

016

ALASKA LEGAL TITLE  
COMPLIES WITH  
986T-986T  
7/98

4064  
SJD  
SB 95



# RECORDS CERTIFICATION

I, the undersigned, an employee of the State of Alaska, do hereby certify that the microfilm images on this microform are accurate reproductions of the original records of the State of Alaska as accumulated during the regular course of business, and that it is the established policy and practice of this State to microfilm its records and to dispose of the original records after microfilm reproductions have been made.

*James O. Smith*  
Signature of Camera Operator

*11/7/89*  
Date

S B

9 5

6/7/85 1st hearing <sup>BILL CONTACT/ACTION</sup> - no testimony - held over

DATE	CONTACT/ACTION
1/24	Ned Jamieson - DNR will discuss
1/24	Kyle Cherry - State Engineer - Dam Safety
1/24	Mike Vediner - 2400
	Ned Fougner
	DNR - proposed amendments
1/28	Mike Frank 276-3550 - Asst A.G. - Anch.
	Halford - new language re: 46.17.120 unless "gross negligence?"
1/30	Bill Mallow - Risk Management 3603
	will work on language
2/3	Amendments delivered
2/5	called Mike Vediner DNR - will attend & Terry
2/18	Mary Lou Haire from Anchorage will attend
2/19	Mary Lou will NOT attend - SB 150 Cancelled FOR MUVS 2/20

# MEMORANDUM

# State of Alaska

TO: Ann Plunkett  
Committee Aid  
Senate Judiciary Committee

DATE: February 3, 1986

FILE NO:

TELEPHONE NO: 465-3603

FROM: Harold M. Brown  
Attorney General

SUBJECT: CSSB 95 - dams  
and reservoirs

By: <sup>6</sup> William G. Mellow  
Assistant Attorney General  
Special Litigation-Juneau

On the following pages I have suggested modifications in the CS for SB 95 which resolve the concerns expressed by Senator Halford that a dam owner should have a remedy against the state for state negligence which injures the dam owner. Alternative amendment no. 1 provides the owner with a remedy for ordinary negligence of the state, that is, the dam owner would have a remedy for damages caused by the failure of the state representative to act as a reasonably prudent person would under similar circumstances. Alternative amendment no. 2 is identical except that the standard of liability is stated to be limited to gross negligence, that is, the dam owner would have a remedy for damages caused by careless disregard for the consequences of an act or failure to act.

I have noted on my calendar that the bill will be under consideration February 4 at 1:30 p.m. I am now scheduled to be in depositions that begin in the morning and may run through into the afternoon. Additionally, preparation of a court memorandum has placed a time constraint upon me. For this reason, unless otherwise requested, I will not be present at the time of the hearing. However, if the event I am back in my office at that time, I can be present within five minutes of a phone message to my office requesting my presence.

WGM:jal  
Attachment

cc: Arthur H. Peterson (w/enc.)

A M E N D M E N T

Offered in the SENATE

By \_\_\_\_\_

TO: CSSB 95

Alternative Amendment No. 1

Page 4, line 28:

Delete "A" and insert "(a) Except as provides in subsection (b), a"

Page 5, between lines 13 and 14, insert:

"(b) A dam owner may bring an action against the state for damages caused an owner by state negligence in actions taken or by failures to act in exercise of state responsibilities under this chapter."

Renumber the following section accordingly.

STATE OF ALASKA  
**DEPARTMENT OF NATURAL RESOURCES**

**OFFICE OF THE COMMISSIONER**

BILL SHEFFIELD GOVERNOR

MAR 25 1985

POUCH M  
JUNEAU, ALASKA 99811  
PHONE: 907-485-2400

March 19, 1985

The Honorable Arliss Sturgulewski, Chair  
Senate Resources Committee  
Pouch V (MS 3100)  
Juneau, AK 99811

Dear Senator Sturgulewski:

Recently, the Resources Committee requested that we prepare new language for SB 95 which would place the responsibility for periodic dam safety inspections on dam owners. We have revised Section 46.17.050 to reflect the direction of the Resources Committee and a copy of the revised section is attached.

The revised Section 46.17.050 places the responsibility for periodic dam safety inspections on the dam owner. The very specialized nature of dam safety requires that the engineer who performs the inspection be approved in advance by the Commissioner of the Department of Natural Resources. This will insure that engineers with experience and expertise in dam safety inspections do the work. We will provide the qualification requirements for engineers in the regulations which will be promulgated under the proposed legislation. Without strict control on the engineers, we can create the potential for extreme risk to the public, as unqualified engineers may be selected by the dam owners based on cost alone. The revised language also reserves the right for the Commissioner to conduct any additional inspections as may be required. The additional staff inspections are necessary to monitor compliance with recommendations of the periodic dam safety inspections and other required owner inspections, to check owner-performed periodic dam safety inspections, and to investigate alleged violations of statutes and regulations. The remainder of the section is unchanged from the original draft.

We would like to point out that the philosophy represented by the revised language is a departure from that which the department has pursued in the past. We also would not be surprised by some objection from dam owners to the transfer of the cost of the periodic dam safety inspections. Further, more than 90 percent of dams covered by SB 95 are owned by municipalities and are used principally for public and industrial water supplies. The burden of paying for these periodic inspections could significantly impact these municipalities, especially the smaller ones. However, we agree with the committee's initiative because it places the burden on the user, resembles the state of the art as reflected by Pennsylvania and FERC programs, and will most certainly lower the financial burden to state government.

The Honorable Arliss Sturgulewski, Chair

Page 2

March 19, 1985

Due to the importance of the proposed Dams Safety Legislation to the safety of Alaskans placed at risk by dams, we would like to urge favorable consideration of SB 95. It is not a question of whether or not dams are going to fail, but whether the state will recognize its responsibility for public safety for non-federal dams. We must provide the necessary protection for the public through an adequate dam safety program to lower the odds on loss of lives and property and damage to natural resources.

We appreciate the continuing interest and assistance of the Senate Resources Committee in drafting dam safety legislation for the protection of Alaska's citizens. Please feel free to call on us for any assistance you require in the future.

Sincerely,



Esther C. Wunnicke  
Commissioner

cc: Tom Hawkins  
Mike Frank  
L. A. Dutton  
Water Resources Board

Sec. 46.17.050 INSPECTIONS. The commissioner shall cause each dam and reservoir subject to this chapter to be inspected by the owner at least once every five years. The inspections must be performed by an engineer qualified in dam design, construction, and safety and approved in advance by the commissioner. The owner must provide the commissioner with inspection reports subject to the approval of the commissioner and which are consistent with regulations promulgated under this chapter. The commissioner may require a dam and reservoir to be inspected more often than once every five years if the dam and reservoir have been classified as high or significant hazard potential or has been found to be an unsafe dam as a result of a dam safety inspection and the unsafe conditions have not been corrected. The commissioner may perform additional inspections as deemed necessary to protect lives, property, and natural resource. (The department shall inspect at least once every five years every dam and reservoir subject to this chapter.) Upon receipt of a written complaint alleging that the person or property of the complainant is endangered by the construction, enlargement, repair, alteration, maintenance, or operation of a dam or reservoir, the department shall physically inspect the dam or reservoir, unless the data, records, and inspection reports on file with the department are adequate to determine that the complaint has no foundation.

STATE OF ALASKA

DK → NR → BFA → DAV  
↓  
SB 95

BILL SHEFFIELD, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF LAND AND WATER MANAGEMENT

POUCH 7-005  
ANCHORAGE, ALASKA 99510-7005  
PHONE: (907) 561-2020

December 20, 1985

The Honorable Arliss Sturgulewski  
Alaska State Senate  
2957 Sheldon Jackson Street  
Anchorage, AK 99508

Re: CSSB 95, Dam Safety

Dear Senator Sturgulewski:

Recently we had the opportunity to discuss CSSB 95 and SB 150 with Senator Halford. Below we have addressed his concerns with the Resource Committee Substitute for SB 95. Due to our desire to completely respond to Senator Halford's concerns with SB 150, we will be sending you a similar letter on SB 150 in the near future when we have all the necessary information.

We propose the following changes in CSSB 95:

Section 46.17.040 - Delete the subsection (b) in its entirety and renumber (c) to (b) and (d) to (c). The concern which prompted subsection (b) will be covered in the revised definition of a "dam," Section 46.17.900(3).

Section 46.17.050 - Delete the second sentence in its entirety and substitute "The commissioner may inspect a dam or reservoir more frequently than every five years to protect public safety."

Section 46.17.060 - Delete the first sentence in its entirety and substitute:

In taking an action under this chapter, the commissioner, after giving two weeks written notice and being refused the right of entry, may seek a search warrant to allow inspection of the dam or reservoir. The commissioner, after being refused inspection of drawings, operational records, or other information concerning a dam or reservoir may seek an administrative subpoena compelling production of the drawings, operational records or other information.

Leave the last sentence unchanged.

Arliss Sturgulewski  
December 20, 1985  
Page 2

Section 46.17.120 - Senator Halford expressed concern that while this section appeared to provide ample protection for the state, it doesn't leave much recourse for a dam owner to seek remedy in the courts in the event a negligent action or inaction on the part of the state causes the dam owner to suffer unnecessary or unreasonable damages.

In researching Senator Halford's concern regarding the state being held liable for some of its actions in dam safety work, we contacted James Dooey, Chief, Division of the Safety of Dams, State of California. The language in this section was essentially taken from the United States Committee on Large Dams Model State Dam Safety Law, which was taken from the California Dam Safety Law. Mr. Dooey stated that by virtue of the type of work dam safety is, such language and sovereign immunity is necessary to avoid inviting legal actions against the state. Further, such language is required to protect dam safety employees from personal liability.

One must recognize that the state is acting in the interest of the public placed at risk below a dam. The public may not be deriving any benefit from the dam, and on the contrary, a hazard exists by virtue of their being placed at risk. The only reason the state would ever take control of a dam or order the owner to breach a dam would be that an imminent danger existed to the public. The imminent danger would be the fault of the owner, either through action or inaction. Suggesting that the burden be shifted to the state in the case of imminent danger relieves the owner of his due responsibility and will cause any agency or state employee to be reluctant to take drastic action for the greater public good. One cannot reasonably expect the state be treated as an individual under law when it is acting in its best judgment to protect the public from a hazard (the presence of a dam) created by a dam owner for the owner's benefit.

We share Senator Halford's concern with this section, and if the section can be worded in some way that provides essential protection to the state and its employees and at the same time provides reasonable protection for dam owners from negligent state actions, the bill would be greatly improved. Possibly you will want to have the Department of Law or Legislature's attorneys review this section to see if other wording is practical.

Section 46.17.120 should remain unchanged, unless acceptable alternative wording can be developed.

Arliss Sturgulewski  
December 20, 1985  
Page 3

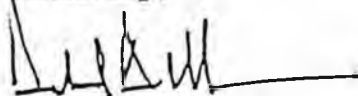
Section 46.17.900(3) - Delete the sentence in its entirety and substitute:

dam means any artificial barrier and appurtenant works which may impound or divert water and (A) that has or will have an impounding capacity at maximum water storage elevation of 50 acre-feet and is at least 10 feet in height measured from the lowest point at either toe of the dam to the crest of the dam or (B) that is at least 20 feet in height measured from the lowest point at either toe of the dam to the crest of the dam or (C) that the commissioner has made a positive determination that the dam poses a threat to lives and property.

Senator Halford's comments were very useful, and with the exception of Section 46.17.120 we have incorporated them in the new language we have suggested. Due to the critical need for this legislation, we urge your continued support of this important public safety measure.

Comments on SB 150 will be forwarded to you when our information is complete.

Sincerely,



hw Tom Hawkins  
Director

cc: Senator Faiks  
Senator Sackett  
Senator Rodéy  
Senator Halford  
Commissioner Wunnicke

DNK → NKR → BFA → DTV

↓  
SB 95

# STATE OF ALASKA

BILL SHEFFIELD, GOVERNOR

## DEPARTMENT OF NATURAL RESOURCES

DIVISION OF LAND AND WATER MANAGEMENT

POUCH 7-005  
ANCHORAGE, ALASKA 99510-7005  
PHONE: (907) 551-2020

December 20, 1985

The Honorable Arliss Sturgulewski  
Alaska State Senate  
2957 Sheldon Jackson Street  
Anchorage, AK 99508

Re: CSSB 95, Dam Safety

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Leave the last sentence unchanged.

Arliss Sturgulewski  
December 20, 1985  
Page 2

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In researching Senator Halford's concern regarding the state being held liable for some of its actions in dam safety work, we contacted James Doody, Chief, Division of the Safety of Dams, State of California. The language in this section was essentially taken from the United States Committee on Large Dams Model State Dam Safety Law, which was taken from the California Dam Safety Law. Mr. Doody stated that by virtue of the type of work dam safety is, such language and sovereign immunity is necessary to avoid inviting legal actions against the state. Further, such language is required to protect dam safety employees from personal liability.

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We share Senator Halford's concern with this section, and if the section can be worded in some way that provides essential protection to the state and its employees and at the same time provides reasonable protection for dam owners from negligent state actions, the bill would be greatly improved. Possibly you will want to have the Department of Law or Legislature's attorneys review this section to see if other wording is practical.

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Arliss Sturgulewski  
December 20, 1985  
Page 3

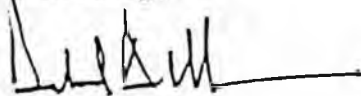
X  
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Comments on SB 150 will be forwarded to you when our information is complete.

Sincerely,



hw Tom Hawkins  
Director

cc: Senator Faiks  
Senator Sackett  
Senator Rodéy  
Senator Halford  
Commissioner Wunnicke

BILL SHEFFIELD  
GOVERNOR



STATE OF ALASKA  
OFFICE OF THE GOVERNOR  
JUNEAU

January 24, 1985

The Honorable Don Bennett  
President of the Senate  
Alaska State Legislature  
Pouch V  
Juneau, AK 99811

Dear Senator Bennett:

ATTACHED → Under the authority of art. III, sec. 18, of the Alaska Constitution, I am transmitting a bill relating to dam safety. The bill comes as a result of the Alaska Water Resources Board resolution 84-4, dated March 14, 1984, recommending review of the existing statutory authority under which dams in the state are regulated by the Department of Natural Resources, division of land and water management.

Currently there are 175 dams on Alaska's dam inventory. In 1981 the U.S. Department of the Army, Corps of Engineers, ended its dam safety program for non-federal dams in Alaska. There are but 20 federal dams in Alaska. The remaining dams are covered under a minimal dam safety program the Department of Natural Resources, division of land and water management, established through regulations. The department adopted 11 AAC 93 under a provision of the Alaska Water Use Act, at AS 46.15.080, which gives the commissioner authority to regulate water diversions. About half of the 50 states have enacted specific dam safety legislation, but most of these states did so in response to dam failures resulting in loss of life and extensive property damage. Clearly it would be advantageous for Alaska to have a well-founded, comprehensive dam safety statutory scheme and program in effect to prevent such tragedies from occurring here. The attached bill is based on the Model Law for State Supervision of Safety of Dams and Reservoirs drafted by the United States Committee on Large Dams of the International Commission on Large Dams.

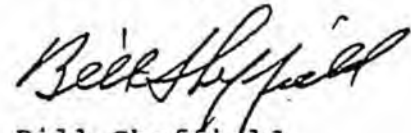
Section 2 contains the body of the bill, which creates a new chapter 17 for AS 46. New AS 46.17.010 first states the purpose of the chapter. It then makes the supervision

of safety of dams and reservoirs the responsibility of the Department of Natural Resources, which is directed to employ a qualified engineer experienced in the design and construction of dams and reservoirs to direct the dam safety program. A new AS 46.17.040 would make it unlawful for anyone to construct, enlarge, repair, alter, remove, maintain, operate or abandon any dam or reservoir, as defined in the bill, except upon application to and approval of the department. To ensure that dams and reservoirs remain safe once constructed, the department is directed in a new AS 46.17.050 to inspect dams and reservoirs covered under the bill at least once every five years. To ensure that it can make adequate inspections, the department is given authority to enter the private property on which the dam or reservoir is located as might be necessary to make the inspection. In addition, the department is allowed in a new AS 46.17.110 to enter into cooperative management agreements with municipal corporations and other state and federal agencies to effectuate its responsibilities under the bill. To ensure that the state's action in inspecting and regulating the operation of dams or reservoirs does not shift the liability of the private owner to the state for loss of life or property damage due to the dam's or reservoir's failure, AS 46.17.120 bars any action against the state based on any purported act or omission of a state agent or employee connected with the dam safety program.

Section 1 of the bill amends AS 11.56.800(a), dealing with the crime of making a false report. A new paragraph (4) will make it a crime to file a false report with the Department of Natural Resources concerning the condition of a dam or reservoir. Additional criminal sanctions are also contained in sec. 2 of the bill in a new AS 46.17.100, which would make it a class A misdemeanor to violate any provision of AS 46.17 or lawful order the department issues under AS 46.17.

Given the importance of a good dam safety program to the citizens of Alaska, I urge your favorable action on this measure.

Sincerely,



Bill Sheffield  
Governor

STATE OF ALASKA 1985 LEGISLATIVE SESSION  
FISCAL NOTE

Revision Date: \_\_\_\_\_

REQUEST

Bill/Resolution No.: 95

Title: Dam Safety

Sponsor: \_\_\_\_\_

Requestor: \_\_\_\_\_

Date of Request: \_\_\_\_\_

FISCAL DETAIL

Agency Affected: Natural Resources

Program Category Affected: NRMEC

BRU, Program or Subprogram(s) Affected:  
Land and Water Management

EXPENDITURES/REVENUES: (Thousands of Dollars)

	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90
<b>OPERATING</b>						
100 PERSONAL SERVICES						
200 TRAVEL						
300 CONTRACTUAL						
400 SUPPLIES						
500 EQUIPMENT						
600 LAND & STRUCTURES						
700 GRANTS, CLAIMS						
800 MISCELLANEOUS						
<b>TOTAL OPERATING</b>	0	0	0	0	0	0

<b>CAPITAL</b>						
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<b>REVENUE</b>						
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FUNDING: (Thousands of Dollars)

GENERAL FUND						
FEDERAL FUNDS						
OTHER						
<b>TOTAL</b>						

POSITIONS:

FULL-TIME						
PART-TIME						
TEMPORARY						

ANALYSIS: Attach a separate page if necessary

The legislation, which establishes in statute dam safety authorities, does not require new funding.

Prepared By: Ned Farguhar Ned Farguhar Phone: 465-2400  
Division: Commissioner's Office Date: 4 January 1985

Approved by Commissioner: Nancy D. Arnold, Deputy Date: 4 January 1985  
Agency: Natural Resources

Distribution (by Agency preparing fiscal note):  
Legislative Finance  
Legislative Sponsor  
Requestor  
Office of Management and Budget  
Impacted Agency(ies)

Resolution No. 84-4

**DAM SAFETY AUTHORITY**

The State Constitution, Article VII Sections 3 and 4, mandates that the legislature promote and protect the public health and welfare of its citizens. It is recognized that existing statute, AS 46.15.080(2), specifies state responsibility only for the adequacy of the construction of water diversions (dams).

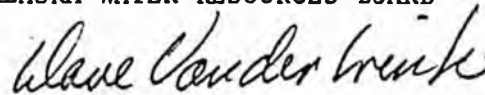
The "Model Law for State Supervision of Safety of Dams and Reservoirs," by the United States Committee on Large Dams, sets forth the criteria for an adequate state dam safety program. The objective is safety and the protection of areas below a dam from the consequences of a failure of a dam and the untimely release of its reservoir contents.

