



# Red Devil Mine

Community Meeting - April 2012



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## Red Devil Mine Remedial Investigation Workshop Objectives

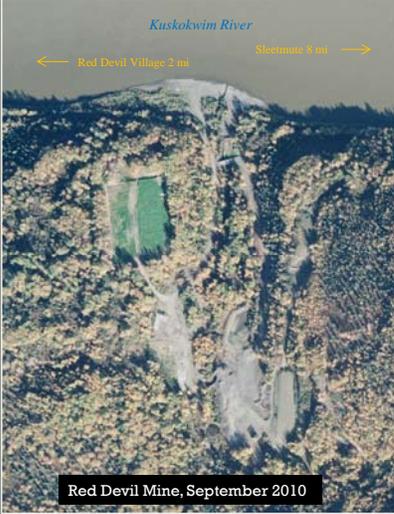
- BLM's Community Outreach Process
- Red Devil Mine Remedial Investigation
  - Participants and the CERCLA Process
  - Remedial Investigation Results
    - Physical Setting
    - Sampling Results
    - Risk Assessment Summary

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## Red Devil Mine Remedial Investigation Background



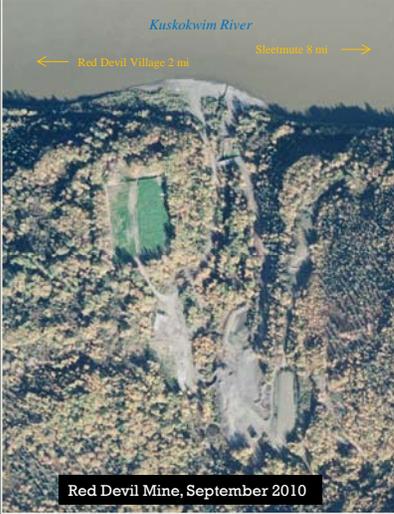
- Red Devil Mine operated 1939-1971
- Largest Cinnabar mine in Alaska
- Underground and surface mining for Cinnabar
- Mercury was extracted from cinnabar onsite
- Extensive cleanup work by BLM has occurred since 1989



Kuskokwim River  
← Red Devil Village 2 mi      Red Devil 8 mi →



Red Devil Mine, August 1971



Red Devil Mine, September 2010

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## Red Devil Mine Remedial Investigation Community Outreach

- Ongoing Outreach to 35 Tribes, Cities and Village Corps (Bethel to Stony River)
  - Community Meetings
  - Tribal Consultations
  - TKC & Calista Briefings
  - Regional Workshop
  - AFE Talking Circle
  - Newsletters
  - Website



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## Red Devil Mine Remedial Investigation Community Outreach

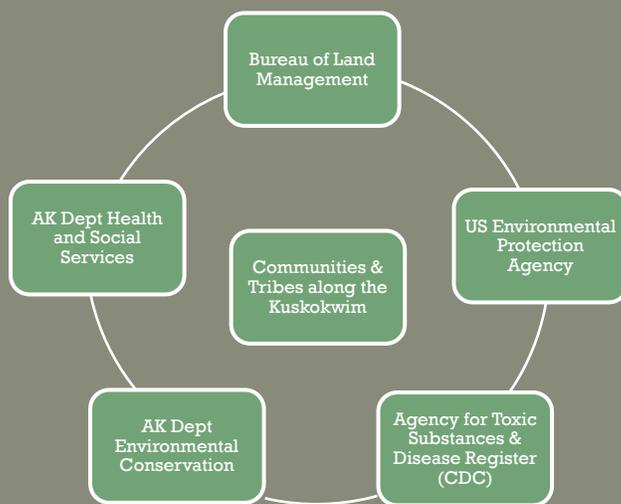
- **2010:** 9 community meetings
- **2011:** 7 community meetings, regional workshop in Anchorage
- **2012:** 9 community meetings are scheduled:



