Mixing Zones Regulations

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Water Quality Standards

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Outline

- What are water quality standards?
- What is a mixing zone?
- What are the recent changes to the regulations?
- How the changes will be implemented?

- Questions

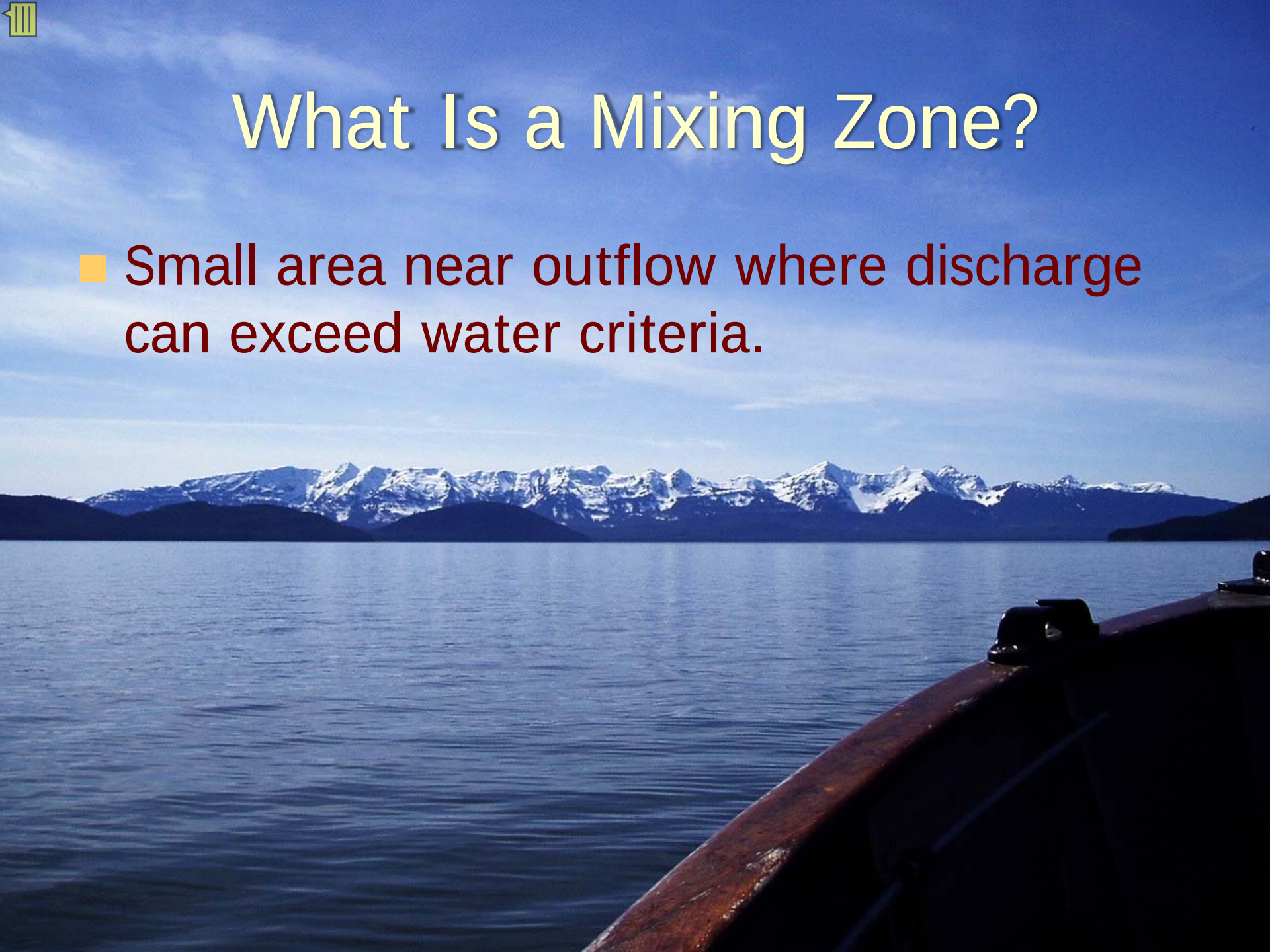
Water Quality Standards

Use + Criteria = Standard

- Designated water use classes (7)
  - drinking, fishing, swimming & other uses
- In Alaska, all waters protected for all uses
- Criteria are pollutant limits to protect uses
- Most stringent criteria becomes the WQS

What Is a Mixing Zone?

- Small area near outflow where discharge can exceed water criteria.



