FALCONBRIDGE

Brunswick Mine

Environmental Management

MEND Workshop

May 24th, 2006

Site Overview

- One of World's Largest Zinc Lead Mines
- Operating Since 1964
- Underground Produces 10,000 Tonnes/day of Ore
- 804 Hectares in Headwater of Little River

Site Overview

Issues Faced Today

- Mine Developed 42 Years Ago
- Water Management - Ground & Surface
- Waste Management - Tailings, Sludge & Hazardous Wastes
- Mine Closure

Water Management

- All Contaminated Water Is Collected
- No. 6 Open Pit
  - Surface Run Off Directed to Pit
  - Pit Water Pumped to No. 12 for Treatment
- No. 12 Mine
  - All Surface Flows Directed To ETP
  - Tailings Seepage & Groundwater Emerge in Lower Ponds

No. 6 Mine Water Management

2002 Benthic Study - No. 6

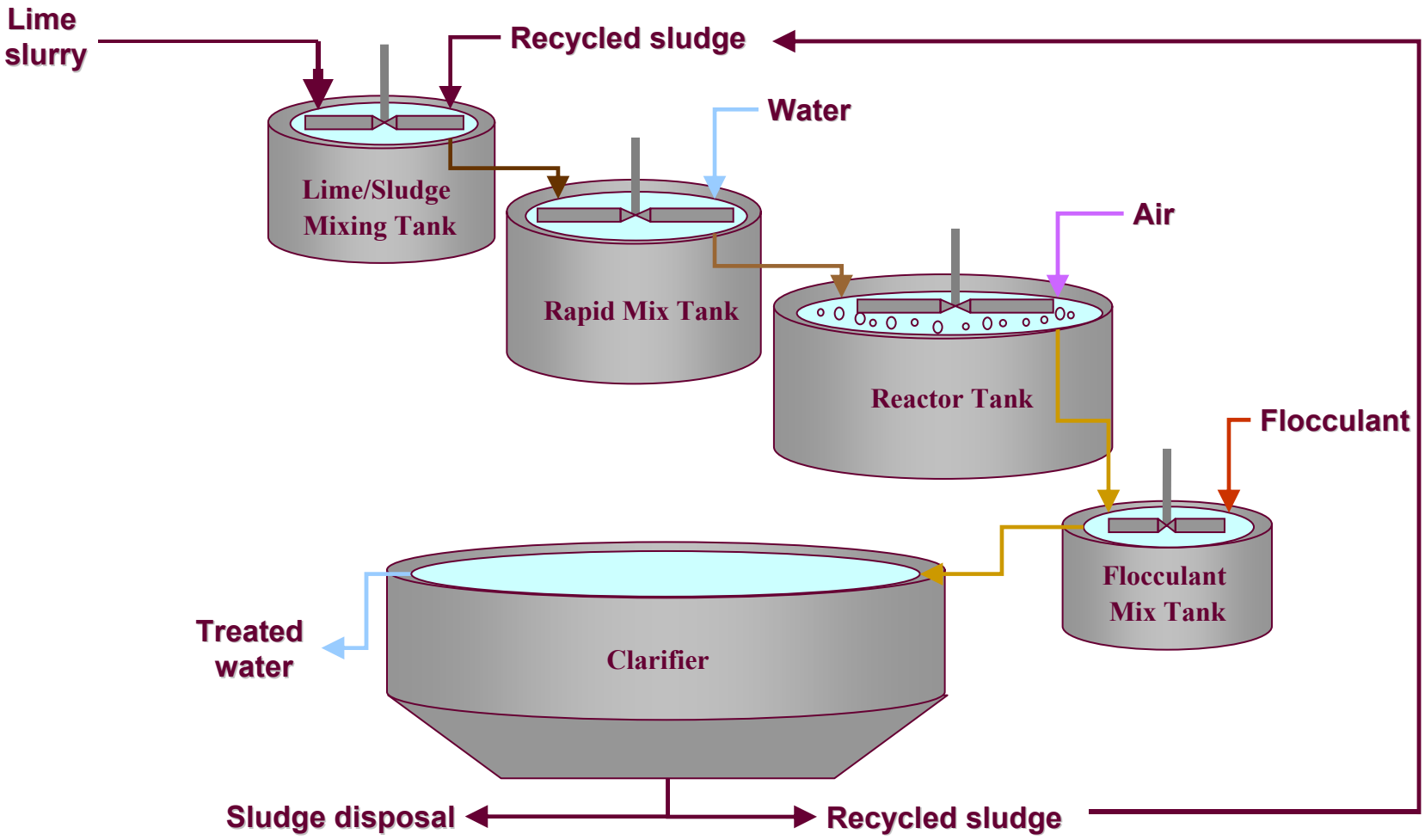
- Benthic Communities in Knights and Austin Brooks Similar to Reference
- Evidence of Transition from ARD Impacted Streams
- Loadings in Austin Brook at Design
- Loadings in Knights Brook Slightly Above Design

