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BY THE COMPTROLLER GENERAL
**Report To The Chairman, Committee On
Public Works And Transportation
House Of Representatives**
OF THE UNITED STATES

**Corps Of Engineers' Acquisition
Of Fish Hatchery Proves Costly**

The Corps of Engineers acquired the Crystal Springs Ranch fish hatchery, Twin Falls County, Idaho, on March 18, 1981, for \$3.425 million as part of its plan to compensate for steelhead trout losses caused by the Corps' building dams on the Lower Snake River in Idaho.

With the assistance of fish biologists, appraisers, and other experts, GAO reviewed the appraisal used to justify the price and found that the appraisal overvalued the hatchery because the appraiser overstated the production capability and the value of the income the facility could generate. A comparable sale in June 1981 indicated that the Government may have paid substantially more than the facility was worth.

If the Government raises the fish, the cost will be about \$6 a pound, whereas if it contracts with commercial fish hatcheries, the cost could be only about \$1 per pound. Legislation will be needed, however, to allow the Corps to contract with commercial hatcheries.



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COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON D.C. 20548

B-202666

The Honorable James J. Howard
Chairman, Committee on Public
Works and Transportation
House of Representatives

Dear Mr. Chairman:

As requested in your February 18, 1981, letter, we reviewed the Corps of Engineers' purchase of the Crystal Springs Ranch fish hatchery in Twin Falls County, Idaho, in connection with the loss of steelhead trout because of dams constructed on the Lower Snake River.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 10 days from the date of the report. At that time, we will send copies to interested parties and make copies available to others on request.

Sincerely yours,

A handwritten signature in cursive script that reads "Milton J. Fowler".

Acting Comptroller General
of the United States



D I G E S T

On March 18, 1981, the Corps of Engineers purchased the Crystal Springs Ranch fish hatchery in Twin Falls County, Idaho, for \$3.425 million from a private individual. Because of the controversy preceding the sale about the price to be paid by the Corps, the Chairman of the House Committee on Public Works and Transportation asked GAO to review the appraised value of the hatchery and whether the Corps should have considered contracting with private hatcheries to raise some of the fish. GAO believes that the way the Corps determined the value of the fish hatchery was deficient and that a more realistic value would have been around \$1 million. The Corps plans to spend an additional \$9.4 million to convert the hatchery, which had been raising rainbow trout, to raise steelhead trout.

APPRAISAL BASED ON INSUFFICIENT
AND INACCURATE INFORMATION

According to the appraiser, the facility's fair market value as of August 13, 1980, was \$4.425 million. The value was revised in December 1980 to \$4.397 million after the Corps determined that part of the land involved was already owned by the Government. Before the Corps purchased the facility, GAO met with Corps officials and explained to them that the value placed on the facility appeared unrealistic. In March 1981 the value was again revised to \$3.4 million. Even the revised value, however, appears to be substantially more than the facility was worth.

Further evidence of the facility's overvaluation is shown by a recent trout farm company sale in the area for about half of Crystal Springs' selling price. This sale included five different rearing facilities with about 4.5 times the water, a processing plant, feed mill, and other assets not included in the Crystal Springs sale. The land involved was approximately 300 acres compared to about 25 acres for Crystal Springs.

Comparing the value of both facilities, it appears that the Federal Government may have paid substantially more than it should have for Crystal Springs.

The production capability the appraiser used to arrive at the facility's value was not adequately supported. The appraiser relied on information given to him orally. The owner did not provide verified historical production data, and neither the appraiser nor the Corps had a technical evaluation made of the estimated production capability.

The appraiser originally said the facility could produce 3.4 million pounds of fish but later changed his estimate to 2.5 million pounds. The majority of people GAO talked with, however, estimated the facility's production capability to be somewhere around 1 million pounds. A review of the revised appraisal by GAO and two fish biologists in the field of fish production found that it contained many technical inaccuracies regarding production. GAO believes the Corps should not have relied on the appraisal. (See pp. 5 to 11.)

GAO also believes (and other appraisers agreed) that the capitalization rate--the rate of return on investment one should expect from investing in the hatchery--was understated. Had the appraiser used more realistic values for the production capability and the capitalization rate, GAO believes the hatchery would have been valued somewhere around \$1 million. (See pp. 11 to 13.)

Because of the controversy surrounding the purchase price, the Corps should have had a second appraisal made and required that a technical evaluation of production capability be made as part of the appraisal process. (See p. 17.)

FEDERAL COST TO PRODUCE STEELHEAD
EXCEEDS PRIVATE COST

The possibility exists that commercial hatcheries could raise steelhead at substantial savings to the Government. However, the Corps would need authority to contract with commercial fish hatcheries to supply the steelhead in the Lower Snake River. Also, the Corps has some

reservations about the commercial hatcheries' ability to provide a continuous, long-term supply of healthy steelhead in time to satisfy mitigation requirements.

Federal and State fish and game officials, a professor of fish resources, and the director of a fish research laboratory told GAO, however, that commercial hatchery operators have developed or could develop the expertise needed to raise quality steelhead. Also, commercial hatchery operators told GAO that they would be willing to enter into long-term contracts to supply steelhead.

Because of the significant difference between the Federal Government's cost (\$6/lb.) to produce steelhead and the commercial hatcheries' selling price (\$1/lb.) for steelhead, GAO believes the Corps should determine if it is feasible for commercial hatchery owners to produce steelhead. (See pp. 20 to 25.)

RECOMMENDATIONS

The Secretary of the Army should direct the Chief, Corps of Engineers, to:

- Require in any future fish hatchery acquisitions where comparable sales are lacking that appraisers obtain a technical evaluation to accurately determine the production capability of the facility; more information to support the capitalization rate; and, if possible, actual production records. (See p. 17.)
- Determine the cost effectiveness and capability of commercial hatcheries in the Lower Snake River area to raise steelhead comparable in quality to those raised in Federal and State hatcheries. As part of its determination process, the Corps may want to have commercial hatcheries demonstrate the capability to raise steelhead. (See p. 23.)
- If it is feasible for commercial hatcheries to supply steelhead, promptly develop and submit to the Congress proposed legislation which would authorize the Corps to contract with commercial fish hatcheries in the

Lower Snake River area for steelhead trout.
(See p. 23.)

AGENCY AND APPRAISER'S COMMENTS
AND GAO'S EVALUATION

The Department of the Army believed the Corps had obtained a good appraisal based on the best data available and had complied with GAO's recommendation to obtain a technical evaluation of production capability and to adequately support the capitalization rate. GAO disagrees.

GAO believes that the Corps' appraisal was based on information which was inaccurate and incomplete and from biased sources. Further, the Corps made no attempt to contact those individuals who disagreed with the sales price even though these individuals represented a major portion of the industry and included other appraisers. (See p. 18.)

Army also disagreed with GAO's recommendation to explore the possibility of contracting with commercial hatcheries for steelhead trout and to obtain the necessary legislative changes to allow the Corps to do so. The Army cited the commercial hatcheries' inexperience in raising steelhead as the major reason for not wanting to contract with them. Interior also raised concerns about the capability of commercial hatcheries to raise quality steelhead but reserved judgment until it has completed a study of alternative fish sources. GAO believes that the commercial hatcheries have the potential capability to raise steelhead and that the Government could save millions of dollars by contracting with them. (See p. 23.)

The appraiser said that his information and methodology were reasonably accurate and that GAO used only biased information to make its judgments.

The appraiser, however, relied on the owner of Crystal Springs for most of his information, he failed to use information in his possession which did not support his position; and he did not contact those who disagreed with his valuation. GAO believes that this resulted in an inaccurate appraisal. (See p. 18.)

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CHAPTER 1

INTRODUCTION

The price the Corps of Engineers paid to acquire Crystal Springs Ranch fish hatchery in Twin Falls County, Idaho, has been extremely controversial because many people in the area associated with the trout farm industry believe the price was too high. In addition, steelhead trout, which will be raised on the site, could possibly be purchased from commercial hatcheries at a substantial savings to the Government. In view of the controversy surrounding these matters, the Chairman, House Committee on Public Works and Transportation, asked us to review the procedures the Corps used to select the hatchery, the method the appraiser used to arrive at his opinion of the hatchery's fair market value, and the possibility of the Corps providing the fish more economically by contracting with commercial hatcheries.

COMPENSATION FOR FISH LOSSES

In 1945 the Congress approved the construction of four dams on the Lower Snake River. The dams affected the natural upstream and downstream migration of steelhead trout, inundated certain spawning grounds, and converted about 140 miles of stream-type fish habitat to reservoirs. Under a provision of the Fish and Wildlife Coordination Act enacted in 1958 (Sec. 2 of Public Law 85-624), loss of fish and wildlife caused by such facilities are to be minimized. The provision requires the agency responsible for constructing the facility to try to prevent loss of and damage to fish and wildlife and to provide for the development and improvement thereof. Consistent with this requirement, the Corps replaces losses caused by its projects.

In 1976 the Congress authorized the Lower Snake River Fish and Wildlife Compensation Plan. The plan calls for the production of 11 million steelhead fish annually, weighing 1.4 million pounds, to be put in headwater areas. From this production, an estimated 55,000 steelhead would return each year to the area to produce 11 million more steelhead.

In 1977 the Corps issued its Fisheries Facilities Site Selection Report which identified the general location, size, estimated cost, design, and construction timetables for facilities needed to meet the steelhead production requirements. To limit environmental impacts associated with building its own hatcheries and to take advantage of existing water supplies, the Corps gave prime consideration to purchasing existing commercial hatcheries.

SELECTION OF CRYSTAL SPRINGS RANCH FISH HATCHERY

From 1977 to 1980 the Corps looked at several different sites but eliminated them for reasons such as location and

water availability. According to the Corps' Fish Facilities Site Selection Report, it made ground water reconnaissance studies to identify additional hatchery sites in Idaho and contacted owners of various potential hatchery sites. Although the Corps contacted some owners, other owners told us that the Corps did not contact them to see if they would be interested in selling their hatcheries.

At first, the Crystal Springs Ranch fish hatchery, which was raising rainbow trout, was not among the five recommended sites in Idaho. However, based on the Corps' investigations in the area on the availability of hatchery sites, three existing commercial trout hatcheries, including Crystal Springs, were studied for purchase and adaptation to raising steelhead. One of the facilities was found to be not acceptable, another facility was acceptable with minor modifications, and the Crystal Springs facility was found to be an acceptable site. Although the Corps considered most of the existing facilities at Crystal Springs to be inadequate for raising steelhead, the location, area, and water supply were found to be acceptable.

In December 1980, following an appraisal of Crystal Springs and the other acceptable facility, the Corps formally selected the Crystal Springs hatchery as one of the facilities needed to meet the mitigation requirements because the Crystal Springs facility was available for purchase and the other site was not. On January 26, 1981, the owner agreed to a \$3.5 million sales price although the facility had been appraised for the Corps at \$4.4 million. However, after a meeting with Corps officials and other individuals revealed that the hatchery was overvalued, the appraiser revised the value of the facility to \$3.4 million. (See app. I.) On March 18, 1981, the Corps purchased the hatchery for \$3.425 million.

OBJECTIVES, SCOPE, AND METHODOLOGY

Our review was directed toward the appraisal method used to arrive at the hatchery's fair market value, the accuracy of the appraisal's production figure and capitalization rate, and whether the Corps could provide fish more economically by contracting with commercial hatcheries. We discussed these matters with many individuals, reviewed various documents and reports, and requested written statements to substantiate individual views on important issues. In arriving at our conclusions, we used the information which we believed was the most accurate and unbiased. Because of time constraints, we were not able to review the Corps' procurement procedures in any great depth.

During our review, we interviewed Corps officials in Washington, D.C., and Walla Walla, Washington; Mr. Robert Smith, the owner of the Idaho Land & Appraisal Service Company which made the appraisal; the company's employee who did most of the appraisal; nine individuals employed or previously employed by private trout farms; two appraisers who had appraised fish hatcheries in the

local area; professors knowledgeable about fishery resources; a University of Idaho professor who did consulting work for the Corps; a director of a research firm who did consulting work for the Department of the Interior's Fish and Wildlife Service on raising steelhead at an existing Federal hatchery in the area; the owner 1/ of the Crystal Springs Ranch fish hatchery; a Federal fish hatchery manager employed by the Fish and Wildlife Service; two officials from Idaho's Department of Fish and Game; an Environmental Protection Agency official; and many other persons who were helpful to us in providing information about the fair market value of the Crystal Springs hatchery and whether commercial hatcheries could raise steelhead cheaper than the Federal Government.

We believe the persons and firms we contacted represent a cross section of views that enable us to feel confident about the conclusions we reached. We also asked Dr. Robert Busch, Director of Rangen Research, a former consultant to the U.S. Fish and Wildlife Service and an elected representative to the U.S. Trout Farmers Association, to review our report for technical accuracy. According to him, the report is technically sound and presents the information in an objective manner.

1/For this report, "the owner" refers to the individual who sold the property to the Corps.

CHAPTER 2

APPRAISAL OVERVALUED CRYSTAL SPRINGS

The Corps of Engineers acquired Crystal Springs Ranch fish hatchery for \$3.4 million although its value appears to be around \$1 million. The Corps overvalued the property because the appraiser, using the income approach, failed to adequately assess the site's trout production capability and used a capitalization rate 1/ not reflective of the trout farm industry--both crucial elements used in the appraisal to arrive at the hatchery's value.

The hatchery's value was originally appraised at \$4.425 million as of August 13, 1980. This amount was later revised in December 1980 to \$4.397 million when it was confirmed that a portion of the hatchery trespassed on lands owned by the Federal Energy Regulatory Commission and that the hatchery actually consisted of about 25 acres, not 35 acres as first determined. After we questioned the methodology and data the appraiser used, the appraised value was again revised in March 1981 to \$3.4 million. Even though the appraiser changed certain aspects of his methodology, we still have serious questions about the accuracy of the appraisal and approach he used. For example, in June 1981 the Clear Springs Trout Company purchased some trout farms involving approximately 365 cubic feet per second (cfs) of water and 300 acres of land for about half the price the Government paid for Crystal Springs. According to one official of Clear Springs, the price the Government paid for Crystal Springs was about nine times more than Clear Springs paid for the private trout farms when considering the land, water quantity, and other fixed assets they received.

CORPS' APPRAISAL BASED ON INCOME APPROACH

Appraisers determine property values by using either one or a combination of three basic appraisal approaches known as the comparable sales, cost, and income approaches. The Crystal Springs Ranch hatchery appraiser primarily relied on the income approach but used the cost approach as well.

The comparable sales approach usually gives the best indication of a property's fair market value because value is based on recent sales of similar properties. The cost approach, which is considered the least reliable, adds the fair market value of the bare land to the depreciated reproduction or replacement cost of

1/The required rate of return necessary to induce investors to buy or hold a property.

the improvements. The income approach capitalizes the income a property can produce to arrive at a fair market value. For example, if the property can produce an income of \$100,000 a year and the expected return on investment is 10 percent, then the property's value would be \$1 million ($\$100,000 \div 0.10 = \$1,000,000$).

In this case, the appraiser was not able to find any recent comparable sales of trout farms that could be used in valuing the property. The trout farmers, appraisers, and other knowledgeable persons we contacted confirmed that there had not been any comparable sales that could be used. Accordingly, the appraiser used the income approach to establish fair market value, supplemented by the cost approach.

APPRAISAL BASED ON INSUFFICIENT AND INACCURATE INFORMATION

Our review of the appraisal showed that the appraiser relied on insufficient and inaccurate information, which resulted in the appraiser overvaluing the Crystal Springs Ranch fish hatchery.

The accuracy of an income approach appraisal depends on the appraiser arriving at reasonably accurate figures for the property's income-producing capability and the rate at which the income should be capitalized. (See app. II for a discussion on the effect of key variables on trout farm values.) If these figures are not accurate, the appraised value is not accurate.

In the August 13, 1980, appraisal:

- The method for determining how many pounds of fish could be produced annually on the site was incorrect and resulted in the production estimate being nearly twice the highest estimate we obtained from other independent sources.
- The amount of water available to the site was overstated.
- The production value included potential production from undeveloped capacity even though the depressed trout market made the value of any additional production questionable.
- The capitalization rate used was not reflective of the trout farm industry.

After we discussed our concerns about the appraisal with Corps officials, they visited the Crystal Springs facility in March 1981 and reviewed the appraiser's production figure with the appraiser, Fish and Wildlife Service officials, Idaho Department of Fish and Game officials, the owner, and other Corps personnel. The Corps also obtained an independent engineer's opinion on the amount of water available at the site. As a result of the Corps' review, the appraiser revised the production figure

and valued the facility at \$3.4 million. (See app. I.) However, our review of the revised appraisal showed that:

- The method for determining production, although changed, was still questionable and resulted in higher production figures than those estimated by other independent sources. (See apps. V and VI.)
- The amount of water that could be beneficially used was overstated.
- The potential capacity was still included in the production estimates, but there was no adequate assessment of whether the marketplace could absorb the increased production.
- The same capitalization rate was used.

Hatchery's income-producing capability not adequately substantiated

The income generated by a trout farm depends on many production factors, such as the water quality and temperature, oxygen levels in the water, the amount of water available and the number of times it can be reused, the size of ponds and the water exchange rate through the ponds, how well the operation is managed, and many other factors.

Because of the many factors involved, the best indicators of the property's production capability would be actual, verified production records for the facility and a technical evaluation of the facility by an independent fisheries expert. Another good indicator would be actual production figures for comparable operations. Lacking any of these indicators, only opinions by those knowledgeable in trout farm operations are left.

A technical evaluation was not made

According to Fish and Wildlife Service officials, a reasonably accurate production capability figure can be calculated if a technical evaluation is made. No attempt was made, however, by the appraiser or the Corps to technically evaluate the facility's production capability.

Insufficient historical production data

The Crystal Springs production figure that the appraiser used in the original appraisal was estimated by the owner during an interview without reference to production records. The production figure used in the revised appraisal was based on a one-page summary provided by the owner showing monthly production

figures for 1980. However, neither we nor the appraiser had access to the owner's production records supporting these summary figures, and consequently the figures could not be verified. Although the owner said that he would have his accounting firm verify the figures for us, we had not received anything from him or the accounting firm as of September 10, 1981.

In addition, historical data for more than 1 year would be needed to establish the facility's average production capability because trout production can vary from year to year. However, the appraiser relied only on the 1980 production figures--a 1-year interval. According to a fish biologist, historical data is maintained because it is an integral part of a hatchery operation for feeding purposes and thus should have been obtained.

Comparable operations
selection was poor

The appraiser had difficulty obtaining financial and production information from trout farm operators in the area. Consequently, the appraiser relied on limited and unverified information to arrive at the facility's production capability in both the original and revised appraisals.

The revised appraisal used three trout farm operations' production to compare with Crystal Springs' production. Two of these operations are "farm pond" types of operations which raise fish to market size from fish brought in from a separate hatchery operation. Because farm pond operations achieve larger production figures than production hatcheries such as Crystal Springs, they are not good comparable operations. Also, the owner of Crystal Springs operates the two farm pond operations and was the source of the production data that the appraiser used. The third comparable operation included a hatchery operation. Although considered by officials from private trout firms to be a better facility than Crystal Springs, it would have had a lower production figure than the appraiser estimated for Crystal Springs except that the appraiser adjusted the figure upward because egg losses resulted in the facility being partially empty during the year. However, the appraiser should not have eliminated all of the lost production because this is a normal business risk and demonstrates the need to use data from more than 1 year so that any losses are averaged out over time.

In all three comparables only 1 year's production data was used instead of an average. Also, two other comparable facilities' production data was not included in the appraiser's revised analysis even though it was available to him. Both facilities are considered to be as good as or better than Crystal Springs. However, using the appraiser's method for computing production, both facilities showed a substantially lower production figure than that used for Crystal Springs. This was true whether or not the production figure used was the average or the best year's figure. The appraisal report was silent on why one of

the facilities was not used and stated only that the appraiser "must disregard" the other because information provided for the original appraisal was "misleading." However, the information in question was simply the result of a misunderstanding about how much water was available and was not a case of purposely providing misleading information. The appraiser should have corrected the information and used this facility as well as the other in the production analysis.

Experts' opinions do not support
appraiser's production figure

With the exception of Crystal Springs' owner and one Fish and Wildlife Service official, everyone knowledgeable about trout farming that we contacted expressed the opinion that the appraiser's production figure was completely out of line for the Crystal Springs facility. Even the owner's and the Fish and Wildlife Service official's potential production estimates were not as high as the appraiser's estimate.

Production capability comparisons are usually expressed in terms of the pounds of fish that can be produced per cubic foot per second (lbs./cfs) of water. The appraiser estimated Crystal Springs' potential production capability to be nearly 31,000 lbs./cfs. The owner stated that a production level of about 25,000 lbs./cfs could be achieved. The Fish and Wildlife Service official originally estimated the site's maximum production to be 18,000 lbs./cfs but later changed his estimate to 30,000 lbs./cfs. The other estimates we obtained from fish biologists, trout farm operators, and consultants ranged from 10,000 to 16,000 lbs./cfs.

Before March 9, 1981, we twice verified with the Fish and Wildlife Service official what he believed the facility's production capability to be. Both times he said that the facility could produce only about 18,000 lbs./cfs. After he met with Corps officials on March 9, 1981, he revised his estimate to 30,000 lbs./cfs. In a March 16, 1981, letter to us (see app. IV), he explained that since his initial involvement, he had learned a great deal about the local trout industry and particularly about its production capabilities.

However, the additional information he obtained appears to be the same information on which the revised appraisal was based--information that has not been verified and therefore could be questionable. The official himself said that it had been difficult to obtain objective information. However, he changed his position on one critical point on which there is no difficulty obtaining information. Although he originally said that the facility had poor aeration, he now contends that the aeration is excellent--a position not supported by anyone else. Proper aeration of water is one of the most critical factors in fish production. Because Crystal Springs does not have excellent aeration, we question the validity of the Fish and Wildlife Service official's production estimate.

Two fish biologists with extensive backgrounds in commercial trout operations told us there was no way Crystal Springs could produce at such high levels. (See apps. V and VI.) One of the biologists said that the Crystal Springs facility

"* * * has extremely limited fall and reaeration potential for maintaining favorable dissolved oxygen levels compared to most other hatcheries in the area due to the low elevation of its primary water supply."

He also said that the hatchery

"* * * is not recognized to be one of the more efficient and productive facilities in Idaho due to obvious constraints in design, construction, and operation * * *."

