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February 13, 1985

Mr. Larry Gilbertson
Aquatic Group Leader
Harza-Ebasco Susitna Joint Venture
711 H Street
Anchorage, Alaska 99501

Dear Mr. Gilbertson:

Please find attached our comments on the draft Long-Term Aquatic Monitoring Plan.

In general, the plan needs a better definition of purpose and objective. The plan is not solidly defined and leaves the reader pondering the question of impact assessment. Before a plan such as this is drafted an assessment of the impacts related to the project are needed. As of yet there appears to be no clear assessment provided in this or previous reports.

A major shortcoming in our view, is the lack of a clear resident fish monitoring program in the middle river and in the impoundment. We feel that the adult and juvenile salmon programs will not provide sufficient overlap for resident species in the middle river. The lower river monitoring requirements also need to be addressed. There also needs to be a program to monitor impoundment grayling and other species in lateral lakes and streams as project (construction) personnel and other incidental activities will impact resident species.

The discussion on heavy metals needs improvement. We suggest that more discussion of the need for this program and an improved analysis of potential problems be prepared before the monitoring program be developed.

If we can be of additional assistance, please feel free to call on me.

Sincerely,

Dana Schmidt
Acting Aquatic Studies Coordinator
Su Hydro Aquatic Studies
Department of Fish and Game
(907) 274-7583

cc: Project Leaders
L. Bartlett
A. Bingham
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February 13, 1985

ALASKA DEPARTMENT OF FISH AND GAME
SUSITNA HYDRO AQUATIC STUDIES

SPECIFIC COMMENTS TO
DRAFT LONG-TERM MONITORING PLAN

WRITTEN BY

HARZA EBASCO SUSITNA JOINT VENTURE
JANUARY, 1985

page, paragraph	comment
1, 1	Construction is scheduled to begin pending issuance of a license... The term natural conditions may be better stated as pre-project conditions throughout the plan text.
1, 2	Will the impacts be unique to each phase of the project relative to the pre-project conditions, or what? There are no impacts associated with the pre-project condition.
2,	(1) Assess the potential efficiency....
2,	(1) This document only addresses...
2	(3) If impacts are to be assessed, wouldn't they be actual impacts? A monitoring program would study actual impacts while an instream flow or other impact program would assess potential impacts.
2, 2	Why are impacts being assessed in a monitoring plan? Monitoring of impacts for operation only does not agree with the last sentence in this paragraph but if it is meant as it reads, more detail on the pre-project and construction phases should be given.

Only the middle reach is discussed in detail in the text of the plan. Perhaps it should be made clear here that the plan will address only those impacts that affect the middle reach. If potential impacts are identified in the lower river, the monitoring plan will require some expansion.

General Comments on Section 1.0

This section confusing as worded. It does not adequately describe the background behind the development of a aquatic monitoring plan or how it will fit into the license or settlement processes.

3, 1 Isn't the IFRR report by EWT&A supposed to provide an understanding which impacts need to be monitored? If not, is this plan intended to assess impacts? If it is intended as an impact assessment, it is not adequate for that purpose.

3, 2 The purposes of the monitoring program is to:

verify pre-project impact predictions.

How do the first and second objectives differ?

if necessary, provide input to refine operations and mitigation measures.

provide supplemental baseline information to evaluate impacts and mitigation options.

3, 3 How many objectives are there? The section on purposes reads like the objectives.

Is the final plan part of the settlement or licensing process or both?

3, 4 When will an open workshop be held? A schedule of events is needed.

4, 2 The length of time and the data requirements needed for pre-project monitoring will depend...

4, 3 Will the parameters which are important and which are good indicators be the same? Who will decide which are important and good indicators? Does only readily measured and analyzed parameters imply that expensive or difficult parameters to measure (if needed) will not be measured?

5, 1 Only the pre-project monitoring program relative to this plan will begin in 1985. Data applicable to the program has been collected over the past several years.

An appendix summarizing the previously collected data should be included.

If the schedule will address only the specific parameters mentioned in the plan it should be stated here; or the state specific parameters mentioned to avoid confusion.

5, 2 Up to page 5 there has been no clear statement of what projected impacts are being discussed so how can they be confirmed?

Who will decide if mitigation measures require modification? Will there be a committee to decide this and agree on specific modifications? Will the resource agencies be on any committee; formed for this purpose?

