# Northeast Minnesota Wetland Mitigation Strategy

Breakout Session:
Mineland Wetland Inventory
July 10, 2008

# Agenda

Background

Work Plan

Project Update

Examples

# Background

**Project Purpose**

- ***Inventory wetland and water resources that have developed on former minelands***
- ***Conduct an analysis of the functions and values of those wetland and water resources***

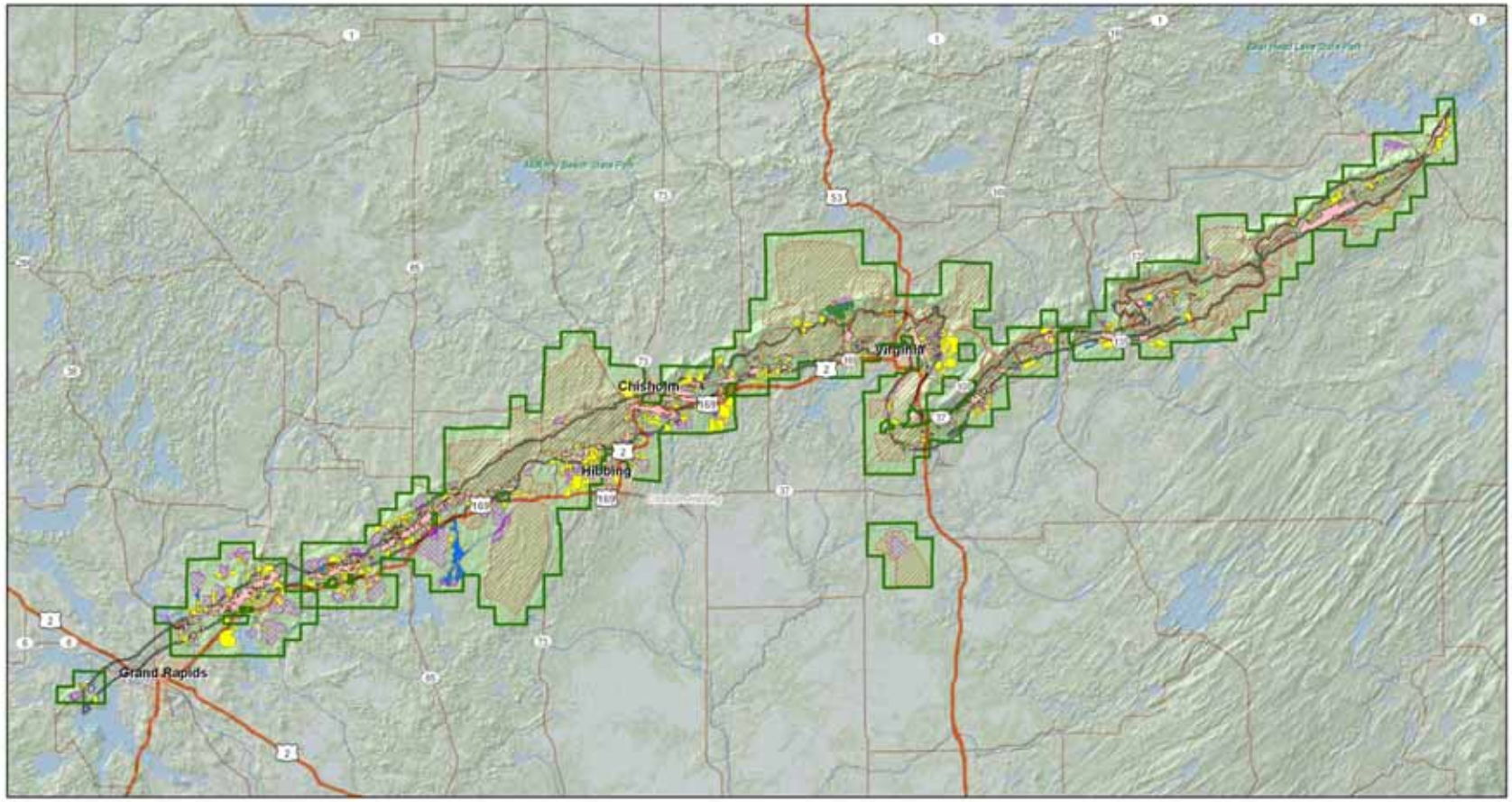
# What are the mitigation needs in NE Minnesota?

