Update on the Glen Canyon Dam/Lake Powell Dissolved Oxygen State-of-Practice Project.
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Scope of Investigation

1. A synthesis or literature review of low DO issues at other Reclamation and non-Reclamation facilities (USACE, TVA, etc.).


3. Risk analysis to resources downstream.

4. Potential tools for addressing low D.O. events at GCD.
Solutions to mitigate low D.O. and potential for success.

• Source
• Forebay
• Dam
• Tailrace
Dissolved Oxygen, or Dissolved Oxygen and Temperature

• Can work with or against each other.
Source

• Not a lot of opportunity here. Very few success stories. Only works for point source effectively.
Forebay

• Forebay options popular.
• Many options
  • Aeration
  • Speece Cone
  • Mechanical mixing (surface water pumps)

• Can impact nutrients and/or metals
Dam

• Turbine aeration
• Vacuum Breaker Injection
• Modified Aeration Turbine
• Penstock Injection
• Multi-level intake (temp and D.O.)
• Spill, Outlet works, Jet tubes
Tailrace

• Aeration Weirs
• Speece cone
• Air Diffusers
  • There are no known successful diffuser applications.
How much are we talking about?

• Assuming 100 percent efficiency we would be looking at about 22 tons of pure oxygen per day to get a 2 mg increase. At a discharge of 8000 CFS

OTE (Oxygen transfer efficiency) values 10% for air diffusers and 20-30% for oxygen in tailrace. OTE values range from 20-40% for air in draft tubes, 60-90% for oxygen in penstocks, and 70-90% for oxygen in forebays.