Water Management:
Issues, Challenges and Opportunities in the 21st Century

Environment and Sustainable Resource Development

PNWER

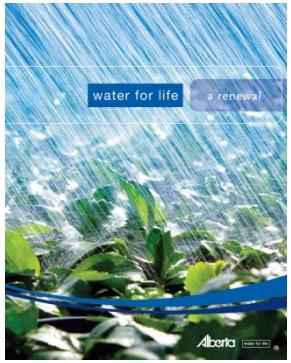
July 2014

Outline

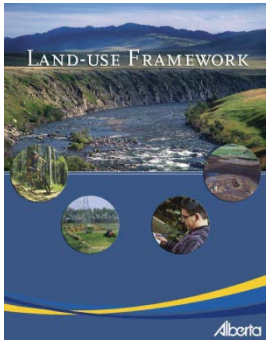
- **Mandate**
- **Focus Areas**
- **Collaboration Opportunities**

Mandate: *What*

- **Water for Life**
  - Whole of government response to meeting water outcomes
    - Safe, secure drinking water supply
    - Healthy aquatic ecosystems
    - Reliable, quality water supplies for a sustainable economy
  - Strategy spans water system (from strategy to regulatory to knowledge and information; economy wide)
    - Action plan, research strategy, partners (WPACS)



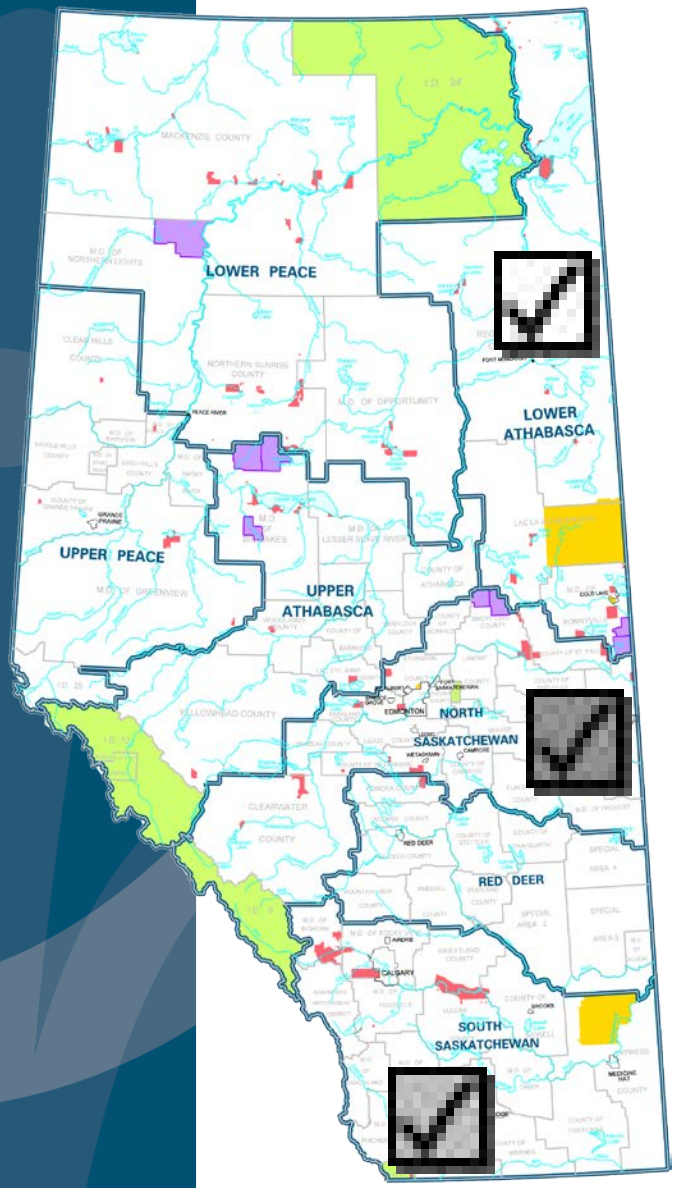
- **Land-Use Framework**
  - Forward looking planning paradigm based on watersheds, and reflects environmental, economic and social interests



