

STATE OF WASHINGTON

DEPARTMENT OF ECC

DANIEL J. EVANS
GOVERNOR

JOHN A. ...
DIRECT

Publication No. 72-e40

WA-35-1010

MEMORANDUM

December 10, 1971

MEMO TO: DICK CUNNINGHAM

FROM: RON PINE

SUBJECT: Columbia and Snake River Transects

In response to your request of November 8, 1971, transect studies were completed below Ice Harbor Dam on the Snake River November 17, 1971, and on Rock Island Dam on the Columbia River November 18, 1971. The results of the Snake River transect are presented in Table 1 and of the Columbia River transect in Table 2. The location of each transect and the best approach by car for sampling is shown in Figure 1 (Snake River) and Figure 2 (Columbia River).

The objective of the transect studies was to suggest new and safer locations for the present routine monitoring stations at Ice Harbor and Rock Island Dams that would be representative of existing water quality at these two locations.

The Snake River transect was located beneath the U.S. Geological Survey gage and cable car crossing approximately 1 mile below Ice Harbor Dam. This is the only location below the dam that would be accessible year around by car and where the river can be easily sampled from the bank. The data in Table 1 indicate that it is questionable whether this is a good location for routine monitoring station. At Station 1 (arms length from bank), the nitrate value was 30% less than the rest of the stations in the cross section and all of the free ammonia is not completely oxidized. There also seems to be a slight variation in the total coliform values.

The Columbia River transect at Rock Island Dam was located at a series of power crossings approximately 3.5 miles below the dam. All of the data in Table 2 indicate that this would be an acceptable location for a routine water quality monitoring station. At the transect location there are seven groups of high voltage power lines crossing the river. The station should be sampled from a concrete pump house beneath the fifth group of power lines counting from the upstream group.

RP:mh
64/5

cc: John R. Raymond
Tom Haggarty

Table 1. Results of transect study below Ice Harbor Dam on the Snake River, November 17, 1971. All values are expressed in mg/l unless otherwise noted.

PARAMETERS	STATION NUMBERS*				
	1	1A	2	3	4
Time	1420	1420	1250	1310	1302
Temp. C	10.0	10.0	10.0	10.0	10.0
D.O.	10.8	10.8	10.8	10.8	10.8
pH	8.0	8.0	8.0	8.0	8.0
Cond. μ mhos/cm	28	17	46	50	46
Alk. as CaCO ₃	135		135	135	135
Chloride	15		14	13	13
Total Coliform Colonies/100ml	30		<100	24	<100
Fecal Coliform Colonies/100ml	<20		<20	<20	<20
NH ₃ - N	.04		.00	.00	.00
NO ₃ - N (Filt.)	.48		.68	.69	.69
NO ₂ - N (Filt.)	<.01		<.01	<.01	<.01
T-PO ₄ (Filt.)	.01		.01	.02	.02
O-PO ₄ (Filt.)	.01		.01	.02	.01

* Station Descriptions

- Station 1 - Arms length from north bank.
- Station 1A - 8 feet from north bank.
- Station 2 - 20 feet from north bank.
- Station 3 - Center of navigation channel.
- Station 4 - South edge of navigation channel.

Table 2. Results of transect study below Rock Island Dam on the Columbia River, November 18, 1971. All values are expressed in mg/l unless otherwise noted.

PARAMETERS	STATION NUMBERS*/DEPTH IN FEET										
	1		2			3			4		
	1	12	1	12	60	1	12	60	1	12	30
Time	1005		1017			1040			1055		
Temp. C	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5
D.O.	10.0	10.0	10.0	10.0	10.4	10.0	10.0	1.04	10.0	10.0	10.2
pH	7.6	7.6	7.6	7.6	8.6	7.6	7.6	7.6	7.6	7.6	7.6
Cond. μ hos/cm	240	260	260	260	260	260	260	260	260	260	260
Alk. as CaCO ₃	58	57	55		56	55		57	55		
Chloride	1.0	1.0	1.0		1.0	1.0		1.0	1.0		
Total Coliform Colonies /100 ml	100		180			200			180		
Fecal Coliform Colonies/100 ml	<20		<20			<20			<20		
NH ₃ - N	0.00	0.00	0.00		0.04	0.04		0.06	0.04		
NO ₃ - N (Filt.)	0.17	0.16	0.15		0.14	0.15		0.15	0.15		
NO ₂ - N (Filt.)	0.00	0.00	0.00		0.00	0.00		0.00	0.00		
T-PO ₄	0.02	0.01	0.03		0.03	0.02		0.02	0.02		
O-PO ₄ (Filt.)	0.01	0.01	0.00		0.00	0.01		0.02	0.00		

* Station Descriptions:

- Station 1 - Next to pump station on east bank.
- Station 2 - East quarter of channel.
- Station 3 - Center of navigation channel.
- Station 4 - West quarter of channel.

