



AMERICAN ENGINEERING ASSOCIATES  
1235 East 4th Avenue Olympia, Washington 98501

November 13, 1986

Richard Berg  
US Army Corps of Engineers  
Regulatory Branch  
P.O. Box C-3755  
Seattle, WA 98124-2255

ILWACO 404 PERMIT (071-OYB-4-010674)

Dear Mr. Berg:

Enclosed is the revised permit which you requested during our meeting of October 29, 1986 on the subject project.

We have attempted to provide all information you requested. We would appreciate your immediate review of the enclosed and advise concerning additional information, if needed, such that we can forward those materials without creating any additional delays.

Please be advised that all funding for this project has been delayed pending issuance of the 404 permit. Consequently, immediate action is required to prevent curtailment of the project. All other permits and approvals have been received.

Thank you for your assistance in this matter.

Very Truly Yours,

A handwritten signature in cursive script that reads "Dennis A. Burke". Below the signature is a small circular stamp containing the initials "DA".

Dennis A. Burke, P.E.

cc: Town of Ilwaco  
US EPA  
US Fish & Wildlife  
WA State Dept of Fisheries  
WA State Dept of Game  
WA State Dept of Ecology

**APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT**

(33 CFR 325)

OMB APPROVAL NO. 0702-0036  
Expires 30 June 1986

The Department of the Army permit program is authorized by Section 10 of the River and Harbor Act of 1899, Section 404 of the Clean Water Act and Section 103 of the Marine, Protection, Research and Sanctuaries Act. These laws require permits authorizing activities in or affecting navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters. Information provided on this form will be used in evaluating the application for a permit. Information in this application is made a matter of public record through issuance of a public notice. Disclosure of the information requested is voluntary; however, the data requested are necessary in order to communicate with the applicant and to evaluate the permit application. If necessary information is not provided, the permit application cannot be processed nor can a permit be issued.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

1. APPLICATION NUMBER (To be assigned by Corps)

071 OYB-010063  
3-53-42194

3. NAME, ADDRESS, AND TITLE OF AUTHORIZED AGENT

American Engineering Associates, Inc.  
1235 East 4th Avenue  
Olympia, WA 98501 ATTN: Dennis A. Burke  
Telephone no. during business hours

2. NAME AND ADDRESS OF APPLICANT

Town of Ilwaco  
P.O. Box 548  
Ilwaco, WA 98624  
ATTN: Mayor Nathan Beard

Telephone no. during business hours

A/C ( ) \_\_\_\_\_ (Residence)  
A/C (206) 642-3145 (Office)

A/C (206) 456-6486 (Residence)  
A/C (206) 754-9672 (Office)

Statement of Authorization: I hereby designate and authorize American Engineering Associates, Inc. to act in my behalf as my agent in the processing of this permit application and to furnish, upon request, supplemental information in support of the application.

SIGNATURE OF APPLICANT

DATE

*Nathan Beard*

*11/2/86*

4. DETAILED DESCRIPTION OF PROPOSED ACTIVITY

4a. ACTIVITY

Construction of earthfill dam, pumping station, transmission lines, and water treatment facilities. Dam will be about 60 feet high and will impound a maximum volume of about 1050 acre-feet over a 40 acre reservoir. Abandon existing Black Lake water intake, treatment plant and water diversion structure.

4b. PURPOSE

The purpose of the dam will be to store runoff generated during the wet winter months for use year round by the Town of Ilwaco as a supply of potable water. Because this is a surface water supply, treatment will be provided to remove potential contaminants such as silt and bacteria. The Town of Ilwaco must obtain a new water supply to replace existing supply since the existing source is polluted with trihalomethanes (THM's) and the Town does not have a water right to the water.

4c. DISCHARGE OF DREDGED OR FILL MATERIAL

No dredging will take place as part of this project. The dam will be a homogenous fill structure keyed into the existing terrain. Core trench will total about 18,400 cubic yards. Earth fill will total about 194,000 cubic yards. This material will be excavated from the right abutment area.

5. NAMES AND ADDRESSES OF ADJOINING PROPERTY OWNERS, LESSEES, ETC., WHOSE PROPERTY ALSO ADJOINS THE WATERWAY

Weyerhaeuser Company  
 O. Box 1000  
 Cosmopolis, WA 98537  
 (206) 532-7110  
 Attn: Don Vahl

Cavenham Forest Products  
 P.O. Box 40  
 Cathlamet, WA 98612  
 (206) 795-3221  
 Attn: Neil Zimmerman

Boise Cascade  
 P.O. Box 290  
 Monmouth, OR 97361  
 (503) 838-1610  
 Attn: Bill Truax

6. WATERBODY AND LOCATION ON WATERBODY WHERE ACTIVITY EXISTS OR IS PROPOSED

Dam to be located on Indian Creek approximately 1.0 miles upstream from confluence with Bear River. Dam and reservoir to be located in Section 28, T.10N., R.10W., W.M. Portions of dam may cross into Section 29, T.10N., R.10W., W.M.

7. LOCATION ON LAND WHERE ACTIVITY EXISTS OR IS PROPOSED

ADDRESS:

Walberg Road (County unpaved road)

STREET, ROAD, ROUTE OR OTHER DESCRIPTIVE LOCATION

Pacific Washington 98624  
 COUNTY STATE ZIP CODE

Pacific County

LOCAL GOVERNING BODY WITH JURISDICTION OVER SITE

8. Is any portion of the activity for which authorization is sought now complete?  YES  NO  
 If answer is "Yes" give reasons, month and year the activity was completed. Indicate the existing work on the drawings.

9. List all approvals or certifications and denials received from other federal, interstate, state or local agencies for any structures, construction, discharges or other activities described in this application.

ISSUING AGENCY	TYPE APPROVAL	IDENTIFICATION NO.	DATE OF APPLICATION	DATE OF APPROVAL	DATE OF DENIAL
USDA FmHA	NEPA, Loan Reqmts.	AD-621	11/15/84	6/85	-
WA DOE	Dam/Reservoir/perm.	R2-26649P	3/86	6/23/86	-
WA DOE	Water rights perm.	S2-25880P	3/86	8/28/86	-
WA DOF	Hydraulics perm.	0030723-02	3/5/86	6/3/86	-
WA UTC	Utilities perm.	40020	4/86	7/22/86	-
WA DSHS	Water supply & treat.	-	3/86	6/86	-
WA DOG	Screening criteria	-	4/86	7/3/86	-
WA DOE	Dam Safety	-	4/86	6/2/86	-

10. Application is hereby made for a permit or permits to authorize the activities described herein. I certify that I am familiar with the information contained in this application, and that to the best of my knowledge and belief such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities or I am acting as the duly authorized agent of the applicant.

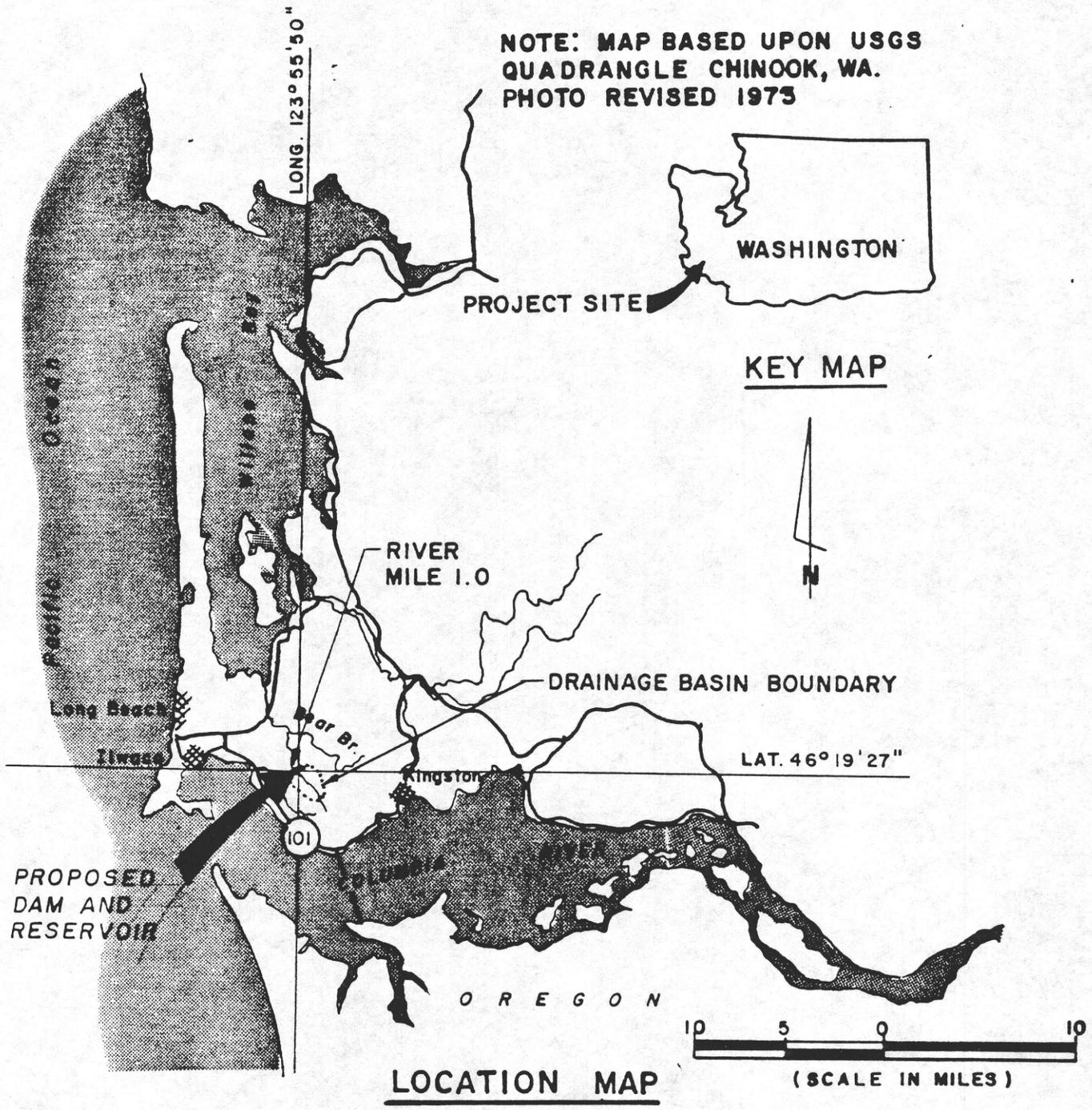
Neil Zimmerman 11/12/86  
 SIGNATURE OF APPLICANT DATE

