately owned by a group of physicians, serves the entire Big Sky development. Present plans indicate almost a tripling of the Center's beds and staff. The proposed road facility would assist in shortening emergency response time from the two villages to the Medical Center.
6. Utilities	With the exception of power and telephone the only remaining utilities are located at Mountain Village.	Mountain Village utility systems were pre-planned anticipating location of an arterial system being followed by the alignment of the U.S. 191 Spur. Major modifications to utility systems are not anticipated from station 159+01 to 494+41.7.
7. Historical and Archaeological Sites	An archaeological survey in the West Fork Area has been conducted by Montana State University Scientists. Their investigations yielded 7 archaeological sites which were open, seasonal campsites on glacial till or local colluvium and alluvium. None of the sites were characterized by lengthy cultural and/or depositional histories. No visible surface features such as burials, cairns, tipi rings or rock lines were found.	Disturbances to significant historical and archaeological sites are not anticipated. The Montana Department of Highways has a continuing agreement with the University of Montana which provides for investigation and preservation of any artifacts discovered during construction.
8. Agricultural	Previous to the Big Sky recreational complex right of way lands were used for timber, production and leased grazing. Retained by the Burlington Northern are Sections 28 and 34 which would have small portions used for the U.S. 191 Spur right of way.	From station 159+01 to 494+41.7 total right of way impacts to (pre-Big Sky development) timber production and grazing lands would amount to approximately 123 acres (total length of alignment).

MEADOW VILLAGE STATION 159+01 TO MOUNTAIN VILLAGE STATION 494+41.7

Existing Land
Use Description

Impacts Described

9. Natural Resources

a. Stream Crossings

The proposed U.S. 191 Spur alignment from station 159+01 to 494+41.7 principally falls within the West Fork of the Gallatin River drainage area.

Alignment crossings appear at 5 locations along the upper portion of the U.S. 191 Spur. Study should be made of each location by a biologist and hydraulologist to determine possible impacts associated with proposed highway stream crossing structures. Location of structures are as follows:

<u>Stream or Drainage</u>	<u>Station</u>	<u>Type</u>
(1) West Fork Main Stream	185+00	Perennial
(2) North Fork of West Fork	202+00	Perennial
(3) Drainage West Fork	299+00	Perennial
(4) Beehive Creek	445+00	Perennial
(5) Drainage Mountain Village Pond	475+00	Intermittent

b. Forestland

Lodge Pole Pine interspersed with minor amounts of Douglas Fir and Englemann Spruce occur along the proposed U.S. 191 Spur upper section.

Approximately 18 acres of forestland would fall within the proposed alignment right of way and would require removal. The largest timber removal areas occur (1) Station 270+00 to 322+00 in an attempt to climb above an active slide zone and (2) station 442 to 451 crossing the Beehive Creek drainage.

10. Other Impacts to
Land Use(a) Community
Cohesiveness

Present development from station 159+01 to 494+41.7 is largely the result of Big Sky of Montana construction since 1970. The proposed U.S. 191 Spur alignment closely conforms to the original proposed Big Sky of Montana Master Plan arterial alignment. Existing land use activity areas will not be encroached upon. Minor modifications to the land use development plan will be required but areas affected are presently undeveloped. Development patterns and concepts incorporated in the Big Sky Plan relative to community cohesiveness would be retained with negative divisive impacts minimal.

(b) Land Use Activity
Changes

The proposed U.S. 191 Spur from Meadow Village to Mountain Village will through increased accessibility and greater traffic volumes provide substantial pressures for land use

TABLE XIX cont.

