Recharge and Ground Water Quality

Idaho DEQ
Barry N. Burnell
Water Quality Division Administrator
Western Water Fact

40% of Colorado’s Homicides from the mid 1920s until 1940 were committed with?

Irrigation Shovels

Rita Crumpton

- Grand Junction Water Manager
Outline

- Ground Water Quality
- Surface Water Quality
- Managed Recharge
- DEQ Programs
Ground Water Quality

- **Bacteria Standards** –
  - Total Coliform
  - Fecal Coliform
  - E. Coli.
Ground Water Quality

- Pathogenic Bacteria are Generally Not Present in Ground Water
Ground Water Quality

- Ground Water Standard for Fecal Coliform and E. Coli is <1 cfu/100 ml
- Total Coliform – Indicator Organism
- Monitoring
  - IDWR Statewide Program - Voluntary
  - Public Water Supplies - Regulatory
  - Health Districts – Mortgage Surveys - Bank
- Follow up monitoring by DEQ or Health Districts
- If Coliform present – disinfect well and retest
- Wells are not generally sampled for Protozoans or Viruses
GWQ Rule Coliform Standard

Primary Ground Water Quality Standards for Fecal Coliform and E. coli

Total Coliform is an Indicator of Potential Harmful Conditions

Fecal Coliform and E. Coli are subsets of Total Coliform

- Better indicators of organisms harmful to humans
**Surface Water Quality Standards – E. coli**

Beaches = 235/100 ml  
All others = 406/100 ml  
Secondary = 576/100 ml  
30 day ave = 126/100 ml  

**Bacteria in Wadable Streams**  
-Beneficial Use Reconnaissance Program Monitoring  

Bacteria are present in surface waters
Monthly Average Fecal Coliform Mid Snake River
1990-1997

<table>
<thead>
<tr>
<th>Month</th>
<th>cfu/100 ml</th>
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<tbody>
<tr>
<td>Jan</td>
<td>4</td>
</tr>
<tr>
<td>Feb</td>
<td>60.6</td>
</tr>
<tr>
<td>Mar</td>
<td>5.3</td>
</tr>
<tr>
<td>Apr</td>
<td>7.1</td>
</tr>
<tr>
<td>May</td>
<td>21.2</td>
</tr>
<tr>
<td>June</td>
<td>11.3</td>
</tr>
<tr>
<td>July</td>
<td>46.3</td>
</tr>
<tr>
<td>Aug</td>
<td>40.2</td>
</tr>
<tr>
<td>Sept</td>
<td>22</td>
</tr>
<tr>
<td>Oct</td>
<td>18</td>
</tr>
<tr>
<td>Nov</td>
<td>12.8</td>
</tr>
<tr>
<td>Dec</td>
<td>N/A</td>
</tr>
<tr>
<td>Drink</td>
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IDWR, 1999 Feasibility of Large Scale Managed Recharge of the Eastern Snake River Plain Aquifer System
Surface Water Quality

Total Coliform

- Milner Gooding
- Ridenbaugh

<table>
<thead>
<tr>
<th>Month</th>
<th>Milner Gooding</th>
<th>Ridenbaugh</th>
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<tbody>
<tr>
<td>May</td>
<td>35</td>
<td>23</td>
</tr>
<tr>
<td>June</td>
<td>23</td>
<td>270</td>
</tr>
<tr>
<td>July</td>
<td>130</td>
<td>600</td>
</tr>
<tr>
<td>August</td>
<td>230</td>
<td>230</td>
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IDWR, 1999 Feasibility of Large Scale Managed Recharge of the Eastern Snake River Plain Aquifer System
Upper Snake River Basin

WQ STDs Not Met in Middle Snake River

- Nutrients
- Sediment
- Dissolved Oxygen
- Temperature
- Turbidity
- Fecal Coliforms
Water Transmitted Pathogens

- **Bacteria**
  - E. Coli, Shigella sp

- **Protozoa**
  - Giardia
  - Cryptosporidium

- **Enteroviruses**
  - Poliovirus
  - Hepatitis A
Managed Recharge

- Managed Recharge –
  - Existing State Policy
  - NO DEQ PERMIT
  - Monitoring Program Approval
Managed Recharge

- Monitoring Policy V-C:
  “The policy of the state of Idaho is that any program designed specifically for the artificial recharge of ground water, existing or proposed, be consistent with the policies and management objectives for water quality and quantity.”
Policy V-C was adopted because “artificial recharge has the potential to significantly impact the quality of ground water.”

DEQ is directed to work cooperatively with other state agencies, to:

- Develop Guidelines,
- Develop Management Practices, and
- Develop Rules to insure that artificial ground water recharge projects comply with the Ground Water Quality Plan (1992).
Managed Recharge Guidance

- “Guidance For Developing a Ground Water Quality Monitoring Program For Managed Recharge Projects by Land Application”

- NO DEQ PERMITS
Managed Recharge

- Main Concern is Pathogens
  - E. Coli
  - Protozoans
  - Viruses
DEQ Programs

- **Wastewater Reuse** –
  - Class A Wastewater can be used for Ground Water Recharge
  - Must have < 2.2 Total Coliform/100 ml
  - Redundant Treatment Systems
  - Disinfection - 5 log Removal for Viruses
  - 1000 feet from Drinking Water Well
DEQ Programs

Septic Systems

- 3, 4 or 6 feet of effective soil depth
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