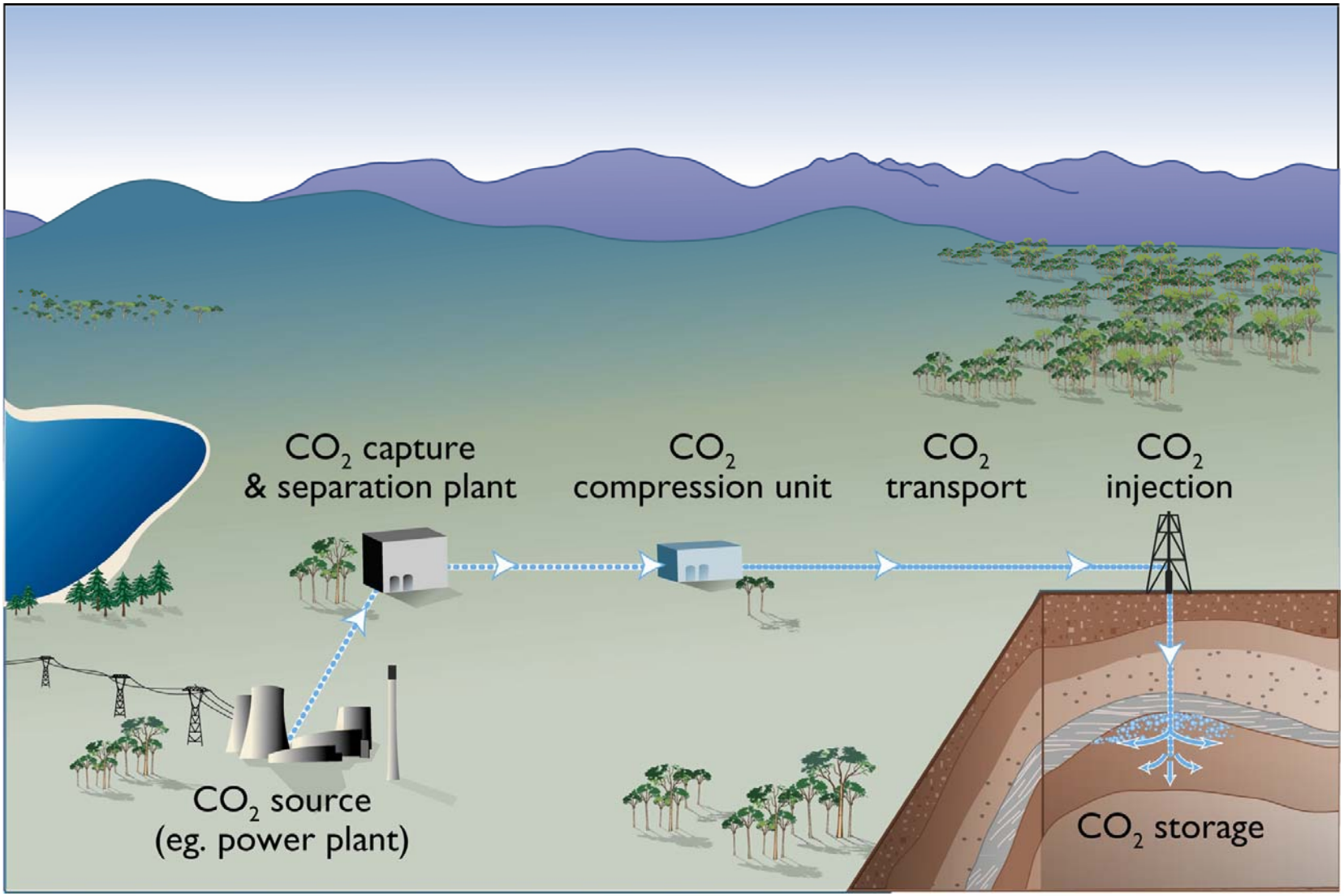
The Otway Basin Pilot Project (OBPP)

