

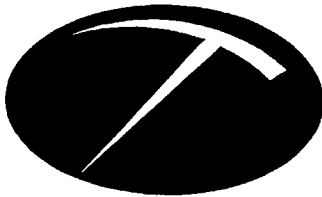
**B.1. Operational Material Characterization and
Monitoring of Weathering at Huckleberry**

by
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and
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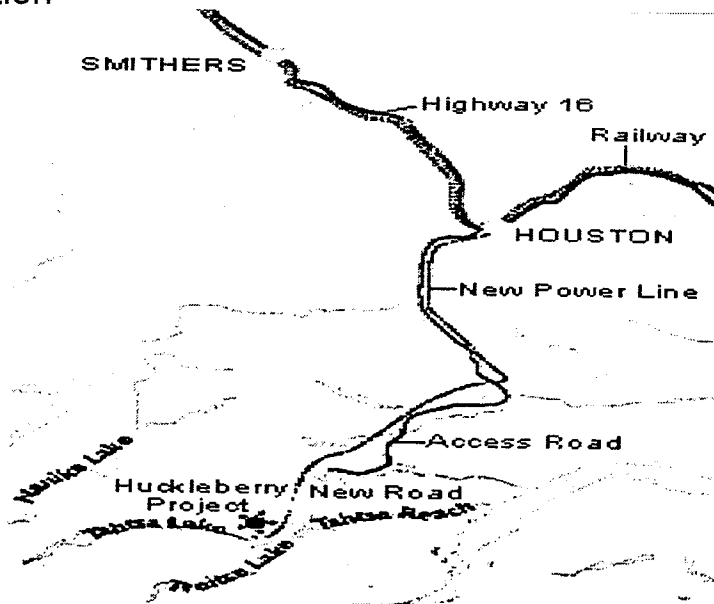


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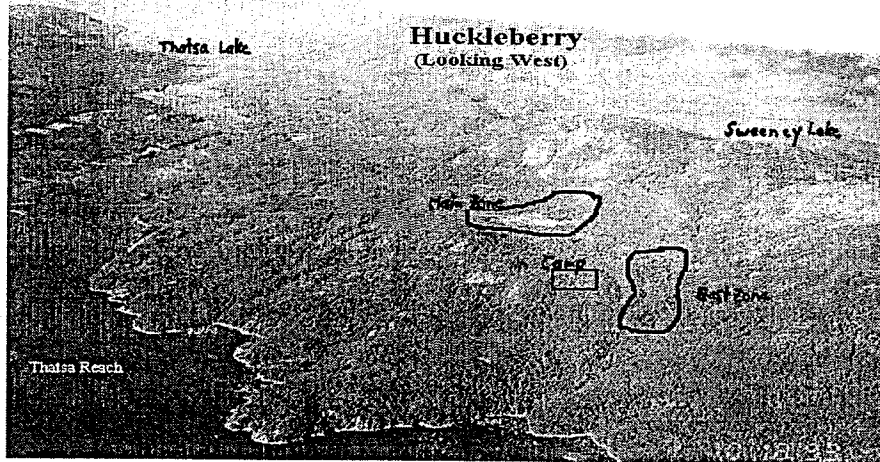
Operational Material Characterization and Monitoring of Weathering at Huckleberry

Huckleberry Mines Ltd. Location



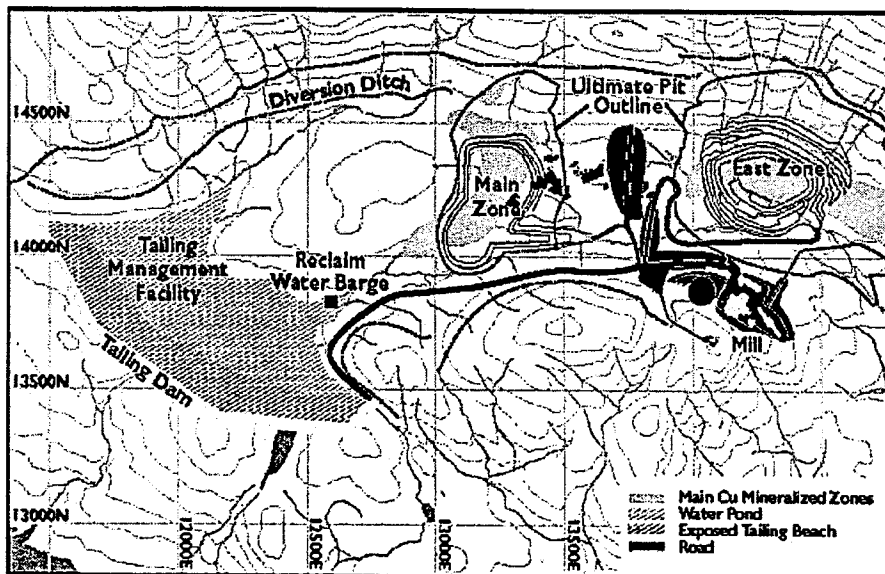
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Site Overview