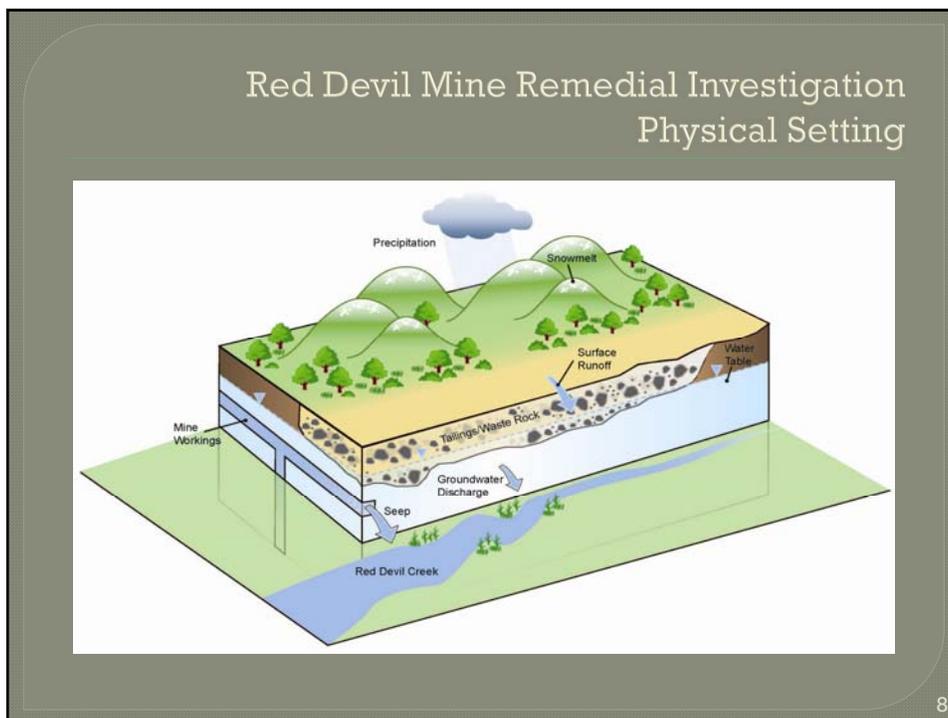
Red Devil, Sleetmute, Bethel, Kwethluk, Akiak, Tuluksuk, Kalskag, Lower Kalskag, and Atmautluak/Nunapitchuk/Kasigluk joint meeting

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## Red Devil Mine Remedial Investigation Participants



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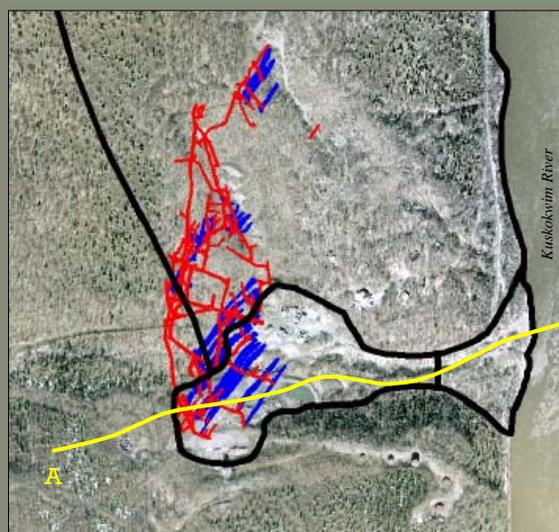
### Red Devil Mine Remedial Investigation Physical Setting



- Site results presented for three areas
  - Surface Mine
  - Main Process
  - Alluvial
- Kuskokwim River Sediment

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### Red Devil Mine Remedial Investigation Physical Setting

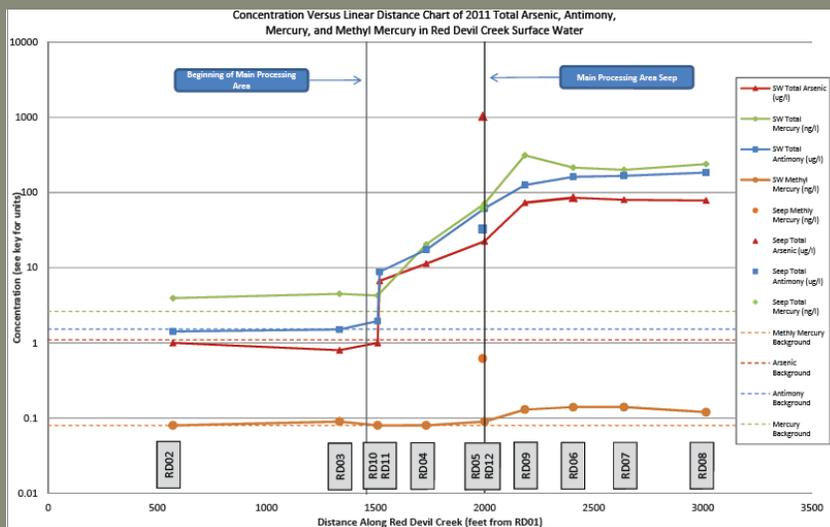


- Shafts and Adits
- Stopes
- Cross-sections

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## Red Devil Mine Remedial Investigation Red Devil Creek Surface Water Concentrations