Demonstrating Geological Storage of Carbon Dioxide (CO_2) in Australia

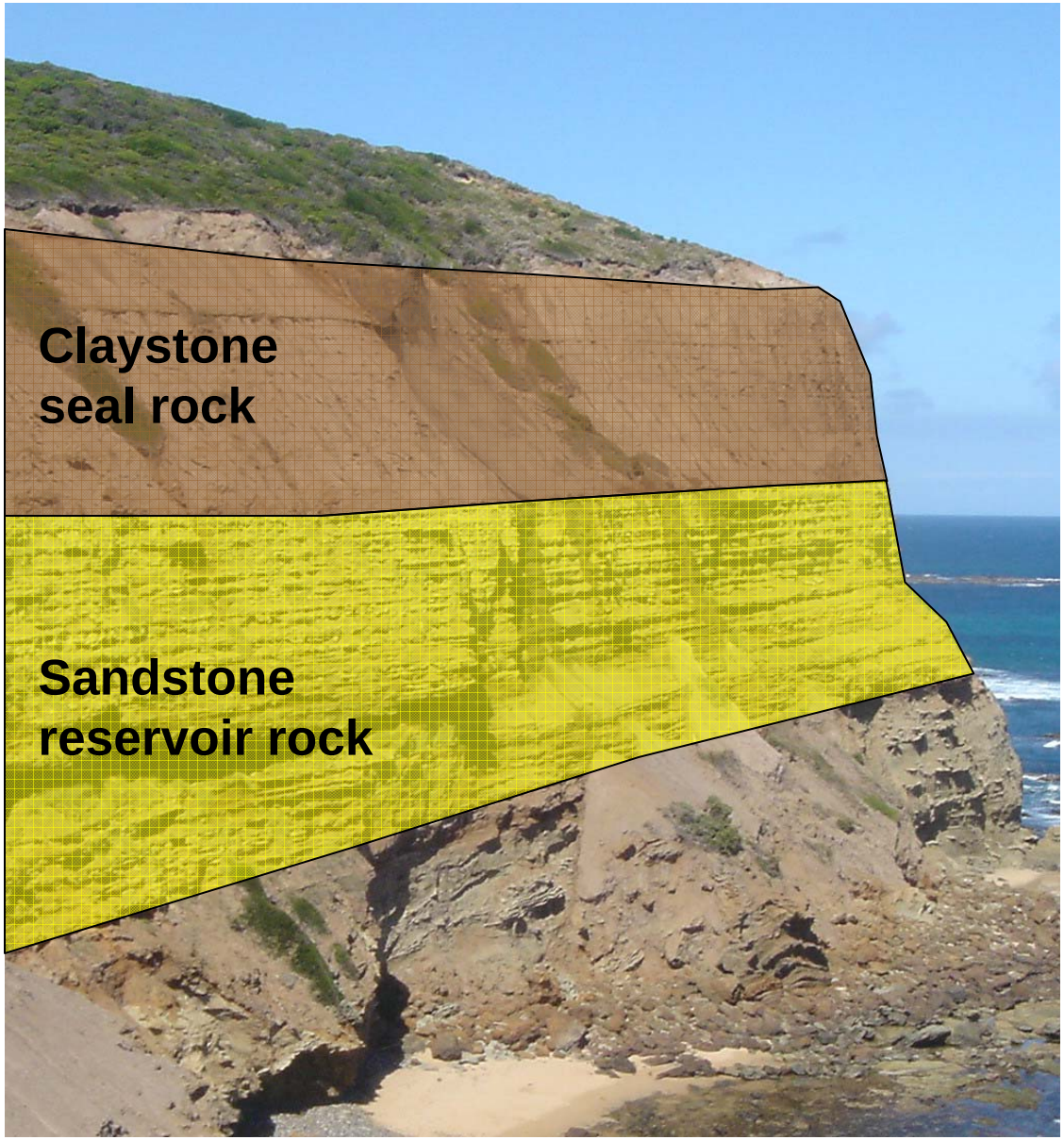
Overview – March 31st 2006

CRC for Greenhouse Gas Technologies (CO2CRC)

