

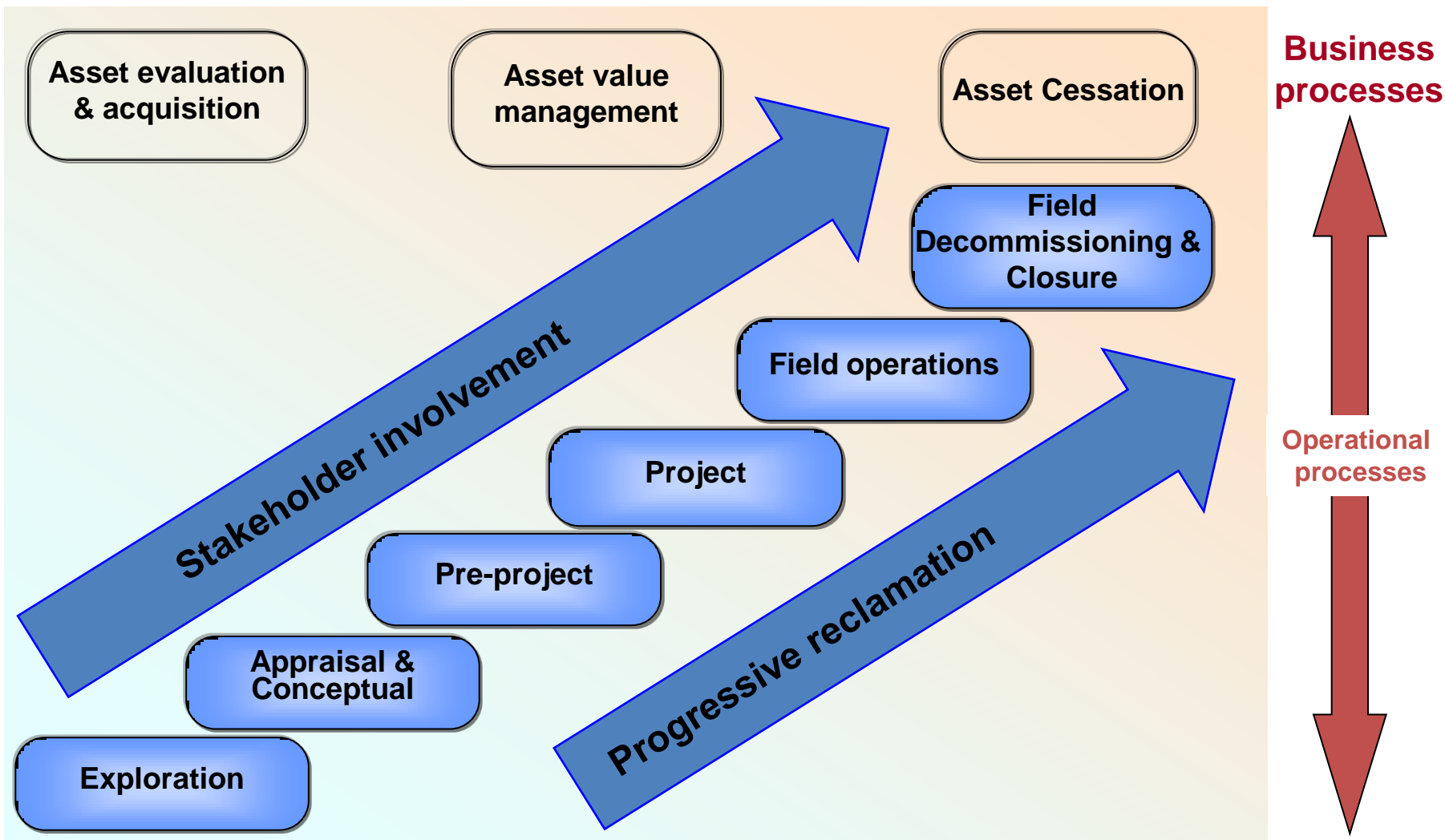


# Closing the Loop, from the Beginning

**Jean-Michel Gires**  
President & CEO  
TOTAL E&P Canada



# 'Closing the Loop' is our Obligation



*Reclamation is integral to CSR practices*

# Characteristics of Oil Sands in Canada

- Canada's boreal forest: 3.2 million km<sup>2</sup>
- Made up of a diverse and complex ecosystem
  - Slow growing in a cold climate
  - Mosaic of trees, wildlife, wetlands, highlands, lowlands
- Oil sands are 140,000 km<sup>2</sup> of which:
  - 4,800 km<sup>2</sup> is mineable (0.1% of Canada's or 1% of Alberta's boreal forest)
  - ~ 20 000 km<sup>2</sup> considered for in situ developments
  - Disturbed area is 602 km<sup>2</sup> (< city of Edmonton)



