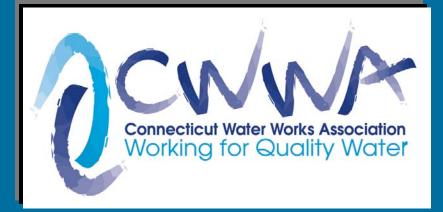
Developing New Streamflow Regulations in Connecticut



November 24, 2009

David Radka Director of Water Resources The Connecticut Water Company

Connecticut Water Company

Organized in 1956
60 Systems
54 Towns
300,000 people
NASDAQ - \$60 M in Revenues

CWC Overview – Regulatory Oversight

Environment

□ 18 Active Reservoirs, 87 wellfields

- 50 MGD
 DEP Permits & Registrations
- Public Health
 DPH Purity &
 Adequacy of Supply

- CONNECTICUT Nor Haven New Haven New Haven
- Public Service
 Public Utility Control Service & Rates

Water Utilities Have Long Been Stewards of the Environment



Support Efforts to Protect Water Resources of the State – 80% of Residents Served

Proposed Streamflow Regulations Published October 13, 2009

Proposed Stream Flow Standards and Regulations Public Notice, October 13, 2009

The Regulations of Connecticut State Agencies are amended by adding sections 26-141b-1 to 26-141b-9, inclusive, as follows:

(NEW) **Section 26-141b-1. Short title.** Sections 26-141b-1 to 26-141b-9, inclusive, shall be known as the department's Stream Flow Standards and Regulations.

(NEW) Sec. 26-141b-2. Definitions. As used in sections 26-141b-1 to 26-141b-9, inclusive, of

the Regulations of Connecticut State Agencies:

- (1) "Anadromous" means a species of aquatic life water to complete its life cycle as an adult;
- (2) "Antecedent period" means the fourteen consecu required release is calculated pursuant to section Connecticut State Agencies;



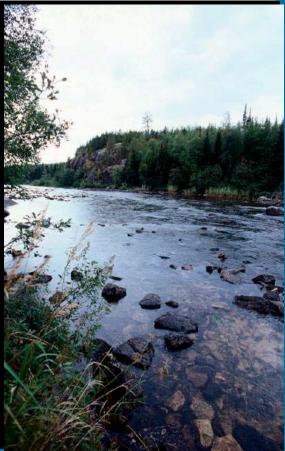
Streamflow – Existing & Future

- Existing Minimum Flow Standards
 Dams on Stocked Watercourses
 Unchanging Daily Flow Release
- Proposed Streamflow Regulations
 Apply to all rivers and streams
 Be based on natural variations of flow
 Preserve and protect natural aquatic and stocked wildlife and promote usage for recreation
 Provide for public health... public utilities, water supply...



Potential Benefits of New Streamflow Regulations...

- More Water in Streams
- Improved Stakeholder Relationships
- Relief from CEPA Claims
- Guidance for Future Diversions
- Improved Land Use Decisions

