

# ML/ARD Impacts and Rehabilitation Planning for Rum Jungle



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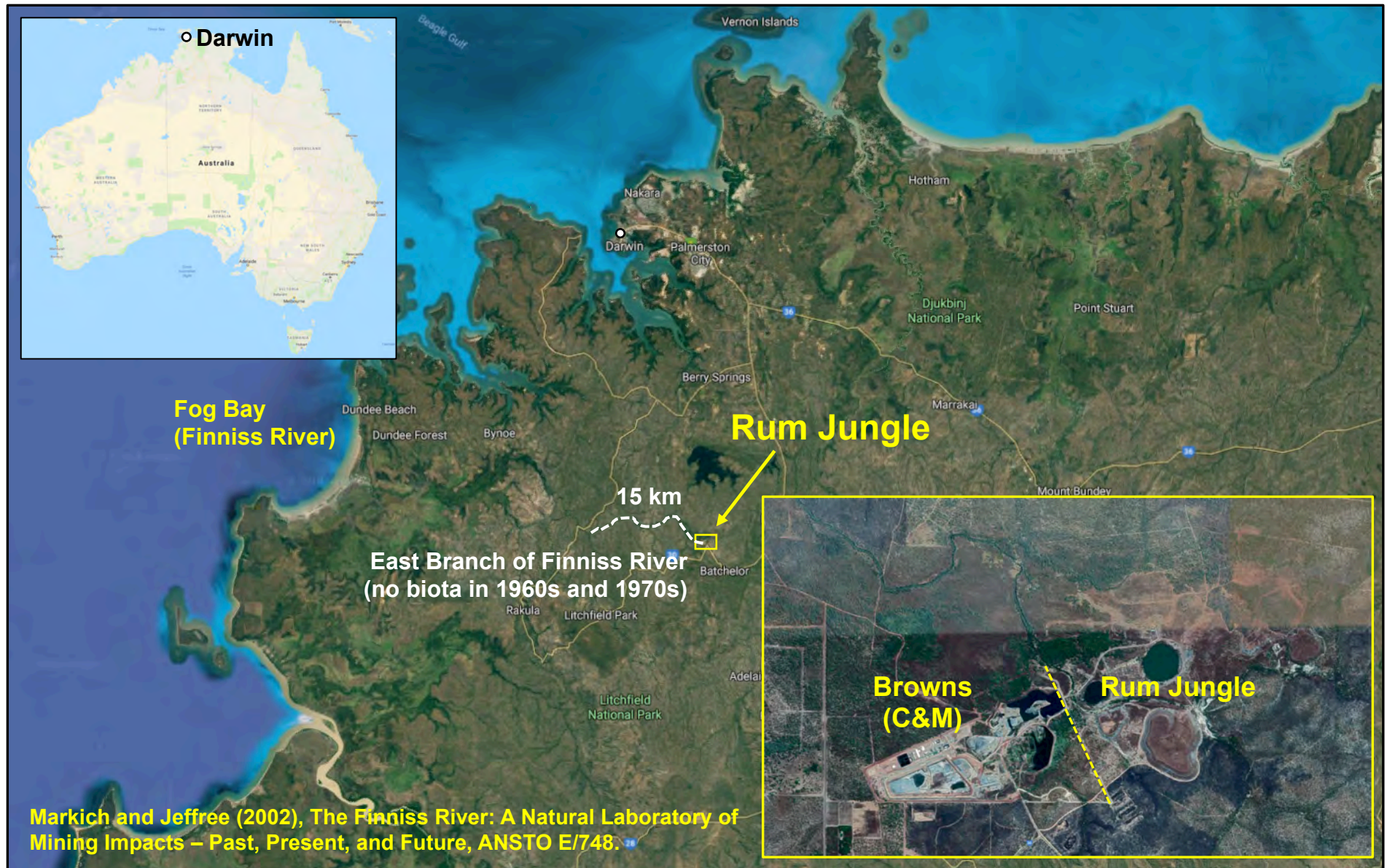
<sup>3</sup>NT Department of Primary Industry and Resources

November 28<sup>th</sup>, 2018  
25<sup>th</sup> MEND ML/ARD Workshop

# Overview

- **Focus: “what happened, what was unexpected and future objectives”**
- **Initial rehabilitation in the 1980s**
  - Works completed
  - Performance
  - Current site conditions
- **Future rehabilitation plan**
  - Preferred rehabilitation strategy
  - Predicted performance
- **Summary and Path Forward**