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Site Plan



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Mine Plan

- Porphyry Copper Deposit
- Two Open Pits
- 19,000 Tonnes/day
- 0.5 % Cu, 150 ppm Mo
- 70 M Tonnes of Remaining Reserves

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ARD Characterization

- East Zone Volcanic waste rock
 - NPR < 1, All PAG
 - 2-4 % Sulphides
- Main Zone Granodiorite waste rock
 - 80 % NAG
 - 0-1 % Sulphides
- Main Zone Volcanic waste rock
 - 20 % NAG
 - 0.3-3% Sulphides

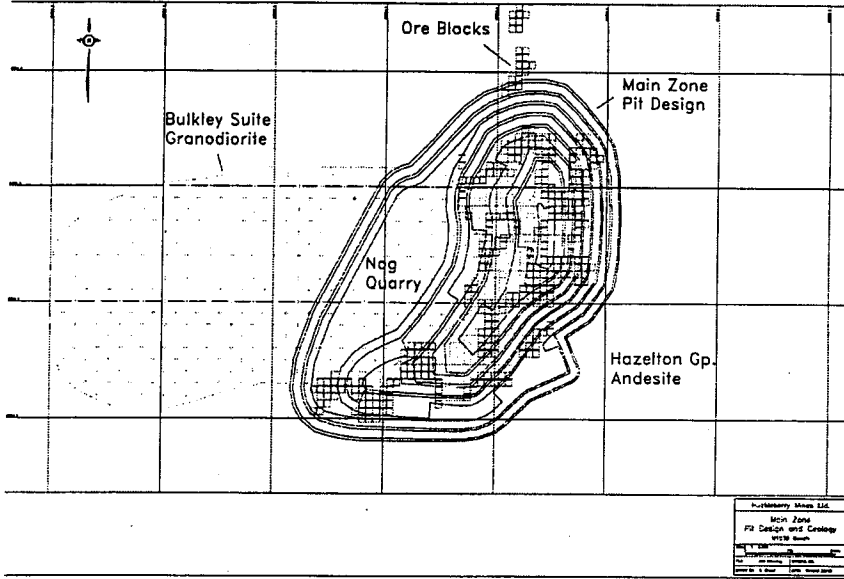
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Materials Handling Requirements

- All PAG waste to be flooded at closure
- Initial requirement for 2 month flooding criteria for PAG
- Operational requirement to use PAG rock construction of on site roads and pads
- MZ Granodiorite NAG, NPR>2
- MZ Volcanic NAG, NPR>3

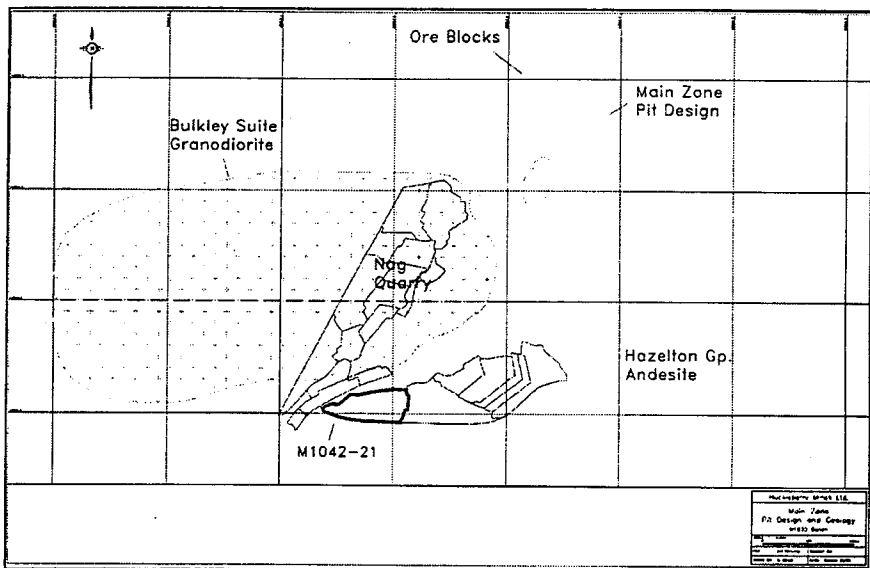
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Operational Characterization

