State of Idaho
DEPARTMENT OF WATER RESOURCES
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ADMINISTRATOR'S MEMORANDUM

App. Processing No. 24 (Amended)

TO: Regional Offices and Water Allocation Section

FROM: Norman C. Young NCY

DATE: June 19 , 1986 (Replaces version dated December 1, 1980)

RE: Approval of Permits for Power Purposes

Changes in Federal Energy Regulatory Commission (FERC) processing requirements have precipitated a modification in Department policy regarding applications for permit for hydropower*. This memorandum provides updated information regarding three unique aspects of hydropower applications: (1) current requirements of the Idaho Public Utilities Commission (PUC) and FERC; (2) Department processing guidelines for Applications for Permit; and (3) a method for calculating a reasonable rate of flow.

(1) CURRENT REQUIREMENTS OF THE PUC AND FERC

PUC

The determination of which power producers are subject to PUC regulation and which are not remains a complex issue. In general, the PUC regulates and requires applications from investor-owned utilities that market power, such as Idaho Power Company, or independent small power producers. Systems that are not regulated include those owned

* This memorandum is written specifically for hydropower use, and the terms power and hydropower are considered to be interchangeable herein. The use of water for purposes associated with thermal and nuclear power plants should be classified as cooling use, and an Application for Permit for this use is not subject to the provisions specified herein.

by public entities (co-ops, municipalities, irrigation districts, etc.), private systems for personal use, and entities meeting the requirements of a qualifying facility (QF*) under PURPA**. If there is a question about jurisdiction in a specific instance, PUC will provide a letter stating their position.

Processing a PUC application requires a public hearing in most cases. Processing time by PUC is usually 3 months to 1 year, and final approval by PUC, in the form of the issuance of a Certificate of Public Convenience and Necessity (CPCN), can be completed prior to approval of the water right application by the Department.

*A QF is defined as a facility that:

A. Is owned by an individual or a corporation (including municipalities), but not more than 50% of the equity interest in a facility may be owned by an electric utility.
B. Produces electric energy primarily by use of a renewable resource (water power is considered to be a renewable resource at both new and existing dams).
C. Has a power production capacity of no more than 80 megawatts.

**Public Utility Regulatory Policies Act of 1978

FERC

Water power development comes within FERC jurisdiction when the project:

A. Is located on federal land, or
B. Is located in or uses water from a navigable stream, or
C. Uses water impounded by a federal dam, or
D. Provides power to a FERC regulated (interstate) power grid.

Where FERC is found to have jurisdiction, frequently the first step toward project development is to obtain a preliminary permit from FERC. A preliminary permit requires minimal information and establishes filing priority for subsequent license or exemption applications. It is not an approval to begin construction, and is not required by FERC.

Project development approval can be obtained by securing either a license or an exemption. An exemption relieves the project of some FERC requirements. Exemptions are generally available for projects that do not use dams or that utilize an existing conduit originally built primarily for non-power purposes.

Three types of license applications are available -- a short form for all projects 5 MW or less, a slightly longer form for projects greater than 5 MW at existing dams, and a long form for major unconstructed or major modified projects greater than 5 MW. Processing times vary depending on the complexity and environmental impact of the projects and can range from several months to several years. A graphical representation of FERC filing categories is depicted in Attachment A.

A change in FERC processing is that in the past FERC required the project applicant to obtain an approved water right permit prior to issuing a FERC license, whereas now FERC will issue a license before a state water right is approved, contingent on the licensee obtaining state water right approval.

DEPARTMENT PROCEDURE WITH RESPECT TO FERC & PUC

The Department does not require FERC &/or PUC approvals to be prerequisites for issuance of a water right permit. However, many of the issues regarding local public interest that are evaluated by the Department are also evaluated by FERC &/or PUC. Thus, the Department normally does not take final action on an application for permit until the application for license or exemption or application for CPCN together with supporting documents have been filed with FERC &/or the PUC. An applicant, however, can request Department action on an application for permit prior to the application submittal to FERC &/or PUC if the applicant provides to the Department all of the information needed for the Department to evaluate the proposed project. Henceforth in this memorandum, in the situations where FERC &/or PUC have jurisdiction, the alternatives of providing either (1) an application for a CPCN from PUC &/or an application for license or exemption from FERC, or (2) information for the evaluation of the proposed project, will be identified as "PUC &/or FERC approvals or alternatives."