# Site Location and Physical Setting



# Timeline for Mining and Rehabilitation

**1949**

Discovery of uranium

**1953 to 1971**

**Active mining**

- Uranium (for CDA)
- Cu, Ni, and Co

**1977**

Limited rehabilitation

**Rehab**

**1983 to 1985**

Rum Jungle Rehabilitation Project  
**(AU\$16.2M)**

**1986 to 1998**

**Monitoring**

**2010**

Rehabilitation planning  
re-commences

**Planning/C&M**

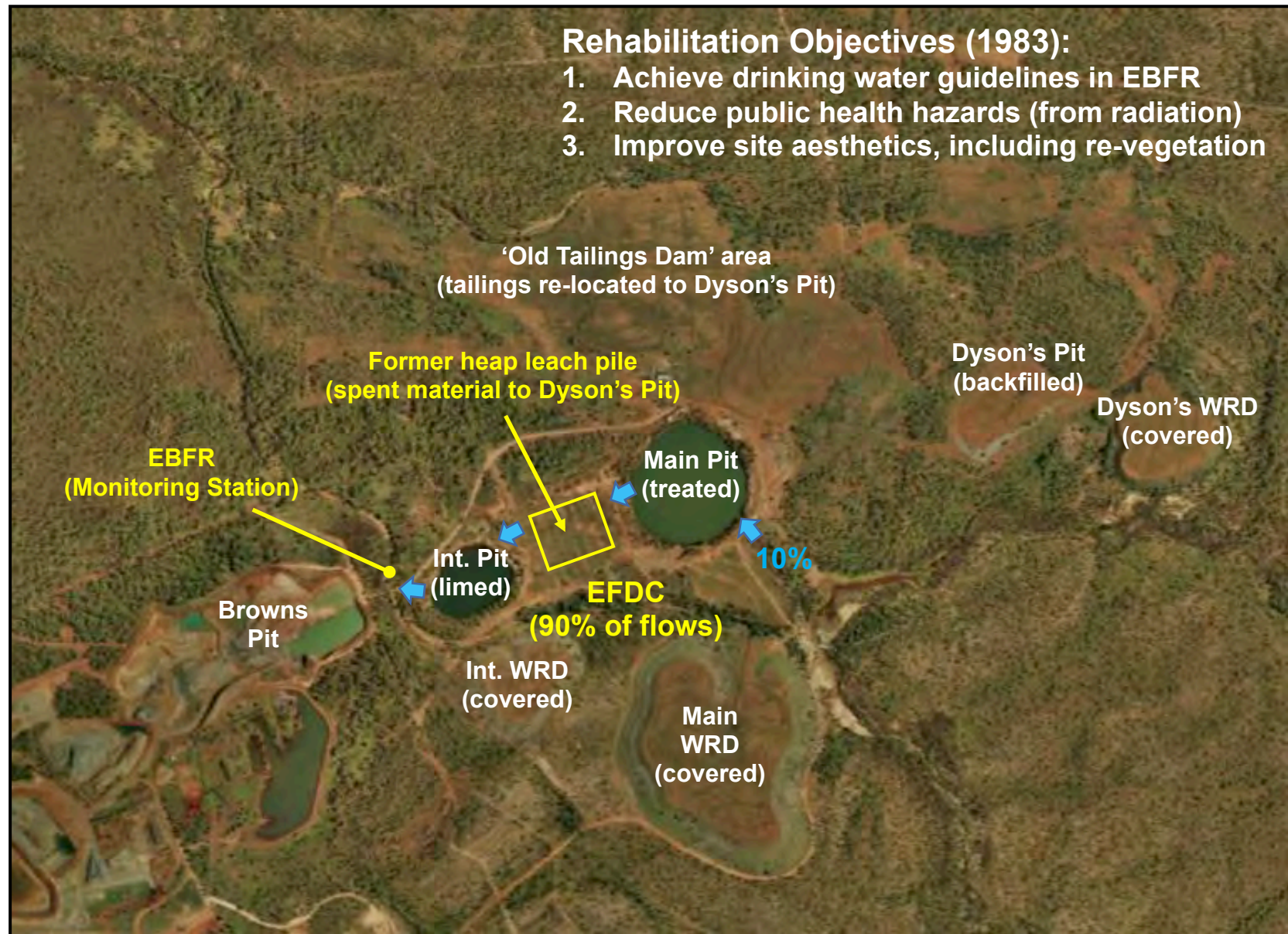
**1971**

Site abandoned

# Historic Site Layout (1970s) – Prior to Rehabilitation



# Post-Rehabilitation (Current) Site Layout

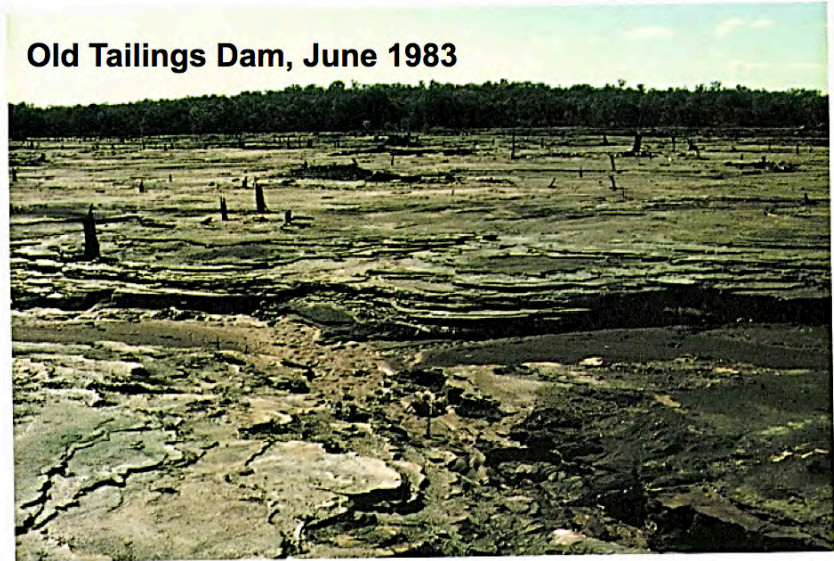


# Pre-Rehabilitation Conditions

Copper heap leach pile, August 1984



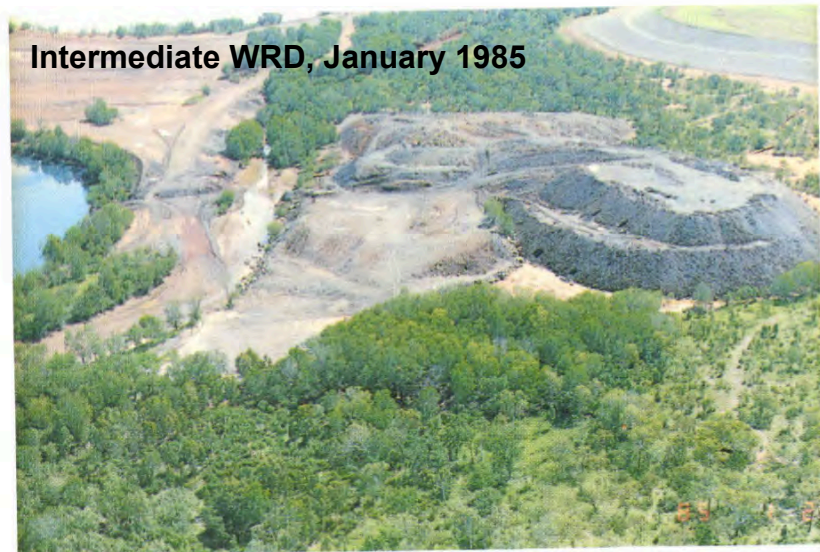
Old Tailings Dam, June 1983



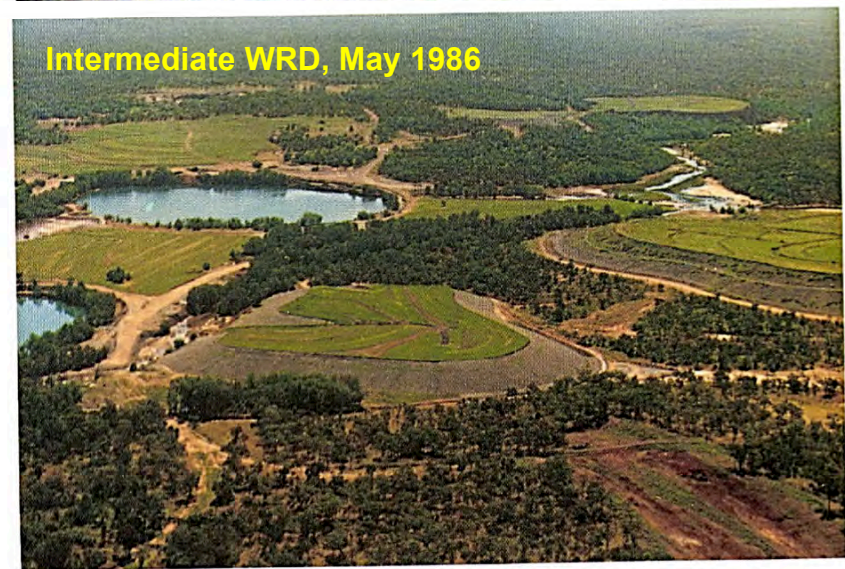
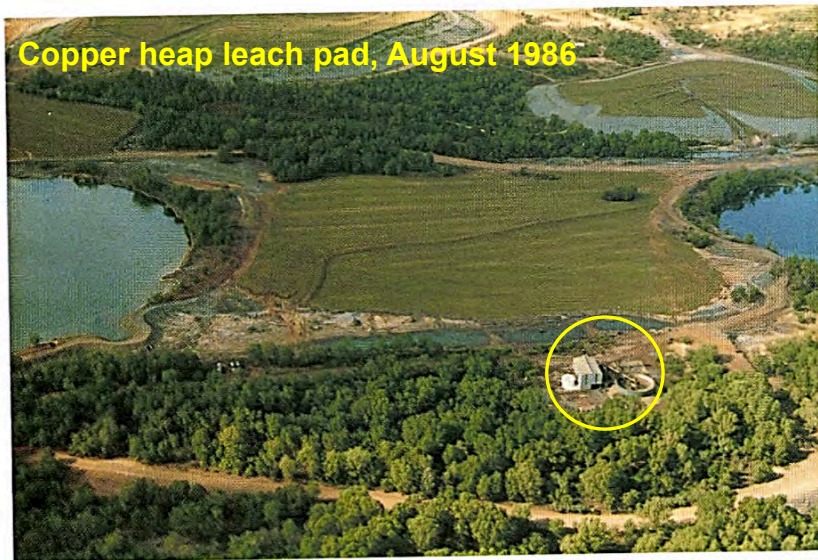
Main (White's) WRD, June 1983



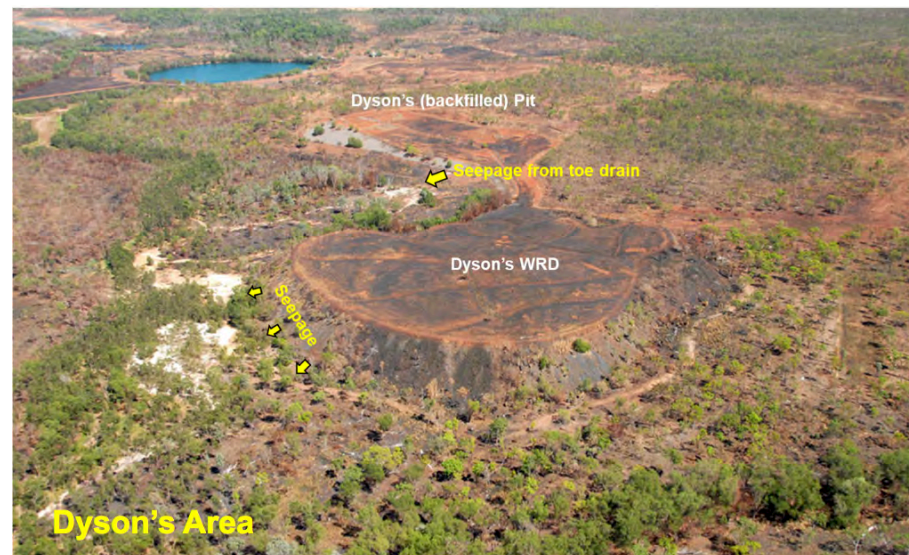
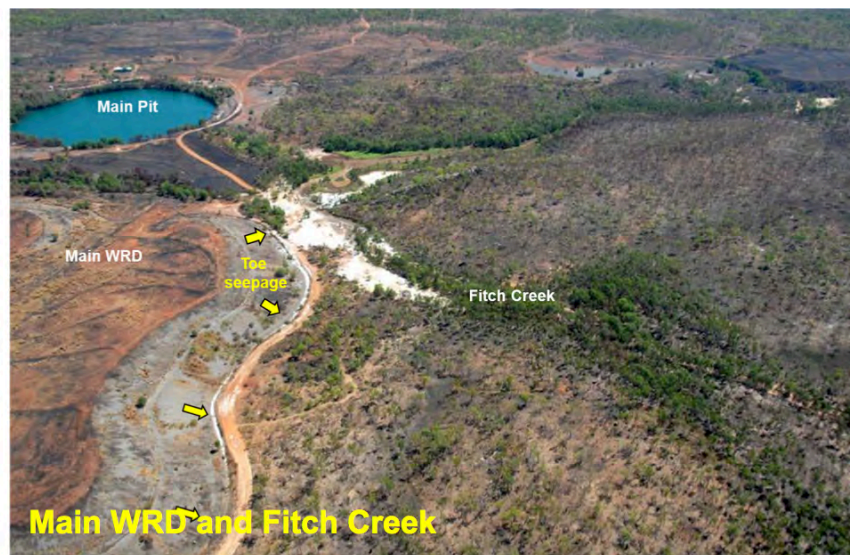
Intermediate WRD, January 1985