Also, information available on the local trout farm industry does not support the appraiser's high production figure. In a published report on "Aquaculture in Idaho and Nationwide" (1975), Klontz and King estimated the total live weight rainbow trout production in Idaho for 1974 to be 22,310,000 pounds on an average annual flow of 2,397 cfs of water for a production rate of 9,307 lbs./cfs. In the U.S. Department of Agriculture's report entitled "Aquaculture: Catfish and Trout, Inventory and Sales 1980," the Idaho rainbow trout sales are reported to be 24,772,000 pounds for a 7-month period. On an annual basis, the sales would be 42,466,000 pounds on 3,884 cfs of water, which would require an average production rate of 10,928 lbs./cfs. Given these average production figures and in view of the opinion that Crystal Springs is not an ideal site, we believe the 31,000 lbs./cfs production figure derived by the appraiser is not realistic.

Appraiser used unconventional method
to develop production estimate

The appraiser developed his production estimate by using an unconventional method that can produce high production values when practical and economic constraints are not considered.

The appraiser's method for determining how many pounds of fish could be produced annually on the site if additional ponds were constructed was incorrect. The appraiser originally estimated that each time the water could be reused--potentially up to eight times for Crystal Springs--the same production achieved on the existing ponds could be achieved on the subsequent ponds that could be built. However, fish biologists, consultants, trout farm operators, and other appraisers all said that the water at the Crystal Springs facility could not be reused over and over and still produce the same quantity and quality of fish in each pond. Therefore, the multiplier effect the appraiser used was technically incorrect. (See app. III for a more complete discussion about reuses of water.)

In his revised appraisal, the appraiser altered this approach by lowering the production on each reuse of the water by 10 percent from the preceding pond. The 10-percent figure was based on an estimate given by the Fish and Wildlife Service official referred to in the previous section. (See app. III.) The appraiser also assumed that the water could be reused an indefinite number of times and still produce some fish.

Both the 10-percent and indefinite reuse of water assumptions were challenged by the two fish biologists we contacted. They said their experience shows that the percentage drop in production increases on each reuse and that a practical limit exists on the number of times the water can be reused. One biologist used a 20-percent drop between the first and second uses, a 25-percent drop between the second and third uses, and a 30-percent drop between the third and fourth uses. He said that water could be reused a maximum of only about four times, explaining that:

"Indeed, some individual hatcheries in the area do use water more often but are only able to do so by decreasing their loading densities throughout the series and recombining water for more rapid turnover times in lower ponds. In the end, they have achieved no greater total production per CFS than [sic] other stations with few serial reuses."

According to Crystal Springs' owner, he produced about 1.1 million pounds of trout during 1980, whereas the appraiser said that the existing facility's total production capacity was 2.1 million pounds and would be 2.5 million pounds if fully developed. However, one biologist estimated the site's total annual production to be no more than about 0.9 million pounds. The other, emphasizing that his estimate was only a guess based on his many years of practical experience, said that the annual production would probably not be more than 1.232 million pounds.

The appraiser also did not adequately consider the economic constraints on production. The owner of another facility told us that he has reduced the number of times he reuses water because the additional reuses are not economically justifiable in the current depressed market. However, the appraiser assumed that most of the increased production at Crystal Springs could be sold in the marketplace. Available information, however, shows that the current market for trout has not kept up with the capacity to produce fish--resulting in a substantial amount of the industry's capacity being taken out of production. According to an official of the U.S. Trout Farmers Association, the industry is planning to reduce production 25 to 35 percent.

Given the current depressed market and the amount of unused capacity in the industry, we believe it is speculative as to when market conditions will improve enough to absorb any increased production. According to the Uniform Appraisal Standards for Federal Land Acquisitions,

"* * * in the words of the Supreme Court of the United States, 'Elements affecting value that depend upon events or combinations of occurrences which, while within the realm of possibility, are not fairly shown to be reasonably probable, should be excluded from consideration, for that would be to allow mere speculation and conjecture to become a guide for the ascertainment of value--a thing to be condemned in business transactions as well as in judicial ascertainment of truth.' * * *"

We believe that the appraiser's production estimate--2.5 million pounds annually--is not only technically unachievable but is also highly speculative economically because the demand for fish is down and it is unknown when the demand will increase.

Capitalization rate used was low

The 10-percent capitalization rate the appraiser used is not reflective of the trout farm industry or of the current economic situation.

The income approach to valuation involves estimating future income attributable to a property and then determining how much one is willing to invest to obtain that level of income. For example, if the income from a property is \$100,000 and an individual wants to invest in property worth \$1 million to obtain that income, the capitalization rate would be 10 percent. On the other hand, if the individual wants to invest only \$700,000 to realize the same amount of income, the capitalization rate would be about 14.3 percent. Thus, the selection of the capitalization rate is critical because a slight change in the rate can result in a large change in the valuation of the property.

Because the capitalization rate is critical, an appraisal should be based on a rate determined by using comparable sales and their associated incomes. However, because of the lack of recent comparable sales and the difficulty the appraiser had in obtaining financial information from the trout farm operators he contacted, this approach could not be used. Instead, the appraiser used two fish hatchery operations on which he was able to obtain information. The information was not sufficient, however, to substantiate a 10-percent capitalization rate.

One operator told the appraiser that his operating costs were 68 cents a pound and that he could accept a 7-cent profit as an appropriate return on his capital investment. The operator said this would give him about a 10-percent return on his invested capital. However, the appraisal report was silent on how much the operator actually invested. Whether the operator incorrectly assumed that the rate of markup over operating costs was the same as the capitalization rate is not clear.

The other operation on which the appraiser was able to obtain information was a proposed sale that did not go through. According to the appraisal report, "The buyer decided a 10 percent return which current fish market conditions indicated he could realize, was not high enough return and he backed out." This statement should have been an indication to the appraiser that a 10-percent capitalization rate may have been too low.

Lacking market data, the appraiser could have determined a capitalization rate by assigning a rate for a risk-free investment and then adding to that rate for factors such as risk and nonliquidity of real estate. The current yield on U.S. Treasury securities is generally used to measure a riskless rate. Over the last few years, long-term Treasury bonds have yielded about 8 percent, but recent yields have been higher--about 12 to 13 percent in March 1981. Adding a risk and nonliquidity factor to this rate would easily put the capitalization rate for fish farms over 10 percent.

We asked trout farm operators, consultants, and appraisers what capitalization rate they felt was appropriate for the trout farm industry. Two appraisers, who had done appraisal work on trout farms in the area, used 15 and 16 percent, respectively. The operators and consultants gave rates ranging from 15 to 30 percent. A 20- to 25-percent capitalization rate seemed reasonable to them.

Even if the 10-percent rate had been correct at the time the appraisal work was done, the appraiser should have adjusted the rate to reflect the substantial change in interest rates that occurred after August 1980 when he subsequently revised the appraisal. The Uniform Appraisal Standards for Federal Land Acquisitions state that:

"Since the demand for a return on the investment, as well as a return of the investment, make up the rate by which income is capitalized to estimate value, there would appear to be every reason to conclude that a substantial increase or decrease in interest rates will have an effect on the market value of real estate."

Since August 1980, the interest rates have increased substantially. However, the appraiser continued to use the 10-percent capitalization rate in his revised appraisals of December 1980 and March 1981.

In view of the high interest rates, the ability of investors to obtain a risk-free return of 12 to 13 percent, and the lack of good comparable investments at the time the original appraisal was done, the 10-percent rate does not appear to have adequately reflected the economic situation at the time of either the original appraisal or the updates. At least a 15-percent rate should have been used.

Furthermore, the Crystal Springs facility, as it existed in 1975 when the owner purchased it for \$425,000, would have had to appreciate at a compound rate of 58 percent a year to have reached the August 1980 appraised value of \$4,425,000 and an annual appreciation rate of 50 percent to reach the revised appraised value of \$3,400,000. ^{1/} Such high annual rates of appreciation should have caused the appraiser to question the validity of the appraised values. However, the appraiser did not use the 1975 sale in his analysis even though the Uniform Appraisal Standards for Federal Land Acquisitions state that

"Since compensation is measured by market value, prior sales of the same property, reasonably recent and not forced, are the best evidence of market value."

The appraiser's explanation for not using the prior sale was that the owner added improvements after the sale. However, the property value could have been adjusted for these improvements--as we did in our analysis--because the values were itemized in the appraiser's cost approach valuation.

LOWER PROPERTY VALUE INDICATED
BY COST APPROACH

The cost approach, which usually provides the upper limit on a property's value, is useful to look at because of the widely differing opinions on the income-producing capability of Crystal Springs. Also, some appraisers believe that in the absence of comparable sales, the cost approach is the best indication of a trout farm's value.

Some appraisers consider the cost approach to be the most reliable indication of a trout farm's value because most of the information needed for this approach is available. Trout farm values based on the cost approach are comprised of three basic parts--land, improvements, and water value. The land and improvements can be valued without a great deal of difficulty, but the water value--which constitutes the largest portion of a trout farm's value--is not as easily determined. Comparable water rights traded in the marketplace would be the best indication of value. However, the trading of water rights has been extremely limited. Therefore, the cost approach must also rely on opinions of value that are not well substantiated by the marketplace.

^{1/}The property values on which the annual appreciation rates were computed were the appraised values less \$205,766. This is the value the appraiser placed on improvements added after the 1975 purchase.

In both the original and revised appraisals, the appraiser's cost approach was based on the same erroneous assumptions about the capitalization rate and the production levels for each reuse of water that were made in the income approach. Using these incorrect assumptions and basing the water value on two lease operations, the appraiser originally derived a water value of \$34,589/cfs which, without the incorrect assumptions, would have been \$8,647/cfs. The revised appraisal used one of the lease operations and a real estate listing for farm land with undeveloped water that could be used for trout farming to arrive at a value of \$33,000/cfs and a property value of \$3.3 million. The appraiser used this value even though he stated in the background section of the appraisal report that water was then selling for \$12,000/cfs to \$15,000/cfs. Furthermore, in another section of the report, he showed a water value of \$5,466/cfs for a fish farm operation that was almost sold. In addition, in a 1980 appraisal of another trout farm operated by the owner, a different appraiser placed a value on spring water of \$10,000/cfs.

After we questioned the amount of water that could be beneficially used at Crystal Springs, the Corps, during March 1981, obtained an independent engineer's opinion on the amount of water available to the site. Because the engineer's opinion was based on measurements made at the site, we used his figures in both the cost and income approach calculations as did the appraiser in his March 1981 revised appraisal.

By using different water values than the appraiser used but using his values for land (\$105,233) and improvements (\$501,374), the following table shows that under the cost approach the appraiser's revised value of \$3.4 million appears to be grossly overstated.

Property Values (Note a)

	<u>Water value/cfs</u>				
<u>cfs</u>	<u>\$5,446/cfs</u>	<u>\$8,647/cfs</u>	<u>\$10,000/cfs</u>	<u>\$12,000/cfs</u>	<u>\$15,000/cfs</u>
b/ 66	\$ 966,043	\$1,177,309	\$1,266,607	\$1,398,607	\$1,596,607
c/ 77	1,025,949	1,272,426	1,376,607	1,530,607	1,761,607
d/ 82	1,053,179	1,315,661	1,426,607	1,590,607	1,836,607

a/Property values were calculated by multiplying the amount of cfs of water times the water value per cfs and then adding to that, the value of land (\$105,233) and improvements (\$501,374).

b/Water flow measured at Crystal Springs on March 11, 1981, by Keith Anderson, consulting engineer.

c/Estimated average annual water flow as determined by Keith Anderson, consulting engineer.

d/Estimated average annual water flow used in the revised appraisal. Assumes modifications to the collection system.

The appraiser used 82 cfs in the revised appraisal, which was the engineer's estimated average annual water flow if modifications were made to the collection system. However, even if the additional water were collected, the current market and Crystal Springs' limited capacity to beneficially use more water make the value of any additional water questionable. We believe the engineer's 77 cfs estimated average annual flow for the existing system is more realistic.

RECENT COMPARABLE SALE

In June 1981, the Clear Springs Trout Company purchased the fixed assets of Thousand Springs, another fish hatchery in the same area as Crystal Springs. According to the Clear Springs' official, the sale included 5-trout production facilities, processing and cold storage facilities, buildings, a feed manufacturing plant, approximately 300 acres of land, approximately 365 cfs of water, and the brand name "Thousand Springs" for approximately \$1.75 million. According to an official of the company, only about 65 cfs in spring water has been previously used. In addition, ponds on about one-third of the acres could be expanded if eight ponds were to be built similar to the configuration used by the appraiser for Crystal Springs. From a practical standpoint, the official said they would not add that many ponds even though the area is large enough to accommodate the additional ponds.

We were unable to obtain precise cost information regarding the recent sale because that is proprietary information we were not able to obtain. However, an estimate of the approximate sale price divided by the amount of water shows that the Corps paid about nine times more for Crystal Springs than Clear Springs paid for Thousand Springs.

WEAKNESSES IN CORPS' PROCEDURES FOR OBTAINING AND REVIEWING APPRAISAL

Because of time constraints, we were unable to fully evaluate the Corps' procedures for selecting the appraiser and reviewing the appraisal. We did note, however, that despite the appraiser's precedent-setting value and appraisal method, the Corps obtained only one appraisal. Also, the Corps did not have persons with appropriate technical knowledge of fish production review certain aspects of the appraisal.

The Corps had two acceptable sites appraised. According to the Corps, several appraisers were considered for the assignment. In May 1980 Mr. Robert Smith of Idaho Land & Appraisal Service Company was contacted and later selected to make the appraisals based on his availability and past performance on this type of appraisal. According to Mr. Smith he had done about three appraisals on fish hatcheries, but the employee who did most of the appraisal had never appraised a fish hatchery before.

According to the Corps' procedures for appraisal, only one appraisal will normally be obtained. However, in cases involving controversial appraisal problems or precedent-setting patterns of value in first priority areas of large projects, more than one appraisal of the property may be obtained if considered necessary by the division or district engineer. According to those individuals, a second appraisal was not obtained because both the Corps' district and division levels reviewed the initial appraisal and found it satisfactory.

We learned from Corps officials, however, that no technical persons knowledgeable in the relationship of water volume and quality to fish production had reviewed the appraisal for the Corps. According to two individuals, one a consultant to the Fish and Wildlife Service regarding steelhead and the other a consultant to the Corps on its mitigation program, they were not consulted about this appraisal.

In view of the appraiser's limited background in trout farm appraisals, the difficulty he experienced in obtaining adequate information from trout farm operators, the controversy surrounding the purchase, and the precedent-setting value this purchase would have on future acquisitions, the Corps should have obtained a second appraisal. Also, it should have had persons with appropriate technical backgrounds review the appraisal.

CONCLUSIONS

The Corps' reliance on an appraisal that used an unconventional method for estimating trout production and that was based on inaccurate and insufficient information has resulted in the Corps' having acquired the Crystal Springs trout farm for substantially more than it appears to have been worth.

We believe better information than what the appraiser used supports a capitalization rate of 15 percent, a water flow of 77 cfs, and a production level from 11,000 to 16,000 lbs./cfs. By applying these figures to the appraiser's income method format, the Crystal Springs trout farm would have a value range from \$763,000 to \$1,129,000 (see app. II), well below the Corps' \$3.4 million purchase price. The cost approach using more realistic water values than the appraiser used also supports a lower value. In view of the controversy regarding what the facility could actually produce, the Corps should have obtained production records from the owner.

Corps officials could have avoided a costly lesson if a more thorough and technical evaluation of the appraisal had been made and a second appraisal had been obtained.

RECOMMENDATION TO THE SECRETARY OF THE ARMY

We recommend that the Secretary of the Army direct the Chief, Corps of Engineers, in future fish hatchery acquisitions where comparable sales are lacking, to require appraisers to obtain a technical evaluation to accurately determine the production capability of the facility; more information to support the capitalization rate; and, if possible, accurate production records.

DEPARTMENT OF THE ARMY'S COMMENTS AND OUR EVALUATION

The Department of the Army stated that the Corps of Engineers acted in good faith and supported its actions with the best data available. It believed our report, however, consisted of a cursory appraisal based on opinions made by competitors in the trout farm industry. It believed that it had already complied with our recommendation to obtain a technical evaluation of a hatchery's production capability and to adequately support the capitalization rate. (See app. VIII for the Army's complete comments and our evaluation.)

We disagree that the Corps' action was supported by the best data available. The data the Corps and its appraiser relied on was unverified verbal or written summary information which was mostly supplied by the owner of Crystal Springs. Most of the facilities used as a comparative check on production capabilities were not comparable facilities. In addition, the appraiser did not use other data in his and the Corps' possession which did

not support their position. We do not consider our work to be an appraisal, but we do believe that our work is based on better and more complete information than the appraiser or the Corps used. We considered opinions from both sides of the controversy as well as those from qualified individuals who were not involved. However, the Corps did not attempt to obtain the opinions of those who disagreed with the sales price even though they represented a major portion of the industry and included noncompetitors such as consultants and other appraisers.

The Corps did not obtain a technical evaluation of Crystal Springs' production capability. The appraiser based the final appraisal estimate on the Fish and Wildlife Service official's estimate. However, the official does not claim to be nor is he considered an expert in commercial trout production. His production estimate was not based on technical data but rather on a tour of the facility and the same unverified information supplied to the appraiser.

The capitalization rate was not adequately supported by market data, opinions, or analysis. The appraiser's support for his capitalization rate consisted of limited information on two noncomparable fish farms and his assumption that aquacultural and agricultural endeavors are similar and would have comparable capitalization rates. However, the relationship of aquacultural property to agricultural land has not been demonstrated. The trout farm operators, consultants, and other appraisers we talked to gave capitalization rates of 15 to 30 percent. We believe the preponderance of evidence supports a higher capitalization rate than the 10 percent used by the appraiser.

APPRAISER'S COMMENTS AND OUR EVALUATION

The appraiser's comments on our report are extensive but address only a few major points. The appraiser's comments are printed in their entirety with our evaluation in appendix X.

Although the appraiser states that obtaining information from the trout farm industry was difficult, he still believes his information and appraisal work were adequate. We believe one of the major reasons that the appraiser's valuation of the hatchery was so far from the most recent comparable sale was the lack of good, reliable information furnished the appraiser by others.

He stated repeatedly that we had used information only from biased sources. We did not rely only on information supplied from potentially biased sources. We contacted individuals that represented both sides of the issue as well as some who were not aligned with either side. However, both the Corps and the appraiser relied on unverified information mostly supplied by the Crystal Springs' owner, and neither one contacted those people who disagreed with the sales price to hear their side of the issue. This group

consisted not only of a sizable portion of the industry but also included other appraisers who had done fish hatchery appraisals in the area. We also disagree that the appraiser's production estimate was well supported. Only Crystal Springs' owner and the Fish and Wildlife Service official were close to the appraiser's estimate. All others told us that the estimate was completely out of line.

The appraiser stated that usually the fish farm site limits the number of uses and not the water quality, and therefore water can be reused more than four times. He gave examples where water was used in as many as 12 different ponds. Everyone we talked to, however, said that a number of factors determine production from a site, with water quality being the most important factor. Site limitations were acknowledged as a factor, but water quality was considered more critical, even by those whose facilities were not site limited. The number of times water can be used cannot be determined by simply counting the number of ponds it flows through. Ponds can vary in size and carrying capacity and they can be loaded lighter than normal so that the water is not completely "used up" before it passes onto the next pond. However, a point will be reached when the water quality decreases to where fish cannot be practically or economically produced. Trout farmers do add additional ponds, but this is usually to facilitate handling the fish.

The appraiser restated his basis for a 10-percent capitalization rate with the primary support being the similarity of agricultural endeavors with fish farming. However, this assumption has not been adequately demonstrated to be true, and even though there are similarities, there are also important differences that make such a comparison questionable. The trout farm operators--who are also potential buyers of trout farms--consultants, and other appraisers we talked to gave capitalization rates of 15 to 30 percent. The appraiser experienced difficulty in determining a proper capitalization rate and in arriving at an accurate appraised value because there have not been any recent trout farm sales in the area.

A recent sale made after Crystal Springs was sold further indicates that the appraiser overvalued Crystal Springs. This sale involved significantly more assets--about 4.5 times the water, 300 acres of land, plus a processing plant, feedmill, and other assets--yet its selling price was about half that of Crystal Springs.

CHAPTER 3

FEDERAL COST TO PRODUCE STEELHEAD

EXCEEDS PRIVATE COST

Producing steelhead trout at Crystal Springs Ranch will cost the Corps about \$5.90 a pound, or about 500 percent more than the \$1 price commercial hatchery owners indicated they would be willing to sell steelhead for. The Corps maintains that commercial hatcheries cannot be relied on to produce healthy fish on a long-term, continuous basis. It also maintains, and we agree, that it does not now have authority to contract the work out to commercial fish hatcheries. ^{1/} Our discussions with fish production experts and commercial hatchery owners revealed that (1) commercial hatcheries may be able to grow steelhead that will meet Federal quality standards and (2) the owners are willing to enter into contracts with the Corps.

FEDERAL VERSUS PRIVATE COSTS TO PRODUCE STEELHEAD

The Corps purchased Crystal Springs for \$3.4 million and estimates it will spend an additional \$9.4 million on capital improvements to produce 291,500 pounds of steelhead annually. As shown in appendix VII, it will cost the Corps \$5.90 to produce a pound of steelhead at Crystal Springs. In contrast, commercial hatchery owners told us they would sell the Corps healthy steelhead for \$1 a pound. There are two reasons for the wide discrepancy in average total costs. First, commercial fisheries can produce steelhead with no incremental additions to physical plant. Second, the cost of federally produced fish includes a large component of capital costs associated with the new physical plant, spread over the planned level of production.

Crystal Springs is only one of five hatcheries the Corps plans to modify or build to compensate for the 1.4-million-pound annual steelhead loss. The estimated per-pound production cost

^{1/}The Corps' proposal to produce steelhead trout is part of a plan to compensate for losses to fish and wildlife on the Lower Snake River caused by Corps projects. The Congress adopted and authorized the plan "substantially in accordance with a report on file with the Chief of Engineers." See section 102 of Public Law No. 94-587. The report included recommendations for the purchase and construction of hatcheries to produce steelhead. It is apparent from the report and from the legislative history of Public Law No. 94-587 that the Congress was authorizing construction of hatcheries, as opposed to contracting out with commercial fisheries to supply the fish. Contracting out would appear to constitute a substantial change in the adopted plan.

for the other hatcheries, excluding Crystal Springs, averages \$6.15 a pound. In contrast, one commercial hatchery (Clear Springs Trout Company) said it could raise steelhead for 63 cents a pound and would sell it to the Government for \$1 a pound. (See app. VII.)

WHY THE CORPS HAS NOT
CONTRACTED FOR STEELHEAD

Corps officials said, and we agree, that the compensation plan approved by Congress does not authorize the Corps to contract with commercial fish hatcheries to supply the needed steelhead. In developing the plan, the Corps could have provided for contracting with commercial hatcheries as encouraged by Office of Management and Budget Circular No. A-76. However, Corps officials said that because of reservations about the commercial hatcheries' ability to provide a continuous, long-term supply of healthy steelhead, the Corps had not sought such authority from the Congress.