5, 3 After rectification of "severe impacts", a decrease in field study can only be justified after long-term monitoring of the modification result is complete.

Does this paragraph mean to say that only significant or severe impacts will be corrected? Again, who makes these decisions?

When will the monitoring program schedule be available?

6,	1	What is meant by acceptable limits? Is this the no net loss mentioned on page 28, paragraph 4?
6,	2	4. Mercury/heavy metals. How can you monitor something that has not been completely assessed?
		Upwelling should be a 5th category to the water quality list.
		There should be a resident fish program to monitor rearing populations and mainstem overwintering. A program for resident fish need not be large but it does need to be considered.
8,	2	concentration <u>can</u> exceed...
		The sentence on the decay rate below Devil Canyon is not true. The slopes (figure 2) are not significantly different.
8,	3	Additional <u>pre-project</u> data?
11,	2	How will the effects of spillway discharge be evaluated? Do we wait for the 50 year flood mentioned on page 7, paragraph 4?
		An additional objective should reassess mitigation actions if necessary.

11,	3	Concentrations previously collected. Testing and operation of the cone values at both Watana and Devil Canyon dams.
12,	1	Continual monitoring at Curry is not needed. A decay rate profile can be obtained by floating the river at various discharges.
12,	4	Dissolved gas sampling over a full range of with-project flows has already been completed.
13,	1	What affect, if any, will power house flows have on gas supersaturation. Monitoring of gas supersaturation should probably be instituted for the history of the project and not just until the cone values operate satisfactorily.
13,	2	If significant amounts of data have already been collected why is one full season of continuous pre-project monitoring needed? Why not just fill in the gaps?
13,	3	This paragraph answers the questions posed about the preceding paragraph. The information about the use of pre-project data should be disclosed in paragraph 2.

Relationships that will be better defined are those:

We suppose that continuous recordings would include a wide range of discharges.

Table 1 Dissolved gas monitoring may have to be done more than one season if a full range of pre-project flows are to be experienced.

Resident species have been omitted. See comment 6, 2.

General Comment on Gas Saturation

The current exceeding of water standards by total dissolved gas (TDG) suggests that a long term record may be desirable for legal reasons.

15, 3 Water temperature in the spring are expected to be below...

16, 2 It would be helpful if river miles were reported with the mentioned sloughs so the reader can form a mental image as to how far apart the ice front will be on warm and cold years.

16, 3 There is not enough data on food habits and on the impacts of temperature changes of food sources to say this impact is anything but potential. Metabolism and food requirements will be elevated with increased water temperature. If the food supply is not adequate, starvation and susceptibility to disease could result. Also, fish growth will be affected all year round.

Reducing growth of juvenile fish in the open water season.

Altering the overwintering and incubation habitat conditions... This could also lengthen incubation time and delay the emergence.

Overtopping of upstream berms is not supposed to happen if they are raised.

Other potential impacts which should be listed are: 1) warmer water in the fall could alter the migration patterns of overwintering juvenile salmon; and 2) temperature changes could stimulate and affect outmigration timing of juvenile salmon so they would reach Cook Inlet at an unfavorable time from the standpoint of food availability.

17,	3	Other stations should include the key slough and side channel sites.
19,	1	There is no comparative data on the present overwintering mortality for "young salmon". There is only egg to outmigrant data on the survival of 0+ chum and sockeye salmon. The 1984-85 winter program should help define overwintering mortality.
19,	2	A statement on the refinement of operating procedures such as this should be included for all subjects discussed.
19,	3	The peak turbidity units may be too high. It would be better to report the weekly or monthly averages and ranges.
20,	2	To detect changes in a fishery resource, or fisheries resources as stated here, would require that that particular resource be monitored. It is stated that not all the important resources are being considered in this plan. Is it being assumed that if the conditions for a few are monitored the others will be covered as well?
20,	4	The comment for 20, 2 applies to this objective as well.
21,	1	What is meant by a "fairly" extensive coverage?