No. 12 Water Management

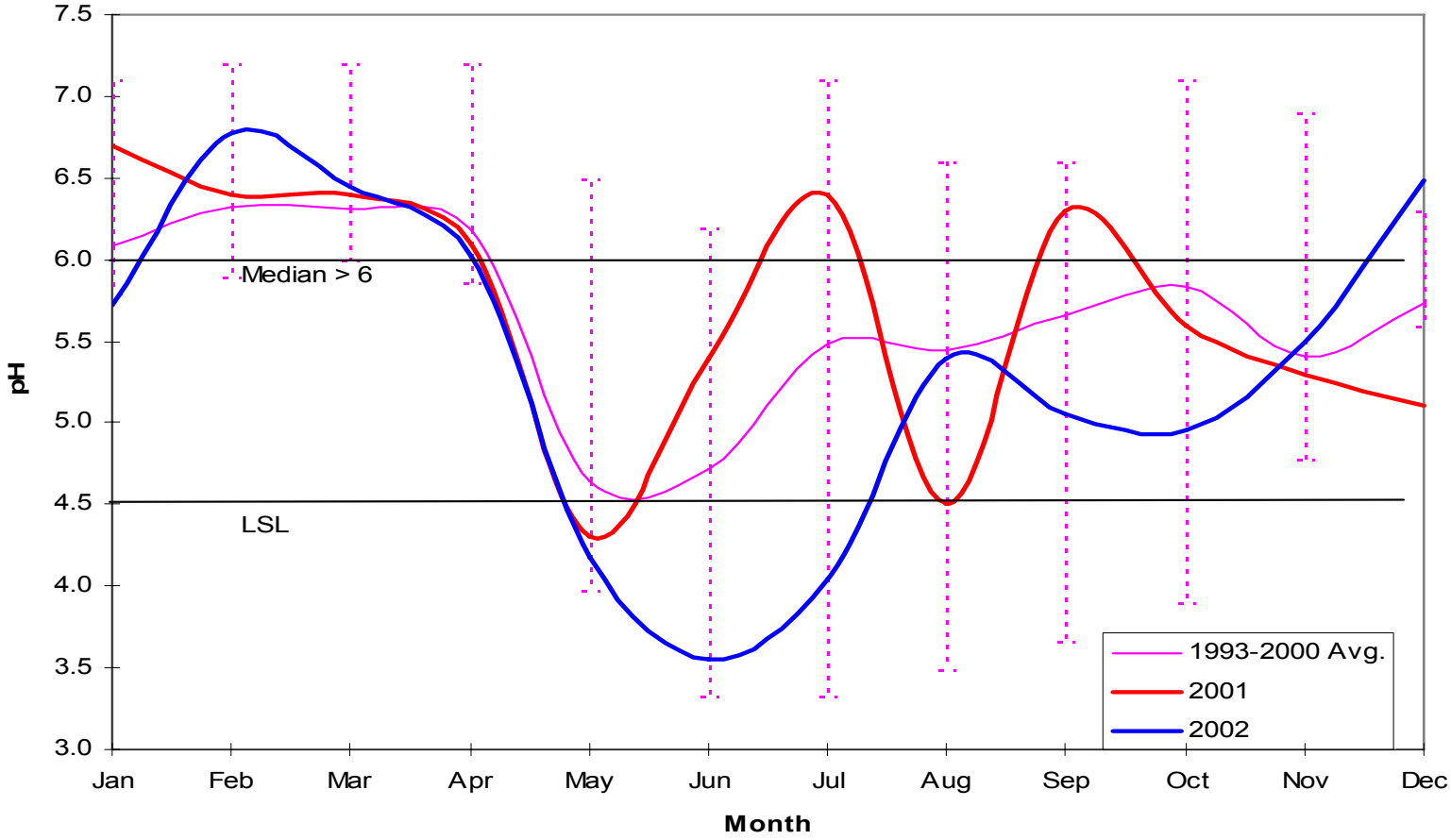
Effluent Treatment Plant (ETP)

2005 Water Treatment

Effluent Treatment Plant (ETP)



