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**REPORT REGARDING FACILITY VOLUME
FOR FISH PROPAGATION**

In Re SRBA

Twin Falls County Civil Case No. 39576
Sub-Case No. 36-07071

Report to the SRBA District Court

Prepared by the Idaho Department of Water Resources
Karl J. Dreher, Director
David R. Tuthill Jr., Acting Adjudication Bureau Chief

September 18, 1996

REPORT REGARDING FACILITY VOLUME FOR FISH PROPAGATION

The Director of the Idaho Department of Water Resources (IDWR) submits this report regarding facility volume for fish propagation for water right 36-07071 in response to the request of Special Master Bilyeu and pursuant to Idaho Code §42-1412(4). This report was prepared under the supervision of Karl J. Dreher, Director, and David R. Tuthill Jr., Acting Adjudication Bureau Chief for IDWR.

David R. Tuthill Jr., Acting Adjudication Bureau Chief, reviewed and verified this Report Regarding Claim to Water Right No. 36-07071. The Affidavit of David R. Tuthill Jr. describes Mr. Tuthill's education and work experience; the affidavit is attached hereto and is incorporated by reference herein.

Steve Clelland, Senior Water Resource Agent, investigated and prepared the preliminary recommendation for claim no. 36-07071. The Affidavit of Steve Clelland as to the Investigation of Claims in the Hagerman Area describes Mr. Clelland's education and work experience, and is incorporated by reference herein. The affidavit also includes a general description of his investigation of claims in the Hagerman area. The Affidavit of Steve Clelland Regarding Claim No. 36-07071 describes Mr. Clelland's investigation of the fish propagation facilities in which this water right is used; the affidavit is attached hereto and incorporated by reference herein.

1. BASIS FOR RECOMMENDATION OF FACILITY VOLUME

The director has concluded that a description of facility volume is appropriate and necessary to define and administer water rights or portions of rights for fish propagation purposes.¹

In the Snake River Basin, IDWR is required to make recommendations as to the extent of beneficial use and administration of each water right.² In each of its recommendations as to a water right, IDWR describes the use with sufficient specificity to identify the extent of use for the purposes for which the right is recommended. For example, for rights to water for irrigation purposes, IDWR includes a statement of the quantity of water used for irrigation in CFS and/or AFY,

¹ IDWR relied upon the following in reaching its conclusion: Idaho Code §42-1411(2), which provides that IDWR shall determine the quantity of water used and the purpose of use to the extent the director deems *appropriate and proper* to define and administer water rights acquired under state law, and Idaho Code §42-1412(6), which provides that the decree shall contain or incorporate a statement of each element of a water right as stated in section 42-1411, as contrasted with language later in section 42-1412 providing for inclusion of general provisions to the extent *necessary* to define and administer water rights.

² Idaho Code §42-1401B(1).

REPORT REGARDING FACILITY VOLUME FOR FISH PROPAGATION

a statement of the general type of use (irrigation), and statement of the number of irrigated acres.³ Not only is the quantity of water beneficially used dependent on the number of irrigated acres, but an increase in the number of acres irrigated could result in an increase in the rate of diversion, volume of diversion, or consumptive use of the water right. Inclusion of the number of irrigated acres thus describes the extent of the use for irrigation with sufficient specificity to prevent future expansions in irrigation use that would result in enlargement in use of the right and/or injury to other water users. If a dispute arises in the future as to whether an appropriator has expanded the use of a water right, and the number of acres is determined in the water right, IDWR can readily compare the number of acres irrigated at the time of the dispute with the number of irrigated acres in the description of the water right to determine whether or not an expansion in use has occurred.

Similarly, the quantity of water beneficially used for fish propagation purposes is dependent on the facility volume.⁴ A future expansion in facility volume could result in expansion of the use and/or injury to other water rights, by:

- a. Increasing the diversion rate,
- b. Increasing diversion volume (even where there is no increase in diversion rate⁵),
- c. Increasing consumptive use (even where there is no increase in diversion rate or volume),⁶ or
- d. Decreasing water quality.⁷

³ The adjudication statute expressly provides for IDWR to determine the extent of irrigation use by the number of irrigated acres, at Idaho Code §42-1411(2) (h). The adjudication statute does not expressly state how the extent of use for other purposes is to be described.