MEADOW VILLAGE STATION 159+01 TO MOUNTAIN VILLAGE STATION 494+41.7

Existing Land
Use Description

Impacts Described

activity changes. For the most part land use activity patterns are already set for Big Sky of Montana lands however considerable latitude appears to exist in areas designated for possible development. Areas of potential land use activity changes to possible commercial activities appear on section 27, T6S, R3R and two smaller possible development areas at stations 460 and 480 at Mountain Village. Already underway are plans for doubling the commercial floor space to Mountain Village. Sections 20, 28 and 34 are currently under the ownership of the Burlington Northern Railroad. These sections would be subject to development pressures particularly with the proposed U.S. 191 Spur right of way adjoining or crossing these lands.

c. Development Pattern
Impacts

Construction of the U.S. 191 Spur would not affect the existing development pattern or deviate from the proposed development pattern. Major development will still be located near or adjacent to the Meadow Village and Mountain Village communities. A negative impact caused by the Spur will be through increased traffic the allowance of Big Sky to expand Mountain Village commercial and recreational facilities in an environmentally fragile area which is the most difficult for the Montana Department of Highways to construct a road facility to. Additional possible problems appear by the fact that the Montana Department of Highways had to reduce its designs standards in order to minimize environmental impacts. With the additional development proposed and reduced volume capacity how long would it be before the proposed Spur facility becomes inadequate?

d. Accessibility

Substantial improvement in terms of access, convenience, time savings, reduced vehicle maintenance costs, and safety will result to Big Sky development residents and guests from construction of the proposed U.S. 191 Spur highway facility. Trip purposes receiving benefits include work trips, access to regional shopping facilities, access to air and rail transportation at Bozeman, school trips and enjoyment of recreational facilities in other parts of the region. Disadvantages of the increased accessibility will be a lowering of the natural qualities formerly enjoyed by local residents.

A. Secondary Impacts

More Rapid Land Development

The Meadow Village to Mountain Village portion of the U.S. 191 Spur will stimulate more rapid land development through accommodating greater traffic volumes, providing easier access during all seasons of the year, and increasing exposure to available residential lots and condominium units for sale through Big Sky of Montana. Advantages of the proposed U.S. 191 Spur will be that existing and future property owners will be able to obtain greater benefits and returns on their investments since the new highway facility will be an all-season road on Montana Federal Aid Primary System.

TABLE XIX cont.

MEADOW VILLAGE STATION 159+01 TO MOUNTAIN VILLAGE STATION 494+41.7

Existing Land
Use Description

Impacts Described

Changed Patterns of Social and Economic Activities

For the most part transition from the individualistic rural ranch and timber oriented economy took place in 1970 with commencement of construction of Big Sky of Montana. The proposed U.S. 191 Spur from Meadow Village to Mountain Village will assist in completing this transition to a more urban, recreation oriented, service demanding populace.

Community Facilities and Inducement of New Facilities

Water and sewer facilities have already been developed through advantages of higher density development within Meadow Village and Mountain Village thereby reducing environmental impacts over a larger geographic area. Accomplishment of higher density development is dependent on an arterial highway connecting the two villages with U.S. 191. The proposed U.S. 191 Spur implements this concept. However as more development takes place additional community facilities and services such as schools, fire stations, etc. will be required as described in the existing and proposed land use section of this report.

V. Planning Status

A. Local Planning Organization and Administration

The Bozeman-Gallatin City County Planning Board has the responsibility for developing planning programs for the City of Bozeman and its surrounding planning jurisdictional area. The City-County Planning Board also acted as a reviewing agency for subdivisions and development plans within Gallatin County until 1974 with the required adoption of mandatory county subdivision regulations. Earlier efforts by the Bozeman-Gallatin City County Planning Staff to organize Area Planning Organizations to meet rapid development pressures throughout the Gallatin County were discouraged by local voters. With the passing of Gallatin County Subdivision Regulations in 1974 came a transfer of the responsibility of subdivision and development plan review to a planning coordinator office located in conjunction with the Gallatin County Surveyors Office. The Gallatin County Board of Commissioners have final approval or denial powers of subdivision plats and development plans.