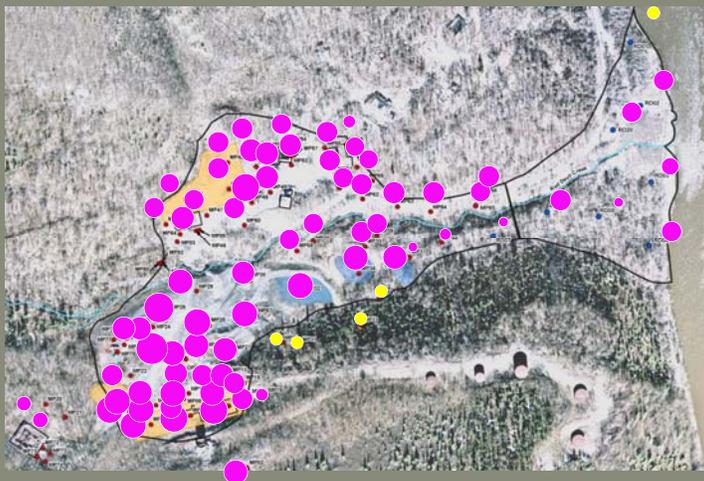
## Red Devil Mine Remedial Investigation Red Devil Creek Surface Water & Sediment

Note: Arsenic and mercury concentrations are represented below by pink circles.



### Red Devil Mine Remedial Investigation Surface Soil Concentrations

Note: Arsenic and mercury concentrations are represented below by pink circles. Yellow circles indicate locations where concentrations are very low.



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### Red Devil Mine Remedial Investigation Subsurface Soil Concentrations

Note: Arsenic and mercury concentrations are represented below by pink circles. Yellow circles indicate locations where concentrations are very low.



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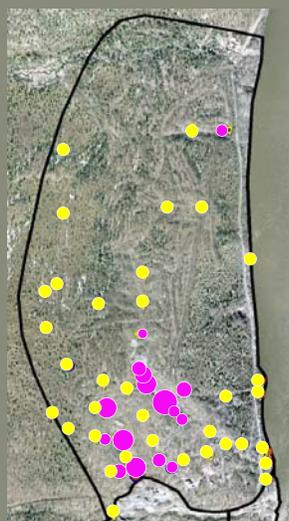
## Red Devil Mine Remedial Investigation Groundwater Concentrations

Note: Arsenic and mercury concentrations are represented below by pink circles. Yellow circles indicate locations where concentrations are very low.



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## Red Devil Mine Remedial Investigation Nature and Extent of Contaminants



### Surface Mine Area Concentrations:

- Surface Soil (yellow)
- Subsurface Soil (red)
- Groundwater (red with blue circle)

Note: Arsenic and mercury concentrations are represented below by pink circles. Yellow circles indicate locations where concentrations are very low.

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## Red Devil Mine Remedial Investigation Kuskokwim River Sediment



- Samples were collected from shoreline and offshore
- Upstream samples were low concentration (red triangles)

Note: Arsenic and mercury concentrations are represented below by pink circles. Yellow circles indicate locations where concentrations are very low.

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## Red Devil Mine Remedial Investigation Human Risk Assessment Assumptions

- Fish Ingestion risk based on model results using sculpin concentrations from Red Devil Creek. The model simulated pike living entire lifetime in Red Devil Creek. Concentrations in fish caught in the Kusko. River near RDM were much lower than the modeled concentrations.
- Concentrations in moose, berries, and other harvested and hunted food are modeled using very conservative assumptions.
- Consumption of wild food is equivalent to the harvest rates reported through a household survey which have been shown to over-estimate consumption rates.
- For a resident, it assumes all wild food consumed is taken from the site area, including all moose, berries, small mammals, etc.