The Office of Management and Budget Circular No. A-76 encourages the use of private businesses by requiring executive branch agencies to use private businesses to supply products and services used by the Government except under certain circumstances, such as when (1) using a commercial source disrupts or materially delays an agency's program, (2) a satisfactory private commercial source is not available and cannot be developed in the required time, or (3) doing so would result in higher cost to the Government. An agency's decision to supply the product or service itself because it would cost less must be supported by a comparative cost analysis.

According to Corps officials, the private sector does not have the capability to produce healthy steelhead on a long-term basis. They said that the use of commercial sources for steelhead production was the subject of an August 21, 1978, letter from Senator James A. McClure to the head of the Corps' district office in Walla Walla, Washington. In that letter, the Senator asked if the Corps was considering buying steelhead rather than building Federal hatcheries.

In separate letters, the Area Manager of the U.S. Fish and Wildlife Service and the Director of the Idaho Department of Fish and Game wrote to Senator McClure that only Federal and State hatcheries have the expertise and continuity of operations needed to assure a continuous, long-term supply of healthy steelhead. The Corps concurred in that conclusion at the time and reiterated its position in a memorandum provided us on February 20, 1981. The Corps' Manager of the Lower Snake River Fish and Wildlife Compensation Plan said this was why the Corps decided to acquire the Crystal Springs Ranch fish hatchery rather than contract with commercial hatcheries.

According to Corps officials, the primary reasons the Corps does not want to purchase steelhead from commercial hatcheries are:

- Untrained commercial hatchery operators might allow disease to break out and destroy entire strains of steelhead.
- Commercial hatchery operators cannot gain the necessary expertise in time to meet the mitigation requirements because of the precarious nature of the Lower Snake River steelhead runs.
- There is no way to assure that commercial hatchery operators will be available to rear steelhead every year for an indefinite period.
- The quality of privately grown steelhead cannot be objectively measured. This would make it very difficult to contract for quality fish.

Although steelhead are not currently being grown by commercial hatcheries in the Crystal Springs area, our discussion with Federal and State fish and game officials in Idaho, a professor of fish resources at the University of Idaho, and the director of a fish research laboratory revealed that commercial hatchery operations have or could develop the expertise needed to raise quality steelhead. One trout producer told us that private industry can control and monitor fish quality and fish health to the same extent as do public agencies. According to the producer, quality and health are based on many interrelated factors that are just as important to commercial food fish production as they are to the public agencies. In addition, commercial hatchery operators told us that they would be willing to enter into long-term contracts to supply steelhead at \$1 a pound plus annual adjustments to cover increases in operating costs.

CONCLUSIONS

The possibility exists that commercial hatcheries, including those now raising rainbow trout, could raise steelhead trout at substantial savings to the Government. Although raising steelhead is more risky than raising rainbow trout, steelhead could be raised by commercial hatcheries provided they make the changes necessary to accommodate the rearing of steelhead. Because of the significant differences between the Federal Government's cost (about \$6/lb.) to produce steelhead and the estimated selling price by commercial hatcheries (\$1/lb.), the Corps should determine if it is feasible for commercial hatchery owners to produce steelhead. To evaluate the capability and cost effectiveness of commercial hatcheries to raise quality steelhead, the Corps may want to have commercial hatcheries demonstrate the capability to raise steelhead. Until the Corps takes this action, it cannot know how much capability exists in the private sector and what the cost will be. Legislation is needed, however,

for the Corps to contract with commercial hatcheries. Therefore, if it is feasible for commercial hatcheries to supply steelhead, the Corps should promptly develop and submit to the Congress proposed legislation which would authorize the Corps to contract with commercial fish hatcheries.

RECOMMENDATIONS TO THE
SECRETARY OF THE ARMY

We recommend that the Secretary of the Army direct the Chief, Corps of Engineers, to:

- Determine the cost effectiveness and capability of commercial hatcheries in the Lower Snake River area to raise steelhead comparable in quality to those raised in Federal and State hatcheries. As part of its determination process, the Corps may want to have commercial hatcheries demonstrate the capability to raise steelhead.
- If it is feasible for commercial hatcheries to supply steelhead, promptly develop and submit to the Congress proposed legislation which would authorize the Corps to contract with commercial fish hatcheries in the Lower Snake River area for steelhead trout.

DEPARTMENT OF THE ARMY'S COMMENTS
AND OUR EVALUATION

The Department of the Army stated that it did not concur with our recommendations concerning contracting out because (1) commercial hatcheries are not experienced in raising steelhead trout, (2) there is not enough time for them to gain experience because of the precarious nature of the Lower Snake River steelhead runs, and (3) failure to perform under terms of the contracts is not amenable to correction through normal contract remedies when a fragile natural resource is at stake. (See app. VIII for the Army's complete comments and our evaluation.)

Although most commercial hatcheries have not raised steelhead trout, some of the hatcheries do have individuals on their staffs who have previously worked for public fish hatcheries and have had experience in raising steelhead. One of the fish hatcheries in the area has raised steelhead in connection with its development of feed for steelhead. According to some commercial hatcheries, they could begin raising steelhead immediately whereas the Crystal Springs Ranch fish hatchery is not expected to be in operation for steelhead for at least 2 years. Because of Army's concern over the critical time element, we are recommending that Army obtain legislation to permit the Corps to contract out if it is feasible for commercial hatcheries to supply steelhead. This should reduce any delays in implementing a program should the Army decide to use commercial hatcheries.

The potential for fish losses is always a risk whether public or private hatcheries are involved. We are simply recommending that the Corps should determine, in view of the potential savings, the possibility of contracting for a portion of the steelhead trout.

DEPARTMENT OF THE INTERIOR'S
COMMENTS AND OUR EVALUATION

The Department of the Interior stated that our calculation that the Federal cost to produce steelhead exceeds private costs was inaccurate because we failed to include capital investment for land and improvements in the commercial hatcheries' costs. It felt that we had not expended enough effort in determining costs and had "uncritically" accepted the \$1/pound figure given by commercial hatcheries. It also believed the commercial production costs cited in our report were for intensive trout culture and not steelhead culture. Interior's comments are printed in their entirety with our evaluation in appendix IX.

We disagree that our figures are not comparable. The \$1/pound selling price quoted to us by the commercial hatcheries was for steelhead culture. Because this is their selling price, it is immaterial what the makeup of their \$1/pound price is. Whatever costs they want to recover for land and improvements are included in the selling price.

Because there is such a large difference between the commercial hatcheries' quoted price and the Government's cost, we think the Government should at least explore the possibility of contracting with the commercial hatcheries.

Interior also stated that (1) commercial trout production facilities are not designed for steelhead production, (2) commercial hatcheries do not have experience in raising steelhead, (3) anadromous fish 1/ are considered public property and commercial producers would have to rely on the Federal Government for eggs, and (4) recent experience in contracting for non-anadromous trout has shown the commercial hatcheries' lack of interest in contracting and lack of capability to meet the terms of the contract. Interior also stated it had a study underway to explore the possibility of using commercial hatcheries on a contract basis.

We believe the concerns raised by Interior are either overstated or could be easily rectified. Dr. Busch, who has experience in raising both steelhead and rainbow trout at his company's facility, stated that there is little, if any, difference between the physical facilities needed for steelhead versus rainbow trout. Commercial hatcheries have not raised steelhead, but some of them

1/Fish such as salmon and steelhead trout that migrate up rivers from the ocean to breed in fresh water.

do have individuals on their staffs with experience in raising steelhead trout. We recognize that the Government would probably have to provide the eggs and that the price quoted to us by the commercial hatcheries was based on the Government's furnishing the eggs. The recent experience in contracting for non-anadromous trout involved a small amount of fish with no long-term commitments and may not be indicative of trout farmers' responses if larger quantities of fish and long-term contracts were involved.

APPRAISER'S INCOME APPROACH COMPUTATIONS

Existing capability:		
2,089,939' x \$0.15/#		\$313,491
Less:		
Management (nonproduction management @ 5%):		
\$313,491 x .05	\$ 15,675	
Taxes 1979 (62.4% of \$2,070).	1,706	
Land rental on excepted areas of lots 5, 9, & 10:		
8.27 Acres @ \$4,100/acre		
x 0.1225	<u>4,154</u>	
Total	-	<u>21,535</u>
Net income to existing capacity		291,956
Capitalized at 10%		\$2,919,560
Additional potential capacity:		
446,930# x \$0.15		67,040
Less:		
Management (nonproduction management @ 5%):		
\$67,040 x .05	3,352	
Taxes 1979 (17.6% of \$2,070)	<u>364</u>	
Total	-	<u>3,716</u>
Net income - potential capacity:		63,324
Capitalized at 10%	\$633,240	
Less costs to achieve additional potential:		
Additional excavation:		
12,000 cu.ft./pond x 5 ponds		
@ \$0.18/cu.ft.	\$ 10,800	
Dress and seal with bentonite @ \$500/Pond:		
5 Ponds x \$500/Pond	2,500	
Concrete dividers with foundation:		
35' x 4' x \$3.85/s.f. x 5 ponds:	524	
Additional reinforced concrete Tail Race:		
210' x \$38.80/l.f.	8,148	
Additional spring collection work:	<u>5,000</u>	
Total added costs to reach full capability:		26,972
Net value of additional potential after subtracting construction costs:		606,268
Discounted for 2 years at 10% in order to allow for industry adjustments for added capacity:		
\$606,268 x 0.82645 = (net value of potential)		<u>501,050</u>
INDICATED VALUE BY INCOME APPROACH:		3,420,610
Rounded to:		<u>\$3,421,000</u>

EFFECT OF KEY VARIABLES ON TROUT FARM VALUES

When a trout farm's value is determined by the income approach, primarily four variables affect its value: the pounds of fish produced per cfs of water, the amount of water being beneficially used, the profit per pound of fish sold, and the capitalization rate. An incorrect determination of any one of these variables can produce a value that is not a reasonable estimate of the property's fair market value.

The following two tables show what the appraised values would be using different estimates of the variables. (See p. 29 for income approach computation format.) A profit per pound of 15 cents is used in both tables because most people we talked to thought it was a good average figure, although the current profit per pound is about 10 cents.

Table 1

Indicated Values in Dollars
Using a 10-Percent Capitalization Rate

cfs of water	11,000 lbs/cfs (note a)	14,000 lbs/cfs (note b)	16,000 lbs/cfs (note c)	25,000 lbs/cfs (note d)	30,000 lbs/cfs (note e)
f/ 66	\$ 972,310	\$1,254,460	\$1,442,560	\$2,289,010	\$2,759,260
g/ 77	1,144,730	1,473,910	1,693,360	2,686,880	3,229,510
h/ 82	1,223,110	1,573,660	1,807,360	2,859,010	3,443,260
i/100	1,505,260	1,932,760	2,217,760	3,500,260	4,217,760

a/Idaho's average production rate for 1980 as reported by the U.S. Department of Agriculture.

b/High end of 10,000 to 14,000 range given to us by individuals knowledgeable in the trout farm industry.

c/Value used by Professor Harold Hagen, Colorado State University, to estimate the upper production limit.

d/Estimated achievable production given by the owner of Crystal Springs.

e/Estimated potential production rate given by David Bruhn, Fish and Wildlife Service.

f/Water flow measured at Crystal Springs on March 11, 1981, by Keith Anderson, consulting engineer.

g/Estimated average annual water flow as determined by Keith Anderson, consulting engineer.

h/Estimated average annual water flow used in the revised appraisal. Assumes modifications would be made to collection system.

i/Water flow used in the August 13, 1980, appraisal.

Table 2

Indicated Values in Dollars
Using a 15-Percent Capitalization Rate

<u>cfs</u> <u>of</u> <u>water</u>	<u>11,000</u> <u>lbs/cfs</u>	<u>14,000</u> <u>lbs/cfs</u>	<u>16,000</u> <u>lbs/cfs</u>	<u>25,000</u> <u>lbs/cfs</u>	<u>30,000</u> <u>lbs/cfs</u>
66	\$ 648,207	\$ 836,307	\$ 961,707	\$1,526,007	\$1,839,507
77	763,153	982,607	1,128,907	1,791,253	2,153,007
82	815,407	1,049,107	1,204,907	1,906,007	2,295,507
100	1,003,507	1,288,507	1,478,507	2,333,507	2,808,507

Note: See table 1 for explanation of values used for cfs of water and lbs/cfs.

The above tables show the wide range of values that can be produced depending on which estimates are used. As shown by the figures below, the range is even greater when the value produced by the lower estimates given to us is compared with the highest value in table 1. The wide range of values demonstrates the importance of the estimates being properly determined.

	<u>Lower</u>	<u>Higher</u>
cfs of water	66	100
Pounds of fish/cfs	11,000	30,000
Capitalization rate (percent)	25	10
Profit/pound	\$0.10	\$0.15
Indicated value	\$250,984	\$4,217,760

The values above were computed using the same basic format the Crystal Springs appraiser used but substituting the lower and higher values given us. The format the appraiser used is shown on page 29 using different variables as indicated.

Format for Income Approach ComputationsAssumptions

cfs available:	77	
pounds of fish/cfs:	16,000	
capitalization rate (percent):	15	
profit/pound:	\$0.15	
Annual production capacity:		
16,000 lbs/cfs x 77 =		<u>1,232,000</u> lbs
Gross profit: 1,232,000 lbs x \$0.15 =		\$184,800
Less: Management (nonproduction management) @5%		
\$184,800 x .05 =	\$9,240	
Taxes (1979)	2,070	
Land rental on excepted area		
8.27 acres @ \$4,100/acre x .1225 =	<u>4,154</u>	
Total		<u>15,464</u>
Net income before recapture		\$ <u><u>169,336</u></u>
Capitalized @ 15%		<u><u>\$1,128,907</u></u>

PRODUCTION FROM REUSE OF WATER

The appraiser's method for determining how many pounds of fish could be produced annually on the site if additional ponds were constructed was incorrect and resulted in the appraiser's production estimate being nearly twice the highest estimate given to us by others. The appraiser originally estimated that each time the water could be reused, the same production achieved on the existing ponds could be achieved on the subsequent ponds that would be built. Using this reasoning, the appraiser determined the potential production by multiplying the number of potential reuses (additional ponds) times the average production of the existing ponds. This error resulted in the appraiser originally estimating the site's potential production capability at 34,200 pounds of fish for each cubic foot per second (cfs) of water used for a total potential production of 3.42 million pounds.

However, fish biologists, consultants, trout farm operators, and other appraisers all stated that the water at the owner's facility could not be reused over and over and still produce the same quantity and quality of fish in each pond. Therefore, the appraiser's use of the multiplier effect was technically incorrect.

In the revised appraisal, the appraiser used a 10-percent factor to lower production on each reuse. The revised appraisal stated:

"To arrive at an expected production level for an 8-use site, we have consulted with Mr. Dave Bruhn of the U.S. Fish and Wildlife office in Hagerman, Idaho. He states that his experience shows a 10 percent reduction in production from each previous use, as multiple uses are incorporated.

"Based on his data, we constructed a projected production per pond factor. The following table sets forth the production factors and their cumulative values for each series of use from 1 through 12 uses; where "x" represents the production capacity in Pond #1."

POND No.	1	2	3	4	5	6	7	8	9	10	11	12
PRODUCTION RATIO	x	.9x	.81x	.73x	.66x	.59x	.53x	.48x	.43x	.39x	.35x	.31x
CUMULATIVE PRODUCTION	1x	1.9x	2.71x	3.44x	4.1x	4.69x	5.2x	5.7x	6.13x	6.52x	6.87x	7.18x

However, the fish biologists we consulted questioned the validity of the 10-percent figure and stated that the percent drop in production would increase each time the water was reused and would reach a point where additional reuse would be impractical. (See apps. V and VI.)

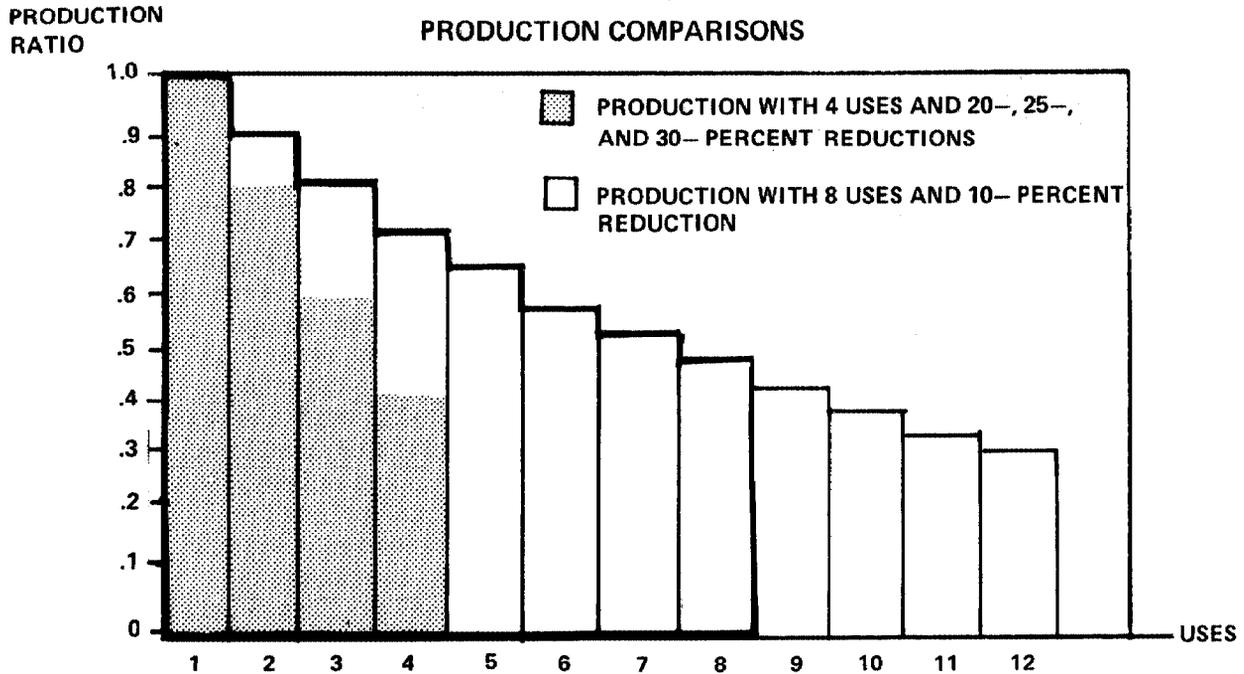
One biologist said that:

"The major limiting factors with regard to further water reuse being able to increase production are dissolved oxygen availability necessary for respiration and growth and cumulative unionized ammonia wastes reaching toxic levels. The Crystal Springs Ranch Hatchery has extremely limited fall and reaeration potential for maintaining favorable dissolved oxygen levels compared to most other hatcheries in the area due to the low elevation of its primary water supply. Toxic unionized ammonia levels are a problem for all hatcheries in the area because of the relative high temperature, alkaline pH, and low hardness of the water found in this region of the country."

He also said that these factors effectively limited the number of uses to four. He suggested that based on industry data, a more accurate estimate of production would produce the following table.

Pond no.	#1	#2	#3	#4
Percent drop in production	-	20	25	30
Production ratio	X	.8X	.6X	.42X
Cumulative production	1X	1.8X	2.4X	2.82X

The following chart graphically displays the difference in total production that occurs depending on whether the appraiser's or the biologist's table is used.



The area bounded by the dark heavy line represents the total production using the appraiser's table and assuming eight uses. The shaded area represents the total production using the fish biologist's table. As the chart demonstrates, vastly differing production figures will result depending on the assumptions used. This accounts, in part, for why the production estimates we received ranged from 11,000 to 30,000 lbs./cfs.



United States Department of the Interior

FISH AND WILDLIFE SERVICE

NATIONAL FISH HATCHERY
ROUTE 1, BOX 256
HAGERMAN, IDAHO 83332

March 16, 1981

Mr. Philip Olson
U. S. General Accounting Office
Room 6814
441 G Street N. W.
Washington, D. C. 20548

Dear Phil:

As per your request, I am providing a written summary of the material and information that resulted in my final assessment of the commercial rainbow trout capability of the Valley Trout Company Crystal Springs hatchery site.

Since my initial involvement, on February 23, with the Crystal Springs controversy I have learned a great deal about the local trout industry; and particularly about its production capabilities. It has been difficult to obtain objective information but through a process of analyzing numerous conversations and figures I believe my conclusion to be as fair and impartial as possible.

In assessing the maximum potential of any hatchery, or hatchery site, there are a number of key factors to consider; including, but not necessarily limited to, water quality, water temperature, number of water uses, fall (drop) between uses, feed quality, feeding method and management.

Attachment number one is a listing of several local commercial hatcheries wherein I attempted to compare their reported annual production, in terms of pounds of rainbow trout produced per CFS of water, with my assessment of how the aforementioned key factors affect their respective production.



Save Energy and You Serve America!

Page 2
Mr. Philip Olson
March 16, 1981

Attachment number two is a listing of the same hatcheries but based on a theoretical uniform eight uses of water, demand feeders and good management. All other factors remain the same as in Attachment number one. You will note that my estimate of pounds per CFS of water ranges from 18,300 to 30,000 and the Remarks column provides comment on these figures.

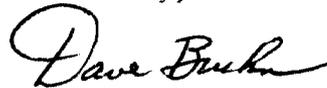
Regarding earthen rearing ponds versus concrete rearing raceways it has been my personal experience that earthen ponds are capable of producing more pounds of rainbow trout per CFS water flow than are concrete units. However, concrete is the favored unit due to simplified overall management.

The type of rearing program at a hatchery also determines the potential pounds produced per CFS of water available. Hatching and initial rearing of small fish produces less poundage as does production of replacement brood fish (development of sexual products as the fish mature reduces poundage gain). Rearing of trout between these two extremes is where the largest gain per CFS water flow is realized (roughly four inches to twelve inches in fish length).

In conclusion, I am aware that my position of producing 30,000 pounds of rainbow trout per CFS water flow is "raising eyebrows" but, until I am convinced otherwise, I will stick with it. I understand the problem you have experienced in obtaining unbiased data from neutral sources. It is unfortunate that there is no private, independent consulting firm (such as was used in the Crystal Springs water flow measurement) to study the subject of trout production capability and provide the government with reliable data.

I am hopeful that this information will be of benefit to you.