[Signature] 11/5/86  
 SIGNATURE OF AGENT DATE

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in Block 3 has been filled out and signed.

8 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of The United States knowingly and willfully falsifies, conceals, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false fictitious or fraudulent statement or entry, shall be fined not more than \$10,000 or imprisoned not more than five years, or both.

Do not send a permit processing fee with this application. The appropriate fee will be assessed when a permit is issued.



NOTE: MAP BASED UPON USGS  
 QUADRANGLE CHINOOK, WA.  
 PHOTO REVISED 1975

WASHINGTON

PROJECT SITE

KEY MAP



RIVER  
 MILE 1.0

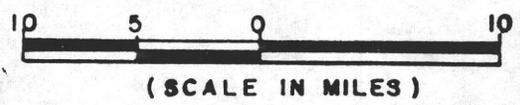
DRAINAGE BASIN BOUNDARY

LAT. 46° 19' 27"

PROPOSED  
 DAM AND  
 RESERVOIR

O R E G O N

LOCATION MAP



PURPOSE: Municipal Water Supply

DATUM NGVD = 0.0

ADJACENT PROPERTY OWNERS:

- ① Weyerhaeuser Company
- ② Crown Zellerbach Corp.
- ③ Boise Cascade Timber & Wood Products Group

071-OYB-4-010674

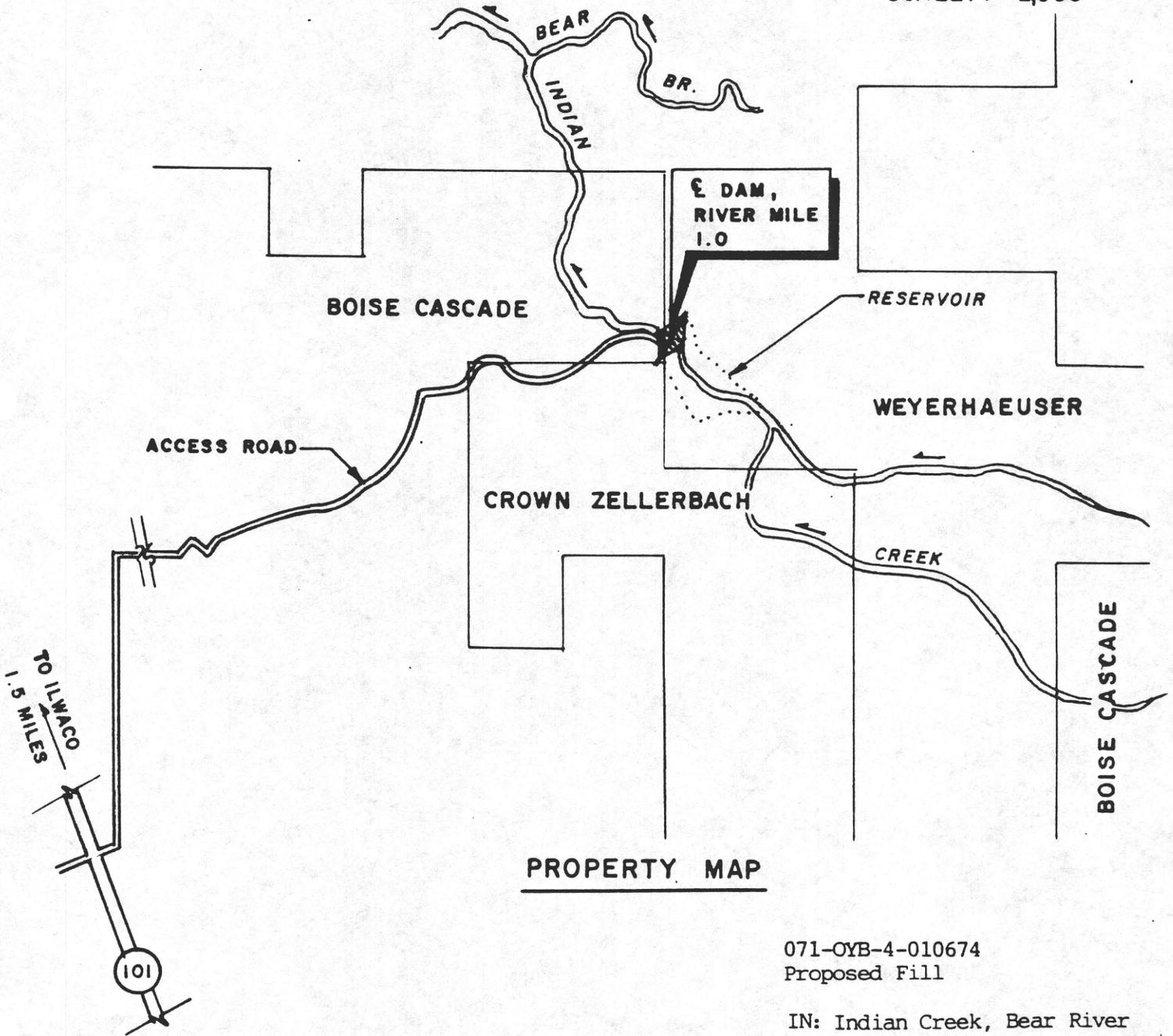
Proposed Fill

IN: Indian Creek, Bear River  
 NEAR: Ilwaco  
 COUNTY OF: Pacific STATE WA  
 APPLICATION BY: Town of Ilwaco

SHEET 1 OF 24 DATE 11/5/84



SCALE: 1"=2,000'