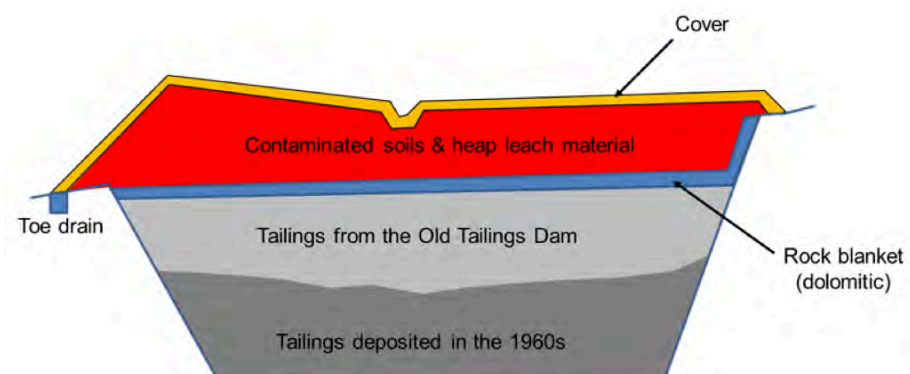
# Post-Rehabilitation Conditions



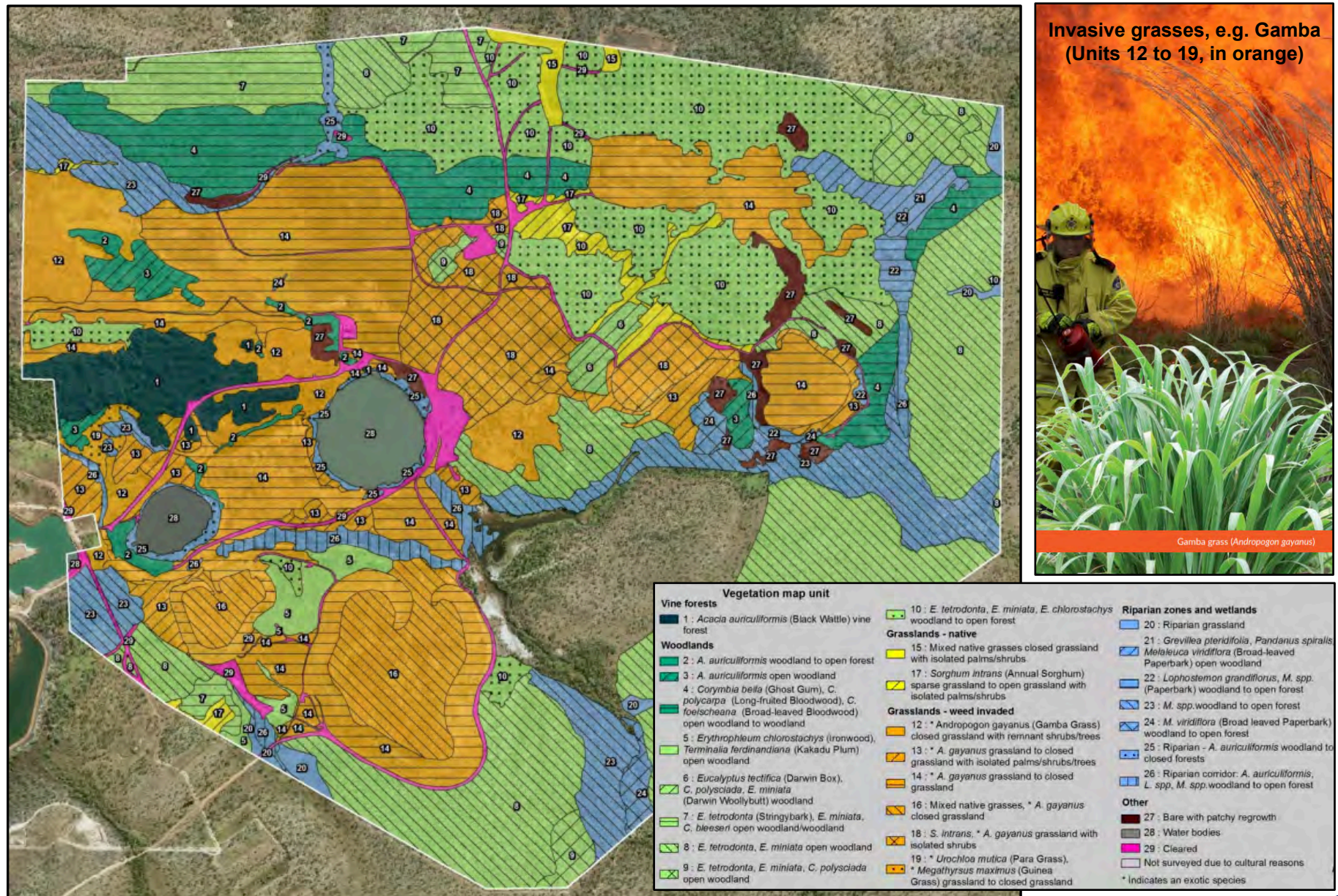
# Current Site Conditions



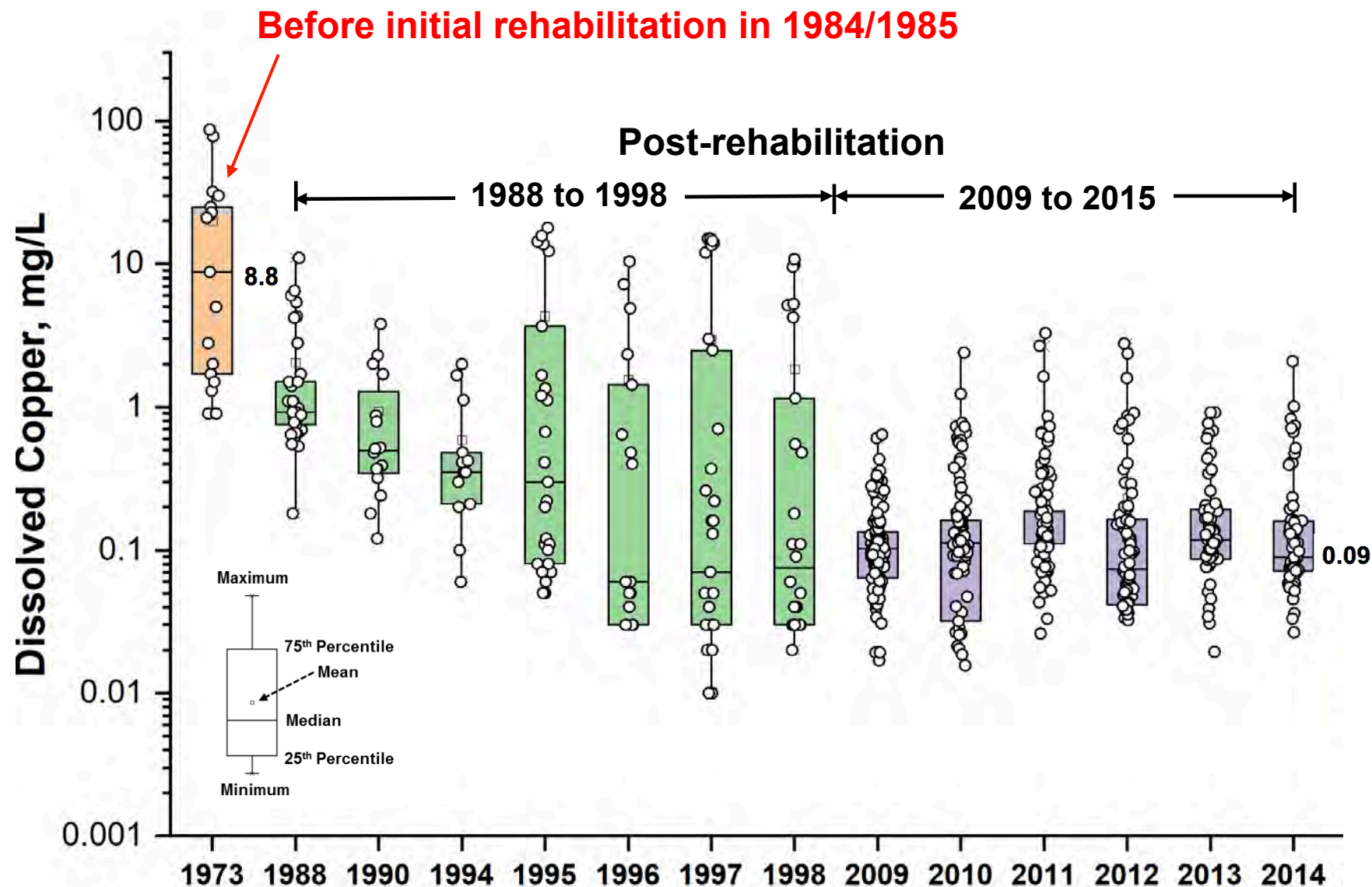
Conceptual cross-section, Dyson's (backfilled) Pit