(2) DEPARTMENT PROCESSING GUIDELINES FOR APPLICATIONS FOR PERMIT

Rule 4 of the Department's Water Appropriation Rules and Regulations provide general considerations to be met by a hydropower applicant. In addition, special processing guidelines have been developed for power applications for permit based on (1) the potential for speculation, (2) Sections 42-205 thru 42-210, Idaho Code, (3) Idaho case law, and (4) interagency coordination. The guidelines are divided into regional office processing and state office processing as follows:

Regional Office Processing

A. Upon receipt of an application for permit for hydropower use, the applicant should be advised, via either a documented conversation or correspondence, of the unique requirements for processing a hydropower water right. Requirements are as follows:

1. Requirements for All Power Applications

a. An affidavit establishing residency and ownership of facilities (Form 205/206).

b. Information that shows whether or not the project will be regulated by FERC &/or PUC.

c. If the project will be regulated by FERC &/or PUC, FERC &/or PUC approvals or alternatives.

2. In the past, the Department basically considered power projects in either a small or large category based on certain criteria. The adopted water appropriation rules and regulations when considered with existing statutes suggest additional categories with different related requirements.

An application for permit (application) for 5 cfs or less and for an installed capacity of 0.37MW or less usually will require no additional information.

An application with a diversion rate greater than 5 cfs will require the submittal of all information described in Rule 4,5,3., Water Appropriation Rules and Regulations.

An application for 5 cfs or less but for an installed capacity of more than 0.37MW will require a financial statement.

An application for more than 25 cfs, or for an installed capacity of more than 5MW will require all of the information described in Rule 4,5,3., Water Appropriation Rules and Regulations in addition to an engineering design.

B. In situations where FERC &/or PUC have jurisdiction, the conference/hearing for a protested application should be delayed until FERC &/or PUC approvals or alternatives are provided.

C. Unprotested applications should be forwarded to the state office when all requirements have been met except FERC &/or PUC approvals or alternatives.

State Office Processing

A. The state office should insure that documentation describing the completion of all requirements is in the file, with the exception of FERC &/or PUC approvals or alternatives.

B. Applicants should be required by the state office to update the file on an annual basis regarding the status of obtaining FERC &/or PUC approval. An exception is that if the applicant receives approval of a preliminary permit, an update is not needed until the permit expires. The applicant must maintain applications with PUC &/or FERC in a valid status to be entitled to the Department processing delays described herein.

C. Applications for permit that would be denied by the Director for reasons other than failure to receive approval from PUC &/or FERC will be denied at the earliest possible time and will not be held pending comments submitted by those agencies.

Attachment B shows standard conditions of approval which are associated with approvals for Applications for Permit for power purposes.

One unique aspect of power applications regards possessory interest. For most water right applications, the applicant must show some "vested interest", or "color of title" to the place of use before the application is deemed valid (see Lemmon v Hardy, 95 Idaho 778, 1974). However, an application for power may be an exception to this requirement since the place of use for power purposes can in some cases be obtained by the applicant through eminent domain after the water right has been obtained. Therefore, a power application may be approved even though possessory interest has not been demonstrated, if all other requirements are satisfied.