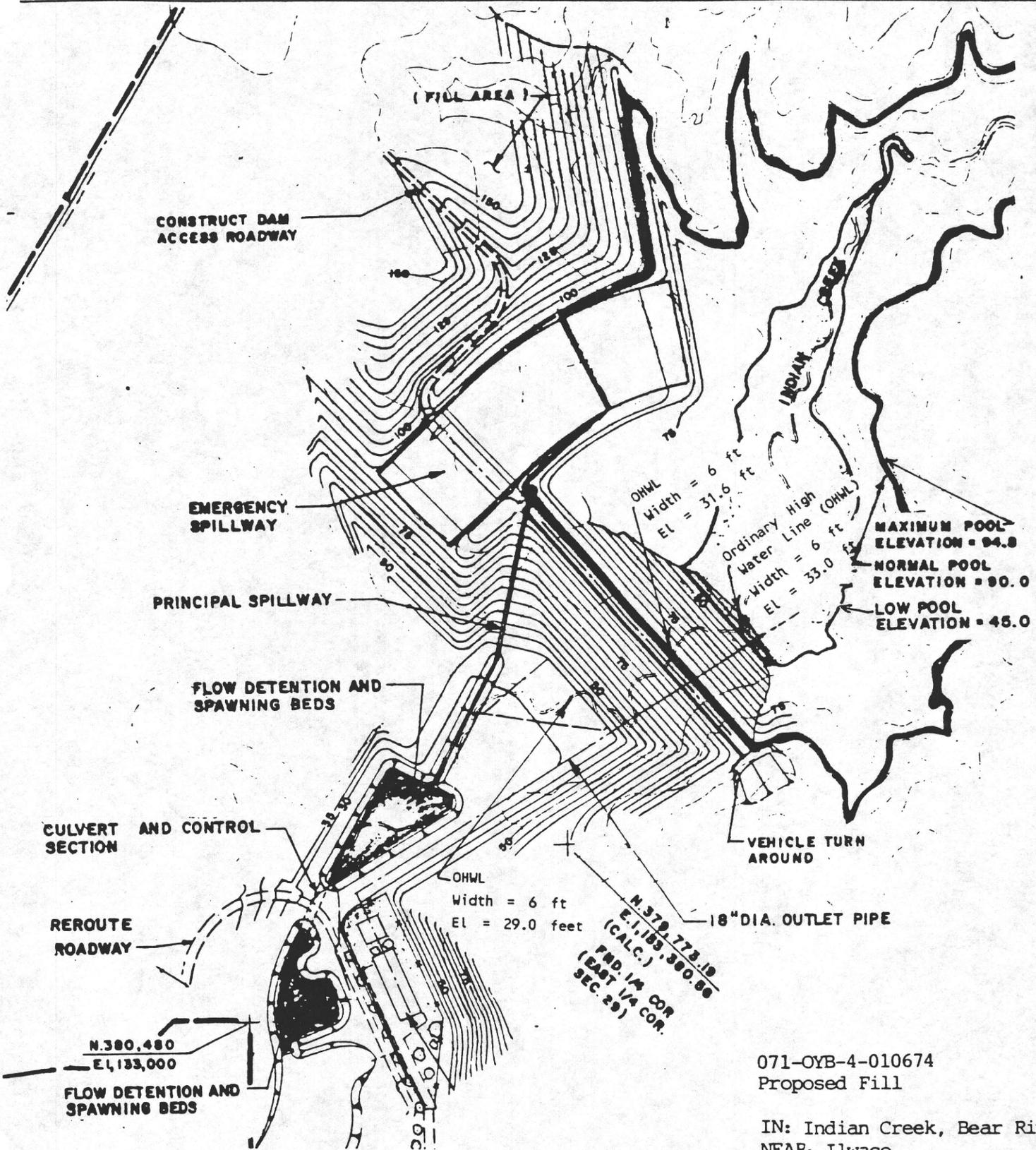


PROPERTY MAP

071-OYB-4-010674  
Proposed Fill

IN: Indian Creek, Bear River  
NEAR: Ilwaco  
COUNTY OF: Pacific STATE WA  
APPLICATION BY: Town of Ilwaco

SHEET 2 OF 24 DATE 11/5/86



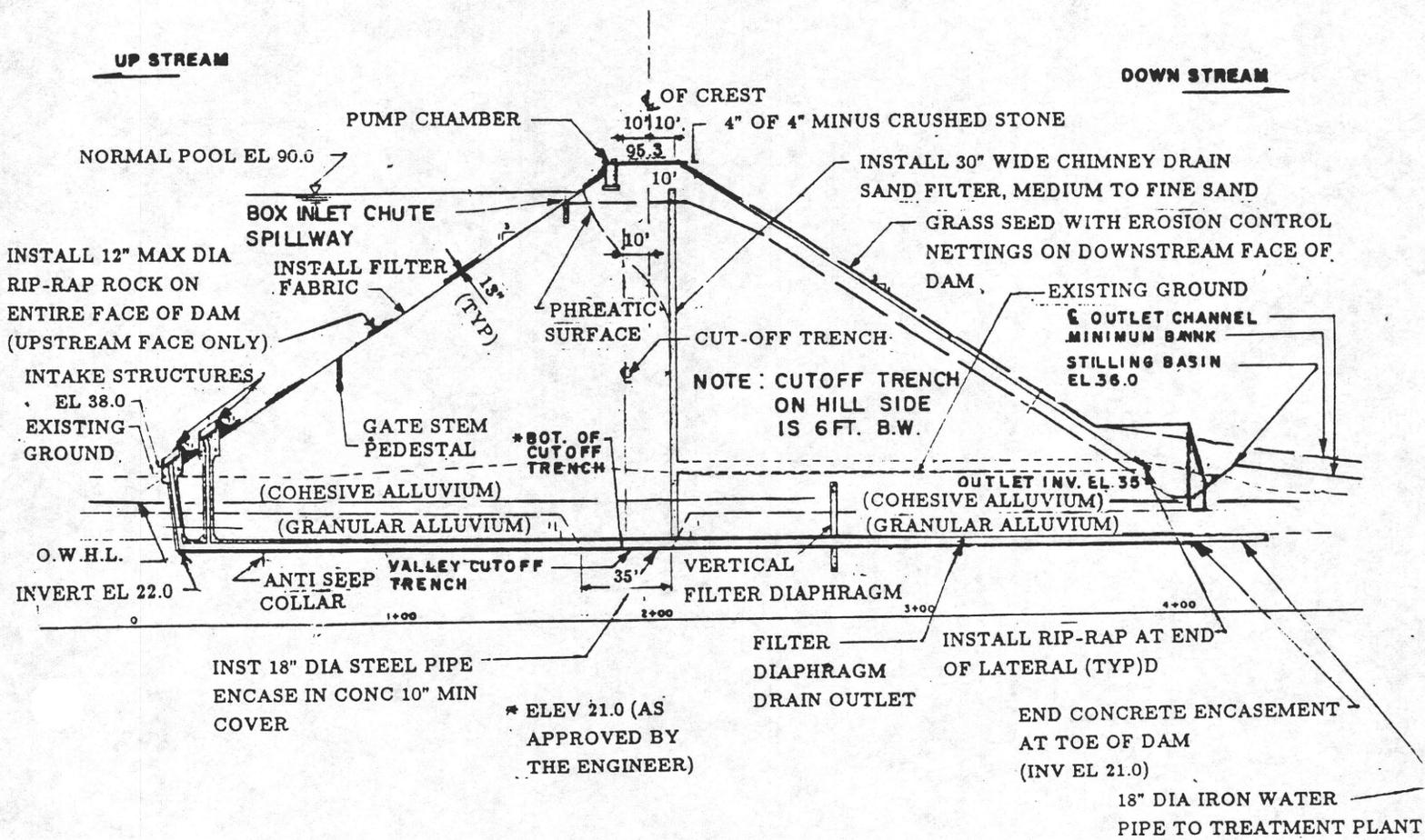
071-OYB-4-010674  
Proposed Fill

IN: Indian Creek, Bear River  
NEAR: Ilwaco  
COUNTY OF: Pacific STATE WA  
APPLICATION BY: Town of Ilwaco

**PLAN VIEW OF DAM**

SCALE 1" = 200'