The Carbon Dioxide Capture and Storage Process



Geological Storage of CO_2

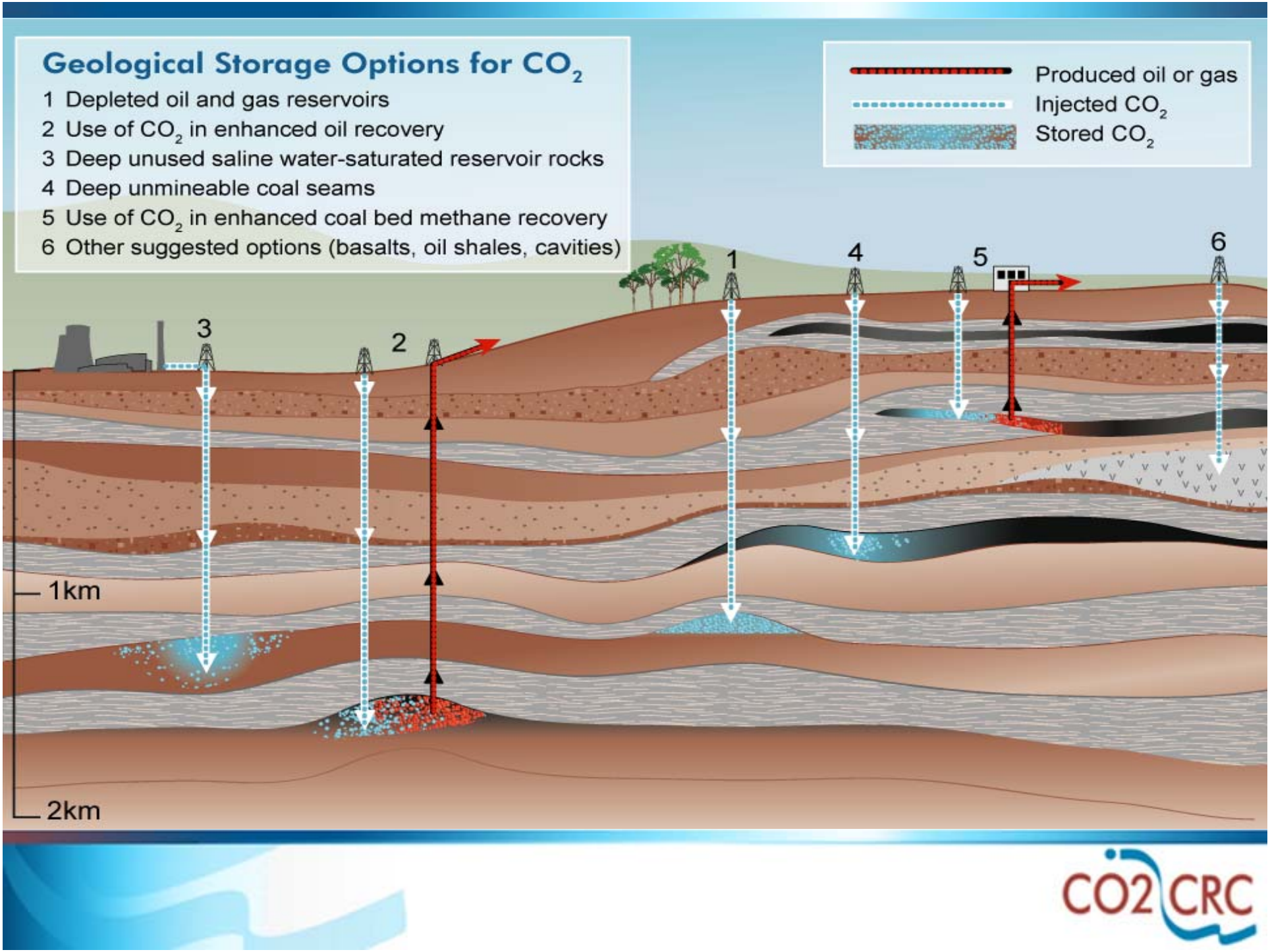


What do we need?

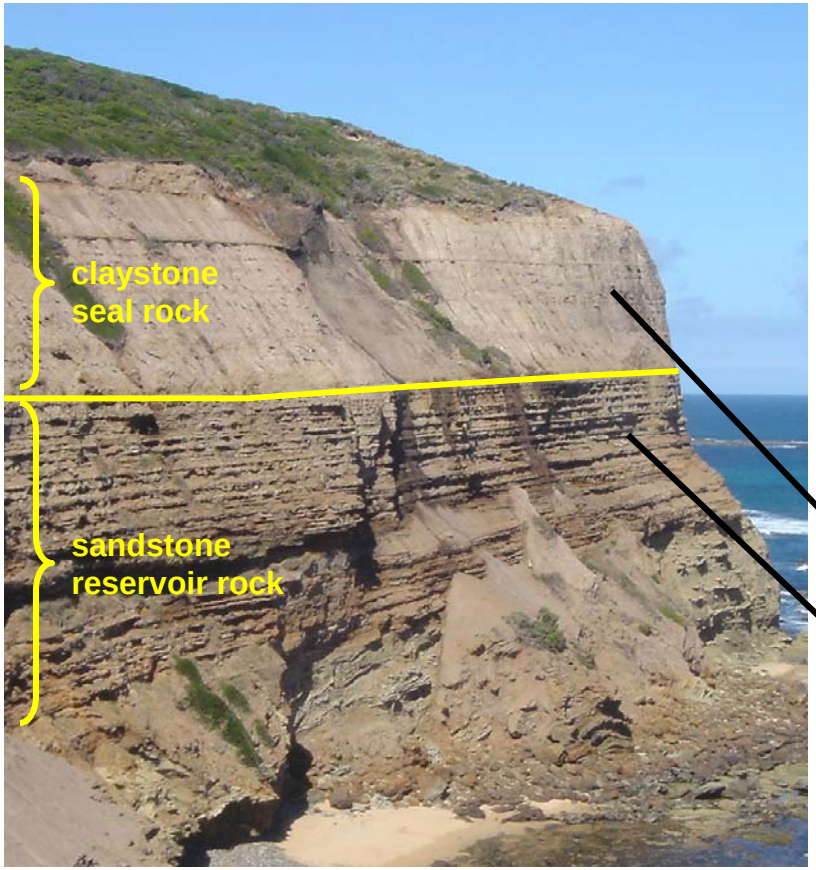
- **RESERVOIR ROCK – porous, e.g. sandstone**
- **SEAL ROCK – non-porous, e.g. claystone**