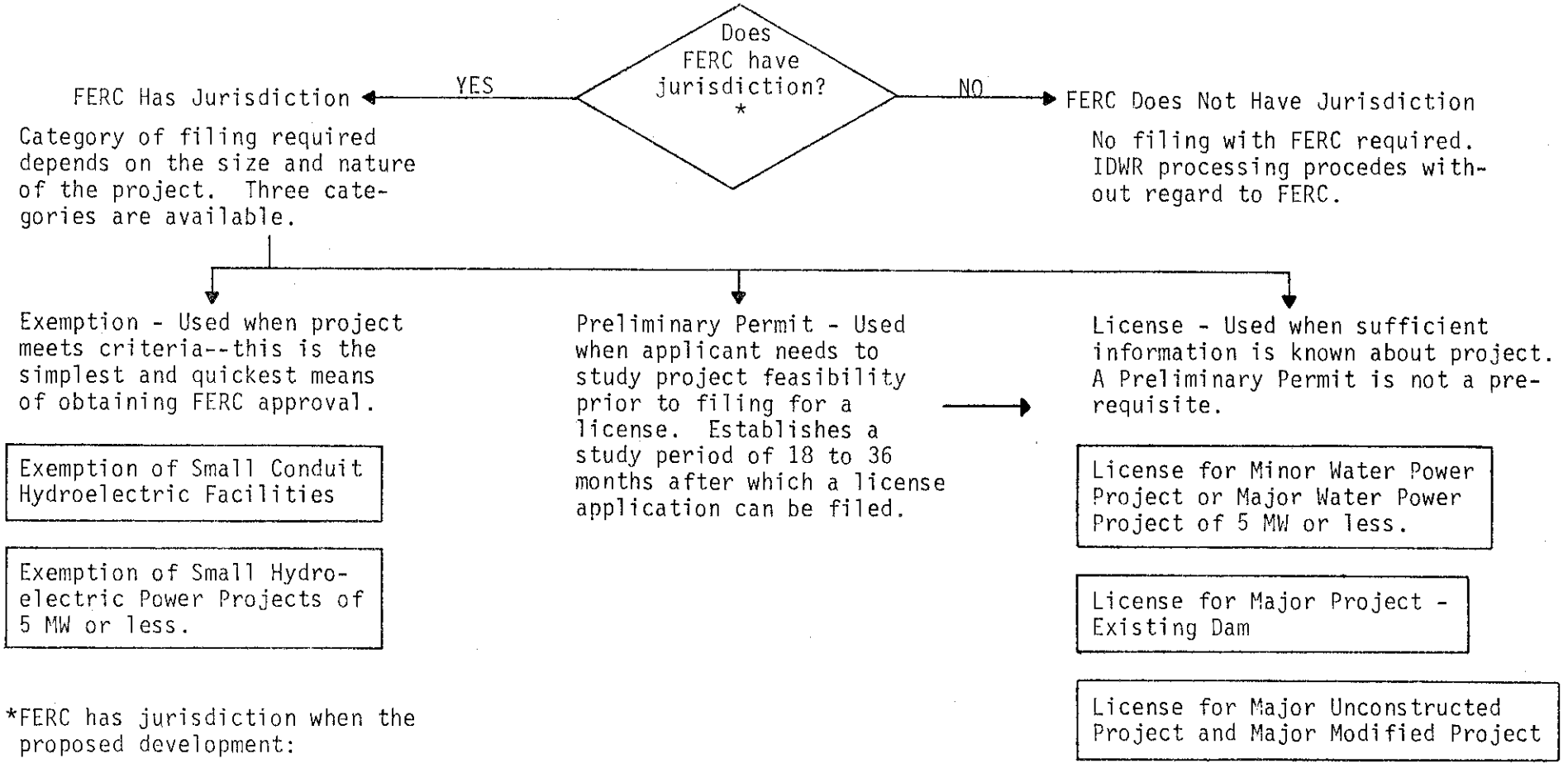
(3) FLOW CALCULATION

Attachment C entitled "Individual Hydropower Production" has been prepared to assist in the determination of a reasonable rate of flow based on (1) the power requirements of the applicant, (2) the type of hydroelectric system to be installed, and (3) available head. The instructions provide a basic method to assess the adequacy of flow requested, but this brief method should not be used to calculate final design flows. If the calculated flows are either much lower or much higher than those shown on the application, the applicant should be required to justify the rate of diversion shown.

ATTACHMENT A

FERC Filing Categories

Each power project can be categorized at a unique location on this chart. Boxes represent categories for which FERC approval is normally required before IDWR issues a permit.