SHEET 3 OF 24 DATE 11/5/6

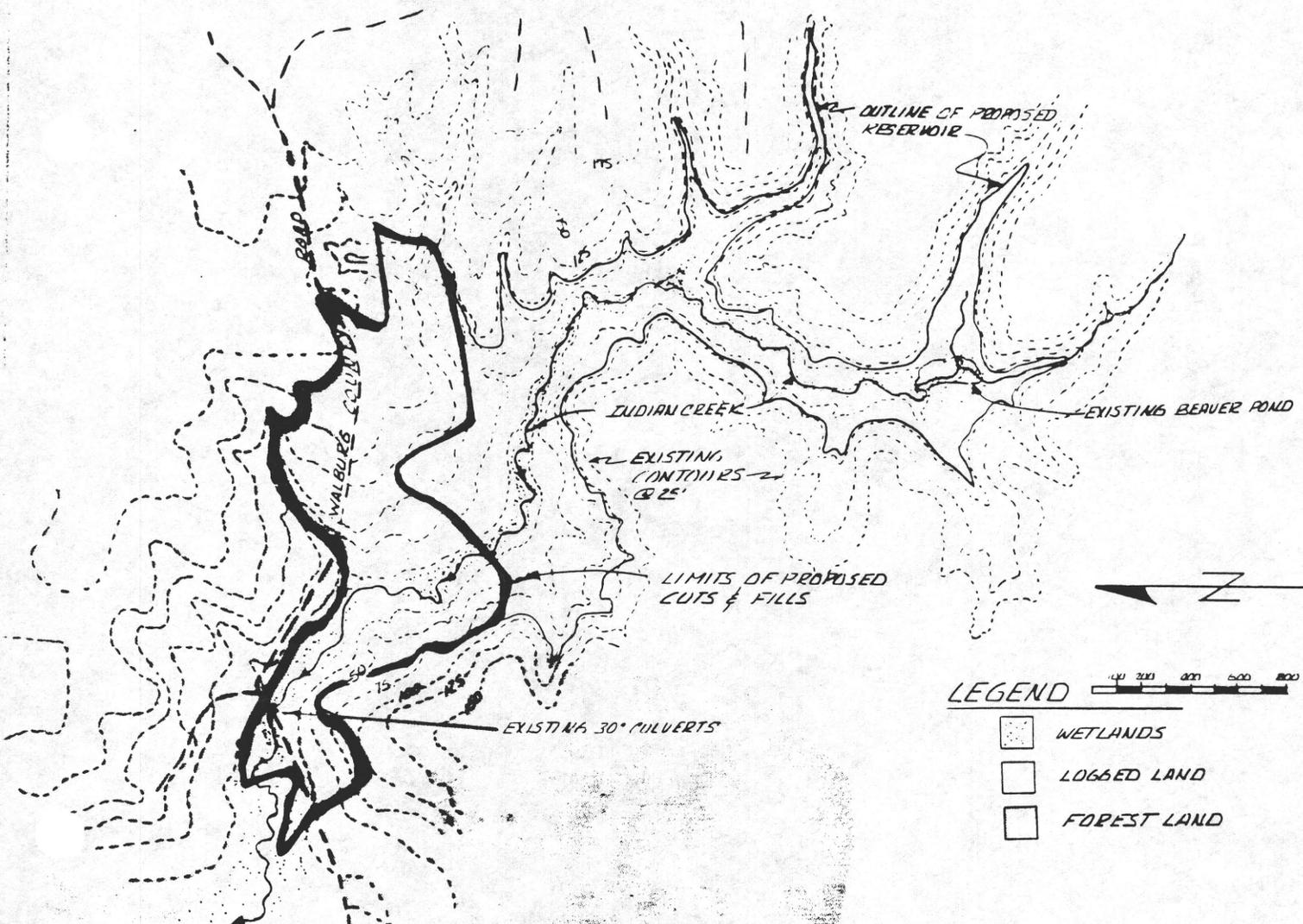


**CROSS-SECTION HOMOGENEOUS EARTH FILL DAM**

071-OYB-4-010674  
Proposed Fill

IN: Indian Creek, Bear River  
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COUNTY OF: Pacific STATE WA  
APPLICATION BY: Town of Ilwaco

SHEET 4 OF 24 DATE 11/5/84



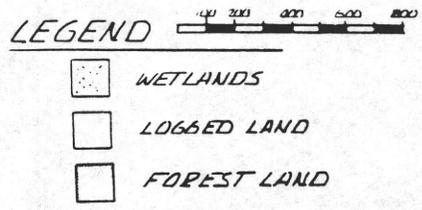
**INDIAN CREEK VALLEY EXISTING CONDITIONS  
AND  
OUTLINE OF PROPOSED CUTS AND FILLS**

**Fill**

<u>Location of Fill Within Wetlands &amp; OHWL*</u>	<u>Quantity in Cubic Yards</u>	<u>Area in Acres</u>	<u>Type of Fill</u>	<u>Method of Placement</u>
Road Relocation	2,100	0.2	Soil & Rock	Scraper & dozer
Regrading below dam	6,500	0.25	Soil	Dozer
Dam	117,000	2.43	Soil & Rock	Scraper & dozer
Reservoir		9.13	Water	

**Excavation**

<u>Location of Excavation within Wetlands &amp; OHWL</u>	<u>Quantity in Cubic Yards</u>	<u>Area in Acres</u>	<u>Method of Excavation</u>
Indian Creek Valley	9,200	2.43	Drag Line
Ponds & Spawning Beds	3,200	1.0	Drag Line
Mitigation Channels	500	0.2	Hoe



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Proposed Fill**

**IN: Indian Creek, Bear River  
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COUNTY OF: Pacific STATE: \\  
APPLICATION BY: Town of Ilwaco  
SHEET 5 OF 24 DATE: 11/5/86**

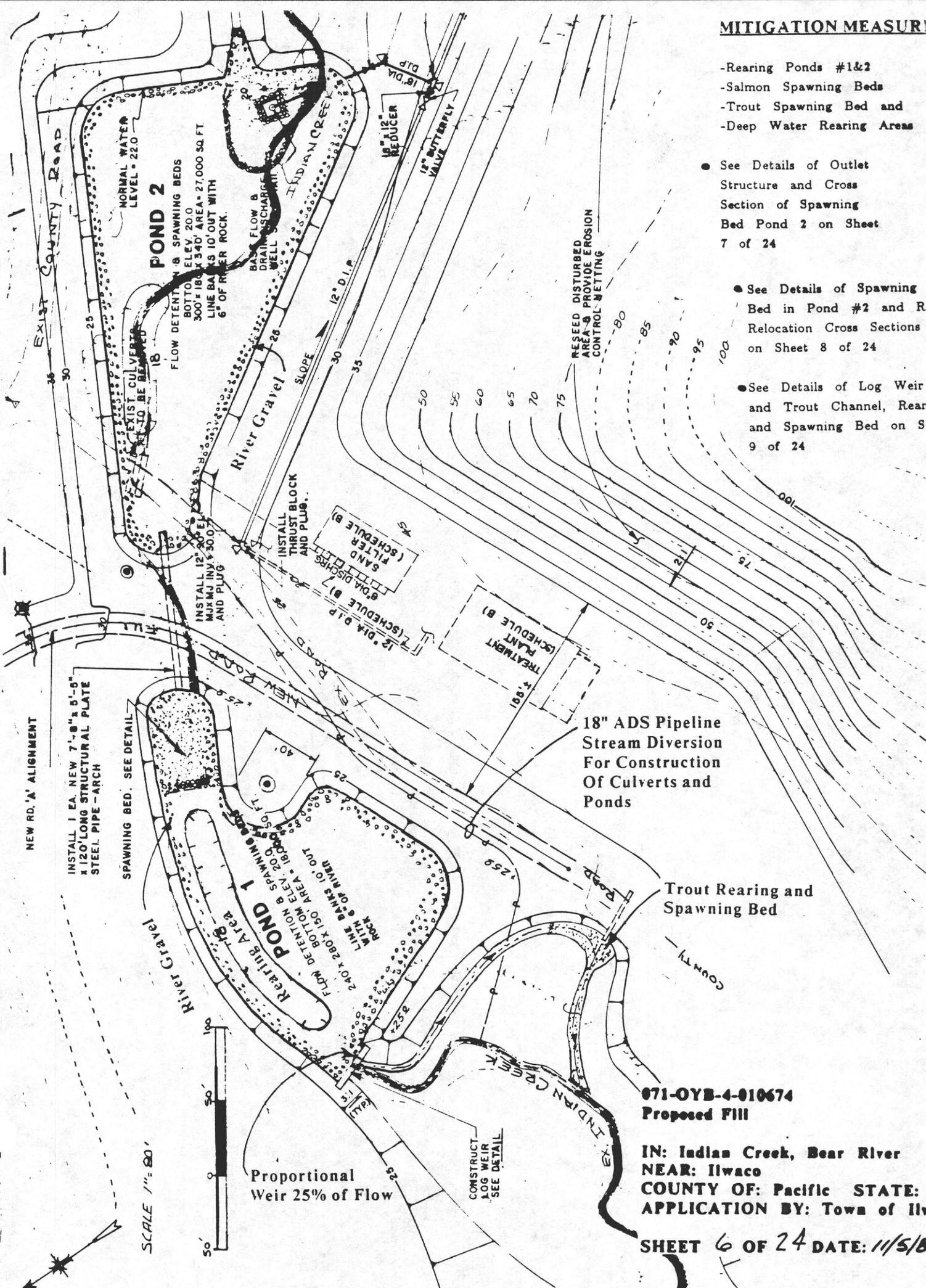
**MITIGATION MEASURES**

- Rearing Ponds #1&2
- Salmon Spawning Beds
- Trout Spawning Bed and
- Deep Water Rearing Areas

- See Details of Outlet Structure and Cross Section of Spawning Bed Pond 2 on Sheet 7 of 24

- See Details of Spawning Bed in Pond #2 and R Relocation Cross Sections on Sheet 8 of 24

- See Details of Log Weir and Trout Channel, Rear and Spawning Bed on Sheet 9 of 24



18" ADS Pipeline Stream Diversion For Construction Of Culverts and Ponds

Trout Rearing and Spawning Bed

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Proposed Fill

IN: Indian Creek, Bear River  
NEAR: Ilwaco  
COUNTY OF: Pacific STATE:  
APPLICATION BY: Town of Ilwaco

SHEET 6 OF 24 DATE: 11/5/81

SCALE 1" = 20'



Proportional Weir 25% of Flow

CONSTRUCT LOG WEIR SEE DETAIL

INSTALL 1 EA. NEW 7'-0" x 5'-0" x 120' LONG STRUCTURAL PLATE STEEL PIPE - ARCH

SPAWNING BED. SEE DETAIL

POND 1

Rearriling Area

River Gravel

POND 2

FLOW DETENTION & SPAWNING BEDS  
BOTTOM ELEV. 20.0  
300' x 180' x 140' AREA = 27,000 SQ. FT.  
LINE BARS 10' OUT WITH 6" OF RIVER ROCK.

River Gravel

SLOPE

12" D.I.P.

INSTALL THRUST BLOCK AND PLUG.

12" DIA. D.I.P.