Sincerely,



David S. Bruhn
Hatchery Manager

DSB/bm

Attachments: 2

Attachment #1
Hatchery Comparison

HATCHERY	WATER QUALITY	WATER TEMPERATURE	NUMBER WATER USES	POND TYPE	FALL BETWEEN USES	FEED QUALITY	FEEDING METHOD	MANAGEMENT	ESTIMATED, OR REPORTED PRODUCTION (LBS./CFS WATER)
Rangen	<u>Excellent</u> 1st user	<u>Excellent</u> Constant 59°F	9	Concrete	Poor	Good	Demand Feeders	Good	20,300 reported and verified
Jones & Sandy	<u>Excellent</u> 1st user	<u>Excellent</u> Constant 59°F	Averages 7	Concrete	Excellent	Good	Mechanized Truck	Marginal	22,100 reported and verified
Le Moyne	Good-3rd user but distance between users adequate	<u>Fair to Good</u> Fluctuates from 48°F to 62°F	3	Concrete	Excellent	Good	Demand Feeders	Good	15,000 reported and record verified
35 McCollum	<u>Excellent</u> 1st user	<u>Excellent</u> Constant 59°F	9	Concrete & Earthen	Excellent	Good	Demand <u>Primarily</u> Some Hand Fed	Good	33,300 reported
Clear Springs (data partially from Feb. 23 letter to GAO; p. 5) Crystal Springs Model; footnote #3)	<u>Excellent</u> 1st user	<u>Excellent</u> Constant 59°F	Average 3	Concrete	Excellent	Good	Demand Feeders	Good	13,000 reported
Crystal Springs (Valley Trout)	<u>Excellent</u> 1st user	<u>Excellent</u> Constant 59°F	Average 5.5	Concrete & Earthen	Excellent	Good	Mechanized Truck	Good	22,700 reported

Attachment #2
Hatchery Comparison Based on Uniform 8 Water Uses, Good Management,
Demand Feeders; and All Other Factors Remaining the Same as Listed
In Attachment #1

HATCHERY	WATER QUALITY	WATER TEMPERATURE	POND TYPE	FALL BETWEEN USES	FEED QUALITY	ESTIMATED PRODUCTION (LBS./CFS WATER)	REMARKS
Rangen	<u>Excellent</u> 1st user	<u>Excellent</u> Constant 59°F	Concrete	Poor	Good	18,300	Poor fall between uses is a severely limiting factor.
Jones & Sandy	<u>Excellent</u> 1st user	<u>Excellent</u> Constant 59°F	Concrete	Excellent	Good	30,000	Demand feeders and good management accounts for increased capabilities.
LeMoyne	<u>Good</u> -3rd user but distance between users adequate	<u>Fair to Good</u> Fluctuates from 48°F to 62°F	Concrete	Excellent	Good	30,000	Fluctuating water temperature factor can be minimized through good management.
McCollum	<u>Excellent</u> 1st user	<u>Excellent</u> Constant 59°F	Concrete & Earthen	Excellent	Good	30,000	
Clear Springs	<u>Excellent</u> 1st user	<u>Excellent</u> Constant 59°F	Concrete	Excellent	Good	27,300	Calculated based on limited data available from Clear Springs letter of Feb. 23 to GAO. Base data utilized to derive projection was average 3 uses of water to produce 13,000 lbs./CFS water.
Crystal Springs	<u>Excellent</u> 1st user	<u>Excellent</u> Constant 59°F	Concrete & Earthen	Excellent	Good	30,000	Demand feeders and increased uses from 5.5 average to 8 accounts for increased capabilities.



Department of Fishery and Wildlife Biology



Colorado State University
Fort Collins, Colorado
80523

March 26, 1981

Mr. Philip A. Olson
Senior Evaluator
U.S. General Accounting Office
441 G Street NW
Room 6814
Washington, DC 20548

Dear Mr. Olson:

Your packet of data on the Crystal Springs Trout Hatchery in Idaho arrived on Monday and I have made an effort to give it an objective evaluation. Unfortunately the entire thesis used for a production estimate is based upon the opinion of Mr. Brehn of the Fish and Wildlife Service, and since there are no supporting data showing how or why he arrived at a figure of 10% reduction in production from each previous use, no validity can be attached to any of the production figures.

The very fact that he has used a linear progression where a curvilinear relationship would logically be involved, suggested to me that it is at best a guess. The subsequent development of theoretical production data becomes nothing more than an interesting exercise that arrives at a figure far above any that I know of anywhere in the world, and approximately 21% higher than the highest possible estimates for a trout facility as measured by U.S. Corps of Engineer's guidelines considering only one use of water. The expansion into as many as eight uses of water gives rise to a set of data that are not supported by any data and in fact are not believable.

I believe the following set of figures illustrates this point. They are derived from the data that you provided me.

Theoretical Production Capability Estimates for Pond Series 8 and/or Series 6 and 7

Pond uses	#8	#6 or 7	Pounds per cubic foot*	Theoretical oxygen reduction
1	55,658 lbs.	55,658	2.3	9.0 PPM**
2	50,092	50,092	2.1	8.1 "
3	45,082	45,082	1.9	7.3 "
4	40,575	40,575	1.7	6.6 "
5	36,517	36,517	1.4	5.9 "
6	32,865	32,865	1.3	5.4 "
7	29,579	29,579	1.2	4.8 "
8		26,621	1.1	4.3 "
	290,368 lbs.	316,989 lbs.		

*based on pond with 24,000 cu ft/water
**saturation at 3,000' and 59°F

Mr. Philip Olson
March 26, 1981
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Thus if we follow their linear relationship, the reduction in O^2 should follow the same line. Obviously it won't since the high loading will increase CO_2 , Ammonia, etc. to such an extent that the oxygen will decrease much more rapidly. But even if we allow this, you can see that theoretically the oxygen at the 6th use would drop to a critical level and the 7th and 8th use would theoretically not be possible.

Subtract then the estimated poundage for use 7 in raceway 8 and use 7 and 8 in raceway 6 and 7 or a total of 141,979 pounds. Also forget the additional production capability of most of the ponds suggested on the last page.

I have not even tried to calculate the difference in the concrete raceways since the figures are difficult to follow. It is stated for example, that some are 3' deep and some 2.5, but actual water depth is not indicated to give me the capacity as potential poundage of fish per cubic foot. At any rate, their use of the same poundage and set of factors as far as the ponds appears to be far too simplistic, and the production figures there need much clarification. I think that a serious technical error is involved here in making the assumption that there is no basic difference.

When you look at their figures for ponds 6 and 7, which are suggested to have 8 uses, they claim that 20.5 CFS of water in those two raceways gives a production of 30,950# per CFS, while in the concrete ponds the larger volume of water used only six times gives a production of only 25,466# per CFS, and in raceways 4 and 5 where the use is only now 4 times, they suggest 18,679# per CFS.

How do you interpret this? Does this mean that its the number of pond uses that determines production per CFS and not the quality of the water? Obviously this is not so but a case could be made for this until more data are provided and a more careful analysis is made to see how this illusion arises.

Another factor that is bothersome is the claim that 82 CFS of water is available on an average daily basis, although the data you submitted shows the figure to be no more than 77 CFS. Granted this is only a 5 CFS difference, but when a claim is made for 30,000 pounds or greater per CFS, this is a significant figure (150,000#).

You have asked that I make an estimate on the production based on information you provide, and from calculations used in other TPE evaluations. Of course I cannot do this since you have not presented me with factual data to use. I can guess, however, and I would guess, based on many years of practical experience with private, as well as government, facilities, that the annual production here would not likely be more than 1,232,000 pounds - using a 77 CFS x 16,000# per CFS figure.

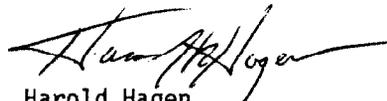
Mr. Philip Olson
March 26, 1981
Page 3

There is a very simple way to prove me wrong, and that is to provide the empirical data that is missing. Since this hatchery is reported to have been in production for 8 years, there must be production records available. I am surprised that these real production data were not the basis for negotiation.

Just think what we could do with this exercise if we ran this factor to its theoretical limit and ended up with another half dozen or more ponds (beyond the 12 calculated), or if we assumed a figure of 6,700 pounds at pond #1 as hinted at for the Sandy and Jones or LeMoyne ponds - or if we did both. Wow!! Theoretically, we could probably produce most of Idaho's present production at just one or two hatcheries.

Sorry I can't be of more help, but I find this too incredible to expand further.

Sincerely,



Harold Hagen
Professor Fishery Science

Rangen Research

A Division of Rangen Inc.

Route 1 Hagerman Idaho 83332 P.O. Box 264
Phone (208) 837-6192

March 30, 1981

Mr. Philip Olson
U.S. General Accounting Office
Room 6814
441 "G" Street, N.W.
Washington, D.C. 20548

Dear Mr. Olson:

I am writing in reply to your letter of 3/20/81, requesting my assistance in reviewing technical considerations used in establishing production levels of rainbow trout for the Crystal Springs Ranch Hatchery of Buhl, Idaho.

Simply stated in my opinion, an appraised total existing annual production capability of 2,089,939 pounds is a gross overstatement of any existing or real potential. The possible cause for this grossly inflated figure cannot be traced to any one single error in reasoning or calculation but rather, to the use of several inaccurate assumptions and multiplicative factors including 1) baseline figures which were "high graded" from a limited number of examples chosen from biased sources, 2) baseline figures which were not derived from comparable facilities in terms of size, design, or mode of operation, and 3) baseline figures which were applied without limitation, reservation, or qualification to the final calculation of production.

When I say that the baseline figures were "high graded", I mean that the appraiser chose to use only the singular best figures taken from a selected few incomparable facilities rather than mean or average values drawn from a variety of more comparable hatcheries in the area. In addition, he has not made clear whether or not his figures are based upon gross pounds recovered or net pounds gained, an important consideration when comparing small "farm pond" type operations with large production hatcheries such as Crystal Springs Ranch.

To further substantiate this point, I have tabulated the following documented information from several comparable operations in the area for illustrative and comparative purposes.

3/30/81 P. Olson

page 2

Table I

Hatchery	Avg. annual flow in CFS	Avg. number of reuses	Avg. annual prod. in net live wght. in pounds	Avg. annual prod. in net pounds/CFS
Rangen	40	6.4	532,712	13,473
Clear Springs	1 325	3.0	4,217,000	12,975
	2 240	3.0	3,482,000	14,508
	3 210	1.0	807,660	3,846
Snake River	105	3.0	1,000,000	9,524
Blue Lakes	1a 25	8.0	131,129	5,245
	1b 14	6.0	91,056	5,055
	2 4	2.0	26,964	6,741
	3 12	3.0	64,760	5,397
	4 323	2.1	4,000,000	12,384
	5 10	6.0	127,854	12,785
	6 8	2.0	22,891	2,861
7 15	9.0	169,639	11,309	
Avg. 12 Hatcheries	1331 CFS total flow	2.78	14,673,965 total net live wght. prod.	11,025

To further document and independently substantiate these figures, Klontz and King (1975), in their published report on "Aquaculture in Idaho and Nationwide", reported the total live weight production of rainbow trout in Idaho in 1974 as 22,310,000 lbs produced on an average annual flow of 2,397 CFS water for a comparable production rate of 9,308 lbs/CFS. In the USDA's recently published "Aquaculture: Catfish and Trout, inventory and sales 1980", it is indicated that Idaho produced approximately 42,466,286 live weight pounds of rainbow trout in 1980 on 3,884 CFS average annual flow of spring water for a production rate of 10,934 lbs/CFS.

Considering that the Crystal Springs Ranch Hatchery is not recognized to be one of the more efficient and productive facilities in Idaho due to obvious constraints in design, construction, and operation, by applying the USDA average figure of 10,934 lbs/CFS production to the 82 CFS flow attributed to the hatchery, I would estimate its present commercial production potential at no more than 896,588 net pounds live weight annually.

In the calculation of existing and potential productions for the Crystal Springs Ranch facility, the appraiser has shown that he is evidently not experienced and knowledgeable about commercial trout culture. This is amply demonstrated by the fact that he applied methods, obviously of his own design, that are impractical and unconventional. In doing so he has made several critical assumptions without providing sufficient data to establish their validity and had proceeded to multiply his projections out in order to fit the design of the existing facility without regard for obvious limitations, qualifications, or reservations. However, I will try to follow through his

3/30/81 P. Olson

page 3

methods and calculations to point out the cumulative source of error resulting in the significant difference between his final appraisal and my own.

First of all, the appraiser begins by assuming an average annual production of 5,432 lbs live weight produced per CFS flow of first use (Pond #1) water. Our own figures show that a figure of approximately 4,760 lbs live weight produced per CFS flow of first use (Pond #1) water to more accurately reflect the average for the industry. The next assumption made in the appraisal is that production decreases only 10% with each serial reuse in a linear fashion without limit. Our figures show that loss in production decreases in logarithmic or exponential fashion with each serial reuse and is effectively limited to a practical maximum of about four serial reuses, due to inherent factors of water chemistry and temperature found in this area of the country. In this regard, I have generated the appraiser's table with more accurate figures drawn from the industry and completed his computation for a more accurate estimate of production.

Table II

Pond No.	#1	#2	#3	#4
Production Ratio	X	.8X	.6X	.42X
Cumulative Production	1X	1.8X	2.4X	2.82X

Therefore: 4,760 lbs/CFS x 2.82 x 82 CFS = 1,100,702 lbs est. annual production.

The above estimate generated by the appraiser's method with our revised figures is 8% greater than my earlier estimate of 896,588 lbs due to the fact that the larger figure is based upon some of the more modern and efficient operations in Idaho and is assuming sustained production at 100% of theoretical capacity, while the smaller figure is based upon a overall average of actual production in the state. Given the inherent constraints in design and mode of operation for the Crystal Springs Ranch Hatchery, I would still go with the lower 896,588 lbs as being the most accurate estimate of actual production.

The single largest error in the appraisal provided is the assumption that the water can be reused indefinitely without limitation or restriction. Given the chemistry and ambient temperature of the water supply for the Crystal Springs Ranch Hatchery and other comparable commercial production facilities in Southern Idaho, the maximum serial reuse of water is approximately four times. Indeed, some individual hatcheries in the area do use water more often but are only able to do so by decreasing their loading densities throughout the series and recombining water for more rapid turnover times in lower ponds. In the end, they have achieved no greater total production per CFS than other stations with fewer serial reuses. This fact is amply demonstrated by 1) an average reuse rate in the area hatcheries of 2.78 times, as shown in

3/30/81 P. Olson

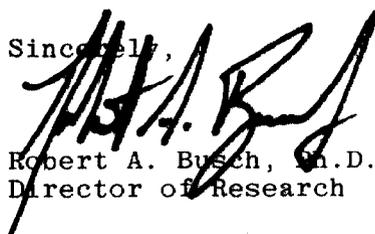
page 4

Table I., and the fact that the Crystal Springs Ranch Hatchery owners have not availed themselves of the opportunity to bring additional lower reuse ponds into production during the past several years while at the same time developing additional new water supplies with limited reuse design hatcheries. It should also be noted that the three operations cited for comparative purposes in the original appraisal have significantly fewer average reuses and a much greater fall between ponds than the Crystal Springs Ranch facility.

The major limiting factors with regard to further water reuse being able to increase production are dissolved oxygen availability necessary for respiration and growth and cumulative unionized ammonia wastes reaching toxic levels. The Crystal Springs Ranch Hatchery has extremely limited fall and reaeration potential for maintaining favorable dissolved oxygen levels compared to most other hatcheries in the area due to the low elevation of its primary water supply. Toxic unionized ammonia levels are a problem for all hatcheries in the area because of the relative high temperature, alkaline pH, and low hardness of the water found in this region of the country.

In summary, it is extremely difficult to establish an estimate of production for any particular hatchery operation because such a great multiplicity of factors need to be considered. However, I have tried to make a reasonable estimate for the Crystal Springs Ranch operation based upon my knowledge and understanding of the situation and documented figures available on averages taken from the industry. I hope that you find this information useful in your evaluation. If you should have any questions with regard to its interpretation or application, please feel free to contact me.

Sincerely,



Robert A. Busch, Ph.D.
Director of Research

RAB:tm

R

GOVERNMENT VERSUS COMMERCIAL COSTSTO PRODUCE STEELHEAD

To annually produce 291,500 pounds of steelhead trout, the Corps of Engineers acquired the Crystal Springs Ranch fish hatchery for \$3.4 million. However, the Corps does not plan to use the existing ponds or structures at the facility, and it plans capital improvements that will cost about \$9.4 million for a total capital investment of \$12.8 million.

Commercial trout farm operators have expressed an interest in raising steelhead trout for mitigation purposes. In determining whether the Government should contract for steelhead, one of the considerations would be the comparative costs. Therefore, we estimated the Government's cost to produce steelhead at Crystal Springs and compared this cost with the amount commercial operators said they would be willing to sell to the Government for.

The commercial operators we talked with generally indicated they would be willing to sell steelhead trout to the Government for about \$1 a pound. As the following schedule on p. 45 shows, we estimated the Government's cost of producing steelhead to be about \$6 a pound.

ESTIMATED COST OF STEELHEAD PRODUCTION AT THE
GOVERNMENT'S PROPOSED CRYSTAL SPRINGS RANCH FISH HATCHERY

Capital costs:

Cost of Crystal Springs Fish Hatchery	\$ 3,400,000
Cost of improvements planned by Corps	<u>9,400,000</u>
Total Federal Government investment	\$12,800,000
Cost of capital--12 percent (note a)	X <u>.12</u>
Annual investment cost	\$ <u>1,536,000</u>
Annual production per Corps	<u>291,500</u> lbs.
Investment cost per pound	\$ 5.27 (\$1,536,000 ÷ 291,500 lbs.)
Cost of production per pound (note b)	<u>.63</u>
Cost per pound of Government-produced steelhead (note c)	\$ <u>5.90</u>
Selling price per pound of steelhead by commercial sources	\$ 1.00
Government's investment cost per pound @ 12% (note a)	<u>.12</u>
Total cost per pound for Government to purchase steelhead	\$ <u>1.12</u>

a/This is the approximate current return being paid on 30-year U.S. Treasury bonds.

b/According to Clear Springs Trout Company officials, the projected costs for the trout farm industry to raise one pound of steelhead trout if the Government furnished the eggs are as follows:

Vaccines	\$0.025
Medication	0.005
Feed	0.340
Labor	0.090
Overhead	<u>0.170</u>
Total	<u>\$0.630</u>

c/This cost does not include depreciation expense, which would make the cost even higher.

To further substantiate the Government's cost to produce steelhead trout, we obtained data on other Government hatchery facilities. As the following schedule shows, the \$6 a pound figure appears to be a reasonable estimate of the Government's cost. This cost is substantially above the cost commercial trout farm operators would be willing to sell steelhead for.

Estimated Cost of Steelhead Production at Other
Lower Snake River Compensation Plan Facilities

<u>Facility</u>	<u>Estimated steelhead production</u> (pounds)	<u>Estimated Federal investment</u> ----- (millions) -----	<u>Annual investment cost (note a)</u>
Hagerman National Hatchery	340,000	\$ 8.5	\$1.0
Clearwater	350,000	15.0	1.8
Oregon	280,000	14.8	1.8
Lyons Ferry	<u>116,000</u>	<u>11.3</u>	<u>1.4</u>
Total	<u>1,086,000</u>	<u>\$49.6</u>	<u>\$6.0</u>

a/This is 12 percent of the Federal investment. Twelve percent is the approximate current return being paid on 30-year U.S. Treasury bonds.

Investment cost per pound:

$$\frac{\$6,000,000}{1,086,000} = \$5.52$$

Total cost per pound of Government-produced steelhead:

$$\$5.52 \text{ investment cost} + \$0.63 \text{ production cost} = \$6.15$$



DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
WASHINGTON, D.C. 20310

JUL 6 1981

Mr. Henry Eschwege
Director, Community and
Economic Development Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Eschwege:

This is in reply to your letter of May 21, 1981, to the Secretary of Defense regarding your Draft Report on "Corps of Engineers Acquisition of Crystal Springs Ranch Fish Hatchery - A Costly Lesson," GAO Code 140110, OSD Case #5716.

We feel that the Corps of Engineers acted in good faith, followed the dictates of Congress and fully substantiated its actions. Further, we object to the titling of the report "A Costly Lesson." The Corps' actions are supported by the best data available, whereas your report reflects a cursory appraisal upon which the conclusions rely, in part, on opinions made by competitors in the "food-fish" industry. The balance of this response consists of a brief synopsis of the acquisition history of this Hatchery, comments on your recommendations and an enclosure with additional comments.

[GAO COMMENT: We disagree. The Corps' action is not supported by the best data available. In the original and revised appraisals, the comparative production data on other hatcheries consisted of verbal information from an extremely limited number of sources which was not verified by an examination of actual production records. Our comments on the appraisal are included in appendix X in response to comments received from the appraiser.

Our report is not a cursory appraisal. We do not consider our work to be an appraisal, but we do believe that our work has produced a range of values that more accurately reflects the value of the property than does the appraisal. Based on our analysis of the information obtained, we found that the appraisal contained serious defects in the method used to estimate production and in the supporting data. We substituted what we believe is better, more complete, and more accurate information into the appraiser's format and derived an estimated range of values.

[GAO NOTE: Page references have been changed to correspond to the final version of the report.]

Our conclusions are based on opinions from both sides of the controversy, including competitors, as well as qualified individuals who were not competitors. Those who disagreed with the sales price were not only competitors, but also other appraisers and knowledgeable individuals. It is our understanding that the appraiser and Corps officials did not obtain opinions at the time the appraisal was revised from those who disagreed with the sales price even though they represented a major part of the industry.]

The Corps of Engineers obtained an independent contract appraisal of the Crystal Springs Ranch Fish Hatchery and followed their usual appraisal review procedure. The appraisal was reviewed and recommended at the District and Division levels and then was approved by the Chief Appraiser of the Office of the Chief of Engineers. Following your preliminary report, the appraisal was again reviewed and the Chiefs of the Acquisition and Appraisal Divisions for the Corps traveled to Idaho to meet with the contract appraisers, representatives of the U.S. Fish and Wildlife Service, and representatives of the State of Idaho. Following this meeting, the State obtained an independent evaluation of the water flow rate into the Crystal Springs Hatchery, and the U.S. Fish and Wildlife Hatchery expert evaluated the production capabilities of the existing and potential ponds. The contract appraiser was then requested to revise his appraisal report to reflect the two additional sets of data presented by the experts. The revised appraisal report was submitted in the amount of \$3,400,000, a reduction of \$995,000, compared with the original appraisal. This report was recommended for approval by the District and Division appraisers, and approved by the Corps' Chief Appraiser. Following additional negotiations with the property owner, the Hatchery was purchased for \$3,425,000.

[GAO COMMENT: Even after those who are knowledgeable about trout farming in the area had objected to the price to be paid for Crystal Springs Ranch and after we had briefed Corps officials on our findings, there was no attempt by the appraiser or Corps officials to contact those who objected to the price so that their opinions could be considered. We believe the Corps' Chiefs of the Acquisition and Appraisal Divisions should have contacted these people during their visit to Idaho.

