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Norman H. Bangert  
Governor

Dee C. Hansen  
Executive Director

Dianne R. Nielson, Ph.D.  
Division Director

# State of Utah

DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING

355 West North Temple  
3 Triad Center, Suite 350  
Salt Lake City, Utah 84180-1203  
801-538-5340

*mine f.*

September 6, 1989

CERTIFIED RETURN RECEIPT REQUESTED  
P 075 063 193

Mr. William P. Balaz  
Sunnyside Reclamation & Salvage, Inc.  
P O Box 99  
Sunnyside, Utah 84539

Dear Mr. Balaz:

Re: Proposed Assessment for State Violation No. N89-26-1-1, ACT/007/007, Folder #5, Carbon County, Utah

The undersigned has been appointed by the Board of Oil, Gas and Mining as the Assessment Officer for assessing penalties under UMC/SMC 845.11-845.17.

Enclosed is the proposed civil penalty assessment for the above referenced violation. This violation was issued by Division Inspector, William J. Malencik on March 29, 1989. Rule UMC/SMC 845.2 et seq. has been utilized to formulate the proposed penalty. By these rules, any written information which was submitted by you or your agent within fifteen (15) days of receipt of this Notice of Violation has been considered in determining the facts surrounding the violation and the amount of penalty.

Within fifteen (15) days after receipt of this proposed assessment, you or your agent may file a written request for an assessment conference to review the proposed penalty. The detailed brief should indicate the specific objections to the proposed assessment, stating the grounds for objection and what your assignment of points would be. (Submit a request for conference to Vicki Bailey, at the above address).

**IF A TIMELY REQUEST IS NOT MADE, THE PROPOSED PENALTY(IES) WILL BECOME FINAL, AND THE PENALTY(IES) WILL BE DUE AND PAYABLE WITHIN THIRTY (30) DAYS OF THE PROPOSED ASSESSMENT.** Please remit payment to the Division, mail c/o Vicki Bailey.

Sincerely,

A handwritten signature in cursive script that reads "Joseph C. Helfrich".

Joseph C. Helfrich  
Assessment Officer

jb  
Enclosure  
MN36/50

WORKSHEET FOR ASSESSMENT OF PENALTIES  
UTAH DIVISION OF OIL, GAS AND MINING

COMPANY/MINE Sunnyside Reclamation & SalvageNOV # N-89-26-1-1PERMIT # ACT/007/007VIOLATION 1 OF 1ASSESSMENT DATE 9/6/89ASSESSMENT OFFICER Joseph C. HelfrichI. HISTORY MAX 25 PTS

- A. Are there previous violations which are not pending or vacated, which fall within 1 year of today's date?

ASSESSMENT DATE 9/6/89EFFECTIVE ONE YEAR TO DATE 9/6/88

PREVIOUS VIOLATIONS	EFFECTIVE DATE	POINTS
<u>C88-19-1-1</u>	<u>01-11-88</u>	<u>5</u>
<u>N88-26-14-1</u>	<u>11-20-88</u>	<u>1</u>
<u>N88-30-2-1</u>	<u>03-21-89</u>	<u>1</u>
<u>N88-30-4-1</u>	<u>07-28-89</u>	<u>1</u>

1 point for each past violation, up to one year  
5 points for each past violation in a CO, up to one year  
No pending notices shall be counted

TOTAL HISTORY POINTS 8II. SERIOUSNESS (either A or B)

NOTE: For assignment of points in Parts II and III, the following applies. Based on the facts supplied by the inspector, the Assessment Officer will determine within which category the violation falls. Beginning at the mid-point of the category, the AO will adjust the points up or down, utilizing the inspector's and operator's statements as guiding documents.

Is this an Event (A) or Hindrance (B) violation? EventA. Event Violations MAX 45 PTS

- What is the event which the violated standard was designed to prevent? Damage to property, environmental harm, water pollution
- What is the probability of the occurrence of the event which a violated standard was designed to prevent?

PROBABILITY	RANGE
None	0
Unlikely	1-9
Likely	10-19
Occurred	20

ASSIGN PROBABILITY OF OCCURRENCE POINTS 20

PROVIDE AN EXPLANATION OF POINTS

The inspector statement revealed that the above named events occurred as a result of the oil spill into Grassy Trail Creek; thus 20 points are assigned.

3. What is the extent of actual or potential damage?

RANGE 0-25\*

\*In assigning points, consider the duration and extent of said damage or impact, in terms of area and impact on the public or environment.