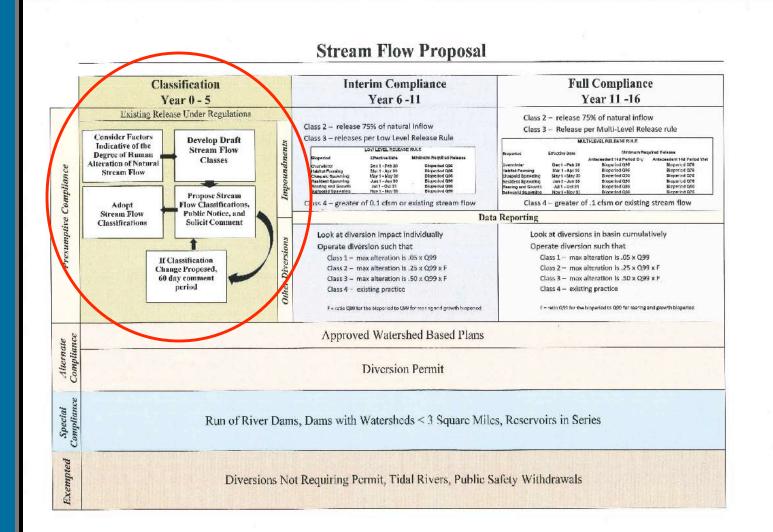


Major Components of Proposed Regs

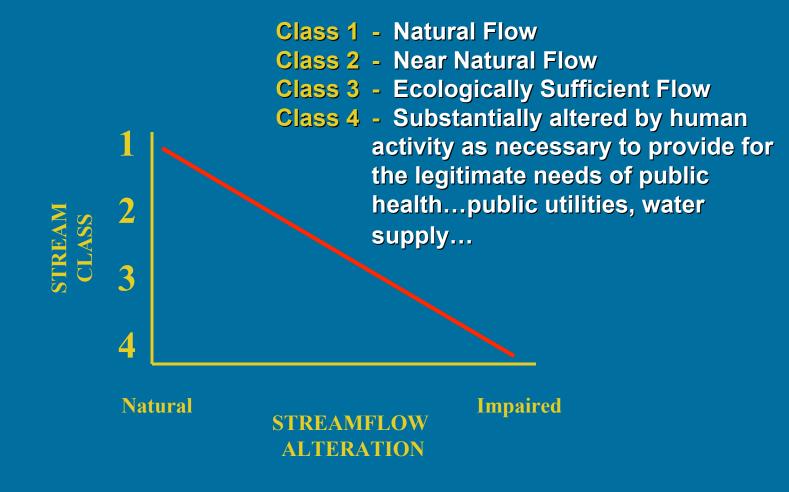
- **Stream Classifications** 1 4
- Reservoir Release Requirements
- Groundwater Withdrawal Limits
- Flow Management Plans
 with Stakeholders as a
 Compliance Alternative



Implementation

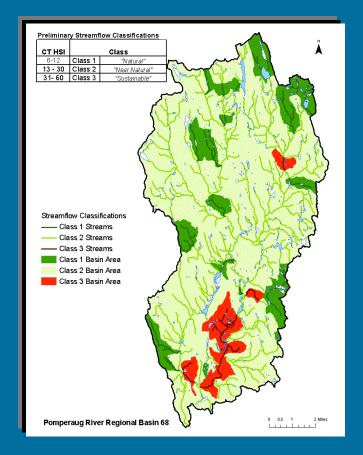


Conceptual Model for Stream Classification



Classification Process

- 5 Year Process by Major Basins
- Based on Relative Conditions of Streams and Future Use
- Required Flow Releases and Groundwater Withdrawals Based on Classifications
- Extent and Timing of Releases and Withdrawal Limits Impact Ability to Supply Customers and the Communities We Serve



