Acidic Airport Drainage Over 20 Years Worth of Experience Shawn Hicks

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# Introduction

- Halifax International Airport built on pyritic slate in the late 1950's
- Acid drainage problem not fully recognized until the early 1980's
- Many techniques used
- As of 2002 our property meets Provincial guidelines following construction of a HDS treatment plant



# Discussion

Low pH and high iron and aluminum concentrations typical of HIA runoff
Basic treatment plant - \$500K
Major dry cover project - \$3million
Numerous other techniques tried but not always fully implemented

# Techniques

- Clay and shotcrete covers
- Small wetlands
- Electrochemical treatment
- Open limestone channels
- Agricultural limestone application
- Calcite or slag "polishing beds"
- Slate encapsulation
- Marine disposal
- Concrete pipes?



## pH in McDOWELL BROOK



DATE

### **ACIDITY in JOHNSON BROOK**

![](_page_7_Figure_1.jpeg)

#### DATE

### Passive Treatment

Open limestone channels and agricultural lime were effective in lowering acidity in the short to medium term

Ultimately the Board of Directors wanted something more controllable

#### New Treatment Plant

- \$7 million high density sludge hydrated lime treatment plant
- 0-2100m<sup>3</sup>/hour system adding lime, air, and floculant.
- Variable flow and winter weather have been challenging

![](_page_10_Picture_0.jpeg)

![](_page_11_Figure_0.jpeg)

10/2/2006

# New Treatment Plant

Compliance
Growing pains
Winter freeze-up
Variable flow

#### pH in Black Brook

![](_page_13_Figure_1.jpeg)

# Conclusion

- HDS facility achieves compliance but is costly to build and operate
- Passive treatment can be effective
- All "solutions" must be site specific, monitored and often improved upon over time
- Marine disposal is a valuable tool
- After 40+ years acidity levels may to be decreasing very slowly
- Acid generating rock must be covered well above the GW table or completely encapsulated