

Date: January 24, 2014
To: Joy Klushkan (YRAA)
c:
From: Don Beard, Bridget LaPenter (Tetra Tech)
Project No./Name: YRAA Hatchery Siting
Subject: Preliminary Report

This memo includes our preliminary findings regarding a possible hatchery in the Yakutat area. We hope that providing this information now will allow you and your board members to give us your thoughts on the best approach to completing our report.

- In Table 1 below, we have developed approximate sizing and water flows for the major fish culture components of facilities with incubation capacities of 10 million, 20 million and 40 million eggs.
- In Tables 2 and 3 below, we have developed a format for estimating the project costs. Before we complete the estimates, we would appreciate the opportunity to review construction costs in Yakutat with you and your staff. We recognize that costs can vary widely depending on how YRAA undertakes the construction. If you have specific contractors in mind, or if some of the work may be performed by your board or staff, it would be helpful to get that information before we estimate costs.
- Also attached are the following drawings:
 - C-100 Hatchery Concept Plan
 - C-101 West Addition Location
 - C-102 Broken Oar Cove Location
 - C-103 Redfield Cove Location
 - C-104 Cold Storage Location

We hope that this information, combined with the draft water supply report, is helpful to you. If you would like to discuss any elements of the project with us, please let us know. Thank you.

Table 1

 Yakutat Regional Aquaculture Assn
 Central Incubation Facility
 Fish Culture Design Criteria

 % Recirc Incub 0%
 % Recirc Fry Pond 0%
 User Inputs

Option	Species	INCUBATION										FRY PONDING ***										NET FRY REARING									
		Egg Capacity	Type	Eggs/Inc	No. Inc	Inc per stack	No. Stacks	Stack GPM	Total GPM	Unit #	Number [M ³]	Vol Flow** [GPM]	Max GPM	Fry No.	Fry Wt [g]	Biomass [kg]	Density [kg/M ³]	Unit **	Volume of Each [M ³]	Number of Pens at 3M Fry each	Total Volume [M ³]	Total Fry at 95% Survival	Fry Final Wt [g]	Biomass [kg]	Density [kg/M ³]						
Enhancement	Chum	10,000,000	Hopad	180,000	56	6	10	20	200	1	40	176	176	1,500,000	0.4	600	15.0	40x40x15	680	4	680	9,500,000	2.0	19,000	7.0						
	Chum	10,000,000	Hopad	180,000	56	3	19	15	285	1	40	176	176	1,500,000	0.4	600	15.0	40x40x15	680	4	680	9,500,000	2.0	19,000	7.0						
	Chum	20,000,000	Hopad	180,000	112	6	19	20	380	1	40	176	176	1,500,000	0.4	600	15.0	40x40x15	680	7	680	19,000,000	2.0	38,000	8.0						
	Chum	20,000,000	Hopad	180,000	112	3	38	15	570	1	40	176	176	1,500,000	0.4	600	15.0	40x40x15	680	7	680	19,000,000	2.0	38,000	8.0						
	Chum	40,000,000	Hopad	180,000	223	6	38	20	760	1	40	176	176	1,500,000	0.4	600	15.0	40x40x15	680	14	680	35,000,000	2.0	76,000	8.0						
	Chum	40,000,000	Hopad	180,000	223	3	75	15	1125	1	40	176	176	1,500,000	0.2	300	7.50	40x40x15	680	14	680	35,000,000	2.0	76,000	8.0						
	Pink	10,000,000	Hopad	300,000	34	6	6	20	120	1	40	176	176	1,500,000	0.2	300	7.50	40x40x15	680	4	680	9,500,000	2.0	19,000	7.0						
	Pink	10,000,000	Hopad	300,000	34	3	12	15	180	1	40	176	176	1,500,000	0.2	300	7.50	40x40x15	680	4	680	9,500,000	2.0	19,000	7.0						
	Pink	20,000,000	Hopad	300,000	67	6	12	20	240	1	40	176	176	1,500,000	0.2	300	7.50	40x40x15	680	7	680	19,000,000	2.0	38,000	8.0						
	Pink	20,000,000	Hopad	300,000	67	3	23	15	345	1	40	176	176	1,500,000	0.2	300	7.50	40x40x15	680	7	680	19,000,000	2.0	38,000	8.0						
	Pink	40,000,000	Hopad	300,000	134	6	23	20	460	1	40	176	176	1,500,000	0.2	300	7.50	40x40x15	680	14	680	35,000,000	2.0	76,000	8.0						
	Pink	40,000,000	Hopad	300,000	134	3	45	15	675	1	40	176	176	1,500,000	0.2	300	7.50	40x40x15	680	14	680	35,000,000	2.0	76,000	8.0						