- ABA analyses including TIC
 - Blastholes, individual and composites
 - Fines monitoring, blasts and deposited materials
- Exposed waste rock monitoring
- Geological sample identification and evaluation

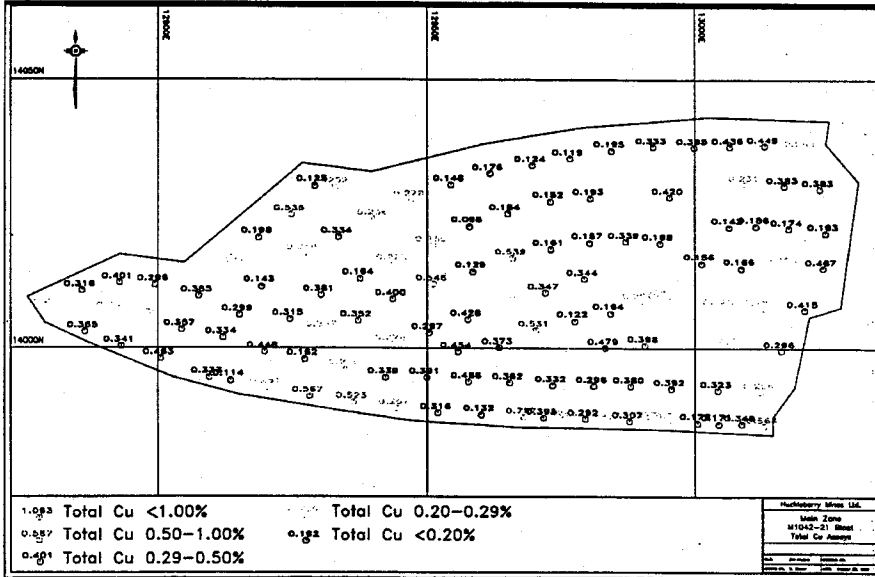
Huckleberry Mines Ltd. General Geology - Main Zone



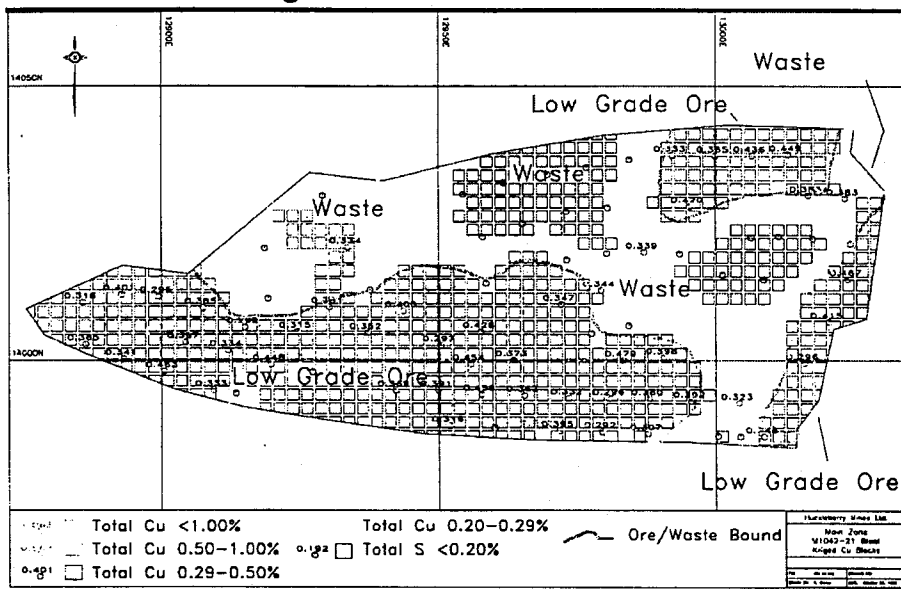
Huckleberry Mines Ltd. Blast M1042-21 Location