**THE ALASKA WATER RESOURCES BOARD** requests that the Commissioner of Natural Resources direct the Division of Land and Water Management, in conjunction with the Attorney General's Office, to undertake:

- a. A comprehensive review of existing statutes and regulations (11 AAC 93.150-200) related to dam safety relative to the "Model State Dam Safety Law."
- b. Propose legislation, if necessary, to provide the citizens of the state with a viable dam safety program and protection from the hazards of unsafe dams.

ADOPTED this 14th day of March, 1984

ALASKA WATER RESOURCES BOARD



David Vanderbrink, Chairman

# Alaska State Legislature

ARLISS STURGULEWSKI, Chairman  
BETTYE FAHRENKAMP, Vice Chairman  
JACK COGHILL  
DICK ELIASON  
VIC FISCHER  
RICK HALFORD  
FRED ZHAROFF



POUCH V  
JUNEAU, ALASKA 99811  
(907) 465-4307

## Senate Committee on Resources

MEMORANDUM

March 27, 1985

TO: " Senate Resource Committee Members

FROM: Senate Resource Committee Staff *MZ*

RE: CS FOR SENATE BILL 95 "An Act relating to supervision of safety of dams and reservoirs; and providing for an effective date"

With one exception, the proposed committee substitute for SB 95 that is before the committee is the same as the bill that the committee voted to pass out and then decided to hold because of concerns about placer mining dams.

A new section (b) has been inserted on page 2. This section would empower the Commissioner of Natural Resources to establish, by regulation, minimum safety standards for low hazard dams under 20 feet in height. It would specify that mining dams are in this category and that such dams would be exempt from requirements of prior approval before construction as long as they met the minimum safety standards.

I have discussed this proposed change with Helen Warner of the Alaska Miner's Association. Though the miners have some reservations about anything done by regulation, she felt this would solve the miner's earlier objections. She said that the miners realize the need for this bill as a public safety issue.

# Alaska State Legislature

ARLISS STURGULEWSKI, Chairman  
BETTYE FAHRENKAMP, Vice Chairman  
JACK COGHILL  
DICK ELIASON  
VIC FISCHER  
RICK HALFORD  
FRED ZHAROFF



POUCH V  
JUNEAU, ALASKA. 99811  
(907) 465-4907

## Senate Committee on Resources

MEMORANDUM

February 7, 1985

TO: All Members  
Senate Resources Committee

FROM: Senate Resources Staff *A*

RE: SB 95 "An Act relating to supervision of safety of dams and reservoirs; and providing for an effective date."

SB 95 "An Act relating to supervision of safety of dams and reservoirs; and providing for an effective date", would provide the Department of Natural Resources (DNR) with the statutory responsibility to supervise the safety of all non-federal dams in Alaska.

Since 1981, DNR has been conducting dam inspections and has been responsible for regulation of all non-federal dams. The department has operated under regulations (11 AAC 93) adopted under its general powers granted under AS 46.15 Alaska Water Use Act. The present regulations are unclear and do not provide for a comprehensive dam safety program.

SB 95 would make DNR responsible for the supervision of safety of dams; require DNR approval for construction, repair and modification of dams; require DNR to inspect dams at least every five years; and provide the ability to enter private property for inspections. In addition, the state would be protected from liability as a result of an inspection and it would be a crime to report false information to DNR regarding the condition of a dam.

Since DNR is currently engaged in the regulation of dams and has staff assigned, there is no fiscal impact of this bill other than those appropriations contained in DNR's existing budget. In FY 84, the dam safety budget was \$133.7 (including \$40.0 contractual) the FY 85 budget is \$216.3 (including \$138.7 contractual).

DNR has two full-time and two part-time staff plus contractual services to regulate the 102 dams covered by this bill. (There are an additional 20 federal dams regulated by the Federal Government and 55 small dams regulated under DNR water rights procedures.) DNR plans to inspect all dams at least every five years.

fh:bh

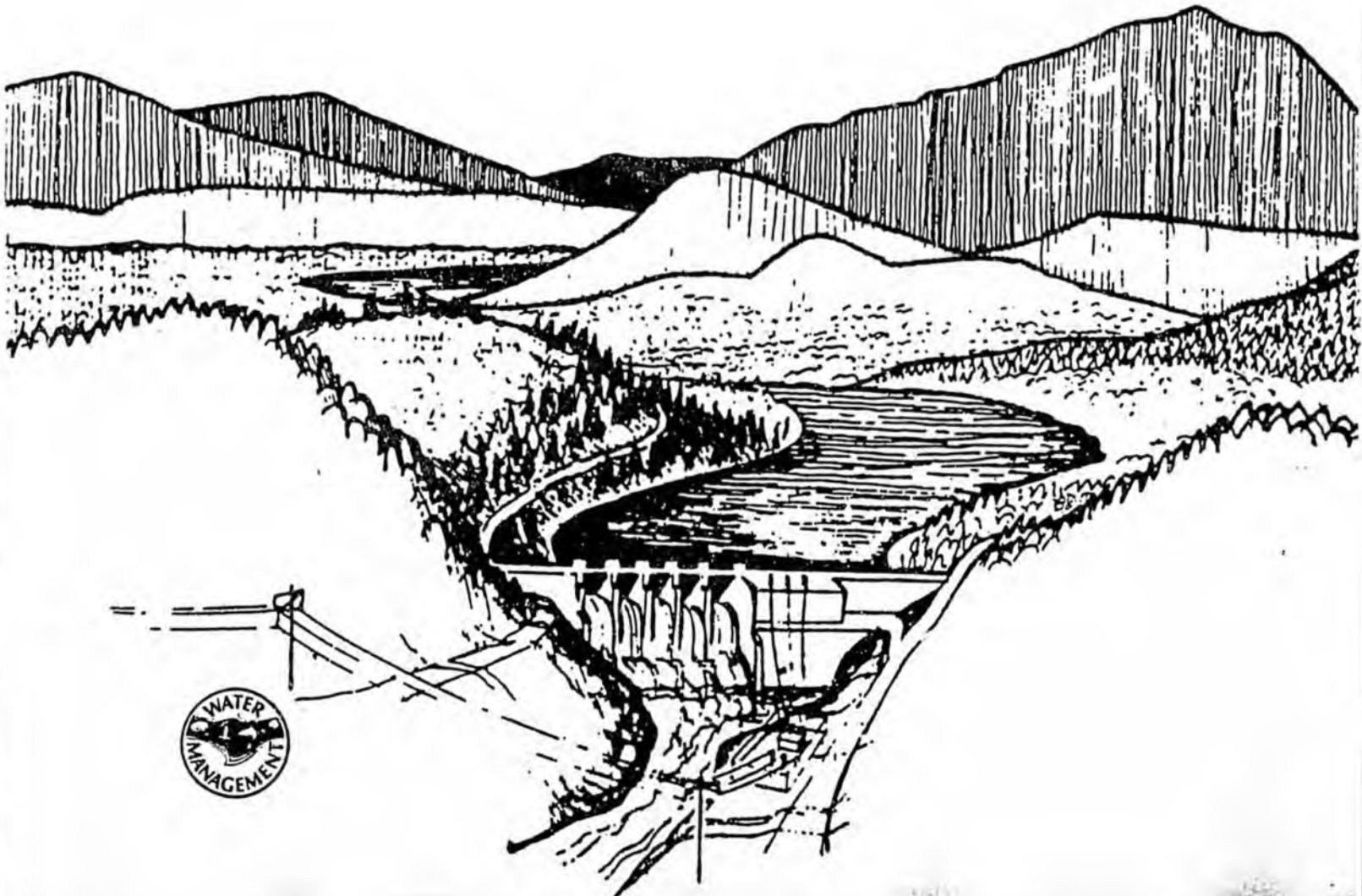


Alaska Department of  
**NATURAL  
RESOURCES**

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# Improving The Safety Of Our State's Dams-- Progress Report And Projections

October 1984



Progress Report  
and  
Projections for the Dam Safety Program

Shortly after Tom Hawkins' appointment as Director of the Division of Land and Water Management (DLWM), he sent a decision memo to Commissioner Wunnicke concerning DNR's responsibility for safety of dams (Decision Memo March 10, 1983).

A summary of the issues at hand were:

- \*A hazardous situation had been noted in our files (Switzer Dams), but no formal inspection had ever been conducted.
- \*The regulations were vague and did not clearly define authority and liability.
- \*Dam safety budget and staffing were not providing adequate public safety for dams.

The options were:

- \*Develop an effective program within DLWM staffed with a licensed engineer having at least three years experience in design, construction, and investigation of dams. For more sophisticated work, consultants could be contracted.
- \*Repeal the regulation and cancel the program altogether.
- \*Move the program to another agency within the state.

Since the latter two options were not within the public's best interest, and the state has some liability by virtue of approval of water diversions, it was determined that the dam safety program should be developed within DLWM where regulating authority and staffing existed.

At that time DLWM began to develop a dam safety program.

Efforts were given to:

\*Rallying support from the state legislature with the report Status of the Alaska Dam Safety Program, April 1983, and support from Water Board members by having speakers William Bivins, Dam Safety Chairman of the Federal Emergency Management Agency, and Harland Moore, Chief Engineer for the Army Corps of Engineers, Alaska District, at the Alaska Water Board meetings in March of 1984, and

\*Corresponding with the Alaska delegation on federal dam safety legislation by:

1. Expressing our needs and concerns about dam safety regulation, and
2. Developing a program in line with up-coming legislation (Senate Bill 1739), and

\*Working with the Federal Emergency Management Agency in proposing program elements.

The result of these and other efforts lead to the following achievements:

- \*Budget: Special attention was given to dam safety by Governor Sheffield in his budget address (1/12/84). For FY 85 the legislature earmarked \$133,700 for contracting qualified engineers to inspect dams.
- \*Staffing: A licensed professional engineer was added to our staff on April 6, 1984, who had six years of experience with dams.
- \*Contracting: Contracting procedures were developed in the spring of 1984 and used in selecting consulting engineers with world class expertise in dam safety investigation.
- \*Inspections: Formal dam safety inspections have been and are being conducted by highly qualified engineers to bring our files up to date and to insure the safety of high and significant dams<sup>1</sup>. A contract was awarded to Charles T. Main on June 15, 1984 to conduct safety inspection of six dams.
- \*Switzer Creek Dams: On July 12, 1984 these high hazard dams were professionally inspected and one dam was identified as unsafe. Action is being taken to correct the situation.
- \*Dam safety legislation: New legislation has been drafted to address the deficiencies of the existing statute and is presently being reviewed.

Our staff is working to continue to move the dam safety program ahead. We are projecting the following accomplishments:

- \*Continue to process applications to construct or modify a dam.
- \*Update all files with correct information.
- \*Insure that owners of dams take action to comply with recommendations.
- \*Continue formal and special inspections by contracting professional services.
- \*Further economize the expense of routine intermediate inspections by training in-house staff to conduct inspections of lower risk dams<sup>2</sup>.
- \*Encourage owner's responsibility by providing educational information on dam safety operation and maintenance, and prompting owners to conduct their own routine informal inspection<sup>3</sup>.
- \*Coordinate with the Department of Transportation materials testing lab for use and services of their facilities.

- \*Provide technical support to district offices on limited bases.
- \*Establish a revolving fund to assist owners when making costly repairs to their dams or administrate public funds for emergency projects such as Lowell Creek diversion in Seward and Chester Lake, Dam rehabilitation in Metlakatla.
- \*Coordinate with the Federal Emergency Management Agencies programs to support state dam safety activities.
- \*Participate in the Association of State Dam Safety Officials.
- \*Coordinate with the State of Alaska Emergency Services in development of emergency action plans.
- \*Develop training and facilitate professional licensing for all staff engineers.
- \*Keep abreast with federal dam safety legislation.
- \*Coordinate with tsunami center in Palmer for prompt identification of location and magnetude of earthquake activities.
- \*Coordinate with the Federal Energy Regulator Commission (FERC) to avoid duplications of inspection efforts.

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Foot Notes: Federal Guideline for Dam Safety, June 25, 1979 recommends:

1. **Formal and special inspections.** A formal inspection is required to verify the safety and integrity of a dam and it should not exceed five years. A special inspection should be performed immediately after the dam has passed unusually large floods or experienced significant earthquakes. Inspections should be conducted under the direction of qualified licensed professional engineers. The inspection team should be chosen on a site-specific basis considering the nature and type of dam.

2. **Intermediate inspections** should be performed on an annual basis, but at least biennially, where there is a high probability that dam failure could result in loss of life. Personnel for inspection should be by technically qualified engineers, experienced in the operation and maintenance of dam.

3. **Informal inspections** should be a frequent observation of the dam and its operation and maintenance the inspections could be performed satisfactorily by an employee at the project and a detailed checklist of items to be inspected may be provided.

**ARTICLE 3.  
DAM SAFETY AND CONSTRUCTION**

**Section**

- 150. Dam safety
- 160. General requirements
- 165. Dam measurement
- 170. Construction of large dams
- 180. Construction of medium-sized dams
- 190. Construction of small dams
- 200. Fee for dam construction permit

11 AAC 93.150. **DAM SAFETY.** Sections 150 - 200 of this chapter do not in any way limit or restrict the amount or character of data that may be required by the commissioner from the owner of any dam, whether new or existing, for the administration of AS 46.15. (Eff. 2/8/67, Reg. 23; am 12/29/79, Reg. 72)

Authority: AS 46.15.020	AS 46.15.080
AS 46.15.040	AS 46.15.135
AS 46.15.060	AS 46.15.180
AS 46.15.070(f)	

11 AAC 93.160. **GENERAL REQUIREMENTS.** (a) No person may begin the construction, enlargement, alteration, or repair of a dam 10 feet or more in height, or storing 50 acre-feet or more of water, without first submitting an application on a form provided by the commissioner, submitting plans as required by this section, paying the fees required by sec. 200 of this chapter, and receiving a certificate of approval for the proposed work. "Alteration or repair" means only an alteration or repair that directly affects the safety of the dam or reservoir and does not mean routine maintenance.

(b) Plans must be prepared on a good grade of scale-stable tracing material. Tracings must be reproducible by standard duplicating processes. Plans and drawings must be of sufficiently large scale and must have enough views with suitable dimensions to allow for complete review and analysis of the proposed project. After reviewing the information, the commissioner will notify the applicant in writing whether or not changes must be made.

(c) Plans must include the following:

(1) plans for a water measuring device that is capable of accurately measuring the total flow

of the stream below the reservoir or the rate of discharge at the outlet works:

(2) a topographic map of the dam site showing the location of the proposed dam by township, range, section, and quarter section, and the location of the spillway, outlet works, borings, test pits, and material pits;

(3) a profile along the dam axis showing the locations, elevations, and depths of borings or test pits, including logs of any bore holes or test pits; and

(4) a maximum cross-section of the dam showing elevation and width of crest, slopes of upstream and downstream faces, thickness of erosion control structures, location of cutoff and bonding trenches, and elevations, size, and type of outlet conduit, valves, and operating mechanism. (Eff. 12/29/79, Reg. 72)

Authority: AS 46.15.020	AS 46.15.100
AS 46.15.080	AS 46.15.180

11 AAC 93.165. **DAM MEASUREMENT.** The height of a dam is measured as the vertical distance from the natural bed of the watercourse of the downstream toe of the barrier, as determined by the commissioner, or from the lowest elevation of the outside limit of the barrier, if it is not across a watercourse, to the maximum storage elevation. (Eff. 12/29/79, Reg. 72)

Authority: AS 46.15.020

**11 AAC 93.170. CONSTRUCTION OF LARGE DAMS.** (a) This section applies to large dams, which are dams that are twenty feet or more in height or have a storage capacity of 100 acre-feet or more.

(b) The following information must be submitted along with the plans and specifications required under sec. 160 of this chapter:

(1) formulas and assumptions used in the design criteria, test results, and detailed construction specifications;

(2) hydrologic data used in the development of flood forecasting for the drainage area;

(3) a physical analysis and a permeability analysis of the materials used in the embankment and a stability analysis of the structure;

(4) an evaluation of earthquake effects in seismic zones III and IV (see the U.S. Army Corps of Engineers' publication TM 5-809-10/NAVFCA P-335/AFM 88-3, Chapter 13, April 73);

(5) a complete seepage analysis;

(6) the type, location, and sizing of the outlet works;

(7) the type, location, and records of the hydrometeorological gauges appurtenant to the project;

(8) foundation data and information on geological features, including logs of borings, geologic maps, profiles, and cross-sections and reports of foundation stability; and

(9) detailed drawings of the spillway, including a curve showing discharge in cubic feet per second versus gauge height of the reservoir storage pool level, the formulas used in making the curve, detailed plans of the spillway structure, cross-sections of the channel leading to and from the spillway, and the spillway profile.

(c) All specifications submitted must include provisions, acceptable to the commissioner, for adequate supervision by a registered professional engineer during the period of construction. The supervising engineer shall devise a schedule of

incremental inspections and submit his findings in writing to the commissioner within 15 days after each inspection.

(d) In addition to the review of the dam construction plans required under sec. 160 of this chapter and (b) and (c) of this section, the work in progress must be inspected before placing any fill material following clearing and excavation of the foundation, before placing backfill around the outlet conduit following installation of the conduit, before beginning to store water following completion of construction and at such other times as determined necessary by the commissioner. (Eff. 12/29/79, Reg. 72)

Authority: AS 46.15.020 AS 46.15.100  
AS 46.15.080 AS 46.15.180

**11 AAC 93.180. CONSTRUCTION OF MEDIUM-SIZED DAMS.** (a) This section applies to medium-sized dams, which are dams that are at least 10 feet in height but less than 20 feet in height, or have a storage capacity of at least 50 acre-feet but less than 100 acre-feet.

(b) The requirements of this section are in addition to those in sec. 160 of this chapter.

(c) Before approving the proposed work, the commissioner will, in his discretion, require the applicant to submit any of the plans or drawings listed in sec. 170(b)(9) of this chapter.

(d) The analysis and construction requirements for large dams under sec. 170(b)(1) - (8) and (c) of this chapter are recommended, but not required, for medium-sized dams.

(e) In addition to the review of the dam construction plans required under sec. 160 of this chapter and this section, the work in progress must be inspected before placing any fill material following clearing and excavation of the foundation, before placing backfill around the outlet conduit following installation of the conduit, before beginning to store water following completion of construction, and at other times determined necessary by the commissioner. (Eff. 12/29/79, Reg. 72)

Authority: AS 46.15.020 AS 46.15.180  
AS 46.15.080 AS 46.15.250  
AS 46.15.100

**11 AAC 93.190. CONSTRUCTION OF SMALL DAMS.** This section applies to small dams, which are dams under 10 feet in height and having a storage capacity of less than 50 acre-feet. No additional permit or approval from the commissioner is needed to construct a small dam as long as such authorization already is included in a permit or certificate to appropriate water issued under sec. 120 or 130 of this chapter. (Eff. 12/29/79, Reg. 72)

Authority: AS 46.15.020  
AS 46.15.180

**11 AAC 93.200. FEE FOR DAM CONSTRUCTION PERMIT.** (a) The fee for a permit to alter or repair an existing dam is based on an estimate made by the commissioner of the costs of inspections to be made by his duly authorized representative.