Comparison of 2003 and 2006 Regulations

- **Anadromous Fish** - Prohibition for spawning areas changed from all anadromous fish to 5 Pacific salmon species.

- **Pre-existing authorizations** - Mixing zone may be reauthorized if evidence show no initial spawning area for salmon or other protected fish.

Comparison of 2003 and 2006 Regulations

- **Other Protected Fish** – Prohibition remains for 14 other species.

- **Exceptions:**
  - Aquatic life criteria are not exceeded.
  - if the applicant submits a mitigation plan that is approved by ADF&G and DEC.

Comparison of 2003 and 2006 Regulations

- **Expanded Protected Waters** - Now includes lakes.
- **Spawning area definition** – time and location used in previous practices are now stated in regulation.
- **Consultation** - DEC is required to consult with ADF&G on spawning areas

Update on Changes

- Revised Regulations - State adopted in 2006
- New Guidance - nearly finalized
  - Covers general provisions for all mixing zones
  - How pre-existing permits can “grandfather” mixing zones
- Spawning Mitigation Plans
  - NOT allowed for Pacific salmon
  - Required for exception in other protected fish spawning areas

Mixing Zone Conditions

DEC must consider:

- the characteristics of the receiving water
- the characteristics of the effluent
- the effects, including cumulative effects, on the uses of the water
- **any measures that would mitigate potential adverse effects to aquatic resources**
- any other relevant factors

Mixing Zone Conditions

A mixing zone must:

- Use effluent that has been treated to remove, reduce and disperse the pollutants with the most effective, technologically and economically feasible methods
- Maintain and protect designated and existing uses of the waterbody as a whole
- Protect overall biological integrity
- Be as small as practicable

Mixing Zone Conditions

A mixing zone must NOT:

- **result in an acute or chronic toxic effect outside the mixing zone**
- create a public health hazard for water supply or contact recreation
- **preclude or limit established processing activities, commercial, sport, personal-use, or subsistence**
  fish and shellfish harvesting
- **reduce fish or shellfish populations**

Mixing Zone Conditions

A mixing zone must NOT:

- **result in permanent or irreparable displacement of indigenous organisms**
- adversely affect threatened or endangered species except as authorized under the ESA
- **form a barrier to migratory species or fish passage**
- **contain pollutants that bioaccumulate, bioconcentrate, or persist above natural levels in sediments, water, or biota**

Mixing Zone Conditions

A mixing zone must NOT:

- present an unacceptable risk to human health from carcinogenic, mutagenic, teratogenic, or other effects
- settle to form objectionable deposits
- produce floating debris, oil, scum and other material in concentrations that form nuisances
- **result in undesirable or nuisance aquatic life**

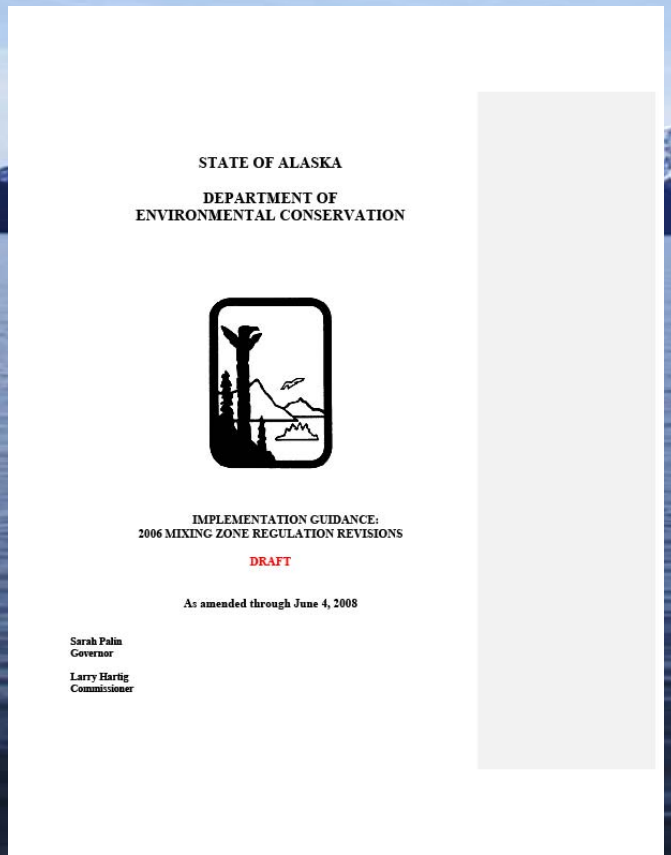
Mixing Zone Conditions

A mixing zone must NOT:

- **produce objectionable color, taste, or odor in aquatic resources harvested**
- **cause lethality to passing organisms**
- **exceed acute aquatic life criteria beyond a smaller initial mixing zone surrounding the outfall**

Guidance Documents

- Implementation guidance (DEC)
- Appendix B - Spawning mitigation guidance (DEC and ADF&G)



STATE OF ALASKA

DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

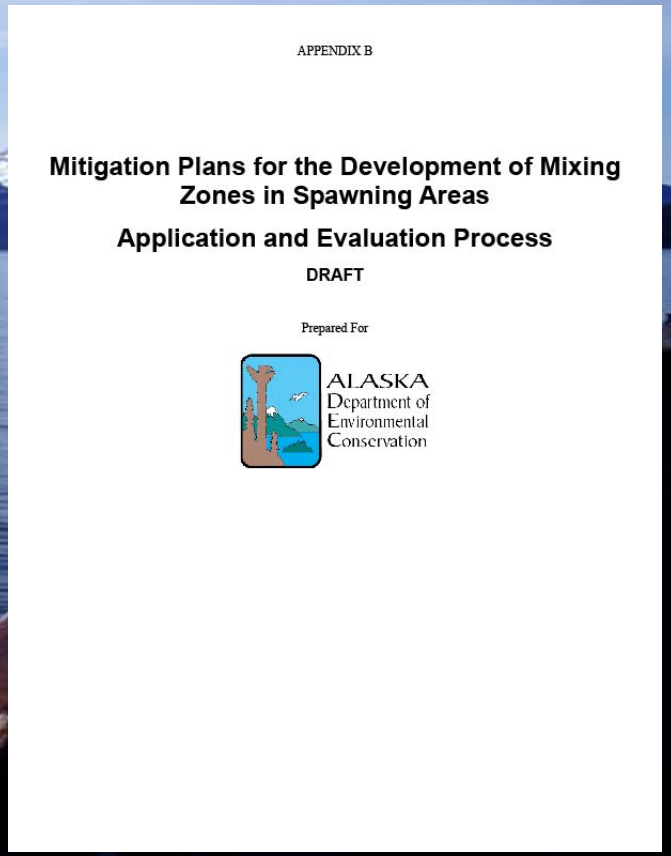
IMPLEMENTATION GUIDANCE:
2006 MIXING ZONE REGULATION REVISIONS

DRAFT

As amended through June 4, 2008

Sarah Palin
Governor

Larry Hartig
Commissioner



APPENDIX B

Mitigation Plans for the Development of Mixing Zones in Spawning Areas

Application and Evaluation Process

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Prepared For

ALASKA
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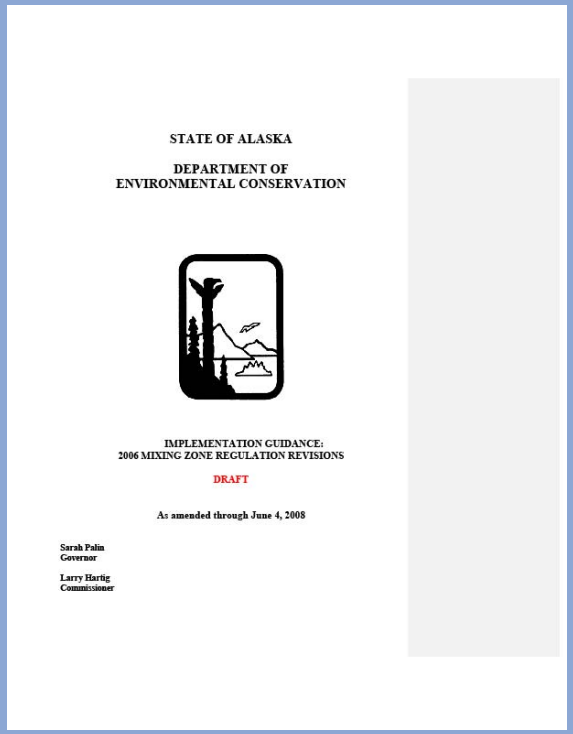
Implementation Guidance

- Info needed for permit
- Burden of proof
- Protection of uses
- Bioaccumulative compounds
- Flow calculations and models
- Endangered Species Act
- Human health criteria
- **Fish spawning**



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Mixing Zone Conditions

Mixing zones are commonly used and must meet statewide conditions to protect human health, subsistence uses, and growth and propagation of fish and shellfish in all waters. Spawning has a temporal and spatial aspect. *Spawning areas* have additional protections for the freshwater species below.