ASSIGN DAMAGE POINTS 25

PROVIDE AN EXPLANATION OF POINTS

See attached memo of April 14, 1989, Tim Provan to Don Ostler

B. Hindrance Violations MAX 25 PTS

1. Is this a potential or actual hindrance to enforcement? \_\_\_\_\_

RANGE 0 - 25

Assign points based on the extent to which enforcement is actually or potentially hindered by the violation.

ASSIGN HINDRANCE POINTS \_\_\_\_\_

PROVIDE AN EXPLANATION OF POINTS

TOTAL SERIOUSNESS POINTS (A OR B) 45

III. NEGLIGENCE MAX 30 PTS

- A. Was this an inadvertent violation which was unavoidable by the exercise of reasonable care? IF SO - NO NEGLIGENCE;  
OR Was this a failure of a permittee to prevent the occurrence of a violation due to indifference, lack of diligence, or lack of reasonable care, or the failure to abate any violation due to the same? IF SO - NEGLIGENCE;  
OR Was this violation the result of reckless, knowing, or intentional conduct? IF SO - GREATER DEGREE OF FAULT THAN NEGLIGENCE.

No Negligence	0
Negligence	1-15
Greater Degree of Fault	16-30

STATE DEGREE OF NEGLIGENCE Negligence

ASSIGN NEGLIGENCE POINTS 10

PROVIDE AN EXPLANATION OF POINTS

Lack of reasonable care with respect to maintenance of mining equipment.

IV. GOOD FAITH MAX -20 PTS. (either A or B) (Does not apply to violations requiring no abatement measures)

- A. Did the operator have onsite the resources necessary to achieve compliance of the violated standard within the permit area?  
IF SO - EASY ABATEMENT

Easy Abatement Situation

**Immediate Compliance** -11 to -20\*

(Immediately following the issuance of the NOV)

**Rapid Compliance** -1 to -10\*

(Permittee used diligence to abate the violation)

**Normal Compliance** 0

(Operator complied within the abatement period required)

(Operator complied with conditions and/or terms of approved Mining and Reclamation Plan)

\*Assign in upper or lower half of range depending on abatement occurring in 1st or 2nd half of abatement period.

- B. Did the permittee not have the resources at hand to achieve compliance OR does the situation require the submission of plans prior to physical activity to achieve compliance?  
IF SO - DIFFICULT ABATEMENT

Difficult Abatement Situation

**Rapid Compliance** -11 to -20\*

(Permittee used diligence to abate the violation)

**Normal Compliance** -1 to -10\*

(Operator complied within the abatement period required)

**Extended Compliance** 0

(Permittee took minimal actions for abatement to stay within the limits of the NOV or the violated standard, or the plan submitted for abatement was incomplete)

(Permittee complied with conditions and/or terms of approved Mining and Reclamation Plan)

EASY OR DIFFICULT ABATEMENT? Difficult ASSIGN GOOD FAITH POINTS 0

PROVIDE AN EXPLANATION OF POINTS

The violation was prematurely terminated and a second deposition of oil and flocculated oil was discharged into Grassy Trail resulting in the issuance of a failure to abate cessation order; thus no good faith points are assigned.

Staff Biologist and Division of Water Rights staff are presently reviewing the stream mitigation plan received on June 30, 1989. Final recommendations and termination of the violation and/or cessation order are forthcoming.

V. ASSESSMENT SUMMARY FOR N89-26-1-1

I. TOTAL HISTORY POINTS	<u>8</u>
II. TOTAL SERIOUSNESS POINTS	<u>45</u>
III. TOTAL NEGLIGENCE POINTS	<u>10</u>
IV. TOTAL GOOD FAITH POINTS	<u>0</u>
TOTAL ASSESSED POINTS	<u>63</u>
TOTAL ASSESSED FINE	<u>*\$ 6,437.26</u>

\* 1620.00 x (5 days of continued effluent limitation non-compliance, March 24, 1989 through March 28, 1989) = 8100.00 - 1662.74  
(restoration to Utah Division of Wildlife Resources) = 6437.26.

jb  
MN35/178-181



DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF WILDLIFE RESOURCES

Norman H. Bangertter  
Governor

Dee C. Hansen  
Executive Director

Timothy H. Provan  
Division Director

1596 West North Temple  
Salt Lake City, Utah 84116-3195  
801-533-9335

April 14, 1989

Mr. Don Ostler, Executive Secretary  
Water Pollution Control Committee  
Utah Department of Health  
P.O. Box 16690  
Salt Lake City, UT 84116-0690