B. Land Use Planning

The appearance of Big Sky of Montana, Inc. as a large scale developer was responsible for a new and more powerful incentive for planning. In March, 1970, a group of Canyon landowners and residents formed an organization, known as the Gallatin Canyon Property Owner's Association, to deal with the potential problems associated with the impact of the proposed recreation complex. The Gallatin Canyon Property Owner's Association a few months later came under considerable internal stress as members debated the issues of planning and zoning for the Canyon. After seven meetings the organization voted to disband in early June of 1970.

Toward the end of June, 1970, some of the Canyon residents and property owners initiated a new organization, the Gallatin Canyon Association. Issues involving planning and zoning were still debated by individual

property owners within the Canyon, but conflict among members of the association seemed to diminish. The State Planning Division was then petitioned to go ahead with arranging for preparation of a Canyon Comprehensive Plan. A California Planning Firm was hired by the State agency to conduct a planning study and to prepare a report recommending a land use plan for the Gallatin Canyon under the direction of Association's Citizens Advisory Committee and Technical Advisory Panel. The final report on the Gallatin Canyon plan entitled "The Gallatin Canyon Planning Study", Murray-McCormick Environmental Group, Sacramento, California was circulated in July, 1972. After much discussion and continuing dissension on the part of some Canyon residents, in December, 1972, the final report was accepted, in principle, by the Citizen/s Advisory Committee. The committee also alerted concerned State agencies of those aspects of the plan pertaining to their areas of jurisdiction and authorized submission of the plan to the Gallatin Canyon Association for consideration. No further public action has been taken to implement a land use plan for the Canyon.

The following presents a review of The Gallatin Canyon Planning Study objectives, policies, and proposals as related to circulation:

Objectives

Two primary objectives appear in the study which have bearing to the U.S. 191 Spur.

- (1) U.S. Highway 191 will be kept to a two-lane facility, with a minimum carrying capacity figure of 4,800 vehicles per day.
(As of yet the impact in terms of anticipated traffic volumes of the U.S. 191 Spur and its relationship relative to additional volume loads on U.S. 191 have not been determined.)
- (2) A highway to connect the Ski Village near Big Sky to the Madison Valley near Ennis. (At this time and in the foreseeable future due to constructing obstacles, environmental impacts and costs of construction the extension of the U.S. 191 Spur through to the Madison Valley appears unfeasible.)

Policies

Conformance of the U.S. 191 Spur

- (1) Promote and encourage the orderly and timely development of the general circulation throughout the Canyon;
- (2) Program balanced expansion of the Canyon circulation system in terms of both need and the expressed planning goals;
- (3) Analyze thoroughly the impact of specific highway improvements on the Canyon environment prior to any actual construction activity;
- (4) Utilize the concept of low-speed recreational and scenic roadways to preserve and enhance the scenic and cultural values of the existing area environment;
- (5) Improvement to Highway 191 should be designed to provide the maximum pleasurable driving experience rather than to facilitate high speed travel;
- (6) Roadside rest areas and scenic viewpoints should be developed at relatively frequent intervals where local site conditions are compatible. Specific locations should be approved by local jurisdictions and the State Highway Commission wherever their jurisdictions are compatible in accordance with existing law; and
- (7) Maximum daytime speed control of 55 mph should be established for Highway 191 as it traverses the study area and that this limit be actively enforced by the appropriate governing agencies.

The proposal is in accord with this policy.

The proposal serves recreational land use activities. A major development goal of the study is the encouragement of recreational development.

Presently accomplished through Montana State University and Montana Department of Highways Environmental Impact Study.

Montana Department of Highways is attempting to scale down highway design standards to preserve existing area environmental qualities.

Undetermined, but may become a reality out of a necessity to comply with the objective of keeping U.S. 191 as a two lane facility.

As of yet not included in the U.S. 191 Spur design.

Presently a 55 mph speed limit is set for the entire State of Montana by law.

