Red Dog Mine Dust Update
October, 2007
Bons Drainage Monitoring

2004 - 2006 Water Quality Monitoring of 10 locations in Bons Drainage sample and monitor flow at 2 collection sumps and water quality at 8 stream locations.

Program designed to monitor drainage from the Overburden Stockpile (Kivalina Stockpile)
Bons Drainage Monitoring Locations
Peak Concentrations

- Generally occur during Freshet
- Increased turbidity (suspended solids) correlates to increased total metal concentrations
- During low flow periods soluble metal concentrations (zinc, cadmium), and total dissolved solids are more prevalent
- Occur regionally as well as in the Mine area including Ickalukrok, Evaingiknuk
Ickalukrok and Evaingiknuk

Ickalukrok @ Station 9

Evaingiknuk @ Eva 11
Risk Assessment and Risk Management Plan Update
Risk Assessment Status

- Review by ADEC and their contractor is complete.
- Making final text revisions to the RA based on comment resolution with ADEC and their contractor.
- Final RA to be submitted in November
- Layman's summary being developed
Summary of Risk Assessment Results

• Ecological Risk Assessment
  – Observed changes in plant communities (differences in plant species mixture near the road, port, and mine; reduced lichen cover as much as 1 to 2 km from road)
  – Possible effects to ptarmigan from lead near the mine and port
  – Effects to other wildlife populations are unlikely
  – No effects predicted for marine, coastal lagoon, and freshwater stream habitats

• Human Health Risk Assessment
  – Safe to continue subsistence harvesting
  – No changes to subsistence lifestyle needed
Risk Management Plan

• Beginning to develop a framework for the Risk Management Plan

• Considering ways to involve stakeholders in the development of the RMP (meetings, workshops, etc).
2007 Fugitive Dust Control Initiatives

- Coarse ore storage building (COSB) baghouse installation
- Purchase of back-up water truck
- Mine concentrate storage building (CSB) baghouse design
- Evaluation of alternative concentrate load-out technology
Red Dog Minesite
TSP Concentration vs. Gyro Production
11 AM January 17 to 6 AM January 19, 2005
Completed Gyratory Crusher
Completed Jaw Crusher
View of PAC to Crusher & COSB
Coarse Ore Stockpile Building Baghouse
Coarse Ore Stockpile Building Baghouse
Coarse Ore Stockpile Building Baghouse
Coarse Ore Stockpile Building Baghouse
Coarse Ore Stockpile Building Baghouse
Coarse Ore Stockpile Building Baghouse
COSB Fan / Compressor Building
2008 Minesite Fugitive Dust Projects

- Concentrate storage building baghouse installation
- Concentrate load-out system evaluation
- Relocation of in-pit stockpiles
Mine Dust Fall Jar Locations
2006 Lead Deposition in Jars
2006 Zinc Deposition in Jars
Total Dust Deposition Comparison 2005 to 2006

2005 to 2006 Change
Total Solids
- > -25%
- -25% - 0.0%
- 0.1% - 25%
- 26% - 50%
- 51% - 75%
- > 75%
Red Dog Mine TEOMS

• PAC TEOM and the Crusher Baghouses
• T- DAM TEOM
• Peak Analysis
  – Haulage from the Course Ore Stockpile Building
  – Tailings Beach Dust Event
## Monthly TSP, Before Crusher Baghouses and After Crusher Baghouses

### PAC 24 Hour Average TSP

<table>
<thead>
<tr>
<th></th>
<th>Before Baghouses</th>
<th>After Baghouse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly Average+</td>
<td>61.6</td>
<td>34.1</td>
</tr>
<tr>
<td>Days*</td>
<td>503.0</td>
<td>377.0</td>
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<tr>
<td>Average Maximum</td>
<td>250.4</td>
<td>122.5</td>
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<tr>
<td>Average Minimum</td>
<td>9.2</td>
<td>7.4</td>
</tr>
<tr>
<td>Average Standard Deviation</td>
<td>61.1</td>
<td>33.2</td>
</tr>
</tbody>
</table>

January 2005 to June 2006 = Before Baghouse  
July 2006 to September 2007 = After Baghouses

### T-Dam 24 Hour Average TSP

- Monthly from January 2005 to June 2006: 23.8
- Monthly From July 06 to August 2007: 28.8

* Valid 24 hour Average = > 20 individual 1 hour readings  
+ Monthly Average of 24 Hour Averages