



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN ELIAS BALDACCI

GOVERNOR

DAVID P. LITTELL

COMMISSIONER

January 27, 2006

Mr. Gene Arsenault
Ela Rearing Station
809 Cross Town Road
Embden, Maine 04958

RE: Maine Pollutant Discharge Elimination System (MEPDES) Permit #ME0001139
Maine Waste Discharge License (WDL) Application # W-002029-5Q-B-R
Final Permit/License

Dear Mr. Arsenault:

Enclosed please find a copy of your **final** MEPDES permit and Maine WDL which was approved by the Department of Environmental Protection. Please read the permit/license and its attached conditions carefully. You must follow the conditions in the order to satisfy the requirements of law. Any discharge not receiving adequate treatment is in violation of State Law and is subject to enforcement action.

Any interested person aggrieved by a Department determination made pursuant to applicable regulations, may appeal the decision following the procedures described in the attached DEP FACT SHEET entitled "*Appealing a Commissioner's Licensing Decision.*"

The Department would like to make you aware that your monthly Discharge Monitoring Report (DMR) forms may not reflect the revisions in this permitting action for several months after permit issuance, however, you are required to report applicable test results for parameters required by this permitting action that do not appear on the DMR. Please see the attached April 2003 O&M Newsletter article regarding this matter.

If you have any questions regarding the matter, please feel free to call me at (207) 287-6114 or contact me via email at Robert.D.Stratton@maine.gov.

Sincerely,

Robert D. Stratton
Division of Water Quality Management
Bureau of Land and Water Quality

Enc./cc: Steve Wilson, John Boland, Russ Danner, Peter Bourque (MDIFW),
Matt Young (MEDEP); [REDACTED]

Sandy Lao USEPA

AUGUSTA

17 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0017
(207) 287-7688 FAX: (207) 287-7826
RAY BLDG., HOSPITAL ST.

BANGOR
106 HOGAN ROAD
BANGOR, MAINE 04401
(207) 941-4570 FAX: (207) 941-4584

PORTLAND
312 CANCO ROAD
PORTLAND, MAINE 04103
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, MAINE 04769-2094
(207) 764-0477 FAX: (207) 760-3143

DMR Lag

(reprinted from April 2003 O&M Newsletter)

When the Department renews discharge permits, the parameter limits may change or parameters may be added or deleted. In some cases, it is merely the replacement of the federally issued NPDES permit with a state-issued MEPDES permit that results in different limits. When the new permit is finalized, a copy of the permit is passed to our data entry staff for coding into EPA's Permits Compliance System (PCS) database. PCS was developed in the 1970's and is not user-friendly. Entering or changing parameters can take weeks or even months. This can create a lag between the time your new permit becomes effective and the new permit limits appearing on your DMRs. If you are faced with this, it can create three different situations that have to be dealt with in different ways.

1. If the parameter was included on previous DMRs, but only the limit was changed, there will be a space for the data. Please go ahead and enter it. When the changes are made to PCS, the program will have the data and compare it to the new limit.
2. When a parameter is eliminated from monitoring in your new permit, but there is a delay in changing the DMR, you will have a space on the DMR that needs to be filled. For a parameter that has been eliminated, please enter the space on the DMR for that parameter only with "NODI-9" (No Discharge Indicator Code #9). This code means monitoring is conditional or not required this monitoring period.
3. When your new permit includes parameters for which monitoring was not previously required, and coding has not caught up on the DMRs, there will not be any space on the DMR identified for those parameters. In that case, please fill out an extra sheet of paper with the facility name and permit number, along with all of the information normally required for each parameter (parameter code, data, frequency of analysis, sample type, and number of exceedances). Each data point should be identified as monthly average, weekly average, daily max, etc. and the units of measurement such as mg/L or lb/day. Staple the extra sheet to the DMR so that the extra data stays with the DMR form. Our data entry staff cannot enter the data for the new parameters until the PCS coding catches up. When the PCS coding does catch up, our data entry staff will have the data right at hand to do the entry without having to take the extra time to seek it from your inspector or from you.

EPA is planning significant improvements for the PCS system that will be implemented in the next few years. These improvements should allow us to issue modified permits and DMRs concurrently. Until then we appreciate your assistance and patience in this effort.



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
STATE HOUSE STATION 17 AUGUSTA, MAINE 04333

DEPARTMENT ORDER

IN THE MATTER OF

ME. DEPT. INLAND FISHERIES & WILDLIFE	)	MAINE POLLUTANT DISCHARGE
ELA REARING STATION	)	ELIMINATION SYSTEM PERMIT
EMBDEN, SOMERSET COUNTY, ME	)	AND
FISH HATCHERY	)	
#ME0001139	)	WASTE DISCHARGE LICENSE
#W-002029-5Q-B-R APPROVAL	)	RENEWAL

Pursuant to the provisions of the Federal Water Pollution Control Act, Title 33 USC, Section 1251, et. seq and Maine Law 38 M.R.S.A., Section 414-A et seq., and applicable regulations the Department of Environmental Protection (Department) has considered the application of the MAINE DEPARTMENT OF INLAND FISHERIES AND WILDLIFE ELA FISH REARING STATION (hereinafter MDIFW Embden), with its supportive data, agency review comments, and other related materials on file and FINDS THE FOLLOWING FACTS:

APPLICATION SUMMARY

The applicant has applied for a renewal of Waste Discharge License (WDL) #W-002029-5Q-A-R, which was issued on July 21, 2000, for a five-year term. The WDL approved the discharge of a maximum of 4.75 million gallons per day (MGD) of fish hatchery wastewater to Mill Stream, Class B from a state brook trout and landlocked Atlantic salmon rearing facility in Embden, Maine.

PERMIT SUMMARY

January 12, 2001 – The Department received authorization from the U.S. Environmental Protection Agency (USEPA) to administer the National Pollutant Discharge Elimination System (NPDES) permit program in Maine, excluding areas of special interest to Maine Indian Tribes. On October 30, 2003, after consultation with the U.S. Department of Justice, USEPA extended Maine's NPDES program delegation to all but tribally owned lands. In those areas, the Department maintains the authority to issue WDLs pursuant to Maine law. The extent of Maine's delegated authority is under appeal at the time of this permitting action. From this point forward, the program will be referred to as the Maine Pollutant Discharge Elimination System (MEPDES) program and permit #ME0001139 will be utilized as the primary reference number for the Embden facility.

This permitting action is similar to the July 21, 2000 WDL in that it is carrying forward:

1. the monthly average and daily maximum reporting requirements for mass of fish on hand; and
2. the pH limit range of 6.0-8.5 standard units.

This permitting action is different from the July 21, 2000 WDL in that it is:

1. eliminating the 4.75 MGD daily maximum discharge flow limit and establishing a 4.75 MGD monthly average flow limit;
2. establishing BOD and TSS monthly average and daily maximum mass and concentration limits with a provision for the Department to establish new limits in the future based on technology performance analyses of the industry as a whole;
3. establishing seasonal monthly average total phosphorus mass and concentration limits and daily maximum monitoring requirements;
4. establishing seasonal monthly average and daily maximum orthophosphate mass and concentration monitoring requirements during 2006;
5. converting previous mass limits and reporting requirements from pounds of pollutant per 100 pounds of fish on hand to pounds of pollutant per unit of time;
6. establishing a daily maximum mass limit for formalin based on Department best professional judgement (BPJ) and monthly average mass and concentration reporting requirements;
7. establishing a daily maximum concentration limit for formalin based on the previously established formaldehyde limit for three years followed by a revised concentration limit based on Department BPJ of formalin toxicity, to provide for infrastructure, operation, and maintenance upgrades as appropriate to insure compliance;
8. establishing a daily minimum effluent limit and monthly average and daily maximum monitoring requirements for effluent dissolved oxygen;
9. establishing minimum monitoring frequency and sample type requirements based on BPJ;
10. restricting approved outfalls to #005A for normal treated wastewater discharges;
11. eliminating the reporting requirement for duration of discharge from the previous settling basin;
12. requiring a current facility Operation and Maintenance Plan;
13. establishing requirements for settling basin cleaning;
14. requiring compliance with existing state salmonid fish health rules;
15. establishing requirements related to proper use and record keeping of therapeutic agents;
16. eliminating effluent limits for chlorine and establishing record keeping requirements for disinfecting/sanitizing agents;
17. establishing BPJ derived minimum treatment technology requirements for the Embden facility;
18. establishing requirements for annual ambient macroinvertebrate biomonitoring beginning in 2007; and
19. replacing previous receiving water study requirements with requirements for ambient dissolved oxygen and temperature monitoring studies.

CONCLUSIONS

BASED on the findings in the attached Fact Sheet dated December 20, 2005, and revised January 24, 2006, and subject to the Conditions listed below, the Department makes the following conclusions:

1. The discharge, either by itself or in combination with other discharges, will not lower the quality of any classified body of water below such classification.
2. The discharge, either by itself or in combination with other discharges, will not lower the quality of any unclassified body of water below the classification which the Department expects to adopt in accordance with state law.
3. The provisions of the State's antidegradation policy, 38 MRSA Section 464(4)(F), will be met, in that:
 - (a) Existing in-stream water uses and the level of water quality necessary to protect and maintain those existing uses will be maintained and protected;
 - (b) Where high quality waters of the State constitute an outstanding national resource, that water quality will be maintained and protected;
 - (c) The standards of classification of the receiving water body are met or, where the standards of classification of the receiving water body are not met, the discharge will not cause or contribute to the failure of the water body to meet the standards of classification;
 - (d) Where the actual quality of any classified receiving water body exceeds the minimum standards of the next highest classification, that higher water quality will be maintained and protected; and
 - (e) Where a discharge will result in lowering the existing quality of any water body, the Department has made the finding, following opportunity for public participation, that this action is necessary to achieve important economic or social benefits to the State.
4. The discharge will be subject to effluent limitations that require application of best practicable treatment.

ACTION

THEREFORE, the Department APPROVES the above noted application of the MDIFW ELA FISH REARING STATION to discharge fish hatchery wastewater consisting of a monthly average flow of 4.75 MGD to Mill Stream, Class B, SUBJECT TO THE ATTACHED CONDITIONS, and all applicable standards and regulations including:

1. "Maine Pollutant Discharge Elimination System Permit Standard Conditions Applicable To All Permits," revised July 1, 2002, copy attached.
2. The attached Special Conditions, including any effluent limitations and monitoring requirements.
3. This permit expires five (5) years from the date of signature below.

DONE AND DATED AT AUGUSTA, MAINE, THIS 30th DAY OF JANUARY, 2006.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

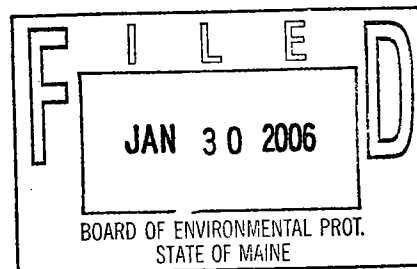
BY: _____

David P. Littell, Commissioner

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: July 18, 2005

Date of application acceptance: July 19, 2005



Date filed with Board of Environmental Protection _____.

This Order prepared by Robert D. Stratton, BUREAU OF LAND & WATER QUALITY

W-002029-5Q-B-R / #ME0001139

January 24, 2006

SPECIAL CONDITIONS

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

- During the period beginning the effective date of this permit and lasting through permit expiration, the permittee is authorized to discharge fish hatchery wastewater from **Outfall #005A** to Mill Stream. Such discharges shall be limited and monitored by the permittee as specified below¹:

Monitoring Parameter	Discharge Limitations and Reporting Requirements				Minimum Monitoring Requirements		
	Monthly <u>Average</u> as specified	Daily <u>Maximum</u> as specified	Monthly <u>Average</u> as specified	Daily <u>Maximum</u> as specified	Daily <u>Minimum</u> as specified	Measurement <u>Frequency</u> as specified	Sample <u>Type</u> as specified
Flow [50050]	4.75 MGD [03]	---	---	---	---	Daily [01/01]	Measured [MS]
BOD ² [00310]	238 lbs/day [26]	396 lbs/day [26]	6 mg/L [19]	10 mg/L [19]	---	Once/2 weeks [01/14]	Composite ³ [CP]
TSS ² [00530]	238 lbs/day [26]	396 lbs/day [26]	6 mg/L [19]	10 mg/L [19]	---	Once/2 weeks [01/14]	Composite ³ [CP]
Total Phosphorus ⁴ June 1 – Sept 30 yearly [00665]	1.4 lbs/day [26]	report lbs/day [26]	0.035 mg/L [19]	report mg/L [19]	---	Once/2 weeks [01/14]	Composite ³ [CP]
Orthophosphate (as P) ⁴ June 1 - Sept 30, 2006 [04175]	report lbs/day [26]	report lbs/day [26]	report mg/L [19]	report mg/L [19]	---	Once/2 weeks [01/14]	Composite ³ [CP]
Fish on Hand [45604]	report lbs/day [26]	report lbs/day [26]	---	---	---	Once/2 weeks [01/14]	Calculated [CA]
Formalin ⁵ Effective until Dec 31, 2008 [51064]	report lbs/day [26]	150 lbs/day [26]	report mg/L [19]	13.5 mg/L [19]	---	Once/2 weeks [01/14]	Calculated [CA]
Formalin ⁵ Beginning Jan 1, 2009 [51064]	report lbs/day [26]	150 lbs/day [26]	report mg/L [19]	1.6 mg/L [19]	---	Once/2 weeks [01/14]	Calculated [CA]
Dissolved Oxygen ⁶ June 1 – Sept 30 yearly [00300]	---	---	report mg/L [19]	report mg/L [19]	7.5 mg/L [19]	1/week [01/07]	Measured [MS]
pH [00400]	---	---	---	6.0-8.5 S.U. [12]	---	Once/2 weeks [01/14]	Grab [GR]

The italicized numeric values bracketed in the table above and in subsequent text are code numbers that Department personnel utilize to code the monthly Discharge Monitoring Reports (DMRs). Footnotes are found on Pages 7 and 8

SPECIAL CONDITIONS

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

2. During the period beginning the effective date of this permit and lasting through permit expiration, the permittee is authorized to discharge **fish hatchery wastewater from Outfall #005A** to Mill Stream. Such discharges shall be limited and monitored by the permittee as specified below from June 1 through September 30 each year:

Monitoring Parameter	Discharge Limitations and Reporting Requirements					Minimum Monitoring Requirements	
	Monthly Average as specified	Daily Maximum as specified	Monthly Average as specified	Daily Maximum as specified	Daily Minimum as specified	Measurement Frequency as specified	Sample Type as specified
Dissolved Oxygen ⁶ Ambient Location 1: Between Embden Pond dam and head of MDIFW Embden facility. [00300]	---	---	Report mg/L [19]	Report mg/L [19]	Report mg/L [19]	1/week [01/07]	Measured [MS]
Water Temperature ⁶ Ambient Location 1 [00010]	---	---	Report Degrees Celsius [04]	Report Degrees Celsius [04]	Report Degrees Celsius [04]	1/week [01/07]	Measured [MS]
Time of Day ^{6,7} Ambient Location 1 [80273]	---	---	---	Report 24-hour time [1Q]	---	1/week [01/07]	Measured [MS]
Dissolved Oxygen ⁶ Ambient Location 2: Below MDIFW Embden outfall. [00300]	---	---	Report mg/L [19]	Report mg/L [19]	Report mg/L [19]	1/week [01/07]	Measured [MS]
Water Temperature ⁶ Ambient Location 2 [00010]	---	---	Report Degrees Celsius [04]	Report Degrees Celsius [04]	Report Degrees Celsius [04]	1/week [01/07]	Measured [MS]
Time of Day ^{6,7} Ambient Location 2 [80273]	---	---	---	Report 24-hour time [1Q]	---	1/week [01/07]	Measured [MS]

The italicized numeric values bracketed in the table above and in subsequent text are code numbers that Department personnel utilize to code the monthly DMRs. Footnotes are found on Pages 7 and 8.