RE: Oil Spill into Grassy Trail Creek/Sunnyside Reclamation and Salvage  
Inc.'s Coal Mine

Dear Don:

A spill of approximately 2,000 gallons of an oil:water (5% oil:95% water) emulsion occurred during late evening on Friday, March 24, 1989, within the Sunnyside No. 1 coal mine. The mine is owned and operated by Sunnyside Reclamation and Salvage Inc., P.O. Box 99, Sunnyside, Utah, 84539. The emulsion, containing a soluble Texaco oil product (D1670 LWM concentrate), is used as a hydraulic fluid in the shields on longwall mining units. The soluble oil emulsion discharged into surface waters of Grassy Trail Creek via the 1.65 million gallon per day--2.55 cubic feet per second (cfs)--(measured by Utah Division of Wildlife Resources on 03/28/89) mine-water discharge system at Pole Canyon. Note: Pole Canyon has intermittent flows and was only discharging mine water at the time of the spill (Figure 1).

Mine personnel noted a milky-white discharge into Grassy Trail Creek early morning Saturday, March 25, 1989. It was flowing from their pond in Pole Canyon, which is an approved UPDES discharge facility (UT0022942). Oil and grease standards for this facility are to be less than 10 mg/l. Oil and grease as measured at the pond's discharge was 50 mg/l on Saturday, March 25, 1989. Pole Canyon flows approximately 300 feet from the pond to its confluence with the perennial Grassy Trail Creek (N1/2 NE1/4 Sec. 29, T14S, R14E, SLBM, Carbon County, Utah). Grassy Trail Creek, as measured by DWR on 3/28/89, upstream from Pole Canyon, flows 3 cfs. Thus, Pole Canyon's mine-water discharge equates to 46% of the 5.55 cfs flow in the impacted zone of Grassy Trail Creek. Grassy Trail Creek was turned a milky-white color due to the soluble oil emulsion.

Utah Division of Oil, Gas, and Mining (Bill Malencik) was notified by mine personnel of the problem during late morning, Saturday, March 25, 1989. Notification by the mine of the U.S. Environmental Protection Agency and the Utah Department of Health concerning the oil spill was not expeditious. Their notification occurred during late afternoon of Monday, March 27, 1989. Mike Reed (EPA) and Don Hilden (Utah Division of Environmental Health) were told of

*Bureau of water pollution control*

the exceedance for the 10 mg/l oil and grease standards at the UPDES discharge point in Pole Canyon. No discussion of an oil spill into the stream was made by the mine.

On Monday, March 27, 1989, (2:30 PM), the mine began to inject a flocculant (Thatcher Chemical Product, T-Floc-IF9) into the mine-water discharge system. Its purpose was to pull the oil out of the solution and deposit it within the settling pond at Pole Canyon. The T-Floc was injected at a rate of 5 gallons/hr (72.7 ppm). Prior to injection of the flocculant, oil and grease being discharged from the pond reached 236 mg/l. The rate of injection for the flocculant was decreased on March 28, 1989, to 2 gallons/hr (29.2 ppm). Oil and grease levels being discharged from the pond were reduced to 20.7-18.8 mg/l by March 29, 1989. The rate of injection for the flocculant was again decreased on April 1, 1989, to 0.67 gallons/hr (0.40 ppm). Oil and grease being discharged from the pond were measured as 7.18 mg/l and 6.5 mg/l on April 2 and 4, respectively. Violation of the UPDES Permit and pollution to Grassy Trail Creek due to an oil spill likely spanned the 9 day period of March 24 through April 1, 1989.

I thought violat  
documented similar.

An anonymous complainant notified Utah Division of Wildlife Resources (Division) of the problem early morning Tuesday, March 28, 1989, since dead fish were evident in the stream. Simultaneously, the U.S. Fish and Wildlife Service and the Utah Department of Health's Division of Environmental Health in Price notified the Division of Wildlife Resources. We proceeded to advise the mine, as well as collect water and biological samples along the reach of polluted stream on that date.