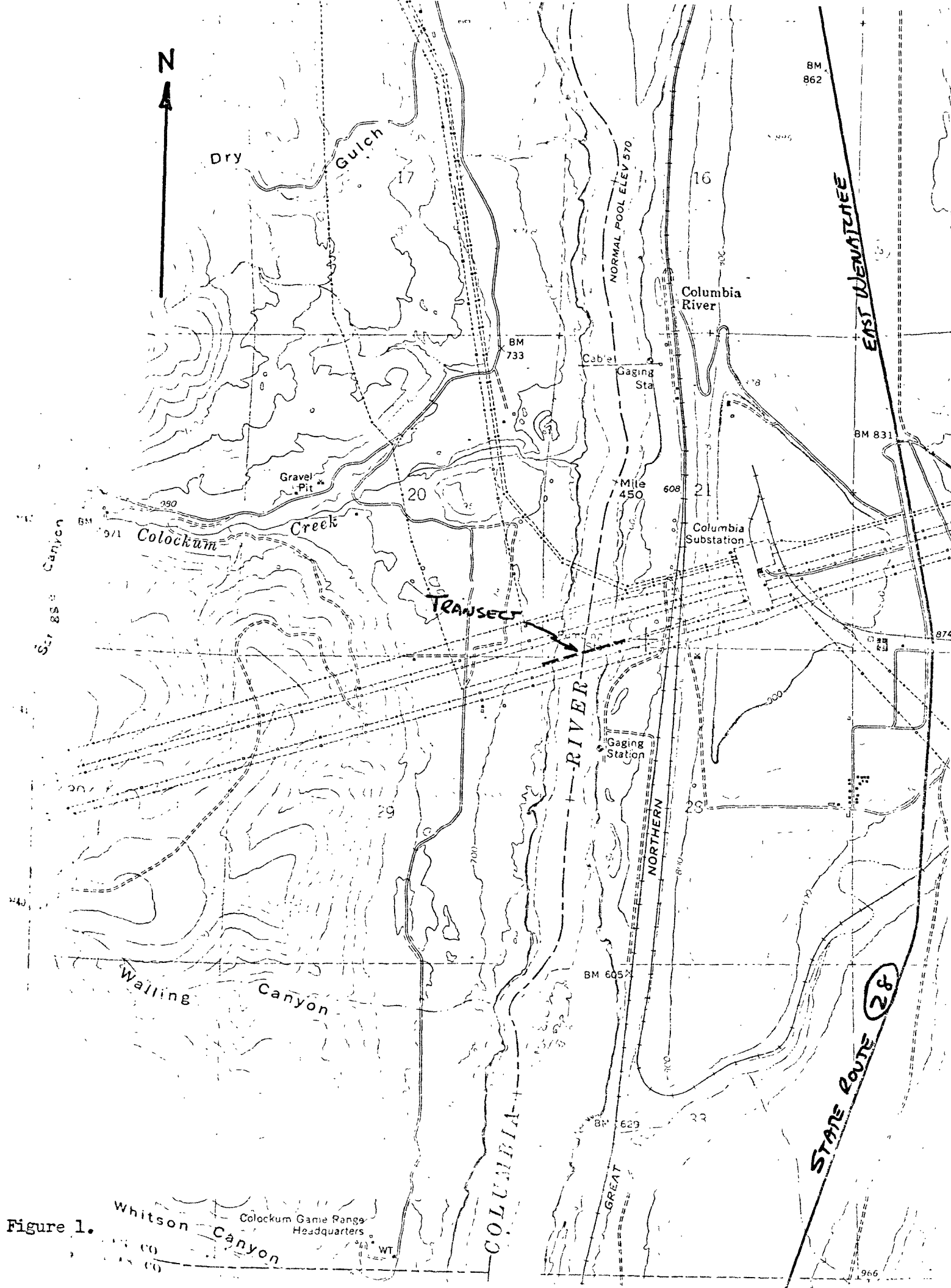


Figure 1.

Whitson Canyon Colockum Game Range Headquarters

equipped with signal equipment. (2) Visual. Visual signals are located outside each lock gate and will be used in conjunction with the sound signals. When the green light is on, the lock is ready for entrance and vessels may enter under full control. When the red light is on, the lock cannot be made ready immediately and the vessel shall stand clear.

Permissible dimensions of boats. The lock chamber is 86 feet wide by 664.5 feet long in the clear. Single tows aggregating 550 feet or less in length will be permitted to lock through without disassembly. At normal pool elevation of 440 feet above m.s.l., the depth of water over the upstream gate sill will be 18 feet. The upstream sill elevation is 422 feet m.s.l. The depth of water over the downstream gate sill will depend upon the flow in the river but will usually exceed 19 feet when McNary Pool is at 340 feet m.s.l. The downstream gate sill elevation is 321 feet m.s.l. Gauges are located on the guide walls at each end of the lock and on the lock walls at each end. These gauges indicate water surface elevations in feet above m.s.l. Depth of water over the sills should be calculated before entrance into the lock. A craft must not attempt to enter the lock if its beam and length are greater than the above-indicated dimensions or if its draft exceeds the calculated depth over the sills with adequate allowances for safe clearances.