| Residential/Commercial | 100 acres/year | |
|---|---|---|
| BWSR Public Road Program | 85 acres/year | |
| MnDOT Roads (250 ac./5 years) | 50 acres/year | 250 acres/5 years |
| Mining (one mining project may impact 1,000 acres) | 300 acres/ year | 3,000 acres?/10 years |
| Total Demand for Mitigation | 500 to 600 acres/Year | |

# Work Plan Summary

- Define mineland study area
- Determine functional assessment method
- Develop & conduct GIS analysis
- Develop field assessment protocols
- Conduct field truthing and assessments
- Compile data in geodatabase

# Mineland Inventory & Functional Assessment Study Area



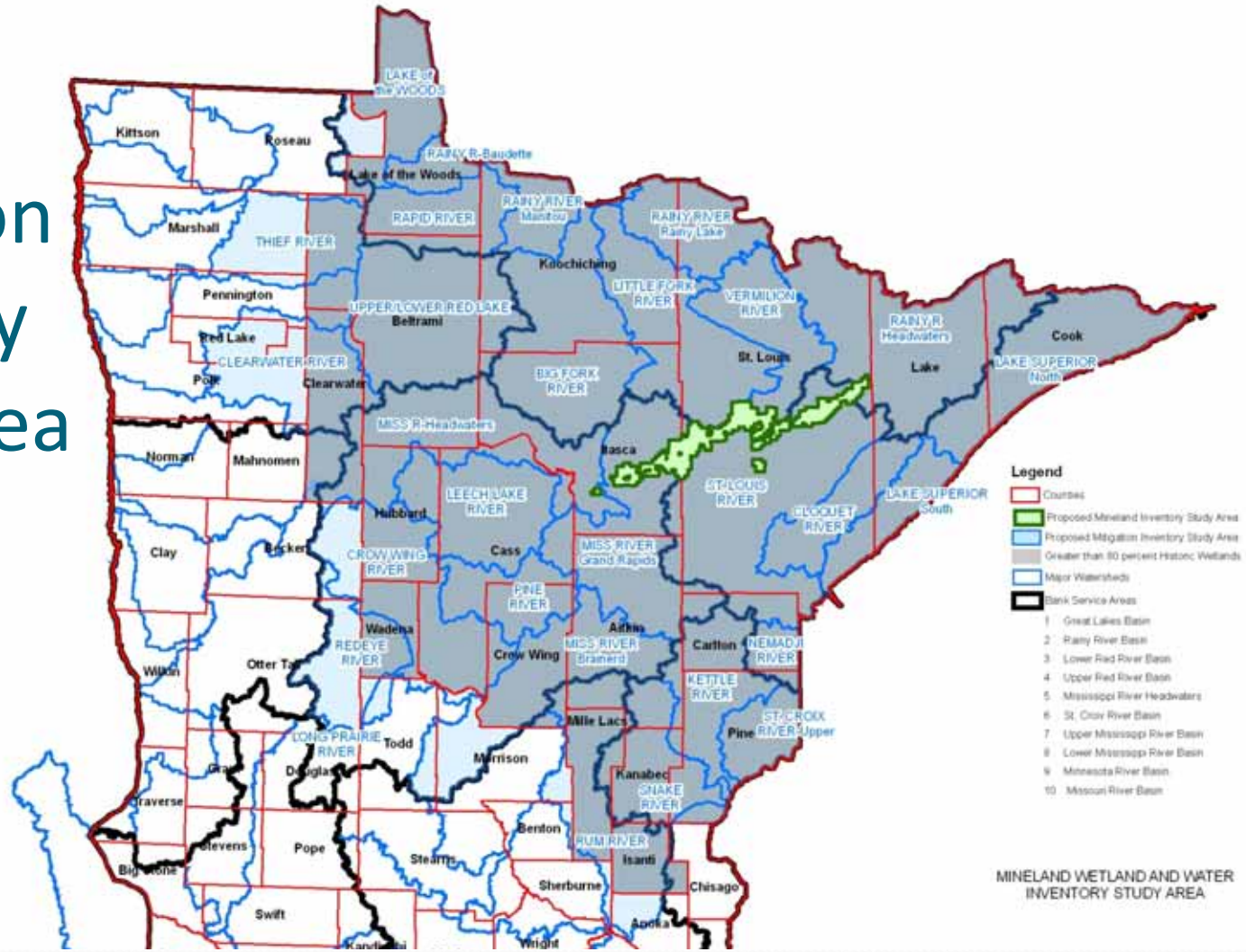

**DNR 2005 Mine Features outside of Excluded Area**

- Other Feature; plant or shop area
- Stockpiles
- In-pit Stockpile
- Mining Related Water Feature
- Pits
- Tailings Basin
- Excluded Areas
- Biwabik Iron Formation
- Proposed Study Area

0 3 6 12
Miles

PROPOSED STUDY AREA
Wetland Mitigation Inventory

# Phase I Mitigation Inventory Study Area



# Functional Assessment Method

- MN Routine Assessment Method, Version 3.2
- Vegetative Diversity/Integrity
  - Effectiveness of diverse vegetation development on artificial substrates – e.g. tailings, stockpiles
- Hydrologic Regime
  - How do they compare to natural hydrology
- Stormwater Storage
  - What role do wetlands play in reclamation landscape?
- Water Quality
  - Role in protecting downstream waters

# Tailings Basin Wetland - High Integrity

# Tailings Basin Wetland - Recreation

# Functional Assessment Method

- Shoreline Protection
  - Mine pit shoreline wetlands could protect against erosion
- Fish, Wildlife, and Amphibian Habitat
  - Value of a well-planned reclamation landscape for wildlife
  - Well-planned mine pits could be valuable fisheries
  - Diverse reclamation landscape valuable for amphibians?
- Aesthetics, Recreation, Education
  - Former minelands used extensively for recreation
- Mine Pit Water Resources
  - Presence of aquatic vegetation and shoreline wetlands

