



epic*energy*

QSN3 Project – The Next Big Thing!

YPF Networking Event
Melbourne
21 August 2009

Kristin Carey (Epic)
Engineering Manager
QSN3 Compression

Russell Carroll (Nacap)
Project Engineer
QSN3 Pipeline Looping

www.epicenergy.com.au

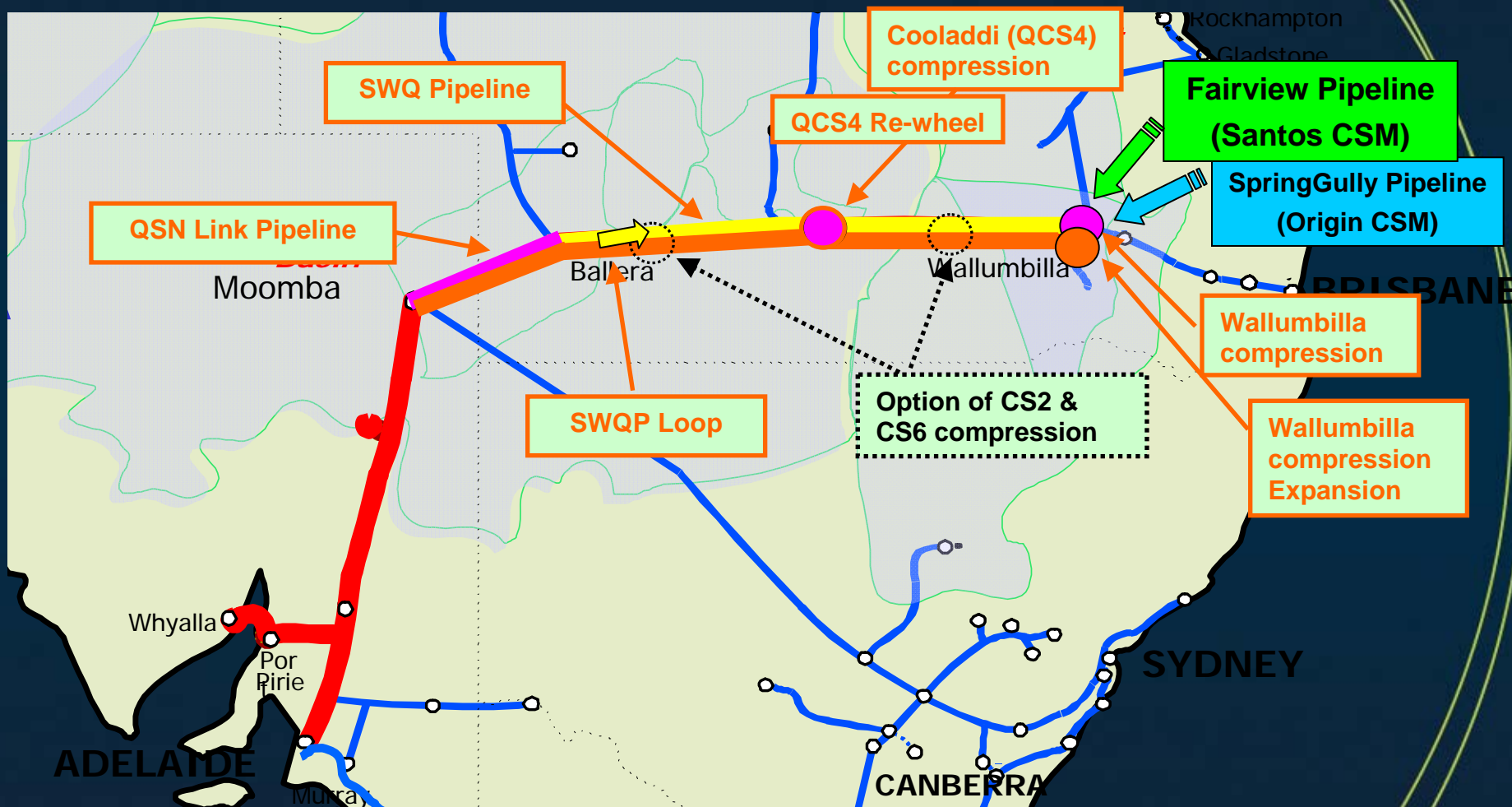
QSN3 Project – Where & What

- Development of the SWQP (South West Qld Pipeline) & QSN Link Pipeline
- Spans Qld & NSW
- 940km pipeline from Wallumbilla to Moomba
- Associated compression & facilities