ICE HARBOR DAM AND LOCK

Navigation regulations are published in Chapter 2, Coast Pilot 7, or subsequent yearly supplements and weekly Notices to Mariners. Copies of the regulations may be obtained at the office of the District Engineer, Corps of Engineers in Walla Walla. Refer to section number 207.716.

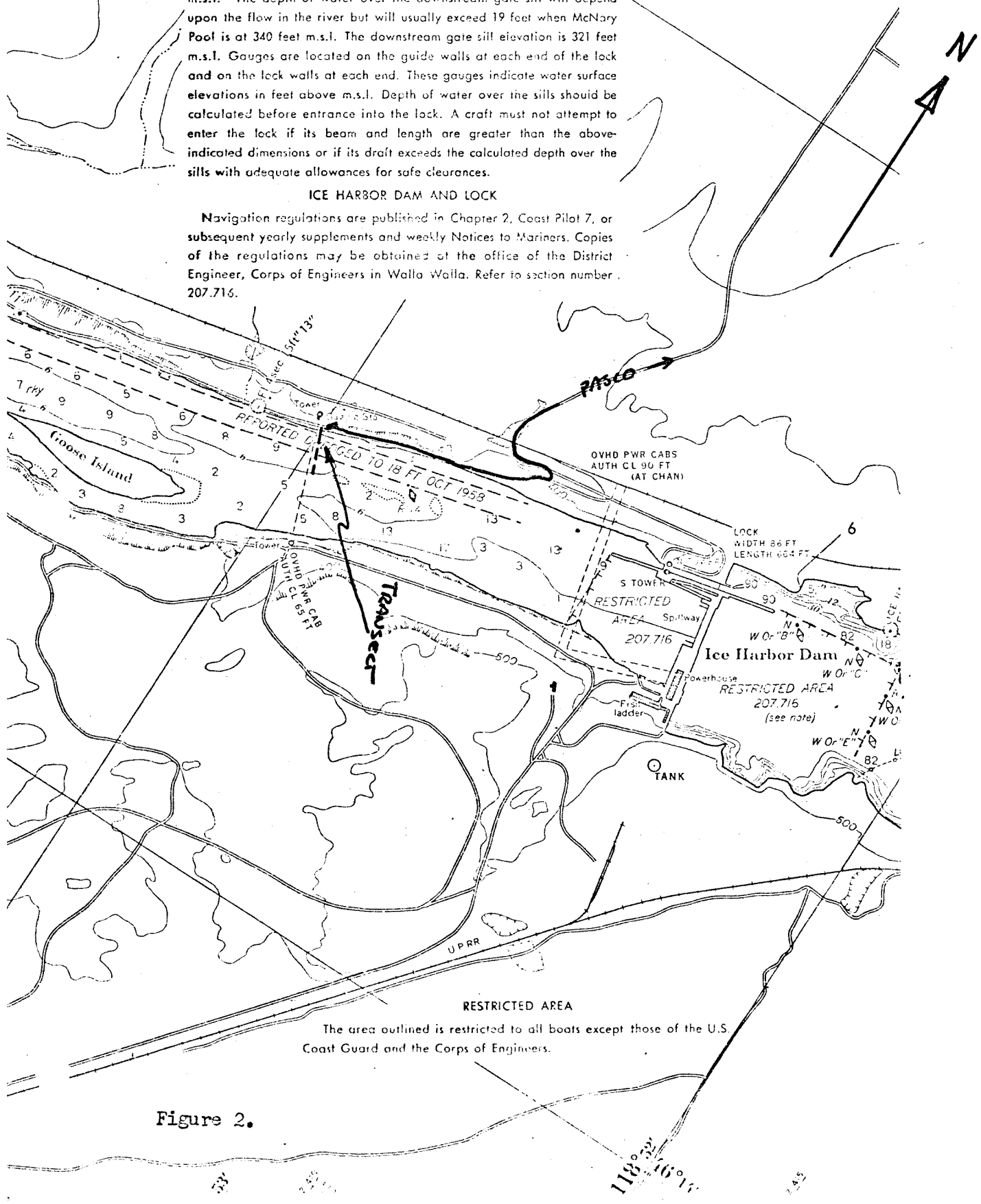


Figure 2.