SPECIAL CONDITIONS

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

FOOTNOTES:

All sampling and analysis must be conducted in accordance with: (a) methods approved by 40 Code of Federal Regulations (CFR) Part 136, (b) alternative methods approved by the Department in accordance with the procedures in 40 CFR Part 136, or (c) as otherwise specified by the Department. Samples that are sent out for analysis shall be analyzed by a laboratory certified by the State of Maine's Department of Human Services unless otherwise approved by the Department. **All effluent limits are gross, end of pipe limits, unless otherwise specified.**

1. Effluent Monitoring: Effluent values shall be determined through sampling at Outfall #005A, the only authorized facility discharge, following all means of wastewater treatment. All monitoring shall be conducted so as to capture conditions representative of wastewater generating processes at the facility, such as flow-through and cleaning discharge flows, use of therapeutic and disinfecting/sanitizing agents, etc. and in consideration of settling pond/basin detention times. Any change in sampling location must be approved by the Department in writing.
2. BOD and TSS: BOD and TSS effluent concentration limits are based on results of secondary level fish hatchery wastewater treatment, developed by EPA. It is the Department's intent to re-evaluate and potentially revise concentration limits in the future based on statistical evaluations of demonstrated performance of consistently and properly utilized treatment technology for the industry.
3. Composite Samples: Samples shall consist of 24-hour composites collected with an automatic composite sampler. Alternatively, when weather conditions and/or equipment prevents automatic compositing and upon Department approval, the permittee may manually composite a minimum of four grab samples collected at two-hour intervals during the working day at the facility.
4. Total Phosphorus and Orthophosphate: The concentration and mass effluent limits and monitoring requirements shall consist of gross, end-of-pipe values. Phosphorus limits and monitoring requirements are seasonal and are only in effect from June 1 through September 30 each year. Orthophosphate monitoring requirements are only in effect from June 1 through September 30, 2006. Laboratory analysis shall be conducted on the same sample and shall consist of a low-level phosphorus analysis with a minimum detection limit of 1 part per billion (1 ug/L).
5. Formalin: Formalin monitoring shall be conducted only when in use at the facility and shall consist of a calculated effluent value. The permittee shall calculate the effluent formalin concentration through accurate determinations of the formalin concentration administered in each facility use, the volume of water to which the formalin is added, and dilutions provided from administration to end-of-pipe. The effluent mass shall be calculated by multiplying the gallons of formalin used by a 9.13 lbs / gallon conversion formula based on the specific gravity of formalin. The permittee shall provide this information and calculations to the Department in a document accompanying the monthly DMR. See Fact Sheet Section 17 for sample calculations.

SPECIAL CONDITIONS

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS, FOOTNOTES (cont'd):

6. Supplemental Data Forms: In addition to specified DMR reporting requirements, the permittee shall submit all data from effluent dissolved oxygen, ambient dissolved oxygen, water temperature, and time of day monitoring to the Department in a supplemental report accompanying the appropriate monthly discharge monitoring report pursuant to Permit Special Conditions E and O.
7. Time of Day: Time of day of ambient dissolved oxygen and temperature monitoring shall be reported using 24-hour time as HH hours, MM minutes, such as 05 hours 10 minutes.

B. NARRATIVE EFFLUENT LIMITATIONS:

1. The effluent shall not contain a visible oil sheen, foam or floating solids at any time which would impair the usages designated by the classification of the receiving waters.
2. The effluent shall not contain materials in concentrations or combinations which are hazardous or toxic to aquatic life, or which would impair the usages designated by the classification of the receiving waters.
3. The discharges shall not cause visible discoloration or turbidity in the receiving waters which would impair the usages designated by the classification of the receiving waters.
4. Notwithstanding specific conditions of this permit the effluent must not lower the quality of any classified body of water below such classification, or lower the existing quality of any body of water if the existing quality is higher than the classification.

C. UNAUTHORIZED DISCHARGES:

The permittee is authorized to discharge only in accordance with the terms and conditions of this permit and only from Outfall #005A, the only authorized facility discharge. Discharges of wastewater from any other point source are not authorized under this permit, and shall be reported in accordance with Standard Condition B(5) (*Bypass*) of this permit.

D. NOTIFICATION REQUIREMENT:

In accordance with Standard Condition D, the permittee shall notify the Department of the following:

1. Any substantial change in the volume or character of pollutants being introduced into the wastewater collection and treatment system.

SPECIAL CONDITIONS

D. NOTIFICATION REQUIREMENT (cont'd):

2. For the purposes of this section, adequate notice shall include information on:
 - a. The quality or quantity of wastewater introduced to the waste water collection and treatment system; and
 - b. Any anticipated impact of the change in the quantity or quality of the wastewater to be discharged from the treatment system.

E. MONITORING AND REPORTING:

Monitoring results obtained during the previous month shall be summarized for each month and reported on separate Discharge Monitoring Report (DMR) forms provided by the Department and postmarked on or before the thirteenth (13th) day of the month or hand-delivered to a Department regional office such that the DMR's are received by the Department on or before the fifteenth (15th) day of the month following the completed reporting period. A signed copy of the DMR and all other reports required herein including reports required pursuant to Permit Special Conditions A (footnote 6), F, G, M, and N, shall be submitted to the Department's assigned compliance inspector at the following address:

Department of Environmental Protection
Bureau of Land and Water Quality
Division of Water Quality Management
106 Hogan Road
Bangor, Maine 04401

F. OPERATION & MAINTENANCE (O&M) PLAN:

On or before July 1, 2006, the permittee shall submit to the Department a current written comprehensive Operation & Maintenance (O&M) Plan *[09699]*. The plan shall provide a systematic approach by which the permittee shall at all times, properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit.

The O&M Plan shall establish Best Management Practices (BMP) to be followed in operating the facility, cleaning the raceways/culture tanks, screens, and other equipment and disposing of any solid waste. The purpose of the BMP portion of the plan is to identify and to describe the practices which minimize the amounts of pollutants (biological, chemical, and medicinal) discharged to surface waters. Among other items, the plan shall describe in detail efficient feed management and feeding strategies to minimize discharges of uneaten feed and waste products, how and when the accumulated solids are to be removed, dewatered, and methods of disposal. The plan shall also describe where the removed material is to be placed and the techniques used to prevent it from re-entering the surface waters from any onsite storage. The plan shall document the recipients and methods of any offsite waste disposal.

SPECIAL CONDITIONS

F. OPERATION & MAINTENANCE (O&M) PLAN (cont'd):

By December 31 of each year, or within 90 days of any process changes or minor equipment upgrades, the permittee shall evaluate and modify the O&M Plan including site plan(s) and schematic(s) for the wastewater treatment facility to ensure that it is up-to-date. The O&M Plan shall be kept on-site at all times and made available to Department and EPA personnel upon request.

Within 90 days of completion of new and or substantial upgrades of the wastewater treatment facility, the permittee shall submit the updated O&M Plan to their Department inspector for review and comment.

G. SCHEDULE OF COMPLIANCE

The Department is establishing a Schedule of Compliance for implementation of the following effluent limits and requirements established in this permitting action to provide for infrastructure, operation and maintenance upgrades as appropriate to insure compliance. The permittee has recently completed major renovations to MDIFW Embden designed to improve both fish production and effluent quality and has requested a minimum of three years for implementation of more restrictive toxicity based effluent limits. MDIFW proposes to use this time to conduct a comprehensive evaluation of the structural and operational effectiveness of its wastewater discharge treatment system and to conduct toxicity testing of formalin and potential alternative therapeutics. The permittee shall adhere to the specific required tasks and deadlines detailed below:

- 1. Technology and Water Quality Based Effluent Limitations:** The permittee shall ensure that the facility provides wastewater treatment equal to or better than the minimum treatment technology for all wastewater discharges and complies with all technology based effluent limitations, monitoring requirements, and operational requirements established in this permitting action **upon its effective date** and shall ensure that the facility complies with all new toxicity based limits (formalin) **on or before January 1, 2009**.

2. Formalin:

- A. On or before January 1, 2007,** the permittee shall submit to the Department for review and comment, facility wide plans (reports) to address operational and physical modifications necessary to ensure compliance with the formalin limits established in this permit [34099]. The plans shall encompass methods, technologies, and implementation schedules for attainment of the formalin limits. For any alternatives involving design and construction, see Fact Sheet Attachment C for Department guidance on developing an Engineer's Facilities Planning Report.

SPECIAL CONDITIONS

G. SCHEDULE OF COMPLIANCE (cont'd)

- B. On or before June 1, 2007**, the permittee shall provide the Department with results of pilot testing and site investigations for the operational and physical modifications necessary to ensure compliance with the formalin limits established in this permit. *[63899]*
- C. On or before January 1, 2008**, the permittee shall complete the design for any physical structure, equipment, and/or operational and physical modifications necessary to ensure compliance with the formalin limits established in this permit, obtain all permits or licenses necessary for construction, and provide the Department with a report of the results *[54299]*.
- D. On or before November 1, 2008**, the permittee shall complete construction and initiate startup of the operational and physical modifications necessary to ensure compliance with the formalin limits established in this permit *[91899]*.
- E. On or before January 1, 2009**, the operational and physical modifications necessary to ensure compliance with the formalin limits established in this permit shall be fully operational and the revised formalin limits shall be in effect *[52599]*.

H. SETTLING BASIN CLEANING:

All wastewater settling structures shall be cleaned when accumulated materials occupy 20% of a basin's capacity, when material deposition in any area of the basins exceeds 50% of the operational depth, or at any time that solids from the basins are contributing to a violation of permit effluent limits. The permittee is responsible for reporting effluent violations pursuant to Standard Conditions D.1 (f) and (g).

I. DISEASE AND PATHOGEN CONTROL AND REPORTING:

MDIFW Embden must comply with Maine Department of Inland Fisheries and Wildlife and Maine Department of Marine Resources salmonid fish health rules (12 MRSA, §6071; 12 MRSA, §§7011, 7035, 7201, and 7202, or revised rules). The cited rules include requirements for notification to the appropriate agency within 24-hours of pathogen detection. In the event of a catastrophic pathogen occurrence, the permittee shall submit to the Department for review, information on the proposed treatment including materials/chemicals to be used, material/chemical toxicity to aquatic life, the mass and concentrations of materials/chemicals as administered, and the concentrations to be expected in the effluent. The Department will address such occurrences through administrative modifications of the permit.

SPECIAL CONDITIONS

J. THERAPEUTIC AGENTS:

All medicated fish feeds, drugs, and other fish health therapeutants shall be registered with USEPA as appropriate, approved by the US Food and Drug Administration (USFDA), and applied according to USFDA accepted guidelines and manufacturer's label instructions. Records of all such materials used are to be maintained at the facility for a period of five years. This permitting action does not authorize routine off-label or extra-label drug use. Such uses shall only be permitted in emergency situations when they are the only feasible treatments available and only under the authority of a veterinarian. **The permittee shall notify the Department in writing within 24-hours of such use.** This notification must be provided by the veterinarian involved and must include the agent(s) used, the concentration and mass applied, a description of how the use constitutes off-label or extra-label use, the necessity for the use in terms of the condition to be treated and the inability to utilize accepted drugs or approved methods, the duration of the use, the likely need of repeat treatments, and information on aquatic toxicity. If, upon review of information regarding the use of a drug pursuant to this section, the Department determines that significant adverse effects are likely to occur, it may restrict or limit such use.

K. DISINFECTING/SANITIZING AGENTS:

Records of all disinfectants and/or sanitizing agents used that have the potential to enter the waste stream or receiving water, their volumes and concentrations as used and concentrations at the point of discharge, shall be maintained at the facility for a period of five years. This permitting action only authorizes the discharge of those materials applied for, evaluated by the Department, and either regulated or determined to be de minimus in this permitting action or in subsequent Department actions.

L. MINIMUM TREATMENT TECHNOLOGY REQUIREMENT:

Between 2000 and 2002, eleven Maine fish hatcheries were evaluated to identify potential options for facility upgrades. All nine Maine Department of Inland Fisheries and Wildlife hatcheries were evaluated by FishPro Inc., while the two USFWS hatcheries were evaluated by the Freshwater Institute. Recommended wastewater treatment upgrades for each of the facilities included microscreen filtration of the effluent. Based on the information provided and Department BPJ, the Department is specifying that minimum treatment technology for the Embden facility shall consist of treatment equal to or better than 60-micron microscreen filtration of the effluent, wastewater settling/clarification, removal of solids. MDIFW Embden shall provide treatment equal to or better than the BPJ minimum treatment technology and shall comply with all effluent limitations, monitoring requirements, and operational requirements established in this permitting action. Additional treatment may be necessary to achieve specific water quality based limitations.