Compliance

Bioperiod		Effective Date		ate Minimum Required Release			pos	al						
				Dry Period Re	lease	Wet Period F	Release							
Overwinter		Dec 1 – Fel	b 28	Bioperiod C)95	Bioperiod	Q75	1			ll Complian Year 11 -16	ce		
Habitat Forming		Mar 1 – Ap	r 30	Bioperiod C	(95	Bioperiod	Q75			Class 2 – release	75% OF Hator and A	ow		
Cluepeid Spawning		May 1 – Ma	ay 30	Bioperiod C	(95	Bioperiod	Q75	le	-	N	e per Multi-Level Re Ulti-level release ruur	elease ruic		
Resident Spawning		Jun 1 – Jur	n 30	Bioperiod C	(90	Bioperiod	Q75	i Foeleeze GG GG	Bropert, Deversion (labitati		Antiscuedant 11 d Period Dry Bioperiod Q95 Bioperiod Q95 Discorted Q93	Anbezeadert 14d Period V Bioperiod 076 Bioperiod 076 Bioperiod 076 Bioperiod 075	Vat	
Rearing and Growth		Jul 1 – Oct	: 31	Bioperiod C	(80	Bioperiod	Q50	90 90 90		Spranke Jun I - Jun 30 rel Growth Juli 1 - Oct 81 Jun 10/10 Nov 1 - Nov 31	Bioperiod Q91 Bioperiod Q89 Bioperiod Q99	Bioperiod 676 Bioperiod 676 Bioperiod 676		
Salmonid Spawning		Nov 1 – No	v 30	Bioperiod C	(90	Bioperiod	Q75	am flow	Data Repo		of .1 cfsm or evicting	stream flow		
	Presumpti		If Classific Change Pro 60 day com	posed, ment	Diversion	Look at diversion Impac Dperate diversion such Class 1 – max alteration Class 2 – max alteration Class 3 – max alteration	that is .05 x Q99 is .25 x Q99 x	F		Operate divers Class 1 – max Class 2 – max	ons in basin cumu ion such that alteration is .05 x Q alteration is .25 x Q alteration is .25 x Q	99 99 x F		
	Presun		Change Pro 60 day con period	posed, ment	ther Diversions	Dperate diversion such Class 1 – max alteration Class 2 – max alteration	that 1 is .05 x Q99 1 is .25 x Q99 x 1 is .50 x Q99 x	F		Operate divers Class 1 – max Class 2 – max Class 3 – max Class 4 – exis	ion such that alteration is $.05 \times Q$ alteration is $.25 \times Q$ alteration is $.50 \times Q$ ting practice	99 99 x F 99 x F		
			Change Pro 60 day con period	posed, nment	ther Diversions	Dperate diversion such Class 1 – max alteration Class 2 – max alteration Class 3 – max alteration Class 4 – existing practi	that 1 is .05 x Q99 1 is .25 x Q99 x 1 is .50 x Q99 x	F	1	Operate divers Class 1 – max Class 2 – max Class 3 – max Class 4 – exis	ion such that alteration is .05 x Q alteration is .25 x Q alteration is .50 x Q	99 99 x F 99 x F	Class 3	
			Change Pro 60 day con period	Bioperiod	uher Diversions	Dperate diversion such Class 1 – max alteration Class 2 – max alteration Class 3 – max alteration Class 4 – existing practi	that h is .05 x Q99 h is .25 x Q99 x is .50 x Q99 x cc	F		Operate divers Class 1 - mar Class 2 - mar Class 3 - mar Class 4 - exis	ion such that alteration is $.05 \times Q$ alteration is $.25 \times Q$ alteration is $.50 \times Q$ ting practice	99 99 x F 99 x F	Class 3 x Q99 x F	
	Alternate Compliance		Change Pro 60 day com period	Bioperiod	ther Diversions	Deperate diversion such Class 1 - max alteration Class 2 - max alteration Class 3 - max alteration Class 4 - existing practi ective Date	that 15.05 × Q99 15.25 × Q99 × 15.50 × Q99 × cc	F Class	299	Operate divers Class 1 - may Class 2 - may Class 3 - may class 4 - exis	ion such that calteration is .05 × Q calteration is .25 × Q calteration is .50 × Q ting practice ass 2	99 99 x F 99 x F 0.50		
	Alternate Compliance		Change Pro 60 day com period Overw Habita	Bioperiod inter	The Diversions	Deperate diversion such Class 1 - max alteration Class 2 - max alteration Class 3 - max alteration Class 4 - existing practi ective Date c 1 - Feb 28	that is .05 x Q99 is .25 x Q99 x is .50 x Q99 x cc 0 0 0	F F Class)99)99	Operate divers Class 1 - may Class 2 - may Class 3 - may Class 4 - exis	ion such that calteration is .05 × Q calteration is .25 × Q interation is .50 × Q ting practice asss 2 x Q99 x F	99 99 × F 99 × F 99 × P 0.50 0.50	x Q99 x F	:
			Change Pro 60 day com period Overw Habita Cluepe	Bioperiod inter t Forming	Eff Dee Ma May	Operate diversion such Class 1 - max alteration Class 2 - max alteration Class 3 - max alteration Class 4 - existing practic ective Date c 1 - Feb 28 ir 1 - Apr 30	that is .05 × Q99 is .25 × Q99 × cc 0 0 0 0 0	F Class 0.05 x C 0.05 x C	299 299 299	Operate divers Class 1 - may Class 2 - may Class 3 - may Class 4 - exis Class 4 - exis One One One One One One One One One One	ion such that calteration is .05 × Q calteration is .25 × Q calteration is .25 × Q ting practice calteration is .50 × Q ting practice calteration is .50 × Q ting practice calteration is .50 × Q ting practice	99 99 × F 99 × F 99 × F 0.50 0.50 0.50	x Q99 x F x Q99 x F	:
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	Alternate Compliance		Change Pro 60 day com period Overw Habita Cluepe Reside Rearin	Bioperiod inter t Forming id Spawning nt Spawning	Eff De Ma Jur Jur	Class 1 - max alteration Class 2 - max alteration Class 2 - max alteration Class 4 - existing praction Class 4 - existing praction ective Date c 1 - Feb 28 or 1 - Apr 30 y 1 - May 30 n 1 - Jun 30	that is .05 × 099 is .25 × 099 × cc 0 0 0 0 0 0 0 0 0 0 0 0 0	Class 0.05 x C 0.05 x C 0.05 x C 0.05 x C 0.05 x C	299 299 299 299 299 299 299	Operate divers Class 1 - may Class 2 - may Class 3 - may Class 4 - exis 0.25 1 0.25 1 0	ion such that calteration is .05 × Q calteration is .25 × Q calteration is .25 × Q calteration is .25 × Q calteration is .50 × Q calterat	99 99 × F 99 × F 99 × F 0.50 0.50 0.50 0.50 0.50	x Q99 x F x Q99 x F x Q99 x F x Q99 x F 0 x Q99 x F 0 x Q99 x F	

Release Rule Example

		Release Rate (cfsm)		
Bioperiod	Dates	Dry Period	Wet Period	
Overwinter	Dec. 1 - Feb. 28	0.46	1.10	
Habitat Forming	March 1 - April 30	1.05	1.71	
Clupeid Spawning	May 1 - May 30	0.52	1.05	
Resident Spawning	June 1 - June 30	0.24	0.40	
Rearing and Growth	July 1 - October 31	80.0	0.28	
Salmonid Spawning	Nov. 1 - Nov. 30	0.24	0.62	