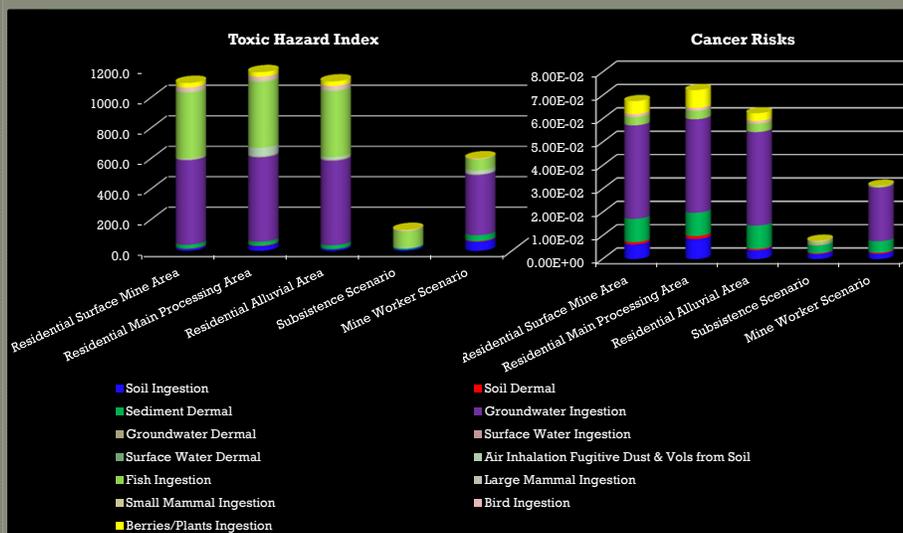
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## Red Devil Mine Remedial Investigation Human Risk Assessment Assumptions

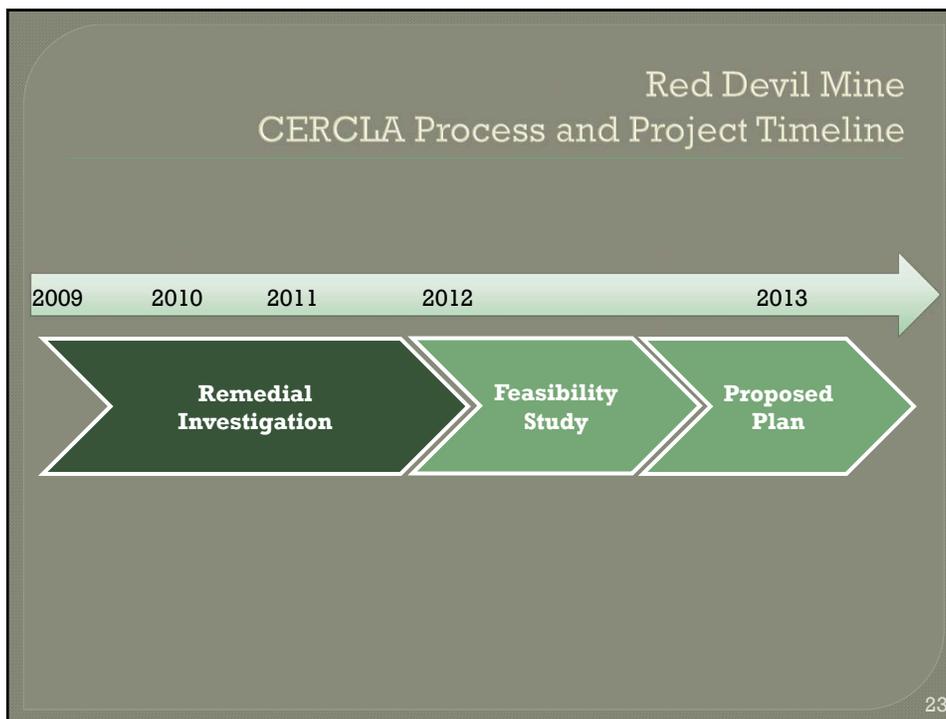
- A person would live, work and go to school within the site boundaries.
- All exposure assumptions are conservative and represent high-end exposure for a person at the site. Actual exposure would most likely be much less.
- A person would be exposed to soil and sediment and would drink groundwater.
- Assumes all exposure to metals is from the mine site.
- For all metals except for arsenic, it is assumed it all can be absorbed into the body. This is known not to be the case for almost all metals. Most likely only a percentage is actually available for absorbed. For arsenic, the availability was adjusted but to still very conservative values.

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## Red Devil Mine Remedial Investigation Human Risk Assessment – Cumulative Arsenic Risk



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### Red Devil Mine Remedial Investigation BLM Points of Contact

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- **Mike McCrum**, BLM Red Devil Mine Project Manager,  
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Project Web site: [www.blm.gov/ak/red\\_devil\\_mine](http://www.blm.gov/ak/red_devil_mine)

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