Thiosalt - Little River pH

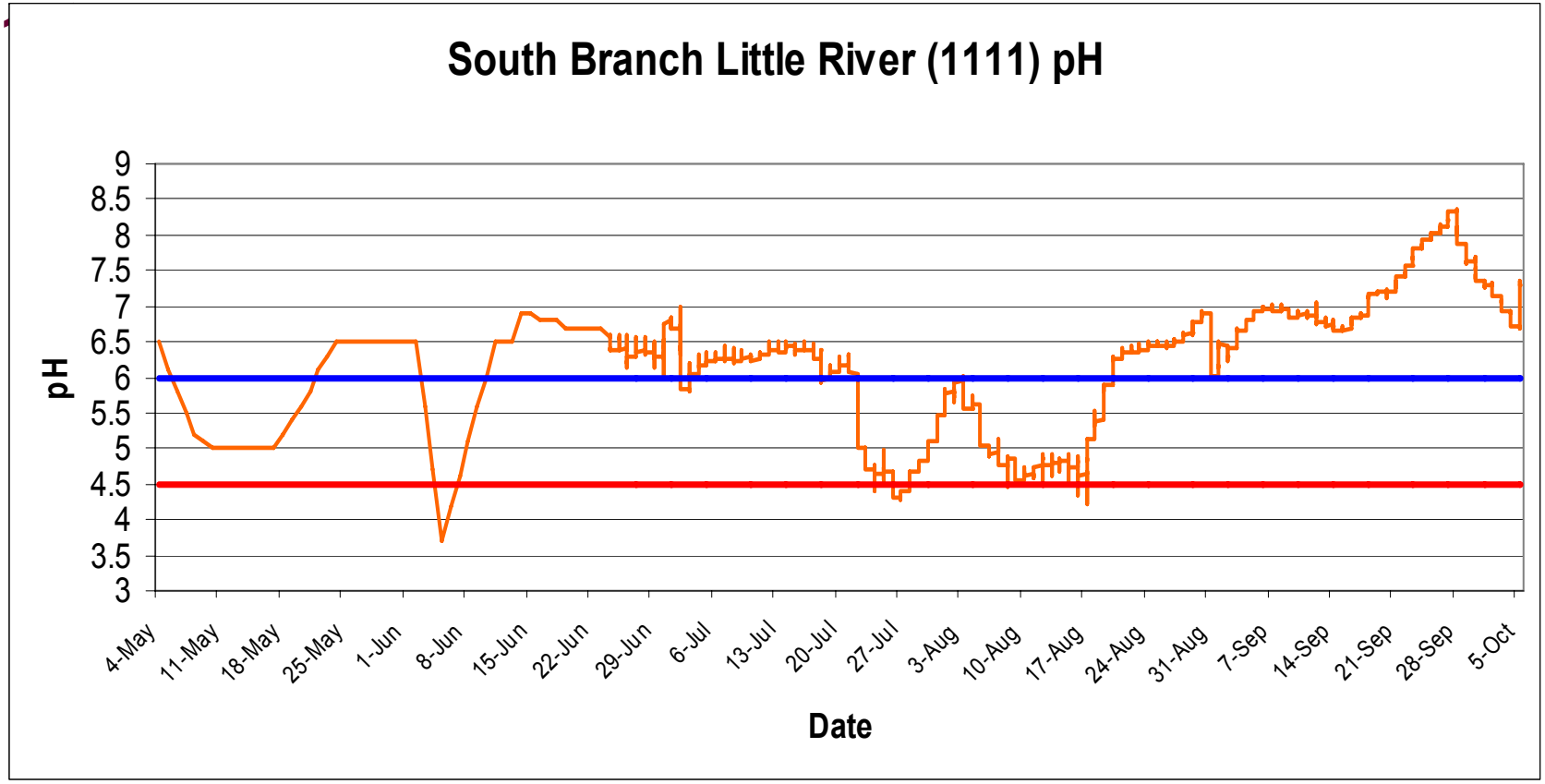


Thiosalt Management

- pH Barrier to Rehabilitate in South Branch LR
- 2000 Government Imposed
- 2002 Optimize Natural Oxidation
- 2003 Chemical Treatment Design
- 2004 Implemented Thiosalt Treatment
- 2005 Water Management to Reduce Cost

Thiosalt - Peroxide 2004

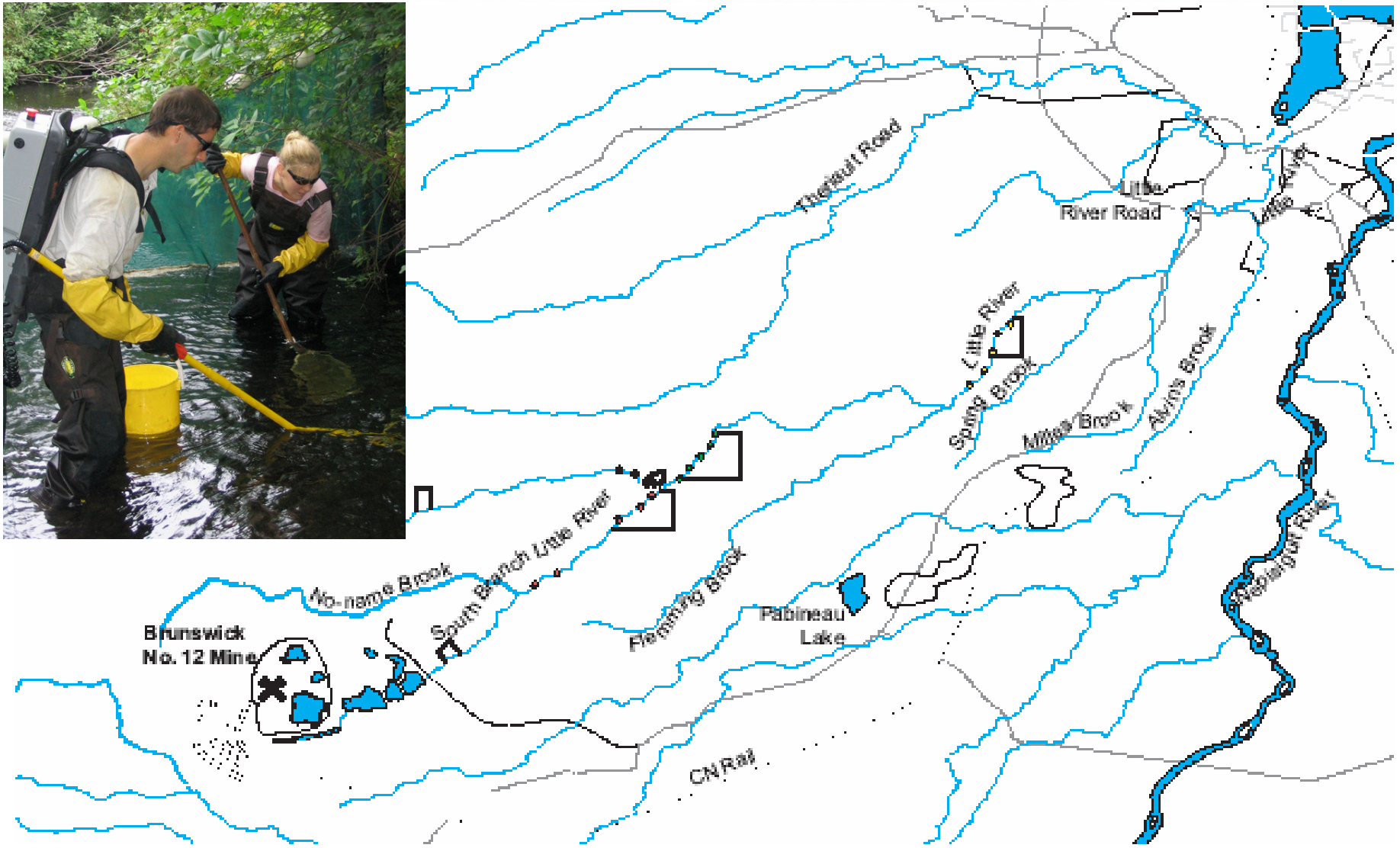
Thiosalt - 2005 Treatment



Thiosalt 2005 – Quarry Reclaim

Thiosalt 2005 – Quarry Reclaim

Thiosalt 2005 - EEM Study



2005 EEM Study

- The Presence and Density of Fish Was Higher than Expected at the Upper (Near-field) Area.