Mandate: *How*

Integrated Resource Management System

Regional-based Planning



- Addressing the sum total of all development activities affecting the environment
- Planning horizon of at least 50 years
- Define desired outcomes for the region
- Identify strategies and proactive actions to achieve outcomes

Management Frameworks

Mid Winter (January 1 to April 15) Weeks 1 - 15	
Weekly Flow Triggers (m^3/s)	Cumulative Water Withdrawal Limits
more than 270 m^3/s	16 m^3/s
150 to 270 m^3/s	6% of Weekly Flow
91.6 to 150 m^3/s	9 m^3/s
87 to 91.6 m^3/s	Weekly Flow minus 82.6 m^3/s
less than 87 m^3/s	4.4 m^3/s

Early Spring (April 16 to May 6) Weeks 16 - 18	
Weekly Flow Triggers (m^3/s)	Cumulative Water Withdrawal Limits
more than 98.6 m^3/s	16 m^3/s
87 to 98.6 m^3/s	Weekly Flow minus 82.6 m^3/s
less than 87 m^3/s	4.4 m^3/s

Late Spring (May 7 to June 10) Weeks 19 - 23	
Weekly Flow Triggers (m^3/s)	Cumulative Water Withdrawal Limits
more than 102.6 m^3/s	20 m^3/s
87 to 102.6 m^3/s	Weekly Flow minus 82.6 m^3/s
less than 87 m^3/s	4.4 m^3/s

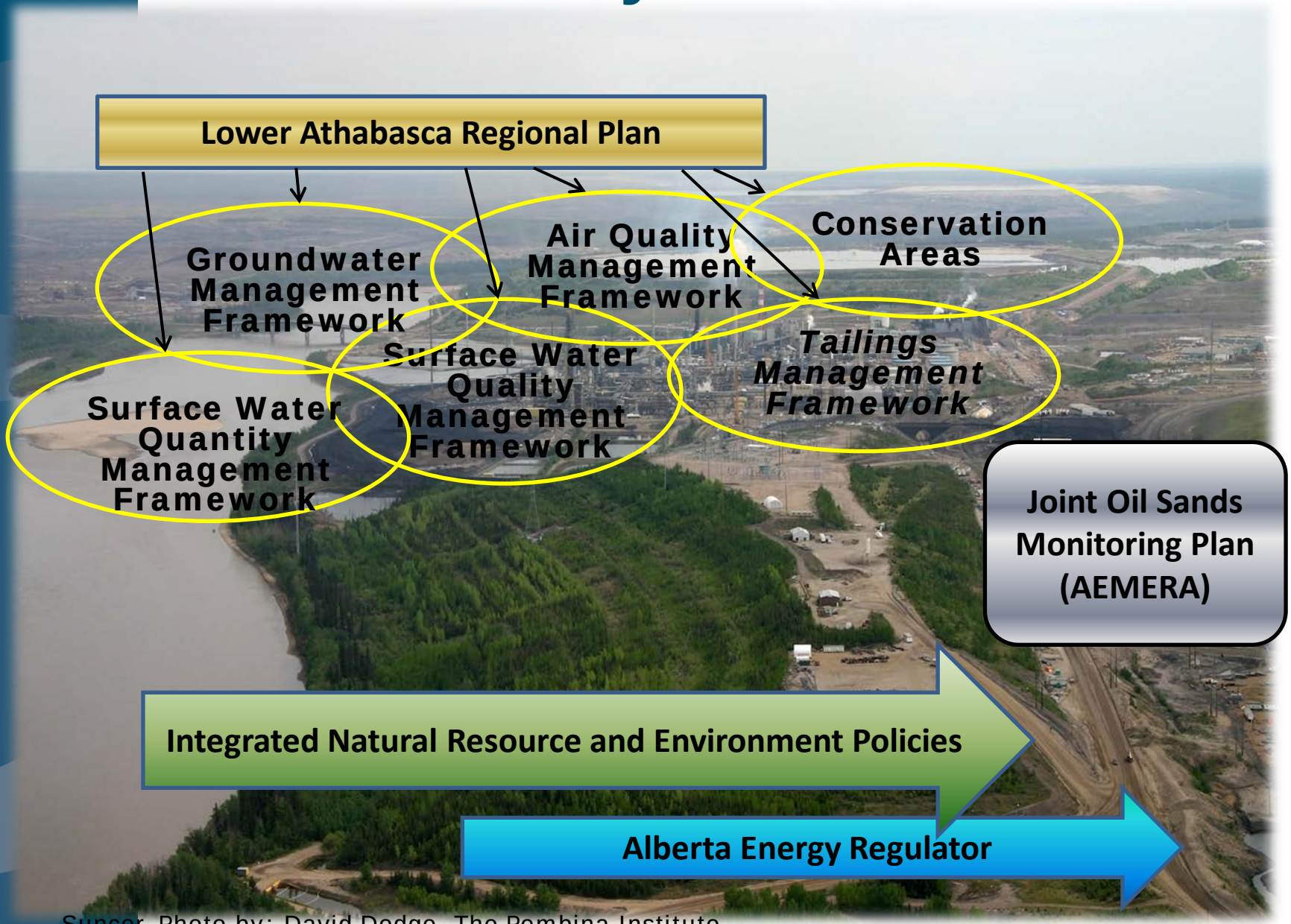
Summer/Fall (June 11 to October 28) Weeks 24 - 43	
Weekly Flow Triggers (m^3/s)	Cumulative Water Withdrawal Limits
more than 111.6 m^3/s	29 m^3/s
87 to 111.6 m^3/s	Weekly Flow minus 82.6 m^3/s
less than 87 m^3/s	4.4 m^3/s