*FERC has jurisdiction when the proposed development:

(A) Is located on federal land, or
(B) Is located on or uses water from a navigable stream, or
(C) Uses water impounded by a federal dam, or
(D) Provides power to a FERC regulated (interstate) power grid.

Source: Federal Energy Guidelines, FERC Statutes and Regulations, Vol. 1, Subchapter B - Regulations Under the Federal Power Act, Part 4, par 2,000 et seq.

ATTACHMENT B

A measuring device and lockable controlling works of a type acceptable to the Department shall be permanently installed and maintained as part of the diverting works.

* The permit holder shall either install a measuring device or a flow measurement port or provide a certified measurement or computation of flow based upon system design to be prepared by a professional engineer.

The issuance of this permit in no way grants any right-of-way or easement across the land of another.

Use of water under this permit is subject to control by the watermaster of State Water District No. <number and name>.

* This permit is subject to the provisions of Sections 42-205 through 42-210, Idaho Code, restricting the sale, transfer, assignment, or mortgage of this permit. Failure to comply with these provisions is cause for immediate cancellation of this permit.

* Water used under this permit if discharged into a natural channel or subsurface system shall meet Idaho Water Quality Standards.

The diversion and use of water under this permit and any license subsequently issued is subject to review by the Director thirty-five (35) years from the date of issuance of this permit. Upon appropriate findings relative to the interest of the public, the Director may cancel all or any part of the use authorized herein and may revise, delete or add conditions under which the right may be exercised.

* The diversion and use of water under this permit and any license subsequently issued is subject to review by the Director on the date(s) of expiration of any license issued by the Federal Energy Regulatory Commission. Upon appropriate findings relative to the interest of the public, the Director may cancel all or any part of the use authorized herein and may revise, delete or add conditions under which the right may be exercised.

* The water right acquired under this permit for hydropower purposes shall be junior and subordinate to all rights to the use of water, other than hydropower, within the State of Idaho that are initiated later in time than the priority of this permit and shall not give rise to any right or claim against future rights to the use of water, other than hydropower, within the State of Idaho initiated later in time than the priority of this permit.

* This permit does not constitute Idaho Public Utilities Commission or Federal Energy Regulatory Commission approval that may be required.

* Project construction shall commence within one year from the date of permit issuance and shall proceed diligently to completion unless it can be shown to the satisfaction of the Director of the Department of Water Resources that delays were due to circumstances over which permit holder had no control.

* Use of water under this permit shall be non-consumptive.

A separate stream alteration permit from the IDWR is required for any activity in the stream channel other than construction and/or maintenance of the diversion structure. If your proposed construction or operation involves construction of an outfall or any other work in the stream channel other than a water diversion, you must contact the Department and obtain a Stream Channel Alteration permit prior to the start of construction.

Power apps from a groundwater source:

Water shall not be diverted solely for power production purposes, however, power may be produced utilizing water diverted for other uses.

*Conditions with an asterisk are used for every hydropower application approved by IDWR. Brackets signify alternative choices based on ancillary parameters.

ATTACHMENT C

INDIVIDUAL HYDROPOWER PRODUCTION

The following is an acceptable means of evaluating water requirements for planning a small scale hydropower facility. This method is general and intended to provide approximate results for use in filing a water right permit application for development of such a facility. Sizing and selection of equipment for installation is much more complicated and should not be attempted without proper technical guidance. Any one of the following four variables can be determined by mathematical or graphical methods providing the other three are known or assumed: (See Figure 1).

1) Power (kilowatts)

2) Gross Head (feet)

3) Design Flow (cubic feet per second)

4) Efficiency

Definition and Explanation of Terms

For turbines, pelton wheels and overshot water wheels, the above variables are defined as follows:

A) Power (P)

System power production capability or system capacity is the amount of electrical power that can be generated by the hydropower system. Power demand is the amount of electrical power that is required by the user to supply electrical appliances. In order to have an operational system, power production capability must be greater than or equal to power demand. Power is commonly measured in kilowatts.