* Assume (1) 40x8x4 raceway for outmigration
 ** Assume 1 change per hour max flow required
 *** Typically lasts 24 hrs with non-volitional outmigration
 Chum typically pond at 0.3-0.4 g/fry
 Pinks typically pond at 0.2 g/fry

Table 2
Project Budget Estimates
YRAA Hatchery

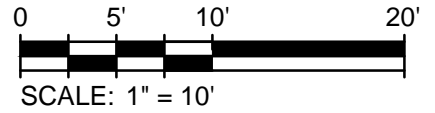
Item No.	Item Description	20 million egg	40 million egg
A	Site Development	TBD	TBD
B	Water Supply and Drain Systems	TBD	TBD
C	Hatchery Building	TBD	TBD
D	Fish Culture Systems	TBD	TBD
E	Process Water Tempering System	TBD	TBD
F	Saltwater Rearing	TBD	TBD
G	Support Facilities (Office, lab, apartment)	TBD	TBD
H	Mobilization	TBD	TBD
	Estimated Construction Bid Amount		
	8% Design		
	1% Permitting		
	8% Construction Administration		
	3% YRAA Legal, Admin Costs		
	8% Construction Contingencies		
	Total Project Budget		



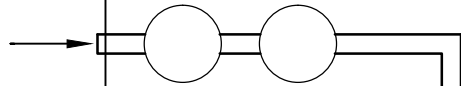
Table 3

**YRAA Hatchery
20 Million Egg Facility
Budget Item Details**

ITEM DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE	AMOUNT	SUBTOTALS	SUBTOTALS WITH EST CONTINGENCY
Site Development					\$0	\$0
1	Fill	cy	100	\$ -		
2	Foundation excavation and preparation	ls	1	\$ -		
3	Septic Tank, Drainfield	ls	1	\$ -		
4	Fuel tanks, pumps, piping	ls	1	\$ -		
5	Emergency Genset	ls	1	\$ -		
6	Communications, Alarms	ls	1	\$ -		
Water Supply and Drain Systems					\$0	\$0
1	Intakes at hillside springs	ea	4	\$ -		
2	Water supply piping	lf	300	\$ -		
4	Water supply piping, installation	ls	1	\$ -		
5	Head tank	ls	1	\$ -		
6	Gas Stabilization Tower	lf	1	\$ -		
7	Valves, misc fittings	ls	1	\$ -		
8	Drain system to saltwater	ls	1	\$ -		
Hatchery Building					\$0	\$0
1	Foundations	cy	30	\$ -		
2	Slab	cy	30	\$ -		
3	Pre-engineered metal bldg, installed	sf	1400	\$ -		
4	Mechanical, heat and vent	ls	1	\$ -		
5	Electrical, lighting	ls	1	\$ -		
Fish Culture Systems					\$0	\$0
1	Nopad Incubators	ea	112	\$ -		
3	40x8x5 alum raceway	ea	1	\$ -		
4	Gas Stabilization Tower	ea	1	\$ -		
5	Distribution Piping	ls	1	\$ -		
6	Shipping and installation	ls	1	\$ -		
Process Water Tempering System					\$0	\$0
1	Boiler or saltwater piping	ls	1	\$ -		
2	Circ pumps	ea	2	\$ -		
3	Heat exchangers	ea	1	\$ -		
4	Electrical	ls	1	\$ -		
5	Control system	ls	1	\$ -		
Saltwater Rearing					\$0	\$0
1	Wavemaster Frames, 40x40	ea	7	\$ -		
2	Nets	ea	7	\$ -		
3	Anchors	ls	1	\$ -		
4	Misc equipment, feed shed, etc.	ls	1	\$ -		
Support Facilities (Office, lab, apartment)					\$0	\$0
1	Office, laboratory, shops etc.	sf	500	\$ -		
2	Apartment	sf	1000	\$ -		
3	Office, laboratory finishes and furnishings	sf	1	\$ -		
Mobilization					\$0	\$0
		%	8%	\$ -	\$ -	\$0
				Subtotal	\$ -	
				20% Design/Estimating Conting	\$0	
				Estimated Construction Bid Amount	\$0	\$0