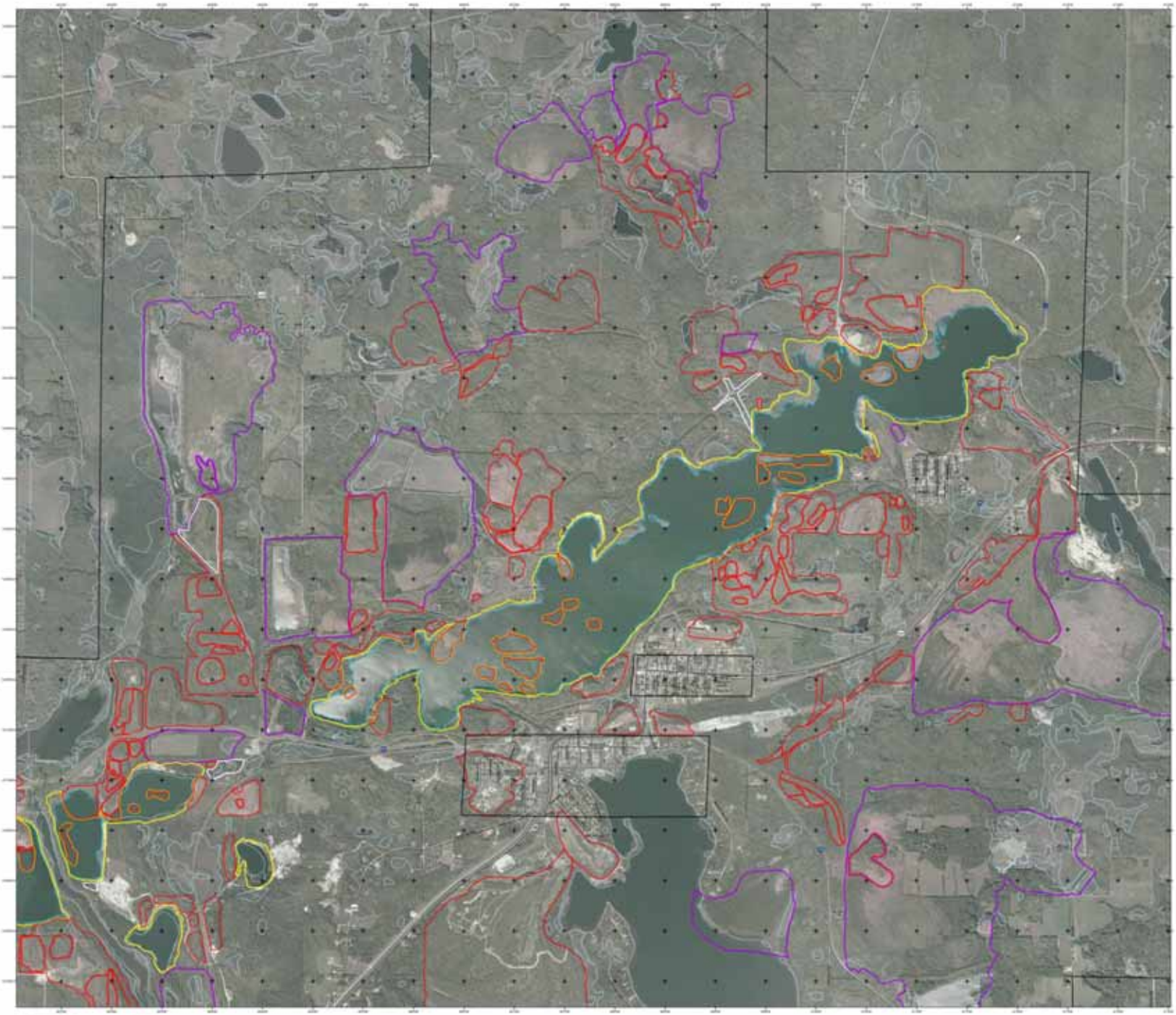
# GIS Analysis

Goal

- Identify potential wetlands and water resources

Data Sources

- MnDNR 2007 Mineland Features – TBs, pits, stockpiles
- National Wetland Inventory
- Public Waters Inventory
- Recent aerial photos – mine pits
- Landcover data
- Mesabi elevation data



MAP F
Wetlands/Mine Area
Work Map

# Field Assessment Protocols

Goal

- Field verify and assess water resources

Considerations

- Access – possible in inactive, former mine areas?
  - Could maps of inaccessible areas be provided?
- Suggestions for determining accessibility in older areas?
- Field assessment – Barr staff, MSHA trained
- Access portion of wetland
- Compile assessment data in laptop MNRAM database