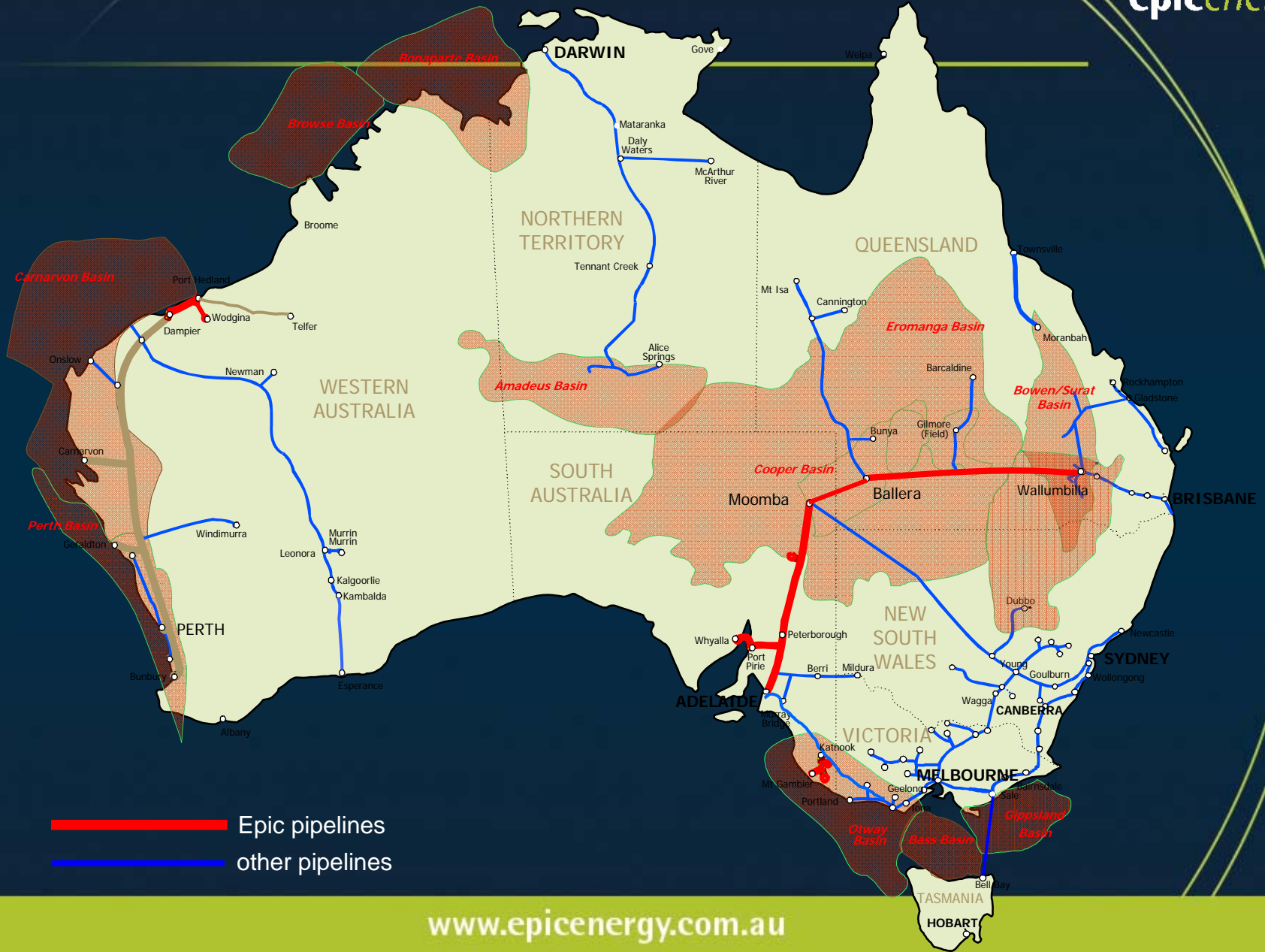


- 1996 – SWQP
- 2005 – Spring Gully Pipeline Connected
- 2007 – Flow Reversal & Fairview Pipeline Connected
- 2009 – “Stage 1” & Berwyndale Pipeline Connected
- 2012 – QSN3 & “Stage 2” option