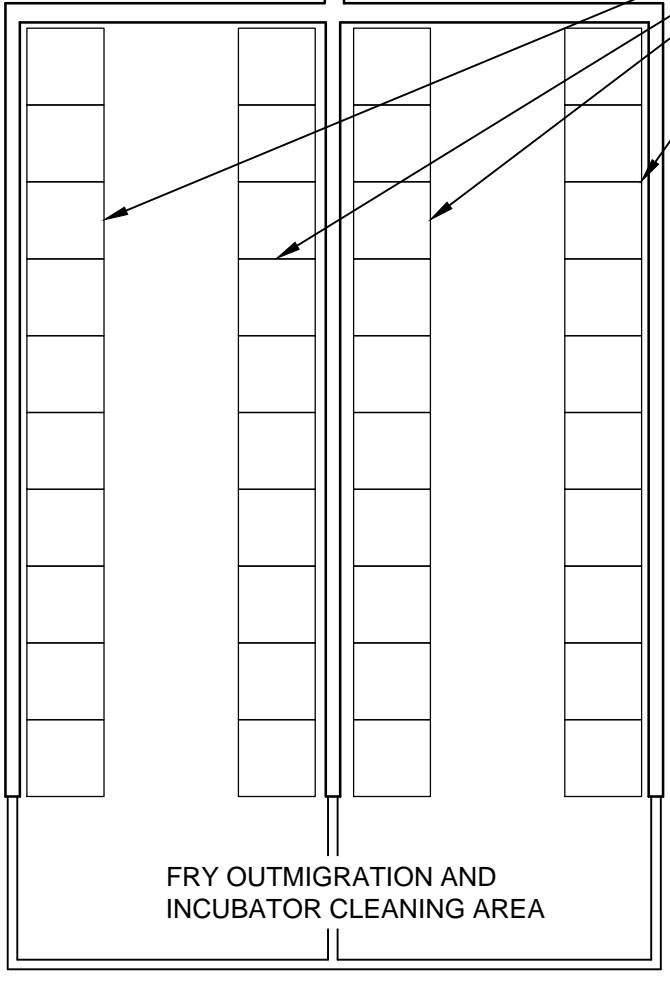


LABORATORY / OFFICE GROUND FLOOR
STAFF APARTMENT SECOND FLOOR

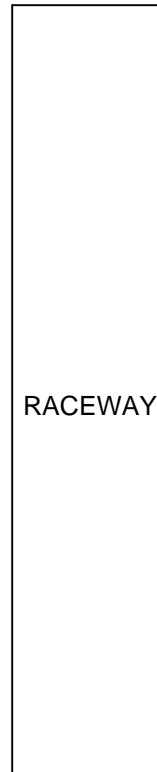


WATER SUPPLY
AND TREATMENT

(40) NOPAD STACKS



FRY OUTMIGRATION AND
INCUBATOR CLEANING AREA



RACEWAY

1/24/2014 5:05:30 PM - P:\97323\135-97323-14001\CAD\SHEETFILES\C-100 HATCHERY CONFIGURATION.DWG - LAPENTER, BRIDGET



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YAKUTAT REGIONAL AQUACULTURE ASSOCIATION

HATCHERY CONCEPT PLAN
CONFIGURED FOR 40 MIL CHUM EGGS