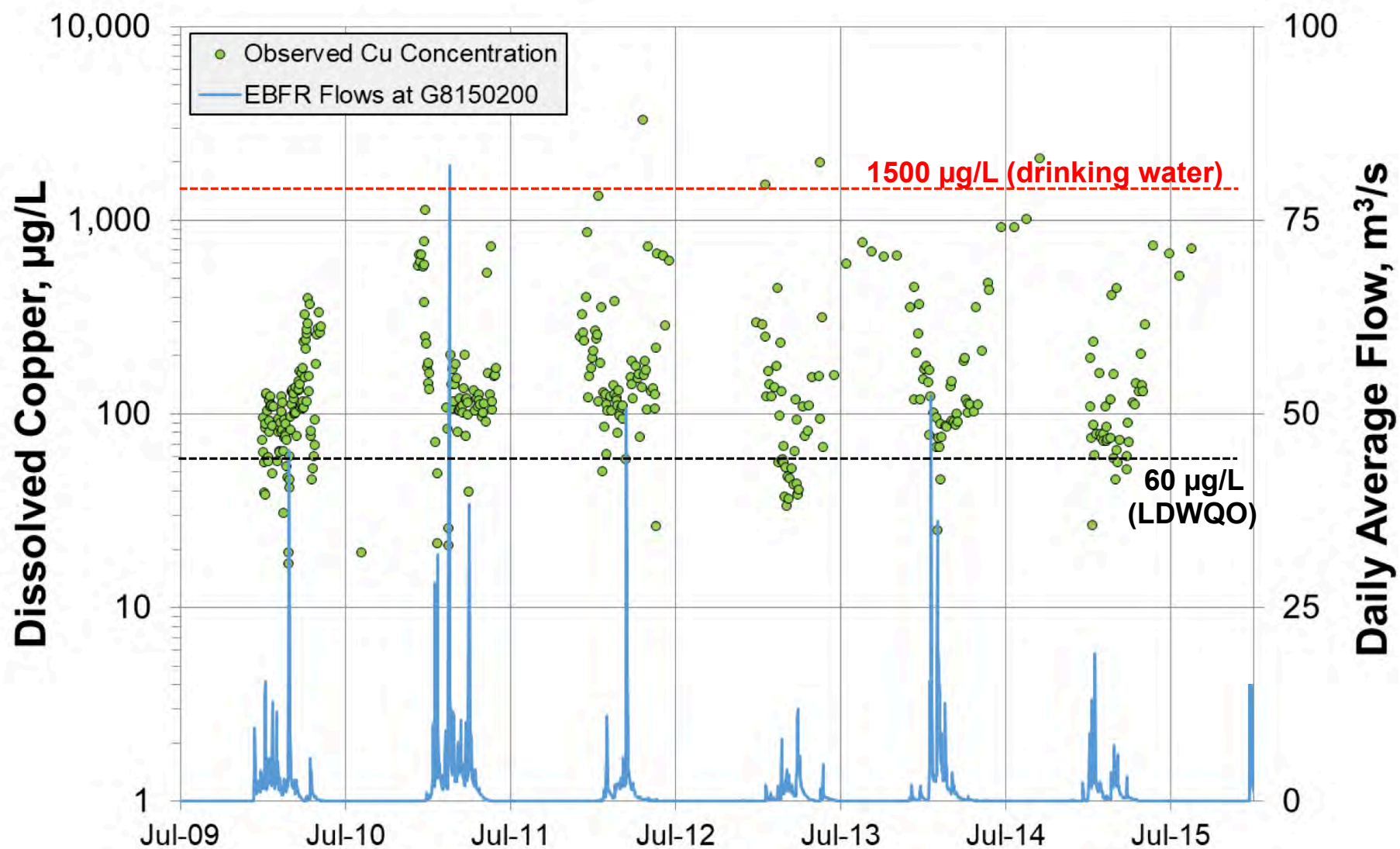
# Vegetation Community Map (from EcoLogical, 2014)