Development Proposals

Conformance of the U.S. 191 Spur

- | | |
|--|--|
| (1) Provide a right-of-way of sufficient size to contain:
-Two paved travel lanes (highways should not exceed two travel lanes);
-Shoulders;
-Safety and snow storage strips;
-Pathways for safe pedestrian-equestrian movements, when necessary, and with ties to external trail systems; and
-Screening and landscape treatment of unsightly roadway construction scars. | Conforms
Conforms
Conforms

Undetermined

Undetermined |
| (2) Use native vegetation to cover and screen, and use other devices to hide the scars of roadway cuts; | Undetermined but being considered by the Montana Department of Highways. |
| (3) Revegetate old borrow pits and hauls roads to eliminate any scars on the landscape; | Proposed |
| (4) Locate roadside rest areas, wayside picnic areas, and scenic viewpoints where the topography is compatible for the use of motorists; | Being Considered |
| (5) Ensure that all architectural and engineering elements relate pleasantly and are in harmony in material, color, and form to the local environment; | Undetermined |
| (6) Hold intersections with side streets and major thoroughfares to a minimum (where they must intersect, cross and left-turn movements should be limited by median and left-turn lanes. Roadside rest areas, wayside picnic areas, and scenic overlooks should be located at intervals where topography is compatible. Criteria for selection of these areas will involve topography, character view, possible multiple uses to reduce numbers and costs and safety); | Proposed |
| (7) Limit access to the street from adjoining properties (numerous curb cuts along the street should be avoided by utilizing single accesses serving several properties). | Proposed |

- | | |
|---|--|
| (8) Locate roads to avoid traversing open meadow areas; | Partial conformance (U.S. 191 to Meadow Village crosses open meadow area approaching lower village). |
| (9) Include the consideration of the need for elk and deer movement on slopes in road location and design and do not create travel barriers for big game animals; | Being Studied |
| (10) Require stringent clearing specifications compatible with the aesthetic values of the landscape; | Undetermined |
| (11) Minimize cut and fill slopes when feasible and utilize one-way roads to eliminate unnecessary road widths; | Conformance where possible. |
| (12) Utilize previous road gradings when they can be effectively incorporated into the over-all design and they do not exceed excessive gradients; | Conformance |
| (13) Do grading or earth moving operations with a minimum of disturbance to the natural ground which might result in unnatural forms; and | Proposed |
| (14) Protect residential areas from unnecessary vehicular noise disturbance and air pollution by providing sufficient right-of-way for protective screening. | Conformance |

C. Transportation Plans

The Montana Functional Classification and Needs Study classifies the 1990 system of highways for the State of Montana according to its uses or function and provides estimates of the costs to provide an adequate system of highways by 1990. Statutory authority originated from the Federal-Aid Highway Act of 1970 calling for the Secretary of Transportation to develop and include: "specific recommendations for the functional realignment of the Federal Aid systems. These recommendations shall be based on the Functional Classification Study made in cooperation with the State Highway Department and local governments as required by the Federal-Aid Highway Act of 1968 and submitted to Congress in 1970, and the Functional Classification and Needs Study now underway of the Federal-Aid Systems in 1990."