SWQP Development



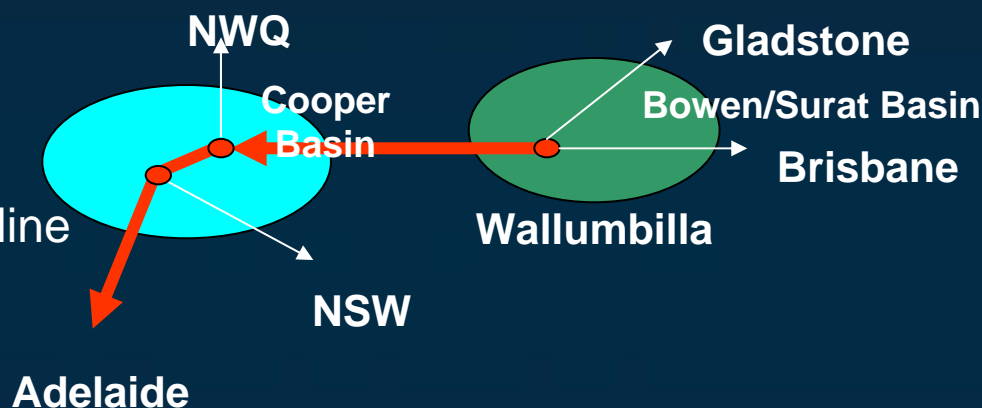
Market Context – Resources & Demand



Strategic Position

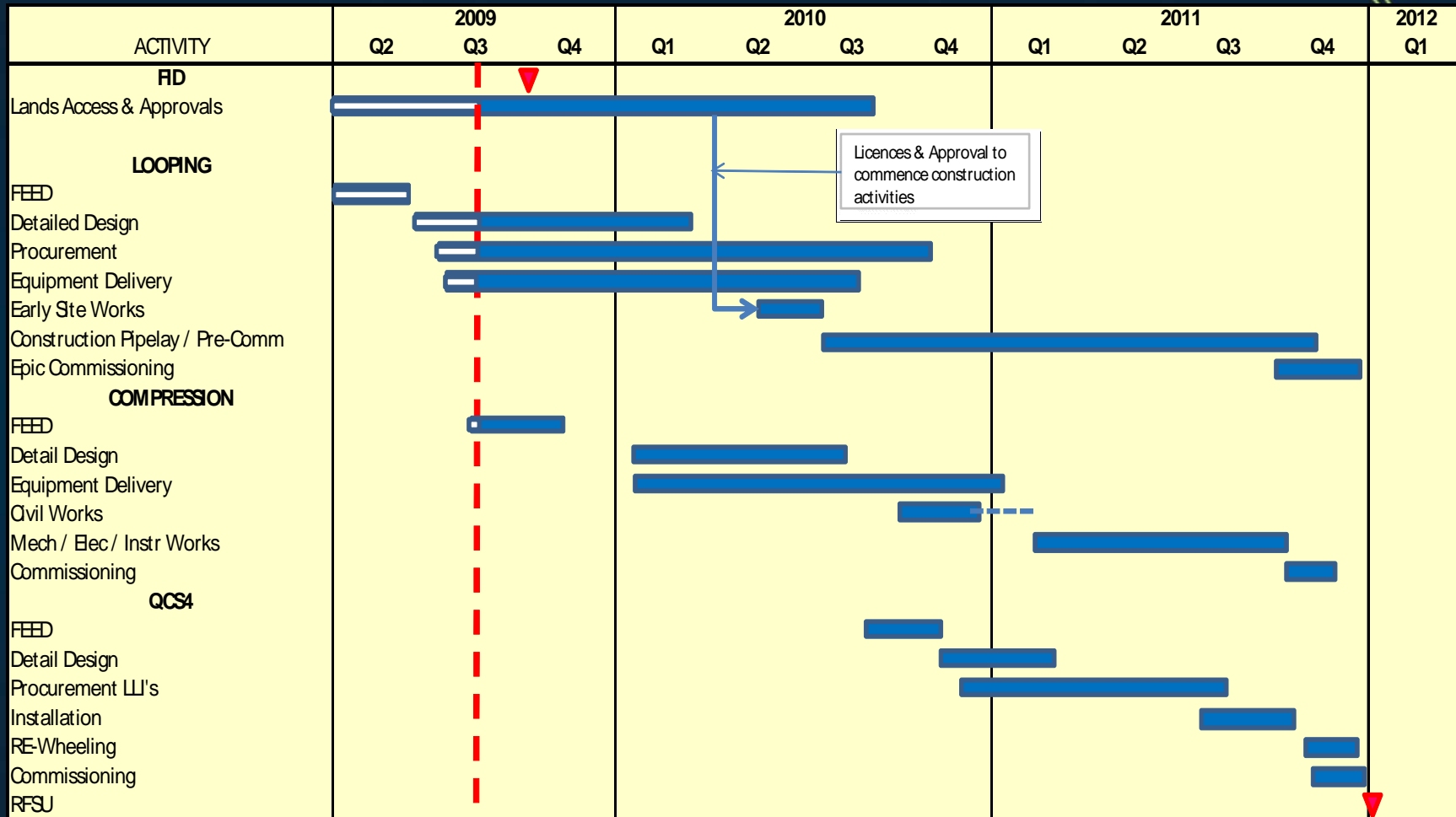
- SWQP/QSN operates as a flow controlled pipeline delivering gas into other pipelines for supply to 5 separate markets:

- Brisbane via RBP
- Gladstone via QGP
- Mt Isa via Carpentaria pipeline
- Adelaide via MAPS
- Sydney via MSP