⁴ The use of facility volume to determine water requirements for fish propagation rights is shown in the Administrator's Memorandum, Application Processing Memo #15, dated August 7, 1979, a copy of which is attached hereto and incorporated herein by reference.

⁵ An increase in diversion volume without an increase in diversion rate would occur where the same diversion rate is diverted for longer periods of time.

⁶ An increase in consumptive use in fish propagation use would generally be due to treatment required to meet water quality standards prior to discharge to a water source.

⁷ Although the authority to regulate for purposes of maintaining water quality is primarily vested in the Division of Environmental Quality, Department of Health and Welfare, there are numerous instances in which water quantity issues within IDWR's duties and authorities include water quality issues. For example, water quality is an issue to be considered as part of the public interest criteria for applications for permits to appropriate water, applications to amend permits, and applications for changes in use of water rights. Idaho Code §§ 42-203A(5), 42-211, 42-222(1); IDAPA 37.03.08, Rule 45.01.e.; Shokal v. Dunn, 109 Idaho 330, 707 P.2d 441 (1985); Hardy v.

REPORT REGARDING FACILITY VOLUME FOR FISH PROPAGATION

IDWR therefore includes a statement of facility volume because it is the most convenient and effective means to define water rights for fish propagation with sufficient specificity to prevent future expansions in fish propagation use that would result in enlargement in use of the right or injury to other water rights. Thus, if the current facility volume is included in the description of the water right, the appropriator later enlarges the facility, and an issue arises at that time as to whether the appropriator has expanded the use of the water right, IDWR can determine the volume of the facility as modified, compare it to the previous facility volume in the description of the water right, and determine whether an expansion in the use of the water right has occurred. If facility volume is not included in the description of the water right, the appropriator later enlarges the facility, and an issue arises at that time as to whether the appropriator has expanded the use of the water right, the prior facility is no longer available to verify the prior facility volume.⁸

II. WATER RIGHT NO. 36-07071

A. Facility Volume

IDWR recommended the facility volume for water right 36-07071 as 173,240 cubic feet. IDWR Senior Agent Steve Clelland gathered the information on which this volume is based from a telephone conversation with Bill Jones on 10/24/1991. Mr. Jones stated in the conversation that he has five groups of raceways. The "large above" raceways consisted of 30 raceways, each with a volume of 2580 cubic feet. The "large west" raceways consisted of 6 raceways, also with individual volumes of 2580 cubic feet. The "large below" raceways consisted of 30 raceways of 2220 cubic feet apiece. There were also 16 "small" raceways, each with a volume of 860 cubic feet. Mr. Jones also described 8 seed ponds, but did not give a volume for those ponds and explained that they were not used.

The total facility volume was determined by multiplying the volume of each

Higginson, 123 Idaho 485, 849 P.2d 946 (1993); IDAPA 37-03-08, Rule 45.01.e; Administrator's Memorandum, Application Processing Memo #50, dated April 1, 1991, and Administrator's Memorandum, Application Processing Memo #55, dated November 16, 1992. Copies of the Administrator's Memorandums are attached hereto and incorporated herein by reference.

⁸ An expansion in facility volume will not necessarily always result in expansion in use of the right and/or injury to other water rights; a determination of the facility volume before and after the alteration of the facility is, however, necessary to determine whether or not an expansion of the facility has occurred, and whether or not that results in an expansion in use of the right and/or injury to other water rights.