Division personnel inspected the problem area on March 28, 29, and again on April 7, 1989. A 3.3 mile length of stream below the point of pollution--confluence of Pole Canyon with Grassy Trail Creek--evidenced 72 dead trout (67 rainbow and 5 brown). This equates to 20 dead rainbow trout and 2 dead brown trout observed per mile. All dead fish were adults, 10 inches or longer. The fish appeared to have been dead for several days. No fish loss was evident upstream from the point of pollution. Intensive evaluation of the fish kill and instream habitat degradation due to the oil emulsion and T-Floc was planned for a later date, April 7, 1989, when the water cleared.

Mar 28  
29

shocking done on April 7, I visit

site on Apr. 12  
later on Apr. 2

Management of Grassy Trail Creek between 1969 and 1979 was with annual stockings of 400 to 1,000 catchable sized rainbow trout. No fish were known to be present prior to that date. Since 1980, fish management has been with self sustaining rainbow and brown trout populations through natural reproduction. Experimental stockings of 1,000 brown trout fingerlings per year occurred proximal to the coal mining operations in 1984, 1985, and 1986. Albino rainbow trout (surplus brood stock 2 lbs. or larger) were stocked in 1987 (179 fish) and 1988 (150 fish).

89-73 - total plant  
84-76 1000 lb  
87-88 1500 lb  
CST. 211W.

Grassy Trail Creek, as a trout fishery, has two distinct areas. The stream reach above Water Canyon is the best section due to less sedimentation and

2 ~ 1 mi above Pole Canyon.

pasture canyon is rocky area.

*← also in 1983 survey*

improved riparian habitat. Population estimates from electro-sampling in 1983, 1987, and 1989 showed 160 (57.1 lb/acre), 561 and 1,535 (163 lb/acre) trout per mile, respectively. Nongame fish were not present. During 1983 only rainbow trout were present. By 1987, 66% of the fish population were rainbow and 34% were brown trout. A similar relationship of 74% rainbow and 26% brown trout was observed in 1989.

3:11 P.M. PG  
large water flow

The section of Grassy Trail Creek between East Carbon City and Water Canyon shows substantial degradation due to livestock grazing and sedimentation from tributary drainages. Periodic mine-water discharges over the years appear to have impacted the stream. Fish population estimates from electro-sampling in 1969, 1970, 1983, 1986, 1987, and 1989 showed 90, 180, 0, 88, 87, and 350 trout per mile. Prior to 1989, all of the fish sampled were rainbow trout. By 1989, 85% of the fish population were rainbow and 15% were brown trout.

2. 1989 survey  
1. 1983 survey  
1987 survey  
1986 survey  
1970 survey  
1969 survey

A Division of Wildlife Resources electro-survey of the stream on April 7, 1989, showed only two fish, both of which were adults, in a 0.2 mile sample area, alive in the polluted zone (Sample station 1-2-2 and 1-3C-1). Sampling immediately above that impacted zone (Sample station 1-3B-1) showed a trout population of multiple age classes which equated to 350 fish/mile (85% rainbow and 15% brown). Fish biomass in the polluted zone was reduced to 4.6 lb/acre (1.97 kg/mile) compared to 126 lb/acre (54.25 kg/mile) immediately upstream in a nonimpacted area. Thus, a 97% loss in fish numbers--1,122 trout (954 rainbow and 168 brown)--and a corresponding 96% decrease of fish biomass occurred in the 3.3 mile long impact zone (Table 1).

2. 1989 survey  
1. 1983 survey

7. 1989 survey  
both used  
was the  
same effort  
in 1983.  
A loss of  
1122 fish

Macroinvertebrate populations in the polluted zone were also damaged. They were decreased in number of organisms by 91% (15 specimens/square foot) immediately below the point of pollution to 58% (67 specimens/square foot) 3.3 miles downstream as compared to the 160 specimens per square foot in the adjacent nonpolluted upstream segment.

350 x 3.3 = 1122

The mechanism for kill of the fish and macroinvertebrates was plugging of the gills by longchain hydrocarbons from the soluble oil. Such a reaction is immediate under high concentrations of oil. The UPDES discharge limit is 10 mg/l. The mine's discharge was five times that level when first noticed and first elevated to nearly 24 times the permitted level.

*coating*

10 x 24 = 240

Texaco has tested the emulsion (5% oil: 95% water) and reported that fathead minnows perished in a static system when 1,000 ppm were reached (LC 50, 96 hr.). Daphnia also perished at the same level (LC 50, 48 hr.).