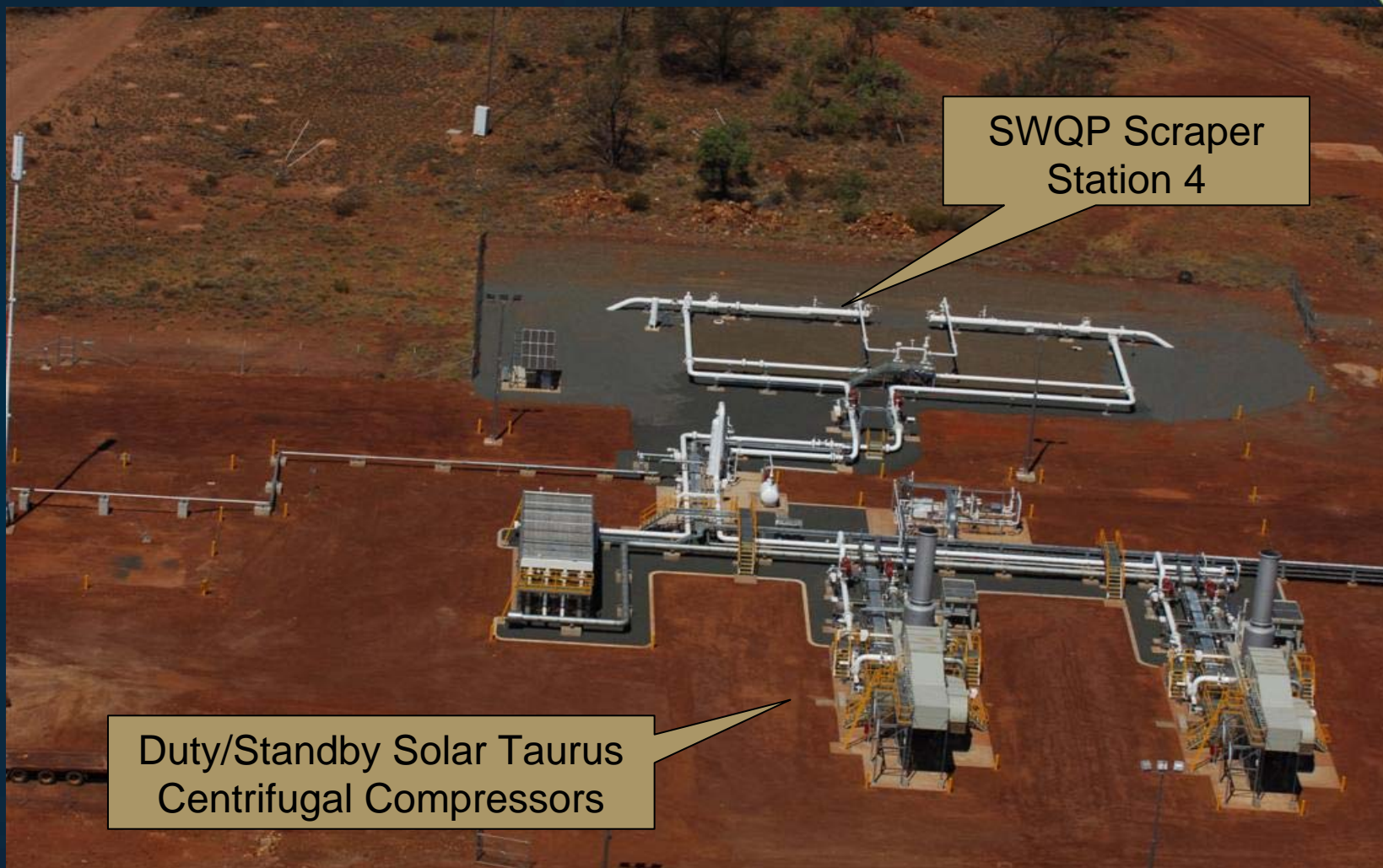


- Epic's Wallumbilla compressor and metering station is now a very important junction and trading hub in the eastern Australian gas market with supply from 3 separate major gas fields (Fairview, Spring Gully and Berwyndale)