Maximum power demand can be estimated by summing the demand of all electrical appliances that may reasonably be in use at one time. The demand requirements of individual electrical appliances can usually be obtained from power suppliers or are listed on the appliances. An estimate of normal household demand can also be obtained from the following table:

Table 1: Maximum Household Power Demand

Electrical Power Use	Demand (Watts/ft^2)
Lighting and refrigeration only	2
Lighting, refrigeration, water heating, cooking and clothes drying	4-7
Total electric home	10-15

Maximum power demand in watts can be computed by multiplying demand in watts per square foot by the home size in square feet. Divide by 1000 to convert watts to kilowatts.

B) Gross Head (H)

1) Pelton Wheel or Hydraulic Turbine

Gross head for a pelton wheel or hydraulic turbine is the total vertical elevation difference in feet between the upper end of the penstock and the lower end of the penstock.

2) Overshot Water Wheel

Gross head for an overshot water wheel is the total vertical elevation difference in feet between the bottom of the discharge flume and the water surface of the tail-water.

C) Design Flow (Q)

The flow in cubic feet per second (cfs) at which the system is designed to operate.

D) Efficiency (e)

The fraction of total hydraulic energy available that can be converted to electrical energy and delivered to the consumer. For estimating purposes, use .50 for pelton wheels and turbines and .40 for overshot water wheels.

EXAMPLE PROBLEM

Problem Statement

A person with a 2000 ft^2 total electric home has a stream near his house which flows a minimum of 15 cfs and has a vertical drop of 400 ft. in the mile upstream from his house. The person desires to supply all of the electrical requirements of his home with a hydropower generating system. How much water does he need?

Solution

This will be a graphical solution using Figure 1 and assuming the use of a pelton wheel or hydraulic turbine system.

1) Determine home electrical power demand.

Using Table 1

$$\text{Maximum Demand} = 2000\ ft^2\ (15\ watts/ft^2)$$
$$= 30{,}000\ watts = 30\ kw$$

2) Assume System Efficiency

Since power is assumed to be generated by a pelton wheel or hydraulic turbine, a reasonable system efficiency might be 50%. Assume e = .5.

3) Determine H x Q Requirement to Produce the Desired Power

Enter the graph (Figure 1) at 30 kw. Cross to the 50% efficiency line and proceed down to the lower axis and find H x Q = 708.