The Fish and Wildlife Service "expert" is not an expert in commercial trout production and he did not perform a technical evaluation of the facility. The Fish and Wildlife Service official based his opinion on the same information given to the appraiser by the owner of Crystal Springs.

This substantial change in the valuation amount from the original to the revised appraisal is an admission by the appraiser and the Corps that the original appraisal was incorrect. In addition, the appraisal report contained additional errors besides those we

mentioned in the body of this report. For example, the appraiser omitted three entire raceways when estimating total production and as a result improperly allocated water among the remaining raceways. Correction of these errors would not have materially affected the appraiser's valuation. However, the appraisal report should not have been approved by the Corps' District, Division, or Chief Appraiser until the errors were corrected.]

The first recommendation that the Secretary of the Army direct the Corps to obtain a technical evaluation and to support the capitalization rates is concurred in. However, no further action is required because this was done in this particular case and is the current policy of the Corps in each case where comparable sales are lacking in the appraisal process.

[GAO COMMENT: We disagree that a technical evaluation was conducted on the production capability of Crystal Springs. The Fish and Wildlife official, on whose estimate the revised appraisal was based, never claimed that his estimate was derived from a technical evaluation.]

We do not concur with the second recommendation that the Secretary of the Army direct the Corps to contact commercial hatchery owners to determine the cost for providing the same quality of steelhead fish by contract. Consideration beyond the preliminary planning stages was not given to fish rearing by contract because commercial hatcheries are not experienced in raising this type of anadromous fish, there is not time for them to gain experience because of the precarious nature of the Lower Snake River steelhead runs, and failure to perform under terms of the contracts is not amenable to correction through normal contract remedies when a fragile natural resource is at stake. The Corps was informed that both the Idaho Department of Fish and Game and the U.S. Fish and Wildlife Service considered it imperative that the fish rearing be done in a hatchery operated by an experienced public agency.

[GAO COMMENT: We disagree that there is not enough time for the commercial hatcheries to learn to raise steelhead. Some commercial hatcheries already have individuals on their staffs who have previously worked for public fish hatcheries and have experience in raising steelhead. One of the fish hatcheries in the area has raised steelhead trout in connection with its development of feed for steelhead. The potential for fish losses is always a risk whether public or private hatcheries are involved. Furthermore, unless the Corps contracts for a portion of the steelhead trout with the commercial hatcheries, the commercial hatcheries will never get the experience to compete with the public hatcheries.]

The third recommendation that the Secretary of the Army direct the Corps to develop and submit to the Congress proposed legislation which would give the Corps authority

to contract with commercial fish hatcheries for steelhead trout is not concurred in because of the need for operation of these specialized facilities by an experienced public agency as described above.

[GAO COMMENT: If it is feasible for commercial hatcheries to supply steelhead, we believe the Corps should promptly propose such legislation through proper channels. Without this legislation, the Federal Government will not be able to take advantage of the enormous potential savings which are available if, and when, it decides to use commercial hatcheries.]

Sincerely,

William R. Gianelli

William R. Gianelli
Assistant Secretary of the Army
(Civil Works)

Enclosure

ADDITIONAL COMMENTS ON GAO DRAFT REPORT
"CORPS OF ENGINEERS ACQUISITION OF CRYSTAL SPRINGS RANCH
FISH HATCHERY - A COSTLY LESSON"

Since the digest is a summary of the report, the following report comments are applicable to the digest.

Page 4: The Corps objects to your statement that "the property's value would be \$1 million." The \$1 million is based on calculations made by GAO auditors and is not supported by a factual real estate appraisal of the value of the property.

[GAO COMMENT: We stated that the property's value would be around \$1 million. As previously stated, we do not consider our work to be an appraisal but rather an estimate developed by using better information than used by the appraiser.]

Page 6: It is indicated that a technical evaluation of the facility was not made. Although the Corps already had what was considered adequate support for the appraiser's projected production potential, following your initial investigation, the Corps obtained additional data on which the final appraisal estimate was based. Reference is made to your Appendix IV, page 33, for this data from the Fish and Wildlife Service technical expert.

[GAO COMMENT: As previously stated, we do not consider the Fish and Wildlife Service official to be an expert in commercial trout production, and we believe the additional data was too limited in nature.]

Pages 6 and 7: It is indicated that the contract appraisers hired by the Corps did not meet their responsibilities in that they were unable to verify production records both for the subject property and the comparable properties used. Production in 1980 was limited to the contract Crystal Springs had with another hatchery. This contract and the actual 1980 production records were available and were examined by the appraiser. However, the Corps contract appraiser did examine the hatchery site and the water flow rate, i.e., cubic feet per second, that was available to Crystal Springs Hatchery. The record of past production certainly is a factor to be considered; however, another factor is the potential for maximum production of fish, which is based upon the operation of the Hatchery, the amount of fish that can be reasonably produced, the physical layout, and the available water flow rate. As with all appraisals, the concept of highest and best use was considered. The highest and best use of Crystal Springs Hatchery was for a fish farm. The availability of water and its quality are the critical factors in this determination.

[GAO COMMENT: At no time has the appraiser asserted that he actually examined production data, but rather he relied on a verbal estimate and later on a 1-page summary of monthly production figures for 1980 supplied by the owner of Crystal Springs Ranch. In addition, the owner's production was not limited by the contract. According to the contract, the owner could sell for stocking and canning purposes any amount of trout in excess of what the processor would buy.]

We agree that the highest and best use of the property is for a fish farm and that maximum potential production should be considered. However, we disagree with the amount of potential undeveloped production capability at the site and believe that the economic justification for developing the potential production capability in the immediate future is too uncertain and therefore it has little, if any, value.]

Page 8: It is stated that the contract appraiser's two contacts with the Fish and Wildlife Service official indicated that the production was about 18,000 lbs/cfs. It is then implied that the Fish and Wildlife Service official's estimate was changed after meeting with Corps officials. That meeting, which also included his superiors and representatives from the State of Idaho, was held to verify or substantiate the water flow rate and to tie down realistic production capabilities to be furnished the appraiser. The Fish and Wildlife expert's opinion as to production capabilities was submitted after the flow rate was authenticated and after the expert had the opportunity to inspect the subject property and comparable operations. The additional information the expert obtained was the same information used in the appraisal report. The appraiser relied on the Fish and Wildlife expert's opinion of production capabilities.

[GAO COMMENT: The two contacts with the Fish and Wildlife Service official were by us and not the appraiser. In fact, the official was not contacted by the appraiser or the Corps until after we had contacted him. The 18,000 lbs./cfs estimate was twice given to us after he toured the facility with us. The additional information the Fish and Wildlife Service official obtained is the same information relied on by the appraiser and which we believe was inadequate and too limited. As previously pointed out, we do not believe the official to be an expert in commercial trout production. Also, we do not believe the official adequately justified in his letter to us (see app. IV) going from 18,000 to 30,000 lbs./cfs, a 67-percent increase from what he originally told us.]

Bottom of page 8 and page 9: The report indicated that the subject property has poor aeration. This is not factual. Examination of the property by the Fish and Wildlife expert, the appraisers, and the Corps officials, revealed excellent aeration in the Crystal Springs Hatchery.

[GAO COMMENT: Crystal Springs Ranch does not have good aeration. Neither the owner nor the Fish and Wildlife Service official on his initial visit with us found the aeration to be excellent. Even the appraiser states in the original appraisal report that the slope is shallow and that reuse is somewhat reduced by the limited drop with no more than 1-foot drop on the first four tiers. In two raceways with more than four tiers or ponds, the remaining ponds do have somewhat better drop between ponds but these ponds constitute only a small part of the present facility. According to trout farm operators and fish biologists we talked to, an excellent drop would be 24 to 48 inches. When we visited the facility, the owner, himself, even mentioned that the Government might want to raise the height of the water coming into the facility so better aeration could occur.]

Pages 9 through 11: GAO accuses the contract appraiser of using "unconventional methodology" in developing his production estimate. The appraiser used the production capabilities as expressed by the Fish and Wildlife Service expert, reducing the production capability of each additional water reuse by 10%, so that by the eighth reuse, production capability was only 48% of the first use. The appraiser estimated the capacity by using this formula on the existing ponds and on the potential use of added ponds. The formulas as used, less cost to achieve the additional production, is logical, practical and, in fact, reflects the present and potential use. Examination of the facility by the appraisers, the Corps' review appraisers, and the Fish and Wildlife expert, revealed adequate proof of the eight reuses of water and the capacity and potential of the Crystal Springs Ranch Fish Hatchery.

[GAO COMMENT: According to fish biologists the method used by the appraiser has never been used by others. The 10-percent drop in production between ponds without a limit on the number of times it can be reused is considered by them to be an oversimplification. An increasing drop in production from each previous pond with a limit on the number of times the water can be reused is considered to be more realistic. Also, each time water flows through a pond does not necessarily mean a reuse has occurred--taking an existing pond and dividing it in half does not create two uses where there used to be one nor does it necessarily increase production. The appraiser simply counted ponds as reuses without consideration for differences in pond size or other factors.

Adequate proof is not observation of fish in all eight ponds. Adjusting loading in the ponds will make it possible to raise fish in all eight ponds but does not mean more fish are being raised than if the earlier ponds were loaded to the maximum with no fish in the latter ponds.]

Pages 11 through 13: GAO asserts that the capitalization rate was too low. The Corps felt that the 10% capitalization rate was reflective of the actual conditions in the fish industry at the time of the appraisal. In fact, the appraisers relate the capitalization rate to existing conditions in the fish industry. To go further, the Corps

could equate the fish production as an agricultural industry producing an agricultural return of a product - table fish. Thousands of sales of agricultural land indicate capitalization rates as low as 1% return on investment. In the Corps' opinion, the 10% capitalization rate used by the appraiser, considering the fish industry, in relation to other risk industries and/or agricultural pursuits, was adequately supported and acceptable.

[GAO COMMENT: We disagree that the capitalization rate was adequately supported and acceptable. The relationship of aquacultural to agricultural land has not been demonstrated but is assumed to exist by the appraiser. Furthermore, the capitalization rate should reflect the rate potential buyers would expect the income to have in relation to their investment in a fish hatchery. The majority of persons we talked to told us they would want a 15-percent return or above. Based on our discussions and review of what the appraiser uses as support, we believe the preponderance of evidence supports a higher capitalization rate than used by the appraiser.]

Pages 14 and 15: GAO questions the selection of the appraisal firm by the Corps. The firm, the Idaho Land and Appraisal Service Company, was selected as being the best qualified firm in the area, with extensive experience in both income and agricultural appraisals. It is the Corps' policy to obtain in most circumstances one appraisal, unless the proposed acquisition is controversial. The controversy, as mentioned by GAO, did not occur until after the appraisal had been made and the purchase had been agreed upon.

[GAO COMMENT: We did not question the selection of the appraiser but the failure of the Corps to obtain a technical evaluation or a second appraisal after we brought our concerns to their attention. Although the controversy may not have surfaced until after the Corps had agreed to a specific purchase price, the Corps should have recognized the potential inaccuracy of the appraisal before it became controversial because of the difficulty the appraiser experienced in trying to obtain adequate information from trout farm operators.

While it may be the Corps' policy to obtain only one appraisal unless the proposed acquisition is controversial, its procedures call for two appraisals in cases involving precedent-setting patterns of value. Crystal Springs is the first private hatchery purchased and would fall into this category.]



United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

JUN 30 1981

Mr. Henry Eschwege
Director, Community and
Economic Development Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Eschwege:

We have reviewed your proposed report to the Chairman, House Committee on Public Works and Transportation, entitled "Corps of Engineers Acquisition of Crystal Springs Ranch Fish Hatchery--A Costly Lesson." Our comments address your findings with respect to comparative costs of public and private steelhead trout production. Since the Corps of Engineers also received the proposed report for review, we will defer to them to discuss the economics of the acquisition of the Crystal Springs Ranch Fish Hatchery.

Your assertion that the "federal cost to produce steelhead exceeds private costs", in our opinion, is inaccurate. The Government's production cost, as developed in Appendix VII to your report, includes both capital investment and production costs. The FOB cost to the Government of fish from commercial sources only reflects variable production costs (labor, fish food, medication, overhead) plus profit. In order for your analysis to be comparable, the initial capital investment for land and improvements should also be included in the estimates of production costs in the private sector.

[GAO COMMENT: Our figures for the private and Government costs are comparable. We do not agree that in order for our analysis to be comparable, the initial capital investment for land and improvements should also be included in the estimates of production costs in the private sector. The \$1/lb. is the price the commercial hatcheries said they are willing to sell steelhead to the Government. Because this is their selling price, it is immaterial how the price was derived. Obviously, the private sector has included in the selling price of \$1/lb. whatever costs it wants to recover for land and improvements.]

We are concerned that the analysis from which your comments and recommendations are derived is based on a double standard. Substantial effort was expended to check out the basis for the Corps' real estate appraisal for the purchase of the hatchery. On the other hand, it appears that the statements of an unspecified number of commercial rainbow trout producers that they can sell steelhead, which they currently do not produce, for \$1.00/pound under long-term contract have been accepted uncritically.

[GAO COMMENT: Our analysis is not based on a double standard. We did not verify the \$1/lb. figure. We are not saying the \$1/lb. figure is accurate but that, with such a large difference between the commercial hatcheries' proposed price and the Government's costs, the Government should consider the possibility of contracting with commercial hatcheries. In addition, Clear Springs Trout Company went on record in writing that it is interested in raising steelhead trout for \$1/lb. The people we talked to said that this does represent a reasonable price at which the Government can obtain steelhead.]

To assist in fully evaluating the issue of the comparative cost of private versus Corps development and operation of Crystal Springs Ranch Fish Hatchery, we make the following observations based on our extensive knowledge of this field:

- ° We estimate the variable costs to the Federal Government to produce and distribute steelhead from the Crystal Springs facility would be about \$1.13 per pound versus approximately \$2.04 per pound from a commercial hatchery. Refer to Enclosures 1 and 2.

[GAO COMMENT: This comparison is not valid because the commercial hatcheries' selling price is the cost to the Government as previously mentioned, and it would include whatever capital costs they wanted to include in the \$1/lb. price. To make the comparison valid, the Government's capital costs would need to be added to its variable costs of \$1.13/lb. If our estimated capital cost for Crystal Springs of \$5.90 is used, the total Government cost would be \$7.03/lb.]

- ° The majority of commercial trout production facilities are neither designed nor very efficient for steelhead culture. Commercial operators might well have to make major improvements, perhaps similar to those proposed for the Crystal Springs Ranch Fish Hatchery, before entering into any long-term contractual agreement to produce steelhead for the Government. If so, development needs and costs would be expected to be somewhat comparable to those estimated by the Corps.

[GAO COMMENT: We question the validity of these statements. Dr. Busch, who has experience in raising both steelhead and rainbow trout at his company's facility, stated that there is little, if any, difference between the physical facilities needed for steelhead versus rainbow trout. In fact, the first commercial hatchery the Corps tried to buy was considered adequate to produce steelhead with only minor changes needed.]

- ° The commercial production costs cited in the draft report reflect intensive trout culture, not steelhead culture. Very few, if any, commercial fish hatcheries in Idaho have experience producing steelhead. In a somewhat analogous situation, however, the variable costs of producing fall chinook are more than 50 percent higher at a private operation than at a comparable national fish hatchery. Further, the return of fish to the private hatchery appears to be significantly lower than the return to comparable Federal hatcheries although a full assessment to verify this conclusion has not been completed.

Should this latter circumstance exist for steelhead, it means that additional fish would have to be purchased to achieve the same level of returning fish.

[GAO COMMENT: The commercial production costs cited in the report are for steelhead trout. Steelhead trout have been raised in a private hatchery. In addition, some commercial operations have individuals on their staffs who have experience in raising anadromous fish. Raising fall chinook salmon is not an analogous situation because fall chinook salmon are one of the most difficult fish to raise and are not comparable to steelhead trout. Coho salmon, which are less difficult to raise than fall chinook salmon, are currently being produced in substantial numbers at commercial hatcheries. Also, the cited example has not been verified and its applicability to steelhead trout is speculative.]

- ° Anadromous fish are considered public (i.e., State) property in most States. It would be necessary to change basic laws to permit commercial hatcheries to obtain eggs and rear smolts for production. Hence, commercial producers would probably have to depend on the Federal Government for eggs necessary for steelhead production. Any cost estimates must be adjusted accordingly.

[GAO COMMENT: We recognize the Government would probably have to provide the eggs and the commercial hatcheries' price of \$1/lb. was based on the Government furnishing the eggs. The Government will incur the cost of the eggs whether it raises the fish or contracts with commercial hatcheries. Therefore, for comparative purposes, we did not include the cost of eggs in either the Government's or commercial hatcheries' cost figures.]

- ° Finally, the Service has some recent experience in contracting for non-anadromous trout. At a contract price comparable to Service costs, the contractor has not been able to fulfill his contractual obligations and is attempting to purchase fish from other private hatcheries that meet the survivability stipulations to which he agreed. Also, although 50 private producers were asked to bid on this contract, only two bids were received which may suggest substantial reluctance to produce for such a specialized market.

[GAO COMMENT: According to one trout farm official, the contract was for a small amount of fish with no guarantees of future contracts and, therefore, many commercial operations may not have been interested in it. Also, the contract was for a given size of fish to be delivered at a given time and the contract allows the contractor to obtain fish from other sources because of the inherent difficulty in meeting the size and time requirements.]

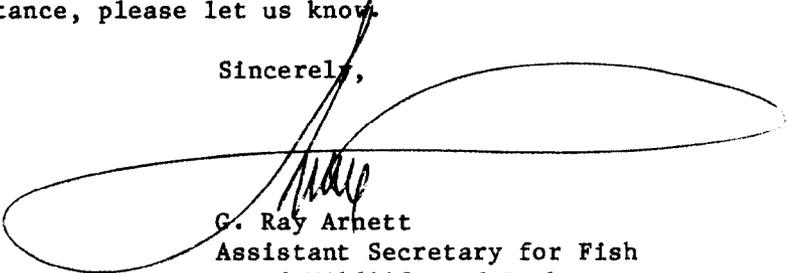
We believe that the question you have raised on comparative fish production costs is far more complex than the treatment in your report would suggest. A study is presently being performed in-house by the Fish and Wildlife Service to determine costs of alternative sources of fish for Service management purposes (which, by extension, would also pertain to mitigation responsibilities of the Corps). The initial phase of this study will be

completed late in FY 1981. It will cover all major groupings of fish (warmwater, coldwater, and anadromous), and include both State and private hatcheries as potential alternative sources of fish for established management purposes and the relevant quality (as health, survivability) and reliability-of-supply factors. The results of this study coupled with subsequent market testing, if appropriate, should help determine whether your recommendations on contracting for fish production are a feasible alternative to hatchery construction by the Corps.

[GAO COMMENT: We recommend a study of this type. Commercial hatcheries should be contacted as part of the study to obtain their input on what capability they have, their interest in contracting with the Government, and the price for raising various quantities of steelhead over a given period of time.]

Thank you for providing us an opportunity to comment on this report. If we can be of further assistance, please let us know.

Sincerely,



G. Ray Arnett
Assistant Secretary for Fish
and Wildlife and Parks

Enclosures

Enclosure No. 1

Estimated Federal Operations Cost
for Crystal Springs Ranch Fish Hatchery* - Cost Summary

Production Capacity - 291,500 lbs. Steelhead Smolts

Fish Rearing

Labor	\$ 87,450
Non-labor	58,300

Fish Rearing (Custodial maintenance)

Labor	5,830
Non-labor	7,288

Fish Distribution

Labor	14,575
Non-labor	32,065

Fish Distribution (Custodial maintenance)

Labor	8,745
Non-labor	5,830

Fish Feed	109,312
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<u>Total Cost</u>	<u>\$329,395</u>
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Cost/lb.	<u>\$1.13</u>
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*Note: Based on the operations cost for steelhead production--Hagerman NFH, Idaho. Excludes support services and non-routine maintenance.

Estimated Federal Operations Cost
for Crystal Springs Ranch Fish Hatchery - Cost Definitions

Fish Rearing

Labor - \$.30/lb. Includes all labor costs associated with broodstock operations, egg incubation, fish health, and fish culture. Excludes custodial maintenance.

Non-labor - \$.20/lb. Includes all non-labor costs (utilities, supplies, gas, oil, chemicals, etc.) associated with broodstock operations, egg incubation, fish health, and fish culture. Excludes cost of fish feed and custodial maintenance.

Fish Rearing (Custodial maintenance)

Labor - \$.02/lb. Includes all labor costs for custodial maintenance related to broodstock, egg incubation, fish health, and fish cultural operations.

Non-labor - \$.025/lb. Includes all non-labor costs for custodial maintenance related to broodstock, egg incubation, fish health, and fish cultural operations.

Fish Distribution

Labor - \$.05/lb. Includes all labor costs associated with fish distribution. Excludes custodial maintenance.

Non-labor - \$.11/lb. Includes all non-labor costs (utilities, gas, oil, supplies, chemicals) associated with fish distribution. Excludes custodial maintenance.

Fish Distribution (Custodial maintenance)

Labor - \$.03/lb. Includes all labor costs for custodial maintenance related to fish distribution.

Non-labor - \$.02/lb. Includes all non-labor costs for custodial maintenance related to fish distribution.

Fish Feed - Based on a fish feed conversion of 1.5.
 291,500 lbs. x 1.5 lbs. feed/lb. = 437,250 lbs. feed
 437,250 lbs. feed x \$.25 lb. = \$109,312

Feed to be fed - Silvercup Diet (only diet to date which provides adequate nutritional balance needed for downstream migration and ocean survival).

Enclosure No. 2

Estimated Commercial Operations Cost for
Steelhead Production - Cost Summary

[GAO COMMENT: Enclosures 2 and 2A represent Interior's estimate of commercial hatcheries' cost to produce steelhead. However, the \$1/lb. selling price given to us by a number of commercial hatcheries is, in our opinion, a more valid estimate of their costs. However, we noted some questionable figures used in the enclosures. The analysis in enclosures 2 and 2A is based on the incorrect assumption that the commercial hatchery costs cited in our report were based on intensive trout culture and not steelhead trout culture. This incorrect assumption resulted in Interior doubling or increasing some of the costs in its analysis because fewer steelhead are raised in a pond than in intensive trout culture. (See p. 56.) Also, we did not include the cost of fish eggs in our comparative analysis because that cost will be incurred whether the Government or commercial hatcheries raise the fish. (See p. 57.)]