# Copper Concentrations in EBFR Downstream

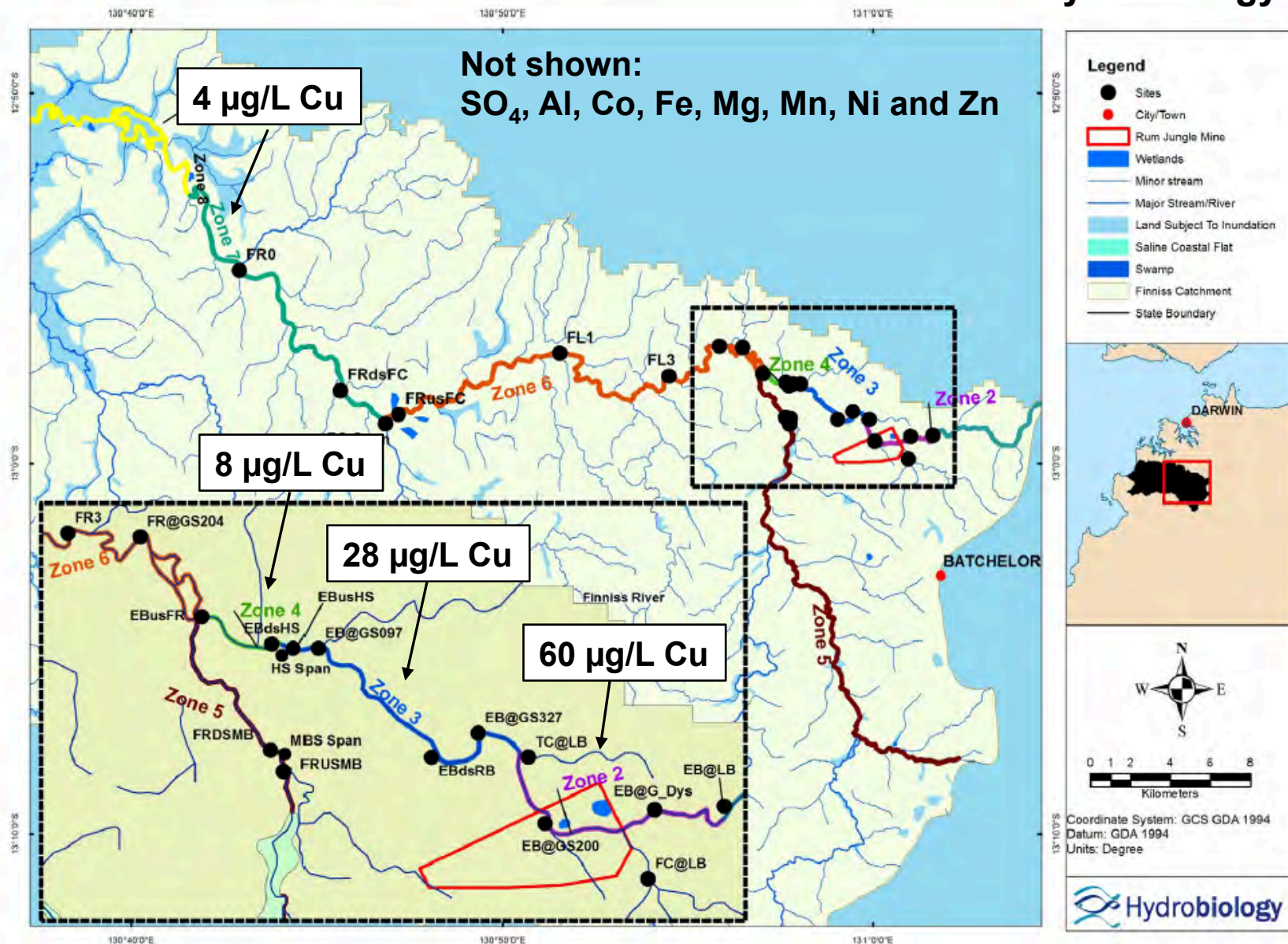


# Dissolved Copper Concentrations in EBFR, 2009 to 2015

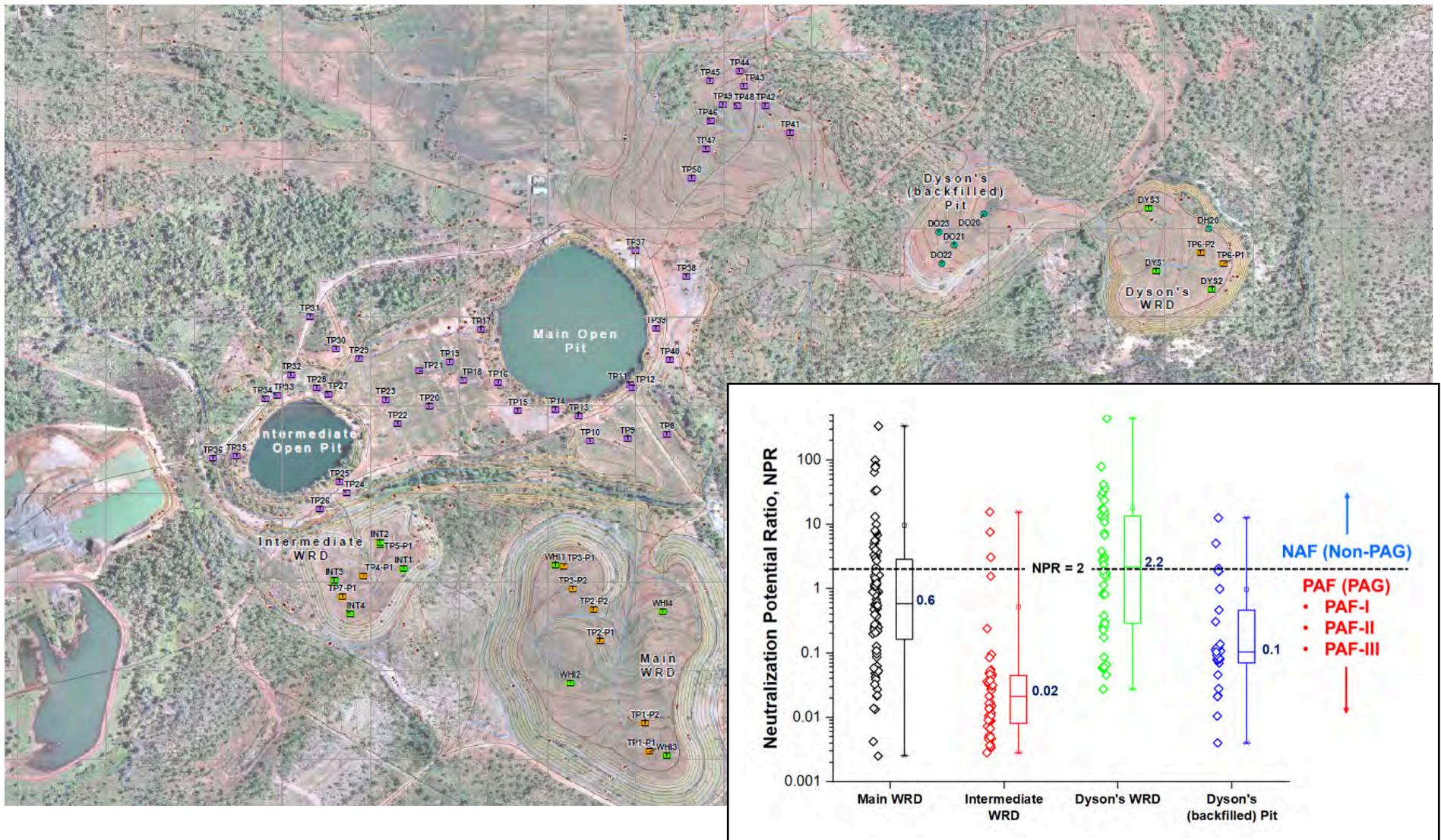


# Locally Derived Water Quality Objectives (LDWQOs)

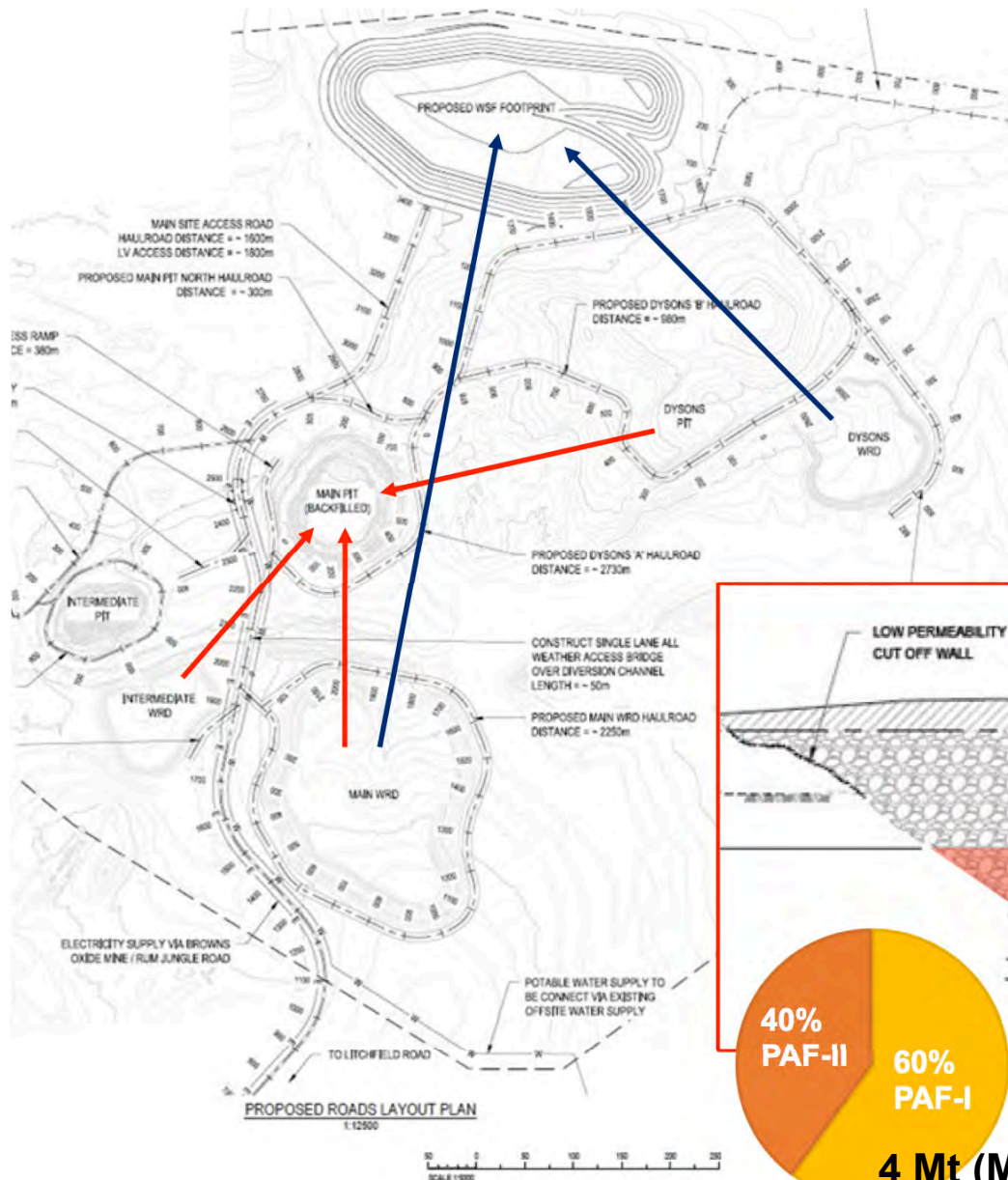
From Hydrobiology (2015)



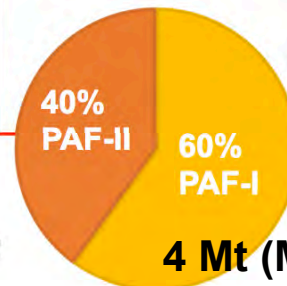
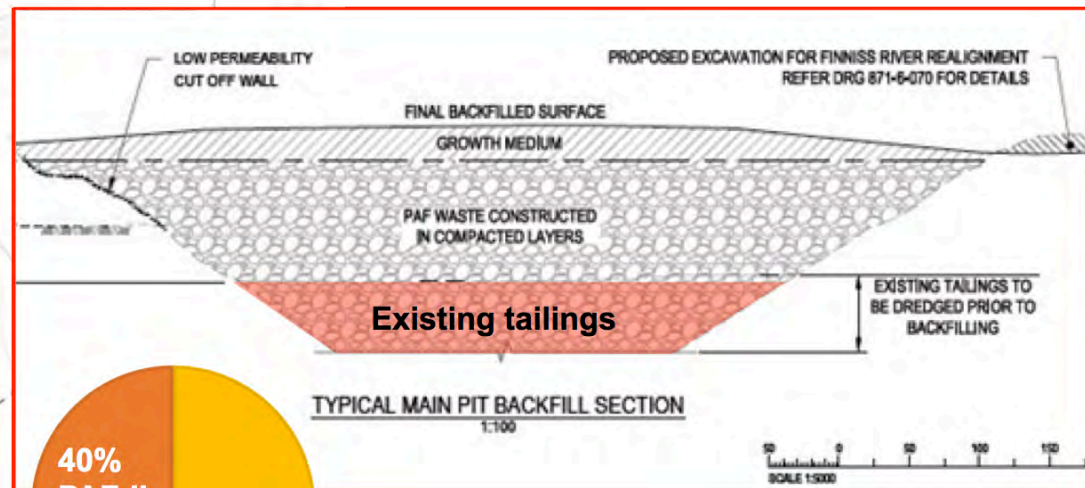
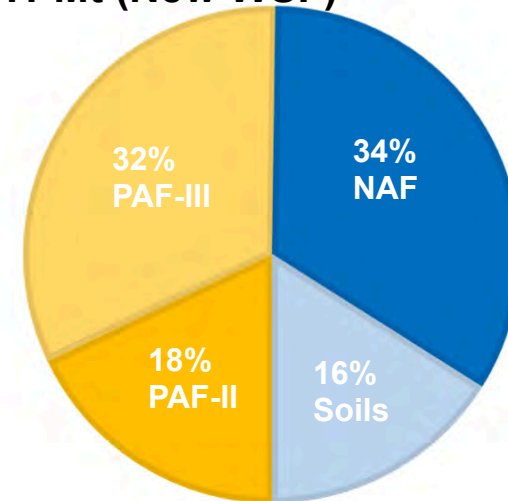
# Test Pitting – WRD and Contaminated Areas