(b) The fee for a permit to construct a new dam is based on the proposed storage capacity. For a permit to enlarge an existing dam and storage reservoir, the fee is based on the proposed increase in storage capacity. The fee schedule is as follows:

(1) for a storage capacity of 50 acre-feet or more but less than 100 acre-feet, \$250 plus \$5 for each additional acre-foot or part of one over the first 50 acre-feet;

(2) for a storage capacity of 100 acre-feet or more but less than 500 acre-feet, \$500 plus \$1 for each acre-foot or part of one over the first 100 acre-feet;

(3) for a storage capacity of 500 acre-feet or more but less than 1,000 acre-feet, \$900 plus 50¢ for each acre-foot or part of one over the first 500 acre-feet;

(4) for a storage capacity of 1,000 acre-feet or more, \$1,150 plus 15¢ for each acre-foot or part of one over the first 1,000 acre-feet; in no case, however, will the fee be more than \$5,000. (Eff. 12/29/79, Reg. 72)

Authority: AS 46.15.020  
AS 46.15.080

#### ARTICLE 4. TEMPORARY WATER USE

##### Section

210. Temporary water use

220. Simplified procedure to appropriate

**11 AAC 93.210. TEMPORARY WATER USE.** (a) Simplified procedures to authorize the temporary use of water, as provided in sec. 220 of this chapter, will be followed if the use of water continues for less than two consecutive years and the water applied for is not otherwise appropriated.

(b) No water right or priority is established by a temporary water use permit issued under sec. 220 of this chapter. Water so used is subject to appropriation by others. (Eff. 2/8/67, Reg. 23; am 12/29/79, Reg. 72)

Authority: AS 46.15.020  
AS 46.15.040  
AS 46.15.070(f)

**11 AAC 93.220. SIMPLIFIED PROCEDURE TO APPROPRIATE.** (a) Application for a temporary water use permit must be made on a form provided by the commissioner.

(b) An application must include

(1) the filing fee as set out in the fee schedule prepared by the commissioner;

(2) a map indicating the location of the property, the take point, and the point of use.

(c) The commissioner will notify the Alaska Departments of Fish and Game and Environmental Conservation of a proposed temporary appropriation. At the applicant's expense, the commissioner will, in his discretion, give additional notice by posting or by publication in the local newspaper if the proposed appropriation is likely to affect the water rights of other persons or the public interest.

(d) The commissioner will, in his discretion, consider any pertinent information in deciding whether to issue or deny a temporary water use permit. The reason for the decision will be furnished to any person who is denied a temporary water use permit and to any person who has filed an objection.

(e) A temporary water use permit will, in his discretion, be issued subject to conditions, including suspension or termination, which he considers necessary to protect the water rights of other persons or the public interest.

(f) Denial of an application under this section does not preclude the applicant from applying for a permit under sec. 40 of this chapter. (Eff. 12/29/79, Reg. 72)

Authority: AS 46.15.020 AS 46.15.070(f)  
AS 46.15.040 AS 46.25.100

ARTICLE 5.  
PREFERRED USE

Section

- 230. Preferred use status
- 240. Application for preferred use status
- 250. Commissioner's decision on preferred use status
- 260. Issuance of a permit to appropriate for preferred use

11 AAC 93.230. PREFERRED USE STATUS. Preferred use status allows the use of water for a preferred use when adequate water is not available from the same source to supply all lawful appropriators. (Eff. 2/8/67, Reg. 23; am 12/29/79, Reg. 72)

Authority: AS 46.15.020  
AS 46.15.150

11 AAC 93.240. APPLICATION FOR PREFERRED USE STATUS. An applicant for preferred use status shall provide the commissioner written evidence that establishes, to the satisfaction of the commissioner, that

(1) the use of water is for a public water utility which serves the general public as defined by AS 42.05.701(2)(A) and AS 42.05.701(5);

(2) the available water supply is or will be inadequate in quantity to satisfy the needs of the applicant; and

(3) water conservation measures are or will be employed to minimize damages to prior appropriators as a result of preferred use status. (Eff. 2/8/67, Reg. 23; am 12/29/79, Reg. 72)

Authority: AS 46.15.020  
AS 46.15.150

11 AAC 93.250. COMMISSIONER'S DECISION ON PREFERRED USE STATUS. (a) If the commissioner determines that additional information is required to rule on an application, he will, in his discretion, require the submission of additional evidence, hold hearings, or provide for investigative studies.

(b) Denial of an application for preferred use status does not preclude the applicant from applying for other water rights under secs. 40 - 140 of this chapter. (Eff. 2/8/67, Reg. 23; am 12/29/79, Reg. 72)

Authority: AS 46.15.020 AS 46.15.090  
AS 46.15.040 AS 46.15.135  
AS 46.15.060 AS 46.15.150  
AS 46.15.070(f) AS 46.15.180

11 AAC 93.260. ISSUANCE OF A PERMIT TO APPROPRIATE FOR PREFERRED USE.

(a) If the commissioner grants an applicant preferred use status under sec. 250 of this chapter, the commissioner will issue a permit to appropriate for preferred use when

(1) notice has been given under sec. 80 of this chapter; and

(2) the applicant has submitted to the commissioner either certified copies of any compensation agreements or any court orders directing the payment of compensation.

(b) If there are no compensation agreements or orders and if scarce water conditions have resulted in the need for immediate action, the commissioner will

(1) order the posting of a bond by the applicant in an amount considered necessary to compensate prior lawful appropriators of record for damages sustained as the result of the reallocation; and

(2) order reallocation of available water among all users; these orders will continue in effect until an agreement on compensation is arrived at as provided in (a) of this section or until the scarce water condition is over. (Eff. 2/8/67, Reg. 23; am 12/29/79, Reg. 72)

Authority: AS 46.15.020  
AS 46.15.150

## ARTICLE 6. ENFORCEMENT

### Section

270. Enforcement  
280. Emergency actions  
290. Commissioner's orders

11 AAC 93.270. **ENFORCEMENT.** A violation of a provision of this chapter, a lawful order of the commissioner issued under this chapter or AS 46.15, or a term or condition of a permit or certificate issued under this chapter is subject to corrective action under secs. 280 – 290 of this chapter. (Eff. 12/29/79, Reg. 72)

Authority: AS 46.15.020 AS 46.15.180  
AS 46.15.100 AS 46.15.250

### 11 AAC 93.280. **EMERGENCY ACTIONS.**

(a) If the commissioner finds that a person is causing, engaging in, or maintaining a condition or activity that involves the use of a water resource and that presents an imminent or present danger to the health, safety or welfare of the people of the state, or with the exception of changes in water quality, to the resource itself, the commissioner will, in his discretion

(1) order the person immediately to discontinue, abate, or alleviate the condition or activity; or

(2) take any other action considered necessary to alleviate the emergency.

(b) The owner of the property or the operator of the improvement or other condition that causes the emergency may be held liable for the costs associated with remedial action taken under this section, including the cost of any work done to make safe a water use structure or its appurtenances. If the person fails to make payment within 90 days, costs may be recovered by the state from the person in an action in superior court. (Eff. 12/29/79, Reg. 72)

Authority: AS 46.15.020 AS 46.15.180  
AS 46.15.080 AS 46.15.250

11 AAC 93.290. **COMMISSIONER'S ORDERS.** (a) In order to protect the public interest the commissioner will, in his discretion, after notice and hearing, issue any of the following orders:

(1) an order prescribing construction and other engineering modifications of works or structures but not waiving the responsibility of the applicant to apply for and receive appropriate state or federal regulatory permits or licenses;

(2) a cease and desist order to any person who, by means including free-flowing wells or drainage into lower strata underground, wastes water without putting it to a beneficial use;

(3) a cease and desist order to any person substantially interfering with the appropriation of water the right to which was granted under the provisions of this chapter; and

(4) a cease and desist order to any person appropriating water without a permit, including uses exempted by 11 AAC 93.920, if the commissioner determines the unauthorized appropriation to be adversely affecting the right of prior appropriators or the public interest.

(b) If he considers it necessary to prevent or rectify a violation of this chapter, the commissioner will obtain a court order authorizing him to seize or remove structures or works of appropriation. (Eff. 12/29/79, Reg. 72; am 9/11/83, Reg. 87)

Authority: AS 46.15.010 AS 46.15.180  
AS 46.15.020 AS 46.15.250

## ARTICLE 7. APPEALS

### Section

300. Appeal to the commissioner

11 AAC 93.300. **APPEAL TO THE COMMISSIONER.** (a) Any person who believes that he has been aggrieved by a delegated decision or order of the commissioner may, within 30 days after the date that the decision or order was mailed or personally served, appeal to the commissioner for a modification or reversal of the decision or order.

(b) Before making a decision, the commissioner may order the taking of additional evidence or the holding of a hearing if he determines that more information is necessary to rule on the appeal or if the appellant requests permission to present further information. (Eff.

2/8/67, Reg. 23; am 12/29/79, Reg. 72)  
 Authority: AS 46.15.020 AS 46.15.135  
 AS 46.15.070(e) AS 46.15.180

### ARTICLE 8. GENERAL PROVISIONS

#### Section

- 910. Change of address
- 920. Exemptions
- 930. Procedure for the change of appropriations
- 940. Procedure on abandonment and forfeiture
- 950. Recording of instruments
- 960. Disclaimer of liability
- 970. Definitions

#### 11 AAC 93.910. CHANGE OF ADDRESS.

(a) All applicants, permit holders, and certificate holders shall promptly notify the commissioner of any change of mailing address. Failure by an applicant or permit holder to comply with this requirement is sufficient cause for discontinuance of the water appropriation procedure under secs. 40 - 140 of this chapter and closure of the case file.

(b) Correspondence and notification sent under provisions of this chapter will be sent to the last address on file with the commissioner. (Eff. 12/29/79, Reg. 72)

Authority: AS 46.15.020  
 AS 46.15.070  
 AS 46.15.120

11 AAC 93.920. EXEMPTIONS. Any person using less than a significant amount of water as defined in sec. 970 of this chapter is not guilty of a misdemeanor for appropriating water without a permit. However, any person using less than a significant amount of water acquires no water right or priority unless an application is filed and a permit or certificate is issued in accordance with secs. 40 - 140 of this chapter. Water used without a permit or certificate is subject to appropriation by others and the use of water without a water right is subject to curtailment in order to supply water to lawful appropriators of record. (Eff. 2/8/67, Reg. 23; am 12/29/79, Reg. 72)

Authority: AS 46.15.020  
 AS 46.15.180

11 AAC 93.930. PROCEDURE FOR THE CHANGE OF APPROPRIATIONS. (a) Any person who desires to change an appropriation, including a change in the location of a take point, depth of taking, nature of use, or place of use and the addition of take points, shall apply for permission to make the change on a form available from the commissioner.

(b) In determining whether a proposed change will be approved, the commissioner will consider its effect on the water rights of other persons and the public interest.

(c) The commissioner will, in his discretion, if he determines that the proposed change will not adversely affect the water rights of other persons or the public interest, issue a temporary permit to make the change. If any person claiming to be injured by the change files an objection within one year after the date the change was made, the commissioner will, in his discretion, if it appears necessary to protect the water rights of other persons, or the public interest, temporarily suspend the order permitting the change. After notice and hearing, the commissioner will, in his discretion, confirm, modify, or rescind the order granting the permit. If no objection is filed within one year, the change will become permanent, and the commissioner will issue an amended permit or certificate to represent the water right as changed.

(d) The commissioner will, in his discretion, if he is uncertain as to the effect of the proposed change on the water rights of other persons or the public interest, give notice, receive objections, and hold a hearing as provided in secs. 80, 90, and 110 of this chapter. The application may be granted and the change allowed unless an objector shows that injury will occur to a valid water right, or unless the commissioner finds that the proposed change will adversely affect or impair the public interest, or that the appropriation proposed to be changed has been abandoned or forfeited. A change may be granted in part or subjected to conditions in order to avoid injury to the water rights of other persons or the public interest. The commissioner will issue an amended permit or certificate to represent the water right as changed. (Eff. 12/29/79, Reg. 72)

Authority: AS 46.15.020  
 AS 46.15.160  
 AS 46.15.185

**11 AAC 93.940. PROCEDURE ON ABANDONMENT AND FORFEITURE.** (a) If the commissioner has reason to believe that all or part of an appropriation has been abandoned or forfeited, he will conduct a preliminary investigation. If the investigation supports a finding that the beneficial use of the water has been wholly or partially abandoned or forfeited, the certificate holder will be notified that the commissioner intends to cancel his certificate for nonuse to the extent of the nonuse. The revocation notice will be sent by certified mail.

(b) The holder has 60 days from the day the notice of revocation was mailed to file objections to a preliminary determination of nonuse. Upon receipt of a timely filed objection from the holder, the commissioner will, in his discretion, take additional evidence or hold a hearing before making a final determination. If no objections are filed within the time period, the determination becomes final.

(c) Based on all the evidence, the commissioner will make a final determination after the close of the response period or, if a hearing is held, after the close of the hearing. The holder will be notified of the decision by certified mail sent to the last known address on record with the division.

(d) An appropriation that is found to be abandoned or forfeited under this section reverts to the state and the water becomes unappropriated. The commissioner will record any final determination or decision that declares an appropriation abandoned in whole or in part at the recorder's office in the district where the appropriation was located. In addition, the commissioner will, in his discretion, secure a court order for the removal of the works of appropriation.

(e) In order to implement this section the commissioner will, in his discretion, require a record of use to be submitted on a specified regular basis. (Eff. 12/29/79, Reg. 72; am 9/11/83, Reg. 87)

Authority: AS 46.15.020  
AS 46.15.140  
AS 46.15.160

**11 AAC 93.950. RECORDING OF INSTRUMENTS.** The holder of a water right issued

under this chapter shall record his certificate in the recorder's office in the district where the appropriation is located to guarantee priority against adverse claimants. (Eff. 12/29/79, Reg. 72; am 9/11/83, Reg. 87)

Authority: AS 46.15.020  
AS 46.15.160  
AS 46.15.170

**11 AAC 93.960. DISCLAIMER OF LIABILITY.** The State of Alaska and the department, its agents, and employees are not liable for any claims arising out of activities conducted under a letter of entry, permit, or certificate issued under this chapter by the holder or owner of it or any third party. Neither this chapter nor any letter of entry, permit, or certificate issued under it is intended as a waiver of sovereign immunity. (Eff. 12/29/79, Reg. 72)

Authority: AS 46.15.010  
AS 46.15.020

**11 AAC 93.970. DEFINITIONS.** Unless the context indicates otherwise, in this chapter

(1) "adjudication" means the administrative determination of the validity and amount of a water right and includes the settlement of conflicting claims among competing lawful water users of record;

(2) "certificate of appropriation" means an instrument granting the owner the right to appropriate water, subject to the terms and conditions contained in it;

(3) "certificate of approval" means a certificate issued by the commissioner for the operation of a dam or reservoir and listing restrictions imposed by the commissioner;

(4) "commissioner" means the commissioner of the Department of Natural Resources or his delegate;

(5) "dam" means any artificial structure, together with appurtenant works, used for the purpose of impounding water; no obstruction in a canal used to raise, lower, or divert water from it and no fill or structure determined by the commissioner to be designed primarily for highway or railroad traffic is considered a dam;

(6) "dam owner" means any corporation (whether public, cooperative or otherwise), company, individual, association of individuals, their lessees, trustees, or receivers appointed by a court or government agency that owns, controls, operates, maintains, manages, or has initiated construction of a dam or reservoir;

(7) "declaration of appropriation" or "grandfather right" means a formal claim to a water right acquired by law before July 1, 1966, in existence on that date, and filed with the department within the designated filing period;

(8) "department" means the Department of Natural Resources;

(9) "division" means the division of forest, land, and water management within the Department of Natural Resources;

(10) "ground water" is any water, except capillary moisture, beneath the land surface or beneath the bed of a stream, lake, reservoir, or other body of surface water within the boundaries of the state, whatever may be the geologic formation or structure in which the water stands, flows, percolates, or otherwise moves;

(11) "permit to appropriate water" means an instrument granting the holder the right, limited to a definite period of time and subject to the terms and conditions contained in it, to construct works necessary to the appropriation of water and to establish a beneficial use;

(12) "priority" as between lawful appropriators means that first in time is first in right;

(13) "public interest" means public interest as determined by the criteria set out in AS 46.15.080;

(14) "significant amount of water" means any use of 5,000 or more gallons of water in a single day from a single source, or the regular daily or recurring seasonal use of 500 or more gallons of water per day for 10 days or more per year from a single source, or any use that may adversely affect the water rights of other appropriators or the public interest;

(15) "storage capacity" means the total storage capacity in acre-feet at the maximum water storage elevation;

(16) "water storage elevation" means the maximum elevation of the water surface that can be obtained by the dam or reservoir without flow in the spillway;

(17) "well" means an artificial opening or artificially altered natural opening more than 18 feet in vertical depth below land surface, however made, by which ground water is sought or through which ground water flows under natural pressure or is artificially withdrawn, except that this definition does not include holes or shafts drilled or dug for the purpose of exploration or production of oil, gas, or valuable minerals unless the hole or shaft is actually used for the production of water;

(18) "certificate of reservation" means an instrument granting a reservation of water subject to the terms and conditions contained in it;

(19) "instream flow" means an instantaneous flow rate of water through a stream during specified periods of time, from a designated location upstream to a designated location downstream, required to support an application to reserve water for one or more permissible purposes, as determined by an appropriate study;

(20) "reservation of water" means to appropriate water for maintaining a specified instream flow or level of water at a specified point on a stream or water body or in a specified part of a stream or water body for specified periods of time and for one or more permissible purposes,

(21) "methodology" means the scientific or technical procedures used to quantify water;

(22) "water body" means surface water in a depression of land, including intragravel water or sloughs, which is supplied from drainage, upwellings, springs, or groundwater;

(23) "stream" means any body of flowing water, including a river, creek, tributary, fork,

and rivulet. (Eff. 2/8/67, Reg. 23; am 12/29/79, Reg. 72; am 9/11/83, Reg. 87)  
Authority: AS 46.15.020 AS 46.15.133  
AS 46.15.040 AS 46.15.145  
AS 46.15.080

CHAPTER 94.  
TRAPPING CABIN CONSTRUCTION  
PERMITS

Article

1. Applicant Qualifications  
(11 AAC 94.010-11 AAC 94.030)
2. Conditions of Permit  
(11 AAC 94.210-11 AAC 94.260)
3. Renewal and Termination  
(11 AAC 94.310-11 AAC 94.330)
4. General Provisions (11 AAC 94.410)

ARTICLE 1.  
APPLICANT QUALIFICATIONS

Section

10. Application for permit
20. Cabin location
30. Issuance of permit

11 AAC 94.010. APPLICATION FOR PERMIT. (a) Application for a trapping cabin construction permit must be made on a form provided by the division and must include the following:

(1) a declaration that each of up to three cabins is needed for the applicant's operation of an established trapline;

(2) evidence that the applicant has a current, valid state trapping license;

(3) evidence of the applicant's regular use of the established trapline, such as tax returns or fur receipts showing previous income derived from trapping, or official records of the Department of Fish and Game, or signed statements by witnesses or officers of the Department of Fish and Game or the division of fish and wildlife protection of the Department of Public Safety;

(4) identification of the established trapline and each cabin site on a United States Geologic Survey Map, 1:63360 scale or its equivalent;

(5) an agreement by the applicant to assume full responsibility for forest fire protection, the cabin structure and area within 150 feet of it, and full liability for any damages resulting from his negligence; and

(6) the notarized signature of the applicant.

