

# Implementation of Clean Water Act Section 316(b)

*Once Through Cooling Research Results  
Symposium, UC Davis*

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State Water Resources Control Board Staff

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# Recent History

- SWRCB First Scoping Meeting – 2006
- RiverKeeper II Decision – January 2007
- US EPA Remand Phase II Rule – July 2007
  
- SWRCB Staff – work on a new statewide policy and initial review of baseline and potential impacts

# Baseline Impacts to Marine Life

- Entrainment mortality is about 80 billion fish larvae, eggs, and selected invertebrates annually
- Impingement mortality is about 9 million annually
- Marine/estuarine wildlife impacted – minimum of 57 per year

To put this in perspective, these levels of mortality would not be allowed if resulting from a discharge of waste.

# Water Board Objectives

- Develop a statewide policy to protect marine life from the impacts of once-through cooling.
- While implementing this policy we will work with energy agencies and stakeholders to ensure continuity of the State's electrical grid.

# Some Alternatives

- Status quo vs. Statewide Policy?
- Future EPA Phase II Rule vs. Statewide Policy?
- Considerations:
  - NPDES Permit backlog
  - Regional BPJ in the absence of a statewide policy –  
Inconsistencies and Petitions
  - Grid reliability is really a statewide consideration

# Best Technology Available (BTA) Compliance Alternatives\*

- Track 1
  - Reduce flow & velocity to level commensurate with closed-cycle re-circulating cooling system
- Track 2 (to provide flexibility)
  - Reduce adverse environ. impacts from intake structure to level comparable to (within 10% of) Track 1

\* Generally modeled after US EPA Phase I rules

# Water Quality Benefits from Closed-cycle Cooling

- Large reduction in discharge flows (and associated impingement & entrainment)
- Large reduction in thermal plume and effects of elevated temperature discharges

# Water Quality Concerns from Closed-cycle Cooling

- Cooling tower may concentrate intake water pollutants by 1.5X or more
- Boiler blow-down may add additional metals from leaching of condenser tube metals.
- Potential Solutions:
  - Modification to discharge lines?
  - Treatment prior to disposal?

# Air Impacts from Closed-Cycle Cooling

- Increased air emissions due to additional fuel consumption from lower fuel efficiencies
- Estimates for Retrofit at a 300 MW Steam Plant:

## Dry cooling:

- 10% increase in combustion air pollutants and CO<sub>2</sub>

## Wet cooling:

- 2% increase in combustion air pollutants and CO<sub>2</sub>
- evaporative salt drift particulates

# Proposed Implementation Steps

- Plant operators develop implementation plan and submit to Regional Board
- Implementation plans of all plants reviewed by Statewide Task Force\*
- Staggered compliance schedule:
  - Load Following Low Capacity Utilization
  - Load Following High Capacity Utilization
  - Base Load Nuclear Plants

\* Task Force includes energy agencies

# Track II Implementation

- For comparison to Track I
- Baseline intake alternatives:
  - mean annual actual flow rate over the last permit cycle, or
  - permitted flow
- Entrainment monitoring
- Impingement monitoring

# Interim Requirements

- Interim period between adoption of Policy and Final Compliance Dates.
- Large Organism Exclusion Devices
  - For offshore intakes
  - Mesh size no greater than 4 inch square
- Reduced flows when not generating electricity for more than 2 days
- Restoration to offset interim impacts

# Restoration as an interim measure

- Calculated by:
  - habitat production foregone model, or
  - based on flow rates
- Implemented by:
  - annual funding, or
  - directly performed by plant operator in conjunction with a third party?
- Required of:
  - all plants, or
  - just high capacity utilization plants?

# Variance Proposal

If the costs of installing Track I (wet cooling towers) or Track II (other comparable structural and operational controls) are, for example:

- “wholly disproportionate” compared to costs being considered by SWRCB, or
- if there are significant adverse environmental impacts, then:

- all interim measures including restoration funding will continue,
- intake velocity set at  $\leq 0.5$  feet per second, and
- further structural controls to reduce entrainment to the extent feasible.

# Next Steps

- Work with other State agencies to refine preliminary draft policy
- Release second scoping document with preliminary draft policy
- Final Expert Review Panel Findings
- Public scoping workshop/public comments
- Release Draft Staff Report and Policy
- Public Hearing
- Response to Comments/Final Draft Report & Policy
- SWRCB Meeting to adopt Policy

# Expert Review Panel Discussion Questions:

- How will baseline be defined?
- Has SWRCB staff correctly estimated statewide marine life impacts due to uncontrolled OTC?
- Are the interim controls effective and feasible to prevent mortality and to reduce takes of wildlife?
- For Track I, did staff adequately consider adverse impacts associated with conversion to closed-cycle cooling?
- For Track II, are the proposed monitoring requirements appropriate to determine actual % reductions in mortality?
- What data and models should be required to determine restoration offsets and how should restoration projects be monitored to determine compliance.
- Other questions...