# Preferred Rehabilitation Strategy



**7.1 Mt (New WSF)**



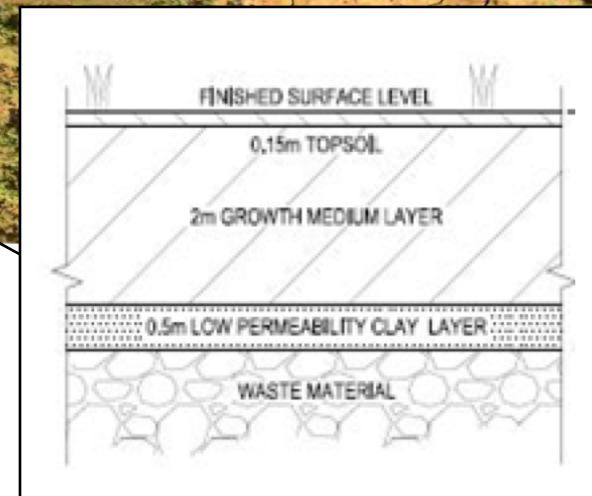
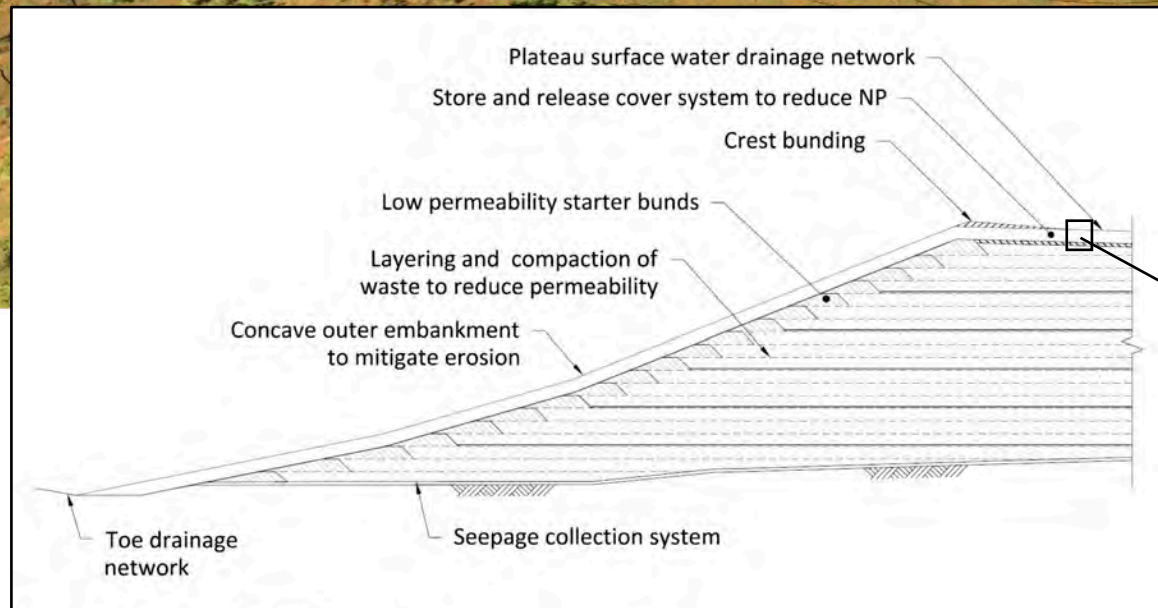
**4 Mt (Main Pit)**

From O'Kane Consultants (2016)

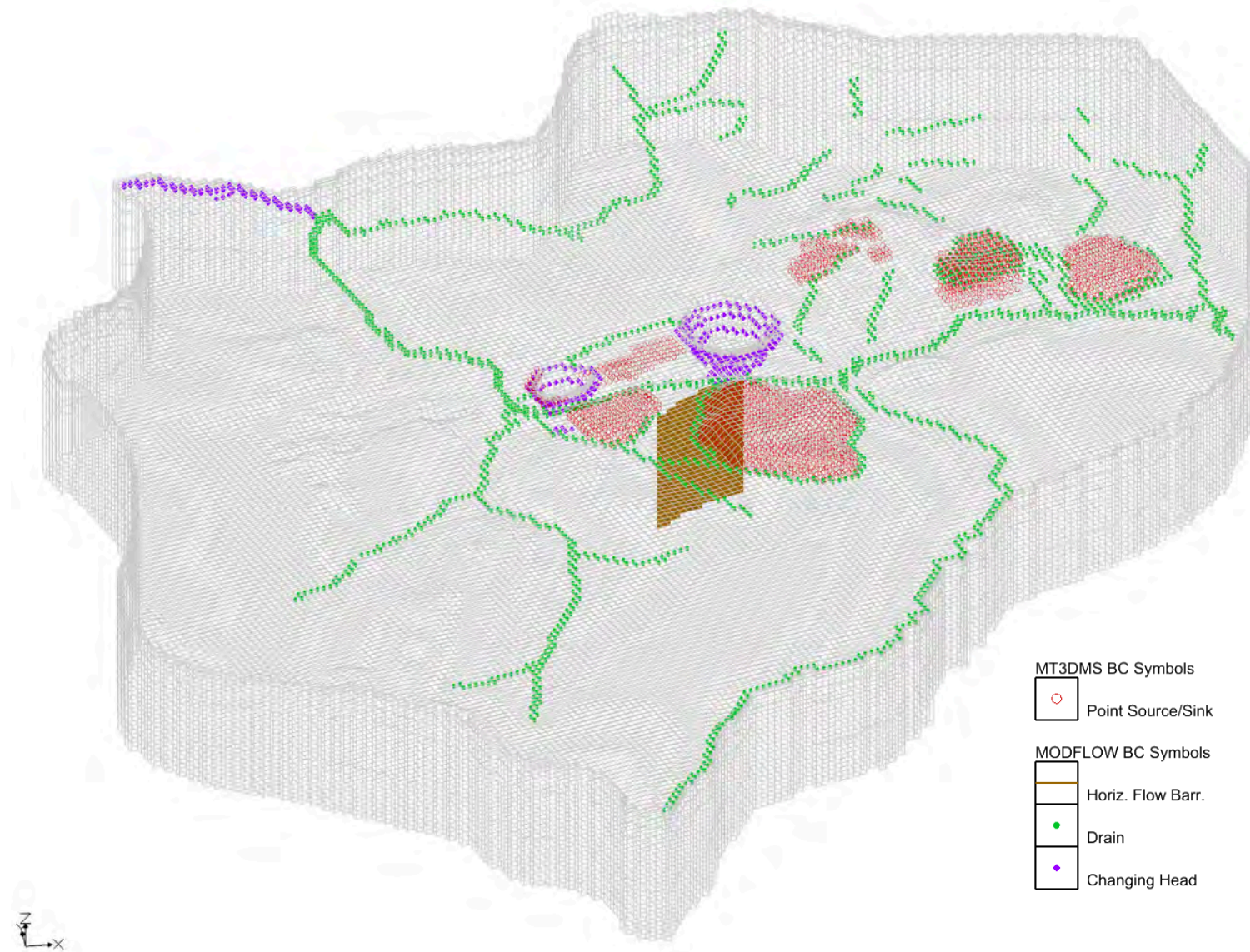
# Conceptual Waste Storage Facility (WSF) Design

From O'Kane Consultants (2016)

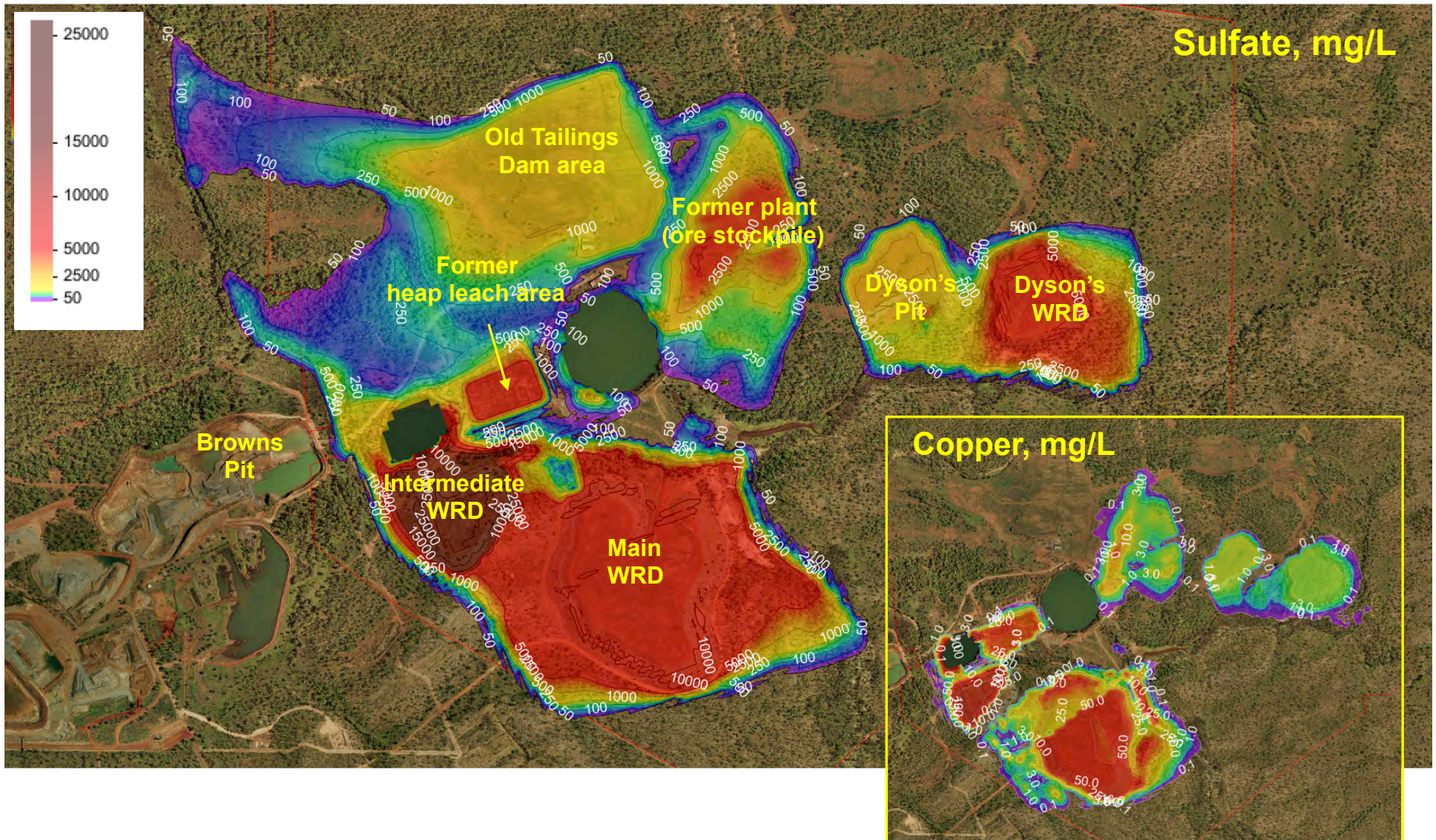
Main Pit  
(backfilled)