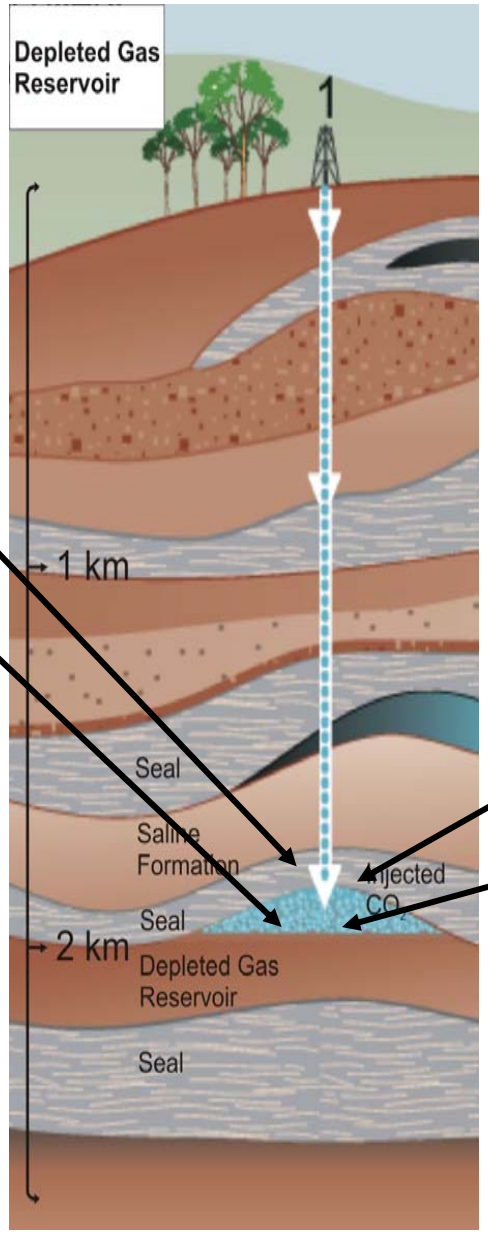
How does it work?

- **CO_2 is injected into porous reservoir rock**
- **CO_2 is held in place by overlying non-porous seal rock**