*This is extremely high!*

← Is this L.D. 5  
(lethal dose)

John Neuhold, Fishery Ecologist and Assistant Dean, Department of Fish and Wildlife at Utah State University, indicated that soluble fractions of Wyoming crude oil caused mortality in rainbow trout fingerlings at levels ranging from 0.15 to 2.7 mg/l. In the same evaluation, fathead minnows perished at 5.4 mg/l. In both tests, flow-through rather than static systems were used, and the longer the time of exposure the higher the mortality rate. Also, the

1. 1983 survey  
2. 1986 survey  
3. 1987 survey  
4. 1989 survey

U.S. Environmental Protection Agency's Water Quality Criteria Handbook (1976) identified mortality in benthic organisms (macroinvertebrates) as occurring between 1 and 10 mg/l. Long term exposure of aquatic organisms to soluble oils can result in mortality due to the small chain aromatic hydrocarbons, also. They ultimately inhibit enzymatic actions in the metabolic process.

The T-Floc, which is believed to have been injected after the aquatic organisms died, can be toxic due to its sodium hydroxide element. Total mortality of aquatic organisms, as reported by Thatcher Chemical Company, has been measured at 100 to 110 ppm (TLM, 96 hr.). The highest level of T-Floc was 73 ppm, and it would have been diluted by 55% when it reached Grassy Trail Creek; likely the flocculant had no impact on the stream.

Monetary value of the fish that were killed amounted to \$1,662.74 (Table 2). In addition, an opportunity for an unknown number of recreational fishing days has been lost. The substrate remains damaged due to adherence of the emulsified oil and penetration of that oil into the interspaces of the gravels. This damaged the macroinvertebrate population, which represents the forage base for fish life. Such damage will persist until the substrate is scoured by a high volume run-off. Then, a year or two will be required for total reestablishment of the benthic organisms.

Don, the following recommendations are provided for your consideration:

1. Utah Division of Wildlife Resources must be reimbursed \$1,662.74 by the mine for monetary value of the fish killed by pollution.
2. T-Floc-IF9, or a suitable substitute having no potential to impact the aquatic environment, must be injected until discharge from the Pole Canyon UPDES Discharge Pond (UT0022942) meets an acceptable standard.

Note that the 10 mg/l oil and grease limit on the UPDES discharge permit does not protect fish life and benthic organisms from soluble oils. In the coal mining industry, longwall mining units utilize high volumes of soluble oils, and many of these mines have UPDES mine-water discharge permits.

It is recommended that soluble oils in a discharge be restricted to less than 1 mg/l. *may be possible from umc 217.97(1)6)*

- 3. The mine must expeditiously modify conditions underground so that inadvertent releases of soluble oil do not occur.
  - (a) Mine water contaminated with soluble oil during routine mining practices should be diverted to underground sumps or old workings where it can be treated to remove the oil.
- 4. The pond now has a layer of soluble oil that has been precipitated to the bottom due to the flocculant. The mine water discharge should be diverted around the pond and the pond be allowed to dry and then be dredged. Oil laden sediments must be appropriately disposed.

*Don, the following recommendations are provided for your consideration:*  
*1. Utah Division of Wildlife Resources must be reimbursed \$1,662.74 by the mine for monetary value of the fish killed by pollution.*  
*2. T-Floc-IF9, or a suitable substitute having no potential to impact the aquatic environment, must be injected until discharge from the Pole Canyon UPDES Discharge Pond (UT0022942) meets an acceptable standard.*  
*Note that the 10 mg/l oil and grease limit on the UPDES discharge permit does not protect fish life and benthic organisms from soluble oils. In the coal mining industry, longwall mining units utilize high volumes of soluble oils, and many of these mines have UPDES mine-water discharge permits.*  
*It is recommended that soluble oils in a discharge be restricted to less than 1 mg/l. may be possible from umc 217.97(1)6)*  
*→ 3. The mine must expeditiously modify conditions underground so that inadvertent releases of soluble oil do not occur.*  
*(a) Mine water contaminated with soluble oil during routine mining practices should be diverted to underground sumps or old workings where it can be treated to remove the oil.*  
*→ 4. The pond now has a layer of soluble oil that has been precipitated to the bottom due to the flocculant. The mine water discharge should be diverted around the pond and the pond be allowed to dry and then be dredged. Oil laden sediments must be appropriately disposed.*  
*Does this?*

How often?  
How intense?  
How long?  
Cost?  
Timing?

(a) Future management of the pond by the mine should include periodic biomonitoring with live rainbow trout to monitor water quality of the discharge. The Division will issue the appropriate permit for this action.

Does  
Timothy  
know?