SPECIAL CONDITIONS

M. AMBIENT MACROINVERTEBRATE BIOMONITORING:

Based on available data, the Department is concerned with the effects of fish hatchery effluent discharges on rivers and streams in Maine and specifically Mill Stream. As macroinvertebrate communities provide indications of the overall ecological health of a receiving water, the Department has determined that biomonitoring is needed to better evaluate attainment of river and stream water classification standards and designated uses, resource impacts, and corrective measures when necessary. In order to address this need, the Department's Division of Environmental Assessment (MEDEP DEA) will conduct macroinvertebrate biomonitoring in the receiving water in 2006 to determine attainment of the aquatic life standards following upgrade of the MDIFW Embden facility. This permitting action requires MDIFW Embden to conduct ambient macroinvertebrate biomonitoring **annually beginning calendar year 2007. On or before March 1; 2007**, MDIFW Embden shall submit a biomonitoring plan for Mill Stream to MEDEP DEA for review and approval [34099]. The plan shall be consistent with "*Methods for Biological Sampling and Analysis of Maine's Rivers and Streams*" (DEP #LW0387-B2002, August 2002) and shall include a scope of work and schedule, monitoring locations and maps, methods and materials, and reporting procedures for the biomonitoring program. Biomonitoring shall be conducted according to a Department approved monitoring plan. Results shall be reported to the Department in a biomonitoring report by December 15 each year [90199, 90299, 90399, 90499]. If the receiving water is determined by the Department to be meeting criteria, standards, and designated uses for its assigned water quality class, including following the 2006 monitoring, the Department will reopen the permit pursuant to Permit Special Condition O, to modify or discontinue the biomonitoring requirement.

N. AMBIENT DISSOLVED OXYGEN AND TEMPERATURE MONITORING:

Based on the low effluent dilution provided in the receiving water and the need for additional data on the effects of the MDIFW Embden facility's effluent on the water quality of its receiving water, this permitting action requires the permittee to seasonally monitor ambient dissolved oxygen and temperature levels in Mill Stream. The permittee shall monitor ambient dissolved oxygen and temperature (Celsius) from June 1 through September 30 each year beginning the effective date of this permit at a frequency of once per week and shall report the time of day the monitoring is conducted. The permittee shall report all monitoring results to the Department in a supplemental report accompanying the appropriate monthly discharge monitoring report [21899]. Monitoring shall be conducted within two hours of sunrise, or as indicated in a Department approved monitoring plan, at two locations: (1) between the Embden Pond dam and the head of the MDIFW Embden facility in an area representing free-flowing conditions and (2) below the MDIFW Embden outfall in an area representing the dissolved oxygen sag point, unless revised by the Department. The permittee shall also report on the composition of river flow between the dam and the head of the facility. The permittee shall specify if river flow results from flow over the dam and provide the estimated depth of that overflow, or only leakage through the dam and provide the length of time that condition persists in days. **On or before three months following the effective date of this permit**, MDIFW Embden shall submit a plan for ambient dissolved oxygen and temperature monitoring and instrument calibration/data quality control to the Department's

SPECIAL CONDITIONS

N. AMBIENT DISSOLVED OXYGEN AND TEMPERATURE MONITORING (cont'd)

Division of Environmental Assessment for review and approval [00201]. The plan shall include a scope of work and schedule, monitoring locations and maps, sampling methods and materials, and reporting procedures for the ambient dissolved oxygen and temperature monitoring program. The plan shall also include procedures for regular instrument calibration to ensure data quality control. Ambient dissolved oxygen and temperature monitoring shall be conducted according to a Department approved monitoring plan.

O. REOPENING OF PERMIT FOR MODIFICATIONS

Upon evaluation of the tests results or monitoring requirements specified in Special Conditions of this permitting action, new site specific information, new water quality monitoring data or modeling information, or any other pertinent test results or information obtained during the term of this permit, the Department may, at anytime and with notice to the permittee, modify this permit to;

- 1) include effluent limits necessary to control specific pollutants or whole effluent toxicity where there is a reasonable potential that the effluent may cause water quality criteria to be exceeded,
- (2) require additional monitoring if results on file are inconclusive; or (3) change monitoring requirements or limitations based on new information.

P. SEVERABILITY

In the event that any provision, or part thereof, of this permit is declared to be unlawful by a reviewing court, the remainder of the permit shall remain in full force and effect, and shall be construed and enforced in all respects as if such unlawful provision, or part thereof, had been omitted, unless otherwise ordered by the court.

**MAINE POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT
AND
MAINE WASTE DISCHARGE LICENSE**

FACT SHEET

Date: December 20, 2005
Revised: January 24, 2006

MEPDES PERMIT NUMBER:
WASTE DISCHARGE LICENSE:

ME0001139
W-002029-5Q-B-R

NAME AND ADDRESS OF APPLICANT:

ELA REARING STATION
Maine Dept. of Inland Fisheries and Wildlife
284 State Street, 41 State House Station
Augusta, Maine 04333

COUNTY: SOMERSET

NAME AND ADDRESS WHERE DISCHARGE OCCURS:

ELA REARING STATION
809 Cross Town Road
Embden, Maine 04958

RECEIVING WATER / CLASSIFICATION: Mill Stream, Class B

COGNIZANT OFFICIAL AND TELEPHONE NUMBER:

Mr. Gene Arsenault Facility Manager (207) 566-0591
Mr. Steve Wilson, MDIFW Hatchery Supervisor (207) 287-5262

1. APPLICATION SUMMARY

The applicant has applied for a renewal of Waste Discharge License (WDL), #W-002029-5Q-A-R, which was issued on July 21, 2000, for a five-year term. The WDL approved the discharge of a maximum of 4.75 million gallons per day (MGD) of fish hatchery wastewater to Mill Stream, Class B from a state brook trout and landlocked Atlantic salmon rearing facility in Embden, Maine.

2. PERMIT SUMMARY

- a. Regulatory - January 12, 2001 – The Department received authorization from the U.S. Environmental Protection Agency (USEPA) to administer the National Pollutant Discharge Elimination System (NPDES) permit program in Maine, excluding areas of special interest to Maine Indian Tribes. On October 30, 2003, after consultation with the U.S. Department of Justice, USEPA extended Maine's NPDES program delegation to all but tribally owned lands. In those areas, the Department maintains the authority to issue WDLs pursuant to Maine law. The extent of Maine's delegated authority is under appeal at the time of this permitting action. From this point forward, the program will be referred to as the Maine Pollutant Discharge Elimination System (MEPDES) program and permit #ME0001139 will be utilized as the primary reference number for the Embden facility. Any previous NPDES permits issued by the EPA will be replaced by the MEPDES permit upon issuance. Once retired, all terms and conditions of any NPDES permits are null and void.
- b. Terms and conditions – This permitting action is similar to the July 21, 2000 WDL in that it is carrying forward:
 1. the monthly average and daily maximum reporting requirements for mass of fish on hand; and
 2. the pH limit range of 6.0-8.5 standard units.

This permitting action is different from the July 21, 2000 WDL in that it is:

1. eliminating the 4.75 MGD daily maximum discharge flow limit and establishing a 4.75 MGD monthly average flow limit;
2. establishing BOD and TSS monthly average and daily maximum mass and concentration limits with a provision for the Department to establish new limits in the future based on technology performance analyses of the industry as a whole;
3. establishing seasonal monthly average total phosphorus mass and concentration limits and daily maximum monitoring requirements;
4. establishing seasonal monthly average and daily maximum orthophosphate mass and concentration monitoring requirements during 2006;
5. converting previous mass limits and reporting requirements from pounds of pollutant per 100 pounds of fish on hand to pounds of pollutant per unit of time;
6. establishing a daily maximum mass limit for formalin based on Department best professional judgement (BPJ) and monthly average mass and concentration reporting requirements;
7. establishing a daily maximum concentration limit for formalin based on the previously established formaldehyde limit for three years followed by a revised concentration limit based on Department BPJ of formalin toxicity, to provide for infrastructure, operation, and maintenance upgrades as appropriate to insure compliance;
8. establishing a daily minimum effluent limit and monthly average and daily maximum monitoring requirements for effluent dissolved oxygen;
9. establishing minimum monitoring frequency and sample type requirements based on BPJ;
10. restricting approved outfalls to #005A for normal treated wastewater discharges;

11. eliminating the reporting requirement for duration of discharge from the previous settling basin;
12. requiring a current facility Operation and Maintenance Plan;
13. establishing requirements for settling basin cleaning;
14. requiring compliance with existing state salmonid fish health rules;
15. establishing requirements related to proper use and record keeping of therapeutic agents;
16. eliminating effluent limits for chlorine and establishing record keeping requirements for disinfecting/sanitizing agents;
17. establishing BPJ derived minimum treatment technology requirements for the Embden facility;
18. establishing requirements for annual ambient macroinvertebrate biomonitoring beginning in 2007; and
19. replacing previous receiving water study requirements with requirements for ambient dissolved oxygen and temperature monitoring studies.

c. History: The most recent licensing/permitting actions include the following:

February 20, 1975 – The USEPA issued NPDES Permit #ME0001139 to the Maine Department of Inland Fisheries and Game for the discharge of an unspecified volume of wastewater from the Embden Rearing Station to Mill Stream. The Permit was valid through February 15, 1980.

May 11, 1983 – The Maine Board of Environmental Protection issued WDL #2029 for the discharge of a daily maximum of 5.0 MGD of fish hatchery wastewater from the MDIFW Embden Rearing Station to Mill Stream, Class B-1. The WDL was a renewal of a previously issued license #2029. The WDL was issued for a five-year term.

July 21, 2000 – The Department issued # W-002029-5Q-A-R to MDIFW Embden Rearing Station for the discharge of a daily maximum of 4.75 MGD of treated fish hatchery wastewater. The WDL was issued for a five-year term.

September 10, 2001 – The Department suspended monitoring requirements established in WDL # W-002029-5Q-A-R for Outfall #001A, designated for effluent discharges from the settling basin when not cleaning raceways. The Department required monitoring for Outfalls #001B and #002A, designated for effluent discharges from the settling basin when cleaning raceways and from non-cleaning flow-through water bypassing the settling basin, to be conducted by autocompositer. The Department made no mention of Outfall #003A, previously designated for a summary of the flow, mass of fish on hand, and total phosphorus values from Outfalls #001B and #002A. MDIFW continued to monitor all outfalls.

February 2002 – On behalf of MDIFW, Fishpro Inc. submitted an Alternative Discharge Study report for all nine MDIFW hatcheries and rearing stations. The study evaluated eliminating effluent discharges through: piping the discharges to larger receiving waters, connecting to municipal wastewater treatment facilities, wastewater storage collection, land application of wastewater, and discharging to existing wetland areas. The study determined that none of the alternatives evaluated were viable options for the MDIFW facilities.

September 12, 2002 – The Department submitted a report entitled *Maine Department of Environmental Protection Water Quality Concerns and Effects from State Fish Hatchery Discharges* to the Maine Legislature's Inland Fisheries and Wildlife Subcommittee's Commission to Study the Needs and Opportunities Associated with the Production of Salmonid Sport Fish in Maine and MDIFW.

November 2002 – FishPro Inc. submitted to MDIFW its *Comprehensive Statewide Fish Hatchery System Engineering Study* addressing recommended upgrades to all MDIFW fish hatcheries and rearing facilities.

July 11, 2003 – The Department administratively modified WDL # W-002029-5Q-A-R to extend the 3-year schedule of compliance for BOD, TSS, and phosphorus effluent limits established in the WDL through the life of the WDL.

July 18, 2005 - The Department received an application from MDIFW for renewal of the WDL for the discharge of fish hatchery wastewater from the Embden facility. The application was assigned WDL # W-002029-5Q-B-R and MEPDES permit #ME0001139.

d. Source Description/ Facility Operation:

The MDIFW Embden facility was constructed in 1957 as a state aquaculture facility. MDIFW Embden is a fish rearing station, raising brook trout, brown trout, and splake fry and landlocked Atlantic salmon fingerlings obtained from other MDIFW hatchery facilities to appropriate sizes for stocking in Maine waters as part of MDIFW's responsibilities in managing fisheries in Maine. In May of each year, MDIFW Embden obtains 1 to 2-inch long Kennebago strain, Maine Hatchery strain, and/or Kennebago-Maine Hatchery cross strain brook trout fry from the MDIFW Phillips, Dry Mills (Gray), and Governor Hill (Augusta) hatcheries. Most of the brook trout are removed for stocking in the fall, while some are held over for spring stocking. Also in May, MDIFW Embden obtains 1 to 2-inch long brown trout fry from the MDIFW New Gloucester hatchery and 1 to 2-inch long splake fry from the Governor Hill (Augusta) hatchery for fall stocking. In October of each year, MDIFW Embden obtains 4 to 6-inch long landlocked Atlantic salmon fingerlings from the MDIFW Grand Lake Stream hatchery for spring stocking. The rearing process is described below. The MDIFW Embden facility underwent significant upgrades in 2005. The narratives below indicate both historical and upgraded conditions.

Influent Water: Source water for the MDIFW Embden facility is obtained from Embden Pond (1,568-acres) through two intake pipes, a deep water (64-feet deep) 24-inch diameter iron pipe and a shallow water (15-feet deep) 24-inch diameter iron pipe. The two intake supply lines previously converged in a valve box near the lake shoreline into one 24-inch diameter iron pipe that ran to the facility. MDIFW Embden blended influent water in a head box at the head of the facility raceway system manually, as needed to meet temperature requirements (35-62 degrees F) for its fish. Neither intake pipe was screened, however the headboxes to the raceways were screened to prevent fish or large debris from entering the

station. MDIFW Embden is a gravity-fed flow-through facility with flows previously run through each of two parallel raceway lines and currently through a 30-unit tank farm system to Mill Stream (Class B), which in turn flows to the Carrabassett (Class B) and Kennebec (Class A) Rivers.

Rearing Facilities: MDIFW Embden's rearing facilities previously consisted of two lines of concrete raceways referred to as the west side and east side raceways. Both the west side and east side raceways consisted of three sets of four raceway pools for a total of 12 pools per side and 24 raceway pools for the facility. The west side raceways were covered, while the east side raceways were uncovered. Each of the raceway pools was 6-feet wide by 100-feet long, operated at a depth of 18-inches. As noted below, the former raceway system has been removed and MDIFW Embden has been upgraded to a 30-unit tank farm facility. The units consist of 20-foot diameter by 3.0-foot deep (7,050-gallon) stainless steel circular fish tanks, arranged in three lines of 10 tanks. Influent water is provided to the head of the three lines of tanks, then independently to each tank. Tank effluent water is independently discharged, but combined for treatment. Feeding is conducted with demand and belt feeders as well as manually. MDIFW Embden indicates using an average of 75 pounds of food per day, a maximum of 196 lbs/day, and a period of peak feeding during August and September. Rearing infrastructure upgrades are further described below.

Fish are raised for both spring and fall stocking. In the fall (September), MDIFW Embden stocks one-year old, 6 to 8-inch long brook trout, brown trout, and splake. In the spring (May), MDIFW Embden stocks one-year old, 6 to 8-inch long landlocked Atlantic salmon and spring yearling (age 1 year +) 10 to 12-inch long brook trout. New trout and salmon fry and fingerlings are brought on station for rearing as outlined above to replace stocked fish. Prior to the 2005 facility upgrade, MDIFW Embden housed approximately 45,000 brook trout and 18,000 salmon during the winter. MDIFW Embden now projects housing approximately 120,000 brook trout, 28,000 salmon, 45,000 brown trout, and 4,500 splake during the winter of 2005-2006.