Fact Sheet:

**DAM SAFETY, CONSTRUCTION and  
MODIFICATION in ALASKA**



Alaska Department of  
**NATURAL  
RESOURCES**

Division of Land and Water Management  
September 1984

**WHO IS ULTIMATELY RESPONSIBLE FOR THE SAFETY  
OF DAMS IN ALASKA?**

Old English common law, on which our legal system is based, holds that the capture of water in itself is a hazardous activity. Therefore, whoever captures the water is liable for any damages caused. In almost all cases, the dam owner is responsible.

**TO WHOM DOES THIS FACT SHEET APPLY?**

Any person undertaking the construction, enlargement, alteration, repair or takes out of service a dam either 10 feet or more in height or impounding 50 acre-feet or more of water, must submit the appropriate application together with plans and specifications to the State of Alaska, Department of Natural Resources, Division of Land and Water Management. A "person" includes:

- An individual
- Partnership
- Association
- Public or private corporation
- State agency
- State political subdivision

**HOW IS THE HEIGHT AND WATER VOLUME OF A DAM  
MEASURED?**

If the dam is across a watercourse, its height is measured vertically from the natural bed of the water-course of the downstream toe of the dam to the maximum storage elevation

If the dam is not across a watercourse, its height is measured from the lowest elevation of the outside limit of the dam to the maximum storage elevation.

Water volume is always expressed by the acre-foot unit, which is the volume that would cover one acre to a depth of one foot. Since water volume, rather than land coverage, is the measured quantity, a pond, two feet deep, covering a one-half acre land area, would also be one acre-foot in volume. State engineers will assist in determining the exact water volume.

**WHAT ARE THE REQUIREMENTS TO BUILD OR  
MODIFY A DAM?**

• File an "Application for Permit to Construct or Modify a Dam" that includes complete plans and specifications. Forms may be obtained at the Division of Land and Water Management District offices listed on the reverse side of Fact Sheet.

• The owner will be notified in writing whether or not changes must be made.

• When the application is approved, construction may begin.

During construction, the state will inspect the work to make sure the dam is being built according to the approved plans and specifications. When the dam is completed and the state is satisfied as to its safety, the owner is issued a water rights certificate that allows him to store water according to certain terms, such as specified water level.

Articles 2 and 3 of the Alaska Administrative Code (11 AAC 93.040 through 200) clearly detail all procedures governing the permitting process. Copies of the code are available at any Division of Land and Water Management district office.

**ARE OTHER PERMITS REQUIRED?**

In most cases water rights permits are required for a water diversion or impoundment. These may be obtained through the Division of Land and Water Management's district offices in your area. The permit itself is not a water right, but is issued to cover the period of developing the water source and constructing the dam. Once use of the dam begins, and water quantity actually used is established, a certificate of appropriation can then be issued. This certificate is the legal document which actually conveys the water rights.

**WHAT OTHER AGENCIES MIGHT REQUIRE PERMITS AND COORDINATION?**

- Dept. of Environmental Conservation
- Alaska Dept. of Fish and Game
- U.S. Fish and Wildlife Service
- U.S. Corps of Engineers
- Federal Energy Regulatory Commission
- U.S. Forest Service
- Local Governments

**HOW MUCH ARE PERMIT FEES?**

The fee for a permit to alter or repair an existing dam is based on an estimate made by the Department of Natural Resources of the costs of inspections to be made. The fee for a permit to construct a new dam is based on the proposed storage capacity. For a permit to enlarge an existing dam and storage reservoir, the fee is based on the proposed increase in storage capacity. The fee schedule is found in the Alaska Administrative Code (11 AAC 93.200) and ranges from a minimum of \$250 for 50 acre-feet to a maximum of \$5,000 for 26,666 acre-feet.

**DOES THE STATE PERFORM SAFETY INSPECTIONS?**

Yes, in an effort to protect the public from present or future hazards related to the storage of water, the state provides technical assistance to owners and conducts periodic inspection of dams.

**CAN THE STATE TAKE ACTION TO CORRECT UNSAFE DAMS?**

Alaska maintains a statewide inventory of dams and classifies them according to how often they should be inspected based on height, size of reservoir, and location in relation to population and property. Should it be determined that the structure is unsafe, the state has authority to require that the owner correct the unsafe condition. The owner is responsible for the safe operation and maintenance of the dam in all cases.

Additional information available for construction of dams or development of micro-hydro energy may be obtained from the following sources:

- Division of Land and Water Management
- U.S. Soil Conservation Service
- Guidelines for the Design and Construction of Small Embankment Dams  
Division of Safety of Dams  
P.O. Box 388  
Sacramento, California 95802
- Design of Gravity Dams  
U.S. Dept. of the Interior  
Bureau of Reclamation  
1376 Denver Federal Center  
Denver, Colorado 80225
- Hydroelectric Commercialization Kit  
State of Alaska  
Division of Community Development  
949 E. 36th Street, 4th Floor  
Anchorage, Alaska 99508

**DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF LAND AND WATER MANAGEMENT  
DIVISION, DISTRICT AND AREA OFFICES**

Division of Land and Water Mgmt.  
555 Cordova Street, 4th Floor  
Pouch 7-005  
Anchorage, Alaska 99510  
Phone: 276-2653

Southcentral District  
3601 C Street, 10th Floor  
Pouch 7-005  
Anchorage, Alaska 99510  
Phone: 276-2653

Southeastern District  
400 Willoughby Avenue  
Pouch MA  
Juneau, Alaska 99811  
Phone: 465-3400

Northcentral District  
4420 Airport Way  
Fairbanks, Alaska 99701  
Phone: 497-2243

Mat-Su Area Office  
Century Plaza, Suite 202  
P.O. Box 874008  
Wasilla, Alaska 99687  
Phone: 376-4595

# STATE OF ALASKA

## DEPARTMENT OF NATURAL RESOURCES

OFFICE OF THE COMMISSIONER

BILL SHEFFIELD, GOVERNOR

POUCH M  
JUNEAU, ALASKA 99811  
PHONE: 907-465-2400

February 4, 1986

The Honorable Pat Rodey  
Alaska State Legislature  
P.O. Box V  
Juneau, Alaska 99811

Dear Senator Rodey:

I am writing to provide an answer to Senator Kelly's question which was raised during your committee's January 28, 1986 hearing on SB 95, relating to Dam Safety. The Senator asked what effect the bill might have had on the Lower Fire Lake dam inspection.

Lower Fire Lake dam is located north of Eagle River and was inspected by the department last year at the request of several concerned property owners. It was apparent from our investigation that the outlet culverts have been raised through unauthorized work causing the lake level to rise. This lake rise has caused the freeboard between the lake surface and the top of the dam to reach an unacceptable level, six inches during last fall's heavy rain. In addition, years of haphazard road grading has created low spots in the crest of the dam.

The Municipality of Anchorage, as dam owner, has agreed, following a public meeting, to repair or replace the outlet culverts and place them at their original grade. Further, the municipality will grade the top of the dam to a level surface. This will provide the necessary freeboard and requires only standard road construction techniques which are neither expensive nor complicated. The remedial work is scheduled to be completed this summer and should be an acceptable solution.

The department's response to the Lower Fire Lake dam situation, including the simple solution we have approved in concept, would not have been significantly different following passage of SB 95. What would be different is that explicit statutory authority to operate our dam safety inspection program would continue to provide this public service without hesitancy about our authority to enter, inspect, and enforce remedial action to repair potentially hazardous structures.


Senator Rodey

-2-

February 4, 1986

We are enclosing a copy of our inspection report and correspondence for your information. If there are further questions that I may answer, please let me know.

Sincerely,

  
Esther C. Wunnicke  
Commissioner

Enclosure

cc: Senator Kelly, w/enclosure  
Senator Halford  
Tom Hawkins  
Kyle Cherry

LOWER FIRE LAKE DAM

ALASKA DAM SAFETY PROGRAM

INSPECTION REPORT July 29, 1985

Dam Safety Unit  
Water Management Section  
Division of Land and Water Management  
Alaska Department of Natural Resources

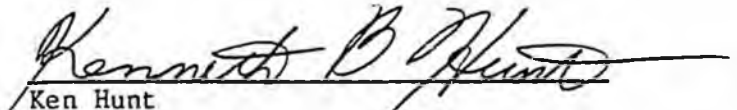
Date: July 17, 1985  
Project Name: Lower Fire Lake Fish Trapping Facility  
Hazard Potential: Significant hazard  
Inspected by: Ken Hunt/Maciej Dajnowics  
Location: Eagle River  
Parts of Project Inspected: Dam and Spillway  
Weather: Sunny, 70°  
Owner: Municipality of Anchorage  
Accompanied by: Messrs. Jack Woodland, Lake Front property owner; Merv Mullen, Emergency manager for Corps of Engineers; Paul Badger, General Foreman, Eagle River Rural Road Service Area, Municipality of Anchorage

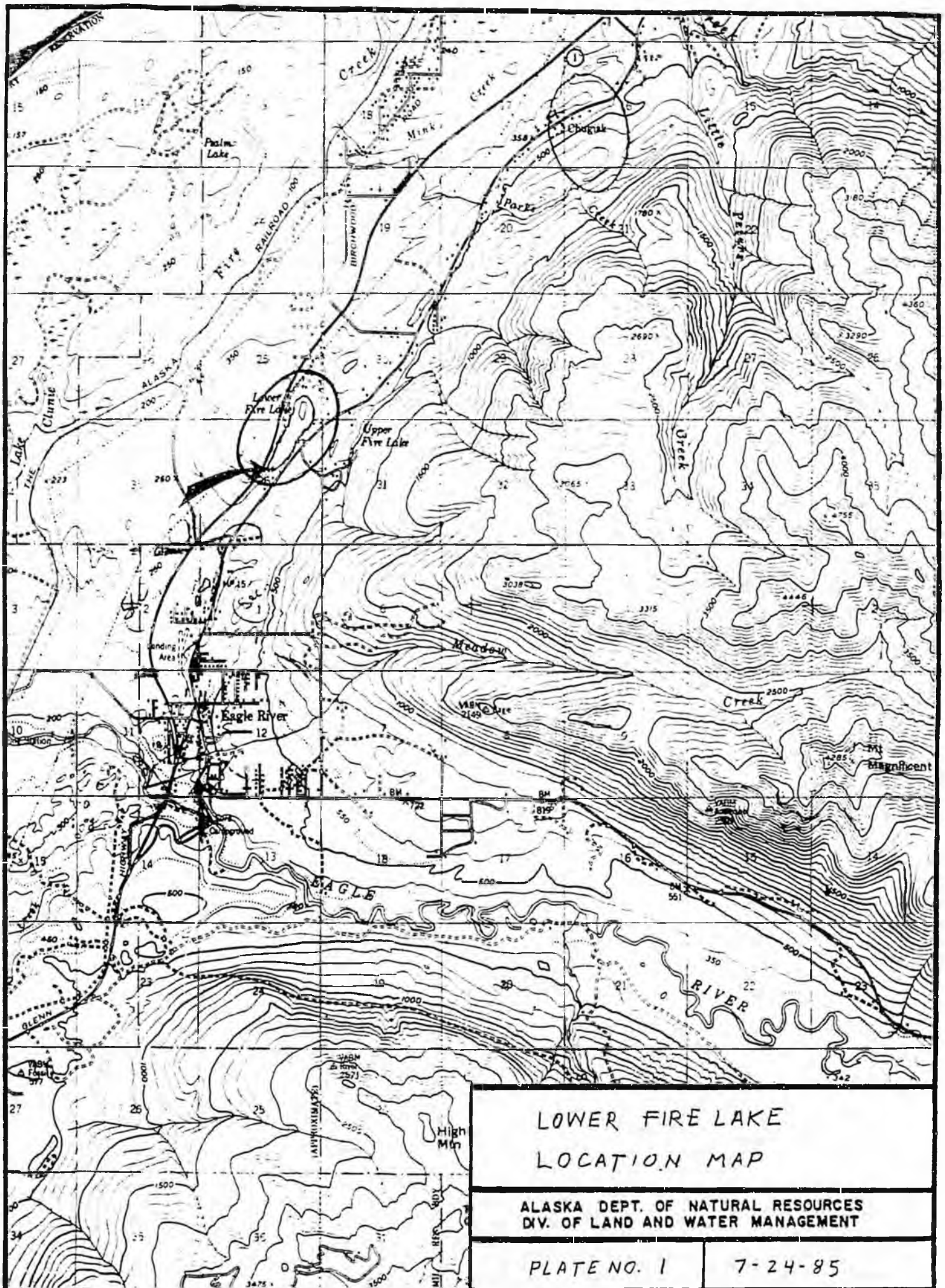
SUMMARY

This report contains the findings for inspection of Lower Fire Lake Dam. The inspection was limited to reviewing any apparent changes to the dam crest, spillway, and lake surface elevation that may pose a threat to the dam structure and public safety. Although the dam appeared stable with no imminent emergency danger of failing, the inspection revealed three major deficiencies:

1. A freeboard of one foot is inadequate.
2. Material over the spillway culverts does not provide adequate protection.
3. Spillway capacity is inadequate.

The condition of the dam is considered to be of an urgent nature since the dam is classified with a significant hazard potential and the spillway is inadequate of passing the 100 year to 1/2 probable maximum flood safely with the present freeboard.

  
Ken Hunt  
Assistant Dam Safety Engineer



## INTRODUCTION

DNR staff representatives for the Dam Safety Unit met with Messrs. Jack Woodland, lake front property owner, Merv Mullen, Emergency Manager, U.S. Army Corps of Engineers, and Paul Badger, General Foreman, Eagle River Rural Road Service Area, Municipality of Anchorage.

We met on site at 2:00 p.m., Monday, July 15, 1985, to view Lower Fire Lake Dam. Concern for the structure of the dam was brought to DNR attention earlier that morning by Mr. Jack Woodland that the lake level had been rising over the years and now threatened spilling over the dam crest during an excessive storm event. Mr. Woodland said that he established an iron stake in the ground at the shore edge of his property back in 1979 relative to some concerns the Corps of Engineers had at that time. The base of the rod is presently 1.2 feet below the water surface. He also said that the culverts for the spillway has been tampered with to raise the lake level.

Discussion with George Cunningham, Department of Fish and Game, indicated that the dam and access road were built by Pollyfco, a land developer for Fire Lake Subdivision. Through an arrangement with the Division of Sports Fisheries, the Department of Fish and Game designed the fish trapping facility by modifying the spillway.

A search of DNR records was made to determine ownership and responsibility of the dam. Records reveal that the right-of-way for the dam and access road was granted to the Department of Fish and Game in 1962 for the development of Lower Fire Lake Dam. On June 25, 1981, the right-of-way was transferred to the Municipality of Anchorage (ADL 18694). (See Appendix I)

## FIELD INSPECTION

The inspection was based on a review of the plans drawn by the Department of Fish and Game. These plans indicate minor revision from 1961 to 1962 and 1964. Some elevations are inconsistent through the drawings, and the original bench mark for the design and construction is unknown; therefore, elevations for this inspection are relative to an assumed elevation on top of the left culvert on the downstream side of the spillway looking downstream. (See appendix II)

1. Reservoir Area: At the time of inspection, the reservoir was at about elevation 50<sup>13</sup> feet (Plate no. 54-62 SH#1). There was no evidence of a recent rise in the lake's surface elevation which might be indicated by water covering grasses along the shore line.

2. Dam Crest: The dam crest is designed to be 24 feet wide with a gravel road surface on top. The wide crest provides an additional factor of safety for stability. The present crest appears to be wider, possibly due to traffic wearing down the side slopes and crest. The crest elevation appears to be about one foot below design grade (Plate no. 54-628 SH#1) with about one foot freeboard. The road surface appears to be maintained and graded with no signs of erosion or unusual movement or settlement.

Upstream face: No shore erosion was noticed. The slope appeared to be stable with about a 3H.-1V. rise.

3. Spillway: The spillway is constructed with three 2-foot diameter culverts located through the dam on the right side. The available design drawings indicate that the existing invert elevation on the upstream side is about one foot higher than designed with the center culvert being the highest as opposed to being the lowest in the design drawing. George Cunningham of the Alaska Department of Fish and Game affirmed that the center culvert was originally installed as the lowest. The culverts all have an inadequate cover of material over them to provide sufficient protection from heavy traffic. Heavy traffic such as water tank trucks have been traveling over them daily.

#### FINDINGS AND CONCLUSIONS

1. The hazard potential classification of significant hazard is due to potential damage to the Glenn Highway and the railroad downstream.
2. The crest road is well traveled every day as access to public and private property on the lake. The dam crest appears to be lower and wider than designed.
3. The structure of the dam and spillway is significantly different from the design drawings.
  - a. Present freeboard is about one foot. The available design drawing indicates a freeboard greater than three feet. (Plate No. 54-628 SH #1).
  - b. Present low point on spillway crest is one foot lower than the high point on the center spillway culvert. The center culvert has been raised. (Plate No. 54-628 SH #1).
  - c. The dam crest appears to be one foot below design grade. (Plate No. 54-628 SH #1)
5. Material over the spillway culverts does not provide adequate protection against being crushed by heavy traffic such as water trucks.
6. The spillway is inadequate and not capable of passing a 100 year flood without overtopping.
7. Although the structure is not in imminent emergency danger of failing, the condition of the dam is considered to be of an urgent nature.
8. Records reveal the Municipality of Anchorage as the responsible owner of Lower Fire Lake Dam.

RECOMMENDATIONS:

1. The owner should obtain a copy of W. R. McKinley Survey Notes, February 3, 1961 for Lower Fire Lake, and establish the proper design elevation for the dam.
2. The dam crest and spillway should be modified to provide adequate freeboard protection in accordance with the available design drawing and hydrologic data. The recommended spillway design flood is 100 years to 1/2 probable maximum flood (PMF).<sup>1</sup>
3. The material over the culverts should be increased in accordance with available design drawings to provide adequate protection to the spillway culverts.
4. The upstream inverts of the spillway culverts should be modified to discourage alteration of the spillway elevation.
5. A staff gauge should be installed to establish and maintain the lake level elevation.