REPORT REGARDING FACILITY VOLUME FOR FISH PROPAGATION

individual raceway by the number of raceways in that group having that same volume. The total volumes of all of the groups of raceways were then added to arrive at a total facility volume. Thus, the total facility volume would be:

"large above" raceways: $30 \times 2580 \text{ cu. ft.} = 77,400 \text{ cu. ft.}$

"large west" raceways: $6 \times 2580 \text{ cu. ft.} = 15,480 \text{ cu. ft.}$

"large below" raceways: $30 \times 2220 \text{ cu. ft.} = 66,600 \text{ cu. ft.}$

"small" raceways: $16 \times 860 \text{ cu. ft.} = 13,760 \text{ cu. ft.}$

"seed ponds": not used = 0 cu. ft

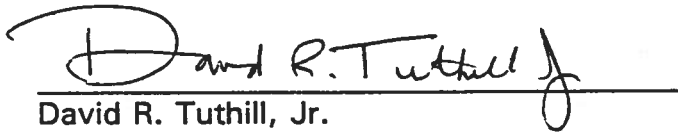
TOTAL FACILITY VOLUME: = 173,240 cu. ft.

REPORT REGARDING FACILITY VOLUME FOR FISH PROPAGATION

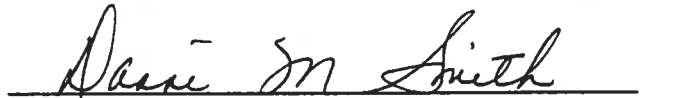
STATE OF IDAHO)
) ss.
County of Ada)

David R. Tuthill, Jr., being first duly sworn, upon oath, deposes and says:

That I am the Acting Adjudication Bureau Chief for IDWR, that I have read the foregoing report, know its contents, and that the statements contained therein are true to the best of my knowledge and belief.


David R. Tuthill, Jr.

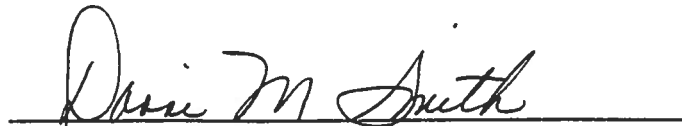
SUBSCRIBED AND SWORN to before me this 17th day of September, 1996.


Notary Public for the State of Idaho
Residing at: Boise ID
My commission expires: 12/5/2000

CERTIFICATE OF SERVICE

I certify that on the 17th day of September, 1996, I hand-delivered copies of the foregoing document, including all attachments, to the following:

Patrick D. Brown
133 Shoshone St North
Twin Falls, ID 83303


Person Mailing Documents



State of Idaho

DEPARTMENT OF WATER RESOURCES

STATE OFFICE, 373 W. Franklin Street, Boise, Idaho

JOHN V. EVANS
GovernorC. STEPHEN ALLRED
DirectorMailing address:
Statehouse
Boise, Idaho 83720
(208) 384-2215ADMINISTRATOR'S MEMORANDUM

TO: Regional Offices and Water Allocation Section

FROM: Dave Shaw DBS

DATE: August 7, 1979

RE: Fish Propagation Applications for Water Rights

Due to the unique nature of applications for water to be used for fish propagation, the following additional information will be required on all applications for 1.0 CFS or greater:

a. Construction plan to include sizes and number of ponds, and total proposed facility volume.

b. Proof of "possessory interest"* of land at place of use.

c. No assignment / no diminished quality conditions

In addition are the following requirements for all fish propagation applications of 25.0 CFS or greater, as authorized in Section 42-202,