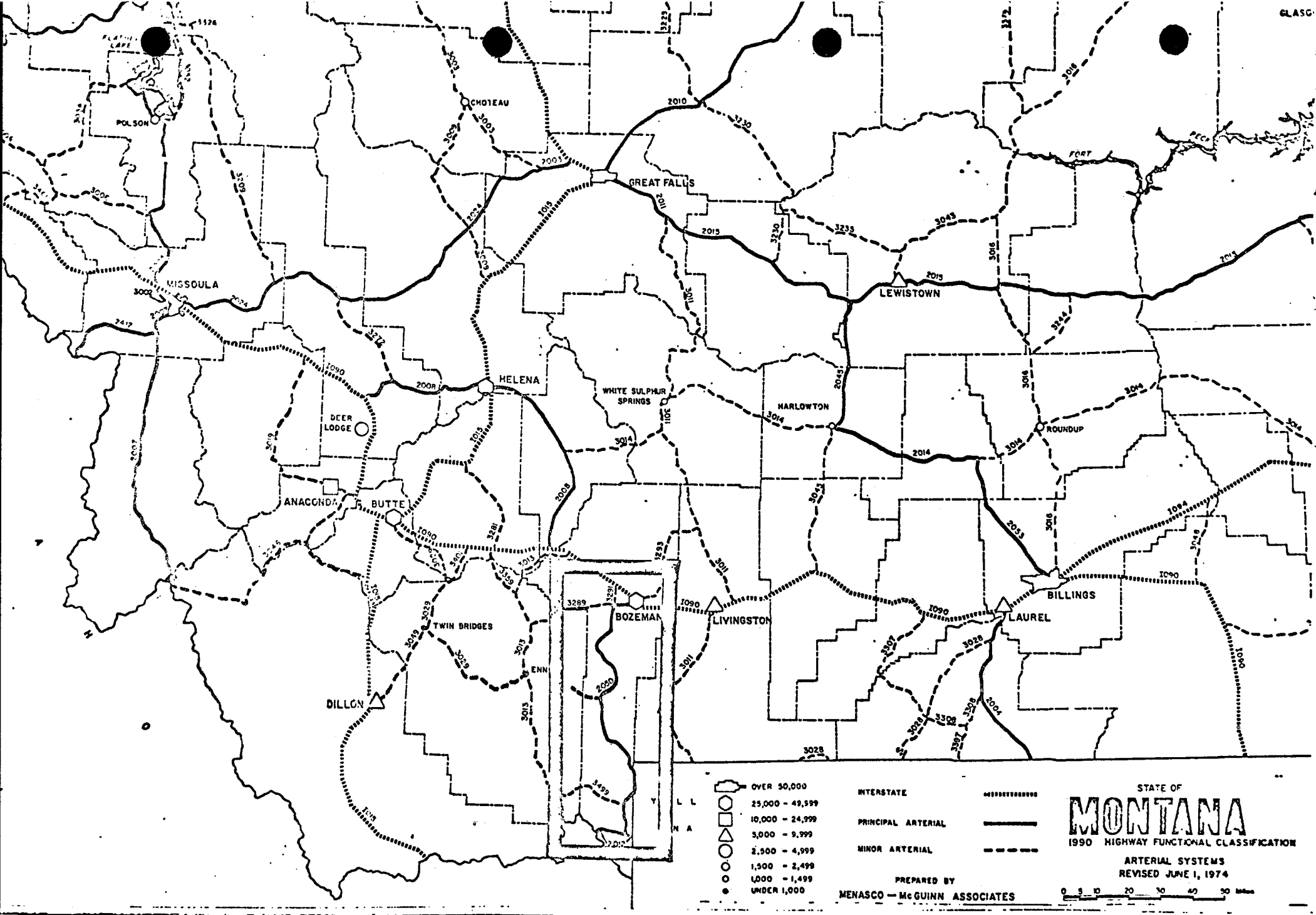
Figure 8 exhibits the 1990 Highway Functional Classification for the southwest portion of the State of Montana. According to the 1990 Montana Highway Functional Classification of arterial systems as revised June 1, 1974 U.S. 191 through the Gallatin Canyon is classified as a principal arterial with the proposed U.S. 191 Spur designated as a minor arterial.

Additional importance has been placed on the West Fork Lone Mountain Road by the area's designation as an economic growth center. In accordance with Section 143 of the Federal Highway Act of 1970 the Governor of the State of Montana selected the West Fork area as a Growth Center since it had the economic potential of contributing significantly to the development of the surrounding areas.

The proposed action, construction of the U.S. 191 Spur, therefore is in accordance with available transportation planning objectives.