8" DIA. DISCHARGE (SCHEDULE B)

SAND FILTER (SCHEDULE B)

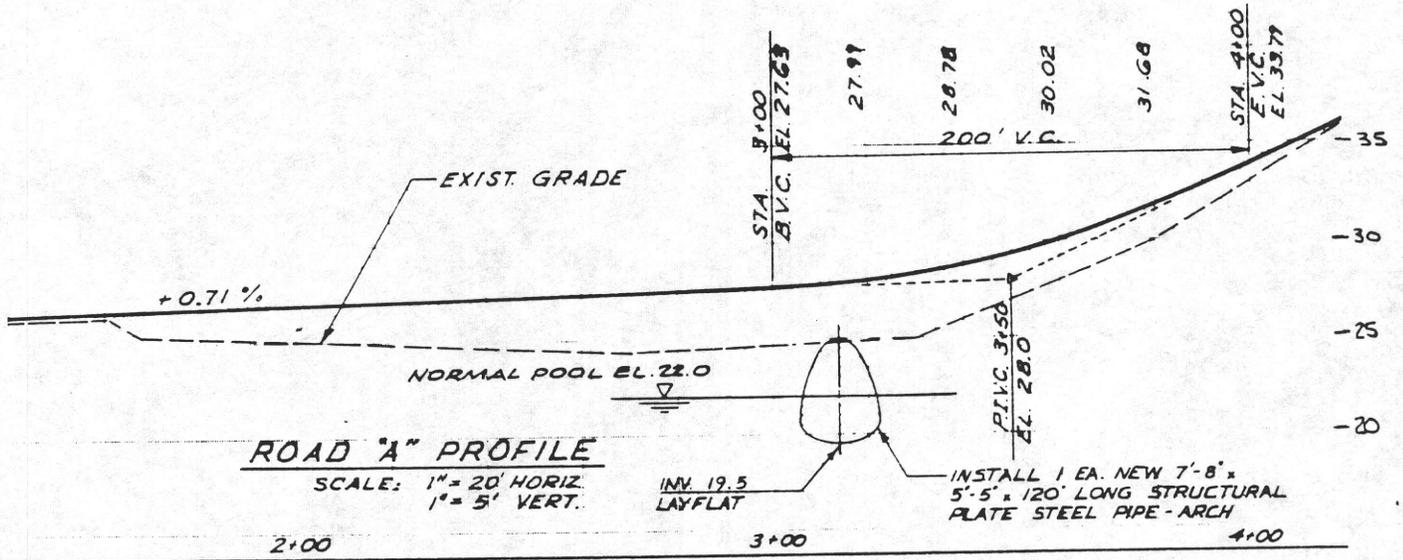
12" DIA. D.I.P.

TREATMENT PLANT (SCHEDULE B)

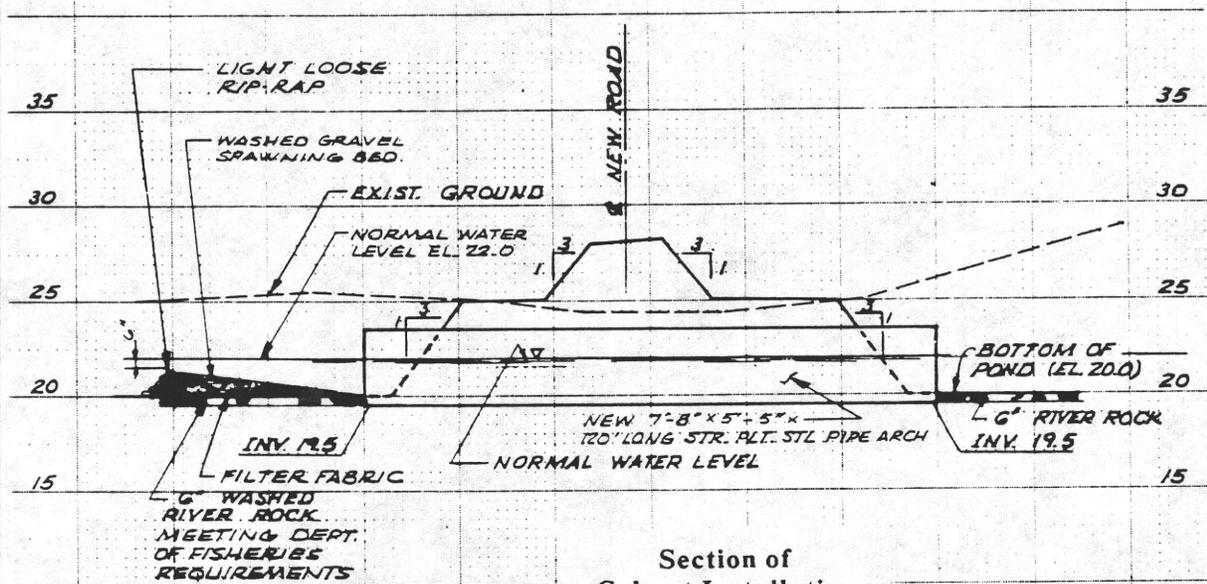
18" ADS PIPE

18" DIA. D.I.P.





**ROAD RELOCATION PROFILE  
 AND  
 NEW CULVERT INSTALLATION**

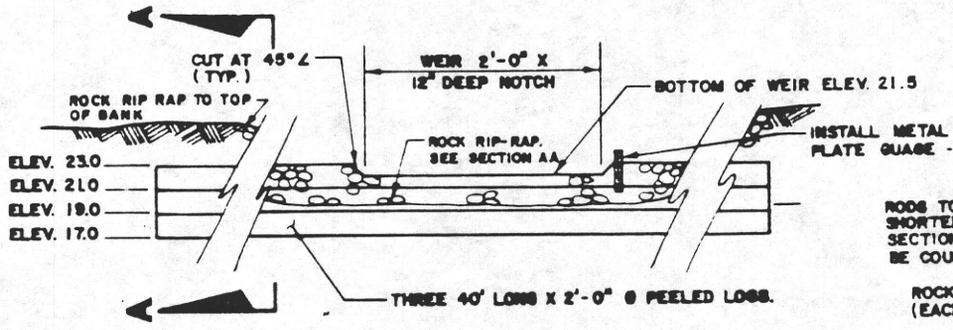


**Section of  
 Culvert Installation  
 and  
 Pond 2 Spawning Bed**

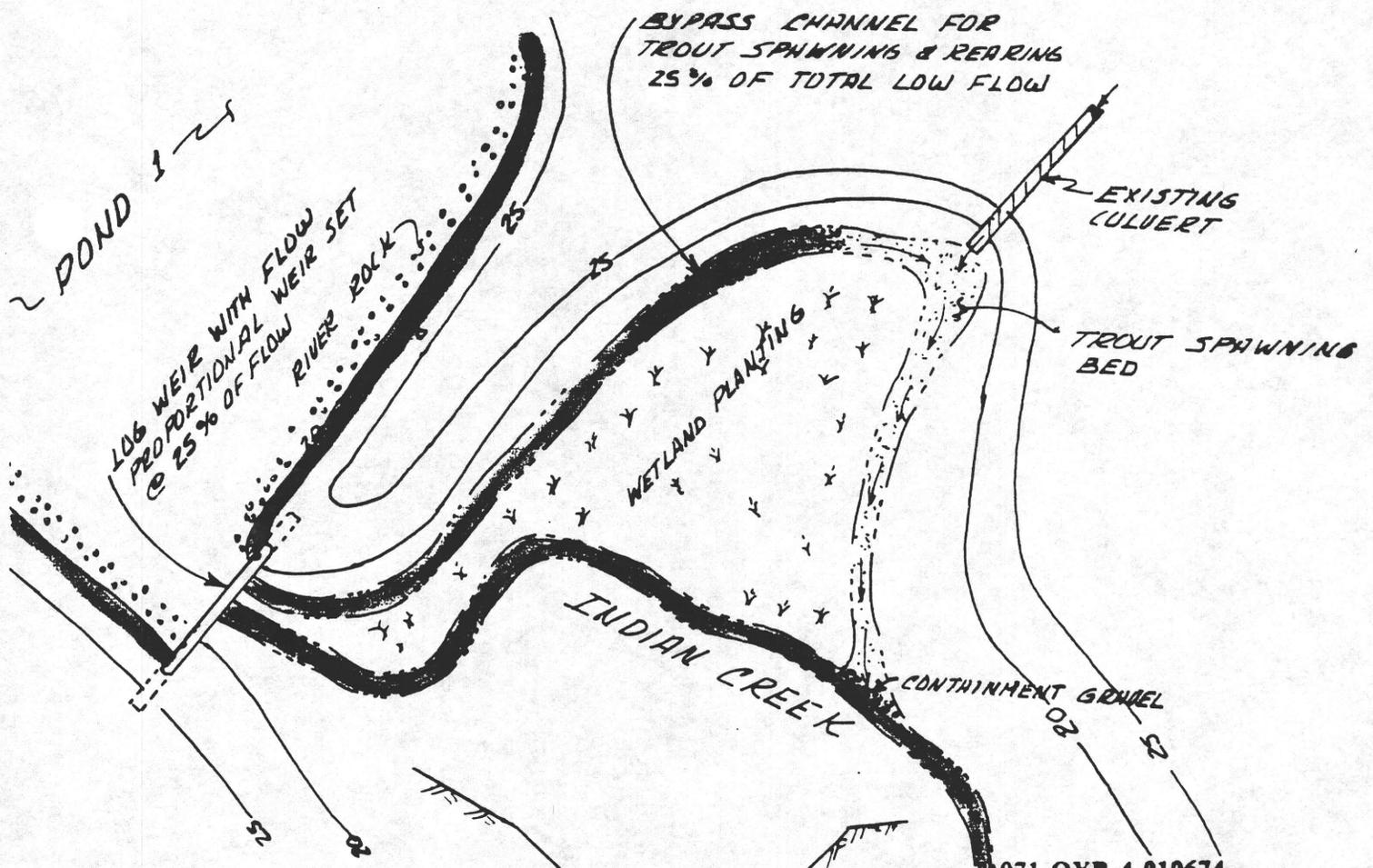
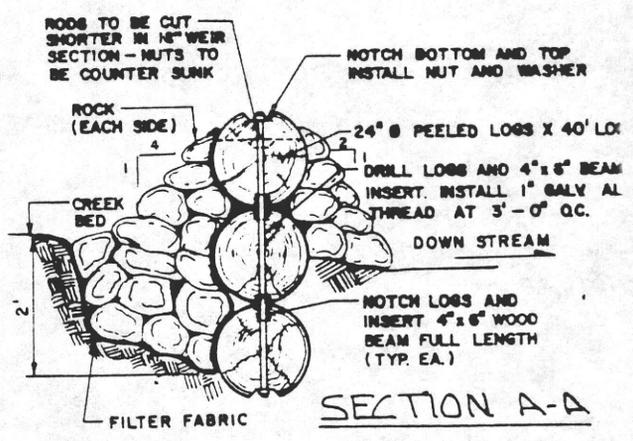
**071-OYB-4-010674  
 Proposed Fill**