When? - Summary Project Schedule



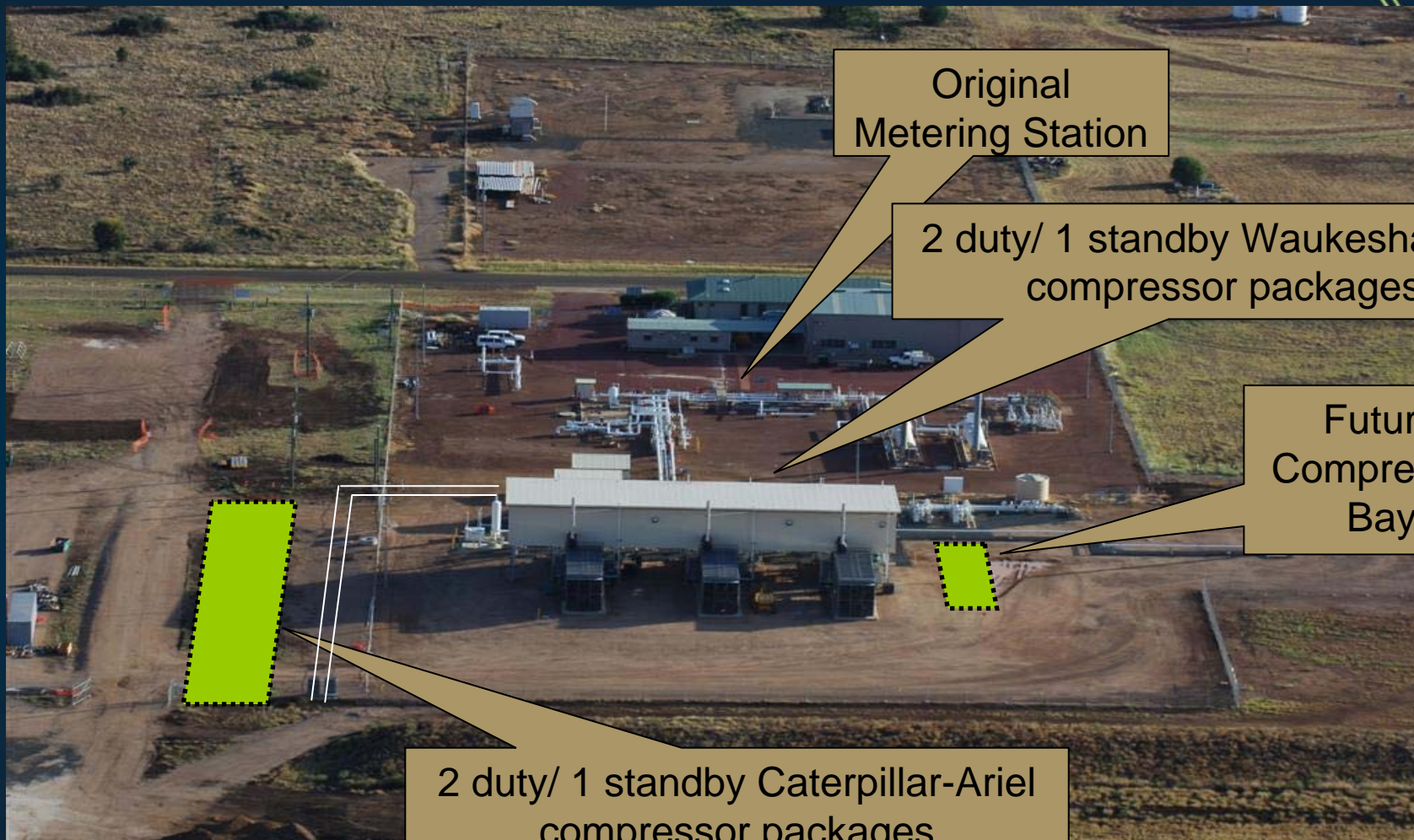
Cooladdie Compressor Station (QCS4)



SWQP Scraper
Station 4

Duty/Standby Solar Taurus
Centrifugal Compressors

Wallumbilla Compression Expansion



Original
Metering
Station

2 duty/ 1 standby Waukesha-Ariel
compressor packages

Future
Compressor
Bay

2 duty/ 1 standby Caterpillar-Ariel
compressor packages

QSN3 Project



Pipeline Looping and Construction of Associated Facilities

nacap

QSN3 Pipeline Looping

SWQP (755.5km, 16 Inch)

Constructed 1996 –1997 by Tenneco Alliance

QSN Link (183km, 16 Inch)

Constructed 2008 by Nacap for Epic Energy

QSN3 Pipeline Looping (939km, 18 Inch)