Early Winter (October 29 to December 31) Weeks 44 - 52	
Weekly Flow Triggers (m^3/s)	Cumulative Water Withdrawal Limits
more than 200 m^3/s	16 m^3/s
150 to 200 m^3/s	8% of Weekly Flow
94.6 to 150 m^3/s	12 m^3/s
87 to 94.6 m^3/s	Weekly Flow minus 82.6 m^3/s
less than 87 m^3/s	4.4 m^3/s

Reporting

- Results reported

IRMS Overlay

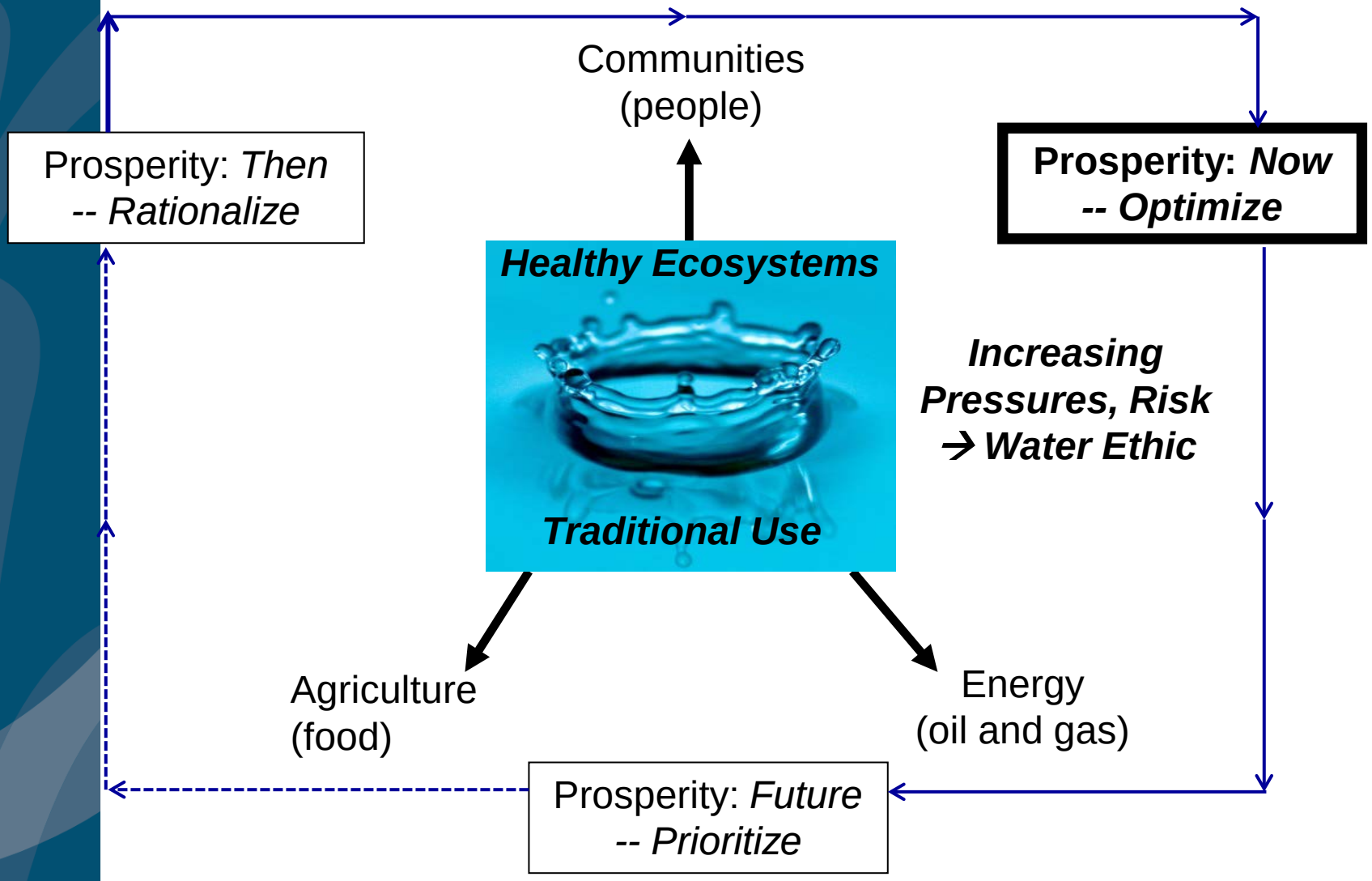


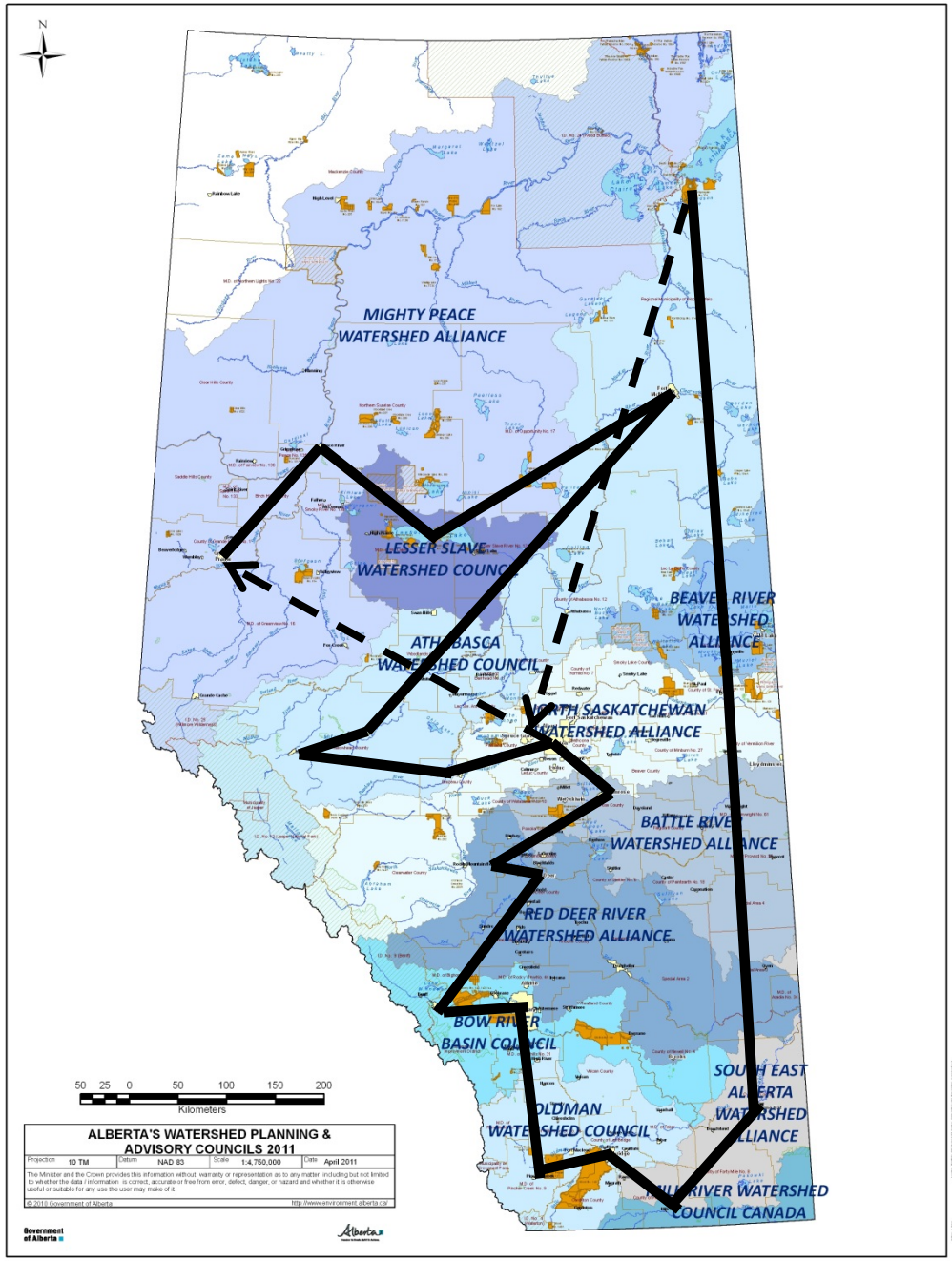
Suncor. Photo by: David Dodge, The Pembina Institute

Focus Areas

- **Responsive**
  - Flooding mitigation
  - Invasive species
- **On-going**
  - Lower Athabasca Water Management Framework (phase 2)
  - Wetlands
- **Proactive**
  - Water conversation
    - Hydraulic Fracturing, Healthy Lakes, Water Management, Sustainable Drinking Water Systems

Alberta Water Nexus





- **Water Conservation Policy for Oil and Gas**
  - Water Use Hierarchy
  - Net effects
- **Water Bank Pilot**
  - System manage water use in time and place
- **Lake Management Framework**
  - Lakes vision, clarity of roles and responsibilities
- **Sustainable Drinking Water Systems**
  - Regional governance models to support full cost accounting

Collaboration Opportunities

- **Literacy**
  - Food/Energy/Community water nexus
  - Information portals
- **Best management practices**
  - Conservation, efficiency, productivity
    - Hydraulic Fracturing (play-based approaches)
    - Municipalities (water re-use)
  - Offsets (wetlands)
    - Quantification and verification protocols, registries, specialist certification
- **Research agenda**
  - Integrated watershed management
  - Adaptation and water management