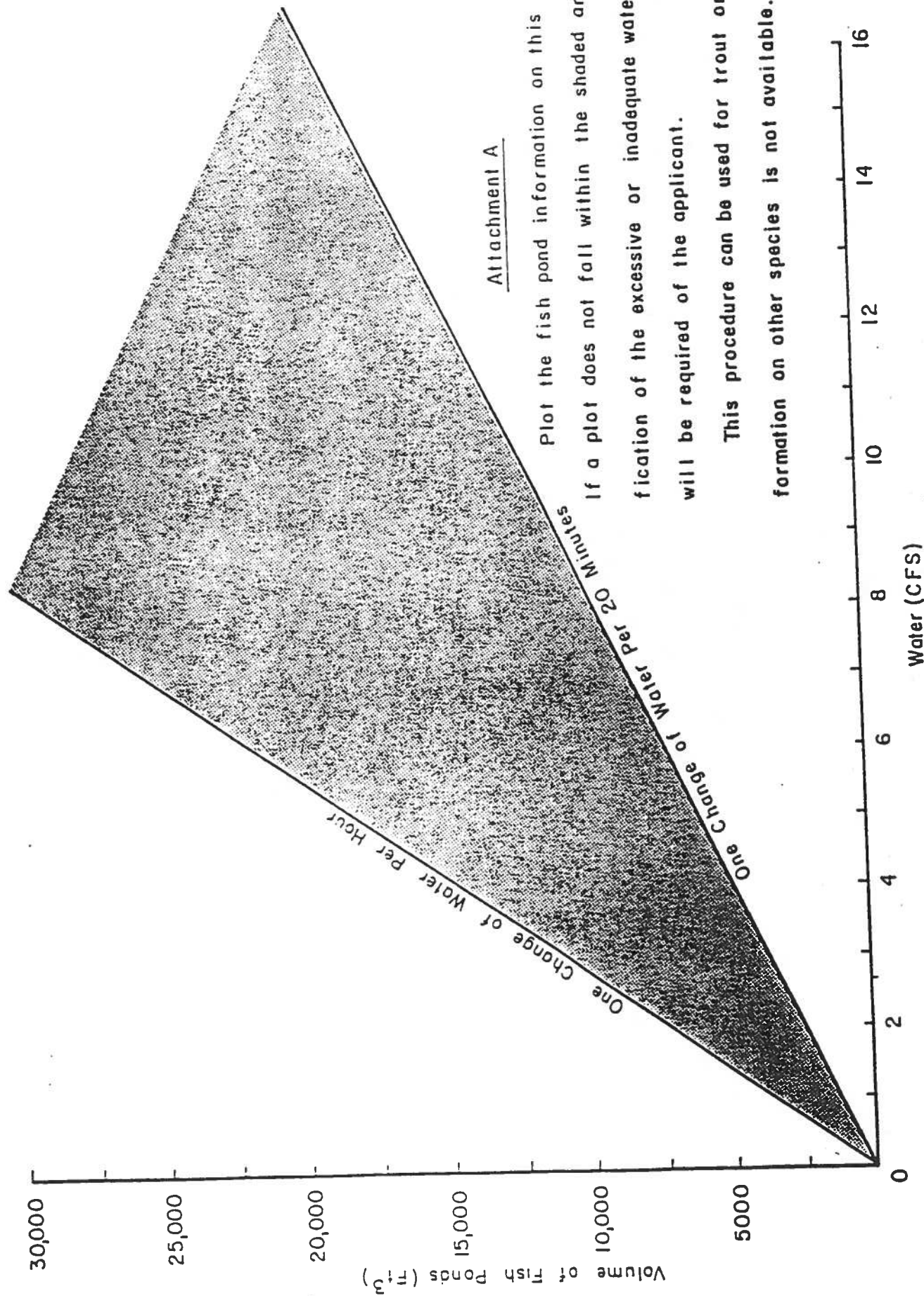
Idaho Code:

- a. A statement of financial resources of the corporation, association, firm or person making the application and the means by which the funds necessary to construct the proposed works are to be provided.
- b. A detailed estimate of construction costs, to include estimated costs of each major component of the construction plan.

* As defined in Administrator's Memorandum dated 4-7-1975

The rate of flow requested in the application must be evaluated by two criteria: (1) Attachment A, and (2) The rate of flow available considering the nature of the source. If the rate of flow requested appears to be excessive, justification for the high rate must be obtained from the applicant.

Measuring devices should be required at both the point of diversion from the source and the point of effluent discharge back to the source when the source is highly appropriated or is regulated by a watermaster. For otherwise unused, unregulated sources, no measuring device is normally necessary.



Water Requirements For Trout Rearing Facilities Based On Total Volume Of Ponds

ESTIMATES OF REQUIREMENTS FOR FISH FARMING

It is difficult to calculate water needs for fish farming since production is usually based on the amount of water available rather than the amount of land or the size of the facilities. Estimates of the water requirements of a facility can be made by two methods, but considerable variation is found in agriculture industry.