**IN: Indian Creek, Bear River  
 NEAR: Ilwaco  
 COUNTY OF: Pacific STATE: W.  
 APPLICATION BY: Town of Ilwaco**

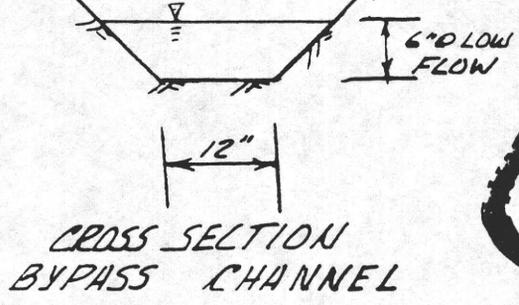
**SHEET 8 OF 24 DATE: 11/5/86**



**LOG WEIR DETAIL**



**BYPASS CHANNEL DETAILS**  
SCALE 1" = 40'



071-OYB-4-010674  
Proposed Fill  
IN: Indian Creek, Bear River  
NEAR: Ilwaco  
COUNTY OF: Pacific STATE:  
APPLICATION BY: Town of Ilw  
SHEET 9 OF 24 DATE: 11/5/E



TOWN OF ILWACO  
INDIAN CREEK DAM & RESERVOIR

**PROJECT DESCRIPTION & NEED**

The Town of Ilwaco is in need of a new water supply to abate the current health risks posed by excessively high THM's and THM precursors found in its existing water source, Black Lake. In addition, the Town must obtain a new supply in accordance with DOE orders since it does not have a right to waters from Black Lake. Excessive withdrawals from Black Lake result in depleted flows to cranberry growers who have prior water rights and the wetlands below Black Lake.

The Town of Ilwaco thus proposes to abandon its existing supply source, Black Lake, and construct a new water supply source on Indian Creek, a tributary to Bear River. The proposed project consists of the following elements:

1. Construction of a treated water booster pump station along Highway 101 and adjacent to the Ilwaco Airport (southeast corner of Stringtown Road and Highway 101). The booster pump station consists of a 12 foot x 20 foot slab on-grade metal building with two 20 hp and one 10 hp booster pumps. Site work consists of balanced cuts and fills to provide a building pad and a 12 foot x 70 foot crushed stone access road.
2. Construction of 21,000 feet of 12 inch PVC water line along US Highway 101, Chinook Valley Road and Bear River Road (also known as Walberg County Road).
3. Construction of a 1.0 mgd (700 gpm) water treatment plant adjacent to Walberg County Road in a 50 foot x 102 foot metal building on a 120 foot by 370 foot cleared and graded upland area (1.02 acres including crushed stone access road and parking areas).

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IN: Indian Creek, Bear River  
NEAR: Ilwaco  
COUNTY OF: Pacific STATE: WA  
APPLICATION BY: Town of Ilwaco

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4. A 158,000 gallon concrete water storage reservoir 30 feet in diameter by 30 foot sidewater depth occupying a 140 foot x 90 foot site (0.29 acres) on upland forest land south of Walberg County Road. Site work to consist of clearing, grading, balanced cuts and fills, fencing, landscaping and crushed stone access drive.
  
5. An earth fill dam approximately 60 feet in height with 20 foot top width, approximately 400 foot bottom width by 800 foot crest length with a 220 foot wide by 800 foot long emergency spillway and a 6 foot wide by 95 foot long by 4 foot high concrete principal spillway. The dam will impound a maximum of 1022 acre feet of water over 38.39 acres of land. Construction of the dam and reservoir will involve the following quantities:

Clear & grub	70 ac
Spillway excavation	270,000 cy
Excavate valley-	
unsuitable material	18,400 cy
Dam fill	194,000 cy
Downstream fill-	
including road relocation	8,618 cy
Rip rap placement	6,000 cy
Erosion control and plantings	33.8 ac

Associated work consists of relocating approximately 1900 feet of county roadway and providing crushed surfacing. Providing two flow detention ponds with three spawning beds and two fish rearing areas each of approximately 1/2 acre (1 acre total size). Peripheral work consists of constructing an intake structure, flow diversion structure, fish screens, 18 inch outlet pipe, low flow release structure and downstream flow measurement weir.

#### Existing Site Conditions

Sheet 1 presents the general location of the project south of the Town of Ilwaco in Pacific County, Washington. Sheet 2 presents the location of the proposed dam and reservoir adjacent to

**071-OYB-4-010674**  
**Proposed Fill**

**IN: Indian Creek, Bear River**  
**NEAR: Ilwaco**  
**COUNTY OF: Pacific STATE: WA**  
**APPLICATION BY: Town of Ilwaco**

**SHEET /2 OF 24 DATE: 4/5/86**

Walberg County Road on Indian Creek approximately 1.0 miles above its confluence with Bear River. The proposed site plan is shown on Sheet 3 and 5 of this permit. Sheet 6 presents a drawing of existing site conditions and an outline of the proposed construction activities.

The Indian Creek Valley consists of a small stream approximately 4 feet in width in which salmon (Coho) and trout fry have been observed. The stream is bounded by wetlands to the toe of the steep banks which form the Indian Creek Valley. Wetlands exist from the stream bank approximately 70 feet north and 15 feet south of Indian Creek (average values).

The steep valley walls composed of tight silt and clay have recently been logged. Replanted trees are beginning to emerge.

#### Environmental Impact

This project, including all mitigation measures and the enlarged reservoir, will impact the existing environment as follows:

1. Removal of approximately 40 acres of wildlife habitat and grazing land and replacing said land with a water reservoir and fish rearing ponds. ]
2. Removal of approximately 400 feet of 4 foot wide stream channel by the dam fill.
3. Inundating approximately 4100 feet of 4 foot wide stream channel above the proposed dam site. Approximately 25 percent of this channel is suitable spawning habitat.
4. Inundating approximately 600 feet of 4 foot wide stream channel and replacement with spawning beds and rearing ponds.
5. Fill of approximately 2.34 acres of wetlands under the dam and relocated county road.
6. Inundation of approximately 8.23 acres of wetlands above the dam site.

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Proposed Fill

IN: Indian Creek, Bear River  
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COUNTY OF: Pacific STATE: WA  
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SHEET 13 OF 24 DATE: 11/5/86

### **Environmental Benefits**

The preceding impacts result from a need to develop a new water source as well as from agreed upon mitigation measures between the Town and Washington State Departments of Fisheries and Game. For example, the reservoir is twice the size required to supply the Town's needs in order to achieve increased low flows within Indian Creek and Bear River.

Incorporation of the proposed mitigation measures within the project will result in the following environmental benefits:

1. Significantly increased flow below the dam. The low flow will increase Indian Creek low flows a minimum of 300 percent. The low flow augmentation will also increase the minimum low flows in the Bear River by a minimum of 25 percent. The increased low flows will provide a significant increase in fish habitat below the dam by increasing the wetted perimeter of Indian Creek and Bear River by 25 percent each. Approximately 5000 feet of Indian Creek and 6000 feet of Bear River channel will benefit from the increased habitat. It is believed that this measure alone will more than compensate for the loss of salmon and trout habitat above the dam.
2. The proposed dam will create a 40 acre reservoir which will provide a significant environmental benefit for water fowl and indigenous wildlife species.
3. The project will result in the purchase of 600 acres of timber land which will be converted to natural forest land.
4. The project will result in the replanting of 35 acres of land, which has been recently logged, with forage crops for elk and other large mammals.
5. The project will result in a reservoir with a perimeter of 15,260 feet under normal pool conditions. Under normal conditions the

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Proposed Fill**

**IN: Indian Creek, Bear River  
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COUNTY OF: Pacific STATE: WA  
APPLICATION BY: Town of Ilwaco**

**SHEET 14 OF 24 DATE: 11/5/86**

reservoir pool will fluctuate a maximum of 12 feet/year. The fluctuating water level will result in the development of 8.5 acres of wetlands surrounding the reservoir which will compensate for the loss of existing wetlands.