# Examples of Mineland Wetlands

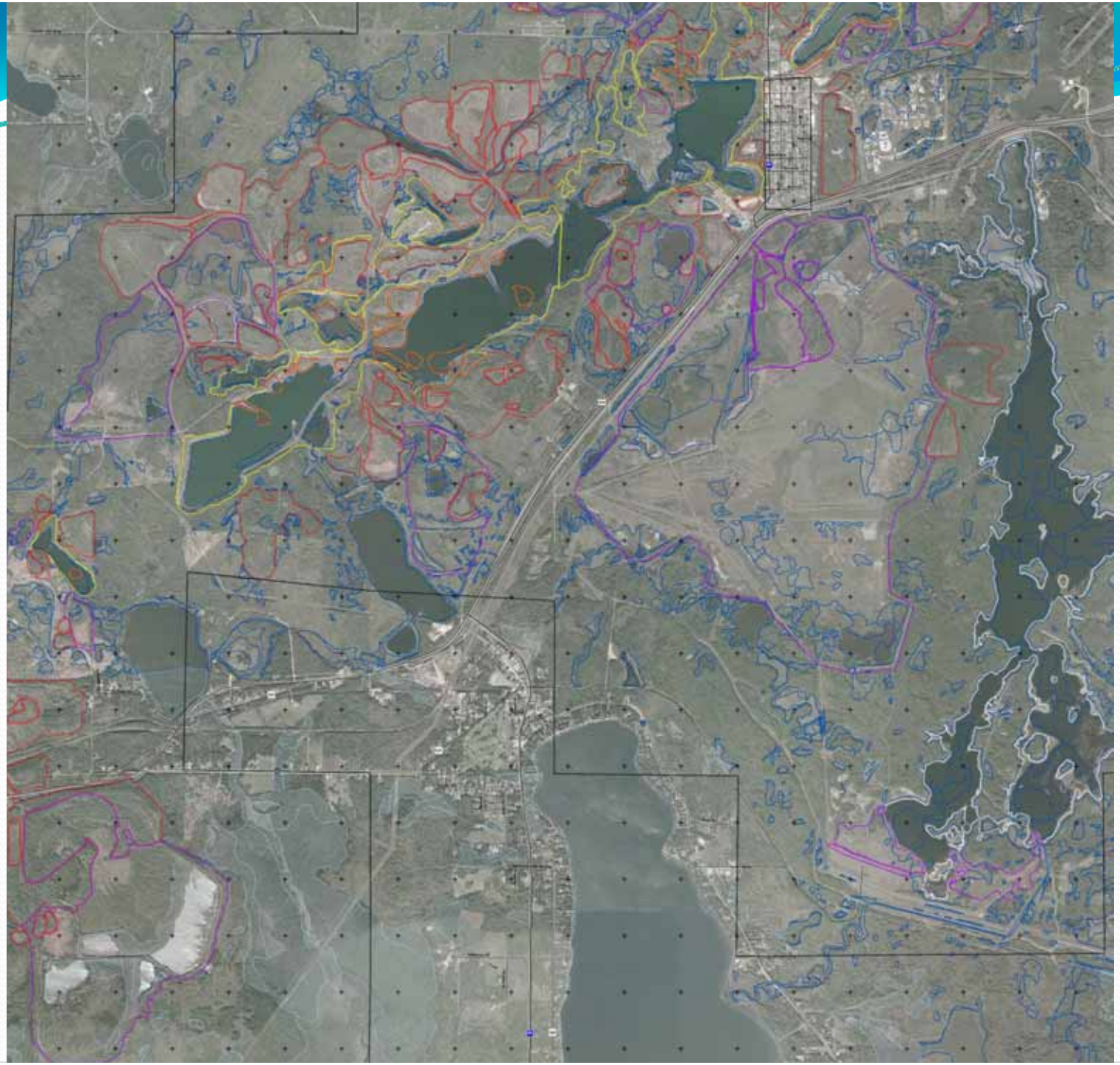
4. 29. 2005

13. 7. 2005

9. 17. 2004

7. 12. 2005

7. 12. 2005



# Conclusions

- Wetlands appear to have predominantly formed on tailings basins – often high quality
- Mine pits have the potential to be developed into diverse ecological systems
- Impoundments can establish wetlands in other areas
- Including wetlands into future reclamation planning can provide economic and ecological benefits
- Results of this study will help identify potential