- The Abundance and Diversity of Fish Found in the South Branch Little River Exceeded Expectations

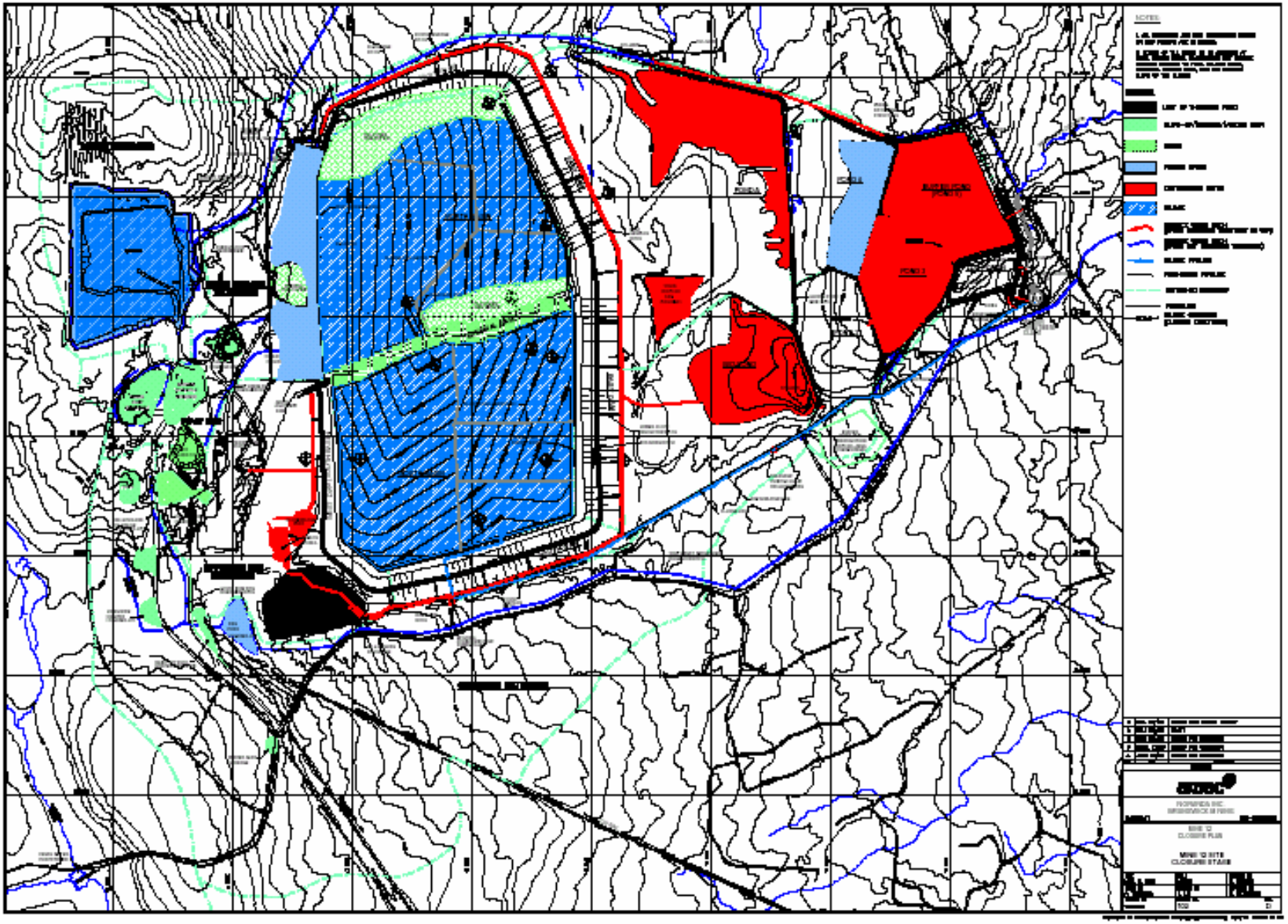
2005 EEM Study

The Fish Community Were Predominantly White Suckers, Minnow Species, Sticklebacks, Brook Trout