Project No.: 135-97323-14001

Date: 01-24-2014

Designed By: DRB

C-100

Bar Measures 1 inch

Copyright: Tetra Tech



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YAKUTAT REGIONAL AQUACULTURE ASSOCIATION

HATCHERY FACILITIES AT
WEST ADDITION HYDRANT LOCATION

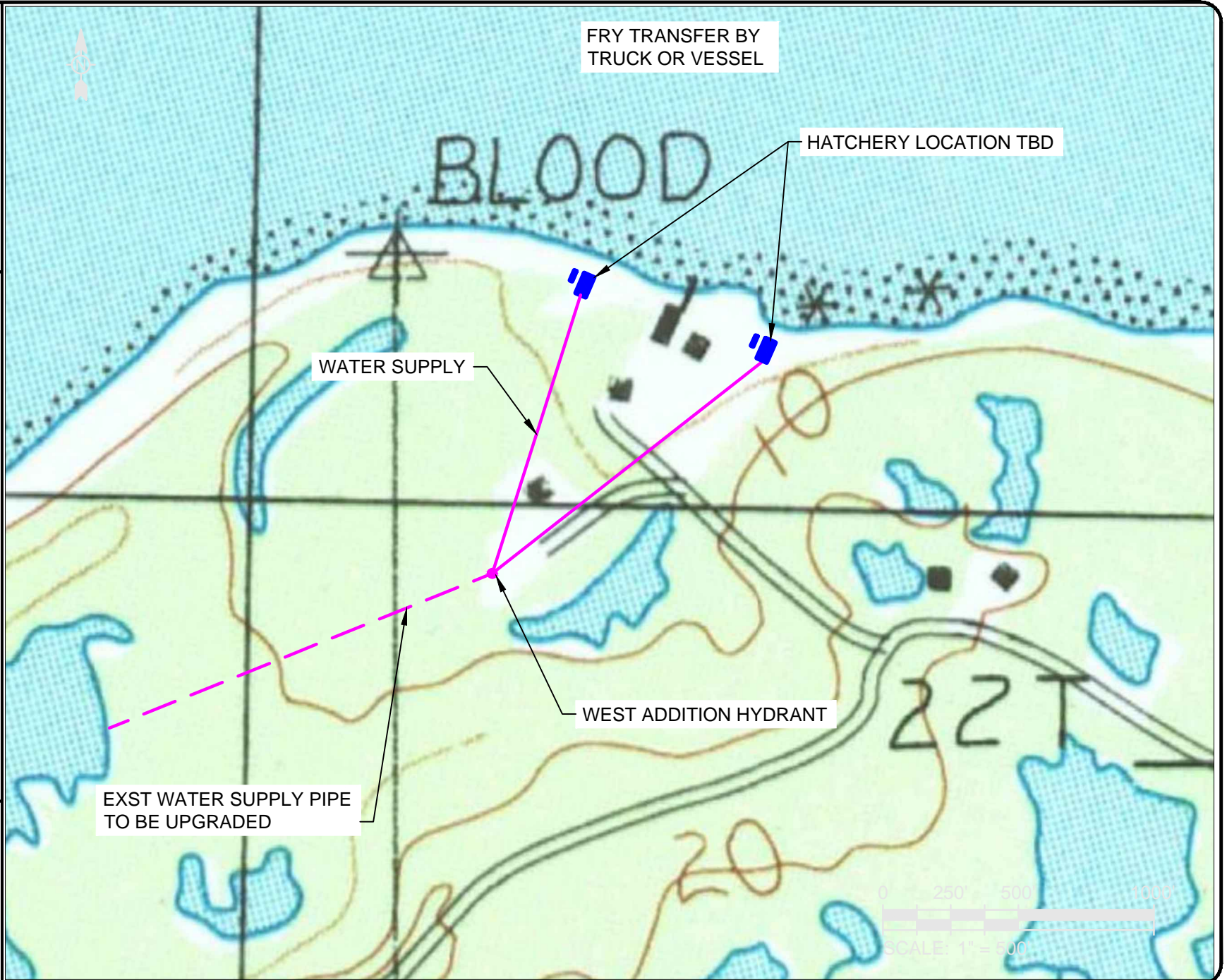
Project No.: 135-97323-14001

Date: 01-24-2014

Designed By: DRB

C-101

Bar Measures 1 inch





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YAKUTAT REGIONAL AQUACULTURE ASSOCIATION