D. Community Facility Plans

As far as can be determined from communication with the Gallatin County



Planning Coordinator the proposed U.S. 191 Spur Highway Project would not interfere or be in conflict with proposed community facility plans.

The Gallatin County Health Department and local residents have been seeking landfill sites. To date a land fill site has not been selected.

The Ophir School District recently expanded its elementary school facility in 1973 to accommodate student enrollments resulting from the Big Sky development. New plans for additional school facilities are not known at this time.

High School facilities at Bozeman are currently being expanded partially as a result of increased enrollment from the Gallatin Canyon and West Fork area and partly from increased expansion of enrollment from other portions of the Gallatin Valley.

Additional police and fire protection, sewage, water, parks and recreation facilities are presently not planned in the West Fork in which possible conflicts may evolve as a result of construction of the U.S. 191 Spur.

E. Local Regulations

- (1) Zoning - As of June 1975 zoning regulations were not adopted or zoning districts designated in accordance with Title 16, Chapter 41 and/or Chapter 47 of the Montana Revised Codes, 1947 in the upper portion of the Gallatin Canyon or West Fork areas.

Recently in the lower portion of the Gallatin Canyon from Buck Creek south an interim zoning district has been designated which places a moratorium on further development within the district. This allows the Gallatin County Commissioners and local residents one year in which to develop zoning regulations for the district.

The proposed U.S. 191 Spur project would not affect local

zoning districts or regulation objectives.

- (2) Subdivision Regulations - Gallatin County adopted county wide subdivision regulations in February of 1975 under the Montana Subdivision and Platting Act. Sections 11-3859 through 11-3876, R.C.M., 1947. The proposed construction of the U.S. 191 Spur does not appear to be in conflict with any portions of the Gallatin County Subdivision Regulations adopted February 26, 1975. New land subdivision and development under private ownership (secondary impacts resulting from construction of the U.S. 191 Spur) would be subject to review by the Gallatin County Commissioners and where permits are required the Montana Department of Highways. Review requirements however are subject to the discretion of Gallatin County concerning access control, capacity, and separation of through and local traffic.
- (3) Protective Covenants - On March 24, 1971 Protective Covenants of Big Sky of Montana Inc., Meadow Village, First Filing were filed with the office of the Clerk and Recorder of Gallatin County. The proposed construction of the U.S. 191 Spur does not appear to be in conflict with the Meadow Village protective covenants. Easements for roads are reserved as appearing on the Meadow Village Plot unless otherwise authorized by an appointed architectural committee. It is recommended in light of the potential magnitude of development that access control of some form be investigated. Also investigated should be the definition of road. Does the definition of road include all forms of access such as drives. Two tracts were left open for future development and could be utilized for parking. The type of land use activity this parking serves should be determined. Further research should be made of protective covenants involving other portions of Big Sky of Montana lands lying adjacent to the proposed Spur alignment.

VI. Planning and Design Measures Recommended to Minimize Harm From Unfavorable Adverse Environmental Effects.

A. Impacts to be resolved.

U.S. 191 Junction to Meadow Village

1. A raise in noise and activity levels will occur to adjacent residential permanent and seasonal units thereby causing a reduction in recreation qualities between station 0+00 to 80+00.
2. Future commercial and residential subdivision development anticipation on both sides of the proposed alignment in Section 31 from approximately station 40+00 to 80+00. Access control measures should be considered through this area.
3. Future land development, the Meadow Village Commercial Center and increased traffic volumes and turning movements would cause increased traffic congestion at Station 104+00. (Intersection of the U.S. 191 Spur with little Coyote Road)
4. Impact of the U.S. 191 Spur with respect to increased traffic volumes and the creation of a possible wild life barrier from station 0+00 to 80+00.
5. Utilization of 5.5± acres of agricultural land for right of way purposes.

Meadow Village to Mountain Village

1. Station 192+00 to 199+00 alignment shift would require modification of 3 designated residential lots.
2. Station 200+00 to 235+00 alignment change would require approximately 13 acres of right of way in an area designated as possible residential development.
3. From Station 280+00 to 318+00 modified spur alignment would encroach upon an area designated for residential development

consisting of 500 future lots.