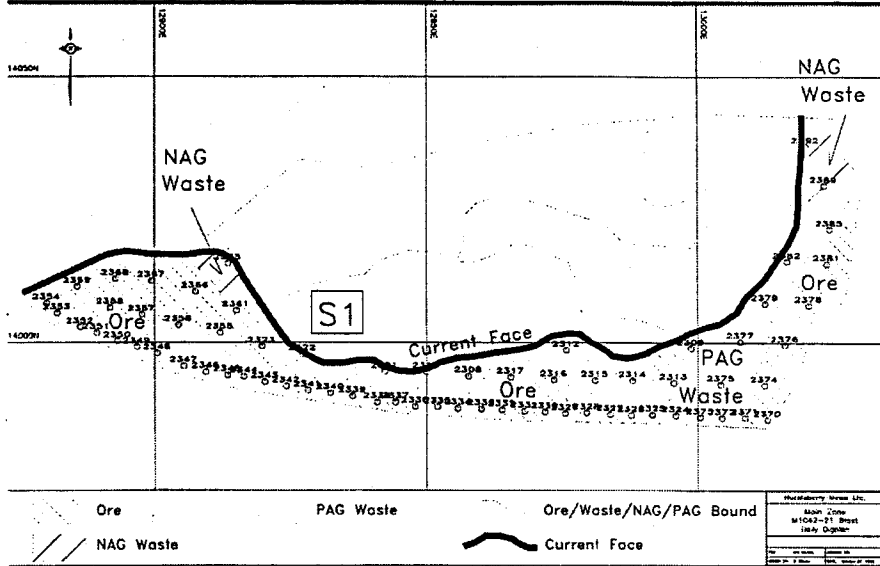
Huckleberry Mines Ltd. M1042-21 Blasthole Cu Grades



Huckleberry Mines Ltd. M1042-21 Kriged Blocks and Ore Boundaries



Huckleberry Mines Ltd. M1042-21 Daily Digplan



Huckleberry Mines Ltd. GPS Surveying



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Materials Handling

- Daily Digplan delivered to operations
- Daily planning of material movement
- Shovel operators and truck drivers given direction in the field
- PAG deposition based on truck counts
- Data compiled from driver reports
- Data reconciled to surveyed volumes

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Water Quality Monitoring

- General site runoff
- Runoff from specific sites
- Open pits
- Ground water monitoring wells
- Tailings pond (closed system)

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Data Compilation and Reporting

- ARD Quarterly Report, includes:
 - PAG rock deposition data
 - Time to flooding for exposed PAG rock
 - All ABA data to date on EZ, MA, tailings and general site materials
 - Quality control data
 - Water quality data
 - Future mine plans

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Communication

- Critical to keep site personnel informed of ARD requirements
 - Weekly engineering planning meetings
 - Safety meetings
 - Newsletters
 - Personal communication

KINETIC QUESTIONS

- Will ARD be generated (waste classification)?
- When will acidic conditions occur (implementation of site flooding)?
- What will be the chemistry of the ARD (impact/treatment requirements)?

HUCKLEBERRY FEATURES

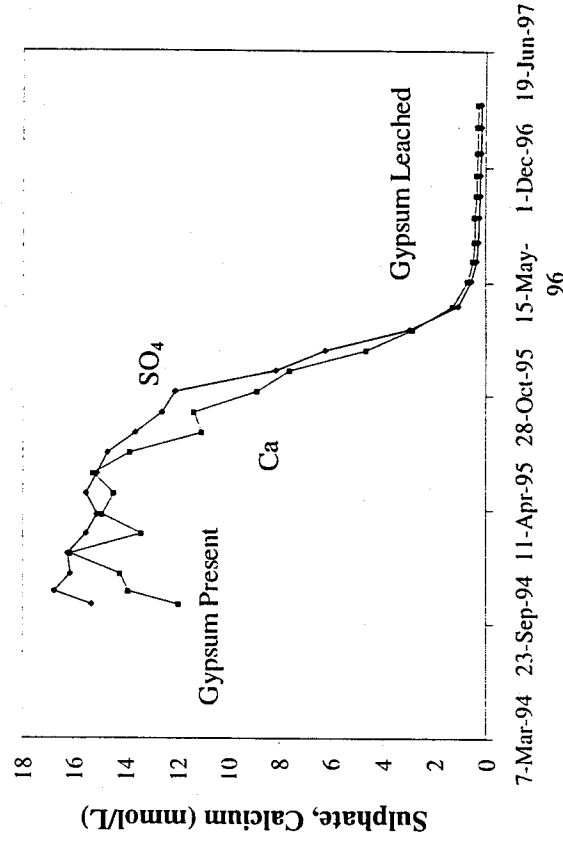
- Abundance of natural gypsum (calcium sulphate)
 - masks sulphide oxidation and acid neutralization.
- Carbonate in PAG rocks.
 - Long delay to onset
- No natural ARD
 - clues on chemistry of ARD and controls.