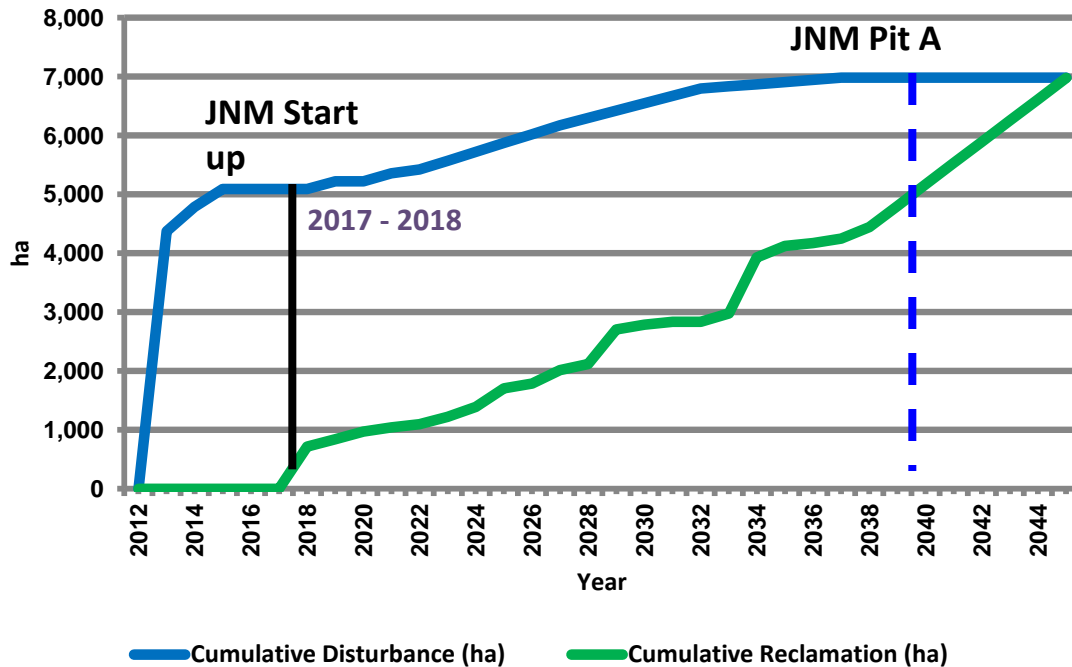
***Characteristics make reclamation challenging***

# Critical to Close the Loop: Solutions & Methods



*Progressive and complete reclamation using best practices*

# Joslyn North Mine Case Study & Conceptual Closure Plan:



- ▶ Maximum disturbance limited to 5,000 ha
- ▶ Progressive reclamation from start of the project with 60% by closure, remainder within 7 years
- ▶ Compensation lake mitigates loss of fish habitat by a 2:1 ratio
- ▶ Loss of wetlands and disturbance to wildlife and species at risk to be mitigated by avoidance, R&D and off-site offsets

*Reducing disturbance and accelerating reclamation*

# Addressing Challenges through Innovation & Collaboration

## Improving and innovating to address key challenges:

- Management of tailings, process-affected water and ecological impact on surrounding ecosystems
- Sustainable ecosystems on tailing deposits after closure
- Reclamation of sustainable peatland wetland ecosystems
- Sustainable aquatic pit lake ecosystem



## Ongoing R&D Work

- At TOTAL level
  - Environmental R&D team at TOTAL in Calgary
  - TOTAL Research Centers: CSTJF (Pau) and PRDML (Lacq)
- Specific Joint Industry Projects
  - Oil Sands Leadership Initiative (OSLI)
  - Oil Sands Tailings Consortium (OSTC)
  - Canadian Oil Sands Network for R&D (CONRAD) Environmental Research & Reclamation Group

## Working with Stakeholders

- First Nations Agreements
- ENGO's
- Cumulative Environmental Management Association – Reclamation Work Group (CEMA)



***Collaboration essential for success***