The first method is to measure the cross-section of all the raceways. Ponds that are arranged in tandem should be considered as one, and ponds that reuse water should not be included in the calculations. The water velocity through the total cross-section should be about 0.05 feet per second (fps). This is an estimate calculated from data in Fisheries Handbook of Engineering Requirements and Biological Criteria (Bell, 1973). Higher velocities would support more fish and remove metabolic waste, but the fish would have to expend energy to maintain their position in the run. Lower velocities would not overwork the fish, but metabolic waste can build up to toxic levels. Figure 1 shows the simple relationships between cross-section and water volume. Higher velocities may be used when production is not important or if diseases or parasites are a problem. Lower velocities are used when a low fish density is present in the pond. In general, velocities which plot between the two outer dashed lines on the figure are acceptable.

The water requirement for a fish farm can also be calculated by assuming one complete change of water per hour. This method is not as useful since in practice the industry varies from two changes per hour to a change every three hours. All fish raceways are used in the calculations. Aeration

between ponds will make it possible to reuse the water several times and reduce the turnover rate. Figure 2 shows the relationship between pond volume and water requirement with one and two changes of water per hour.

All of the above calculations are for rainbow trout and do not apply to salmon, catfish, or other species. All cross-sections or volumes refer only to the wetted area of the raceways, not to the entire depth, since most concrete ponds have considerable freeboard. The graphs apply only to concrete ponds and raceways. Ponds and unlined raceways have lower production rates and require slightly less water.

Other parameters which affect the water requirements include the following:

Dissolved Oxygen

More water per unit of production is needed if the amount of dissolved oxygen is low. Fish mortality will occur if the concentrations drop below 5 ppm for any length of time. Saturation levels should not be more than 110% or less than 90%.

Temperature

More water per unit of production is needed as water temperature increases. Very slow production will occur below 50°F and mortality will occur over 65°F.

Ammonia

Ammonia decreases production and will cause mortality when concentrations exceed 0.1 ppm.

Trout Hatchery Water Requirements

Idaho Fish and Game Department

Trout Rearing Raceways

Maximum annual production of trout in raceways in southern Idaho is 1 1/2 to 2 pounds of trout per cubic foot of water.

A water change of 2 1/2 times per hour is required to maintain adequate oxygen for trout. A raceway 6 feet wide, 2 1/2 feet deep, and 100 feet in length requires 1/4 c.f.s. flow. Water can be reused up to a maximum of 500 feet if it is aerated by dropping it 6 to 12 inches each 100 feet.

A rule of thumb for a profitable trout hatchery is not less than 5 c.f.s. of 50 to 60 degree Fahrenheit water. A good trout hatchery will produce about 8,000 pounds of trout annually for each c.f.s. of water flow if water is reused. This should be considered as maximum production.

Earthen Rearing Ponds or Small Lakes

Commercial producers often use earthen ponds or small lakes to rear trout. In this case trout density should not exceed 1/2 pound per cubic foot of water. Greater densities will lead to diseases that are difficult to handle in earthen ponds.

Small fish feed in upper 2/3 of pond. 1. 2 1/2 feet in depth

MEMORANDUM

App. Proc No. 50

To: Water Management Division
From: Norman C. Young *NCY*
RE: FISH PROPAGATION APPLICATION APPROVAL GUIDELINES
Date: April 1, 1991

The Idaho Aquaculture Association has provided information to the department which uses a point rating system to evaluate the potential affect of a proposed new fish propagation facility (facility) upon other existing facilities. The rating system is intended to be used as a guide and is not intended to negate the obligation of an applicant to comply with all other local, state and federal requirements applicable to a proposed facility and appropriation of water.

The common factors and parameters which determine the affect of one facility upon another include disease, oxygen level, carbon dioxide, ammonia, nitrates, settleable solids and water temperature.

The point system described below should be used in the department's evaluation of applications proposing a new or enlarged facility which is upstream from an existing facility. The number of cumulative points associated with the new facility can then be used as a guideline to determine the potential affect of the new facility on existing facilities. Depending on the amount of the affect, new appropriations can be approved, denied or approved with specific conditions to prevent or minimize injury to existing water rights for fish propagation purposes.