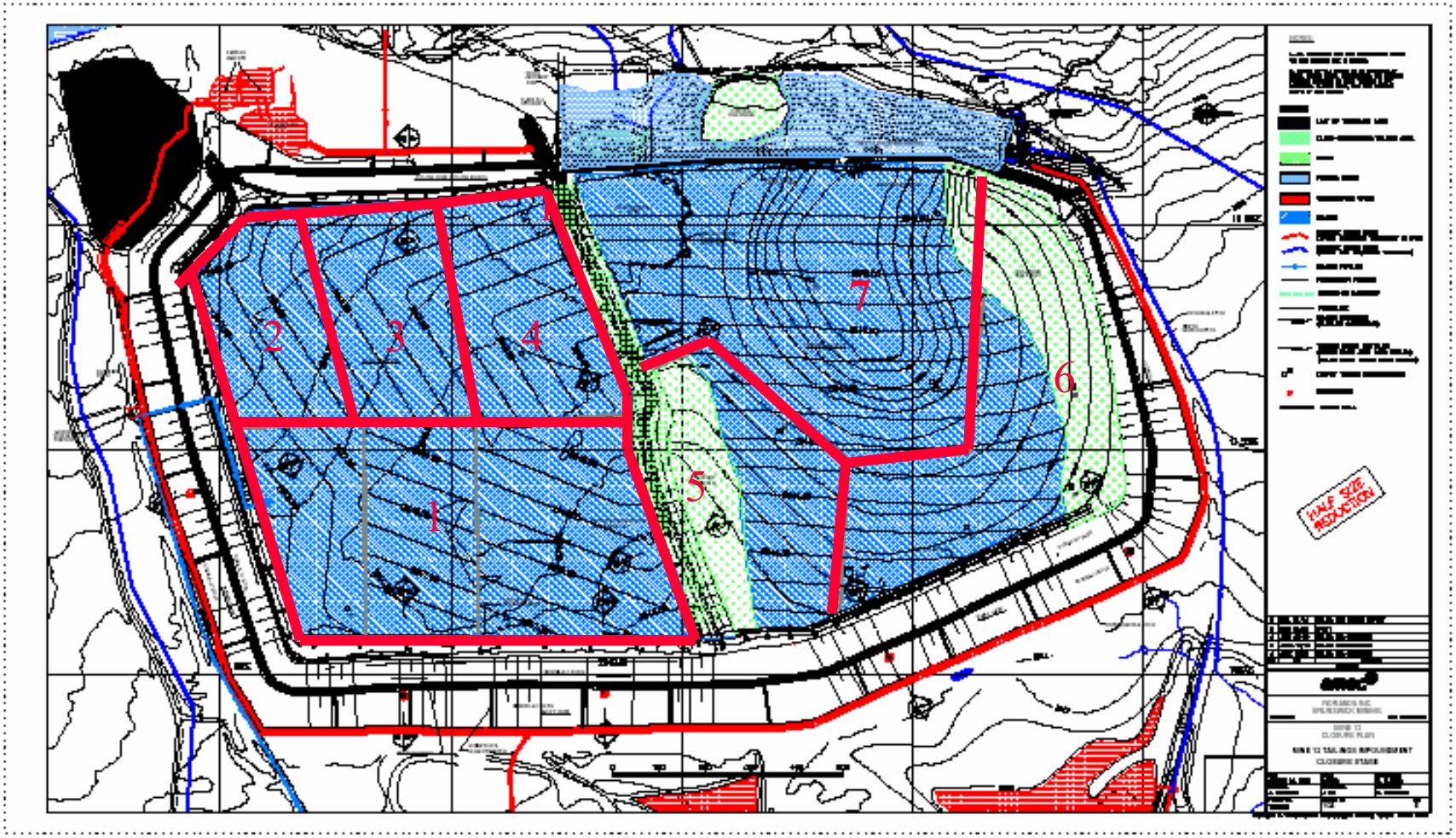
"**Overall, the fish community assessment results were very positive, especially relative to historical surveys which found no or very few fish in both the South Branch Little River and the (Main Branch) Little River, respectively**"