Production Capacity - 291,500 lbs. Steelhead Smolts

Fish Rearing

Labor	\$ 52,470
Non-labor	99,110

Fish Rearing (Custodial Maintenance)

Labor	0.00
Non-labor	0.00

Fish Distribution

Labor	8,745
Non-labor	32,065

Fish Distribution (Custodial Maintenance)

Labor	0.00
Non-labor	5,830

Fish Feed	138,462
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APPENDIX IX

APPENDIX IX

Fish Eggs	53,370
Fish Health Diagnostic Services	1,900
<u>Total Cost</u>	<u>\$391,952</u>
Cost/lb.	<u>\$1.35</u>
Selling price per pound of steelhead by commercial sources.	<u>\$1.85</u>
10% Government administrative cost per pound.	\$.19
Total cost per pound for Government to purchase steelhead.	\$2.04

*Cost is based upon information provided by Crystal Springs Trout Company officials and Hagerman NFH operations cost. Government contract would require steelhead smolts to be of the same size, high quality, and fish health as those reared at Federal installations. The smolts would have to be in specified condition and delivered to release sites at a particular time of month and year to meet management requirements for downstream migration, ocean survival, and adult returns. In order to accomplish this, the commercial dealers would have to reduce their normal rearing density for rainbow trout by 1/2 to 2/3, adopt similar fish cultural and fish health techniques, facility maintenance, and feed the silvercup diet. Their labor and non-labor costs would increase in almost a direct proportion to density decreases because of an increase in the number of fish cultural units and cfs of water required to achieve the desired results.

Enclosure No. 2A

Estimated Commercial Operations Cost for
Steelhead Production - Cost Definitions

Fish Rearing

Labor - 2 times the quoted labor cost/lb. - $\$.09 \times 2 = \$.18$. Includes all labor costs associated with egg incubation, fish health, custodial maintenance, and fish rearing. Excludes labor costs for broodstock and fish health diagnostic services.

Non-labor - 2 times the quoted overhead costs - $\$.17 \times 2 = \$.34$. Includes all non-labor costs associated with egg incubation, fish health, custodial maintenance, and fish rearing. Excludes cost of fish feed and egg purchase.

Fish Rearing (Custodial Maintenance)

Labor - Included in Fish Rearing, Labor.

Non-labor - Included in Fish Rearing, Non-labor.

Fish Distribution

Labor - 56 percent of Hagerman NFH's distribution labor cost (trout farm industry's rearing and custodial labor costs is 56 percent of Hagerman's). $56\% \text{ of } \$.05 = \$.03/\text{lb.}$

Non-labor - Cost will be equivalent to Hagerman NFH cost of $\$.11/\text{lb.}$ (Commercial cost may be higher because of Hagerman's lower cost for gasoline - Government contract).

Fish Distribution (Custodial Maintenance)

Labor - Included in Fish Distribution, Labor.

Non-labor - Cost will be equivalent (if not higher) than that for Hagerman NFH. Based on a cost of - $\$.02/\text{lb.}$

Fish Feed

Hagerman NFH's trout fish feed conversion rate averages 1.4 vs. the trout farm industry's 1.8. Since Hagerman's feed conversion rate for steelhead is 1.5, the trout farm industry would average 1.9 to 2.0.

$291,500 \text{ lbs.} \times 1.9 \text{ lbs. feed/lb.} = 553,850 \text{ pounds feed}$
 $553,850 \text{ lbs. feed} \times \$.25/\text{lb.} = \$138,462$

Fish eggs

Based on 3,558,088 green eggs @ 85 percent eye-up = 3,024,375 eyed eggs
(number required to achieve production goal).

Egg cost - \$15/1,000
\$15/1,000 eggs x 3,558,088 eggs = \$53,370

Fish Health Diagnostic Services

Government contract and fish health requirements would require 2 complete inspections per year. Commercial labs charge approximately \$500 per inspection plus per diem and travel (\$150). Government hatcheries also receive approximately 4 diagnostic checks per year. A commercial lab would charge approximately \$150 for these services.

2 times \$650 = \$1,300
4 times \$150 = 600
\$1,900

(Government inspections and checks are provided by Federal fish health officers or station biologists and the costs are included under fish rearing).

Cost/lb.

\$390,981 divided by 290,660 lbs. = \$1.35/lb.

Selling price per pound of steelhead by commercial sources.

Trout farm industry would expect a profit of \$.37 on every dollar
(based on quoted prices).

IDAHO LAND & APPRAISAL SERVICE CO.

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ROBERT W. SMITH, M.A.I.
GERALD F. THUMMEL
MARK W. RICHEY
JOHN E. NOWIERSKI
W. ROSS BEAL

June 20, 1981

Mr. Henry Eschwege, Director
United States General Accounting Office
Community & Economic Development Division
Washington, D. C. 20548

Dear Mr. Eschwege:

I have read the draft of Chapter Two of the "Corps of Engineers Acquisition of Crystal Springs Ranch Fish Hatchery-- A Costly Lesson" and feel it is important that I defend our company and work product. However, I do not have the time or money for my defense as your office had in preparing the report.

After reading the report, I had the feeling the staff directed their entire efforts in trying to discredit our appraisal rather than weighing both sides of the issue in an attempt to arrive at an unbiased conclusion. This is supported by the fact that even after our interview with them on February 22, 1981 the report still contains the same misinterpretations and misunderstandings that were discussed. In addition, we found the only people that were interviewed in Twin Falls, except for us and Mr. Ellis, were in support of a selected segment of the industry that opposed our valuation. Apparently, no attempt was made to contact individuals outside this vocal group. A list of the people that were interviewed would support this. Therefore, it is our concern the Committee did not consider all of the information available or provided them during their investigation, but rather made an early assumption the appraisal was erroneous and set out to prove it. For this reason I feel it is necessary to again present our side of the story in hopes that it will be included in the final report.

For your convenience, the following comments will be correlated to your draft with corresponding numbers in the margins of each.

[GAO COMMENT: We did not direct our efforts to discredit the appraisal, but rather we reviewed other matters such as how much it would cost the Corps to produce steelhead and whether, instead, it would be cheaper for the Corps to contract with commercial hatcheries for steelhead trout. Our work was performed at the request of Chairman James J. Howard, which was prompted by local concern over the high appraisal price of the hatchery. The appraiser failed to mention that during our meeting with him on February 22, 1981, we pointed out some misinterpretations and misunderstandings he had regarding the production capability of the hatchery.

[GAO NOTE: Page references have been changed to correspond to the final version of the report.]

After we brought these matters to his attention, the appraiser revised his production estimate downward from 3.4 to 2.5 million pounds. In addition, we contacted individuals that represented both sides of the issue as well as some who were not aligned with either side. As shown by the list of people we contacted (see pp. 2 and 3), we talked with persons outside the group that were vocally opposed to the appraiser's valuation of the hatchery. After we briefed the Corps' Acquisition and Appraisal Chiefs on our initial findings, they made a visit to the area but neither they nor the appraiser contacted persons who disagreed with the sales price to hear their side of the argument. This group consisted not only of a sizable number of industry persons but also included other appraisers who had done fish hatchery appraisals in the area.]

Page 4, Second Paragraph

- (1) At the time of our original appraisal, we found there were 10 acres in the site that were under the apparent ownership of the U.S. Government. This was reported to the Corps of Engineers, who instructed us to complete our appraisal based on the original acreage while they checked the discrepancy out further. After their investigation we were instructed to revise our August 13, 1980 appraisal based on the lesser acreage. This was our December 1980 revision.

[GAO COMMENT: Report revised to clarify why original appraisal was inaccurate. (See p. 4.)]

At the time we were awarded the appraisal assignment, a letter was given to us by the Corps from the State of Idaho Department of Fish & Game that stated, "The measured flow at the Valley Trout Hatchery on July 2, 1980 was 82 cubic feet per second, plus or minus five cubic feet per second." It was assumed this was the volume of water being delivered across the river to the subject site. At the time of our inspection, an estimated 15 cfs was being wasted at the collection system. We concluded about 100 cfs was available to the hatchery which the pipe was reported to carry. This was 20 cfs less than what was reported as available by the owner.

[GAO COMMENT: We do not disagree with the use of the State of Idaho's water flow data, but we do disagree with the appraiser taking the reported measurement of 82 cfs of water, plus or minus 5 cfs, and, without explanation or justification, adding the plus 5 cfs to the 82 cfs to establish a base of 87 cfs from which to compute the potential available water. We believe the 82 cfs figure should have been used in the original appraisal because that is the amount that was actually measured.]

Before our last revision, Mr. Keith Anderson, consulting engineer, measured the water and estimated about 82 cfs would be a reasonable average annual flow for the springs after adjusting for seasonal fluctuations. This was based on the following computations from Mr. Anderson's report:

"Hatchery Flows	66 cfs
Pipeline Inlet Flow Bypass	4 cfs
Additional Water Developed at Minimal Cost	<u>5</u> cfs
March 13, 1981 Estimate:	75 cfs"

"Lowest flows generally in about March-April."

"Typical mean annual flow at Crystal Springs would be about 110% of minimum monthly mean flow.
Minimum flow 75 cfs x 110% = 82.5 cfs."

"Maximum flows 125% of minimum.
Minimum flow 75 cfs x 125% = 93.7 cfs."

Our estimated mean annual flow after Anderson's measurement was 82 cfs.

[GAO COMMENT: We do not question the amount of water available to the site. We do question, however, the amount of water that the appraiser said could be put to beneficial use. Mr. Keith Anderson estimated the average annual flow at 77 cfs with no modifications to the collection system. Whether any modification to increase the water supply is cost justified depends on whether the additional water can be used to produce more fish. Increasing the amount of water going through the existing facility would only be beneficial if the present water exchange rate in the ponds is low. If the rate is not low, then only adding more raceways will make the added water beneficial. However, the appraisal report never discusses exchange rates. Also, when we toured the hatchery, the owner told us that it would not be practical for the flow to be increased. According to the owner, he was beneficially using 50-60 cfs and an increase in water flow would tend to make the fish swim harder thereby making it more difficult for the fish to grow as rapidly.]

Appraisal Based on Insufficient and Inaccurate Information,
Page 5.

(2) In the August 13, 1980 appraisal:

"The method for determining how many pounds of fish could be produced annually on the site was incorrect and resulted in the production estimate being nearly twice the highest estimate we obtained from other independent sources."

If you use Mr. Bruhn's 30,000 pound estimate and Mr. Klontz's 10,000 to 40,000 pounds per cfs figures, which you must have chosen to withhold and then adjust Mr. Busch's estimate to his employer's actual production, our estimate is well supported.

[GAO NOTE: Mr. Bruhn is the U.S. Fish and Wildlife Service official referred to in this report who originally gave us an estimate of 18,000 lbs./cfs and later changed his estimate to 30,000 lbs./cfs. Dr. Klontz is a professor at the University of Idaho who has stud-

ied the trout farm industry. Dr. Busch is the Director of Rangen Research, a former consultant to the U.S. Fish and Wildlife Service, and an elected representative to the U.S. Trout Farmers Association.]

[GAO COMMENT: We disagree. The appraiser's estimate was not well supported. Only the owner and Mr. Bruhn were close to the appraiser's estimate. Even their estimates were below the 34,200 lbs./cfs used by the appraiser. All other persons told us that the production figure estimated by the appraiser was completely out of line. Mr. Bruhn originally told us 18,000 lbs./cfs but changed his estimate after the Corps officials met with him. Dr. Klontz, in our initial conversations with him, gave a production figure of 10,000 lbs./cfs and later, in a letter to us, gave two theoretical production figures of 30,530 lbs./cfs and 40,151 lbs./cfs. However, Dr. Klontz stated that both schemes were impractical and did not include mortality data. He also stated that "No production-minded trout grower would attempt to make money with this configuration (8 reuses). Four reuses are about the limits of practicality * * *." It should be noted that both Mr. Bruhn and Dr. Klontz were initially contacted by us, and the appraiser did not contact them until after our meeting with them. Also the Corps did not ask Dr. Klontz to review the appraiser's production estimate even though he had previously been used by the Corps as a consultant involving the rearing of steelhead under its mitigation program.]

On Page 45 of our August 13 appraisal, we summarized the reported number of pounds of fish per cfs. As can be noted, there is sizeable variation from the five farms. However, if the data is adjusted to the number of uses to which the water is put and the number of pounds per cfs per use, it falls within a very close range. This explained the large discrepancy we were receiving from different fish farmers in the area as to the production capability of a cubic foot of water. It was obvious the producers who were reporting the higher production rates were getting more uses from the water.

[GAO COMMENT: Production data on one of the fish farms cited on page 45 of the appraisal was inaccurate and was corrected by the owner. After correcting the production data for this farm, four of the five farms' production rates--pounds/cfs--are reasonably close. Crystal Springs Ranch, the fifth farm, was not close and had a higher production than the facility with better water and fall between ponds and which had 8 uses compared to Crystal Springs' 5.5 average uses. This method oversimplifies and ignores important differences in hatchery design, water quality, and management.]

It is common knowledge that usually the fish farm site limits the number of uses--not the quality of water. You will generally find where a fish producer has adequate land area on his site to support more ponds, they will be added. This makes me feel your "independent sources" are probably that segment of the industry whose reuses are limited by physical boundaries and not water quality. They do not

know the full capability of their water since they have no opportunity to expand their facilities to include additional ponds. I know of one situation where the producer reports he can only use his water 3 times, but yet another fish farmer immediately picks up the water and reuses it another 2 times before it enters the river.

[GAO COMMENT: We do not agree that it is common knowledge that usually the fish farm site, not the quality of water, limits the number of uses. If this were true, a fish farmer could reuse water over and over again if he had enough room. The experts we talked to said that a number of factors determine site production with water quality being the most important factor. Site limitation was acknowledged as a factor but water quality was considered more critical even by those whose facilities were not site limited. Because pollutants build up in water as water is reused, the quality of water and its ability to produce quality fish decrease. Once the water quality decreases to where fish cannot be practically produced, it matters little that the water can flow through more and more ponds. The appraiser, throughout his comments, fails to give much weight to this biological fact.]

It should be noted that our estimated 4,275#/cfs/use is not the production of each and every one of the 8 ponds but an average of the total production for the 8 ponds. It is very obvious the first pond will produce more pounds of fish than the eighth pond, but yet the last pond will produce a significant number of fish as was observed during our field inspection.

[GAO COMMENT: The estimate of 4,275 lbs./cfs/use in the original appraisal was computed on an average number of uses of 5.5 and not 8 uses. The appraiser did not recognize that production would drop on each reuse as evidenced by his applying the 4,275 lbs./cfs/use figure to potential uses beyond 5.5 uses.

Also, observing fish in an eighth pond is not an indication that fish production is being maximized per cfs of water. By lowering the number of fish raised in prior ponds, it is possible to raise fish in the eighth pond because the quality of water may be good enough for fish to be raised. Less fish in prior ponds means less pollutants by the time the water reaches the eighth pond. There is also a question of economics--poor water quality means more disease problems, poor growth, and low quality fish, which translates into higher costs for poorer quality fish.]

(3) "The amount of water available to the site was overstated."

The estimated cfs of water available to the site was based on an assumed reliable source, the State of Idaho Department of Fish & Game. This was changed after another measurement was made.

[GAO COMMENT: As previously pointed out, we did not question the source of the data but questioned the appraiser's use of the highest figure possible--87 cfs when the measurement was 82 cfs, plus or minus 5 cfs.]

- (4) "The production value included potential but undeveloped capacity even though the current depressed trout market makes its value questionable."

As an appraiser, I have yet to see a depressed agriculture market have any substantial effect on farm land prices. It is common knowledge prices paid for pork, beef, and poultry are dictated by supply and demand. You will find fish fall within the same pattern. When you have an oversupply, the price will go down, while an undersupply will raise prices. If this price cycle were directly tied to farm and ranch values, then the real estate market would raise and lower depending on meat prices. I have been in the appraisal business for 16 years and I have yet to see agricultural land values go down even though there have been many depressed market situations in the meat and food products industry over the years. The fish industry has had its oversupply problems in the past which were corrected, and I am certain they will have them in the future. All that is happening is the fish producer is currently experiencing a down cycle like the beef industry. A case in point, even with the low beef prices, cattle ranches are selling stronger in the Northwest than any other type of real estate at this time.

[GAO COMMENT: The income approach to valuing property, which is the approach used by the appraiser, is based on the income the property can generate. We are simply saying that in a depressed market a producer will not develop unused capacity because the additional production cannot be sold in the marketplace. If the market conditions were such that in all likelihood the additional capacity could produce income in the near future, then the additional capacity should be valued. However, the current trout market has created unused capacity in existing facilities to such a degree that a prediction as to when the market will improve to the point where additional capacity would be needed, beyond that now in existence, would be highly speculative. The Uniform Appraisal Standards for Federal Land Acquisitions requires that elements which, while within the realm of possibility, are not fairly shown to be reasonably probable, should be excluded from consideration. As we pointed out in our report, we believe that undeveloped capacity in this case is the type of element being referred to in the standards. The depressed market should have had some impact on the value placed on the facility by the appraiser. The appraiser apparently feels that a depressed market has no impact on determining value. The appraiser uses the argument that because he has never seen agricultural land values go down even during depressed times, the price paid for the hatchery should not be reduced because of the depressed market for fish. What the appraiser fails to recognize is that while values may not go down, the value of land may not have increased as rapidly because of the depressed market.]

- (5) "The capitalization rate used was not reflective of the trout farm industry."

Capitalization rates have little to do with the health of the agriculture industry. If that were the case, then you would find a reduction in real estate values from time to time as meat prices fall. The "real world" shows that during a down cycle buyers are generally motivated to buy, recognizing that supply is being adjusted to demand and that good times are ahead. They can ride in on a price upswing and enjoy a strong market until overproduction again forces prices down.

[GAO COMMENT: What we stated is that the capitalization rate was not reflective of the trout farm industry as a whole; we did not state the effect of a depressed trout market on the capitalization rate other than that it should have some impact and should have been considered by the appraiser.]

March 1981 Revision:

- (6) "The method for determining production, although changed, was still questionable and resulted in higher production figures than those estimated by other independent sources."

If the production estimates of your "independent sources" were used or analyzed objectively, they would support our figures.

Our change in determining production was used solely as another method to support our earlier production capacity estimate. This data was given to us by a highly reputable government employee, and when applied to the number of water uses it strongly supported what was actually being experienced in the field. It is not to say our computations are not lacking and maybe an over-simplification; but, for the producers who have adequate land area for more ponds, the computations are surprisingly close to what is being experienced in the field. The new method of computing production was used only in support of our August 13 estimate and is not meant to be a change from our August 13, 1980 actual production rates.

[GAO COMMENT: If the "new method of computing production" was actually used only in support of "the original appraisal" and "is not meant to be a change from" the "actual production rates" in the original appraisal, then the original appraised value would not have been lowered by the appraiser by nearly 25 percent from \$4.4 million to \$3.4 million. The change in value is too substantial to argue that no changes in production rates were made. Obviously, the "new method of computing production" was given more credence because the final valuation was based on that method's production estimate.]

- (7) "The amount of water that could be beneficially used was overstated."

Mr. Keith Anderson measured the total available flow at 70 cfs with a minimal cost to obtain an additional 5 cfs. It is our opinion that since it is available at a minimal cost, an owner would develop the additional 5 cfs. This would make available 75 cfs in March, at the time of measurement, the reported lowest annual flow. Mr. Anderson states the 75 cfs is 110% of the average monthly mean flow, or 82.5 cfs. The maximum flow is reported to be 125% of minimum or 93.75 cfs. We used 82 cfs, being the average. I do not agree that the amount of water was "overstated" in our March 1981 report.

[GAO COMMENT: We do not disagree that the additional 5 cfs could be collected with little additional expense. We disagree, however, that an owner would go to the expense to increase water flow if the additional water could not be used to produce more fish. In a depressed market, increased production will not be sought after and, if the present rearing facility cannot beneficially use more water by increasing the water exchange rate to achieve higher production, additional water will not be added regardless of the expense. Therefore, we do not believe the appraiser had a strong enough basis to assume that the additional water flow could have been used beneficially.]

- (8) "The potential capacity was still included in the production estimates without adequately explaining if the increased production can be absorbed in the marketplace."

There is adequate water and land area to substantially expand the current facility. We estimated an additional two years to absorb the additional production and discounted it accordingly (see Page 48 of our August 13 report). Based on Mr. Busch's letter (Page 41 of your report), the live trout production in Idaho has increased at about 3,359,381#/year over the past 6 years. Recognizing the amount of available water remaining, it is not unreasonable to assume the subject's increased production could be easily absorbed into the market over 2 years.

[GAO COMMENT: While we recognize that it is difficult to predict the future, it has been nearly a year since the appraiser determined that increased production could be absorbed over a 2-year period. However, the industry still has unused capacity and is planning on further reductions in production for the coming year, and it looks very unlikely that demand will absorb the unused capacity. Also, if the existing facility has the production capability claimed by the appraiser (2,089,939 lbs. annually) and the facility only produced the amount reported by the owner (1,111,408 lbs.), the market would have to absorb 978,531 pounds production from the existing facility before any of the fish could be sold from the additional ponds that could be built. The additional production that could be obtained from this one facility alone, would represent nearly 30 percent of the annual production

increase of 3,359,381 pounds that occurred over each of the last 6 years. In our opinion, the appraiser has not shown the demand for the increased production to be reasonably probable.]

(9) "The same capitalization rate was used."

If the capitalization rate has changed, the value of the real estate would go down. Real estate values have not gone down since the depression.

[GAO COMMENT: See our discussion of this matter on page 75.]

(10) Insufficient Historical Production Data, Pages 6 and 7

Every attempt was made to gather as much production data as possible. Records were inspected when available and some producers were taken at their word, like Mr. Olson did. When summarized production figures were given to us by Mr. Ellis, they supported his earlier verbal estimates. Mr. Ellis gave us no reason to suspect his figures since they were similar to other fish farmers who were willing to make their production figures available.

[GAO COMMENT: We recognize the difficulty the appraiser had in obtaining production information. This difficulty, however, should have caused the appraiser to recognize the increased potential for error because of the lack of good, reliable information and the need to examine actual production records for Crystal Springs before putting such a high value on the facility. Crystal Springs' records were not examined and the only written documentation provided by Mr. Ellis was provided only after we questioned his production figures. Also, he was the primary source of production information for three facilities used for comparison purposes in the revised appraisal. Two of these facilities are leased by Mr. Ellis. Mr. Ellis said he was going to have his accounting firm verify his production figure for us but as of September 10, 1981, we still had not received such verification.]

We are aware that production rates will vary from year to year. The estimated production figures used in our report took this into consideration. The primary reason only one year's production figures were used on the subject farm was that Mr. Ellis has been expanding his operation and has been able to increase his production annually. If an average were taken over a 3 to 5 year period, it would not have given him credit for his increased size. If we would have used average production figures, the site's current capability would not have been valued.