<sup>1</sup>"Recommended Guidelines for Safety Inspection of Dams", Dept. of the Army, Office of the Chief Engineer, Washington, D.C. 20314, Appendix D, p. D-12

APPENDIX I

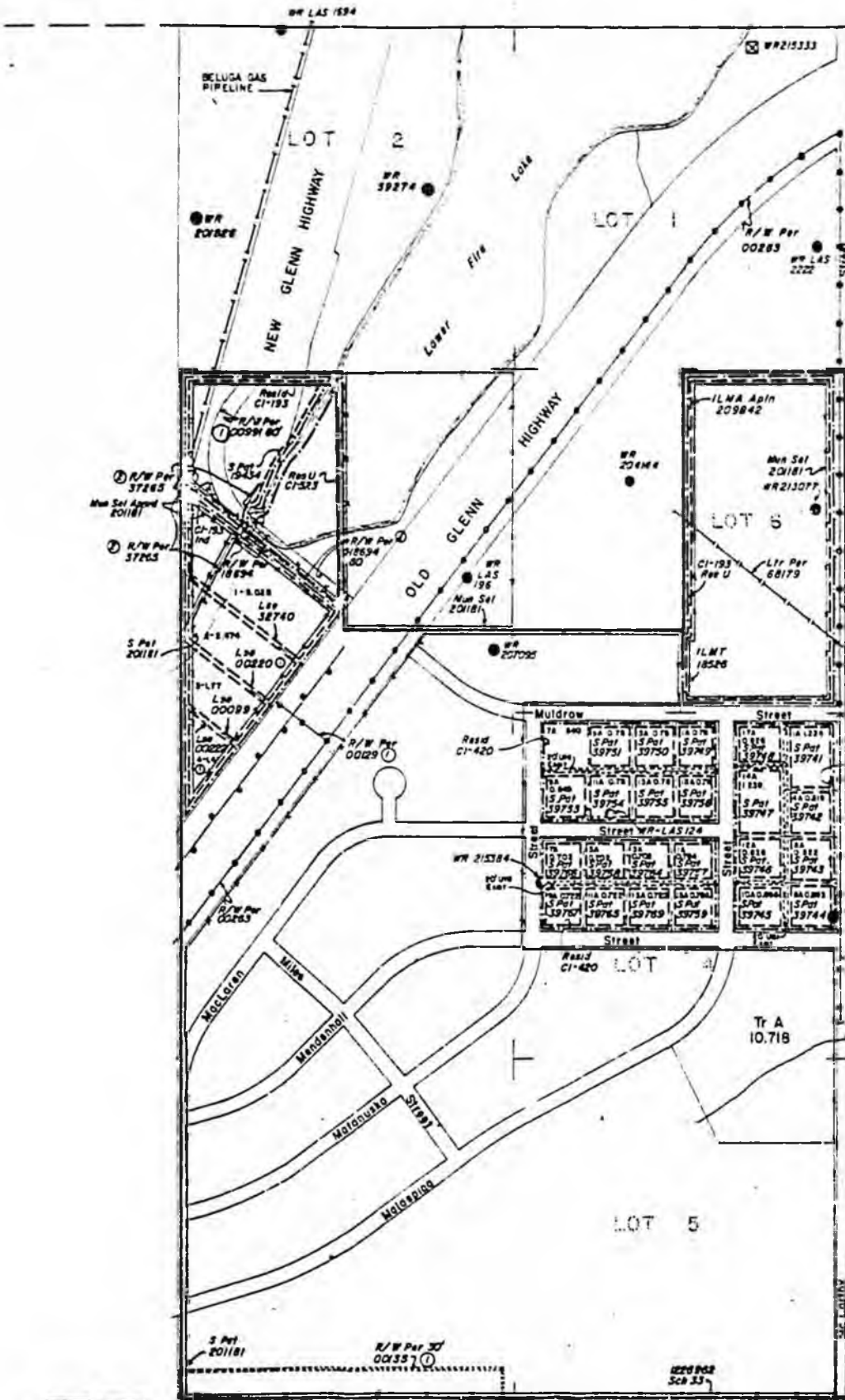
SERIAL REGISTER

STATE OF ALASKA  
DEPT. OF NATURAL RESOURCES  
DIVISION OF LANDS

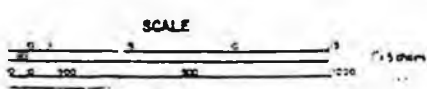
<p>CASE TYPE</p> <p>R/W PER. <del>APLN.</del></p>	<p>SERIAL NUMBER</p> <p>13694</p>
<p>NAME AND MAILING ADDRESS</p> <p>State of Alaska, Dept. of Fish &amp; Game, Sport Fish Support Bldg., Juneau, Alaska</p>	
<p>DESCRIPTION OF LAND</p> <p>T. 15 N., R. 2 W., S. M Sec. 36: M &amp; B withinto incl. culvert and weir.</p> <p>.1.34 ac.</p>	
<p>DATE OF ACTION</p> <p>7-11-62 8-9-62 1-26-67 6-25-81  9-1-81</p>	<p>ACTION TAKEN</p> <p>Apln. rec'd. (jlo) Per. iss. eff. 7-30-62. (jlo) Descrip. amended. (mir) Transferred to the Municipality of Anch. Case closed. T. 15N., R. 4W., S.M. Sec. 36: w/in E<math>\frac{1}{2}</math> Corrected desc. rec'd. to read: T. 15N., R. 2W., S.M. Sec. 36: w/in E<math>\frac{1}{2}</math></p>

N RANGE 2W OF THE SEWARD MERIDIAN, ALASKA

STATUS P  
(SUPPL



OTHER ACTIONS AFFECTING USE OF STATE LANDS  
 Entries w/ Alaska Code Act  
 Two Part Sur Sec 21-29, 32-38, 4  
 Special Sur Sec 38 Accepted 8/12,  
 Part of Sur of Part W 1/2 SW 1/4  
 10/10/63 File 34-87  
 Part of E 1/2 Sec 38 Acctd 11/14/  
 City Lot Subd Accepted 1/24/65  
 Notice Land Auction 77 3/3/  
 Notice Comm of Close 9/17/73  
 Use Note filed prior to 9/17/73  
 ANCSA Villages Selections under  
 1. Title to Map of Area  
 2. A Title to Map of Area




STATE OF ALASKA  
 DEPT. OF NATURAL RESOURCES  
 DIVISION OF LANDS

DATE	BASED
3/80	Revised from existing

DATE	CHECK
4-20-95	[Signature]

APPENDIX II

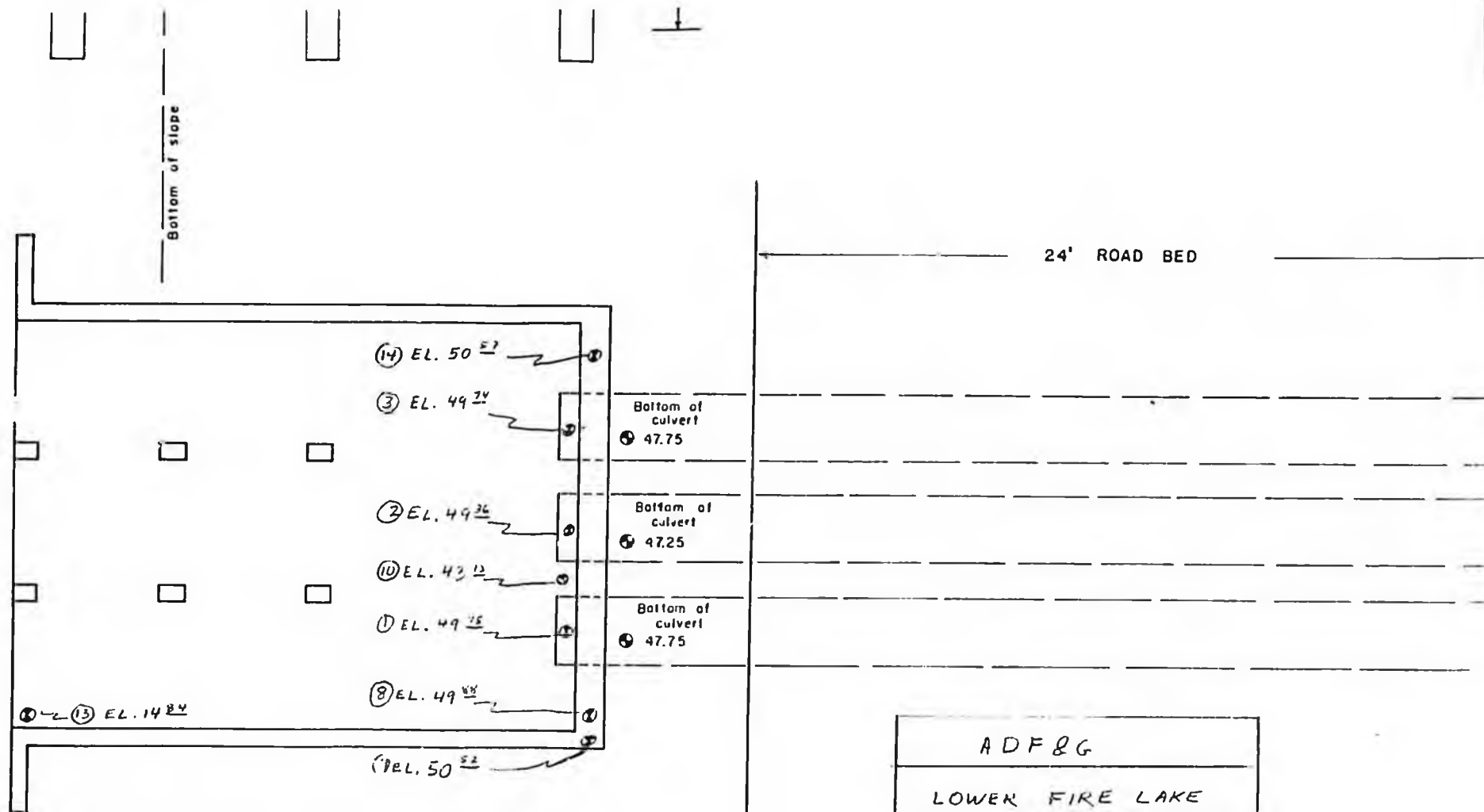
# LOWER FIRE LAKE

K. HUNT T  
 MAC ET "NNOWICZ / 75°  7/15/45

STA	BS	HI	FS	IFS	ELEV.
		<del>57.33</del> 55.03			
SAY LT. CMP.					
④ LT. CMP UP STREAM			5.61		51.72 <del>49.72</del> 50.03
⑤ MID. CMP UP STREAM			5.30		50.03 <del>51.45</del>
⑥ RT. CMP "			5.88		49.45
⑦ C. OF RD. ON CMP			5.58		51.75 <del>49.75</del>
⑧ TOP LT. COR. ABOUT. ↓			6.81		50.55 <del>48.52</del>
⑨ TOP LT. COR. ABOUT. ↘			1.45		49.88
⑩ BASE OF SPW Y TAIL RACE			14.20		43 <del>47.13</del>
⑪ WATER EL.			7.20		50 <del>48.13</del>
⑫ C. OF ROAD LT SIDE 200'			6.25		51.08 <del>49.08</del>
⑬ TAIL RACE TOE			15.49		
⑭ TOP RT. COR. ABOUT.			6.76		

	(CMP)	ELEV	BS	HI
① LEFT CULVERT		49.75 <del>47.75</del>	7.58	<del>57.33</del> 55.33
② MID. "		47.25 <del>47.25</del>	7.97	<del>57.32</del> 55.22
③ RT. "		47.75	7.59	57.34



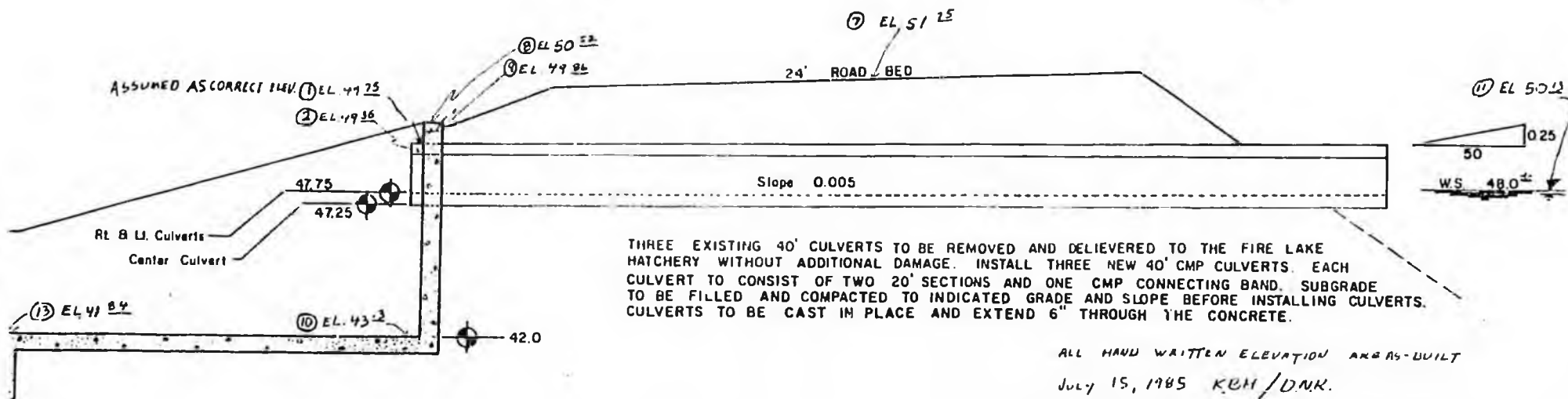


NOTE

1. Excavated material shall be piled to one side and re-used for back fill behind wing walls
2. Contractor shall furnish and place 14 cubic yards of gravel subgrade fill. Fill to extend two foot from edges of structure with minimum depth of one foot.
3. All culvert joints to be banded.

ALL ELEVATION IN HAND WRITING ARE

AS-BUILT JULY 15, 1985 KBH./UNR



**CROSS - SECTION**

Scale 1/4"=1'0"

**ALASKA DEPARTMENT OF FISH AND GAME**

SUPPORT BUILDING

JUNEAU, ALASKA

**LOWER FIRE LAKE  
 FISH TRAPPING FACILITY-REBUILD**

DRAWN BY	CHECKED BY	DATE	SHEET / of /
<i>G. Cunningham</i>		MAY 1964	
APPROVED BY	SCALE 1/2"=1'0"	NUMBER	
<i>J. J. Hansen, PE</i>	AS SHOWN	54-649-1	

# MEMORANDUM

# State of Alaska

Department of Natural Resources, Division of Land and Water Management

TO: Kyle Cherry  
Dam Safety Engineer *RDB for Kyle*

DATE: July 29, 1985

FILE NO:

TELEPHONE NO.

FROM: Carol Larson *CLM*  
Hydrologist

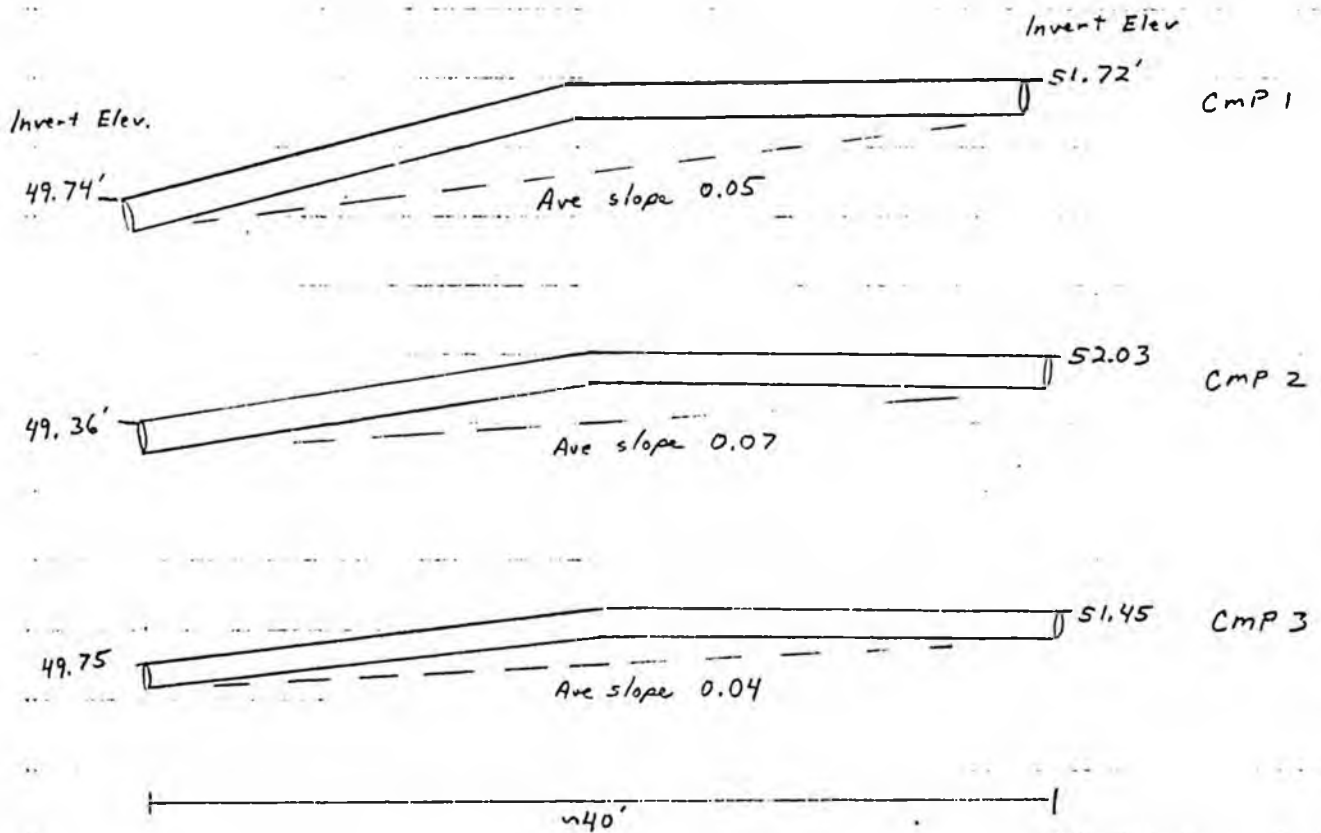
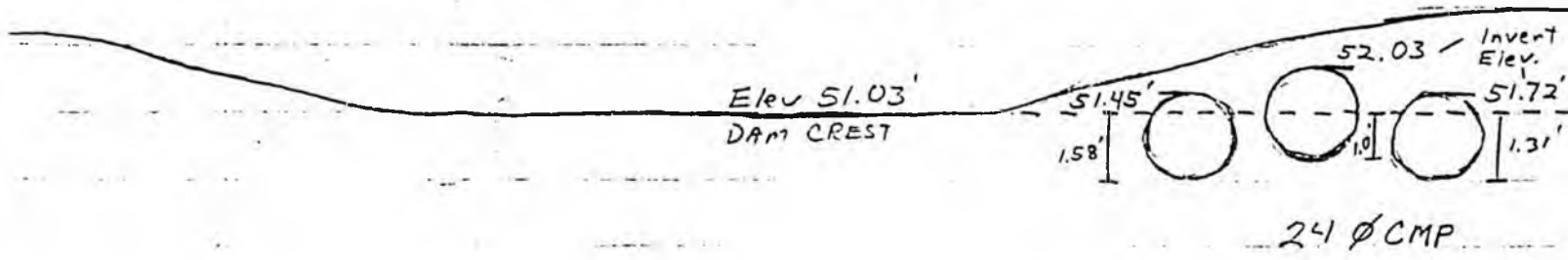
SUBJECT: Lower Fire Lake  
Dam Spillway Capacity

Preliminary hydrologic analysis of the spillway capacity at Lower Fire Lake indicates that the spillway as presently configured may not be adequate to pass the 100 year flood. Depending on initial assumptions, spillway capacity with the lake level at the crest of the dam ranges from 66 cfs to as low as 21 cfs, while the 100 year flood has been calculated as 49 cfs. Calculations are attached.