HATCHERY FACILITIES AT
BROKEN OAR COVE LOCATION

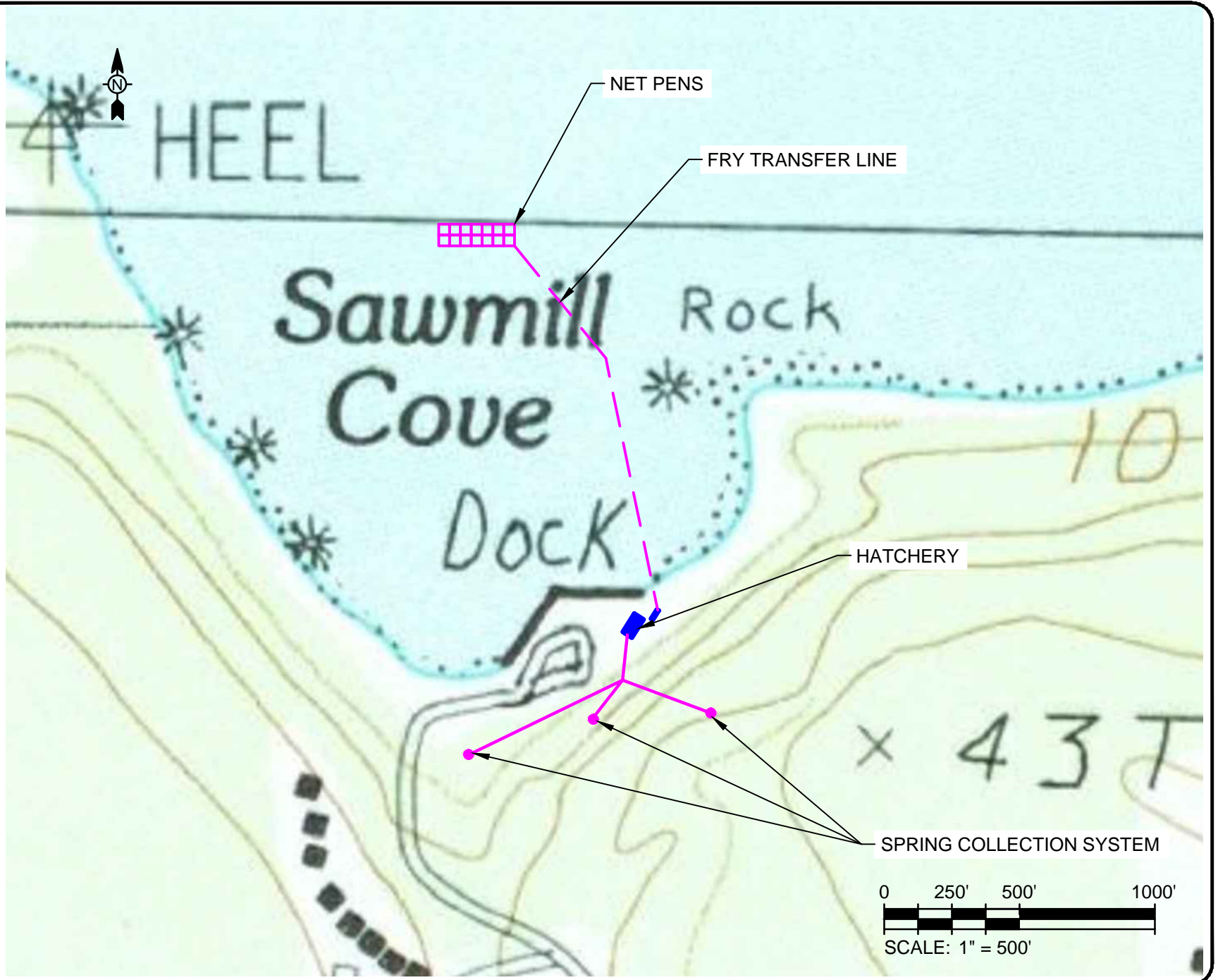
Project No.: 135-97323-14001

Date: 01-24-2014

Designed By: DRB

C-102

Bar Measures 1 inch





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YAKUTAT REGIONAL AQUACULTURE ASSOCIATION

HATCHERY FACILITIES AT
REDFIELD COVE LOCATION

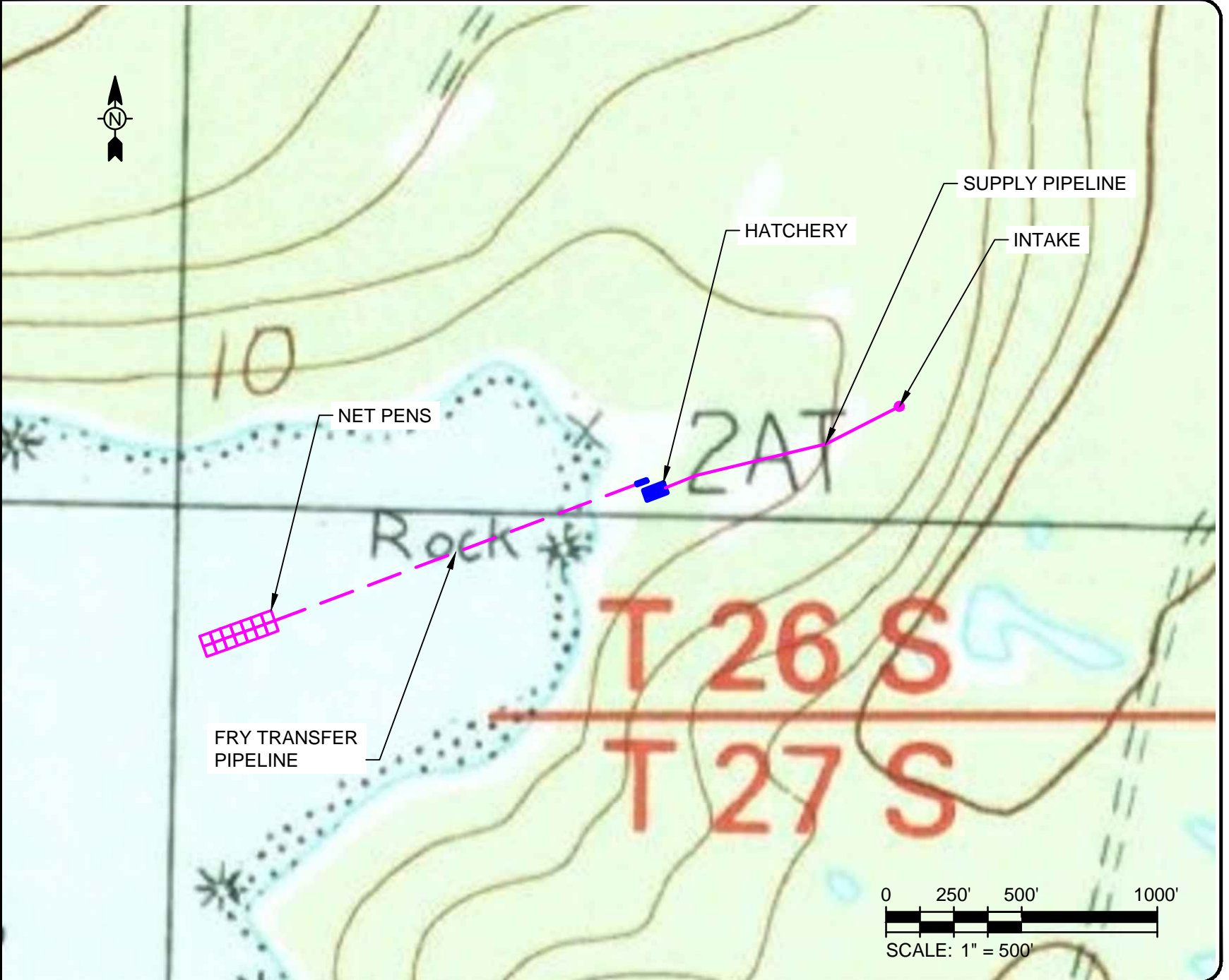
Project No.: 135-97323-14001

Date: 01-24-2014

Designed By: DRB

C-103

Bar Measures 1 inch





FRY TRANSFER BY TRUCK OR VESSEL

HATCHERY

EXST WATER SUPPLY TO TANK

YA-22
BM 14.5

BOLD

Tank

Water Tank

Tank

0 250' 500' 1000'

SCALE: 1" = 500'

1/24/2014 4:28:03 PM - P:\97323\135-97323-14001\CAD\SHEETFILES\C-104 COLDSTORAGE.DWG - LAPENTER, BRIDGET



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YAKUTAT REGIONAL AQUACULTURE ASSOCIATION

HATCHERY FACILITIES AT
COLD STORAGE LOCATION

Project No.: 135-97323-14001

Date: 01-24-2014

Designed By: DRB

C-104

Bar Measures 1 inch

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