- e. Wastewater Treatment: To clean the previous raceway system, MDIFW staff historically scrubbed the sides and bottoms from the top end of the raceway pool moving down-flow toward the bottom end. At the bottom of all raceway pools was located a screened 1.5-foot long "quiescent zone" with a covered discharge pipe routed through a 12-inch diameter iron pipe to the facility settling basin described below. When approximately two-thirds of the pool's length was cleaned, the discharge pipe "plug" was removed, sending cleaning flows to the settling basin. After the raceway pool and quiescent zone screen were cleaned, the quiescent zone plug was replaced and the cleaners move to the next raceway pool. Summer practices involved cleaning all raceways approximately twice per week, while non-summer practices involved cleaning one linear set of raceways (four pools) per day resulting in the entire facility being cleaned once over a one-week period. MDIFW Palermo indicates that it took approximately 20 minutes to clean each raceway pool and approximately eight hours to clean all pools.

The upgraded facility's rearing tanks contain a screened pit on the bottom for settling and collection of solid waste materials. As necessary based on daily inspection, MDIFW Embden removes standpipes from individual rearing tanks to divert waste materials contained in the pit to the facility wastewater treatment infrastructure described below for filtration, settling, and removal of solids. Additionally, rearing tanks are anticipated to be inspected a minimum of twice per year and cleaned by power washing as needed when empty. These cleaning flows will be treated as described below.

Historically, MDIFW Embden provided wastewater treatment through settling in a 40-foot by 90-foot by 3.5-foot deep (94,250-gallons) concrete settling basin located at the end of the raceways, which was also used to house large "show fish". Approximately two-thirds of normal facility flow consisted of flow-through water directly to Mill Stream through a 30-inch diameter iron pipe, while one-third, including all facility cleaning water, flowed through the facility settling basin prior to discharge to Mill Stream through a 12-inch diameter iron pipe. Historically, the settling basin was infrequently cleaned with deposited solid waste material, over which one-third of the facility wastewaters flowed, accumulating to significant depths.

Wastewater Treatment Upgrade: During 2005, MDIFW Embden underwent a series of facility improvements and upgrades, which resulted in removal of the concrete raceways and incorporation of the following:

- modification of the shallow water intake pipe and flow delivery infrastructure to provide for separation of intake flows to the facility, enabling better water temperature management.
- replacement of influent water control and mixing valves.
- new influent pipe screens (2-inch x 4-inch grating) for better exclusion of wild fish and debris followed by influent strainers (1/8-inch mesh) in the facility headbox to remove finer debris and small fish.
- a dissolved oxygen management system for the flow-through water with bulk liquid oxygen and low head oxygen contact chambers.
- installation of automatic air release valves on influent water supply pipes to eliminate air locking potential.
- ultraviolet disinfection of influent water with one UV unit dedicated to each of three lines of rearing tanks.
- replace raceways with thirty 20-foot diameter by 3.0-foot deep (7,050-gallon) stainless steel circular fish tanks, arranged in three lines of ten tanks.
- installation of a common wastewater pipeline to intercept all facility drains and improved management of facility wastewater flows to route all cleaning and flow-through wastewater through microscreen drumfilters prior to discharge to the receiving water. Filter backwash of captured solids is routed to a clarifier, with removed solids automatically or manually pumped to an adjoining sludge storage/dewatering tank designed to provide a minimum of 6-months of storage capacity. Clarifier supernatant will be periodically routed through the filter unit and discharged. Sludge tank supernatant will be routed to the clarifier for additional treatment as needed.

- installation of two 30-micron drum filters for filtration of all cleaning and flow-through wastewater, designed to be operated simultaneously under normal conditions or alone in the case of needed maintenance.
- modification of the existing settling basin (40-feet by 90-feet by 3.5-feet) to consist of a new clarifier (40-feet by 45-feet by depths ranging from a few inches to 3.5-feet to facilitate settling (23,562-gallons)) and an adjoining sludge storage/dewatering tank (40-feet by 45-feet by 5-feet (67,320-gallons)).
- use of automated composite effluent samplers.
- infrastructure to allow discharge of influent lake water flows directly to the facility filter plant in the event that influent screens become blocked and flows back-up.

MDIFW Embden's revised standard procedures involve full wastewater treatment of all effluent flows and discharge through a single outfall, Outfall #005A, a 24-inch diameter HDPE pipe that discharges approximately one-foot above stream level onto a riprap apron. MDIFW Embden's discharge is at all times subject to the effluent limitations and monitoring requirements established in this permitting action.

Use of agents for therapeutic and disinfecting/sanitizing purposes are addressed in subsequent Fact Sheet sections titled accordingly.

3. CONDITIONS OF PERMITS

Maine law, 38 M.R.S.A. Section 414-A, requires that the effluent limitations prescribed for discharges, including, but not limited to, effluent toxicity, require application of best practicable treatment (BPT), be consistent with the U.S. Clean Water Act, and ensure that the receiving waters attain the State water quality standards as described in Maine's Surface Water Classification System. In addition, 38 M.R.S.A., Section 420 and Department rule 06-096 CMR Chapter 530, *Surface Water Toxics Control Program*, require the regulation of toxic substances not to exceed levels set forth in Department rule 06-096 CMR Chapter 584, *Surface Water Quality Criteria for Toxic Pollutants*, and that ensure safe levels for the discharge of toxic pollutants such that existing and designated uses of surface waters are maintained and protected.

4. RECEIVING WATER QUALITY STANDARDS:

Maine law, 38 M.R.S.A., Section 467.4.B(2)(b) classifies Mill Stream at the point of discharge as a Class B water. Maine law, 38 M.R.S.A., Section 465.3, describes the standards for Class B waters.

5. RECEIVING WATER QUALITY CONDITIONS:

The State of Maine 2004 *Integrated Water Quality Monitoring and Assessment Report* (DEPLW0665), prepared pursuant to Sections 303(d) and 305(b) of the Federal Water Pollution Control Act includes the receiving water in the designation *Mill Stream (Embden)* (Assessment Unit ME0103000304, Segment ID 313R01), listed in Category 5-A, Rivers and Streams Impaired by Pollutants Other Than Those Listed in 5-B Through 5-D (TMDL Required). The listing identifies a 2.0 mile segment of Class B water determined in 2000 to be not attaining its aquatic life standard due to aquaculture point source discharge(s) and indicates that a TMDL (total maximum daily load) analysis is planned for 2006. Further, Department biomonitoring conducted in Mill Stream below the Embden station in 2000 revealed that the macroinvertebrate communities in the stream are not indicative of Class B waters, further non-attainment of the aquatic life standard. All freshwaters in Maine are listed as only partially attaining the designated use of recreational fishing due to a fish consumption advisory (Category 5-C). The advisory was established in response to elevated levels of mercury in some fish caused by atmospheric deposition. The Department has no information that the Embden facility causes or adversely contributes to the consumption advisory. However, the Department finds that MDIFW Embden has caused or adversely contributed to the other non-attainment conditions indicated and is establishing effluent limitations, monitoring and operational requirements accordingly, including requirements for ambient macroinvertebrate biomonitoring (Permit Special Condition M) and ambient monitoring for dissolved oxygen and temperature (Permit Special Condition N).

If it is determined that non-attainment conditions persist in the receiving water and that MDIFW Embden causes or contributes to those conditions, this permitting action may be reopened pursuant to Permit Special Condition O and effluent limitations, monitoring and operational requirements, and/or wastewater treatment requirements adjusted accordingly.

6. EFFLUENT LIMITATIONS & MONITORING REQUIREMENTS:

On June 30, 2004, USEPA finalized the Effluent Limitations Guidelines and New Source Performance Standards for the Concentrated Aquatic Animal Production Point Source Category (National Effluent Guidelines). The earlier September 12, 2002 proposed National Effluent Guidelines (NEGs) and subsequent working draft NEGs established numerical limitations for the discharge of TSS and requirements for facilities to develop and implement best management practices (BMP) plans for control of other pollutants.

In the final NEGs, EPA expressed effluent limitations in the form of narrative standards, rather than as numerical values. The final NEGs require facilities to develop and implement BMPs regarding operation and maintenance of the facility, as does this permitting action. EPA stated that it determined it more appropriate to promulgate limits “...that could better respond to regional and site-specific conditions and accommodate existing state programs in cases where these appear to be working well.” The final NEGs reference a section of the federal Clean Water Act inclusive of 40 CFR, Part 125.31(f), which states, “Nothing in this section shall be construed to impair the right of any State or locality under section 510 of the

Act to impose more stringent limitations than those required by Federal law." Section 510 states, "Except as expressly provided in this Act, nothing in this Act shall (1) preclude or deny the right of any State...to adopt or enforce...any standard o(r) limitation respecting discharges of pollutants, or...any requirement respecting control or abatement of pollution; except that if an effluent limitation...or standard of performance is in effect under this Act, such State...may not adopt or enforce any effluent limitation...or standard of performance which is less stringent than the effluent limitation...or standard of performance under this Act; or (2) be construed as impairing or in any manner affecting any right or jurisdiction of the States with respect to the waters...of such States ".

Pursuant to Maine Law (38 M.R.S.A., §414-A.1), the Department shall only authorize discharges to Maine waters when those discharges, either by themselves or in combination with other discharges, *"will not lower the quality of any classified body of water below such classification"*. Further, *"the discharge will be subject to effluent limitations that require application of the best practicable treatment"*. *"Best practicable treatment (BPT) means the methods of reduction, treatment, control and handling of pollutants, including process methods, and the application of best conventional pollutant control technology or best available technology economically available, for a category or class of discharge sources that the department determines are best calculated to protect and improve the quality of the receiving water and that are consistent with the requirements of the Federal Water Pollution Control Act" (40 CFR). "If no applicable standards exist for a specific activity or discharge, the department must establish limits on a case-by-case basis using best professional judgement..." considering "...the existing state of technology, the effectiveness of the available alternatives for control of the type of discharge and the economic feasibility of such alternatives..."*. Pursuant to 38 M.R.S.A., §414-A.1 and §464.4, the Department regulates wastewater discharges through establishment of effluent limitations and monitoring requirements that are protective of Maine waters.

Between calendar years 2000 and 2002, eleven Maine fish hatcheries were evaluated to identify potential options for facility upgrades. All nine Maine Department of Inland Fisheries and Wildlife hatcheries were evaluated by FishPro Inc., while the two USFWS hatcheries were evaluated by the Freshwater Institute. Recommended wastewater treatment upgrades for each of the facilities included microscreen filtration of the effluent. Based on the information provided and Department best professional judgement (BPJ), the Department is specifying that minimum treatment technology for the MDIFW Embden facility shall consist of treatment equal to or better than 60-micron microscreen filtration of the effluent, wastewater settling/clarification, and removal of solids (Permit Special Condition L, Fact Sheet Section 13). MDIFW Embden shall provide treatment equal to or better than the BPJ minimum treatment technology and shall comply with all effluent limitations, monitoring requirements, and operational requirements established in this permitting action. Additional treatment may be necessary to achieve specific water quality based limitations.

The previous licensing action established the following outfall designations and corresponding processes: Outfall #001A for effluent discharges from the settling basin when not cleaning raceways; Outfall #001B for effluent discharges from the settling basin when cleaning raceways; Outfall #002A for effluent discharges from non-cleaning flow-through

water bypassing the settling basin; and Outfall #003A for a summary of the flow, mass of fish on hand, and total phosphorus values from Outfalls #001B and #002A. Additional outfalls were established to correspond to locations and timings of in-stream water quality monitoring, and are addressed in the corresponding Fact Sheet section. This permitting action is revising outfall designations to correspond to actual physical discharge points only. The MDIFW Embden facility outfall shall be designated as Outfall #005A for all effluent discharges from the facility's only authorized discharge point. The outfall designation is being renumbered to distinguish between the pre and post upgraded facility.

- a. Flow: The previous licensing action established a daily maximum flow discharge limit of 4.75 MGD and a requirement to monitor and report the monthly average discharge flow. Discharge flow was required to be measured at a frequency of once per month. The previous licensing action established effluent limits and monitoring requirements for discharge flow for Outfalls #001A, #001B, #002A, and #003A as described above. As all of these processes were assumed to be distinctly separate, the 4.75 MGD limit was established for each outfall designation. The previous licensing action established an Effluent Limitation Compliance Schedule that required compliance with effluent limits within three years of the effective date of the WDL and delayed imposition of the limits until that time. The WDL compliance schedule was administratively modified as described in Fact Sheet Section 2c. In this permitting action, the Department is eliminating the daily maximum flow limit and establishing a monthly average flow limit of 4.75 MGD based on information provided by MDIFW on facility operations and design capacity and to provide the facility with operational flexibility. This permitting action requires daily measurement of discharge flow, consistent with Department guidelines for wastewater treatment facility discharges.
- b. Dilution Factors: Dilution factors associated with wastewater discharges are derived in accordance with freshwater protocols established in Department Regulation Chapter 530, Surface Water Toxics Control Program, October 2005 and methods for low flow calculation contained in Estimating Monthly, Annual, and Low 7-day, 10-year Streamflows for Ungaged Rivers in Maine (Scientific Investigations Report 2004-5026, US Department of Interior, US Geological Service). To calculate potential effects from a facility's effluent discharge, the Department utilizes the receiving water's available dilution during low flow conditions. The MDIFW Embden facility discharges its treated effluent via a discharge pipe into the side of Mill Stream. Typically, these types of discharges do not achieve rapid and complete mixing with the receiving water since initial dilution is based on mixing resulting from the momentum of a discharge as it exits a discharge pipe (jet effect) as well as the dispersion of the effluent plume as it rises to the surface of the receiving water. Chapter 530.4.B(1) states that analyses using numeric acute criteria for aquatic life must be based on $\frac{1}{4}$ of the 1Q10 stream design flow to prevent substantial acute toxicity within any mixing zone. The regulation goes on to say that where it can be demonstrated that a discharge achieves rapid and complete mixing with the receiving water by way of an efficient diffuser or other effective method, analyses may use a greater proportion of the stream design, up to including all of it.