Attachment

CLM:hr

VIEW OF UPSTREAM FACE  
(NOT TO SCALE)



Design slope = 0.005

SPILLWAY CAPACITY:

Assume:  $n = 0.022$

$\phi = 24''$

$S = \text{average slopes} = 0.05$

CMP 1

0.07

CMP 2

0.04

CMP 3

= design slope = 0.005

$$Q = \frac{1.49}{n} A R^{\frac{2}{3}} S^{\frac{1}{2}}$$

$$= \frac{1.49}{0.022} (\pi \cdot 12)^2 \left( \frac{\pi \cdot 12}{2 \cdot \pi \cdot 1} \right)^{\frac{2}{3}} \left( \frac{1}{2} \right)^{\frac{1}{2}}$$

$$= 134.04 (5^{\frac{2}{3}})$$

$$Q_1 = 29.97 \text{ cfs}$$

$$Q_2 = 35.46 \text{ cfs}$$

$$Q_3 = 26.81 \text{ cfs}$$

$$Q_{\text{design}} = 9.48 \text{ cfs}$$

Assume Average Slopes:

Slope S Full Q (Partly Full)

Ratio D/Pipe Diameter

% Q

Discharge,  $Q$ , with Water at Dam Crest

Assume Design Slope:

CMP 1 0.005 9.48 cfs

CMP 2 0.005 9.48

CMP 3 0.005 9.48

1.31 ft

0.66

76

7.2 cfs

1.00

0.50

48

4.5

1.58

0.79

97

9.2

Spillway Capacity Water at Dam Crest Assuming Design Slope 21 cfs

Assume Average Slopes:	Slope S	Full Q (Partly Full)	Ratio D/Pipe Diameter	% Q	Discharge, $Q$ , with Water at Dam Crest
CMP 1	0.05	29.97 cfs	1.31 ft	0.66	76
CMP 2	0.07	35.46	1.00	0.50	48
CMP 3	0.04	26.81	1.58	0.79	97
					Spillway Capacity Water at Dam Crest Assuming Average Slope
					66 cfs
					23 cfs
					17
					26

Clark & Vesman.

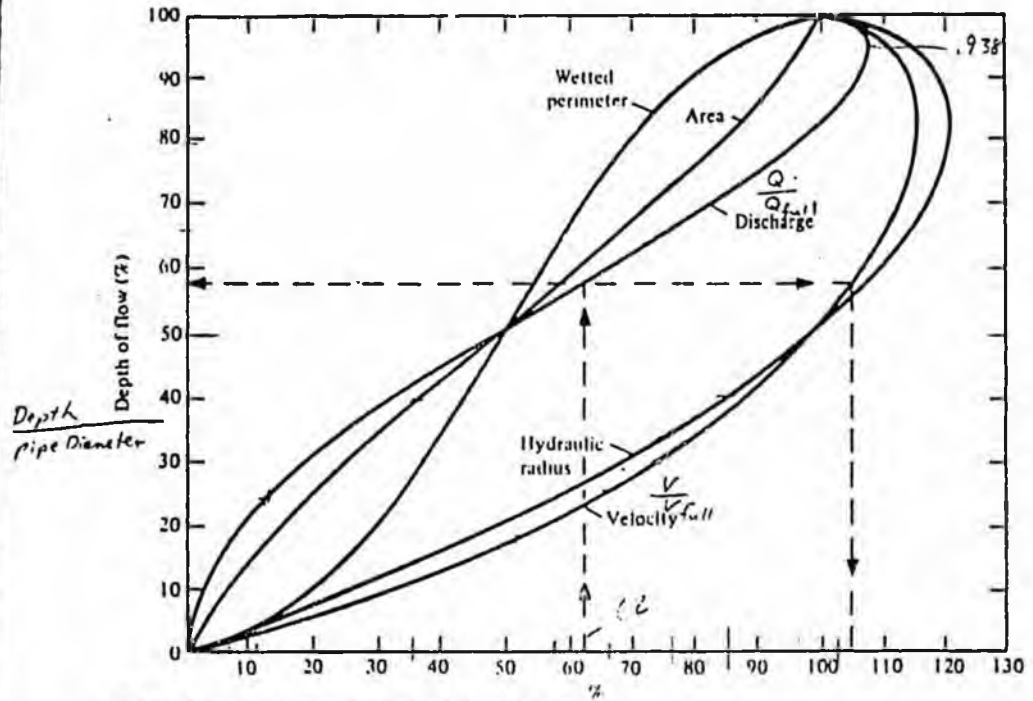


FIGURE 6-2 Hydraulic elements of a circular section.

a given discharge may occur at critical depth, at less than critical depth, or at greater than critical depth. Critical depth occurs when the specific energy is a minimum. Specific energy is defined as

$$E_s = d + \frac{V^2}{2g} \quad (6-2)$$

where  $d$  = depth of flow  
 $V$  = mean velocity

Flow at critical depth is highly unstable, and designs indicating flow at or near critical depth are to be avoided. For any value of  $E_s$  above the minimum, two alternative depths of flow are possible. One is greater than critical depth, the other less than critical depth. The former case indicates subcritical flow, the latter, supercritical flow. Critical depth for a channel can be found by taking the derivative of Eq. 6-2 with respect to depth, setting this equal to zero, and solving for  $d_c$ . For mild slopes the normal depth is greater than  $d_c$  and subcritical flow prevails. On steep slopes the normal depth is less than the critical depth and flow is supercritical. Once the critical depth has been computed, critical velocity is easily obtained. Critical velocity for a channel of any cross section can be shown to be

$$V_c = \sqrt{g \frac{A}{B}} \quad (6-3)$$

Velocity (fps)

ill in which

## 100 YEAR FLOOD

Utilized regression equation developed for use in Southcentral Alaska by the U.S. Forest Service (Water Resources Atlas, 1979, revised 1984).

$$Q_{100} = .892 P^{1.21} A^{.999} L^{-.366}$$

where  $P$  is mean annual precipitation (inches)  
 $A$  is basin area (square miles)  
 $L$  is percentage of basin storage in lakes  
 $[L = \text{area of lakes} / A \times 100 + 1]$

This method has the advantage of taking lake storage into account.

Assume  $P = 16.06$  inches (source AEIDC for Eagle River)

$A = 3.16 \text{ mi}^2$  (planimetered from U.S.G.S 1:63,360 Anchorage B-7)

$L = 4$  (planimetered from USGS 1:63360 Anchorage B-7. The area of Lower Fire Lake shown as swamp was included since much of this area became part of the lake with construction of the dam.)

$$Q_{100} = .892 (16.06)^{1.21} (3.16)^{.999} (4)^{-.366}$$

$$Q_{100} = 49 \text{ cfs}$$

# STATE OF ALASKA

## DEPARTMENT OF NATURAL RESOURCES

DIVISION OF LAND AND WATER MANAGEMENT

BILL SHEFFIELD, GOVERNOR

POUCH 7-005  
ANCHORAGE ALASKA 99510-7005  
PHONE: (907) 561-2020

January 13, 1986

William Betlach  
Manager of Construction & Design  
Municipality of Anchorage  
Dept. of Public Works  
P.O. Box 196650

Re: Responsibility for Fire Lake Dam

Dear Bill:

Last December I spoke with Ken Duffus in regards to Lower Fire Lake Dam. He mentioned that the transfer of the right-of-way by Alaska Dept. of Fish & Game may not have included the dam. It is my understanding that the Municipality's legal department has been reviewing this possibility.

We are anxious to hear the outcome of this review. If, indeed, the Municipality alleges it is not responsible for the dam, we will want to review the matter with the Attorney General's office. We are anxious to see the problem remedied this coming summer.

Sincerely,



Ken Hunt  
Assistant Dam Safety Engineer

December 30, 1985

William Etlach  
Municipality of Anchorage  
Dept. of Public Works  
P.O. Box 196650  
Anchorage, AK 99519-6650

Re: Proposed Maintenance of the Fire Lake Dam

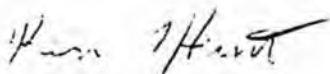
Dear Mr. Etlach:

In response to your letter of December 17, 1985, there are two permits required by our Division:

1. **Water Rights:** Water rights are required for impounding water behind Lower Fire Lake Dam. For details contact the Water Office at the Southcentral District Office, 3601 C Street, 10th Floor, Pouch 7-005, Anchorage, AK 99510, tele. 762-2277. Note that a \$50 fee goes into effect January 1, 1985.

2. **APPLICATION FOR PERMIT TO CONSTRUCT OR MODIFY A DAM:** This permit will be required for the repair of the dam and should be submitted along with plans, specifications, and fees required under 11 AAC 93, Dam Safety and Construction Regulations.

Sincerely,



Ken Hunt  
Assistant Dam Safety Engineer

**Enclosures:**

Water Use Handbook  
Water Rights Application  
11 AAC 93 Dam Safety and Construction Regulation  
Application for Permit to Construct or Modify a Dam

cc: Gary Prokosch, Water Officer

Khhz

# Municipality of Anchorage



P. O. BOX 196650  
ANCHORAGE, ALASKA 99519-6650  
(907) 786-8160

TONY KNOWLES  
MAYOR

DEPARTMENT OF PUBLIC WORKS  
(3500 East Tudor Road)

December 17, 1985

Kyle Cherry  
State of Alaska  
DNR/Div. of Land & Water Management  
Pouch 7-005  
Anchorage, Alaska 99510-7005

RE: PROPOSED MAINTENANCE OF THE FIRE LAKE DAM

Dear Kyle:

Certain property owners have approached us and asked for our assistance in resolving the rising water level of Lower Fire Lake. The property owners maintain that a dam structure which controls the level of Lower Fire Lake has been altered over the years. Presently we are providing a minimum level of maintenance to the area roads and no maintenance to the dam structure itself. Due to the concerns expressed by the local residents, we plan to initiate an accelerated maintenance program as soon as possible which will hopefully resolve the problem with the rising lake level. We, therefore, request a determination as to whether a permit is required for maintaining the dam and road structure in a configuration as it was previously designed in 1964 (See Appendix 1). The present conditions (See Appendix 2) are such that it requires the removal and replacement of certain sections of culvert. This will affect both the roadway and the adjacent waterbody.

Please advise us if a permit is required or if you need any additional information before an assessment can be made.

Please contact Ken Duffus at 786-8111 if you should have additional questions.

Sincerely,

A handwritten signature in dark ink, appearing to read "William Betlach", is written over the typed name.

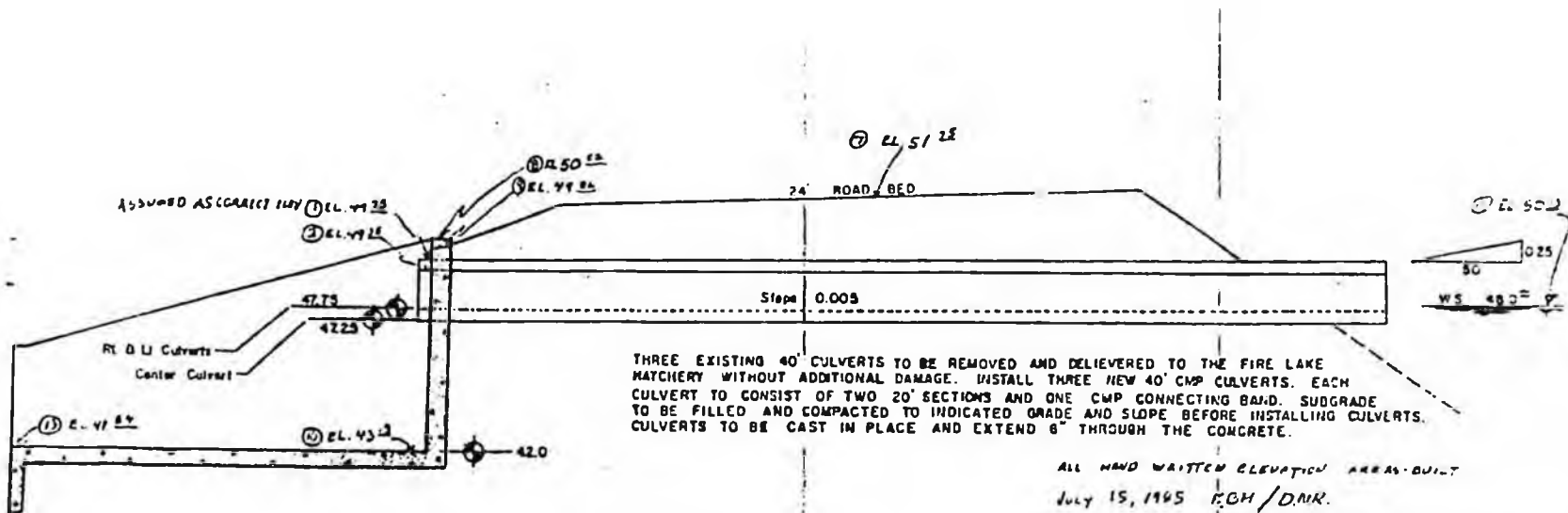
William Betlach  
Manager  
Design & Construction

Attachment

cc: Director, Public Works  
Municipal Engineer

WBB/KD/dc  
4/wb/13

12/19/85



THREE EXISTING 40' CULVERTS TO BE REMOVED AND DELIVERED TO THE FIRE LAKE MATCHERY WITHOUT ADDITIONAL DAMAGE. INSTALL THREE NEW 40' CMP CULVERTS. EACH CULVERT TO CONSIST OF TWO 20' SECTIONS AND ONE CMP CONNECTING BAND. SUBGRADE TO BE FILLED AND COMPACTED TO INDICATED GRADE AND SLOPE BEFORE INSTALLING CULVERTS. CULVERTS TO BE CAST IN PLACE AND EXTEND 6" THROUGH THE CONCRETE.

CROSS-SECTION  
Scale 1/4"=1'0"

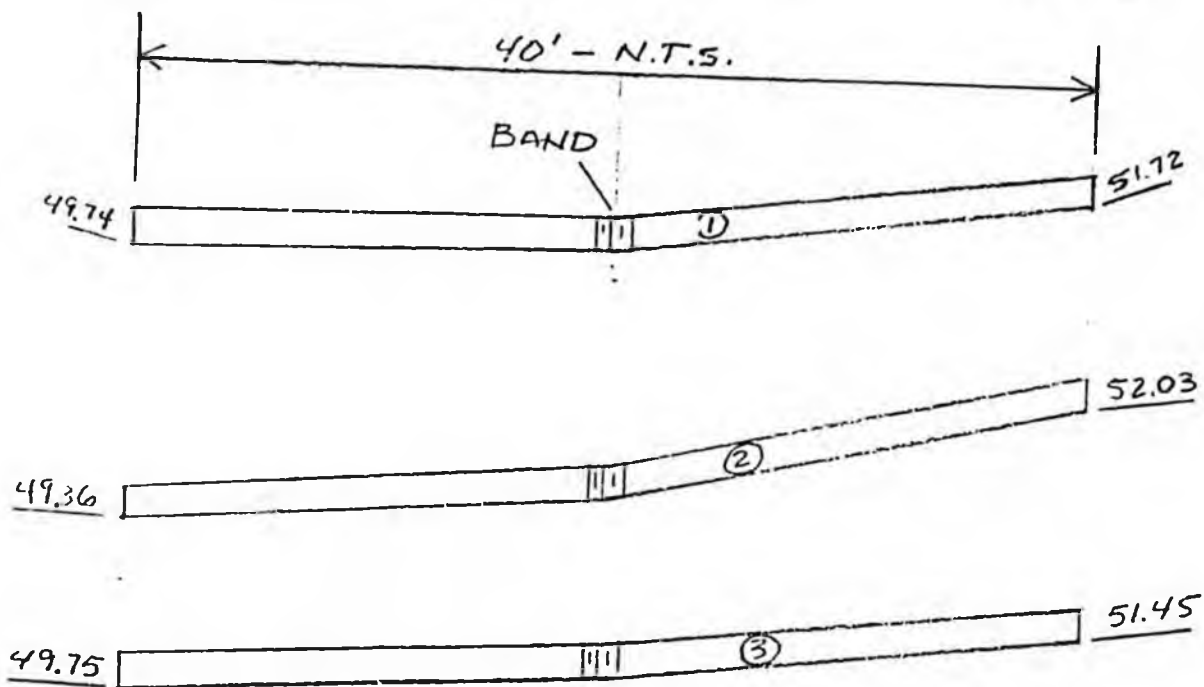
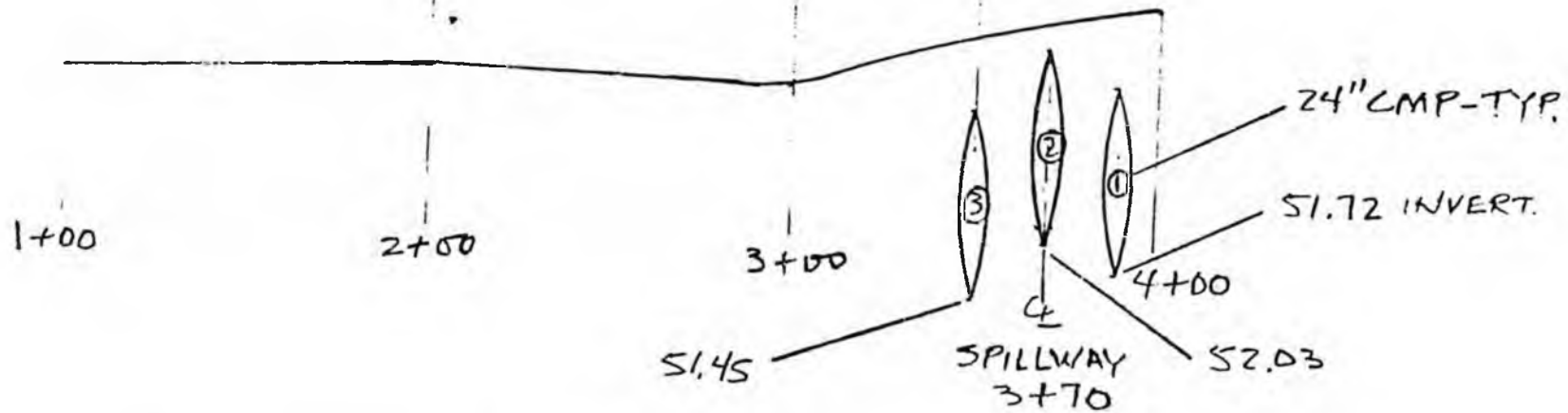
ALASKA DEPARTMENT OF FISH AND GAME			
SUPPORT BUILDING		ANVAU, ALASKA	
LOWER FIRE LAKE FISH TRAPPING FACILITY-REBUILD			
DRAWN BY <i>R. Cunningham</i>	CHECKED BY	DATE MAY 1964	SHEET 1 of 1
APPROVED BY <i>L. J. [Signature]</i> PE	SCALE 1/2"=1'0 AS SHOWN	NUMBER 542549-1	

LEV.  
4

LOWER FIRE LAKE DAM

MUNIC. OF ANCH. - DESIGN

12-5-85



APPENDIX 2

H.G.

PROJECT: LOWER FIRE LAKE IMPROVEMENTS

YEAR 85/86

MONTH	NOV	DEC	JAN	FEB	MARCH	APRIL	MAY	JUNE
IDENTIFY FUNDING FOR PRELIMINARY INVESTIGATION	■							
ANALYZE AVAILABLE INFORMATION		■						
DEVELOP ALTERNATIVES W/COST ESTIMATES		■						
SUBMIT REQUESTS FOR PERMITS TO THE APPROPRIATE AGENCY		■						
IDENTIFY FUNDING FOR RECOMMENDED ALTERNATIVES			■					
HOLD PUBLIC HEARING ON RECOMMENDED ALTERNATIVE				■				
IMPLEMENT ALTERNATIVE *					■	■	■	■
INITIATE CONTINUED MONITORING PROGRAM FOR THE LAKE							■	■
FOLLOW-UP MEETING TO DETERMINE SUCCESS OF PROJECT								June '87

\* Estimated time frame for implementing alternative. Actual construction will depend on availability of forces, material and weather.