2005 Straw Crimping and Hydroseeding

Closure Plan

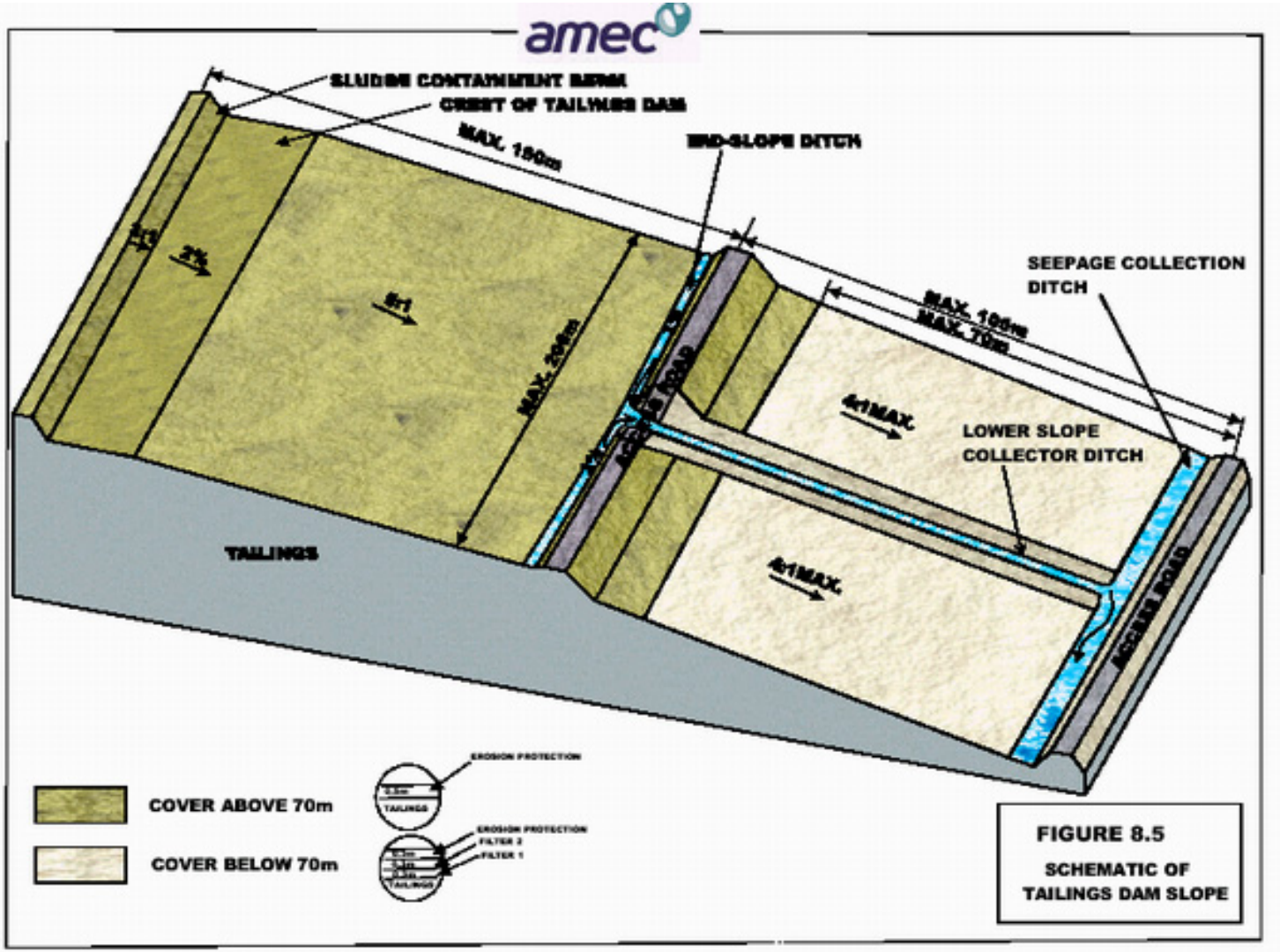


Sludge Management Closure Plan



Brunswick Tailings Dam

Closure Plan – Dam Cover



Mine Closure - Env. Assessment

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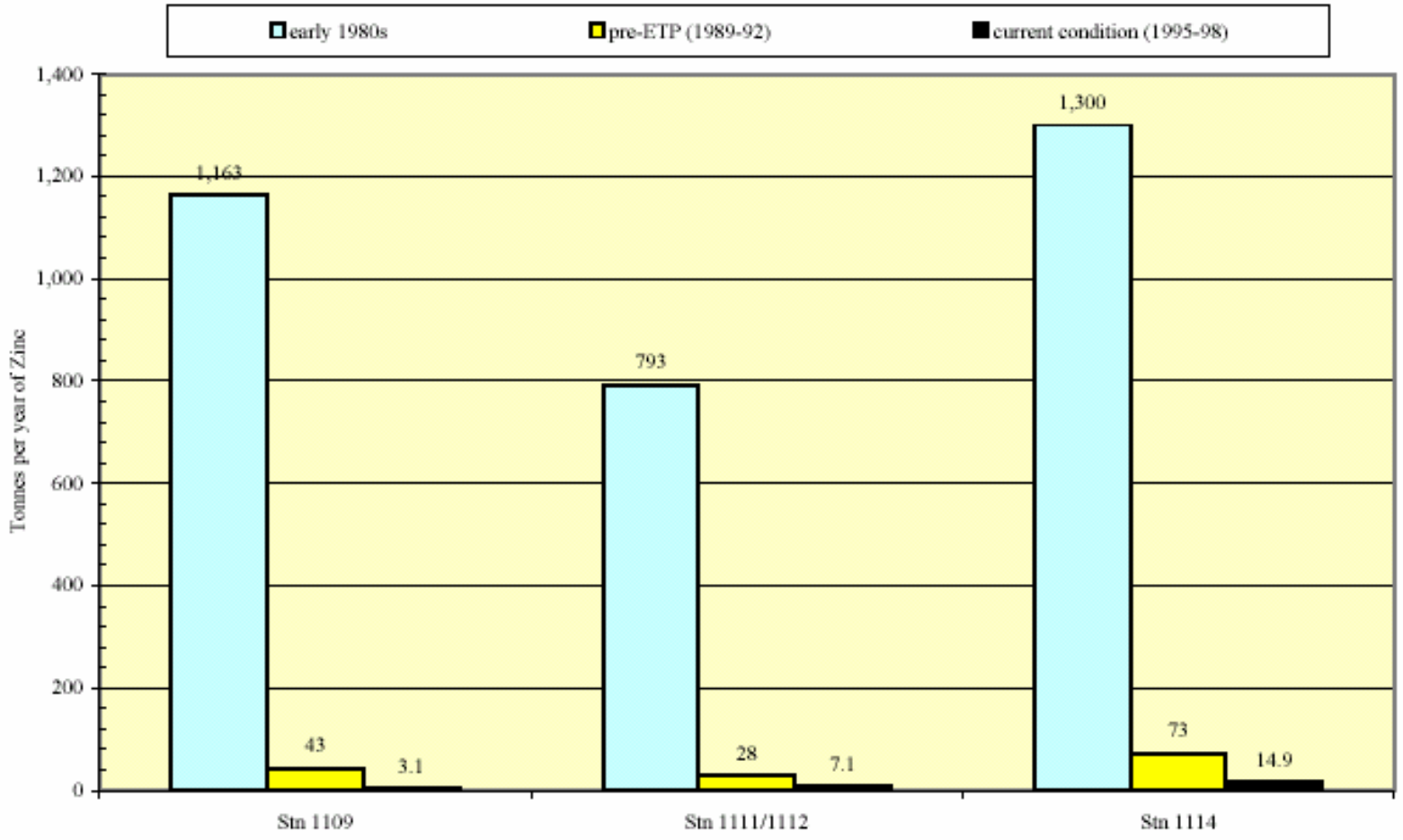
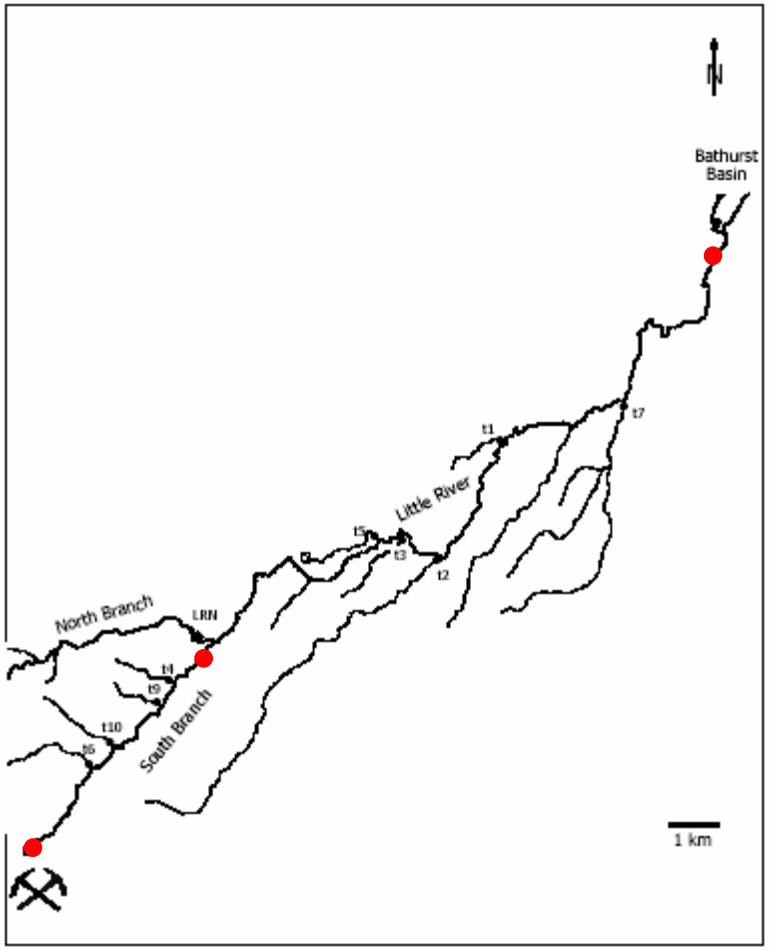
FIGURE 6.2: TYPICAL CURRENT AND HISTORIC ZINC LOADINGS TO THE LITTLE RIVER, 1980 TO PRESENT