In developing the previous WDL, the Department utilized a chronic dilution of 1.2:1 based on a 7Q10 low flow value of 0.99 MGD and MDIFW Embden's daily maximum discharge limit of 4.75 MGD. However, this approach appears to have been incorrect. MDIFW owns the dam on Embden Pond. There is a formal Water Level Order for Embden Pond dated December 6, 1978, but there is no formal requirement specifying a minimum flow that must be passed over or through the dam to Mill Stream. MDIFW Embden reports and Department evidence supports that the area of Embden Pond around the dam and the upper portion of Mill Stream are significantly or completely dewatered on occasion. At those times, the MDIFW Embden discharge constitutes the only flow in that portion of Mill Stream. Based on this information, the Department must assume a seasonal low flow of 0 cubic feet per second in Mill Stream and acute (1Q10), chronic (7Q10) and harmonic mean dilution factors of 1:1, representative of the fact that the MDIFW Embden discharge sometimes constitutes the only river flow. If MDIFW wishes to establish a guaranteed minimum flow from the Embden Pond dam in the future, this determination may be revisited.

- c. BOD and TSS: The previous licensing action contained monthly average concentration limits of 2 mg/L and monthly average mass reporting requirements in pounds of pollutant per 100 pounds of fish on hand for both biochemical oxygen demand (BOD) and total suspended solids (TSS). Monitoring requirements consisted of a composite of a minimum of four grab samples collected at two hour increments during a facility working day at a frequency of once per month. The previous licensing action established effluent limits and monitoring requirements for BOD and TSS for Outfalls #001A, #001B, and #002A, as described above. The previous licensing action established an Effluent Limitation Compliance Schedule that required compliance with effluent limits within three years of the effective date of the WDL and delayed imposition of the limits until that time. The WDL compliance schedule was administratively modified as described in Fact Sheet Section 2c.

In licensing actions for twelve state and commercially owned fish hatcheries in 1999 and 2000, the Department established monthly average concentration limits for BOD and TSS of 2 mg/L based on the Department's best professional judgement of best practicable treatment (BPJ or BPT) limits. The BPT limits were developed based on the Department's analysis of effluent data from licensed fish hatcheries in Maine supplied through Discharge Monitoring Reports (DMRs). Based on this analysis, the Department determined that the concentration limits of 2 mg/L constituted achievable levels of these pollutants in fish hatchery wastewater. The Department also required that the BOD and TSS effluent mass be monitored and reported in pounds per 100 pounds of fish on hand. Through extensive facility inspections in 2002, the Department discovered significant variability in facility effluent sampling procedures, calling into question the validity of submitted DMR data, the previous data analysis, and the Department's previous assumptions and conclusions.

In the 2002 proposed NEG, EPA recommended national TSS effluent limitations for recirculating and flow-through hatcheries of various designs and levels of production. The most restrictive recommended limits were based on a secondary level of fish hatchery wastewater treatment and consisted of a monthly average limit of 6 mg/L and a daily maximum limit of 10 mg/L. The 2002 proposed draft NEG did not propose to regulate BOD as EPA believed it would be managed through best management practices at the hatcheries and treatment for TSS.

According to EPA's final NEG, effluent from fish hatcheries and rearing facilities can contain "...*high concentrations of suspended solids and nutrients, high BOD and low dissolved oxygen levels. Organic matter is discharged primarily from feces and uneaten feed*". As stated in the 2002 proposed NEG, "*elevated levels of organic compounds contribute to eutrophication and oxygen depletion.*" This is expressed as BOD "...*because oxygen is consumed when microorganisms decompose organic matter*". "*The greater the BOD, the greater the degree of pollution and the less oxygen available.*" The discharge of high BOD wastewater to small receiving waters with insufficient dilutions can result in formation of oxygen deficient areas known as sag points. Oxygen sag points represent both localized impacts to habitat and aquatic life as well as barriers to migration throughout the receiving water. Based on this premises and a long standing practice of regulating effluent BOD, the Department considers BOD a significant pollutant and therefore is establishing effluent limitations and monitoring requirements.

In this permitting action the Department is establishing a BPJ of minimum treatment technology for the MDIFW Embden facility. (Permit Special Conditions L, Fact Sheet Section 13). BOD and TSS concentration limits of 6 mg/L for monthly average and 10 mg/L for daily maximum, as well as mass limits based on the concentration limits and the monthly average effluent flow, shall be in effect for Outfall #005A. These numbers are based on fish hatchery wastewater secondary treatment projections and the Department's judgement that effluent BOD should also be regulated. The Department has evaluated actual and projected post-facility upgrade effluent quality data for a significant number of fish hatcheries in Maine and determined that facilities incorporating the minimum treatment technology outlined can be expected to consistently meet the BOD and TSS concentration limits established in this permitting action. It is the Department's intent to re-evaluate and potentially revise limits in the future based on statistical evaluations of demonstrated performance of consistently and properly utilized treatment technology for the industry. The Department reserves the right to reopen facility discharge permits to establish these limits pursuant to Special Condition O of this permit.

In this permitting action, mass is limited in the more conventional unit of pounds per day instead of the previous pounds per hundred pounds of fish on hand. This permitting action establishes once per two week effluent BOD and TSS monitoring on a year round basis based on the Department's BPJ of monitoring frequencies necessary to more accurately characterize facility effluent conditions.

- d. Total Phosphorus and Orthophosphate: Phosphorus is a nutrient that encourages the growth of plants such as planktonic algae and macrophytes in northern waters. Oxygen levels in the water are reduced in the early morning hours due to extended nighttime respiration of algae. The decomposition of excess plant material further reduces the amount of available oxygen in the water through biochemical oxygen demand. Lowering oxygen levels in a receiving water impacts the aquatic life in that water, making it unfit for some forms of life. Further, enrichment from excess nutrients, such as phosphorus, can result in reductions in aquatic macro-invertebrate species diversity, an indicator of the overall health of a receiving water. Excess phosphorus can also result in undesirable aesthetic conditions in a receiving water, impacting that water's ability to meet standards for maintaining recreational use, a designated use by law. Therefore, any increase in the phosphorus content in a receiving water has the potential to cause or contribute to non-attainment of classification standards. Orthophosphate is the portion of total phosphorus that is readily available for uptake by aquatic plants. It is important to be able to characterize the facility effluent in terms of the relationship between orthophosphate and total phosphorus in order to better understand the effects on the receiving water. Maine law (38 MRSA § 464.4.A.4) states that "...the Department may not issue a water discharge license for...the...discharge of pollutants to waters of the State that...cause those waters to be unsuitable for the designated uses and characteristics ascribed to their class".

The previous licensing action contained a monthly average total phosphorus concentration limit of 0.03 mg/L, a monthly average mass limit of 0.54 kg/day (1.2 lbs/day), and a monthly average mass reporting requirement in pounds of phosphorus per 100 pounds of fish on hand for Outfalls #001A, #001B, and #002A, and the monthly average mass limit of 0.54 kg/day for Outfall #003A. The required minimum detection level for phosphorus was 0.001 parts per million (ppm). Monitoring requirements consisted of a composite of a minimum of four grab samples collected at two hour increments during a facility working day at a frequency of once per month. The previous licensing action established an Effluent Limitation Compliance Schedule that required compliance with effluent limits within three years of the effective date of the WDL and delayed imposition of the limits until that time. The WDL compliance schedule was administratively modified as described in Fact Sheet Section 2c. The phosphorus limits contained in the previous WDL originated from Department BPJ of water quality based limits necessary to protect the receiving water and its designated uses at the time of issuance.

For river and stream wastewater discharges, the Department typically utilizes a 0.035-mg/L instream phosphorus concentration limit (ambient water quality threshold) and the dilution provided in a receiving water to calculate water quality based effluent limits, a revised method of analysis from that used and available at the time of issuance of the previous WDL. Based on Department research, the AWQC of 0.035 mg/L corresponds to the maximum level at which algae blooms will not typically occur in a receiving river or stream under normal circumstances. As phosphorus is typically of concern under chronic discharge conditions, the 7Q10 dilution of 1:1 described in Fact Sheet Section 6b, Dilution Factors, is being utilized in calculation of a water quality based effluent concentration limit of 0.035 mg/L. This permitting action is also establishing a

monthly average mass limit of 1.4 lbs/day based on the concentration limit, monthly average effluent flow limit, and a conversion factor of 8.34 lbs/gallon. As these limit are less restrictive than the concentration and mass limits established in the previous WDL and in consideration of the recent facility upgrade conducted, this permitting action is not establishing a schedule of compliance for its implementation. The revised phosphorus limits are in effect as of the effective date of this permitting action. This permitting action is also establishing monitoring and reporting requirements for the daily maximum phosphorus and monthly average and daily maximum orthophosphate masses and concentrations discharged. In free flowing rivers and streams, phosphorus and orthophosphate are typically summer time concerns for water quality. Therefore, this permitting action revises the previously established year round phosphorus concentration limits and monitoring requirements and establishes phosphorus limits and phosphorous and orthophosphate monitoring requirements that are in effect from June 1 through September 30 each year. Orthophosphate monitoring and reporting requirements are being established seasonally during 2006. This permitting action establishes a once per two-week monitoring requirement based on the Department's BPJ of monitoring frequencies necessary to more accurately characterize facility effluent conditions.

Reported values shall be expressed in gross end-of-pipe values and phosphorous and orthophosphate analysis shall be conducted on the same sample collected. Laboratory analysis shall consist of a low-level phosphorus analysis with a minimum detection limit of 1 part per billion (1 ug/L), equivalent to the previous 0.001 mg/L detection limit. Based on the results of monitoring, the Department may reopen the permit in the future pursuant to Special Condition O to address facility specific effluent limitations, monitoring and operational requirements.

- e. Fish on Hand: The reporting requirement for monthly average and daily maximum mass of fish on hand is being carried forward from the previous licensing action. This parameter is intended to enable both the Department and the permittee in evaluating management practices at the facility and trends in effluent quality and receiving water impacts. The previous licensing action required measurement of fish on hand in pounds at a frequency of once per month for Outfalls #001A, #001B, #002A, and #003A as described above. This permitting action establishes once per two week monitoring on a year-round basis based on the Department's BPJ of monitoring frequencies necessary to more accurately characterize facility effluent conditions.
- f. Formalin: Fish hatcheries commonly use formalin based biocides for therapeutic treatment of fungal infections and external parasites of finfish and finfish eggs. Formalin products (Paracide-F, Formalin-F, or Parasite-S) contain approximately 37 percent by weight formaldehyde gas. USEPA Region 1 provided information related to formaldehyde concerns and limitations in hatchery permitting in Massachusetts specifying that formalin use should be consistent with U.S. Food and Drug Administration (FDA) labeling instructions (21CFR 1 § 529.1030).

However, toxicity data indicates that formalin is toxic to aquatic organisms at concentrations below FDA labeling guidelines. There are currently no ambient water quality criteria for formalin or formaldehyde established in Maine's Surface Water Toxics Control Program (Toxics Program, Chapter 584). Therefore, the Department is evaluating potential effects, effluent limitations, and monitoring requirements based on currently available information and best professional judgement.

EPA's hatchery permitting program in Massachusetts (EPA/MA) establishes acute and chronic water quality based effluent limits and requires Whole Effluent Toxicity testing in any calendar quarter in which formalin is used at a hatchery. EPA/MA's limits were developed based on work by Gerald Szal, Aquatic Ecologist, Massachusetts Department of Environmental Protection (October 24, 1990). Szal's methodology is based on review of a U.S. Fish and Wildlife document (Bills et al. 1977) which lists lethal concentrations (LC₅₀s) of formalin for a variety of fingerling fish. Two species of *Ictalurid* common to Massachusetts waters were selected as appropriate indicator species. Black bullhead had a 96-hour LC₅₀ of 62.1 ul/l (mg/L) and Channel Catfish had a 96-hour LC₅₀ of 65.8 ul/l (mg/L).

In addition to the Szal information, the Department reviewed studies provided by EPA's hatchery permitting program in New Hampshire (EPA/NH): Environmental Impact Assessment for the Use of Formalin in the Control of External Parasites on Fish, January 1995 (Dr. Stanley Katz, Rutgers University), a 1995 amendment for review of its use as a fungicide on eggs (Katz), and a 1981 Environmental Assessment titled Use of Formalin in Fish Culture as a Parasiticide and Fungicide (John Matheson, USDA, Bureau of Veterinary Medicine). The most conservative results indicate an LC₅₀ of 1.15 mg/L of formalin for ostracods from a study by Bells, Marking, and Chandler (1977) included in the 1995 and 1981 studies above.

The Department also reviewed the results of formalin toxicity testing on EPA's ECOTOX database. Published toxicity data contained LC₅₀ values ranging by several orders of magnitude for the same species in the same studies.

Maine's toxics rules (Chapter 530.1.B) state, "*No person may discharge any toxic substance in any amount or concentration...that may cause or contribute to the failure of any classified body of surface water to attain its existing and designated uses or to meet narrative or numeric water quality criteria.*". Further, Chapter 530.3 states, "*the Department shall establish appropriate discharge prohibitions, effluent limits and monitoring requirements in waste discharge licenses...*" as needed to ensure compliance with water quality criteria, existing and designated uses. The Department found a large range of toxicity data for formalin with significant variation between studies. The Department typically uses the most conservative data in order to ensure protection of aquatic life in Maine, however the range of published toxicity data was so extensive and inconclusive that the Department determined that a more focused study specific to Maine waters was warranted. Using methods similar to those specified in Chapter 530 for establishing site specific criteria, the Department contracted with a commercial laboratory (Lotic Inc., Unity, Maine) in October 2003 to provide information on the acute toxicity of

formalin to the water flea (*Ceriodaphnia dubia*), a species commonly used in freshwater toxicity testing. All testing was performed by a certified laboratory according to standard methods. According to Katz (1995), formalin undergoes oxidation to formic acid followed by metabolic oxidation by microorganisms to form carbon dioxide and water. The half-life of formalin in water is estimated at 36 hours. Considering the nature of formalin and its intermittent use, the Department determined that acute criteria would be most applicable for comparison.

As reported by the testing laboratory, Lotic Inc., dosing rates in the Department's testing *"were initially established for a range-finding evaluation bracketed by (formalin) concentrations between 4.05 and 500 mg/L using 5 dilutions (0.3 dilution factor)"*. Pursuant to standard practices, the dosing ranges were modified downward *"in subsequent tests to more accurately bracket appropriate endpoint determinations (A-NOEC (acute no-effect concentration), LC50)"*. A total of four series of tests were conducted with the final two test series (tests) consisting of duplicate "definitive" tests utilizing a 0.5 dilution factor. Lotic reported that trend analyses revealed clear concentration-response relationships for the final three tests. Based on Lotic's experience, differences in survival for the two definitive tests *"are within the realm of normal variability for the testing of dilute organic pollutants"*. *"For the two definitive tests, the A-NOECs (IC10s) ranged between 0.62 and 2.5 mg/L; LC50s ranged between 5.13 and 20 mg/L"*. *"The A-NOEC for formalin (Parasite S) for C. dubia could be as low as 0.62 mg/L"*. However, based on the limited number of tests performed and *"given the test variability in the data for the two definitive tests"*, Lotic recommended that *"it would be prudent to average the A-NOEC values from these two evaluations (1.56 mg/L)"*. *"This value will still be well below the most conservative LC50 value reported (5.13 mg/L)"*. USEPA'S National Exposure Research Laboratory reviewed the testing results and found the variances observed to be appropriate. Further, USEPA found utilization of the 1.56 mg/L value as the A-NOEC to be a reasonable approach supported by test results in formulating an agency best professional judgement determination. Therefore, based on the Department's best professional judgement, this A-NOEC is being utilized as the acute criteria for establishing a facility effluent limit. The Department notes that a permittee is free to undertake site specific and water specific toxicity analyses to provide additional information on the toxicity of formalin.