Freshwater

Salt water

Mixing zones must meet Statewide Conditions

Salmon Spawning areas:

Mixing zones are *prohibited* except for rare cases where spawning began after initial authorization

Spawning areas:

Mixing zones must meet Statewide Water Quality Standards and additional conditions

for Arctic grayling, n. pike, lake & brook trout, sheefish, burbot, A. or resident Rainbow Trout Arctic char, Dolly varden, whitefish, or cutthroat trout

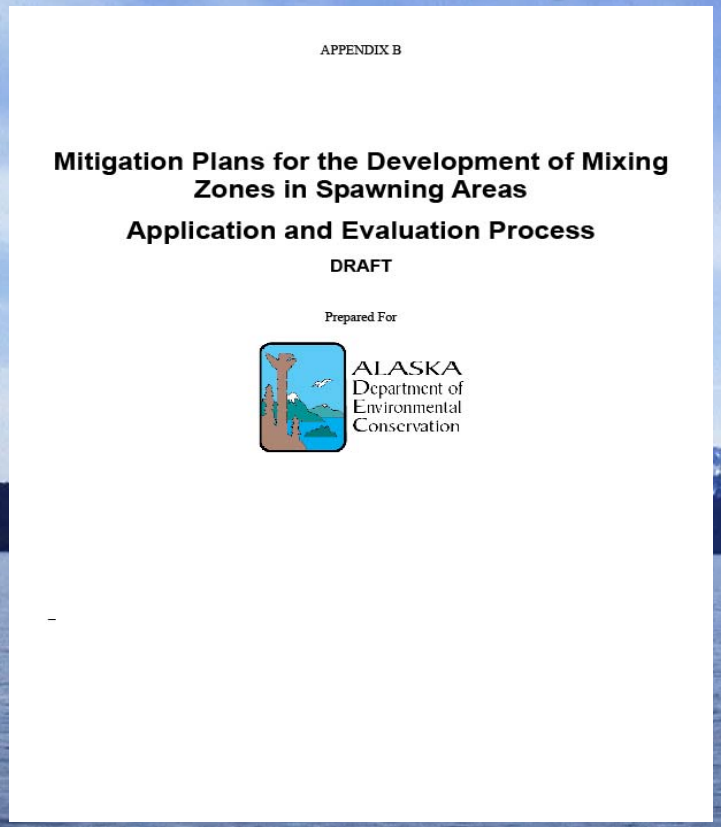
Non Spawning area:

Mixing zones must meet Statewide Conditions

Additional Conditions for allowing mixing zones in spawning areas

- Approved Mitigation Plan –ADF&G /ADEC
- Not adversely affect capability of area to support future spawning, incubation, & rearing activities

Appendix B - Spawning mitigation guidance (DEC and ADF&G)



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Arctic grayling northern pike

rainbow trout lake trout

brook trout cutthroat trout

whitefish sheefish

burbot Arctic char

Dolly Varden

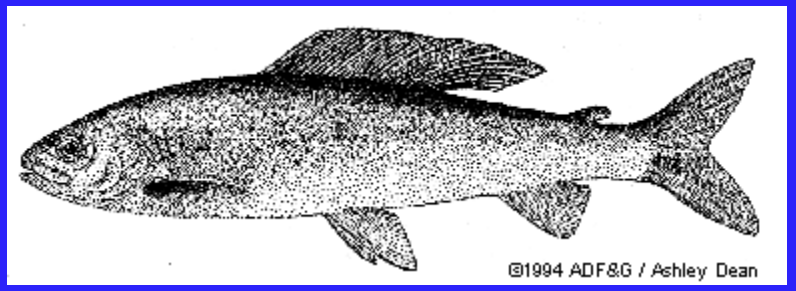
landlocked coho, king, and sockeye salmon.

Spawning Mitigation Plans

- Reviewed by ADF&G Habitat Division and DEC
- Must use all available scientific and local knowledge
- Appropriate monitoring required

1) Avoid
2) Minimize
3) Rectify
4) Reduce impact
5) Compensate

Bons Pond-Red Dog Mine



- Arctic grayling (*Thymallus arcticus*) transplanted into Bons Pond in 1994 and 1995 have established a self-sustaining population

- Arctic grayling population exceeds 5,000 fish greater than 200 mm long (about 8 inches)

- Arctic grayling have left Bons Pond and returned as a component of the spring spawning migration into North Fork Red Dog Creek which provides the only area of documented significant spawning habitat in the Ikalukrok Creek drainage