# MEMORANDUM

# State of Alaska

Department of Natural Resources, Division of Land and Water Management

TO L.A. Dutton  
Chief, Water Management

FROM *Kyle J. Cherry*  
Kyle Cherry  
State Dam Safety Engineer

DATE: November 12, 1985

FILE NO: 2450/7300

TELEPHONE NO: 4318

SUBJECT: Fire Lake Public Meeting

I

Ken and attended the public meeting held in Eagle River by the Municipality of Anchorage (MOA) on November 11 to discuss the problems associated with Lower Fire Lake Dam. Gary Prokosch also attended. In addition to the public, Senator Tim Kelley and Roger Porter from Rick Halford's office were present for part of the meeting.

Ray Mann, MOA Director of Public Works, chaired the meeting and gave a brief history of MOA's evaluation of the problem. He was interrupted by having to engage in a hot debate with a resident on the lake. After hearing from residents, Mr. Mann stated that MOA was prepared to lower the lake to the "legal" level as defined by the original subdivision plat, approximately 6 1/2 feet lower than the present level. This would satisfy all health and safety problems and cease the trespass of the lake water on private property. This was more than the residents wanted!

It was finally decided to lower the lake to the 1964 level as defined by the ADF&G control structure, which is approximately 2 1/2 feet lower than the present level. An engineering study will also evaluate whether or not it is feasible to go for a more complex control structure in the near future or simply rely on the present culvert overflow system.

If the work can be accomplished for less than \$25,000, then MOA will do it out of road district maintenance funds. If it is larger, they will go for a capital appropriation from the state legislature. Work to use the present scheme to lower the level by installing new culverts at the original grade and leveling the surface of the dam will be done this winter if possible, and next summer if not. This will satisfy our three concerns: spillway capacity, freeboard, and a level dam crest.

KJC:kmb

cc: Gary Prokosch

# MEMORANDUM

# State of Alaska

Department of Natural Resources, Division of Land and Water Management

TO L.A. Dutton  
Chief, Water Management

DATE November 1, 1985

FILE NO 7300

*Kyle J Cherry*  
FROM Kyle Cherry  
State Dam Safety Engineer

TELEPHONE NO 4318

SUBJECT Lower Fire Lake Dam  
Meeting

On 10/30/85, Ken and I attended a meeting on the Lower Fire Lake Dam at the request of Ray Mann, Municipality of Anchorage (MOA) MOA Director of Public Works. Gary Prokosch was also present, as well as personnel from MOA Public Works and MOA Health and Environmental Protection.

Mr. Mann stated that MOA was responsible for the dam and was working to resolve the problem. MOA will determine the "legal" water level and will set the first level based on health and safety issues only. A public meeting will be held on 11/7/85, 7:00 p.m., Eagle River Town Hall. Local and state politicians have been invited.

Mr. Mann said if the remedial work was in the \$10,000 range, MOA could easily handle it; if it was significantly larger, assistance would be requested from the state due to ADF&G's involvement in the original construction of the dam. We told MOA that we viewed the work as providing adequate culverts, adequate freeboard, and a level crest. Further, that if it were accomplished by lowering the dam, the work should not be costly. Gary then gave a brief presentation on water rights.

It would appear we are all moving in the same direction at this time. MOA is considering doing the work this winter if it is decided to lower the level. However, it is more likely it will be done next summer. John Oiness, Public Works - Engineering, is the lead person for the plan and has been instructed to work with us.

KJC:kmb

cc: Gary Prokosch, SCRO

KENNETH R. ATKINSON  
JOHN M. CONWAY  
JESSE C. BELL  
BRUCE E. GAGNON  
ROBERT J. DICKSON  
W. MICHAEL MOODY  
GEORGE M. KAPOLCHOK  
JOHN A. TREPTOW  
PATRICK B. GILMORE  
SUSAN WRIGHT MASON  
RICHARD E. VOLLEPTSEN  
GARY M. GUARINO  
NEIL T. O'DONNELL  
ROBIN O. BRENA

LAW OFFICES OF  
ATKINSON, CONWAY, BELL & GAGNON, INC.  
A PROFESSIONAL CORPORATION  
420 L STREET  
SUITE 500  
ANCHORAGE, ALASKA 99501

October 17, 1985

CABLE ADDRESS:  
DOVER

TELEPHONE 276-1700  
AREA CODE 907

TELEX NUMBER:  
26-517

TELECOPIER/FACSIMILE:  
(907) 272-2082

HAND DELIVERED

Honorable Tony Knowles  
Mayor and Chief Executive  
Municipality of Anchorage  
632 West Sixth Avenue  
Anchorage, Alaska 99501

Re: Lower Fire Lake Dam

Dear Mayor Knowles:

This letter brings to your attention a matter of some urgency. There are problems with the dam forming Lower Fire Lake in Eagle River that affect not only land owners around the lake, but also pose health and safety hazards to downstream residents, the Glenn Highway and the Alaska Railroad. The purpose of this letter is to make you aware of the problems in hopes they will be remedied promptly. Since there is always a chance that will not occur, this letter also is to advise of my intent to pursue litigation against the Municipality of Anchorage unless the problem is remedied in a manner that removes the trespass from my land. My property is Lot 2, Tract A-1, Lake Ridge Terrace.

At the behest of Jack Woodland, a local landowner, the dam was inspected on July 17, 1985 by the Dam Safety Unit of the State of Alaska. Enclosed is a copy of the report of Ken Hunt, Assistant Dam Safety Engineer, pointing out the discrepancies in the dam. In addition to other deficiencies, the inspection determined that the outlet culverts through the dam are approximately two feet above their original location. As a result, there is inadequate freeboard between the water level and the top of the dam. The Dam Safety Unit also determined that the dam is inadequate to survive a 100-year flood. A copy of the report is enclosed. As you will see, Mr. Hunt states in two places that the condition of the dam is of an "urgent nature."

As indicated by the three enclosed copies of letters from the Department of Natural Resources, the State is very concerned about this situation, but has encountered difficulty getting the Municipality to act on the problem. Although originally disclaiming ownership of the dam, the Municipality has finally determined that

Mayor Tony Knowles  
October 17, 1985  
Page 2

it owns the dam. Unfortunately, it appears that no department within the Municipality is yet willing to admit that it has responsibility for rectifying the problems with the dam. Because of this apparent lack of assumption of responsibility by a specific municipal department, I have written to you as the chief executive of the Municipality. Jack Woodland and I recently met with Paul Badger, the general foreman of the Eagle River rural road service area, and Jerry O'Connor. Although those gentlemen appreciated the hazards posed, they indicated there were no funds available to correct them. There was some discussion whether the solution should be classified as capital construction rather than maintenance, and what department should be responsible for doing the work. Regardless how the Municipality classifies the solution or what department has jurisdiction, the money must be found for a prompt permanent solution to the problem. Hopefully your office can facilitate the funding efforts.

The form of the solution is a major concern. Because the dam in its altered state holds at least two feet more of water than it should, land surrounding the lake has been inundated. This causes several problems. First, it makes the land under water unuseable. Second, it affects the water table around the lake. This affects not only the ability of land owners to install septic systems but also imperils existing septic systems. I am told there is at least one existing system now known to be impacted by the rising water level. A thorough investigation would undoubtedly reveal other systems that no longer satisfy health requirements because the water level has encroached on them. The health hazard is obvious. Third, it transforms formerly dry land into inundated wetlands. As you are probably aware, even though those newly-created wetlands fall on private land, use of them is restricted by the Corps of Engineers. Thus landowners not only lose dry land but also lose the right to control or use the inundated land.

Because of the foregoing reasons, it would not be an acceptable solution to simply build up the dam to a higher level. Moreover, as noted in Mr. Hunt's report, there are deficiencies with the culverts themselves that must be remedied. When those deficiencies are remedied, the culvert or other form of outlet utilized must be returned to its original 1964 level.

The Municipality of Anchorage has no right to maintain this structure so that water inundates private land. It is well-established law that trespass is committed when one inundates the land of another by damming a water body. The Municipality of Anchorage has been and continues to be in trespass with regard to the land inundated by maintaining the dam outlets artificially high. As such, the Municipality is liable for damages in

Mayor Tony Knowles  
October 17, 1985  
Page 3

trespass. This is a continuing trespass and the damages increase each day the trespass is maintained. As part of their damages, landowners may elect to recover either the decrease in value of their property or the cost of restoring their land to a dry state. G & A Contractors, Inc. v. Alaska Greenhouses, 517 P.2d 1379 (Alaska 1974); Restatement (Second) of Torts § 929. Finally, since trees and shrubs have been damaged by the inundation, the damages are trebled under AS 09.45.730. If the Municipality continues this trespass after notice and chooses to rectify the dam problem in a manner that perpetuates the trespass, punitive damages would seem appropriate.

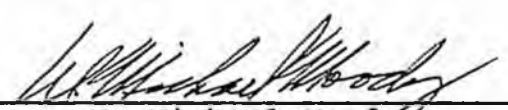
You are hereby notified that if the dam emergency is not rectified in a manner that removes the approximately two feet of water inundating a portion of my property, all possible legal and equitable remedies will be enforced through legal action against the Municipality. While this letter is written on my own behalf, I have been assured by other landowners that they would also pursue their remedies in court if necessary.

We all hope that will not be necessary. There is no question that the dam must be repaired. Our concern is that it be done promptly and correctly, in a manner that will lower the lake to its proper level and maintain it there. After you have examined the question, I am confident you will agree that is the proper way to remedy the problem. Given the safety concerns of the Dam Safety Unit, surely there must be a source of funds to remedy the emergency. If you or your representatives have any questions, I would be happy to discuss them.

Very truly yours,

ATKINSON, CONWAY & GAGNON

By

  
W. Michael Moody

WMM:vs

Enclosures

cc: ✓ Mr. Ken Hunt (w/o enclosures)  
Mr. Ray Mann (w/o enclosures)  
Risk Management Division,  
Municipality of Anchorage (w/o enclosures)  
Mr. David G. Berry (w/o enclosures)

# Municipality of Anchorage



P.O. BOX 6650  
ANCHORAGE, ALASKA 99502-0650  
(907) 786-8160

TONY KNOWLES  
MAYOR

DEPARTMENT OF PUBLIC WORKS  
(3500 East Tudor Road)

October 11, 1985

Mr. Kyle J. Cherry  
State Dam Safety Engineer  
State of Alaska  
Division of Land & Water Management  
Pouch 7-005  
Anchorage, Alaska 99510-7005

Dear Mr. Cherry:

This is in regard to your recent correspondence with Mr. David G. Berry, Director of Property and Facilities Management for the Municipality of Anchorage. We have received a copy of the dam report for the lower Fire Lake dam and associated correspondence from your office. The Department of Public Works is pursuing a resolution to the problems pointed out in the dam safety inspection report of July 29, 1985. I recently briefed Ken Hunt of your office on our efforts in this regard.

In summary, we are proceeding as follows:

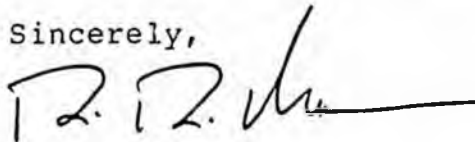
1. Producing an engineer's estimate of the work required and cost of such work associated with maintaining the safety of the lower Fire Lake dam.
2. Researching the historic level of the lake through the review of survey documents and plats as well as evaluating questions regarding riparian rights.
3. In the next several weeks we will conduct a meeting of lower Fire Lake residents to explain current status of the dam and to solicit input regarding solutions such as lowering the water level of the lake.
4. In preparation for the above-referenced meeting, we will be contacting agencies such as the U.S. Army Corps of Engineers, the Alaska Department of Environmental Conservation, the Department of Fish and Game, and others regarding their role in this project. We also anticipate having representatives of those agencies at the homeowners meeting.

Mr. Kyle J. Cherry  
October 11, 1985  
Page 2

5. Based on the input received from effected homeowners and on our research regarding the water level of the lake and riparian rights, we will proceed to design whatever remedies are necessary and attempt to secure funding to allow those remedies to be implemented in 1986.

We trust this answers your concerns about the Municipality's efforts to respond to the dam safety evaluation conducted by your office. If you have any questions concerning our progress please contact me directly at 786-8160.

Sincerely,



R. R. Mann  
Director of Public Works

RRM/bmco  
4/rrm/7

cc: Jerry O'Connor, Municipal Assemblyman  
Fred Dyson, Municipal Assemblyman

October 8, 1985

CERTIFIED MAIL 715 618 012  
RETURN RECEIPT REQUESTED

Don Shiesl  
Municipality of Anchorage  
Department of Public Works  
P.O. Box 11960  
Anchorage, AK 99519-6650

Re: Lower Fire Lake Dam

Dear Mr. Shiesl:

I appreciated the conversation we had Friday 10/4/85. Per your request, I have enclosed another copy of Lower Fire Lake Dam inspection report. The following are some initial steps to be taken towards resolving the problems with Lower Fire Lake.

A. Make the dam safe

A common approach for temporary solutions to problems of this nature is to lower the level of the impoundment to a safe operating level and maintain that level until the corrective work is completed. This would be considered one acceptable approach by this office.

B. Obtain Water Rights

The Municipality of Anchorage should obtain water rights since the dam controls the level of the lake. This will establish the lake level or quantity of water to be used for recreational purposes and will be helpful in determining the criteria necessary to bring the dam up to safe standards. Please contact the Southcentral Region's Office for water rights information, at the Frontier Building, 3601 C Street, telephone 561-2020.

Don Shiesl  
October 8, 1985  
Page 2

C. Obtain Approval to Construct or Modify a Dam

Approval must be received from this office prior to any changes which are to be made to a dam. This is apart from normal operation and maintenance and is accomplished by filling out an application to construct or modify a dam and submitting the application to the Southcentral Regional Office.

Please inform us in writing as to the action you are taking to resolve this problem within 15 days from receipt of this letter.

I am sure we both share the public's concern, and I hope this will be helpful for you to expeditiously correct the unsafe condition.

Sincerely,



Ken Hunt  
Assistant Dam Safety Engineer

Enclosures:

Lower Fire Lake Inspection Report, July 29, 1985  
Water Rights Application  
Water Use Handbook  
Application to Construct or Modify a Dam  
Regulations

cc: Gary Prokosch, SCRU

AK:hr

# Municipality of Anchorage



POUC 3-650  
ANCHORAGE, ALASKA 99502-0650  
(907) 264-4317

TONY KNOWLES  
MAYOR

DEPARTMENT OF PROPERTY & FACILITY MANAGEMENT

September 20, 1985

Kyle J. Cherry, P.E.  
State Dam Safety Engineer  
State of Alaska, DNR  
Div. of Land and Water Management  
Pouch 7-005  
Anchorage, Alaska 99510-7005

Re: Fire Lake Dam

Dear Mr. Cherry:

Please forgive my tardiness in responding to your July 29th letter regarding the situation at Fire Lake Dam. It took us some time to research the ownership situation at the dam, and once that was determined, to decide which department of the Municipality would have responsibility. This department handles real estate for the Municipality, including facilities such as major buildings. A structure such as Fire Lake Dam, however, is not the type of "facility" which we manage. We determined that the Dam was appropriately the responsibility of the Public Works Department. With that decision, I passed your letter on to Ray Mann, the Public Works Director. Ray advised me several weeks ago that someone from his department would look into the matter right away. I do not know what progress has been made to date, but I feel certain that Ray shares your concerns for the safety of the Dam and the surrounding area, and will see to it that the problem is resolved soon.

If you have any questions about what actions are being taken, please call Ray Mann directly at 786-8160.

Sincerely,

David G. Berry, Director  
Property and Facilities Management

cc: R. R. Mann

September 20, 1985

Kyle J. Cherry, P.E.  
State Dam Safety Engineer  
State of Alaska, DNR  
Div. of Land and Water Management  
Pouch 7-005  
Anchorage, Alaska 99510-7005


Re: Fire Lake Dam

Dear Mr. Cherry:

Please forgive my tardiness in responding to your July 29th letter regarding the situation at Fire Lake Dam. It took us some time to research the ownership situation at the dam, and once that was determined, to decide which department of the Municipality would have responsibility. This department handles real estate for the Municipality, including facilities such as major buildings. A structure such as Fire Lake Dam, however, is not the type of "facility" which we manage. We determined that the Dam was appropriately the responsibility of the Public Works Department. With that decision, I passed your letter on to Ray Mann, the Public Works Director. Ray advised me several weeks ago that someone from his department would look into the matter right away. I do not know what progress has been made to date, but I feel certain that Ray shares your concerns for the safety of the Dam and the surrounding area, and will see to it that the problem is resolved soon.

If you have any questions about what actions are being taken, please call Ray Mann directly at 786-8160.

Sincerely,



David G. Berry, Director  
Property and Facilities Management

cc: R. R. Mann

September 17, 1985

CERTIFIED MAIL NO. 715 618 011  
RETURN RECEIPT REQUESTED

David G. Berry, Director  
Property & Facility Management  
Municipality of Anchorage  
Pouch 6-650  
Anchorage, AK 99502

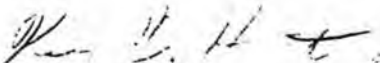
Dear Mr. Berry:

On July 29, 1985, a letter was sent to you concerning the unsafe condition of Lower Fire Lake dam followed by a phone call in August. Your office informed us that the Municipal Attorney was still determining the Municipality's responsibility and would take action accordingly.

More than sufficient time has passed and no response as to the action you will be taking has been received by us. This lack of a response leads us to believe you may not be aware of the consequences of the failure of the dam. We hesitate to consider the alternative that you are not concerned about public safety and losses which private and public property owners could suffer.

Please inform us within 48 hours of receipt of this letter of what steps you will be taking, and when, to correct the condition of the dam. Your failure to respond to our request and to correct the dam will cause us to consider more formal action.

Sincerely,

  
Kyle J. Cherry, P.E.  
State Dam Safety Engineer

KJC:LAD:KH:hr

KEN

AUG 29 1985

Date AUG 29 1985  
Chugiak-Eagle  
River Star

Client No. 240

# Road board rejects dam problem

By MARJORIE COCHRANE  
Chief Writer, The Star

The Chugiak - Eagle River rural road board has been handed a dam it doesn't want and won't accept.

Not only did board members say emphatically at a meeting Monday night that they aren't "in the dam business," but they particularly don't want the Lower Fire Lake dam and its associated problems.

The earthen dam, which is topped by an access road for homes on the western side of Fire Lake has a "significant" hazard potential, a dam safety engineer has determined.

Who owns the dam has been in question for the past several weeks, ever since Fire Lake resident Jack Woodland alerted the U.S. Army Corps of Engineers to what he says is a steadily-rising level of the lake that could cause the lake to breach the dam and flood the Glenn Highway and the Alaska Railroad downstream from the outlet.

Now it's apparently been decided that it belongs to the municipality which in turn thinks it's up to the road board to take over the responsibility.

A report which has since been issued by the Department of Natural Resources says that right of way for the dam and access road was granted to the Department of Fish and Game in 1962 for the development of the dam. In 1981 the right-of-way was transferred to the municipality, a record search revealed.