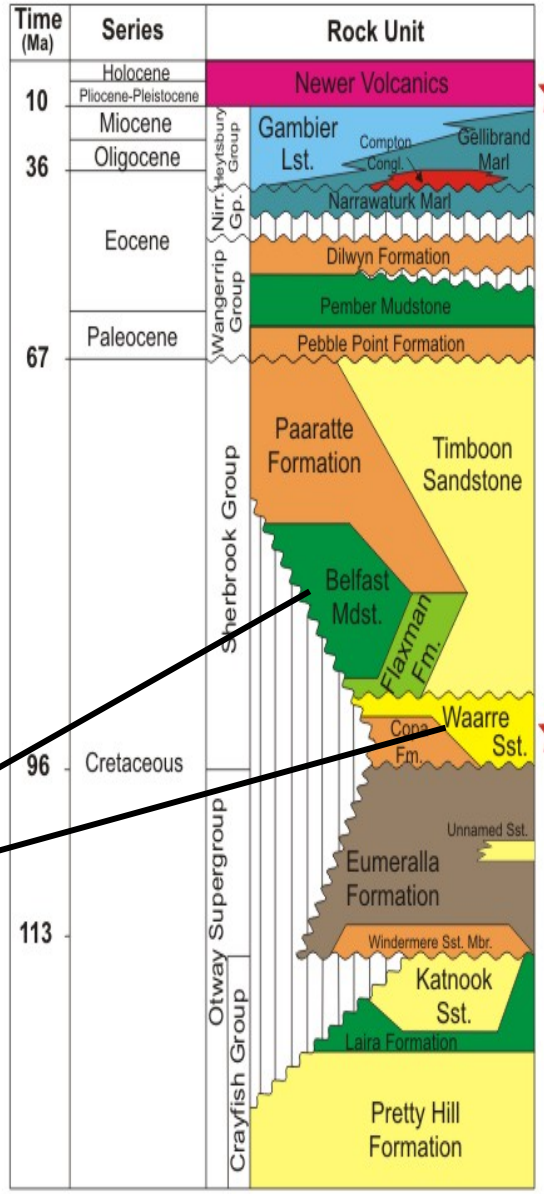

Geological Storage Options for CO_2
1 Depleted oil and gas reservoirs
2 Use of CO_2 in enhanced oil recovery
3 Deep unused saline water-saturated reservoir rocks
4 Deep unmineable coal seams
5 Use of CO_2 in enhanced coal bed methane recovery
6 Other suggested options (basalts, oil shales, cavities)
Produced oil or gas
Injected CO_2
Stored CO_2
1
2
3
4
5
6
1km
2km

Geological Storage of CO_2; Otway Basin Stratigraphy





Otway Basin Stratigraphy



CO_2 storage sites:

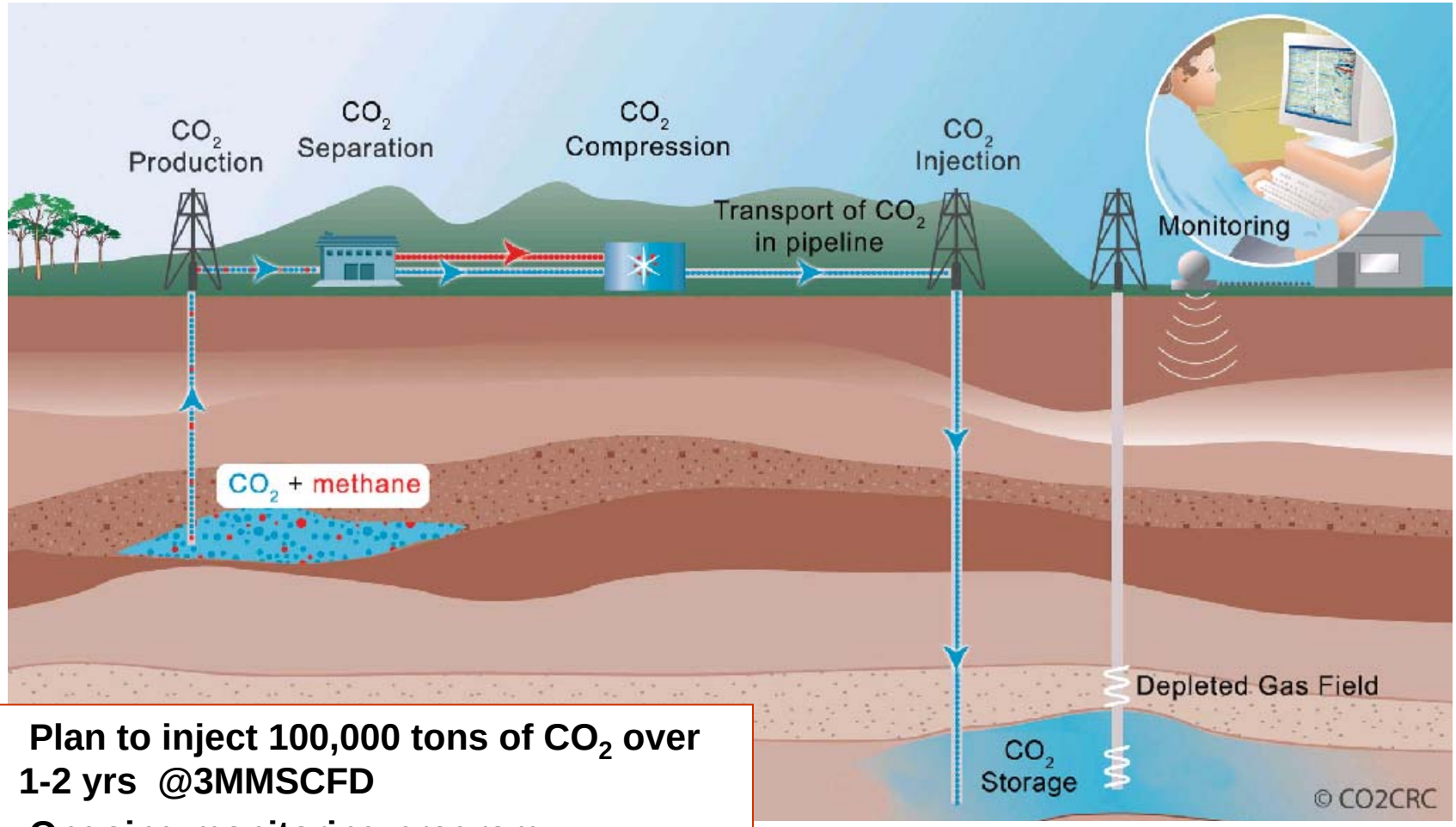
- **Several kilometres below surface**
- **Similar locations to oil and gas**