Mine Closure - Env. Assessment

- ETP - 2.6 tonnes
- Buffer Pond - 1.4 tonnes
- **Unexplained - 2.7 tonnes**
- Unnamed Brk - 0.4 tonnes
  - Total 7.1 tonnes
- Runoff to Main Branch
  - **7.8 tonnes**
- Total Mouth Little River
  - 14.9 tonnes



Mine Closure - Env. Assessment

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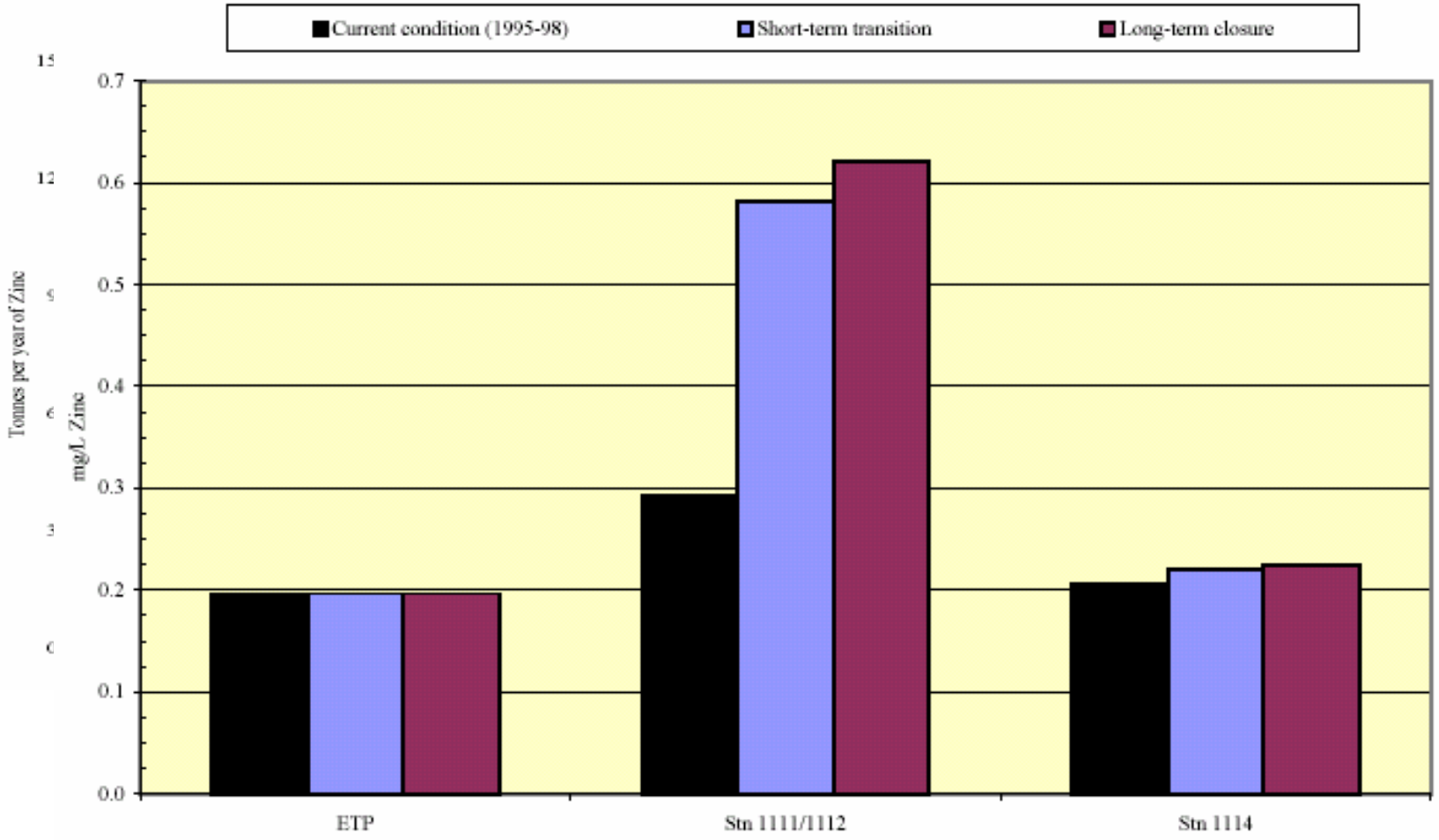
FIGURE 9.2: MEAN ANNUAL ZINC CONCENTRATIONS IN THE LITTLE RIVER UNDER THE NO. 12 MINE CLOSURE SCENARIO