6. The project will result in the creation of three spawning beds (two Coho and one Cutthroat) which will compensate for the loss of spawning gravels within the Indian Creek.
7. The project will result in the creation of a one acre rearing area (in two ponds) which will compensate for the loss of rearing habitat inundated by the reservoir (0.37 acres).
8. The project will result in the annual planting of 2500 Coho which will compensate for the estimated annual production of Coho within the inundated portion of Indian Creek.
9. The project will result in improved flow to wetlands and thus existing wetland productivity through low flow augmentation on Indian Creek and the curtailing of withdrawals from Black Lake. It is estimated that an additional 1,300,000 gpd will be discharged to 275 acres of existing wetland. Under low flow conditions, the added flow will significantly increase the productivity of those wetlands.

Table I presents a comparison of the adverse environmental effects and benefits of the proposed project.

**071-OYB-4-010674**  
**Proposed Fill**

**IN: Indian Creek, Bear River**  
**NEAR: Ilwaco**  
**COUNTY OF: Pacific STATE: WA**  
**APPLICATION BY: Town of Ilwaco**

**SHEET 15 OF 24 DATE: 11/5/86**

**TABLE I**  
**BENEFICIAL AND ADVERSE EFFECTS**  
**OF PROPOSED PROJECT**  
**TOWN OF ILWACO WATER SYSTEM IMPROVEMENTS**

	FISH HABITAT	FISH PRODUCTION (SPAWNING)	WETLAND AREA	WILDLIFE HABITAT	LAKE & WATER RESOURCE
<b>ADVERSE EFFECTS</b>					
Loss of wildlife grazing				40 ac	
Loss of stream channel	0.41 ac	0.10 ac			
Fill of wetlands			2.34 ac		
Inundation of wetlands			8.23 ac		
<b>BENEFICIAL EFFECTS</b>					
Increased flow	3.56 ac				
Reservoir					35 ac
Wetlands created			8.5 ac		
Spawning beds		0.1 ac			
Rearing pond		1.0 ac			
Planting		2500 Coho			
Wetland productivity			275 ac		
Natural forest				600 ac	
Forage & grazing land				35 ac	

**MITIGATION MEASURES**

The above described environmental benefits of the project result from the following mitigation measures as shown on Sheets 7 through 10

**Planting of Forage Crops**

Approximately 70 acres of land will be cleared and grubbed during construction. Approximately 40 of those acres will be permanently inundated as a result of reservoir formation. A majority of the land being cleared and grubbed provides poor forage for wildlife. In order to compensate for the loss of forage crops, landscaping will be performed on the remaining 30 acres which meets Washington State Department of Game's requirements and will compensate for the 40 acre loss by substantially improving the productivity of the remaining 30 acres.

The following is the proposed planting schedule (see Sheet 7 for location):

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**Proposed Fill**

**IN: Indian Creek, Bear River**  
**NEAR: Ilwaco**  
**COUNTY OF: Pacific STATE: WA**  
**APPLICATION BY: Town of Ilwaco**

**SHEET 16 OF 24 DATE: 11/5/86**

1. Hydroseeding Disturbed Areas Elevation 75 to 95+  
Shall be as Follows:

Wood fiber	2 tons/acre
Red Fescue	8 lb/acre
Colonial	1 lb/acre
White Clover	2 lb/acre
Birdsfoot Trefoil	1 lb/acre
Annual Ryegrass	8 lb/acre
Nitrogen fertilizer	40 lb N/acre
or	
10-20-20	400 lb/acre

Plug plant 200 square feet of reeds, skirpus, and cattails at 100 feet intervals around reservoir in shallow slope areas after construction complete and reservoir filled to elevation 50.0

2. Erosion Control Grass

White Clover	2 lb/acre
Birdsfoot Trefoil	2 lb/acre
Highland Creeping Bent Grass	1 lb/acre
Annual Ryegrass	5 lb/acre
Creeping Red Fescue	10 lb/acre
Nitrogen fertilizer	40 lb/acre
or	
10-20-20	400 lb/acre

3. Erosion Control Wit Fir Planting

Same grass application as above (2) except Douglas Fir trees to be planted at 125 trees per acre. (Note that DNR planting rate is 325 to 375 trees/acre after thinning - the tree planting rate proposed herein is 1/3 the DNR rate of 125 trees/acre. The resultant spacing is approximately one tree per 350/square feet of trees spaced on a 19 foot square grid).

4. Selected Plantings

Catsear	2 lb/acre
Hawksbeard	2 lb/acre
Phacelia	1 lb/acre
Birdsfoot Trefoil	2 lb/acre

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**IN: Indian Creek, Bear River**  
**NEAR: Ilwaco**  
**COUNTY OF: Pacific STATE: W.**  
**APPLICATION BY: Town of Ilwac**

**SHEET 17 OF 24 DATE: 11/5/06**

White Clover	2 lb/acre
Creeping Blackberry	1 lb/acre
Nitrogen	40 lb/acre
or	
10-20-20	400 lb/acre

#### Construction of Spawning Beds

Since the proposed dam will block future mitigation of fish above the dam location and remove approximately 450 square yards of spawning habitat, it is proposed that the spawning habitat be replaced through the creation of three spawning beds. Two spawning beds will be constructed for Coho. One spawning bed will be constructed for Cutthroat trout. The size and location of the spawning beds are shown on Sheet 8. The materials of construction shall be river run gravel meeting the following specifications:

<u>Size</u>	<u>Percent by Volume</u>
3" - 1 1/2"	15+-5%
1 1/2" - 3/4"	40+-5%
3/4" - 1/4"	40+-5%

Fines less than 1/4" diameter shall not exceed 2 percent by volume.

#### Construction of Fish Rearing Ponds & Channels

Since approximately 4100 feet of 4 foot wide channel (16,400 square feet) will be lost rearing habitat, it is proposed that two rearing ponds be created. The ponds will be approximately 1/2 acre each with a total surface area of approximately 43,000 square feet. Deep channels will be constructed within the ponds to provide a safe habitat and minimize predation by birds. The channels shall be 35 feet wide by 180 feet long (6300 square feet) by 6 feet deep. The fish rearing ponds are presented on Sheets 8 and 9.

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## Coho Planting

In lieu of providing a fish way at the dam, the Town has agreed to annually plant the equivalent number of yearling out-migrant Coho salmon (smolts) as Indian Creek upstream of the dam is capable of providing each year. This number is not to exceed 2500 smolts annually. Planting will begin in 1988 and continue for as long as the dam is a block to migration. At the end of four years of planting an evaluation will be made by the Town and Washington State Department of Fisheries of the success of the fish plantings. Adjustments of the fish plant numbers will be made as a result of that evaluation.

## IMPROVEMENTS TO EXISTING WETLANDS

This project will remove approximately 10.57 acres of wetlands through dam fill and inundation by the reservoir. In order to compensate for the loss, the Town of Ilwaco will perform the following:

1. Abandon the existing Black Lake water supply and thus provide for an additional 1 cfs of flow to 200 acres of wetland which require additional water during dry periods.
2. Increasing low flows to wetlands within the Indian Creek Valley. The existing low flow in Indian Creek is approximately 0.8 cfs. The proposed project will provide a minimum low flow below the dam of 2.0 cfs. The increased low flow will directly benefit and improve the productivity of approximately 75 acres of wetland below the proposed dam site.
3. Planting wetlands species within the normal 12 foot drawdown zone surrounding the reservoir. The reservoir perimeter is 15,260 feet at normal pool. Under normal conditions, the reservoir will fluctuate from normal pool to low pool from July through September of each year. A 20 foot zone (elevation 75 to elevation 95) will be seeded with the seed mixture described on Sheet 17. Wetlands similar to the existing wetlands will be created surrounding the reservoir. In

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addition, willow plantings will be made in the locations shown on Sheet 7. The wetlands created through this measure will be equal to 7.01 acres which will significantly offset to the 8.23 acre loss.

#### Low Flow Enhancement

Minimum low flows will be maintained at 2 cfs which is a 300 percent increase to presently incurring low flows. Increased low flows will provide a significant increase in fish habitat below the dam by increasing the wetted parameter of Indian Creek and Bear River by approximately 25 percent. Approximately 11,000 feet of Indian Creek and Bear River channel will benefit. This measure will enhance fish, wildlife and wetland production below the dam.