Constructed Wetlands at Fort Knox

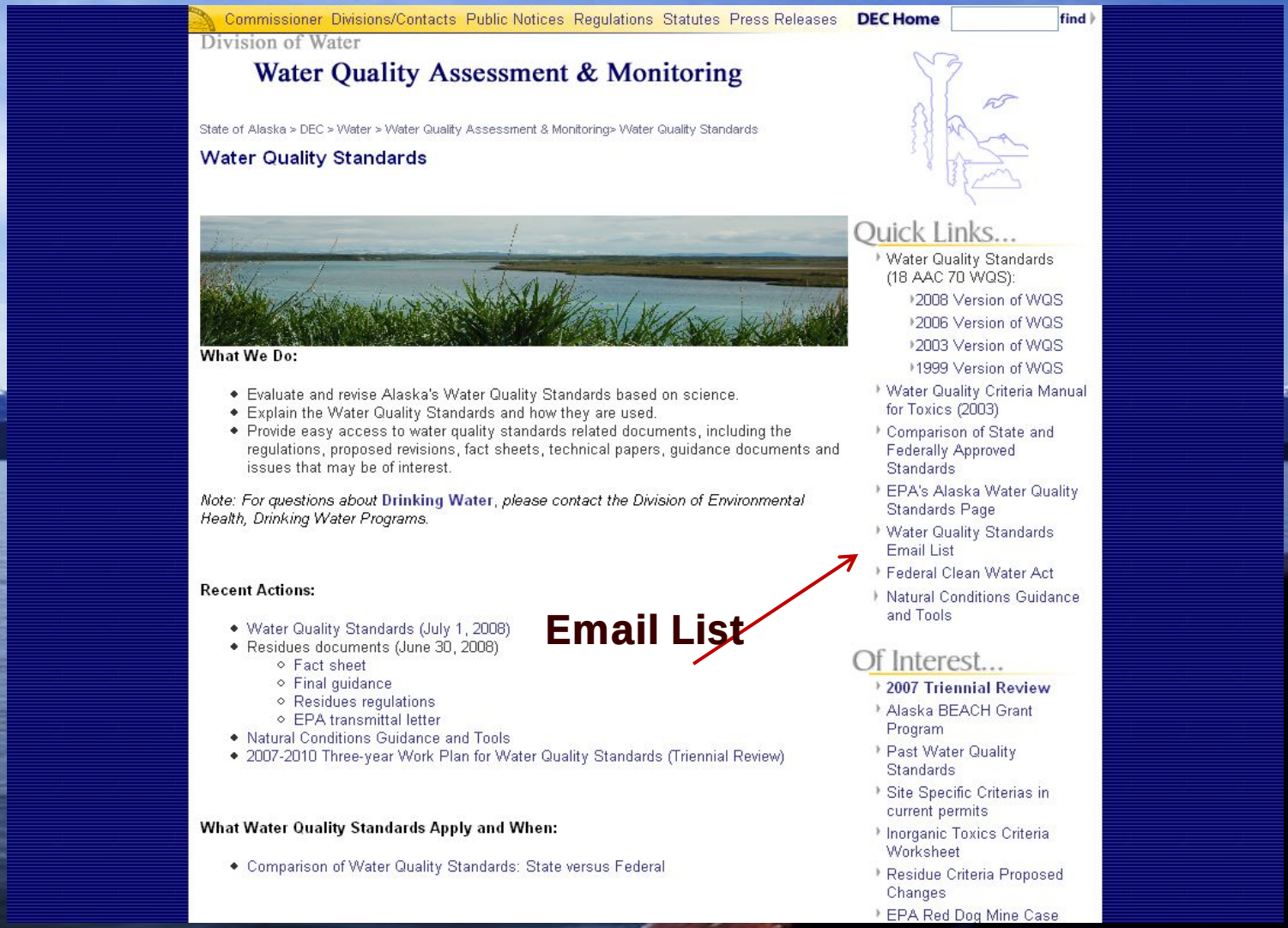
Pond-stream-channel system created from mine tailings

Habitat for waterfowl and wildlife

Federal Review

- DEC expects to transmit the updated package to EPA in late 2008.
  - MOA – ADF&G and DEC
  - Implementation Guidance: 2006 Mixing Zone Regulation Revisions
- ESA consultation is ongoing.
- Upon EPA's approval, the new mixing zone regulation will go into effect for Clean Water Act purposes including NPDES wastewater permits.

Further Mixing Zone Regulations Updates



Questions

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http://www.dec.state.ak.us/water/wqsar/wqs/index.htm