An applicant needs to provide enough information to allow the department to evaluate a proposed facility using the parameters in this memo.

Considering the characteristics associated with a proposed new facility, determine the number of points shown to the right of each of the seven (7) categories below:

1. Type of water supply currently used by existing facility.

- | | |
|---|---|
| a. Surface with fish cultured upstream | 1 |
| b. Surface with no fish cultured upstream | 2 |
| c. Spring with fish cultured upstream | 3 |
| d. Spring with no fish cultured upstream | 4 |

2. Average percent of existing facility's water to be used by the proposed facility.

- | | |
|---|----|
| a. Less than 10% | 1 |
| b. 10% but less than 25% | 2 |
| c. 25% but less than 50% | 3 |
| d. 50% but less than 75% | 5 |
| e. 75% or more | 7 |
| | |
| 3. Distance between existing facility intake and proposed facility discharge. | |
| a. 1.0 mile or more | 1 |
| b. 0.50 mile to less than 1.0 mile | 2 |
| c. 0.25 mile to less than 0.5 mile | 3 |
| d. 0.10 mile to less than 0.25 mile | 5 |
| e. Less than 0.10 mile | 7 |
| | |
| 4. Change in elevation between discharge of new facility and the intake of the existing facility. | |
| a. 50 feet or more | 1 |
| b. More than 20 feet but less than 50 feet | 2 |
| c. More than 10 feet but less than 20 feet | 3 |
| d. More than 5 feet but less than 10 feet | 5 |
| e. Less than 5 feet | 7 |
| | |
| 5. Anticipated temperature change in new facility | |
| a. Less than 1 degree F. | 1 |
| b. 2 degrees F. | 2 |
| c. 3 degrees F. | 3 |
| d. 4 degrees F. | 5 |
| e. 5 degrees F. | 7 |
| | |
| 6. Existing facility consideration | |
| a. Raises fish seasonally and proposed facility is a year around facility | -3 |
| b. Hatches eggs | 5 |
| c. Is a certified disease free facility | 7 |
| | |
| 7. Proposed new facility | |
| a. Spring or well source with no fish facility above | -3 |

The points associated with the characteristics of the new facility should be added and then compared to the following guideline:

TOTAL POINTS

0 - 15
16 - 20
21 or more

GUIDELINE

Generally approve
Approve with conditions
Generally disapprove

MEMORANDUM

TO: Regions and Water Allocations Bureau
FROM: Norman C. Young *NY* ADMINISTRATIVE MEMORANDUM
DATE: November 16, 1992 APPLICATION PROCESSING #55

RE: Consideration of Water Right Applications for Fish Propagation

The courts have held that the Department cannot approve an application which will violate Idaho water quality standards. The courts' determination was specifically related to fish propagation proposals in the Middle Snake area. Consideration of applications for permit to appropriate water for fish propagation must be coordinated with the Idaho Department of Health and Welfare, Division of Environmental Quality (DEQ) to determine whether the use of water proposed by the application will be consistent with the local public interest.

DEQ has been developing industry discharge standards for river segments throughout the state, particularly in the Middle Snake River. During the development of industry standards, DEQ will not certify any project which will result in a net increase in nutrient discharge to the river. As a result, the Department of Water Resources has approved only one application for fish propagation which DEQ stated could satisfy the no-net-increase standard. After receiving information from DEQ regarding the likely future DEQ standards, it appeared that the no-net-increase standard is likely to remain in place following the adoption of industry standards. However, the final decision on this standard will be made in early 1993.

The Department is sending a letter to all applicants informing them that processing will be resumed upon submittal of plans and specifications to the Department, including a certificate by DEQ, that the project will not increase nutrients in the receiving stream in accordance with the standards to be adopted.

We will continue to withhold action on pending applications for fish propagation until DEQ certification is provided that the project can be built and operated in conformance to the established standards. I regret the continuing delay in being able to issue a decision on the applications, some of which have been pending a long time.

NCY:GS:js