Multiplying the acute criteria by the low flow dilution factor of 1:1 described in Fact Sheet Section 6b, Dilution Factors, yields the following acute water quality based effluent limit:

$$1.56 \text{ mg/L (acute criteria)} \times 1 \text{ (dilution)} = 1.6 \text{ mg/L acute formalin limit}$$

Comparatively, the previous licensing action established a requirement stating, *"at no time shall the discharge of Formaldehyde exceed 5 milligrams per liter"*. This limit was based on the Department's best professional judgement at the time. As formaldehyde constitutes 37% of formalin, the 5 mg/L limit would equate to a 13.5 mg/L formalin limit. Parts per million (ppm) and mg/L are equivalent measurements.

Actual effluent levels of formalin can be calculated based on the use and dilution available at the facility. MDIFW Embden uses a total of approximately 55 gallons of formalin per year for treatment of fungal infections and external parasites on the fish, applied in four treatments per year.

For treatments on fish, MDIFW Embden administers formalin as needed to achieve a dose of 250 ppm in the rearing tanks. The formalin is administered in the influent water at the head of one line of fish tanks at a time. Approximately 12-gallons of undiluted formalin is administered at the head of the line by drip and allowed to flow through the entire line over a one hour period. The flow through water is then blended into the full facility wastewater and discharged to the receiving water. The facility monthly average discharge flow of 4.75 MGD equates to 197,917-gallons in the one hour treatment / flow exchange period. The end of pipe concentration from fish treatment can be calculated as follows:

$$\begin{aligned} 197,917 \text{ gal facility wastewater} / 12 \text{ gal formalin} &= 16,493:1 \text{ dilution} \\ 1,000,000 \text{ ppm (undiluted) formalin} / 16,493 &= 60.6 \text{ ppm formalin discharged} \end{aligned}$$

Permits issued by this department impose the more stringent of the calculated water quality based or best practicable treatment (BPT) based limits. Although no formal BPT based limit has been developed for formalin, the Department considers a facility's discharge under best management practices to correspond to a BPJ of BPT. The calculated water quality based effluent limit is significantly more stringent than the potential effluent formalin concentrations from fish treatments and is therefore being established in this permitting action. As the calculated acute limit of 1.6 mg/L represents a new more stringent water quality based limit, the Department is establishing a schedule of compliance (Permit Special Condition G) pursuant to State Law, 38 M.R.S.A., Section 414-A.2 to address the investigation and implementation of operational and physical modifications necessary to ensure compliance with the formalin limits established in this permit. From the effective date of the permit until December 31, 2008, a formalin effluent limit of 13.5 mg/L, based on the formaldehyde limit contained in the previous licensing action, shall be in effect. Beginning January 1, 2009, the 1.6 mg/L formalin limit shall be in effect. The Department has not determined an appropriate chronic limit for formalin use at this time.

This permitting action also establishes effluent mass limits pursuant to Department Rules, Chapter 523.6(f). The daily maximum mass limit is calculated based on the permittee's projected maximum amount of formalin used per day (16.5 gallons) times the specific gravity of formalin (9.13 lbs/gal), resulting in a value of 150 lbs/day. This method was used to provide for flexibility in management of necessary treatments and to ensure that formalin is not discharged in toxic amounts. Throughout the term of the permit, the permittee shall report the monthly average effluent formalin mass and concentration. Effluent values shall be determined through calculations, as described in Special Condition A, Footnote 5 and Fact Sheet Section 17.

This permitting action is establishing effluent limitations and monitoring requirements for formalin, as this is the commonly used form, and not for formaldehyde. The Department is requiring MDIFW Embden to report therapeutic agents used at the facility that have the potential to be discharged to the receiving water.

- g. Dissolved Oxygen (effluent): Because of the low dilution of facility effluent provided in the receiving water and to determine effluent effects on the receiving water, this permitting action establishes seasonal monthly average and daily maximum concentration monitoring requirements for effluent dissolved oxygen (D.O.). Further, based on Department modeling and to ensure compliance with Class B D.O. standards, this permitting action establishes a seasonal daily minimum effluent D.O. limit of 7.5 mg/L and once per week monitoring requirements from June 1 through September 30 each year. In addition to requirements established in Permit Special Condition A to report daily minimum, daily maximum, and monthly average concentration results, the permittee shall submit all data from effluent dissolved oxygen monitoring to the Department in a supplemental report accompanying the appropriate monthly discharge monitoring report pursuant to Permit Special Conditions A (footnote 6) and E.
- h. pH: The previous licensing action contained the requirement, *"the pH shall not be less than 6.0 or greater than 8.5 at any time unless as naturally occurs in the receiving water"* for Outfalls #001A, #001B, and #002A, but contained no monitoring requirements. This permitting action is carrying forward the pH range limitation of 6.0-8.5 standard units consistent with the pH limit established in discharge licenses for other fish hatcheries, which is considered by the Department as a best practicable treatment standard. This permitting action establishes once per two week effluent pH monitoring on a year-round basis based on the Department's BPJ of monitoring frequencies necessary to more accurately characterize facility effluent conditions.
- i. Duration of Discharge: The previous licensing action required the licensee to report the numbers of hours per month that raceways were cleaned. This permitting action eliminates this requirement, establishing instead a requirement to provide minimum treatment technology, development of operation and maintenance plans, and revised technology based and water quality based effluent limits and monitoring requirements.
- j. Receiving Water Study: The previous licensing action required the licensee to monitor dissolved oxygen, BOD, TSS, and total phosphorus in Mill Stream at locations upstream and downstream of the outfall. Monitoring was required to be conducted in the mornings and afternoons between July 1 and September 30, 2000, and was designated as Outfalls #011A, #012A, #011P, and #012P. The intent of this requirement was to *"better quantify the characteristics of the hatchery effluent, the effectiveness of the various stages of treatment, and to determine effects on water quality..."*. In this permitting action, the Department is utilizing other methods of assessing effluent effects on the receiving water and attainment of water classification standards through ambient macroinvertebrate biomonitoring, ambient dissolved oxygen and temperature monitoring, and effluent monitoring, and is therefore not carrying forward this requirement.

7. ANTI-BACKSLIDING

Federal regulation 40 CFR, §122(l) and Department rules Chapter 523.5(1) contain the criteria for what is often referred to as the anti-backsliding provisions of the Federal Water Pollution Control Act (Clean Water Act). In general, the regulation states that except for provisions specified therein, effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards or conditions in the previous permit. Allowable exceptions to the anti-backsliding provisions include when:

- (1) material and substantial alterations or additions to the permitted facility occurred after permit issuance which justify the application of a less stringent effluent limitation and
- (2) information is available which was not available at the time of the permit issuance (other than revised regulations, guidance or test methods) and which would justify the application of less stringent effluent limitations at the time of permit issuance.

This permitting action revises previously established effluent limitations and monitoring requirements for several pollutants including BOD, TSS, and total phosphorus. The rationale for these actions is contained in Fact Sheet Section 6, *Effluent Limitations & Monitoring Requirements*. The Department believes that these actions are consistent with the anti-backsliding provisions.

8. ANTI-DEGRADATION

Maine's anti-degradation policy is included in 38 M.R.S.A., Section 464(4)(F) and addressed in the *Conclusions* section of this permit. Pursuant to the policy, where a new or increased discharge is proposed, the Department shall determine whether the discharge will result in a significant lowering of existing water quality. Increased discharge means a discharge that would add one or more new pollutants to an existing effluent, increase existing levels of pollutants in an effluent, or cause an effluent to exceed one or more of its current licensed discharge flow or effluent limits, after the application of applicable best practicable treatment technology. As revisions to previous effluent limitations for some pollutants may appear less stringent, the Department is addressing the implications under the anti-degradation policy.

This permitting action revises previously established effluent limitations and monitoring requirements for several pollutants including BOD, TSS, and total phosphorus. The rationale for these actions is contained in Fact Sheet Section 6, *Effluent Limitations & Monitoring Requirements*. Based on the information provided in the referenced section, as well as anticipated improvements in effluent quality over previous facility discharges due to improved wastewater treatment infrastructure and operations, the Department does not consider these actions to result in increased discharges of pollutants and therefore does not consider the anti-degradation policy to be of issue.

9. SETTLING BASIN CLEANING:

Discharge of inadequately treated fish hatchery wastewater (excess feed and fish waste) contributes solids, BOD, and nutrients to receiving waters, which can contribute to eutrophication and oxygen depletion. This, in combination with other pollutant specific toxic effects, impacts the aquatic life and habitat value in the receiving water. Typical hatchery wastewater treatment practices include effluent filtration and settling with solids removal.

The previous licensing action required the licensee to clean its settling basins when accumulated materials occupy 20% of the basin capacity, or prior to this point if the facility is violating its TSS limits. In this permitting action, the Department is requiring that any settling structures be cleaned when accumulated materials occupy 20% of a basin's capacity, when material deposition in any area of the basins exceeds 50% of the operational depth, or at any time that solids from the basins are contributing to a violation of permit effluent limits. The previous action also required the licensee to measure sludge deposits a minimum of once per year during October at four representative locations in each settling structure. In this permitting action, this requirement is being eliminated and measurement of waste deposition left to the discretion and responsibility of MDIFW Embden.

10. DISEASE AND PATHOGEN CONTROL AND REPORTING:

Maine Department of Inland Fisheries and Wildlife (MDIFW) Rules (Chapter 2.03-A) and Maine Department of Marine Resources (MeDMR) Rules (Chapter 24.21) state that *"the transfer and/or introduction of organisms fall within the jurisdiction of the Department of Marine Resources (12 MRSA, §6071) into coastal waters within the State of Maine and the Department of Inland Fisheries and Wildlife (12 MRSA, §§7011, 7035 and 7201, 7202) into public and/or private waters within the State of Maine. These rules are intended to protect wild and farmed salmonid fish populations and shall be applicable to all individuals involved in the culture and movement of live salmonids and gametes."* Further, both agencies' rules define Diseases of Regulatory Concern as *"...infectious agents that have been demonstrated to cause a significant increase in the risk of mortality among salmonid populations in the State of Maine. Diseases of Regulatory Concern are classified by the Commissioner into three (3) disease categories: exotic, endemic (limited distribution) and endemic based on an annual review and analysis of epidemiological data."* The previous licensing action required the licensee to notify the MEDEP the next business day of any diseases in the fish of regulatory concern. In this permitting action, as a salmonid aquaculture facility, MDIFW Embden must comply with MDIFW and MeDMR salmonid fish health rules (12 MRSA, §6071; 12 MRSA, §§7011, 7035, 7201, and 7202, or revised rules). The cited rules include requirements for notification to the appropriate agency within 24-hours of pathogen detection. In the event of a catastrophic pathogen occurrence, the permittee shall submit to the Department for review, information on the proposed treatment including materials/chemicals to be used, material/chemical toxicity to aquatic life, the mass and concentrations of materials/chemicals as administered, and the concentrations to be expected in the effluent. The Department will address such occurrences through administrative modifications of the permit.

11. THERAPEUTIC AGENTS:

In the June 30, 2004 final NEG, EPA requires proper storage of drugs, pesticides and feed and requires facilities to report use of any investigational new animal drug (INAD), extra-label drug use, and spills of drugs, pesticides or feed that results in a discharge to waters of the U.S.

The previous licensing action required that all medicated fish feeds, drugs, and other fish health therapeutants shall be approved by the US Food and Drug Administration (USFDA) and applied according to USFDA acceptable guidelines. Further, records of all such materials used were to be maintained at the facility for five years. The Department is carrying forward these requirements in this permitting action with modifications that therapeutants be applied according to USFDA accepted guidelines and manufacturer's label instructions and that therapeutic agents must also be registered with USEPA, as appropriate.

This permitting action does not authorize routine off-label or extra-label drug use. Such uses shall only be permitted in emergency situations when they are the only feasible treatments available and only under the authority of a veterinarian. The permittee shall notify the Department in writing within 24-hours of such use. This notification must be provided by the veterinarian involved and must include the agent(s) used, the concentration and mass applied, a description of how the use constitutes off-label or extra-label use, the necessity for the use in terms of the condition to be treated and the inability to utilize accepted drugs or approved methods, the duration of the use, the likely need of repeat treatments, and information on aquatic toxicity. If, upon review of information regarding the use of a drug pursuant to this section, the Department determines that significant adverse effects are likely to occur, it may restrict or limit such use.

This permitting action does not authorize the discharge of drugs authorized by the USFDA pursuant to the Investigational New Animal Drug (INAD) program. As the INAD program typically involves the long-term study of drugs, their benefits and effects, the permittee is anticipated to be able to notify the Department of its intent to conduct, and provide information related to, such study. The permittee is required to provide notification to the Department for review and approval prior to the use and discharge of any drug pursuant to the INAD program. This notification must include information to demonstrate that the minimum amount of drug necessary to evaluate its safety, efficacy, and possible environmental impacts will be used. Notifications must also include an environmental monitoring and evaluation program that at a minimum describes sampling strategies, analytical procedures, evaluation techniques and a timetable for completion of the program. The program must consider the possible effects on the water column, benthic conditions and organisms in or uses of the surrounding waters. Review and approval of INAD related uses and discharges will be addressed through administrative modifications of the permit.

Formaldehyde: The previous licensing action established a requirement stating, “*at no time shall the discharge of Formaldehyde exceed 5 milligrams per liter*”. The discharge of formaldehyde is addressed in Fact Sheet Section 6f, EFFLUENT LIMITATIONS & MONITORING REQUIREMENTS, Formalin, above. The Department is requiring MDIFW Embden to continue to report therapeutic agents used at the facility that have the potential to be discharged to the receiving water.

Other Materials: MDIFW Embden reports using no other therapeutic or medicinal agents.