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

DANIEL J. EVANS
GOVERNOR

JOHN A. BIGGS
DIRECTOR

November 8, 1971

MEMORANDUM

TO: Ron Pine

FROM: Dick Cunningham

SUBJECT: Columbia River and Snake River Transect Studies

As I indicated in a recent discussion with you, we would like to have transect studies conducted on the Columbia River below Rock Island Dam and on the Snake River below Ice Harbor Dam during the week of November 15th. Later this year, during a time when a significant quantity of water is being spilled, we would like to have these studies repeated.

Below Rock Island the cross section study should extend from the east bank, at a point approximately 200 yards below the dam and immediately north of a large gully, across the river. Particular attention should be paid to the water quality immediately adjacent to the east bank as convenience dictates that we collect our future routine monitoring samples at this point.

Below Ice Harbor Dam the cross sectional study should extend from the end of the Lock's wing wall south across the river. Again, particular attention should be paid to the water quality at the extremes of the cross section as the absence of a bridge dictates that we collect our future samples from either the end of the wing wall or the south bank of the river.

I would suggest that these be 8 - 9 hour studies during the daylight hours between 8 - 5. Parameters selected should include in situ measurements for conductivity and possibly DO and other measurements for nutrients and coliform.

I will be in the office on Thursday (November 11) to discuss this further with you.

DC:bj

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

OFFICE OF TECHNICAL SERVICES

ANALYTICAL REPORT SHEET

Routing

Original to LABORATOR

Copies to: _____

Ren P.ue

Merley McCall

To: DICK CUNNINGHAM

The following are the analytical results from survey conducted at:

Columbia River Below Rock Island Dam

03-02.20

Collected 11/18/71

LAB. NO.	STATION NO.	ppm as CaCO ₃	ppm	colonies / 100 ml	colonies / 100 ml			
		Alkalinity	Chlorides	Total Coliform	Fecal coliform			
71-3718	1	58.	1.	100.	420.			
19	1A	57.	1.					
20	2	55.	1.	180.	420.			
21	2B	56.	1.					
22	3	55.	1.	200.	420.			
23	3B	57.	1.					
24	4	55.	1.	180.	420.			
		ppm	ppm	ppm	ppm	ppm		
		NH ₃ -N	NO ₃ -N Filtered	NO ₃ -N Filtered	T-PO ₄ -P	O-PO ₄ -P Filtered		
71-3718	1	.00	.17	.00	.02	.01		
19	1A	.00	.16	.00	.01	.01		
20	2	.00	.15	.00	.03	.00		
21	2B	.04	.14	.00	.03	.00		
22	3	.04	.15	.00	.02	4.01		
23	3B	.06	.15	.00	.02	.02		
24	4	.04	.15	.00	.02	.00		

Summarized by Pat Lee

Date 11/29/71

Notes:

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

OFFICE OF TECHNICAL SERVICES

ANALYTICAL REPORT SHEET

Routing

Original to LABORATORY

Copies to:

Ron Pine

To: DICK CUNNINGHAM

Merley McCall

The following are the analytical results from survey conducted at:

Snake River Below Ice Harbor Dam

03-02.20

Collected 11/17/71

LAB. NO.	STATION NO.	ppm as CaCO ₃		ppm		colonies / 100ml	colonies / 100ml			
		Alkalinity	Chlorides	Total Coliform	Fecal Coliform					
71-3713	1	135	15	30	220					
3714	2	135	14	2100	220					
3715	3	135	13	24	220					
3716	4	135	13	2100	220					
		ppm NH ₃ -N	ppm NO ₃ -N Filtered	ppm NO ₃ -N Filtered	ppm T-PO ₄ -P	ppm O-PO ₄ -P Filtered				
71-3713	1	.04	.48	2.01	.01	.01				
3714	2	.00	.68	2.01	.01	2.01				
3715	3	.00	.69	2.01	.02	.02				
3716	4	.00	.69	2.01	.02	.01				

Notes:

Summarized by

Pat Lee

Date

11/29/71

ANALYTICAL REPORT SHEET

By: Ron Lee

The following are the analytical results from survey conducted at:

Columbia River Above Snake River Confluence 04-0002

Collected 6/8/71

LAB. NO.	ppm <u>NO₃-N Filtered</u>	ppm <u>NO₂-N Filtered</u>	ppm <u>NH₃-N Unfiltered</u>	ppm <u>Organic Nitrogen-N</u>	ppm <u>T-P₀₄-P Unfiltered</u>	ppm <u>T-P₀₄-P Filtered</u>	ppm <u>O-P₀₄-P Unfiltered</u>	ppm <u>O-P₀₄-P Filtered</u>
<u>71-1512</u>								
<u>71-1809</u>	<u>.65</u>	<u>.00</u>	<u>1.98</u>	<u>.10</u>	<u>.01</u>	<u>.01</u>	<u>.00</u>	<u>.00</u>
			<u>Bad Data</u>					

Notes: _____ Summarized by Pat Lee Date 6/17/71