(b) Water quality monitoring needs to be increased due to the evidence in the stream of historic discharges from the pond having high nutrient loads and high concentrations of oil and grease.

If within 100 ft of  
Grassy trail (could be closed)  
Public walk-in? (?)  
before mitigation.

5. In order to maintain the wild trout quality of the stream, restocking will be accomplished through natural downstream drift. Because of the fish kill, a substantial loss of angling opportunity will occur. We suggest that mitigation for this loss can be accomplished by the mine allowing public walk-in access for life-of-mine along the full length of stream and at the Whitmore Reservoir. We would not recommend vehicle access for the public beyond the existing gate. The Division of Wildlife Resources would appropriately manage Whitmore Reservoir to accommodate the anticipated increased angler use.

(a) The mine should be encouraged to erect an informational sign near the mouth of the canyon indicating that the stream and Whitmore Reservoir are open to public walk-in access for purposes of angling.

Other grazing  
might not be adequate

6. Mitigation for damage to the aquatic habitat, (the stream's substrate, and its potential to provide forage--macroinvertebrates--for fish life) as riparian enhancement must occur. We recommend the mine should fence the stream such that livestock grazing is precluded between the reservoir and Sunnyside town. This will stabilize streambanks, reduce sediment loading, improve substrate conditions, and allow for cooler summertime temperatures due to shade. An enhanced riparian will increase available detritus for use as forage by macroinvertebrates.

If you have any further questions, please coordinate with the Resource Analyst, Larry Dalton (telephone 637-3310), in our Price Regional Office.

Sincerely,

*Darrell H. Nish*  
Acting Director

Timothy H. Provan  
Director

cc: U.S. Environmental Protection Agency  
Sunnyside Reclamation and Salvage, Inc.  
Division of Oil, Gas and Mining  
David Ariotti, Division of Environmental Health, Price

Enclosures



Table 1. Age and growth of trout collected with electrogear from Grassy Trail Creek, Utah, on April 7, 1989

Station	Species	Parameter	AGE					
			I	II	III	IV	V	VI (+)
1-2-2	Rbt	N						
1-3C-1	Rbt	N			1	1		
		$\bar{X}$ TL (mm)			212	230		
		$\bar{X}$ W (g)			91	106		
		$\bar{X}$ K			.96	.87		
1-3B-1	Rbt	N		1	15	9	1	3
		$\bar{X}$ TL (mm)		126	194	227	262	347
		$\bar{X}$ W (g)		26	83	133	202	494
	$\bar{X}$ K		1.30	1.12	1.13	1.12	1.17	
	Brn	N		1		3*	1*	
		$\bar{X}$ TL (mm)		129		300	337	
$\bar{X}$ W (g)			24		236	337		
		$\bar{X}$ K		1.12		0.87	0.99	

*length & weight ratio around 1.0 is best.*

\*Assumed stocked as fingerling in 1984-5, respectively

TABLE 2

Monetary value of fish lost due to Sunnyside Reclamation and Salvage's pollution of Grassy Trail Creek on March 24, 1989. Methodology derived from "Monetary Values of Freshwater Fish and Fish Kill Counting Guidelines" (1982). Prepared by the Monetary Values of Freshwater Fish Committee and the Pollution Committee, American Fisheries Society; special publication No. 13 (ISSN 0097-0638); 40 pp.

Size Class (% Total)	Fish Kill (Number of Fish)	1979-80 Value (\$/Fish)/Total	Consumer Price Index** (Increase From 1979-80 to Feb. 1989)	1989 Value (\$)
954 Rainbow Trout				
5" (3.5%)	33	0.39/\$12.87	56.9%	\$20.19
8" (52%)	497	0.67/\$332.99	56.9%	\$522.46
9" (31%)	296	0.83/\$245.68	56.9%	\$385.47
10" (3.5%)	33	1.06/\$34.98	56.9%	\$54.88
14" (10%)	95	2.06/\$195.71*	56.9%	\$307.07
168 Brown Trout				
5" (20%)	34	0.39/\$13.26	56.9%	\$20.81
12" (60%)	100	1.60/\$160.00	56.9%	\$251.04
13" (20%)	34	1.89/\$64.26	56.9%	\$100.82
TOTAL:				\$1,662.74

\*1979-80 value is \$1.89/lb. average 14" rainbow trout in sample weighed 1.09 lb. (494 grams).

\*\*U.S. Bureau of Labor Statistics, Consumer Price Index (CPI-U)