Flow changes on 1st and 15th of each month Extensive Monitoring and Variability

Reservoir Release Drought Cutbacks

	Stream Flow Release Requirements			
Drought Trigger	Rearing & Growth	All other Bioperiods		
Advisory	100% of Base Flow	75% of Base Flow		
Watch	50% of Base Flow	50% of Base Flow		
Warning	25% of Base Flow	25% of Base Flow		
Emergency	No release required	No release required		

Base Flow = "Dry" Period Release

Defining drought triggers important – Must be adequate without being too frequent

Groundwater Allowed Withdrawal Applied to existing and new sources

Bioperiod	Effective Date						
Disperiou		Class 1	Class 2	Class 3			
Overwinter	Dec 1 – Feb 28	0.05 x Q99	0.25 x Q99 x F	0.50 x Q99 x F			
Habitat Forming	Mar 1 – Apr 30	0.05 x Q99	0.25 x Q99 x F	0.50 x Q99 x F			
Cluepeid Spawning	May 1 – May 30	0.05 x Q99	0.25 x Q99 x F	0.50 x Q99 x F			
Resident Spawning	Jun 1 – Jun 30	0.05 x Q99	0.25 x Q99 x F	0.50 x Q99 x F			
Rearing and Growth	Jul 1 – Oct 31	0.05 x Q99	0.25 x Q99	0.50 x Q99			
Salmonid Spawning	Nov 1 – Nov 30	0.05 x Q99	0.25 x Q99 x F	0.50 x Q99 x F			
	"F" represents the ratio of bioperiod Q99 to Rearing and growth bioperiod Q99 at site						

Q99 = Flow equaled or exceeded 99% of the time (\approx 7Q10).

Compliance on Class 4 Streams

Reservoirs
 0.1 cfsm or Current Release Rule
 Groundwater
 Continue Unaffected
 Flow Management Plan

Flow Management Plans

- Adopted by DEP
 □ Public process
- Include all structures subject to Standards
- Include BMPs to minimize flow alteration
 Conservation
 - Demand management
- Include compliance plan
- Expensive
- Uncertain

Compliance Requirements for Public Water Suppliers

- Dam Modifications
- Release Monitoring
- Distribution System Modifications
- Increased Treatment Needs
- New Source Development
- Flow Management Plans
- Conservation/Demand Management



Potential Public Water System Impacts

System Specific

- Loss of Available Supply Reservoir Safe Yield / Well Capacity – especially during summer months
- Water Quality & Aesthetics
- Capital and O&M Costs
- Frequency & Duration of Requests to Customers for Use Restrictions
 - Operating Revenue Implications



Potential Impacts on Customers and Local Communities

- Increased Frequency and Longer Duration of Water Use Restrictions
- Moratoriums
 - Wholesale Between Utilities to Address Regional Issues
 Routine Development – Residential, Commercial, Industrial, Public Authority





Impact on Economic Development and Recovery

Impacts on Municipalities

Unfunded Mandate on Cities and Towns
 Compliance costs for municipal water departments
 Compliance requirements for non-PWS dams
 Limits Ability to Plan

Impacts on Business
Industry
Direct – Compliance
Indirect – Customer





Implementation Questions?

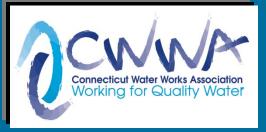
Compliance

Will compliance cause conflicts with other (DPH, DPUC, OCC) regulatory obligations?

Are alternative supplies available?

Public Policy

 Is significant uncertainty and risk in our public water systems acceptable – and to what degree?
 At what cost would we be implementing these regulations and to what end?



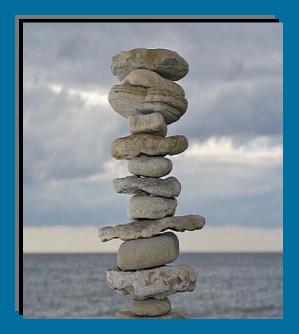
Want to Ensure New Streamflow Regulations

Adequately balance environmental, public health and safety, and economic interests

Meet the needs of the residents of the state

Need to Find Appropriate Balance

- These are important regulations but there is still more work to do before they can be adopted
- We stand ready to work with stakeholders and policymakers to develop balanced regulations
- Must meet the mandate of the law and the needs of the residents of Connecticut



Balancing Environmental & Other Interests

- Conduct cost-benefit analysis
- Identify appropriate exemptions or special conditions to minimize impacts on water supplies,



customers and the communities served

Identify equitable cost distribution so not all expenses borne by water utility customers

 Develop appropriate implementation process that prioritizes needs and allows for extensive phase-in for compliance

Schedule

Public Hearing January 21, 2010 Hearing Officer Report Revisions are Possible AG Review for Legal Sufficiency Determination Regulations Review Committee

Outcome Uncertain

QUI

TRANSTULIT



"Well, we needed the rain."

Questions?