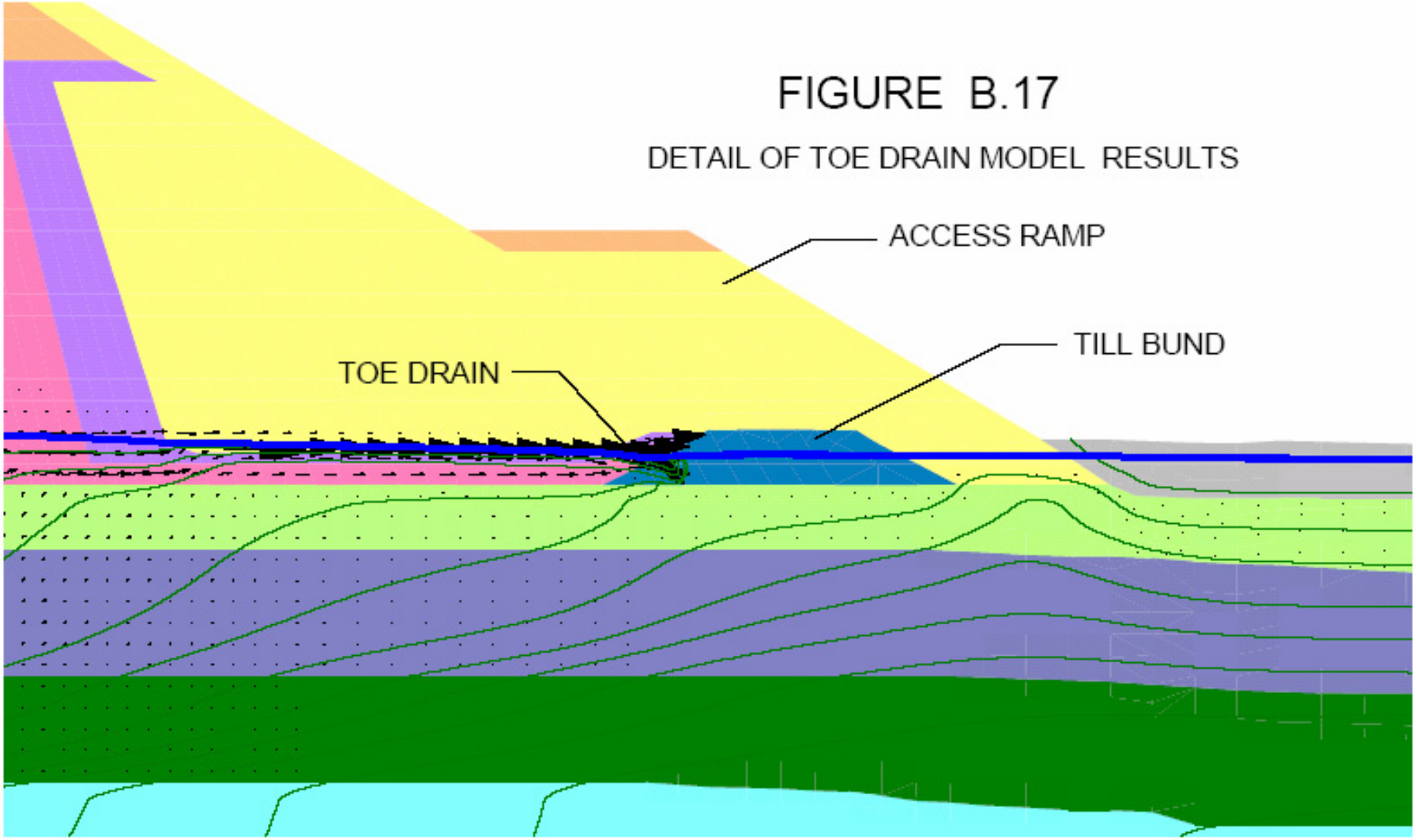
Closure EA Conclusions

- Stable pH Conditions Acceptable to Aquatic Life
- Zn Loadings Will Decrease by ~1.3 tonnes/yr Short Term and an Additional ~ 0.5 tonnes/yr Long Term
- Zn Will Be Unaffected in LR Remaining at 0.2 mg/l
- The 2.7 tonnes/yr Unexplained Is ~ 20% of Total Projected Loadings, If Reduced Still Minimal Change in Zn Concentration in LR
- Zn Conc. Will Increase in SLR Due to Less Dilution

Closure EA Conclusions

- Biological Conditions in Main Branch LR Will Improve Mainly Due to Stable pH
- Based on Mesocosm Study, LR Adverse Effects Will Not Occur
- Zn of 0.2 mg/l in LR Will Allow Some Level of Salmon Productivity
- Zn Levels in SLR (0.5-0.6 mg/l) Will Prevent the Establishment of a Permanent Fish Community

Groundwater - Seepage Study



Groundwater - Seepage Study

- The Hydraulic Conductivity Of The Fractured Bedrock (1.5 - 3 M) Most Pronounced Effect
- 85-95 % of Seepage Reports to SBLR Within 120 M of Dam
- This Seepage Combined with ETP Discharge is the majority of the SBLR's 7.1 t/a
- No Indications of a Significant Deep Groundwater Plume
- Possibility to Reduce Loadings with Collection System (0 to 50% ?)

Questions?