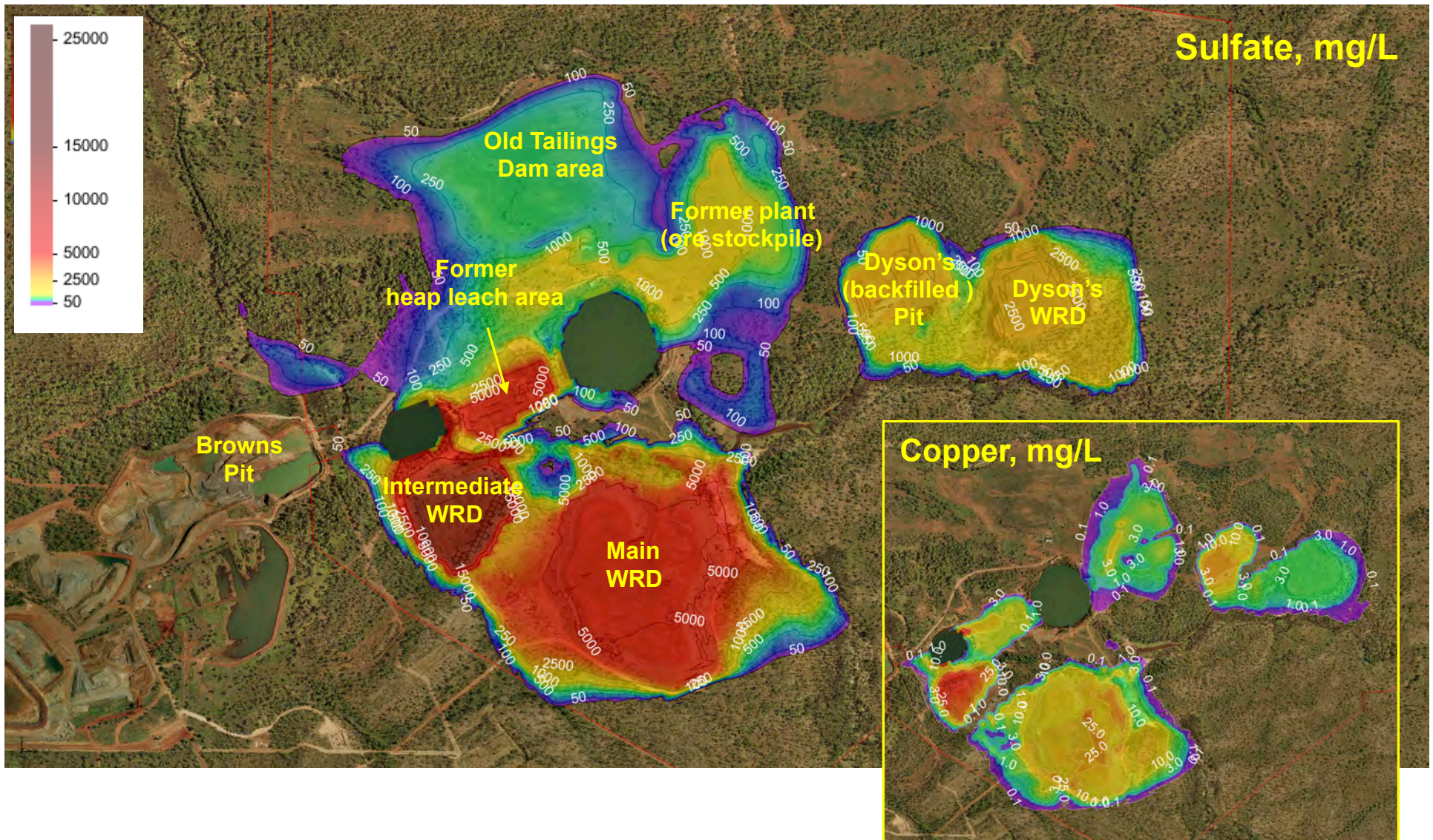
# MODFLOW/MT3D Model Domain and Boundary Conditions



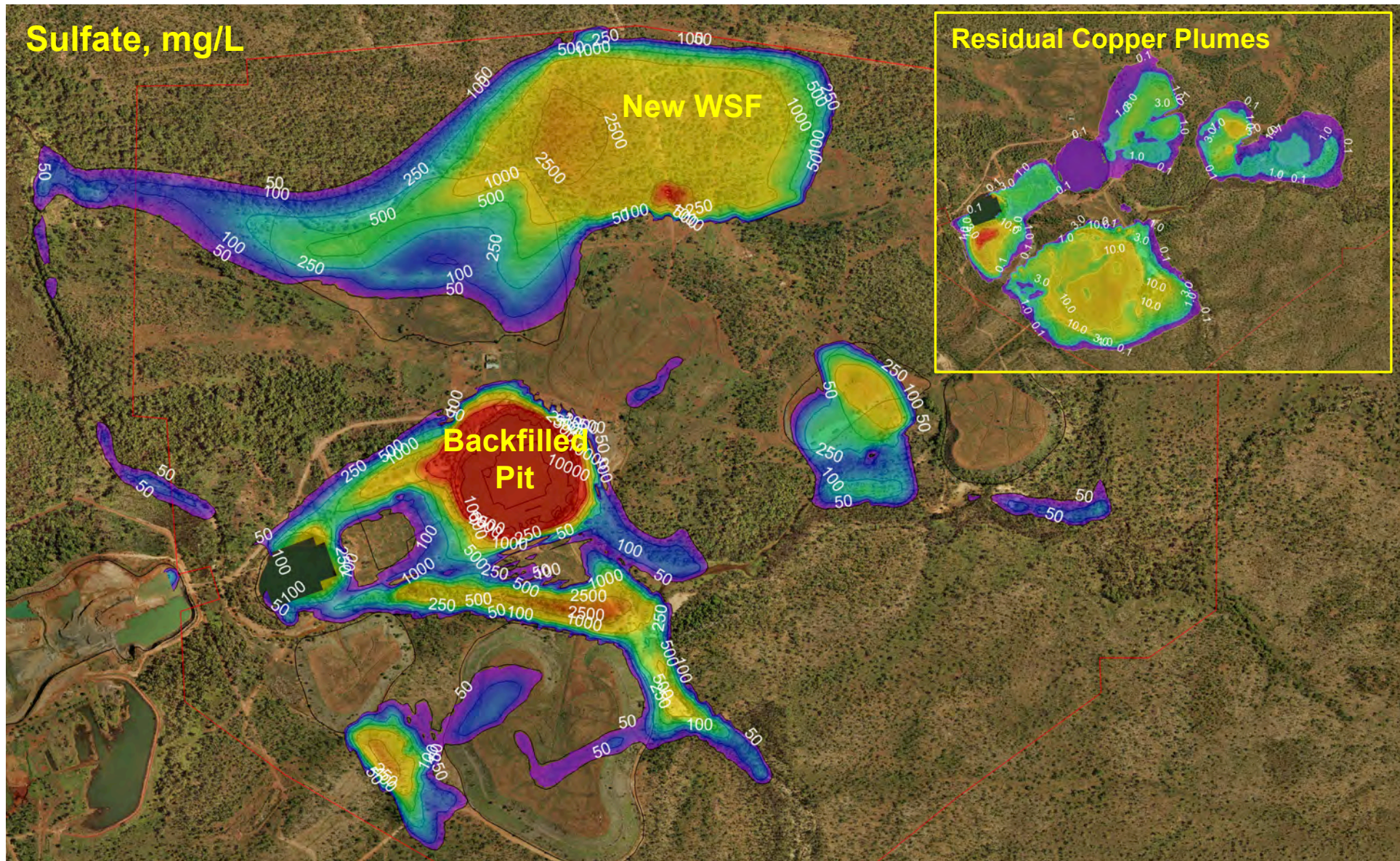
# Simulated Contaminant Plumes (Pre-Rehabilitation), 1984