While road board members agreed they would accept the road and its maintenance, they don't want the dam, they told road district supervisor Paul Badger. The board will decide how to handle the situation at a meeting Sept. 23. In saying "yes" to the road and "no" to the dam, board member Paul Myers pointed out that there was no cost estimate on correcting deficiencies in the dam cited in the July 29 report.



The dam and culverts which cross Fire Lake have been found to be inadequate.

Those deficiencies listed in the report prepared by Kenneth Hunt, assistant dam safety engineer, are:

- an inadequate "freeboard" (the distance from the surface of the water to the top of the dam) of one foot.

- material over spillway culverts that doesn't provide adequate protection.

- inadequate spillway capacity.

Hunt pointed out that the road on the dam's crest appears to be lower and wider than designed. The structure of the dam and spillway are also "significantly different" from the design drawings, he found. He warned that the spillway is "not capable of passing a 100 year flood (one that could be expected to occur given the right set of circumstances at any time in a 100-year period) without overtopping."

Hunt added that while there is probably no "imminent emergency danger" that the dam will fail, he considers its condition "urgent" and recommends modifying both the dam crest and the spillway to provide more freeboard protection. He said that materials over the culverts should also be increased and that spillways should be modified to

"discourage" changing their elevation.

# Farmers can burn again

Point MacKenzie farmers will be allowed to burn slash on their agricultural parcels under a new permit approved by the state's Department of Environmental Conservation (DEC). The permit was issued to the state's Department of Natural Resources, whose Division of Forestry will oversee the farmers' controlled burning.

DEC and the Department of Natural Resources worked out terms of the permit, which includes the following restrictions:

- Permission to burn will be given by DEC on a day-by-day basis, depending on air quality readings and weather.

- No more than three miles of windrow will be ignited per day unless additional approval is granted by DEC. If DEC allows an increase, it would be for no more than three additional miles of windrow each day.

- All burning must cease if smoke becomes evident in populated areas.

- A telephone line will be staffed by DEC and DNR to give necessary information to the public.

- An adequate ventilation factor (ability of smoke to rise) must exist.

Bill Lamoreaux, DEC's Southeastern regional supervisor, says that this permit follows a successful burn project conducted in May by DNR. Lamoreaux stressed that while in this case, the farmers will do the burning, the same tight controls will be in place. He said that quantities of wood allowed to burn each day will be much lower than those allowed during that earlier burning program.

In May, a total of 62 miles of windrow was burned, and the highest amount burned in one day was 25 miles.

DNR Deputy Commissioner Jim Barnett said there are more than 200 miles of windrows of timber debris still left at Point MacKenzie and that material needs to be removed.

"The Point MacKenzie farmers are bound to a development schedule they agreed to when they purchased their agricultural lottery parcels," said Barnett. He said the slash needs to be removed now because it is a fire hazard if not burned under controlled conditions, and a breeding ground for forest pests that cause damage to healthy timber.

"After the successful burn that our forestry division conducted this spring," Barnett said, "we are confident we have the necessary controls and monitoring systems to permit burning by farmers on a limited basis."

Ignitions will be prohibited if winds would tend to blow smoke into populated areas, or if particulate readings are too high at air monitoring stations.

As in the earlier burn, procedures must be followed as outlined in an operations plan developed

jointly by DNR and DEC which describes roles and responsibilities of each division, and in the Air Pollution Episode Plan, which specifies actions to be taken in the event air quality is degraded in populated areas as a result of burning. The specified actions are designed to protect public health and are based upon readings of particulate levels monitored at local air quality stations.

Barnett said that DNR will continue its efforts to see that any salvageable wood at the Point MacKenzie site is made available for fuelwood and other purposes.

Burning may begin as soon as weather allows and the permit expires on Oct. 31. Point MacKenzie farmers who wish to burn should contact Jake Shaw at DNR's Division of Agriculture in Palmer, 745-7200.

Public information telephone numbers that may be called to obtain smoke and monitoring data are: Dept. of Environmental Conservation, 376-5139 (during office hours); DNR, Division of Forestry, Anchorage/Mat-Su Area Office at Big Lake, 592-6027 (during office hours); or DNR's 24-hour recorded message, 746-2412.

July 29, 1985

David G. Berry, Director  
Property & Facility Management  
Municipality of Anchorage  
Pouch 6-650  
Anchorage, AK 99502

Dear Mr. Berry:

On July 15, 1985, we received a complaint from Mr. Jack Woodland concerning the raised level of Lower Fire Lake in Eagle River. Mr. Woodland owns property on the lake. Staff in our Dam Safety Unit went to Fire Lake that same day to check the condition of the dam and to meet on site with Mr. Woodland and representatives of the U.S. Army Corps of Engineers and the Eagle River Rural Road Service Area. A copy of the report of the inspection made that day by Ken Hunt, Assistant Dam Safety Engineer, is enclosed.

Subsequent to the inspection and as part of the report preparation, DNR land status records were checked for ownership of the dam. The status records revealed that the dam was authorized by right-of-way permit ADL 18694, issued to the Department of Fish and Game in 1961. This right-of-way, however, was transferred to the Municipality of Anchorage on June 6, 1981; thus it appears that the Municipality owns the dam.

Our inspection on July 15 revealed that the structure of Lower Fire Lake Dam is significantly different from the design drawing and has these major deficiencies:

1. Inadequate freeboard, which is about one foot,
2. Inadequate protection of spillway culverts, and
3. Inadequate spillway capacity.

The condition is considered urgent, since the dam is classified with a significant hazard potential and the spillway is inadequate to pass flood flows. The report suggests that one of the structure's primary function is a road, in addition to being a dam.

Please contact our office within 10 days of receipt of this notice to apprise us of action you will be taking to correct the deficiencies.

Sincerely,

*Frank D. Muth*

for Tom Hawkins  
Director

cc: Richard A. LeFebvre

# MEMORANDUM

# State of Alaska

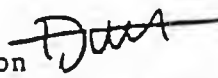
Department of Natural Resources, Division of Land and Water Management

TO Dick LeFebvre  
Acting Regional Manager, SCR0

DATE July 29, 1985

FILE NO 655.3

TELEPHONE NO 4317

FROM L.A. Dutton   
Chief, Water Management

SUBJECT Lower Fire Lake Dam

In response to your July 25, 1985 memo, we also received a complaint from Jack Woodland on July 15, 1985, concerning the raised elevation of the lake. On that same day we met on site with Mr. Woodland and representatives of the Corps of Engineers and the Eagle River Rural Road Service Area and field inspected the dam (see enclosed report from Ken Hunt dated July 29, 1985).

DNR's land status records show that a right-of-way was granted to the Department of Fish and Game in 1961 for the development of Lower Fire Lake Dam. Later, on June 25, 1981, the ROW was transferred to the Municipality of Anchorage (ADL 18694). A notice has been sent to the Municipality of Anchorage (see copy) notifying them of Mr. Woodland's complaint, of their apparent ownership of the dam, and informing them of the dam's deficiencies. A copy of Ken's report was sent with the notice.

You will note that our report suggests that although the structure is a dam, it seems to function primarily as a road. The records indicate that the structure was designed as a dam by ADF&G about 1962 and that they were involved in the construction. The structure's design apparently lent itself to use as an access road to the lake. Now the structure or road provides both public and private property access. Ken's report also suggests that the structure has been altered or tampered with to the extent that the lake level has been effected. We do not feel that a decision as to the level of the lake is necessarily within our purview. Our concern is with the adequacy of the structure and public safety regardless of what the lake level is. Our report states what needs to be done to make the structure safe.

While Mr. Woodland's complaint concerns the raised level of the lake, other property owners on the lake may desire the present level be maintained to facilitate float plane and other lake uses. Before taking any direct action to remedy Mr. Woodland's concern, we suggest the Regional Office may, or more appropriately, the Municipality may want to hold a public meeting of all the property owners and concerned agencies to determine the general interest about the lake level.

Finally, according to DNR's land status records, no water right was ever granted for the Lower Fire Lake impoundment. You may want to pursue this with the dam owner.

LAD:kmb

Enclosures

cc: Tom Hawkins  
Carl A. Yanagawa  
Gary Prokosch

# MEMORANDUM

Stat of Alaska

By Copy -

DEPT. OF NATURAL RESOURCES, DIV. OF LAND & WATER MGMT., SOUTHCENTRAL REGION

TO: Larry Dutton, Chief  
Water Management Section

DATE: July 25, 1985

Kyle  
Ken

FILE NO: 655.3

TELEPHONE NO: 786-2251

FROM: Richard A. LeFebvre  
District Regional Manager

SUBJECT: Lower Fire Lake Dam

I received a call from a property owner by the name of Jack Woodland (phone 276-2505) concerning the lower Fire Lake Dam. He apparently talked to Ken Hunt about his problems. My concern is that the state has been put on notice that there may be problems with the dam and we need to take some definitive action.

From what I could gather from the conversation with him, the following needs to be addressed:

1. Determine ownership of the dam.
2. Evaluate the dam and determine necessary maintenance action.
3. Decide if the water level needs to be lowered ~~and~~ because of the optimum level **PREVIOUSLY ESTABLISHED WHEN THE LAND WAS CONVEYED TO THE STATE OR JUST FOR SAFETY PURPOSES.**

What I would like is an assessment of the situation from Dam Safety, and then we can get together and decide what has to be done and by whom. Thanks.

*[Signature]*



The waters of Fire Lake have been slowly rising over the past few years and state officials are worried the dam at the foot of the lake could be washed out in heavy rains. They say the culverts in the dam, visible in the center of the photo, are adding to the problem.

STAR FILE PHOTO

## Fire Lake dam could wash out

By MARJORIE COCHRANE  
Chief Writer, The Star

The waters of Fire Lake have been rising behind the earthen road-topped dam at the lake's outlet, and there's a real possibility, a state engineer says, that the dam could be washed out.

"There is no imminent emergency," emphasized Kenneth Hunt, assistant engineer with the Department of Natural Resources. "There's still a margin of safety." But the lake's waters are now within a foot of the top of the dam (Hunt terms this the "freeboard") and the three culverts that allow water from the lake to escape under the dam's road bed into Fire Creek don't have enough protective cover.

The dam itself appears to be stable, Hunt says, but should an "excessive" rainstorm occur,

there's a real possibility that the dam might be breached, or that the reservoir's waters would flood over the top of the 10-foot high structure.

Hunt says that DNR sees the situation "as something that needs to be corrected."

But that's not as simple as it appears. No one knows who has the responsibility for maintaining the dam.

"I'm planning to start with Fish and Game," said Hunt, since that department was involved in the dam's construction in the early 1960's, in the days when it was operating a fish hatchery at Upper Fire Lake. "If they don't claim it, I'll try to locate who does, or find who has partial interest in it."

The first thing Hunt wants to ask the owners, whoever they may be, are "why the dam isn't presently functioning according

to the design drawings."

For instance, said Hunt, the design indicates three culverts, with the center culvert lower than the two on either side. Now, however, on the upstream side, the center culvert is higher than the other two. In addition, the existing elevations don't conform with the design, Hunt notes, so he's trying to locate the person who did the survey work in 1961 and obtain notes that would show what the lake's surface elevation is supposed to be. The design drawings he has "indicate that the freeboard should be at least three feet."

Basically, Hunt said, DNR's job "is to verify why there are inconsistencies. It's for owners to demonstrate to us that the dam is constructed properly, and give us the reason for the changes."

Owners, Hunt said, could (Continued on page 10)

## Local school

By MARJORIE COCHRANE  
Chief Writer, The Star

School construction for Chugiak - Eagle River is the number one project on the separate \$50 million bond election for the Chugiak - Eagle River School District before voters in November.

The top item on the ballot is \$6,134,000 to construct 22 classroom buildings at Chugiak High School and an elementary school in the community at an estimated \$12 million is a high priority for Bond issue A.

Bond issue B would provide \$1 million for an additional wood elementary school.

The school board last night approved proposals which require the okay of the Anchorage Municipal Ballot Commission in order to appear on a municipal ballot in the November elections.

Bond issue A would provide approximately \$61 million which is a high priority, officials said in June. The state is expected to compensate for the loss by Gov. Bill Worton's legislative appropriations for the district's capital projects.

The governor has indicated a cut of almost 10 percent in an appropriate reduction of state construction from \$18 million. If the bond issue wins, the board expects to receive 10 percent of the state funds. The district would be used

# Ownership of Fire Lake dam is key to fixing it

(Continued from page 1)

"either lower the culverts, or raise the road bed. Or they could work with a qualified hydrologist to show us that there will never be a storm unusual enough to threaten the dam."

The fact that the culverts are at least a foot nearer the surface of the road than they're supposed to be means that they are more apt to be damaged by the traffic that constantly crisscrosses the dam, the major access to homes on the west side of the lake. Pressure on the culverts could squeeze them shut, rocks pushed downward could puncture them or they could become clogged. And any of those situations could threaten the dam.

"It's a pretty low dam, as dams go," said Hunt, "but there's quite a bit of storage behind it, about 64 acres." He estimates the crest of the dam as 24 feet wide, "about three times as wide as you normally need for a dam that high, so there's an added margin of safety there."

However, Hunt said, the hydraulic height of the reservoir is now eight feet "and the correct elevation could be six or seven feet."

Hunt, a representative of the Army Corps of Engineers and members of the public works department inspected the dam and the road Monday. Hunt said that the municipality has responsibility for maintaining the surface of the road across the dam.

Marvin Mullins of the Corps of Engineers said that the Corps would have authority in the dam situation "only if there were an immediate possibility of failure and serious damage downstream. Then we would be involved." He said that at one time, the Corps was given primary responsibility for inspecting dams nationwide, but in Alaska the state has now taken over the dam safety program.

"There's a problem (at Fire Lake)," Mullins agreed, "but the

exact degree of the hazard is still being evaluated."

Should the major storm that might tip the scales toward the rupture of the dam occur, floodwaters could threaten the Glenn Highway and wash out the railroad bridge that crosses Fire Creek farther downstream.

Jack Cervantes, Civil Defense director, said that he has also met with state and municipal officials and inspected the dam site Monday. If the dam should break and extensive flooding were to occur, Cervantes would be the disaster coordinator. "Our office is 'reactive'," Cervantes said. "We don't do prevention. But if anyone were flooded out, we would come to the rescue, with the Red Cross. And we would be heavily involved with coordinating efforts to repair damages."

Fire Lake resident Jack Woodland, who has owned property on the lake since 1971 and built his home seven years ago, said that he marked the edge of the water line on his property in 1980. Now it's three feet farther up the bank than it was then. And he, too, is worried.

Woodland says that he believes a "prudent forecast" would be that if the lake keeps rising, the dam may wash out. But any effort to lower the lake level, he says, will probably be greeted with animosity by many of the lakeshore residents. Some, he said, have built docks and made improvements to their property based on a higher level of water.

But Woodland calls the situation that now exists "flirting with disaster."

Woodland said he believed that before the reservoir was created, Fire Lake itself was only seven acres in size. The dam, which he thinks was built initially by residents with the approval of the Department of Fish and Game, increased the size of the lake to nearly 90 acres.

## CHS Class

A two-day reunion for the Chugiak High School class of 1975 will be held August 3 and 4 — and members of the 1974 and 1976 classes are invited to join in.

## Our home le

At First National we'll give you sound advice based on your unique financial situation. Advise that can streamline your search for the perfect hideaway. Here are some of the ways First National can help you take the direct route to home ownership:

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694-2

# Curtis

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# MEMORANDUM


# State of Alaska

TO: Kyle Cherry, PE  
State Dam Safety Engineer - Anchorage  
Division of Land and Water Management  
Department of Natural Resources

DATE: February 13, 1985

FILE NO:

TELEPHONE NO: 267-2237

FROM: Fred Harding   
Regional Engineer  
FRED Division - Anchorage  
Department of Fish and Game

SUBJECT: ADF&G Dams

Reference your memo of 7 Feb. 85, and confirming my telephone conversation with Ken Hunt.

Attached are plans for the culvert and outlet box array at Lower Fire Lake. As far as I can determine, the structure was a rebuild of a previous culvert, intended for some reason lost in history to control fish movement up into the lake. ADF&G has not operated the box in twelve years or so, and has no interest in it. I would assume that whatever corporate entity maintains the road is now the only organization directly interested in the integrity of the culverts and embankments.

The Big Lake Outlet Control Structure was built by Waters and Harbors Division of Department of Public Works (now DOT/PF). We have no plans on file for the structure, and suggest you chase them through DOT/PF. ADF&G does operate the structure, and operational information can be gotten from Bob Chlupach at Big Lake Hatchery, telephone 892-6816.

Attachment

cc: Dave Daisy  
Russ Redick  
Bob Chlupach  
Larry Engel

# MEMORANDUM

# State of Alaska

Department of Natural Resources, Division of Land and Water Management

TO: L. A. Dutton, Chief  
Water Management Section

DATE: February 1, 1985

FILE NO:

TELEPHONE NO:

FROM: *Kyle J. Cherry*  
Kyle J. Cherry, P. E.  
State Dam Safety Engineer

SUBJECT: Trip Report

At the request of the Southcentral Regional Office, Ken Hunt and I traveled to Wasilla to meet with representatives of ADF&G and Corps of Engineers to inspect an ADF&G dam at the outlet of Lucille Lake. The cause of the inspection was a citizen's complaint to ADF&G that the dam was in danger of failing.

The dam is a wood buttress dam constructed in 1964. The dam is 6.5 feet high and approximately 97 feet long. The left non-overflow section is wooden buttress with earthfill. The right non-overflow section has a two foot wood buttress section adjacent to the spillway and the remainder is compacted earthfill. The spillway section is 22 feet long with a crest elevation of 99.92 feet. An inclined screen approximately ten inches in height sits atop the spillway crest. Drawings were obtained from ADF&G and the above information was taken from those drawings. Ice made it impossible to obtain field measurements.

The downstream wingwalls have moved out of vertical alignment and bracing has been installed downstream of the crest. The wingwalls need to be repaired and realigned. With proper attention to tiebacks the bracing might not be required. The soundness of structural members was checked by probing with a pocket knife. All members which were accessible appeared to be sound. When leaves accumulate in the fall on the outlet screen, they must be removed slowly by hand or the flow will be beyond the capacity of two culverts installed in a roadway approximately two hundred yards downstream.

The present dam appears to be in no immediate danger of failing. The wingwalls should be realigned and new fill added behind them to bring the fill up to grade. The culvert capacity in the roadway crossing downstream should also be increased to prevent flooding from normal flows and the potential of a washout.

This dam was not on our inventory. By virtue of the amount of water it impounds, it is a large dam. The hazard potential needs evaluating but it will be at least significant.

L. A. Dutton  
February 1, 1985  
Page 2

Next Ken and I made a preliminary inspection of the Big Lake Control Structure at Fish Creek. By virtue of the amount of water this two foot high structure impounds, it is also a large dam. It is not on the inventory. We will try to obtain plans from ADF&G. Its hazard class is probably low.

We returned to the Wasilla area and met with Emergency Services personnel regarding our role in emergencies involving dams. The time spent was profitable and we now have a good contact point for working with that agency.

On the way back to Anchorage we did a preliminary inspection on Lower Fire Lake Dam. By virtue of its impoundment it is a large dam and its hazard class would be significant. Plans may be available from ADF&G.

Follow up work:

1. Report to ADF&G on condition of dam and make recommendations.
2. Inspect and make hazard survey for all three dams when weather permits.
3. Continue liason with Emergency Services and make sure we notify them of unsafe dams.

cc: Gary Prokosch

KJC:hr