12. DISINFECTING/SANITIZING AGENTS:

The previous licensing action required the licensee to submit a list of all sanitizing agents and/or disinfectants used on rearing equipment, their concentrations as used and concentrations and masses at the point of discharge. Further, the previous licensing action required that at no time shall the concentration of chlorine in the receiving water exceed 11 parts per billion (ppb) for chronic and/or 19 ppb for acute toxicity concerns. Also, all footbath wastes were required to be disposed of by approved methods and not into the hatchery waste stream or receiving waters.

MDIFW Embden reports that no chlorine based products are used at the facility in such a way that they will enter the waste-stream or receiving water. Therefore, this permitting action eliminates previously established effluent limitations for chlorine. MDIFW Embden reports that it uses a hard surface disinfectant (“T.B.Q.”) for equipment and vehicle disinfection, but that no disinfectants enter the waste-stream or receiving water. MDIFW Embden further reports that it will be using an iodine based product for footbath disinfection, but that all footbath wastes will be properly disposed of and will not enter the waste-stream or receiving water.

This permitting action requires MDIFW Embden to maintain records of all sanitizing agents and/or disinfectants used that have the potential to enter the waste-stream or receiving water, their volumes and concentrations as used and concentrations at the point of discharge, at the facility for a period of five years. This permitting action only authorizes the discharge of those materials applied for, evaluated by the Department, and either regulated or determined to be de minimus in this permitting action or in subsequent Department actions. The discharges of any other agents or waste products not specifically included in this permitting action are considered unauthorized discharges pursuant to Permit Special Condition C.

13. MINIMUM TREATMENT TECHNOLOGY REQUIREMENT:

Between 2000 and 2002, eleven Maine fish hatcheries were evaluated to identify potential options for facility upgrades. All nine Maine Department of Inland Fisheries and Wildlife hatcheries were evaluated by FishPro Inc., while the two USFWS hatcheries were evaluated by the Freshwater Institute. Recommended wastewater treatment upgrades for each of the facilities included microscreen filtration of the effluent. Based on the information provided

and Department BPJ, the Department is specifying that minimum treatment technology for the Embden facility shall consist of treatment equal to or better than 60-micron microscreen filtration of the effluent, wastewater settling/clarification, removal of solids. MDIFW Embden shall provide treatment equal to or better than the BPJ minimum treatment technology and shall comply with all effluent limitations, monitoring requirements, and operational requirements established in this permitting action. Additional treatment may be necessary to achieve specific water quality based limitations.

It is the Department's intent to evaluate effluent data and potentially revise technology based effluent limits in the future based on statistical evaluations of demonstrated performance of consistently and properly utilized treatment technology. The Department reserves the right to reopen facility discharge permits to establish these limits.

14. AMBIENT MACROINVERTEBRATE BIOMONITORING:

The previous licensing action required the licensee to conduct macroinvertebrate biomonitoring in the receiving water at a point downstream of the facility discharge after complete mixing during the summer of either 2000 or 2001.

Based on available data, the Department is concerned with the effects of fish hatchery effluent discharges on rivers and streams in Maine and specifically Mill Stream. As macroinvertebrate communities provide indications of the overall ecological health of a receiving water, the Department has determined that biomonitoring is needed to better evaluate attainment of river and stream water classification standards and designated uses, resource impacts, and corrective measures when necessary. In order to address this need, the Department's Division of Environmental Assessment (MEDEP DEA) will conduct macroinvertebrate biomonitoring in the receiving water in 2006 to determine attainment of the aquatic life standards following upgrade of the MDIFW Embden facility. This permitting action requires MDIFW Embden to conduct ambient macroinvertebrate biomonitoring annually beginning calendar year 2007. On or before March 1, 2007, MDIFW Embden shall submit a biomonitoring plan for Mill Stream to MEDEP DEA for review and approval. The plan shall be consistent with "*Methods for Biological Sampling and Analysis of Maine's Rivers and Streams*" (DEP #LW0387-B2002, August 2002) and shall include a scope of work and schedule, monitoring locations and maps, methods and materials, and reporting procedures for the biomonitoring program. Biomonitoring shall be conducted according to a Department approved monitoring plan. Results shall be reported to the Department in a biomonitoring report by December 15 each year. If the receiving water is determined by the Department to be meeting criteria, standards, and designated uses for its assigned water quality class, including following the 2006 monitoring, the Department will reopen the permit pursuant to Permit Special Condition O, to modify or discontinue the biomonitoring requirement.

15. AMBIENT DISSOLVED OXYGEN AND TEMPERATURE MONITORING:

The previous licensing action required the licensee to monitor dissolved oxygen, BOD, TSS, and total phosphorus in Mill Stream at locations upstream and downstream of the outfall. Monitoring was required to be conducted in the mornings and afternoons between July 1 and September 30, 2000, and was designated as Outfalls #011A, #012A, #011P, and #012P. The intent of this requirement was to *“better quantify the characteristics of the hatchery effluent, the effectiveness of the various stages of treatment, and to determine effects on water quality...”*.

Based on the low effluent dilution provided in the receiving water and the need for additional data on the effects of the MDIFW Embden’s effluent on the water quality of its receiving water, this permitting action requires the permittee to seasonally monitor ambient dissolved oxygen and temperature levels in Mill Stream. The permittee shall monitor ambient dissolved oxygen and temperature (Celsius) from June 1 through September 30 each year beginning the effective date of this permit at a frequency of once per week and shall report the time of day the monitoring is conducted. The permittee shall report all monitoring results to the Department in a supplemental report accompanying the appropriate monthly discharge monitoring report. Monitoring shall be conducted within two hours of sunrise, or as indicated in a Department approved monitoring plan, at two locations: (1) between the Embden Pond dam and the head of the MDIFW Embden facility in an area representing free-flowing conditions and (2) below the MDIFW Embden outfall in an area representing the dissolved oxygen sag point, unless revised by the Department. The permittee shall also report on the composition of river flow between the dam and the head of the facility. The permittee shall specify if river flow results from flow over the dam and provide the estimated depth of that overflow, or only leakage through the dam and provide the length of time that condition persists in days. On or before three months following the effective date of this permit, MDIFW Embden shall submit a plan for ambient dissolved oxygen and temperature monitoring and instrument calibration/data quality control to the Department’s Division of Environmental Assessment for review and approval. The plan shall include a scope of work and schedule, monitoring locations and maps, sampling methods and materials, and reporting procedures for the ambient dissolved oxygen and temperature monitoring program. The plan shall also include procedures for regular instrument calibration to ensure data quality control. Ambient dissolved oxygen and temperature monitoring shall be conducted according to a Department approved monitoring plan.

16. SALMON GENETIC INTEGRITY AND HATCHERY ESCAPE PREVENTION:

The US Fish and Wildlife Service and the National Oceanic and Atmospheric Administration’s National Marine Fisheries Service (NOAA Fisheries) formally listed the Atlantic salmon as an endangered species on November 17, 2000. Two significant issues of concern regarding the rearing of salmon in Maine involve the genetic integrity of the salmon and escape prevention to avoid impacts on native fish.

On December 4, 2000, in regard to the Department's pending delegation to administer the NPDES Permit Program, USEPA Region I informed the Department that *"permits issued to freshwater hatcheries raising salmon will require that the facility be designed or modified to achieve zero escapement of fish from the facility"*. The EPA also stated, *"The information contained in the (US Fish and Wildlife and NOAA Fisheries) Services' listing documents indicates that a remnant population of wild Atlantic salmon is present in..."* Maine waters *"...and that salmon fish farms and hatcheries are activities having a significant impact on the..."* Gulf of Maine Distinct Population Segment of Atlantic salmon (DPS) *"...through, among other things, the escape of farmed and non-North American strains of salmon which may interbreed with the wild Maine strains, compete for habitat, disrupt native salmon redds, and spread disease."* *"Based on this information, the Services have concluded that the escape of farm-raised salmon from fish farms and hatcheries is likely to significantly impair the growth, reproduction and habitat of wild salmon, thereby impairing the viability of the DPS."* *"EPA has analyzed current information, including these findings, and based on this information believes that this remnant population constitutes an existing instream use of certain Gulf of Maine rivers and considers that the above-described impacts to the population would be inconsistent with Maine's water quality standards. Assuming the information discussed above does not significantly change, EPA will utilize its authorities to ensure compliance with Maine water quality standards by ensuring that conditions to protect the remnant population of Atlantic salmon are included in NPDES permits for salmon fish farms and hatcheries, which are subject to regulation as concentrated aquatic animal production facilities."* *"In view of the substantial danger of extinction to the DPS described by the Services, it is EPA's view that proposed permits authorizing activities that would adversely affect the population, as described earlier in this letter, would be inconsistent with Maine's water quality standards and objectionable under the CWA."*

Leading up to the listing and in subsequent draft MEPDES Permit / Maine WDL reviews, the USFWS and NOAA Fisheries have advocated for genetic testing of Atlantic salmon housed at hatchery and rearing facilities to ensure that they are of North American origin, as well as employment of a fully functional Containment Management System (CMS) at facilities to prevent the escape of raised salmon or other species of concern in order to avoid impacts on native fish populations. These issues are of particular concern for the Gulf of Maine DPS.

MDIFW Embden is a state brook trout, brown trout, splake, and landlocked Atlantic salmon rearing facility that produces fish for stocking in Maine waters as part of MDIFW's responsibilities in managing fisheries. MDIFW Embden does not raise Atlantic salmon as envisioned in the USEPA opinion above and thus is not subject to genetic testing requirements. MDIFW Embden discharges its effluent to Mill Stream, which in turn flows to the Carrabassett and Kennebec Rivers. Although lower portions of the Kennebec River are designated DPS river segments, the receiving waters in the vicinity of the discharge are not DPS waters.

NOAA Fisheries indicated that as MDIFW Embden does not discharge effluent to a Gulf of Maine DPS river segment, a CMS plan is not required for the protection of endangered Atlantic salmon. However, NOAA Fisheries further commented that from an ecosystem perspective, fish containment would certainly help protect native fauna in the receiving

water. In consideration of this information and as the 2005 upgrades of the Embden facility provide significant fish containment management, neither genetic testing nor a CMS is being required in this permitting action.

17. SAMPLE CALCULATIONS FOR EFFLUENT FORMALIN

To calculate the effluent formalin concentration, the permittee shall utilize the concentration administered, the volume of water to which the formalin is added, and dilutions provided from administration to end-of-pipe. Parts per million (ppm) and milligrams per liter (mg/L) are equivalent measurements. The Department's method of calculating effluent formalin levels at the MDIFW Embden facility are contained in Fact Sheet Section 6.f. The following are examples of alternate methods to calculate effluent formalin levels.

For egg treatments, this example involves administration of 1,720 ppm of formalin for 15 minutes in flow-through water. It assumes a rate of water through the egg trays of 150 gallons per minute times the 15-minute treatment period yielding 2,250 gallons of initial wastewater. The total facility wastewater flow during the same 15-minute period can be calculated by taking a current discharge flow of 8,300 gpm times 15 minutes yielding 124,500 gallons. The formalin would receive an initial dilution of $124,500 \text{ gal.} / 2,250 \text{ gal} = 55.3:1$. The 124,500 gallons of wastewater flows to the facility settling ponds, which have a total capacity of 969,000 gallons. The formalin would receive a second dilution of $969,000 \text{ gal} / 124,500 \text{ gal} = 7.8:1$. The end of pipe concentration can be calculated as follows:

$$1,720 \text{ ppm formalin} / 55.3 / 7.8 = 4 \text{ ppm formalin discharged}$$

For external parasite treatments on fish, the example facility administers formalin at a dose of 225 ppm. In this example, two 7,700 gallon pools are treated simultaneously (15,400 gal). The volumes of the two pools are gradually exchanged with fresh water and discharged into the 8,300 gpm facility waste stream over 112 minutes providing an initial dilution. The facility wastewater flows to the settling ponds, which provide a small second dilution. The effluent concentration can be calculated as follows:

$$\begin{aligned} 8,300 \text{ gpm} \times 112 \text{ minutes} &= 929,600 \text{ gal facility wastewater during pool discharge} \\ 929,600 \text{ gal facility wastewater} / 15,400 \text{ gal pool volume} &= 60.3:1 \text{ initial dilution} \\ 969,000 \text{ gal settling pond} / 929,600 \text{ gal facility wastewater} &= 1.04:1 \text{ second dilution} \\ 225 \text{ ppm formalin} / 60.3 / 1.04 &= 3.6 \text{ ppm formalin discharged} \end{aligned}$$

For broodstock external parasite treatments, the example facility administers formalin to new broodstock fish at a dose of 25 ppm in flow-through water. This example assumes a flow through rate of 80 gpm times a treatment period of 6-hours (360 minutes) per day yielding 28,800 gallons of initial wastewater. The wastewater then flows to the 969,000 gallon capacity settling ponds. The effluent concentration can be calculated as follows:

$$\begin{aligned} 969,000 \text{ gal settling pond} / 28,800 \text{ gal. waste stream} &= 33.6:1 \text{ dilution} \\ 25 \text{ ppm formalin} / 33.6 &= 0.74 \text{ ppm formalin discharged} \end{aligned}$$

The effluent mass shall be calculated by multiplying the actual gallons of formalin used at the facility in a 24-hour period by a 9.13 lbs/gallon conversion factor based on the specific gravity of formalin. The conversion factor is derived by multiplying the weight of water (8.34 lbs/gal) times the specific gravity of formalin as compared to water (1.095). If a facility administers 1.04 gallons of formalin in a day, the formalin mass can be calculated as follows:

$$1.04 \text{ gal formalin} \times 9.13 \text{ lbs/gallon} = 9.5 \text{ lbs formalin discharged}$$

In these examples, the various types of formalin treatments are not administered or discharged at the same time. If multiple discharges of formalin were to occur simultaneously, the facility would have to consider the cumulative formalin concentration and mass. These examples illustrate end-of-pipe (EOP) concentrations, which would be further diluted depending upon the facility's effluent dilution in the receiving water. If a facility receives a 3:1 effluent dilution in the receiving water, the calculated EOP concentration should be divided by three to provide the concentration in the receiving water after mixing.

18. DISCHARGE IMPACT ON RECEIVING WATER QUALITY:

As permitted, the Department has determined the existing water uses will be maintained and protected and the discharge will not cause or contribute to the failure of Mill Stream to meet standards for Class B classification. In response to concerns with effects of fish hatchery effluent discharges on rivers and streams in Maine and limited available data, as outlined in Permit Special Condition M and Fact Sheet Section 14, MDIFW Embden is required to conduct ambient macroinvertebrate biomonitoring during the term of this permit. MDIFW Embden is also required to conduct ambient monitoring for dissolved oxygen and temperature, as specified in Permit Special Condition N and Fact Sheet Section 15. Data collected will be used to evaluate attainment of water classification standards and designated uses, resource impacts, and corrective measures when necessary.