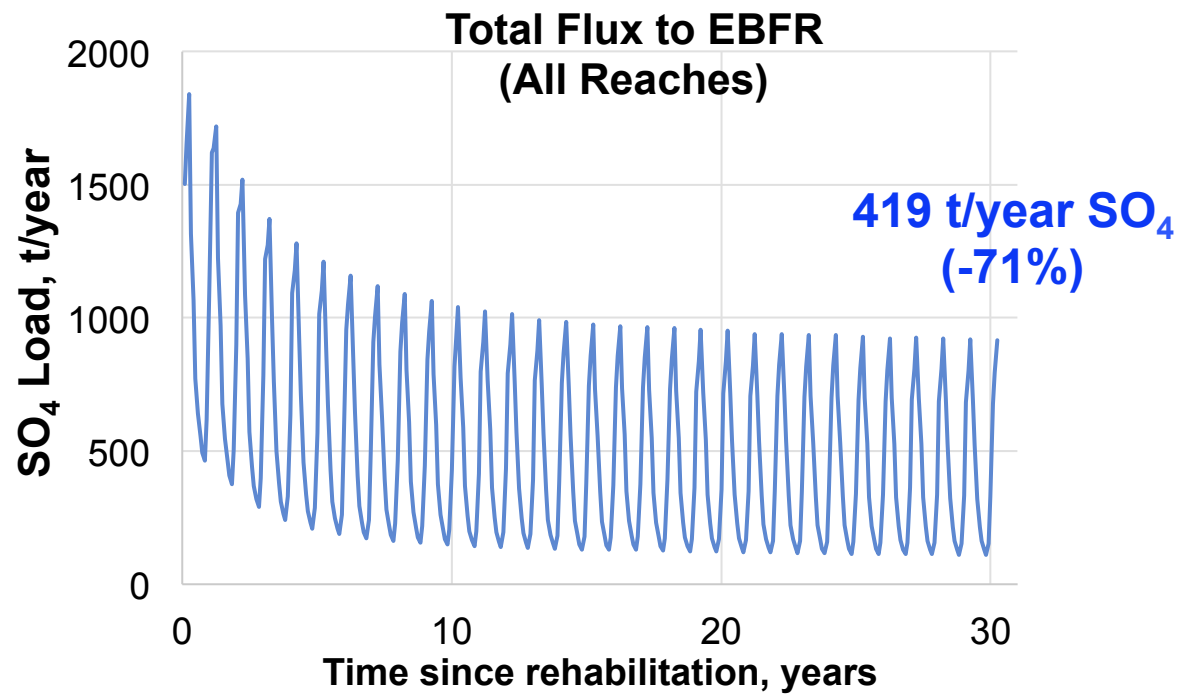
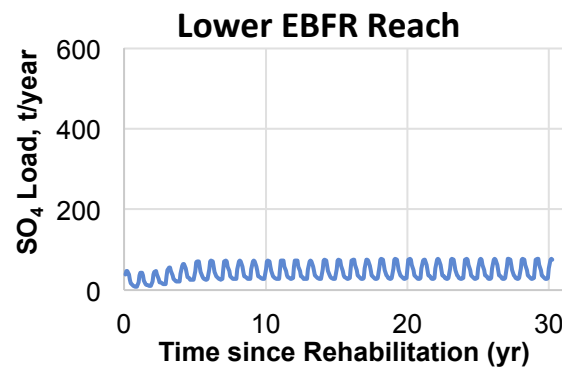
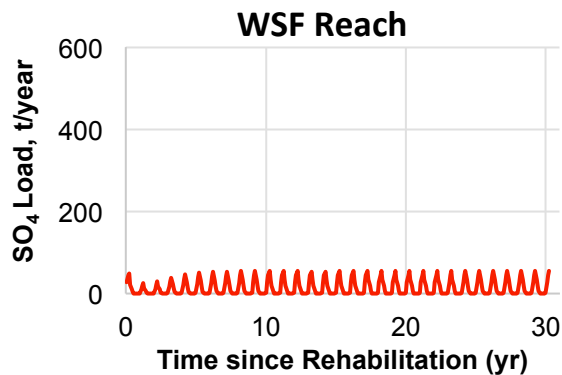
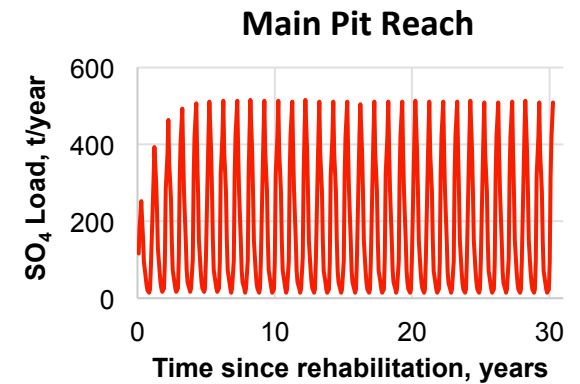
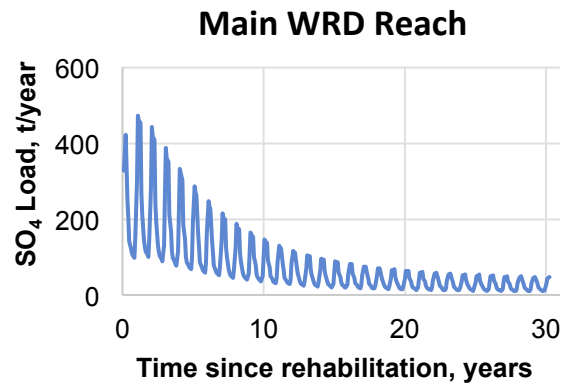
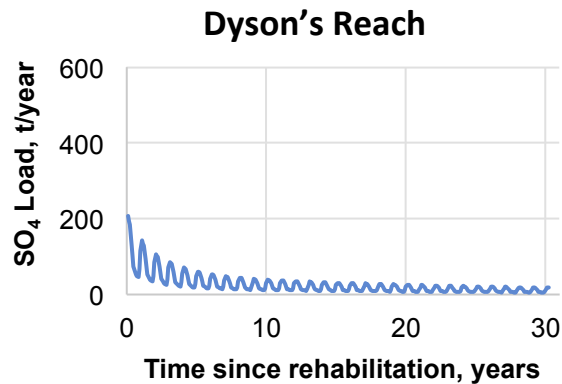
# Simulated Contaminant Plumes (Current Conditions), 2015



# Predicted Contaminant Plumes (Post-Rehabilitation), 2045



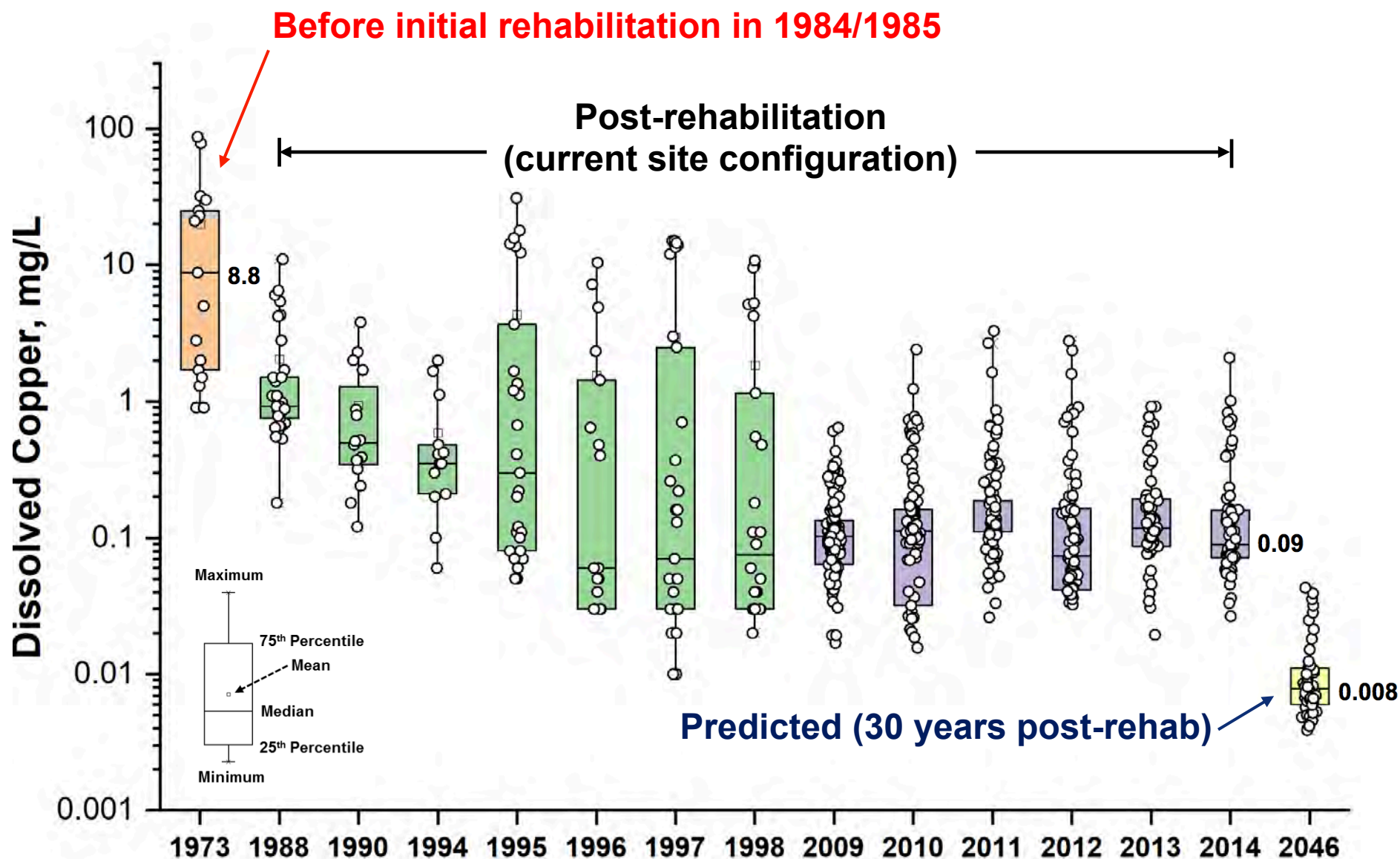
# Predicted Sulfate Loads to EBFR



# Predicted Copper Loads to EBFR



# Predicted Copper Concentrations in EBFR



# Path Forward

- **DPIR (the 'Proponent') intends to submit an EIS to NT EPA by mid-2019 and Detailed Business Case (DBC) by end of 2019**
- **Refinements being considered (Stage 2A):**
  - Main Pit configuration: (i) covered landform or (ii) flooded above backfill.
  - New WSF location: (i) northern or (ii) central location).
  - Post-rehab seepage (SD) management: WTP, MNA, and/or passive options.
- **Other issues to be addressed:**
  - Re-vegetation treatments and weed management
  - Borrow area and haul road disturbances (on Finniss River Land Trust)
- **Each refinement/issue has environmental and social implications that require Traditional Owner (TO) input.**
- **Financial and liability implications for Commonwealth Government of Australia must also be considered in NT's DBC.**

## Questions/Comments