21,	3	Will weekly sampling provide an adequate representation of natural turbidity conditions? Present data suggests wide variation can occur over a single week. We recommend daily sampling at the Curry or Talkeetna fish migrant study sites. Whose standard methods? There are several in use. How do you plan to analyze suspended sediment versus turbidity data?
22,	3	If turbidity can not be controlled, are there any mitigation options planned?
23,	1	It is not true that only Hg "bioaccumulates" to dangerous levels in aquatic organism. There are several papers written on the effects of heavy metal leechates from mine tailings that will refute this statement. The word "bioaccumulate" can not be found in any English language dictionary that we are aware of. Perhaps using "concentrates" would be better.
23,	2	Would not, in many cases, chelation tend to inhibit the toxicity of heavy metals?

23,	3	How will fewer fish in the impoundment minimize Hg "bioaccumulation" in those affected? It seems that the effects will just be less noticeable because of "limited fish populations".
24,	3	It is not true that Zn will not concentrate to dangerous levels within aquatic organisms. Much work has been done in Idaho and Montana on the effects of Zn, Cu, Cd and Hg as principal heavy metals in aquatic systems. E. Woody Trihey should be aware of much of the work done on the Couer d'alene River drainage in Idaho by Washington State University and the University of Idaho in the early 1970's.
25,	2	Technically there is no "tundra" in the impoundment area. Muskeg perhaps, but not tundra by definition.
25,	3	Restructure the last sentence to read "These areas will be samples for both natural (pre-project is preferred) and with-project conditions.
25,	4	Wouldn't it be better to select one or two target species ubiquitous to both areas? For example burbot and Arctic grayling.
26,	4	How many fish are needed each year for the study?

26, 6 Do the author(s) mean inorganic nitrogen and phosphorus?

27, 3 The project may potentially affect discharge from middle river sloughs? Seems it will for certain especially if berms are made at their heads.

28, 2 A major shortcoming of this plan is the lack of a resident fish program. See our FY 86 plan of study for our proposal. The numbers of rainbow trout, Arctic grayling, Dolly Varden and other resident species will likely increase with the project. Burbot, currently more a subsistence species than a sport species, will likely be reduced in numbers.

Does the incidental catch of sportfish referred to mean those taken by the fishwheels? Very little pertinent information on trends in population size and composition can be ascertained from this method because of low catches and seasonal movements. Fishwheels are ineffective when sampling resident species with the possible exception of humpback whitefish. Fishwheels are deployed after the immigration (May) and removed before the outmigration (September/October).

29, 2 In 1983, only sockeye and chum were tagged with coded wire tags by ADF&G. Delete the extra wording of sloughs in this sentence.

RE: the last sentence. We don't have population and survival parameters for juvenile chinook, coho or pink salmon. Only indices of distribution and relative abundance. Are estimates of population and survival for these species going to be part of the program?

29, 3 A monitoring effort on the Talkeetna River should be considered as a control.

30, 1 Mentions of juvenile fish in the adult subobjectives seems inappropriate and should perhaps be in the juvenile section.

30, 2 This depends on the accurate and complete operation of the Adult Anadromous program because all survival estimates are based on this data. The cold branding program on chinook and coho may provide some data but if we are going to be expected to provide data on all five species, we had better initiate a program with open water this spring.

30, 3 Monitor long-term trends in the numbers and the timing of emergence...

Will there be a program to provide this data over the long term?

Sunshine, in addition to Curry, is needed to monitor the adult escapement.

31, 2 A permanent monitoring station should be developed on the Talkeetna River to provide baseline data for comparison to post-project conditions on the Susitna River.

31, 3 Only scale samples need be collected to determine age, weights are not necessary for age determination.

31, 4 We do not have the correct type of sonar (Biosonics) to place near fishwheels at Curry and still expect to accurately differentiate between adults destined for the middle reach and those engaged in milling activity.

Sonar may replace the need for mark/recapture efforts but until sonar can differentiate species, age, sex and size, fishwheels will be a necessary component.

31, 5 Length, age and sex sampling is done at the fishwheels and not on the spawning grounds. Tag numbers, except for "observation life" tags, can not be reliably observed during surveys of live salmon . Other tag numbers can be recorded from carcasses only.

32, 2 Smolt traps are better termed outmigrant traps.

32,	4	Again, a control station on the Talkeetna River needs consideration.
33,	2	Don't forget that juveniles need to get in and out (resident fish also) before the adults return.
33,	5	Delete <u>to measure run size</u> from the first sentence. Also change sentence tense.
		What are "natural" levels of production?

The last sentence is nonsensical and should be reworded.