Proposed Otway Basin Pilot Project Objectives

- To demonstrate that CO_2 capture and storage is a viable, safe, secure option for greenhouse gas abatement in Australia by
  - Safely producing gas from the source
  - Safely processing gas to produce a concentrated CO_2 stream
  - Safely transporting CO_2 from source to sink
  - Safely injecting CO_2 into deep underground reservoirs
  - Safely storing CO_2 in deep underground reservoirs
  - Modelling and monitoring stored CO_2 and confirming effectiveness
  - Safely removing facilities and restoring sites
- And
  - Communicating to all stakeholders
  - Capturing all research outcomes

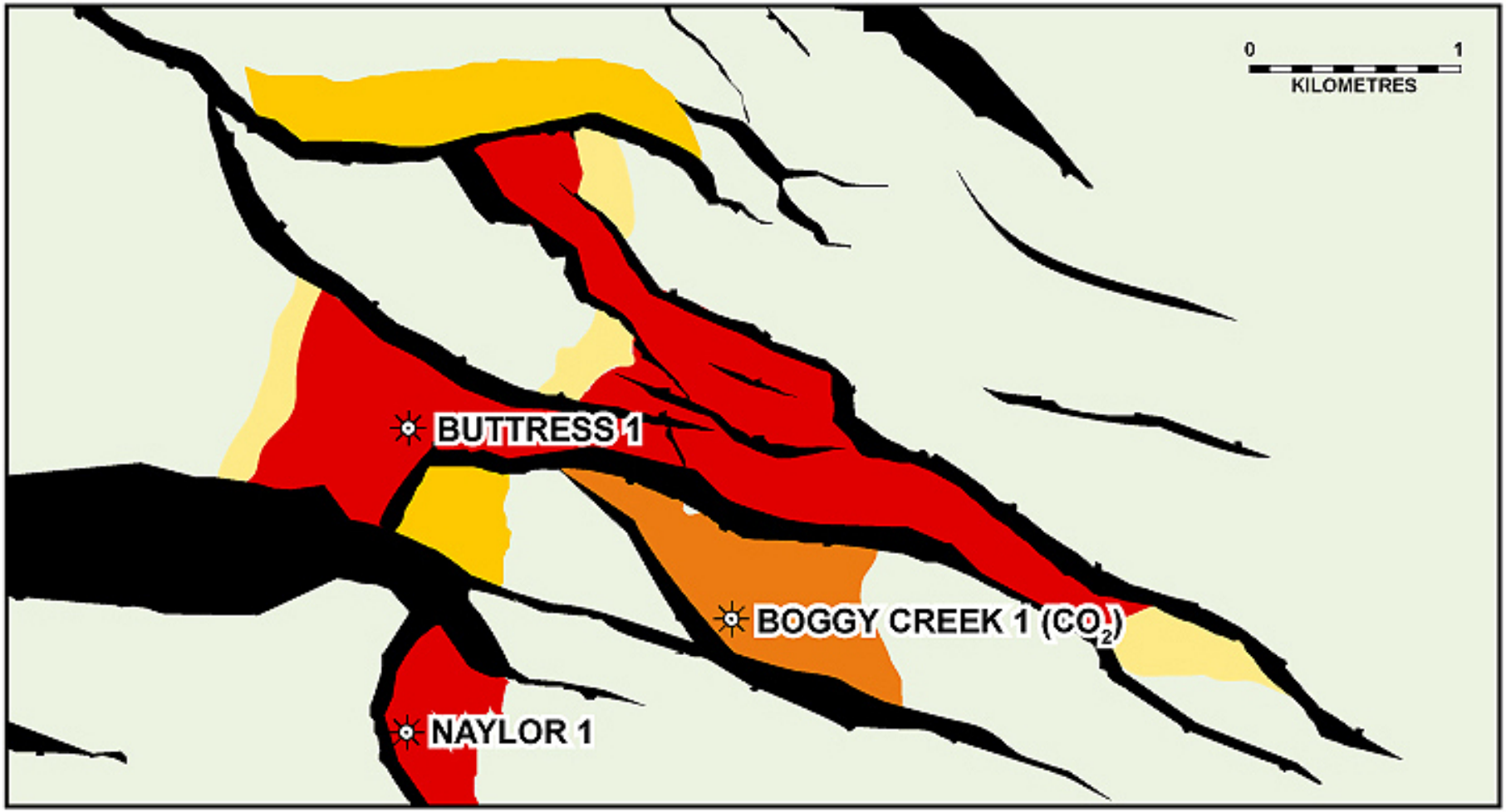
CO2CRC

Conceptual Representation of Proposed Otway Basin Pilot Project

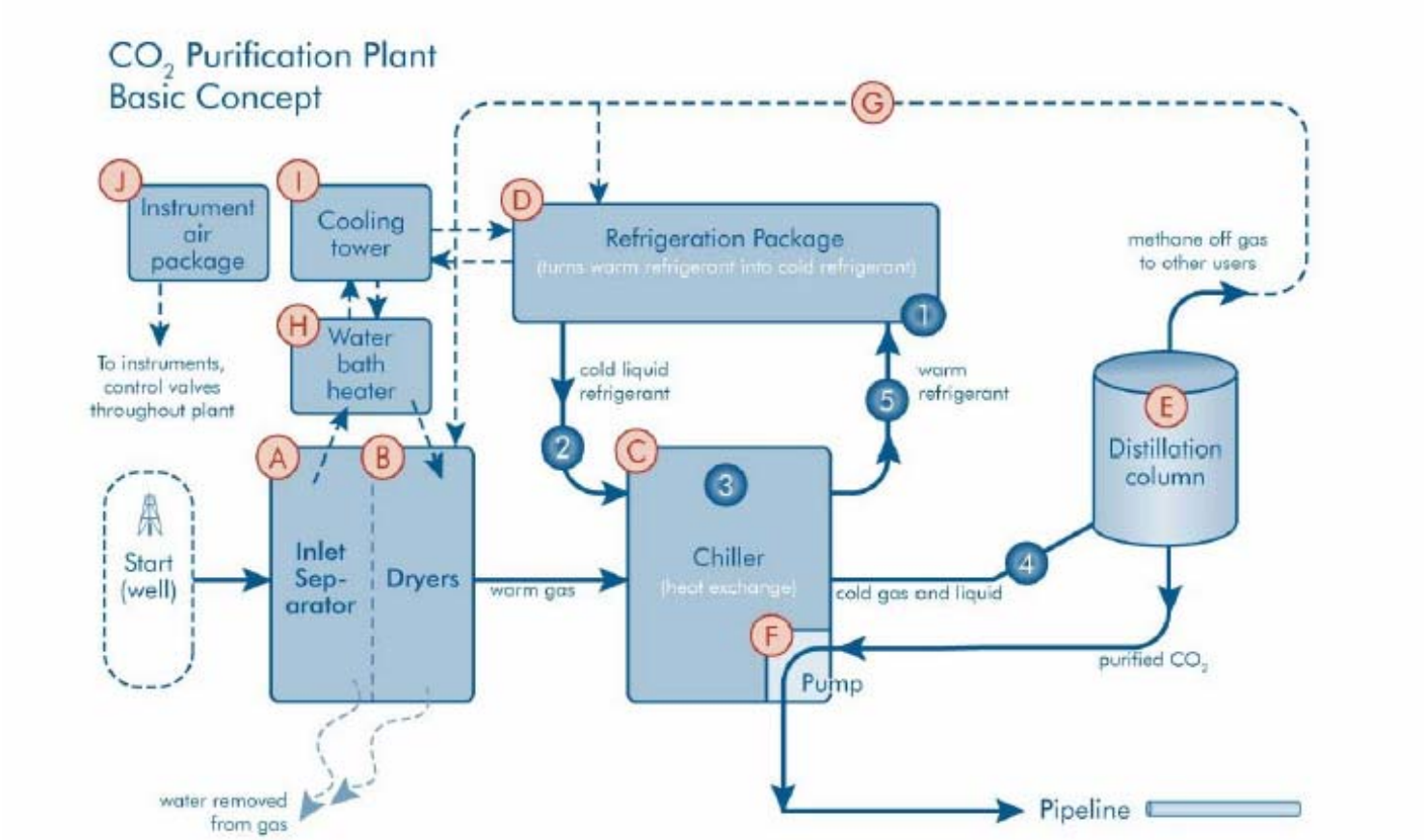


- Plan to inject 100,000 tons of CO_2 over 1-2 yrs @3MMSCFD
- Ongoing monitoring program