#### Construction Mitigation Measures

Other mitigation measures agreed to between the Town and Washington State Department of Fisheries (WDF) include the following:

1. The Town of Ilwaco shall arrange an on-site pre-construction conference with the contractor and the WDF representative for this project as soon as possible after award of this contract and at least 10 days before project start. The purpose of the conference shall be to discuss the project requirements, how the contractor intends to comply with the provisions of the HPA, and to discuss any changes the contractor feels necessary to complete the project.
2. A continuous effort shall be made to prevent erosion of cut and fill slopes and sedimentation of the stream within and downstream of the project limits. The contractor shall provide WDF with an erosion control plan for the project.
3. Instream work shall occur only during the periods of July 1, 1987 to October 1, 1987 and June 15, 1988 to October 1, 1988. It is further recommended that other site work involving substantial cuts or fills be limited to the

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period of April 15, 1987 to October 15 of each construction year.

4. The use of equipment in the flowing stream shall be restricted to that necessary to divert stream flow into temporary or permanent pipes, culverts, or channels and then only if the machinery is stationed on the banks (i.e., backhoe, clam shell, etc.).
5. Construction of the detention ponds shall be done in isolation from the stream flow. This shall be accomplished by the use of a temporary diversion pipe beginning at the downstream end of the existing culverts to bypass the new culvert site and the location of the downstream pond and outlet weir, and by using the permanent intake pipe or temporary pipe to the upper pond site.
6. All fish abandoned in the existing channel shall be safely removed to the flowing stream downstream of the project, under the direct supervision of WDF.
7. All temporary and permanent diversions of the stream shall be approved and accomplished under the direct supervision of WDF.
8. There shall be no blockages to upstream or downstream migration of salmonids during the period October 1, 1986 to June 15, 1987.
9. Spawning beds shall not be constructed until 1988 construction season to avoid contamination during the first winter while the ponds are used for instream settling of sediments from the first season's construction.
10. Stream flow shall be rerouted to the ponds prior to October 1, 1987. Placement of spawning gravel and containment rock without dewatering the pond.
11. The new culvert shall be installed as indicated on the plans and in isolation from stream flow.

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12. Excavation for the dam and construction of the fill shall be accomplished in isolation from stream flow. This may be accomplished by constructing a temporary dam to bypass the stream through the work area to the upper pond. Again, fish with the abandoned channel will have to be safely removed under the direct supervision of WDF. This work shall occur during the period June 15, 1987 and October 1, 1988.
13. Clearing and grubbing of the reservoir during the 1987 season shall take place with equipment operating on the banks. Stream fording with equipment shall be limited to those areas and times agreed to by the contractor and WDF and specified in a subsequent modification to this HPA.
14. Instream woody debris in the reservoir area shall not be removed or disturbed until the 1987 construction period (June 15 through October 1, 1987).

#### MONITORING

Monitoring activities proposed by the Town of Ilwaco include the following:

##### During Construction

1. Downstream water quality to establish the effects, if any, on the stream water quality as a result of construction activities. Water quality parameters shall include the following:
  - a. Turbidity
  - b. Suspended solids
  - c. Temperature
  - d. pH
  - e. Flow (cfs)
2. Pore pressure dam fills

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**Post Construction**

1. Emergence of wetland and forage crops (plantings)
2. Ground cover
3. Stream flows
4. Raw water quality
  - a. Turbidity
  - b. Suspended solids
  - c. Temperature
  - d. pH & DO
  - e. Heavy metals
  - f. Hardness
5. Stream flow from recording station
6. Reservoir levels
7. Presence, health, and vitality of wildlife
8. Presence of Cutthroat and Coho smolts within rearing area.

**1988 to 1993**

1. Ground cover - wetland and forage crops
2. Stream flows (downstream)
3. Withdrawal flows
4. Water quality
  - a. Turbidity
  - b. Suspended solids
  - c. Temperature
  - d. pH & DO
  - e. Heavy metals
  - f. Hardness
5. Reservoir levels

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6. Fish present within fish rearing area

**CONTINGENCY PLANS AND SUCCESS AND FAILURE DETERMINATION**

The proposed mitigation measures will be deemed a success if the following occur:

1. The presence of fish and wildlife remain at or equal to the quantity currently found within Indian Creek (prior to the proposed activity).
2. The forage crops created will be sufficiently dense to compensate for the loss of forage land.
3. The wetlands created will be equivalent to in area and character of the existing wetlands.

If the fish and wildlife values fall below the levels currently found (average of previous survey and proposed removal of fish by the WDF) an analysis will be made to establish the cause. Corrective actions will be proposed. If the forage crops and wetland seeding is not effective, the contractor will be required to replant such that the proper density and diversity occur. If water quality controls are not effective, the contractor shall revise the sedimentation and erosion control plan such that effective controls are achieved.

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COUNTY OF: Pacific STATE: WA  
APPLICATION BY: Town of Ilwaco**

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Unsigned

INDIAN CREEK MITIGATION AGREEMENT

BETWEEN

TOWN OF ILWACO (ILWACO)

AND

STATE OF WASHINGTON  
DEPARTMENT OF FISHERIES (FISHERIES)

AND

STATE OF WASHINGTON  
DEPARTMENT OF WILDLIFE (WILDLIFE)

WHEREAS RCW 75.20.060 provides that fishways are required in dams;

WHEREAS RCW 75.20.090 provides, in lieu of a fishway, fish hatcheries or other hydraulic work to compensate for damages caused by lack of a fishway, may be allowed where the Director of Fisheries deems a fishway impractical;

WHEREAS Fisheries and Wildlife have the responsibility to preserve, protect, and perpetuate the fish and wildlife resources of the State of Washington. Through this agreement, the departments also implement their responsibility under the Fish and Wildlife Coordination Act, 16 USC Section 661, et seq., to consult with and report to the Corps of Engineers regarding the appropriate measures for mitigating the adverse impacts of this project it is their duty to protect.

WHEREAS Ilwaco will construct a water supply dam on Indian Creek, a tributary of Bear River in Pacific County; said proposal does not include a fishway and as such will preclude future migration of anadromous fishes beyond the site of construction; said proposal will alter or eliminate 70 acres of terrestrial wildlife habitat; said proposal will also affect the natural flow in Indian Creek and the Bear River. \_\_\_\_\_

Be it hereby resolved the impacts of this project upon the fish and wildlife resources, their habitat, and other wildlife recreation activity have been identified. Appropriate mitigation measures have been identified by the Departments. This document memorializes the agreement of the [parties hereto with respect to all mitigation measures which have been agreed upon. These measures are set forth below.

1. Ilwaco, in lieu of providing a fishway at the dam, agrees to annually plant the equivalent number of yearling outmigrant coho salmon (smolts) as the stream upstream of the dam is capable of providing each year. This number is not to exceed 2,500 smolts annually. Planting will begin in 1988 and continue for as long as the dam is a block to fish migration.

2. Ilwaco agrees to construct and maintain to their designed efficiency three graveled spawning areas down stream of the dam site to compensate for the loss of upstream spawning sites necessary to seed the lower stream with coho fry, and to compensate for the loss of cutthroat trout spawning habitat. Construction of the spawning areas shall be incorporated with the dam construction and shall be completed prior to September 15, 1988.

3. As required in RCW 75.20.090, the Town of Ilwaco will post a bond in the sum of \$50,000 to ensure performance of items 1, 2, and 3 above.

4. Ilwaco agrees to construct a parallel side channel to Indian Creek as depicted on page 7 of schedule C. This channel shall be constructed to duplicate to the extent possible the side slope, gradient, and ponding as exists in Indian Creek.

5. Ilwaco will construct a proportional weir and the outlet of pond 1 to direct 75% of the flow to the existing Indian Creek channel and 25% of the flow to the side channel described in 4 above.

6. Ilwaco agrees to re-vegetate the disturbed and affected areas with the appropriate seed mixes as described in appendix a and depicted on page 18 of schedule C, plans and specifications.

7. Ilwaco agrees to maintain instream flows as required by the Department of Ecology and all parties recognize and agree that maintenance of these flows are critical to the success of these mitigation proposals.

Be it also resolved that:

1. Fisheries agrees to accept fish plants and construction of spawning areas in lieu of a fishway at the dam and loss of spawning area above the dam and will not require a fishway at this site or compensation other than that specified herein.

2. Fisheries agrees to consider, at the end of four years of fish planting, whether to adjust the numbers required to be planted below the dam, in consideration of increased

streamflow below the dam.

Ilwaco, Fisheries and Wildlife agree to meet jointly on site at appropriate construction phases to inspect and accept the adequacy of the above mitigation measures.

This agreement shall be effective as of the date of execution by all parties and shall continue in force and in effect as long as Fisheries and Wildlife deem the dam is a blockage to fish passage.

Accepted and Approved By:

\_\_\_\_\_  
City of Ilwaco

\_\_\_\_\_  
Date

\_\_\_\_\_  
Director, Department of  
Fisheries

\_\_\_\_\_  
Date

Approved as to Form this  
\_\_\_\_ day of \_\_\_\_\_

\_\_\_\_\_  
Director, Department of  
Wildlife

\_\_\_\_\_  
Asst. Attorney General

\_\_\_\_\_  
Date