[GAO COMMENT: We agree that the current capability of the facility is what the appraisal should be based on. However, prior years' production figures are still useful even if the facility has been expanded. Adjustments for any increased capacity could be made when comparing production figures. Had the appraiser obtained production for a couple of years, it would have been clear to him

that the 2.1 million pounds production per year figure he used was unrealistic. The owner eventually said that he produced 1 million pounds of fish during a 1-year period. However, this figure was never verified.]

(11) Comparable Operations Selection Was Poor, Pages 7 and 8

According to the owner, the egg losses that were referred to was the loss of an opportunity to purchase a sufficient number of eggs, caused by a poor manager and not a normal business risk. Our stated production of this farm is not only from one year's records but is also supported by what the owner feels the capacity of his facility is under good management practices. When appraising real estate, we assume the operation is under sound and competent management.

[GAO COMMENT: Poor management is a business risk, although for appraisal purposes a property is appraised as if under good management. We do not believe that an owner's production estimate of what his facility could do--especially an owner who is attempting to sell his facility--is as good as actual production data.]

Averages should never be used when estimating prices or production. The word used in appraising is "normalized," and that is what we used in our appraisal. Averages do not consider the attitudes and motivations in the current marketplace. Buyers have a greater interest in forecasting what is going to happen tomorrow based on current trends rather than what may have occurred 2 to 5 years ago. This is especially true during inflationary times, as we are experiencing today.

[GAO COMMENT: Because production can vary from year to year, an average figure over the last couple of years is meaningful to a buyer in estimating what will happen in the future. Whether the production figures are averaged or "normalized," more than 1 year's worth of data should be used. In estimating what a facility normally can produce, adjustments can be made to averages for current conditions.]

There was no way we could correct the misunderstanding with one of the producers. His initial production figures given to us earlier as being derived from one water source was actually the product of two fish farms and could not be separated according to the owner. Therefore, we could not use this information in our revised appraisal. However, he has subsequently stated to us that most of the pounds come from the one system. There is no support that "Both facilities are considered to be as good as or better than Crystal Springs."

[GAO COMMENTS: We disagree with the statement that "There was no way we could correct the misunderstanding with one of the producers." The misunderstanding was corrected but the appraiser did not use the revised information. Originally, the appraiser used the facility to justify the high production capability of Crystal

Springs. Information we obtained during our review indicated that the facilities in question were as good as or better than Crystal Springs.]

(12) Expert's Opinions Do Not Support Appraisers' Production Figure, Pages 8 and 9

- Mr. David Bruhn's original opinion as to pounds of fish per cfs is very typical to many in the industry. However, when you go into the field and see what is really happening in the industry rather than listening to opinions, then you can be convinced that water can be put to 8 or more uses. All I can say is when you stand there and look at the eighth pond where the fish are healthy and not in any stress, you have to question the opinions of "everyone knowledgeable about trout farming." This is what Mr. Bruhn did and he was a big enough man to admit he made a mistake. The proof is in the field and not in a laboratory or textbook.
- (13)

[GAO COMMENT: Mr. Bruhn's original opinion is not typical to many in the industry. In fact, Mr. Bruhn is not even associated with the commercial side of the fish industry. Many of the opinions we obtained were from those in the industry--both from those who have eight uses and those who do not. According to these opinions, the Crystal Springs production is below 18,000 lbs./cfs. Standing and looking at fish in an eighth pond does not prove that fish can economically or physically be raised in an eighth use since previous uses may be loaded lighter than their maximum carrying capacity. We agree the proof is in the field and that is why actual production figures are so critical and why the appraiser's estimated figures were questioned.]

It is a known fact that the majority of the fish farms in the area use the water only two to four times. However, the primary reason for this is the original design of the farm or there is not adequate land area to site more ponds. For some facilities that have more land to develop and additional ponds are constructed, increased production is being experienced. An example of this is Mr. Jensen's new trout farm in Hagerman Valley that was completed in August 1980. It has 11 uses, 4 of which are earth ponds. He expects to produce in excess of 300,000 net pounds of fish annually from 12 cfs of water.

[GAO COMMENT: In a letter to us, Mr. Jensen stated that he does use some of the water 11 times but that his ponds were stocked light throughout because of this. He stated that he built this many ponds for many reasons, such as disease control, improved feed conversion rate, and space for the fish to grow to processing size because the fish are not graded from the time they are put in until they are taken out. He also said the statement that he expected to produce 300,000 net pounds annually is not true. Ideally, he hopes to produce between 240,000 to 260,000 gross pounds annually. However, he points out that it is a new facility without a proven track record.]

Actual production figures and not anticipated production figures will have to be developed before much reliance should be placed on Mr. Jensen's trout facility's capability. Also, this is a farm pond operation and therefore is not a good comparable facility. As previously stated by Dr. Klontz, however, four reuses are about the limits of practicality.]

It should be noted that even with numerous fish farms dumping waste water into Billingsley Creek at Hagerman, Idaho, there are currently filings on the stream for additional fish propagation. Hearings with Idaho's Department of Resources are currently under way in an attempt to stop any further development on what some local residents feel is already a heavily polluted stream.

Again, averages--and especially State averages--should not be used in estimating fish production for any one site. At the very best, these figures are just guesstimates due to the uncooperative nature of the industry to disclose income and production figures to anyone, including their fellow producers.

[GAO COMMENT: We used the reported State averages as a point of reference with which to compare the appraiser's production estimate for Crystal Springs. We did not use the State averages to estimate production. However, even with such a large difference between the State averages and the appraiser's production estimate and the appraiser's own admission that obtaining information from the industry is difficult, the appraiser still continues to insist that his information is accurate and reliable. We were not furnished any reliable information to justify the appraiser saying the owner's facility could produce 34,200 pounds per cfs as he mentioned in his appraisal report. To the contrary, most of the information we received supported a production rate more in line with what the U.S. Department of Agriculture reported for the area. Furthermore, the averages were only obtained because of the cooperativeness of the industry and the appraiser presents no basis to support that the figures are "guesstimates."]

(14) Appraiser Used Unconventional Method to Develop Production Estimate, Pages 9 and 10

There was no place in our original report where we stated the same production rate could be achieved from each additional use. Our estimates from the farms we were given production figures were based on the average production from the number of uses, recognizing the first pond could be stocked with more pounds of fish than the last pond. After these averages were correlated to the number of uses on the subject, a total production figure was estimated.

[GAO COMMENT: We agree that the original report did not state that "The same production rate could be achieved from each additional use." Although unstated, the assumption was made in computing the facility's total potential production. The appraiser computed an average production of 4,275 lbs./cfs/use based on 5.5 average actual uses of the water at the facility. However, the

appraiser, when computing the facility's total potential production capability, including undeveloped capacity, used the same figure of 4,275 lbs./cfs/use for the subsequent uses in computing production up to eight uses. The appraiser said that he recognized that the first pond could be stocked with more fish than the last pond. The appraiser apparently failed to recognize that the latter ponds' average would be less than the average for the first few ponds.]

In our revised appraisal we did use a mathematical analysis but this was only in support of our original estimates based on actual production rates. The 10 percent figure was an estimate given to us by a Fish & Wildlife official which did support what was being experienced on sites that could expand their water use.

[GAO COMMENT: The 10-percent figure is an estimate by a Fish and Wildlife official who is not involved in the commercial production of fish and whose estimate is not based on an empirical study. The fish biologists we talked to are involved with commercial trout production and have done studies on production rates and, therefore, we believe more reliance should be placed on their estimates. See appendixes IV and V.]

(15) It is very difficult for me to understand how a recognized fish pathologist could say that "The maximum reuse of water is approximately 4 times" even when his employer gets 6 uses. There are situations where the water is being used 12 times, and fish farmers are expanding their operations, where their site will allow, to take advantage of this increased production. Why would a producer go to the expense of putting in 8 to 12 ponds when he could have achieved the same production in 4?

I can see good reason for the fish pathologist to disagree with our estimates if he feels no added production can be achieved over 4 uses. Even his employer's farm demonstrates his error in analysis.

[GAO COMMENT: The question of how many times water can productively and economically be reused cannot be determined simply by counting the number of ponds in a raceway, although this was done by the appraiser. Water can continue to be used until a critical limiting factor has deteriorated to the point where the oxygen level, ammonia level, carbon dioxide level, or other water quality factors make the additional production of fish impractical, impossible, or uneconomical. Normally, however, oxygen is the first critical factor that becomes limiting. When this occurs, the water has been "used" once. Normally, a low oxygen level can be corrected by dropping the water from one pond to the next one to partially recharge the water with oxygen. With proper drop, this process can usually be repeated until a second critical factor becomes limiting. When this occurs, the water has essentially reached the maximum number of times it can be used unless additional and often costly treatment systems are included in the hatchery design. These additional treatment systems are not considered economically feasible for commercial trout producers at

this time. Also, all things being equal, a facility that has a small drop between ponds would need more ponds to achieve the same production as a facility with excellent drop. Furthermore, the fish farmer used in the appraiser's original estimate but not in the appraiser's revised production estimate told us that he was not using his seventh and eighth ponds. This information, along with Dr. Klontz' and Dr. Busch's opinions that four uses is the practical limit, supports a much lower usage figure than the 3 to 12 uses set forth by the appraiser.]

It should be noted that the Crystal Springs owner held back his 1980 production due to the depressed market and the limit his processor put on his production. He should not be penalized in the valuation of his property for the need to temporarily reduce the oversupply of fish in storage. Mr. Ellis stated the 1.1 million pounds was well below the capacity of the operation at that time.

[GAO COMMENT: Crystal Springs' production was not limited by the processor. In its contract with the processor, as amended on July 2, 1980, the processor agreed to buy all rainbow trout grown by the owner in his production facilities and delivered live to the processor's processing facilities during calendar year 1980. In our opinion, the owner limited his production because the market was depressed, not because of the contract.]

At the time of our original appraisal, the fish prices were in a down cycle with a growing oversupply of fish in storage. As discussed earlier, this is a normal cycle in the meat industry and will recover when supply is adjusted to meet demand. With a reported 6-year growth of 3 million pounds of fish per year in Idaho, the oversupply condition should not be lasting. This is another product of our national recession and, like any other industry in the United States, there is still strong optimism for recovery.

[GAO COMMENT: We question when the oversupply condition will change, not if it will change. The appraiser states that "The fish prices were in a down cycle with a growing oversupply of fish in storage." Therefore, we question the appraiser's placing a value on potential production from undeveloped facilities when, according to the owner and the appraiser, the existing facility is only producing at a little over half its capacity. Considering the time the market could take to increase demand to the point where additional production capacity is needed (not only at Crystal Springs but throughout the industry), the present value of this additional undeveloped capacity is probably very small.]

In our appraisal we estimated 15¢/lb. for fish. This was not the high or low for the industry but a normalized price that could be reasonably expected in the foreseeable future. This takes into consideration future price trends and levels out the fluctuations in the market. By using a normalized price, our valuation took into consideration the current depressed fish price but also allowed for a normal price cycle in the industry.

[GAO COMMENT: We agree with the appraiser's estimate of \$0.15/lb. for fish. We found general agreement that \$0.15/lb. profit is a reasonable figure and, therefore, used it in our analysis.]

Historically, the demand for Idaho's fish has increased at a reported average rate of 3+ million pounds per year over the past six years. Recognizing the recessionary period the country is currently going through, it is not surprising that the industry finds itself with an oversupply in the warehouse. However, all forecasts predict better times with increased population and food consumption, so why is it highly speculative to anticipate future growth in the industry? The owners of Clear Springs must have confidence in the future or they would not have recently purchased the Thousand Springs operation. I feel it is reasonably probable there will be a strong recovery as soon as the supply is moved out of storage. As one producer states, an oversupply condition like that which is occurring today can be seen as being good for the industry. To move the surplus, prices are reduced to a level that will increase consumption. This means the taste for trout will be introduced to a much larger market that will carry over into the future.

[GAO COMMENT: Clear Springs' purchase of the Thousand Springs operation does not represent an increase in production capability for the industry but is simply a transfer of ownership of existing production capability. Trout is a specialized food product which is not part of the average consumer's diet. What the impact of reduced prices may have on consumption is hard to predict but there are other factors besides price in creating or expanding a market of this type.]

(16) Capitalization Rate Used Was Low, Pages 11, 12, and 13

In selecting a capitalization rate for the subject property, we not only tried to find some indications in the marketplace but we also compared the industry with other types of investments. It was our opinion that fish farming has many similarities to the agricultural community where overall rates below 7% is common. Many of the same risks exist, the ratio between depreciable versus non-depreciable assets are about the same, and the prices received for trout are cyclic like all other farm products. Therefore, there is good reason to select the 10% capitalization rate over something higher. A 15% rate of return is not normal for any type of real estate investment let alone the agriculture industry, of which fish farming is a part.

[GAO COMMENT: We question the comparability of trout farming to agricultural endeavors, such as farming and cattle ranching, which the appraiser makes. Important differences exist, such as:

- The value of trout farming is in the water, not the land.
- The amount of risk is lower for many agricultural endeavors.

- There is a limited and specialized market for trout products.
- The market for a trout facility is limited compared to the market for agricultural land.
- A trout farm has more difficulty shifting to the production of a different product.
- A trout farm has few, if any, alternative uses for property.

Because a fish farm's value is mainly in the water and the water has little value except for fish farming, an investor who buys a fish farm is investing more in an operating business than in the real estate. Although the final proof of a proper capitalization rate would be from actual sales, the majority of persons in the industry we talked to said a 10-percent capitalization rate was too low.]

The principle of competition applies to the fish farming business like any other industry. It implies that when net income exceeds the requirements of labor, capital, coordination and land, the excess constitutes profit and encourages competition. Therefore, if the fish industry is reporting higher rates of return than is typically being experienced in like or similar types of investments, then this tends to breed ruinous competition. An example of this is when demand increases for meat, prices and production increase until there is an oversupply in the market. Prices then fall to encourage consumption, and production is reduced to again meet the demand. This is the history of agriculture.

To clarify the comparison of 68¢/lb. versus 7¢ profit that was used in our report, the operator did not give us an in-depth analysis of his investment or operation. However, he stated a 10% return was acceptable on his invested capital and the 7¢ would give him that return.

[GAO COMMENT: Again, as stated in the report, rates of return and profit margins are not the same thing. However, whether the operator understood the distinction between rate of return and profit is unclear without additional information.]

There is no way a capitalization rate can be determined by using a risk-free investment rate plus a margin for risk and nonliquidity without also considering appreciation, tax benefits, and leverage. If these three factors are included in your computations, it would substantially reduce any rate developed by your suggested method. Using our 10% capitalization rate plus 10% annual appreciation, which is conservative in Idaho's market, a buyer will actually receive an overall yield of about 20% before figuring any leverage or tax benefits. This is what motivates buyers--not just the annual dividend rate. This is also why a depressed trout price has little to do with market value.

[GAO COMMENT: The capitalization rate used in the income approach should reflect the relationship of income the property can generate to its market value. The best guide to the proper rate at which the net income should be capitalized is the ratio of net income to sales price in similar transactions because factors such as risk and nonliquidity are already reflected in the capitalization rate. However, the capitalization rate could not be determined this way because of the lack of comparable sales. Lacking comparable sales, the appraiser based his judgment for a capitalization rate of 10 percent on two questionable examples and his own opinion that capitalization rates for fish farms "closely parallel farming operations, as contrasted to returns from business alternatives." We believe that the appraiser's support for a 10-percent capitalization rate is inadequate. The Uniform Appraisal Standards for Federal Land Acquisitions state that in determining capitalization rates:

"Each of the factors must be carefully analyzed and objectively supported to prevent the result from being utterly fanciful. It is most necessary that the capitalization rate be supported by showing of rates from comparable investments. It must be borne in mind that sometimes a change of even a fraction of a percent in the capitalization rate can make an immense change in the capitalized value. Too often appraisal witnesses select a capitalization rate 'on the basis of my own judgment and experience.' This is not substantial support for the rate used. As has been indicated, support from the market place is vital."

In determining a capitalization rate by taking a risk-free rate and increasing it for risk and nonliquidity, factors such as appreciation, tax benefits, and leverage are not included. This method is an accepted method for estimating a capitalization rate.]

The 15-16% capitalization rate used by the two appraisers in the area should also be examined before it is used to discredit our work product. Opinions should not be used by the committee without support for their reasoning. This is also true for operators and consultants.

[GAO COMMENT: The appraisers could not show us their appraisal reports because the reports are the property of those for whom the appraisal was done. However, both appraisers told us that fish farming is a riskier business than farming and should have a higher capitalization rate. Also, one appraiser stated that the 16-percent capitalization rate he used was based on the ratio of income to sales price for three fish farms that had been sold.

Operators' opinions are valuable because they know the amount of return they are getting and expect to get. They are also potential buyers of any fish farms that are on the market and, therefore, their opinions represent potential investors' opinions as well.]

- (17) Capitalization rates are not directly tied to interest rates, as you appear to believe. Even with the high rates for the past two years, it has had little to no effect on the price of agricultural land or has it affected their historically low rates of return. As I stated above, there are other benefits to owning real estate other than annual cash return on the investment. I can agree with you, "...there would appear to be every reason to conclude that a substantial increase or decrease in interest rates will have an effect on the market value of real estate" but that has not happened in the real estate market yet. The reason it hasn't happened is there are people out there who feel real estate is still a good hedge against inflation and they are confident that interest rates will come down and good times are ahead.

[GAO COMMENT: Standards for appraisal work for Federal agencies are set forth in the Uniform Appraisal Standards for Federal Land Acquisitions. The statement attributed to us in this paragraph is actually a quote from those standards. The extent to which high interest rates affect real estate values may be difficult to measure but they can have a moderating effect on the rate of appreciation.]

- (18) Lower Property Value Indicated by Cost Approach, Pages 13, 14, 15

Water rights under the Twin Falls Irrigation District are currently selling for in excess of \$30,000/cfs. This water can only be used 4 months out of the year.

[GAO COMMENT: Irrigation water and water used in most trout farms are not comparable. Irrigation water values include the distribution system--which can be extensive--and the use of the water is a consumptive use. Most of the water used in the trout farms has little, if any, value for irrigation purposes because the water is usually inaccessible. Also, its use is nonconsumptive.]

The sale of the subject is good evidence of market value if it had not been substantially improved by investing large sums of money. Therefore, the Crystal Springs facility should not be used as a comparable. At the time of purchase, the property was not even similar to what can be found today.

[GAO COMMENT: The sale of Crystal Springs was adjusted by removing the cost of improvements added since 1975. The value placed on these improvements by the appraiser was \$205,766 and is not a large sum of money when a value of \$3.4 million is placed on a property. The amount of the improvements represented only 6 percent of the appraised value.]

In our "Area/Neighborhood Data" section we made a general statement that water "...is now selling for \$12,000 to \$15,000 per cfs and higher..." This statement is very true when, in most cases, the operator can use his water only two to four times due to limited land area. For the

few sites where the use of the water can be expanded, the value per cfs is higher. If the water can be used only 2 to 4 times, it certainly is not as valuable as water that can be used 8 to 12 times where a concomitant increase in production is experienced.

[GAO COMMENT: The appraiser's statement is based on the assumption that there is an economic value for the additional uses--an assumption that we have repeatedly questioned. The appraiser states that the "value per cfs is higher" at the fish farms with 3 to 12 uses. However, we are not aware of any sales of these farms that would establish such a value and the appraiser does not cite any examples.]

The reported asking price of \$5,446/cfs is water from Billingsley Creek that is heavily polluted from upstream trout farms and is interrupted during the summer months by Hagerman Irrigation Ditch Co. The value of this water can hardly be compared to the subject's unused crystal clear water that has about the same flow the year around and can produce many more pounds of fish.

[GAO COMMENT: We agree that Crystal Springs has better quality water. The \$5,466/cfs figure was used only for background information and to establish a range of values.]

If another appraiser's work is going to be used to discredit our water value, the support for his opinion should be made available in this report. Why should the committee give more weight to another appraiser's unsupported opinion and ignore documented data.

[GAO COMMENT: The other appraiser does document and explain why he used the \$10,000/cfs value. On the other hand, the appraiser's derived value of \$33,000/cfs is based on his erroneous assumption about reuses. The "documented data" used by the appraiser of Crystal Springs consists of an analysis, based on the appraiser's assumptions concerning reuse of water, of an operation leased by the owner of Crystal Springs and a real estate listing for farm land with undeveloped water that could be used for trout farming. We do not believe such extremely limited information is adequate support for the value established by the appraiser.]

(19) In developing your table on the top of Page 15, why not also use our estimated value for the Crystal Springs water? The \$5,446 water is a polluted-use source, the \$8,647 figure is based on our "same erroneous assumption" with no proof we are wrong, the \$10,000 is the value from an unsupported estimate given by an unidentified appraiser, and the \$12,000 and \$15,000 are based on a general statement about the value of average use water in the valley. I cannot see how any of this data can be used to support the value of the subject farm.

[GAO COMMENT: The appraiser's value was not used because our report demonstrates the fallacy of the appraiser's method in deriving the water value and because we found no support for his figure among those associated with the industry. See previous comment and our discussion on page 14.]

There is nothing to support your statement that Crystal Springs has a limited capacity. There is additional land area on the site to construct more ponds to put the 5 cfs to beneficial use. A fish farmer would be a poor manager if he did not take advantage of this additional water to maximize his production.

[GAO COMMENT: Running more water through existing raceways will improve production only if the current water flow is less than optimal. If this is the case, then the additional water could be used. Adding additional ponds to existing raceways would be re-using water already available to the site. Adding a new raceway would be a beneficial use if the production can be marketed. It is not clear, however, whether the Crystal Springs site would be able to accommodate an additional raceway without redesigning the hatchery.]

(20) APPENDIX V

Mr. Harold Hagen's letter suggests that any oxygen reduction below 5.0 PPM would be at "a critical level and the 7th and 8th use would theoretically not be possible." Apparently, Mr. Hagen has not had a chance to study the following laboratory study.

On February 26, 1980, Dr. Robert A. Busch, PhD., of Rangen Research, presented testimony to the Idaho State Legislature. Part of his presentation was a study on the "Effect of Reduced Dissolved Oxygen Levels on Growth, Feed Conversion, and Mortality Among Rainbow Trout Under Commercial Hatchery Production Conditions." The results of this study indicate oxygen levels as low as 4.00 mg/l will produce about the same pounds of fish with better conversion and a much lower mortality rate than an aeriated group whose dissolved oxygen level did not get below 5 mg/l. This is proof that water can be used more than 6 times, contrary to Mr. Hagen's statement. Additional support comes from a trout farm in Hagerman Valley that recently recorded an oxygen level of 9 p/m in the 11th pond after that many uses.

This is just additional support to verify the fact that the full potential of this spring water has not been reached, but limited only by land area and those who say it cannot be done.