Sealing Faults in the vicinity of the Pilot Project



Proposed Plant Concept



Subject to DPI and Shire Planning Approvals

Confidence in Proposed Site

The Otway Site is appropriate for a Pilot

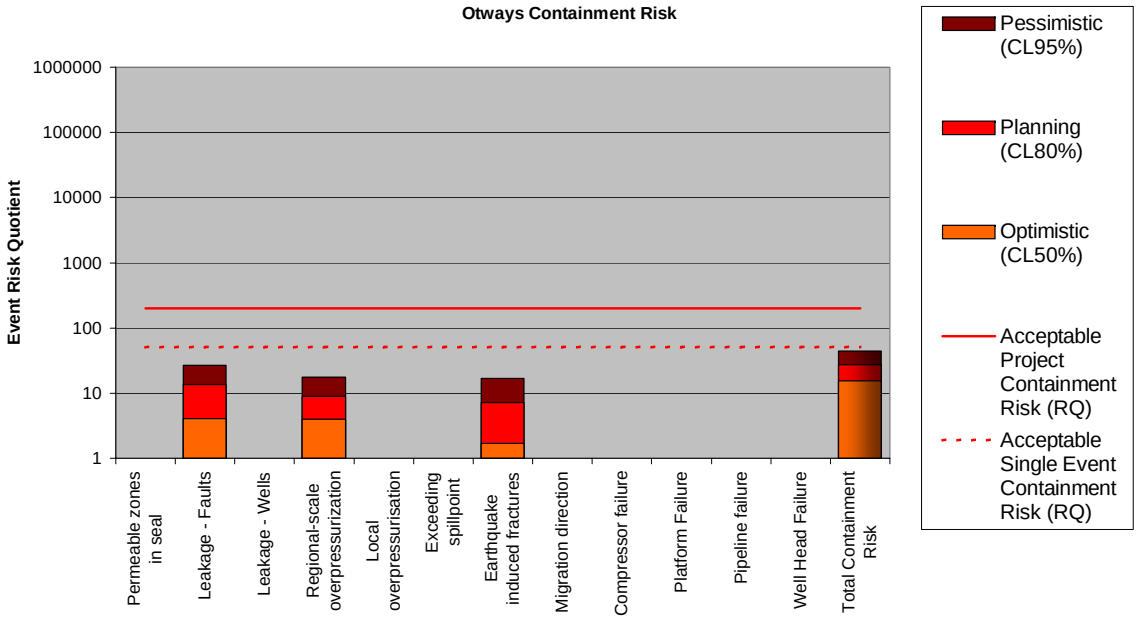
- Depleted gas field
- Deep injection far below any useable water sources
- Good geology to keep the CO_2 trapped
- Established oil and gas operations in the area

Quantitative Risk Assessment (QRA)

- Considered both natural and man-made risk events.
- "Expert Panel" based approach

Risk Management

- Adherence to established operational procedures and standards
- Comprehensive Monitoring program



Monitoring at the Proposed Storage Site

- **Monitoring across: Atmospheric, Near Surface and Subsurface domains**
- **Predictive computer-based models to understand the behaviour of the CO_2 in the sub-surface**
- **Validate predictive models through ongoing monitoring**
- **Full set of Operational Measurements ie. alarms, gauges etc.**
- **Well integrity measurements**
- **Specific Key Performance Indicators agreed with regulators**

Proposed Pilot Project: Summary and Next Steps

- **Research Project :**
  - **To be conducted by a not-for-profit organisation.**
  - **To prove that CCS is possible under Australian conditions.**
  - **To undertake comprehensive scientific effort**
    - **Universities, CSIRO and industry experience**
  - **To be tightly regulated**
    - **Petroleum Act: Victorian Department of Primary Industry (DPI)**
    - **Environmental Protection Act: Victorian EPA**
    - **Planning and Environment Act: Local Shire**
    - **Other Regulators, Department of Sustainability and Environment (DSE), Department of Environment and Heritage (DEH) will be kept updated regarding project**
- **Next Steps:**
  - **Secure landholder agreements, and arrange assignment of lead contractor**
  - **Undertake soil gas sampling research and baseline surveys, and undertake testing of existing wells**
  - **Finalise project options**
  - **Obtain regulatory approvals**

CO2CRC and the Otway Basin Pilot Project

- **CO2CRC is not-for-profit research organisation, funded by government, industry, and research bodies**
- **The Pilot Project is a really important demonstration of the geological storage of CO_2 for Victoria, Australia and the World**
- **CO2CRC propose to inject purified CO_2 down to depth of 2000m and monitor it**
- **It will be subject to all the necessary planning and environmental approvals**
- **CO2CRC will be using safe, proven technology**
- **CO2CRC will have the highest standards of HSE**
- **There will be transparency about the Project at all times**
- **There will be community consultation & open engagement - CO2CRC wants to hear the community's views on the Project**

CO2CRC Participants:

Australian Government

Geoscience Australia

Australian Greenhouse Office

Department of Industry, Tourism and Resources

RIO TINTO

Schlumberger