If monitoring conducted pursuant to this permitting action and/or the TMDL analysis noted in Fact Sheet Section 5 indicate that non-attainment conditions persist in the receiving water(s) and that MDIFW Embden causes or contributes to those conditions, this permitting action may be reopened pursuant to Permit Special Condition O and effluent limitations, monitoring and operational requirements, and/or wastewater treatment requirements adjusted accordingly.

19. PUBLIC COMMENTS:

Public notice of this application was made in the Morning Sentinel newspaper on or about July 18, 2005. The Department receives public comments on an application until the date a final agency action is taken on that application. Those persons receiving copies of draft permits shall have at least 30 days in which to submit comments on the draft or to request a public hearing, pursuant to Chapter 522 of the Department's rules.

20. DEPARTMENT CONTACTS:

Additional information concerning this permitting action may be obtained from and written comments should be sent to:

Robert D. Stratton
Division of Water Quality Management
Bureau of Land and Water Quality
Department of Environmental Protection
17 State House Station
Augusta, Maine 04333-0017

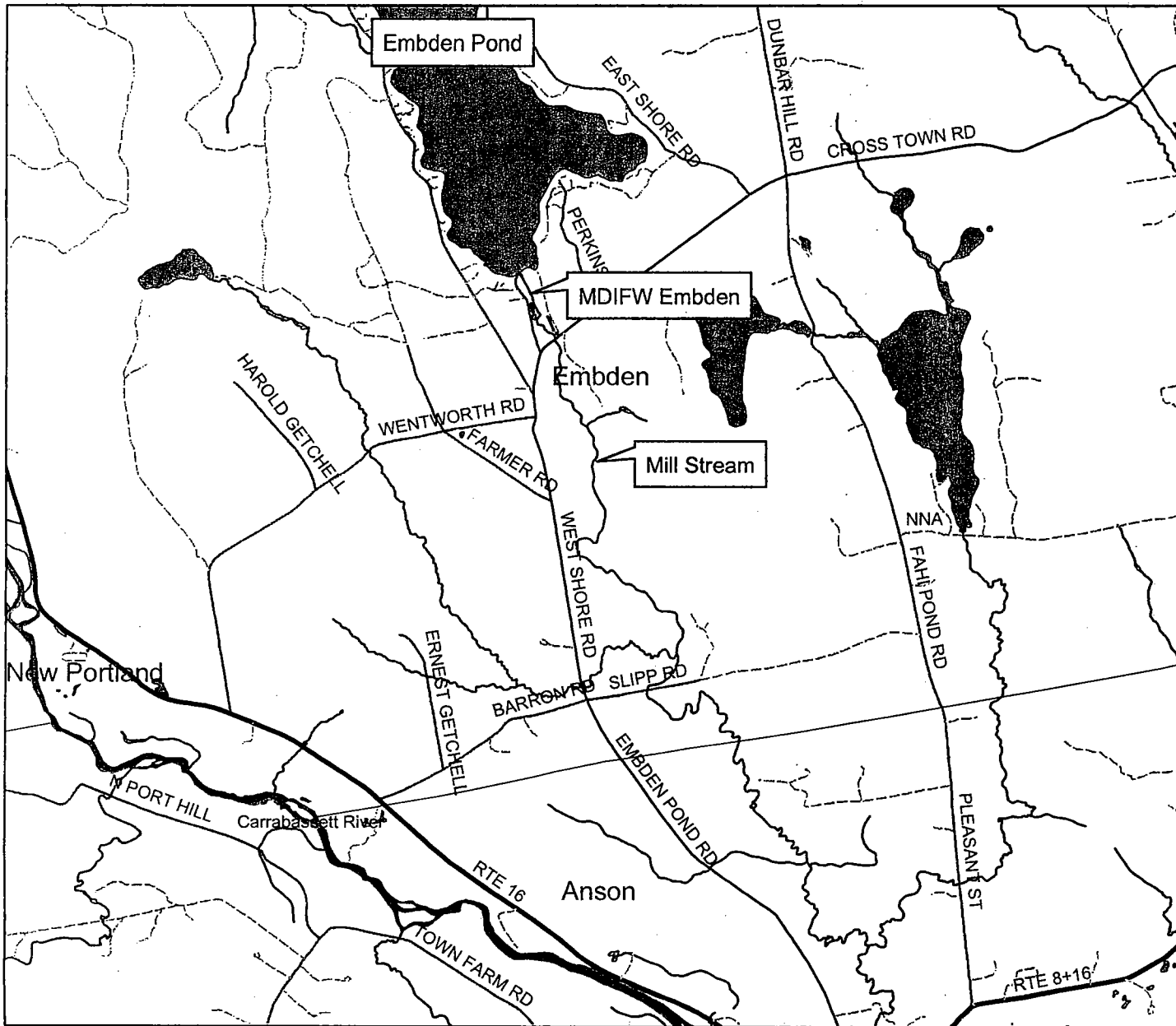
Telephone: (207) 287-6114
Fax: (207) 287-7826
email: Robert.D.Stratton@maine.gov

21. RESPONSE TO COMMENTS:

During the period of December 20, 2005 through January 23, 2006, the Department solicited comments on the proposed draft Maine Pollutant Discharge Elimination System Permit to be issued to the MDIFW Ela Fish Rearing Station for the proposed discharge. The Department did not receive any comments that resulted in significant revisions to the permit. Therefore, no response to comments has been prepared.

ATTACHMENT A

(Facility Location Maps)

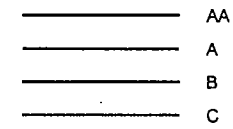


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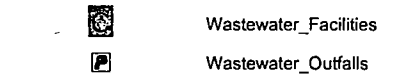
Rivers



Streams

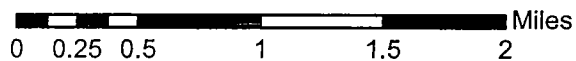
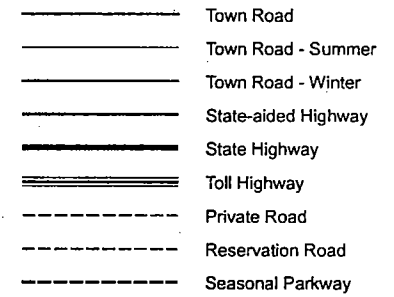


Ponds and Lakes



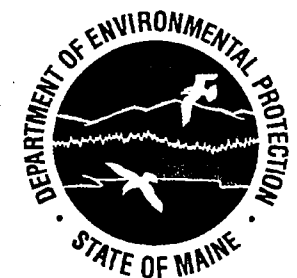
Roads

JURISDICTION



MDIFW Ela Rearing Station
Embden, Maine

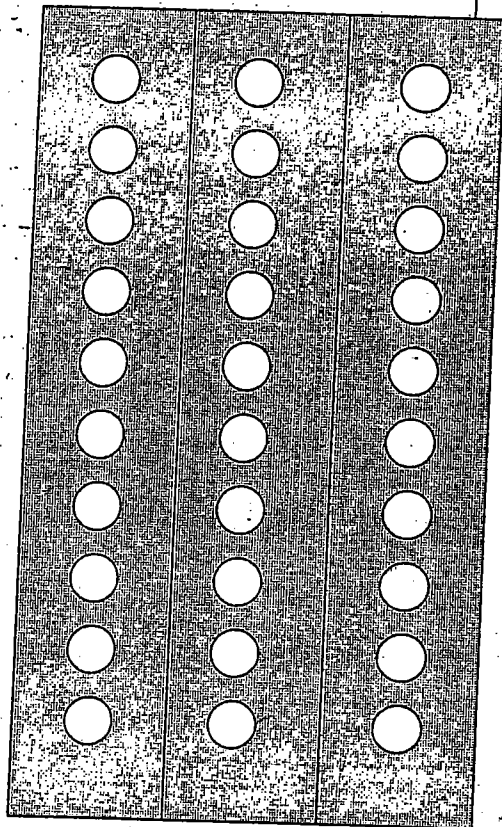
Map created by:
 Bob Stratton
 Division of Water Resource Regulation
 Maine Department of Environmental Protection



ATTACHMENT B

(Facility Site Plans)

Head Box



Microscreen
Building

(E) Clarifier

Sludge storage
+ dewatering

Earlier upgrade design

IMPROVEMENTS

- | | |
|--|---|
| (A1) Agriculture Water Supply | (B5) Site |
| (A2) Lake Water Supply Improvements | (B6) Repair Domestic Wastewater Treatment System |
| (A3) Intake T-Screening | (B7) Security Fencing (see item E6) |
| (A4) Dissolved Oxygen Management System | (B8) Improve Site Drainage |
| (A5) Supply Pipeline Automatic Air Release | (B9) Road and Parking Resurfacing |
| (A6) Replace Valves (see C-EM-5) | (B10) Agriculture Wastewater |
| (A7) Sediment Removal System | (B11) Wastewater Piping |
| (A8) Disinfection System | (B12) Effluent Microscreen System |
| (A9) Calcium Dosing System (not shown) | (B13) Clarifier Improvements |
| (A10) Pumped Recirculation | (B14) Sludge Storage |
| (A11) Fish Rearing Units | (B15) Effluent Composite Sampling and Flow Measurement |
| (A12) Replace Raceway Valve and Drains (see dwg. C-EM-5) | (B16) Wastewater Related Sitework |
| (A13) Raceway Concrete Repairs (see dwg. C-EM-5) | (B17) Flow Baffles (see C-EM-5) |
| (A14) Raceway Rammed (see dwg. C-EM-5) | (B18) Improve Quiescent Zones (see C-EM-5) |
| (A15) Tank Farm Construction | (B19) Electrical and HVAC |
| (A16) Raceway Covers (see dwg. C-EM-5) | (B20) Upgrade Electrical System |
| (A17) Buildings | (B21) Fences and Lights |
| (A18) Add Storage Space | (B22) Raceway Power (see dwg. C-EM-5) |
| (A19) Residence Renovation | (B23) Building Ventilation |
| (A20) New Residence | (B24) Emergency Generator |
| (A21) Garage Renovation | (B25) Site Lighting |
| (A22) Flammable Liquid and Chemical Storage | (B26) Visitor Education / Interpretation |
| | (B27) Upgrade Visitor Education and Interpretation Area |
| | (B28) Visitor's Restroom |

LEGEND

- ONDOKS & DETOKES
- PROPERTY LINE
- FENCE
- OXYGEN
- WATER SUPPLY
- DOMESTIC WATER
- DOMESTIC WASTE WATER
- BACKWASH
- WASTE WATER
- DRAIN
- OVERFLOW WATER
- PUMPED RELEASE WATER
- SPECIAL RELEASE WATER
- NEW PIPING IMPROVEMENTS
- ELECTRICAL
- NEW SITE LIGHTING
- SURFACE WATER / EXISTING RACEWAY
- LINED POND
- BUILDINGS / STRUCTURES
- NEW BUILDINGS / STRUCTURES
- RACEWAY COVERS
- BOND / PREDACTION METERS
- EFFLUENT / WASTEWATER
- COVERED READING UNIT
- NEW READING UNIT
- ROADWAY
- NEW ROADWAY

NOTE: EXISTING CONDITIONS DRAWINGS WERE GENERATED USING AERIAL PHOTOGRAPHY FOR GRAPHICAL PRESENTATION PURPOSES ONLY. DRAWINGS SHOULD NOT BE USED FOR SCALED ENGINEERING DESIGN.

SEAL:



FISHPRO
Consulting Engineers and Scientists

5201 South Sixth Street Road
Springfield, IL 62779-2142
(217) 565-2221

Port Orchard, Wa.
Portland, Or.



STATE OF MAINE
DEPARTMENT OF INLAND
FISHERIES AND WILDLIFE



STATE OF MAINE

DRAWING TITLE

SITE IMPROVEMENTS (OPTION 1)

PROJECT:

MAINE COMPREHENSIVE STATEWIDE FISH
HATCHERY SYSTEM ENGINEERING STUDY

FP 800-085

DATE: MAR. 2002

SHEET:

C-EM-6

OF 2 SHEETS

ATTACHMENT C
(Engineer's Facilities Planning Report)

MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Land and Water Quality
Division of Water Quality Management

INVESTIGATION PROTOCOL

All reports, plans and specifications shall be submitted by the dates specified in the permit. The documents submitted for formal approval shall include the engineer's report, final plans and specifications.

Procurement of Engineering Services.

This step requires retaining an engineering firm to plan, study, and design the project. The owner then hires one or more separate construction contractors to build the project; construction services, including construction management, are performed by the design firm. Start-up and operator instruction services are performed by the design engineer.

Engineer's Facilities Planning Report (Reports Required Pursuant to Permit Special Condition G).

The purpose of the report is to present in clear, concise form a description of the problem, alternative solutions examined, rejected and recommended, their technical and financial feasibility, and their environmental impact. The report should contain a detailed basis of design covering each component of the treatment process. The engineer's report should provide a description of alternative wastewater treatment processes screened for consideration, as well as factors considered in selecting processes. Such factors should include:

- Compatibility with existing facilities
- Flexibility for expansion
- Ability to meet required permit limits
- Suitability to handle probable variations in plant loading
- Proven effectiveness
- Land area requirements
- Labor requirements
- Construction costs
- Operational costs
- Energy requirements
- Odor potential

System Alternatives: The engineer must carefully consider all feasible designs for the facility. The initial evaluation should focus on the technical appropriateness of all alternatives. Then, those deemed technically appropriate should receive in-depth technical and economic evaluation. The alternatives that should be evaluated include: source reduction through pollution prevention, storage and release to the receiving water as appropriate to reduce toxic amounts, conveyance of the waste to the POTW, pretreatment, conventional treatment and innovative/alternative treatment.

Conclusions, Recommendations, and Proposed Schedules: The engineer's facility planning report should clearly summarize the detailed evaluations contained in the body of the report. Provide a clear description of what is being proposed and propose an implementation schedule for approval. A typical schedule should reflect various future phases of the project such as required approvals, final design, bidding, contract award, construction and start-up. The facility shall be fully operational within the timeframes established in the permit.

Final Design Contract Drawings and Specifications

Plans should consist of general views, specific plan areas, elevations, sections, and details. Together with the specifications, these provide information for the contract and construction of the project. Complete technical specifications for the work should accompany the plans. Technical specifications should be clear and concise. They should include, but are not limited to, all construction information that the builder needs that is not shown on the plans, such as details of the design requirements, including the quality of materials, lists of required manuals, tools, chemicals, spare parts, and calibration equipment.