[GAO COMMENT: Dr. Hagen has examined the laboratory report and has discussed its results with Dr. Busch. He stated that the results cited by the appraiser were taken out of context and sees no reason to change his position. It is interesting to note that the appraiser used Dr. Busch to say that water can be used more than six times, contrary to Dr. Hagen's statement. However, Dr. Busch told us that from a practical standpoint, water at Crystal Springs could not be used the eight times the appraiser claimed.]

RANGEN RESEARCH LABORATORY STUDY RESULTS*

Parameters	Control Group	Aeration Group
Pond Size	3.75'x8'x80'	3.75'x8'x80'
Water Flow (cfs)	0.6986 mean	0.8443 mean
Start Size	3.52/pound	3.51/pound
End Size	1.75/pound	1.60/pound
Pounds Gained	1638 pounds	1675 pounds
Percent Gained	81.9%	83.8%
Conversion	2.478	2.582
Total Mortality	358	420
Percent Mortality	2.53%	3.05%
Dissolved Oxygen Inflow		
Average	7.03 mg/l	7.00 mg/l
Range	5.40-8.21 mg/l	5.50-8.40 mg/l
Dissolved Oxygen Outflow		
Average	5.50 mg/l	6.51 mg/l
Range	4.00-7.55 mg/l	5.00-8.49 mg/l

"Effect of Reduced Dissolved Oxygen Levels on Growth, Feed Conversion, and Mortality Among Rainbow Trout Under Commercial Hatchery Production Conditions"

APPENDIX VI

It is beyond my best imagination how a staff representing the U.S. Government can be so naive as to assume that Mr. Busch is an unbiased source of information in the appraisal of Mr. Ellis' fish farm. He is directly employed by Mr. Thorleif Rangen who has competed with Mr. Ellis over the years in fish production and fish food manufacturing and sales and was one of the strongest critics of the Corps of Engineers' purchase of Crystal Springs Ranch. I have never worked for the Government but I do know that in the outside world where there are no labor unions you do not contradict your employer without expecting to be fired.

This letter has been used as your primary source of documented information to discredit Mr. David Bruhn, the U.S. Corps of Engineers, and us as appraisers. If your unidentified and undocumented sources are just as objective as Mr. Busch, then I can see the reason for our great discrepancy. This statement is supported by the following critique of Mr. Busch's letter.

[GAO COMMENT: Dr. Busch was not the only one relied on in our analysis of the appraisal. We recognize that he is employed by Rangen Research, which has a small hatchery operation. However, Rangen and Valley Trout, Inc., which Crystal Springs Ranch was a part of, are not in direct competition. The Rangen company is mainly a feed manufacturer and its hatchery operation is used primarily for research. Valley Trout is a large trout producer which mainly manufactures feed for its own operations. However, we also obtained opinions and information from numerous other sources that verified Dr. Busch's credibility. Furthermore, Dr. Busch was a consultant for the U.S. Fish and Wildlife Service in 1979 regarding the raising of steelhead. The competitors and others who have criticized the Corps have directed their criticism at the price the Corps paid for Crystal Springs and not at the actual acquisition of the facility. Those, besides the competitors, who have been critical of the price have included other appraisers, consultants to the commercial trout industry, and professors who are familiar with the industry. The only support we found for the price paid for Crystal Springs came from the appraiser, the owner, and the Corps of Engineers.]

First off, as appraisers we did everything possible to gather as much material as possible in making this appraisal. Numerous fish facilities were visited and operators interviewed, but the success rate of acquiring production and financial records was almost impossible. For those who were willing to share this information with us, we used their information; but this was a very small percentage of those interviewed. Therefore, the conclusions that we reached were based on this data and it had to be assumed true for the industry. There was no attempt on our part to "high grade" any information, or select any particular type of operation or use any figures that were not normalized to the industry.

[GAO COMMENT: With such an admission by the appraiser that his information was extremely limited, he, along with the Corps, should have recognized the potential for error and should not have "assumed" the information to be true for the industry since published industry data did not support the high figures derived by the appraiser. Some "high grading" did occur, such as using 87 cfs when the information showed that water available to the hatchery was 82 cfs plus or minus 5 cfs.]

At this time, we are provided documented information which was not made available during our field investigation. Mr. Busch's source of these tabulations is not known, but it does leave much to be questioned.

Firstly, it would be wise if Mr. Busch became a little better acquainted with his own parent company's operation. According to a signed statement by Daryl Tadlock which is attached, Lynn Babington, Manager of Rangen Research Station, stated on February 27, 1981 that in 1980 he raised 630,000 pounds gain on 30 cfs of water average or 21,000 pounds per cfs. He further reported at a U.S. Trout Farms Convention that his poundage was in excess of 700,000 or 23,330 pounds per cfs. A document given out at the end of October 1980 stated the Rangen production was 617,253 pounds with an average flow of 30.4 cfs for apparently 10 months of operation. If these figures are based on a full year, it would indicate 24,365 pounds per cfs could be reached. Another interesting point is Mr. Babington feels the Rangen operation could exceed 800,000 pounds of gain on the current water supply. This is 26,666 pounds per cfs from 6 uses. If not for a county road that restricts additional ponds, no telling how many pounds of fish the 30 cfs would produce. It should be noted that after this water leaves the Rangen farm it enters Billingsley Creek where it is reused a number of additional times by downstream trout farmers.

[GAO COMMENT: Daryl Tadlock is the manager at Crystal Springs. Dr. Busch is responsible for the hatchery operation and is more familiar with its capability than anyone else. Mr. Babington was representing Babington Enterprises, a manufacturer of demand feeders, at the convention and not Rangen, Inc. The information he gave out at the convention for 1980 was for their fiscal year 1980 ending on June 30, 1980, and therefore the reported production of 617,253 pounds was for 12 full months. Dr. Busch stated that 1980 was an extremely good year but, as the chart shows, production can vary greatly from year to year. In a letter to us, Mr. Babington stated that he did not make the statement that the production would be in excess of 700,000 pounds in 1980. He also said his statement that the Rangen facility could produce 800,000 pounds could be termed a "pipe dream or hatchery manager's optimism" as he had pointed out to Mr. Tadlock at the time. This figure was given on the premise "that with better feeding techniques, better management, improved feed formulas, better quality eggs, new drugs and disease control measures, production should go up in the future." He further stated that he did not know how much production will go up (if any) and when, and that only time would tell.]



2-28-81

KENNETH ELLIS
BRENDA ELLIS

VALLEY TROUT FARMS, Inc.

PHONE 543-8244 • BOX 50 • ROUTE THREE • BUHL, IDAHO 83316

PRODUCTION - RANGEN RESEARCH STATION

Lynn Babington, Manager

1980

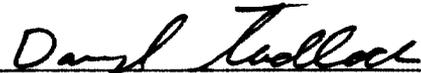
CONVERSATION BETWEEN Lynn Babington AND Daryl Tadlock- 2-27-81

Lynn said that in 1980 that he raised 630,000 # gain. He said that he had 30 C.F.S. of water average. This would relay to 21,000# per C.F.S. per year. At the U.S. Trout Farmers Convention Lynn stated that the poundage for 1980 would be in excess of 700,000#. If we use the 30 C.F.S. at 700,000#, this would equal 23,333 # per C.F.S.

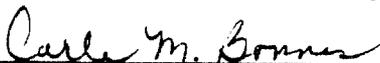
Attached is Exhibit (A). This document was given out at the U.S. Trout Farmers Trout Convention in Twin Falls at the end of October 1980. In this document it states that 1980 production was 617,253 # with an average water flow of 30.4 C.F.S. with production per C.F.S. of 20,304 # per C.F.S. raised apparently for the first 10 months of the year.

Lynn also stated that he felt he could exceed 800,000 # of gain with his current water supply per year. This would equate to 26,666# per C.F.S. per year. I presume Lynn was talking of the 800,000 # of gain possible if this were not a research facility where they try to carry a light enough load as to not stress the fish.

I certify that these are true and correct statements between Daryl Tadlock and Lynn Babington on 2-27-81


Daryl Tadlock

DATE 2-28-81


Notary Public for Idaho
Residing at Buhl

RANGEN RESEARCH HATCHERY

Year	Average C.F.S.	Average Inventory Lbs/C.F.S.	Total Hatchery H ₂ O changes /Hour	Conversions	Pounds of Production	Production / 1 C.F.S.	Total Feed Fed	Revenue Loss due to disease based on Medicated Feed @ 1978 prices
1972	54.7	4658	.98	2.27	532,000	9,725	1,210,812	\$17,861.00
1973	47.8	3538	.85	1.84	621,659	12,994	1,142,131	6,855.00
1974	45.8	4914	.82	2.10	575,690	12,561	1,209,579	5,379.00
1975	41.8	4633	.75	2.05	481,689	11,518	987,703	8,070.00
1976	42.6	4724	.75	1.91	592,084	13,892	1,131,886	9,358.00
1977	33.9	4303	.61	1.94	536,930	15,801	1,044,056	24,155.00
1978	29.9	4017	.53	1.96	404,400	13,525	792,624	23,693.00
1979	29.0	4955	.52	2.11	432,702	14,920	916,695	13,948.00
1980	30.4	5406	.54	1.80	617,253	20,304	1,112,123	5,299.00

Clear Springs' operations are all restricted to 1 and 3 uses by limited land area, with no room for additional expansion. Therefore, no telling how many more pounds of fish they could produce if they could have only 6 uses like the Rangen farm. Based on Mr. Babington's 1980 reported production figures, it could be in excess of 18,600,000 pounds.

Something else that Mr. Busch didn't report is that after Clear Springs has used the water 3 times on one of their facilities, another producer immediately picks up this water and reuses it another 2 times. Why isn't that production included in his figures?

The water from Clear Springs #3 can only be used once since it dumps immediately into Clear Lakes. There is no reason this water could not be reused even another 2 times if it wasn't for limited land area. This is what is wrong with averages. I feel if Mr. Busch was objective with his report, this would have been brought to the attention of the staff and the proper adjustments would be made to the table.

Even though Mr. Busch reports that Snake River Trout Farm will produce 1,000,000 pounds, it has been stated by a well informed source that the farm was up to 1,500,000 and had the capability of 2,000,000 pounds of fish with 90 cfs rather than the reported 105. This site is again limited by land area due to an adjoining owner. No telling what the production of this farm would be if they could expand their facilities.

Blue Lakes is another fish farm operation that should cause you to question the objectivity of your fish pathologist. According to one of the owners of this operation, this was a substantially overstated quantity of water and an average of 3 uses would be the maximum due to restricted land area. It was his opinion the total production was limited by the site and not the quality of water.

[GAO COMMENT: According to Dr. Busch, all of the figures on other hatcheries' production were obtained from the owners or managers of those operations. A number of fish hatcheries in the area are limited by their sites in the number of times that water can be reused. However, too many other factors are involved to speculate what might be produced if the hatcheries were not site limited. Although the appraiser continues to say that the larger the land area the higher the production, this reasoning was not supported by the majority of technical persons we talked to. They told us that there is a limit to the amount of fish that can be raised per cfs, regardless of the land area or number of ponds involved. For example, the Rangen facility has a potential for nine reuses but cannot use all of its ponds at the same time.]

If you continue using this "documented information" and work with the averages, the 2.78 uses will produce 3,966 pounds of fish per cfs per use. If this is applied to 6 uses, like on the Rangen Farm, it would indicate 23,796 pounds per cfs, approximately the same as reported by Mr. Babington, the manager. Adding another 2 uses, this would be 31.728 pounds of fish per cfs--very close to our figures.

[GAO COMMENT: The appraiser reverted to the same method he used in the original appraisal to compute the figures he cites. However, if the appraiser had used the method he used in his revised appraisal--lowering production from each previous use because water quality becomes worse during each use--his production figure for eight uses would have been 24,818 lbs./cfs as opposed to the 31,728 lbs./cfs he cites. Based on the information developed by Dr. Busch for the hatcheries in table I of his letter, the average annual production for first use water is 4,861 lbs./cfs or 13,703 lbs./cfs if the water were used four times.]

Again, the use of averages is a very poor source of information. An example of this would be, if, as an appraiser, I were to use the 10,934 pounds per cfs, as suggested by Mr. Busch, to appraise his employer's fish farm that produced a reported 24,000 pounds of fish per cfs in 1980, I would be strongly criticized by my client and Mr. Busch would probably be fired.

Mr. Busch suggests that we use the State average to appraise Crystal Springs Ranch Hatchery, but I am certain he would be promoting much higher production figures for his employer's facility.

To answer Mr. Busch's criticism of our procedure for estimating production figures, I will again use the Rangen Farm as an example. Based on their 1980 production of 24,000 per cfs confined to 4 uses and using Mr. Busch's "accurate estimate of production," the first pond would require about 8,500 pounds, the second 6,800 pounds, the third 5,000 pounds, and the fourth 3,500 pounds per cfs to achieve Mr. Babington's current production. This is well above our 5,432 pounds and almost twice as much as Mr. Busch says is average for first pond use in the industry. However, according to him, "They have achieved no greater total production per cfs than other stations with fewer serial reuses."

[GAO COMMENT: The appraiser has again assumed that Dr. Busch's figures are incorrect. Dr. Busch's reported production at his facility is 13,473 lbs./cfs--reasonably close to the State average of 10,934 lbs./cfs. If Dr. Busch's reported production at Rangen Farm of 532,712 lbs. on 40 cfs of water were produced on four uses, the first pond production would be 4,723 lbs./cfs, not 8,500 as the appraiser stated.]

Contrary to Mr. Busch's statement that "The Crystal Springs Ranch Hatchery has extremely limiting fall and reaeration potential for maintaining favorable dissolved oxygen levels..." to be objective he should add that the Rangen Farm has a lesser fall between ponds than Crystal Springs but can still use the water 6 times.

[GAO COMMENT: Although the Rangen hatchery does have limited fall, 9 to 18 inches between ponds, the fall is as great as the fall at Crystal Springs. In this regard, the two facilities are similar but the Rangen hatchery is a better designed facility. Differences exist at the Rangen hatchery which allow for

greater production per cfs than at Crystal Springs, such as concrete ponds, demand feeders, ability to recombine water, and the addition of fresh water to lower ponds.]

I am attaching a statement by Mr. Mike Fennen, a local fish biologist, which I feel will also support my opinion that Mr. Busch is not being objective with his critique. Mr. Fennen holds a B.S. Degree in Fisheries from the University of California, Humboldt, he did graduate work in Marine Biology at the University of California, Humboldt, and he worked with trout for the California Fish & Game. In 1969 Mr. Fennen took the manager's position at Thousand Springs Trout Farm, leaving in August 1980 to work for Valley Trout.

[GAO COMMENT: Valley Trout, Mr. Fennen's employer, is the parent company of Crystal Springs. The appraiser has repeatedly accused us of using what he considers biased sources, including the implication that Dr. Busch would not contradict his employer for fear of being fired, yet he seems to never question his sources that are obviously biased. Also, the document is not signed, which reduces the credibility we can place on such a document.]

Another question that develops from this report is, why didn't the staff use the information provided them by Mr. G. W. Klontz? He is a well known fish biologist for the University of Idaho who has been very familiar with fish farming in Idaho over the years and has done many research projects for the industry and published a report on "Aquaculture in Idaho & Nationwide" quoted by Mr. Busch in his critique. I feel this individual would be more creditable and have a much better understanding of fish farming in Idaho, where more than 90% of the United States commercial trout is raised, compared to Mr. Harold Hagen from Colorado or Mr. Robert Busch, a fish pathologist employed by Rangen, Inc. that directly competes with Mr. Ellis in the total fish business. The only reason I see is that Mr. Klontz's report apparently did not support the staff's directed conclusion. I have not seen Mr. Klontz's report, but it is his stated opinion that water can produce from 10,000 to 40,000 pounds of fish per cfs depending on the site, water quality, size of fish, design of the ponds, and management. This would support Mr. David Bruhn's estimate, another knowledgeable, unbiased individual.

[GAO COMMENT: The two individuals we used to evaluate the production capability of Crystal Springs are well qualified. Dr. Hagen has been involved with Idaho area trout farms for many years and is familiar with their operations. He is employed at Colorado State University and has done consulting work for the State Department for setting up fish hatcheries in foreign countries. Dr. Busch was used because of his prior consulting experience with the U.S. Fish and Wildlife Service regarding steelhead production. The production estimates provided by Dr. Klontz do not support the appraiser's position as previously explained on page 67. We did not use Dr. Klontz's information because his production estimates did not represent what could be achieved in actual practice and his apparent concern about what was actually happening in Crystal Springs. In his letter to us he stated:

"* * * I sometimes wonder if the GAO and the Corps are dealing with the same farm in question. Each agency has a different concept of what is or could be produced. Also, I talked with Mr. Ellis about what is going on and has gone on there, and his description differs from what the Corps related to me. Frankly, I am quite confused."

Another reason we did not rely entirely on Dr. Klontz's opinion was that the owner was exceptionally critical of Dr. Klontz. We wanted to be objective and decided to rely more on the other knowledgeable people we consulted.]

I have learned over the years that fish farming is a very closed industry, controlled by a few, and operated under very secret conditions. A segment of this group refuses to disclose any production and financial data, yet they are the first to criticize, without producing any documents to support their accusations. They report the industry experiences small margins and tough times but yet they continue to expand to meet a very impressive growth of 3,000,000 pounds of fish per year. The only thing that can be concluded from this is not to take the reported gloom of the industry too seriously as they are all looking forward to a very bright future.

I trust the time spent in trying to present my side of the story will not be handled in the same manner as our interview on February 22, 1981. Every attempt has been made to be as objective as possible with the hope that you will reexamine your draft and present the other point of view. Being a real estate appraiser, this is not the first time my work product has been challenged and probably will not be the last time, but the use of undocumented opinions, hearsay, and biased information from self-interest groups to support your report is not what I would have expected from the U.S. General Accounting Office.

[GAO COMMENT: Mr. Smith repeatedly accuses us of using biased sources and not fairly considering his views. We believe we have been as objective as possible. We have contacted persons on both sides of the controversy and have brought in individuals who were not previously involved in the controversy--including Dr. Klontz, Dr. Hagen, Mr. Bruhn, and others. We found little support for Mr. Smith's valuation among fish farm operators, consultants, other appraisers, or fish biologists. His supporters are limited to Ken Ellis, the owner; Corps officials; and Mr. Bruhn, Fish and Wildlife Service. Mr. Bruhn's original production estimate did not support the appraiser's but was later changed by him based on a meeting with those supporting the appraiser's valuation and an examination of data on selected trout farms provided by Mr. Ellis. Mr. Bruhn does not claim to be an expert on commercial trout farming but simply offered his opinion. The majority of the trout farms selected by Mr. Ellis and used by Mr. Bruhn in changing the estimate were either not comparable or were part of Mr. Ellis' operation.]

Mr. Smith accuses Mr. Ellis' competitors of being biased. Yet at no time has anyone clearly demonstrated or clearly explained why it is to the competitor's advantage to see Crystal Springs not sold to the Corps or to have the facility sold at a reduced price. The sale to the Federal Government would reduce competition. Although the competitors said their taxes could go up because of the sale, the people appeared very concerned that the Government was paying too high a price and were trying, as best they could, to have the Federal Government spend the taxpayers' money as efficiently as possible. They are also concerned that this sale will be used in court and other places to value water rights and estates.

Mr. Smith relied extensively on information supplied to him by potentially biased sources. For example, in the revised appraisal, Mr. Ellis was the source of the information used by the appraiser to compare Crystal Springs' reported production with production data on two other operations Mr. Ellis managed. In addition, the owner of one of these operations leased to Mr. Ellis acted as the real estate agent in the Crystal Springs transaction. The only other operation used by the appraiser for comparative purposes was a fish farm that was for sale. The appraiser's sources of information are not unbiased sources.]

I will be more than happy to discuss this with you at any time.

Very truly yours,

IDAHO LAND & APPRAISAL SERVICE CO.



Robert W. Smith, M.A.I., A.R.A.

RWS:sjj

(June 18, 1981)

TO WHOM IT MAY CONCERN:

This letter is in response to Dr. Busch's "Critique of Crystal Springs Ranch Hatchery," dated March 30, 1981.

Dr. Busch is one of the most respected trout pathologists and immunologists in the commercial trout industry. However, Dr. Busch should limit his expert testimony to the field of his profession, clinical diagnosis, and not mislead his audience by giving opinions.

One of the first observations of Dr. Busch's table is that the commercial hatcheries listed are "landlocked." The number of times the water is reused is limited by physical and geographical topography. Several examples of this would be: Clear Lakes Trout Farm is limited in the number of reuses because the affluent of production ponds flows directly into a lake. Rangen's hatchery is limited in the number of reuses because of a county road. The Snake River Trout Farm is limited in the number of reuses of water because the adjoining property is privately owned and not available for trout production. Land, water quality, water quantity, and good hatchery management practices will give the optimum production of trout.

No one to my knowledge has successfully developed a scientific equation on exactly how many pounds of trout can be produced at the facilities in the Magic Valley. Dr. Busch's figures are related to pounds of production per cfs. This is only part of the story in commercially producing trout. If you have ample elevation and land, you can increase your production significantly by reusing the water. It would be better to express production in terms of cfs and number of reuses.

Dr. Busch feels that 2.78 reuses of water is an ideal average. Using his figure of 2.78 reuses divided into his 11,025 pounds per cfs equals 4,000 pounds per reuse. The Rangen Hatchery where Dr. Busch works reuses the water 6.4 times for a total of 2,000 pounds per reuse of water. That's 50 percent below his own suggested average for production.

[GAO COMMENT: Dr. Busch does not state that 2.78 reuses of water is an ideal average. What he does say is that water in the area can usually be used four times but that the average on the facilities listed by him was 2.78 uses.]

The Crystal Springs Ranch Hatchery was primarily developed as a nursery facility to hatch eggs and raise small fish that would eventually be stocked out to local farm pond operators. The Crystal Springs Ranch Hatchery has an excellent drop in elevation from source to production ponds and from pond to pond. Ample land was available, so the production ponds were increased to use the water approximately 8 times. Again, by using Dr. Busch's average production

figure of 4,000 per reuse times 8 reuses at Crystal Springs Ranch Hatchery equals 32,000 pounds per reuse of water.

[GAO COMMENT: These calculations do not allow for any reduction in production from one use to the next and use the same erroneous assumption by the appraiser we have previously pointed out. Also, we assume Mr. Fennen means 32,000 pounds per cfs and not 32,000 pounds per reuse of water.]

My final statement is that Dr. Busch's figures represent a segment of the commercial trout industry where physical and geographical limitations are expressed whereby optimum production is limited by the lack of reusing water. His figures are quite conservative.

Sincerely,

Mike Fennen

[GAO COMMENT: Mr. Fennen is an employee of the owner of Crystal Springs as pointed out by the appraiser. Therefore, the statement should not be considered as coming from an unbiased source. Also, the most credible information we obtained supports Dr. Busch's figures which we were informed by others are not conservative.]



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