New Mexico Dept. of Game and Fish’s Response to the Gold King Mine Spill

Presented by Eric Frey

Fisheries Division
Event Timeline

- August 5, 2015, Spilled occurred
- August 8, 2015, Catch and release recommendation issued
- August 14, 2015, “white paper” drafted to outline impacts to wildlife
- August 25, 2015, Fish and macroinvertebrate tissue collected for heavy metal analysis
- September 4, 2015, Catch and release recommendation lifted
- October 7, 2015, Rainbow trout stocking reinitiated in Animas River
- March 8, 2016, Six month post spill fish and macroinvertebrate tissue collected for heavy metal analysis
- June 1, 2016, Six month sampling results received from lab
Fish and Macroinvertebrate sampling

• 5 collection sites

• Collected muscle and liver tissue on fish

• 7 fish species, different trophic levels

• Collected:
  – 131 fish in August 2015
  – 186 fish in March 2016

• Macroinvertebrates
<table>
<thead>
<tr>
<th>Metal</th>
<th>Immediate Post Spill</th>
<th>6 Month Post Spill</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum</td>
<td>7%</td>
<td>4%</td>
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<tr>
<td>Arsenic</td>
<td>16%</td>
<td>17%</td>
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<tr>
<td>Cadmium</td>
<td>9%</td>
<td>0%</td>
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<tr>
<td>Copper</td>
<td>2%</td>
<td>3%</td>
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<tr>
<td>Lead</td>
<td>31%</td>
<td>&lt;1%</td>
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<tr>
<td>Manganese</td>
<td>89%</td>
<td>63%</td>
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<tr>
<td>Selenium</td>
<td>98%</td>
<td>18%</td>
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<td>Mercury</td>
<td>86%</td>
<td>100%</td>
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<tr>
<td><strong>Total detection</strong></td>
<td><strong>42%</strong></td>
<td><strong>18%</strong></td>
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*Does not include SJR-1, which is a control site*
Average Heavy Metal Concentrations from Fish Muscle Tissue
Sites within Spill Area

- Aluminum
- Arsenic
- Cadmium
- Copper
- Lead
- Manganese
- Selenium
- Mercury

Parts per million

Immediate post spill
6 months post spill
Average Heavy Metal Concentrations from Fish Muscle Tissue Control Site

- Aluminum
- Arsenic
- Cadmium
- Copper
- Lead
- Manganese
- Selenium
- Mercury

Graph showing the concentration of heavy metals in fish muscle tissue over time:
- Immediate post spill
- 6 months post spill

Parts per million

Fisheries Division
Average Heavy Metal Concentrations from Fish Liver Tissue Sites within Spill Area

- Aluminum
- Arsenic
- Cadmium
- Copper
- Lead
- Manganese
- Selenium

Parts per million

Immediate post spill 6 months post spill
Average Heavy Metal Concentrations from Macroinvertebrates
Sites within Spill Area

- Aluminum
- Arsenic
- Cadmium
- Copper
- Lead
- Manganese
- Selenium

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<thead>
<tr>
<th>Site</th>
<th>Aluminum</th>
<th>Arsenic</th>
<th>Cadmium</th>
<th>Copper</th>
<th>Lead</th>
<th>Manganese</th>
<th>Selenium</th>
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</table>

Immediate post spill 6 months post spill
Average Heavy Metal Concentrations from Macroinvertebrates Sites Control

- Aluminum
- Arsenic
- Cadmium
- Copper
- Lead
- Manganese
- Selenium

<table>
<thead>
<tr>
<th>Parts per million</th>
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<tbody>
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Immediate post spill | 6 months post spill
Conclusions to date

- Heavy metals are below public health risk for fish consumption
- Fish and macroinvertebrate populations and biodiversity appear normal
- Fish condition and health appear normal
- Metal concentrations decreased 6 months post spill
- Long term effects still unknown...
Ongoing efforts

- 1 year post fish and macroinvertebrate sampling
- Continue to work with NMED, DOH, and other stakeholders
- Monitoring native fish community in lower San Juan River
QUESTIONS?