4) Select a Head and Solve for the Flow

H x Q = 708; therefore

$$Q = \frac{708}{H}$$

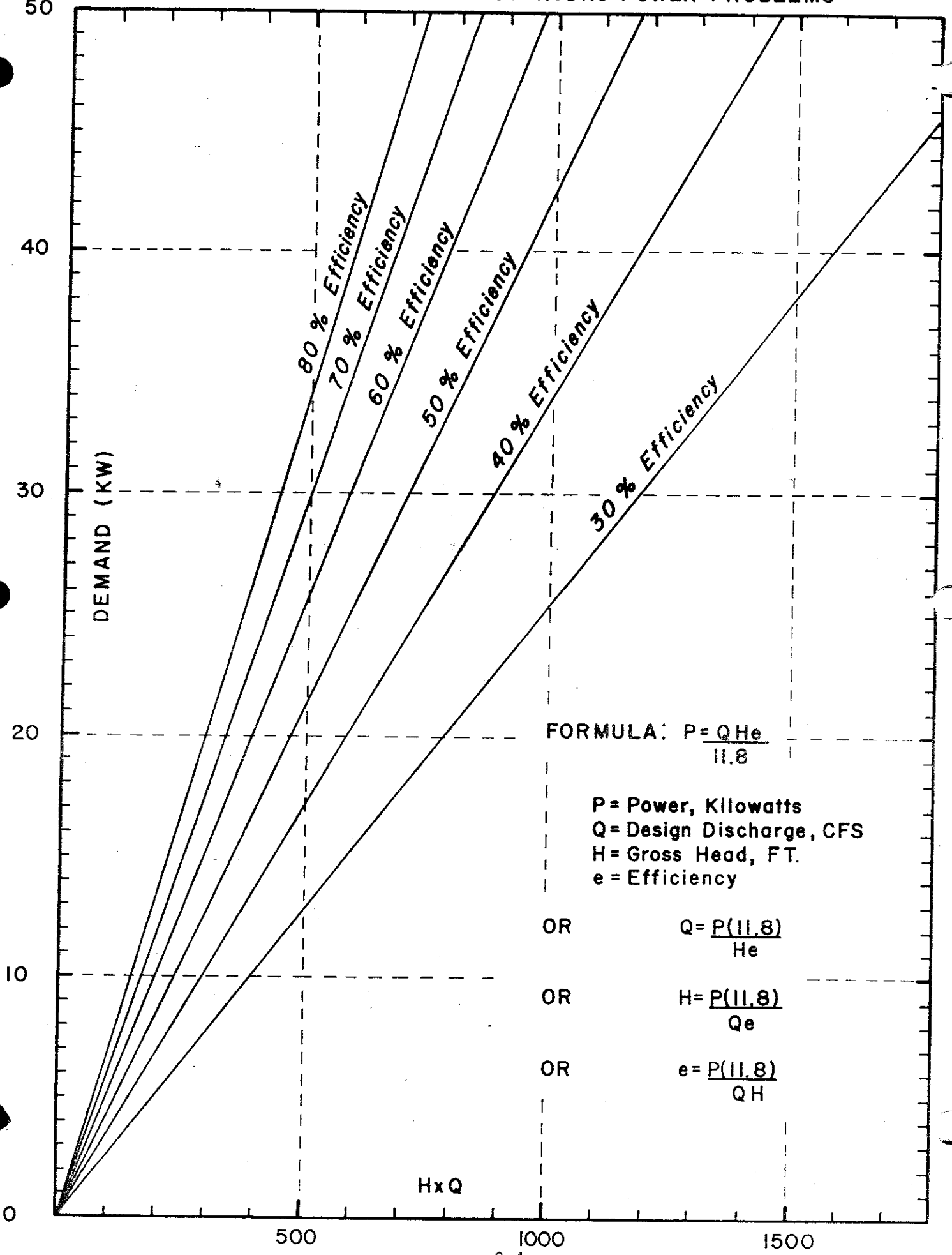
If H = 400 ft.; $Q = \frac{708}{400} = 1.8$ cfs

If H = 200 ft.; Q = 3.5 cfs

If H = 50 ft.; Q = 14.2 cfs

(It should be noted that there are an infinite number of possible solutions for H x Q = 708 that provide 30 kw of power.)

FIGURE I: GRAPHICAL SOLUTION OF HYDRO POWER PROBLEMS



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MEMORANDUM

TO: Glen Saxton
Bob Fleenor

FROM: Norm Young

DATE: February 23, 1984

RE: Approval of Hydropower Rights

Please do not approve any application having hydropower as a purpose until the legislature has completed its consideration of subordination and until further direction is received from Ken Dunn.

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MEMORANDUM

March 22, 1984

TO: Glen Saxton
Bob Fleenor

FROM: Norm Young NY

RE: APPROVAL OF HYDROPOWER RIGHTS
(Supersedes memo dated February 23, 1984)

Applications proposing power generation may be approved assuming the following usual factors have been considered:

a) the guidelines of the existing administrative memo dated 12-1-1980 and 3-3-1980 are met

b) appropriate conditions of approval including subordination are shown.

In addition, all permits issued for power purposes or including power as a use (excluding the exceptions in my 3-3-1980 administrative memo) should have the following conditions of approval:

"The diversion and use of water under this permit and any license subsequently issued is subject to review by the Director thirty (30) years from the date of issuance of this permit or the date of FERC approval expiration (if applicable). Upon appropriate findings relative to the interest of the public, the Director may cancel all or any part of the use authorized herein and may revise, delete or add conditions under which the right may be exercised."

"Project construction shall commence within one year from the date of permit issuance and shall proceed diligently to completion unless it can be shown to the satisfaction of the Director of the Department of Water Resources that delays were due to circumstances over which permit holder had no control."