4. Considerable modification would be required in terms of land fall and timber removal to cross the Beehive Creek drainage between station 443+00 and 451+00. These residential lots would require alteration.
5. Station 460+00 to 480+00 approximately 1.5 acres of undeveloped multi family tracts, and 2 acres of area designated for later possible development would be required.
6. Special intersection consideration should be given at station 465+00.
7. Special intersection consideration should be given at station 475+00.
8. The proposed alignments would have to make 5 stream crossings located on (1) West Fork Main Stream, (2) North Fork of West Fork, (3) West Fork Drainage, (4) Beehive Creek, (5) Intermittent stream providing flow to Mountain Village pond.
9. Required would be the removal of 18 acres of forestland for right of way purposes.
10. As the U.S. 191 Spur increases accessibility, and greater numbers of people seek available recreation activities greater conflicts will result particularly with respect to hunting, fishing, hiking, horseback riding and wildlife viewing.
11. Through increased accessibility and greater traffic volumes substantial pressures for land use activity changes will result. For the most part land use activity patterns are already set for Big Sky of Montana lands however considerable latitude appears to exist in areas designated for possible development. This condition coupled with commercial floor space expansion

plans, and the opening of Burlington Northern lands to development in Sections 20, 28 and 34⁽⁶⁵³⁰⁾ will substantially build traffic volumes on the U.S. 191 Spur upper portion. Development objectives and potential are working in conflict to the Montana Department of Highways objective to reduce as much as possible highway design standards in order to reduce environmental impacts in this environmentally fragile area.

General

Utilize the concept of low speed recreational and scenic roadways to preserve and enhance the scenic and cultural values of the existing area environment. This concept may become a reality out of necessity due to increasing development and traffic volumes, particularly if the objective of retaining a two lane facility through the Gallatin Canyon is adhered to.

B. Location Measures Recommended

1. Minimum deviation from present alignment

- A. Utilize previous road gradings when they can be efficiently incorporated into the over-all design and they do not exceed excessive gradients.
- B. Include the consideration of the need for elk and deer movement on slopes in the road location and design and do not create travel barriers for big game animals.
- C. Minimize cut and fill slopes.
- D. Do grading on earth moving operations with a minimum of disturbance to the natural ground which might result in unnatural forms.

C. Design Measures Recommended

- 1. Utilize minimum pavement width required.
- 2. Use native vegetation to cover and screen, and use the devices to hide the scars of roadway cuts.

3. Revegetate old borrow pits and haul roads to eliminate any scars on the landscape.
4. Ensure that all architectural and engineering elements relate pleasantly and are in harmony in material, color, and forms to the local environment.
5. Limit access to the U.S. 191 Spur from adjoining properties.
6. Special intersection design consideration should be given at stations 104+00, 190+00, 465+00, and 475+00.

D. Planning Measures Recommended

1. Encourage the adoption of zoning regulations by Gallatin County in order to regulate dwelling unit densities in the West Fork thereby preventing environmental degradation from over development and creating excessive traffic volumes on the proposed U.S. 191 Spur and U.S. 191.
2. Attempt to have Burlington Northern and private property owners within the West Fork to design Master Plans for intended development of their properties.
3. The Montana Department of Highways should work in conjunction with the Gallatin County Commissioners in the review of West Fork subdivisions in order to review and effectuate access control along the proposed U.S. 191 Spur.
4. Big Sky of Montana should be encouraged to Master Plan areas designated for possible development. Substantial setbacks should be required in those areas from the proposed U.S. 191 Spur in order to protect residential development from increasing vehicular noise disturbances.
5. An access control plan should be developed by the Montana Department of Highways incorporating the master plans of Big Sky of Montana,

Burlington Northern, and local private property owners.