TYPES OF TESTING

- Will ARD be generated?
 - Tests on gypsum-depleted rock.
- When will acidic conditions occur?
 - Long term tests (5 years).
- What will be the chemistry of the ARD?
 - Artificial depletion of neutralization potential

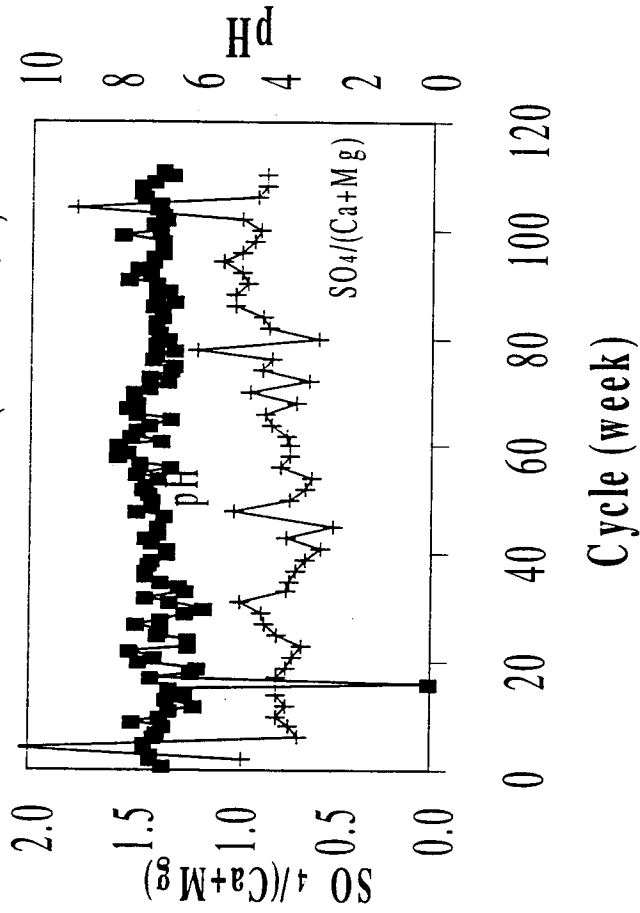
GYPSUM DEPLETED PAG ROCK

WELL-FLUSHED SUBAQUEOUS COLUMN



WILL ARD BE GENERATED?

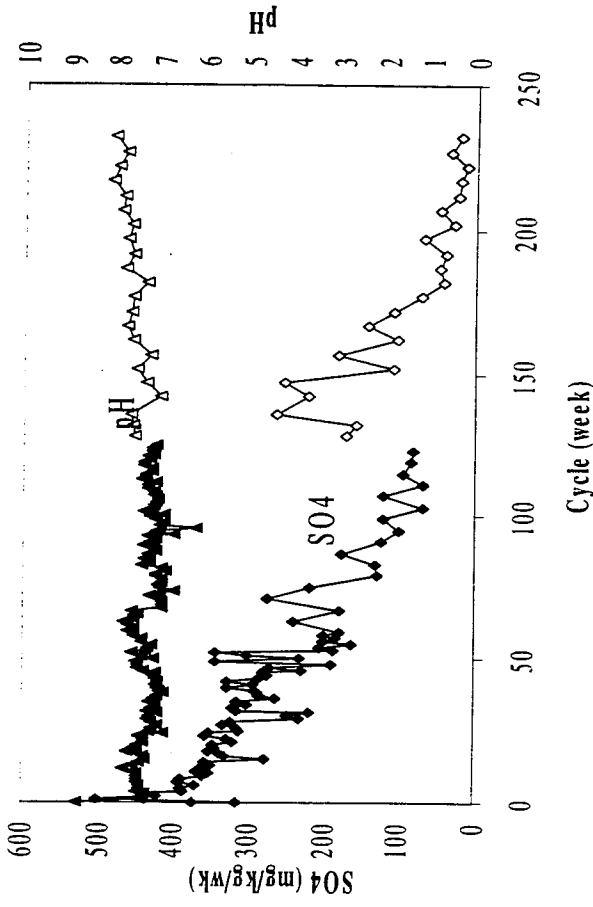
GYPSP DEPLETED COLUMN RESIDUE
HUMIDITY CELL (PAG ROCK)



⑤

WHEN WILL ACIDIC CONDITIONS OCCUR?

FIVE YEAR HUMIDITY CELL (PAG ROCK)



⑥

WHAT WILL BE THE CHEMISTRY OF ARD?

KINETICS FINDINGS

- Will ARD be generated?
 - PAG rock NP/AP < 1.3 (permit NP/AP < 2 or 3 depending on rock)
- When will acidic conditions occur?
 - Beyond mine life
- What will be the chemistry of the ARD?
 - 3 < pH < 4, Cu, Fe.

ARTIFICIAL NP DEPLETION HUMIDITY CELL