2010 – 2011 Looping of SWQP and QSN Link by Nacap for Epic Energy

QSN3 Pipeline Looping

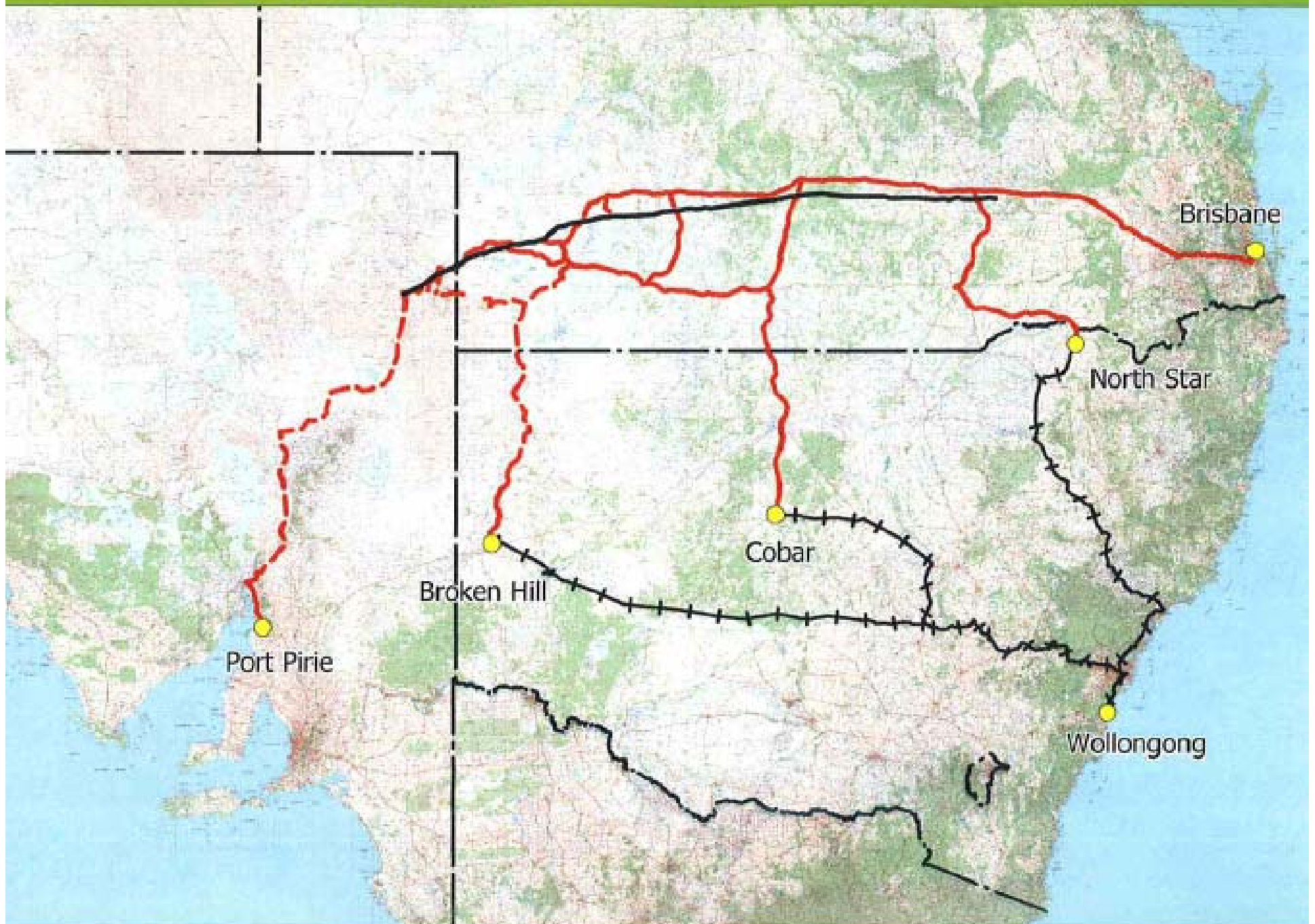
ECI / FEED to Contract Execution

- Nacap worked with Epic and WorleyParsons in FEED phase to produce estimated cost of the project
- ECI was a joint effort between Epic, Nacap and WorleyParsons to identify project risks and opportunities in an open and frank manner
- ECI benefits:
 - Combines the experience of the Pipeline Owner / Operator, Design Contractor, and Construction Contractor
 - As many project risks and opportunities as possible are identified prior to contract execution
 - During ECI phase, each risk element is allocated to either the Owner or Contractor after discussion and mutual agreement

Some Numbers on Pipe

- DN450 (18")
 - Wall thickness 9.1mm (light), 10.8mm (heavy), 12.7mm (“no rupture”)
 - Combination of Overseas and Australian Sourced
 - Combination of Overseas and Australian Coated
 - Internally FBE lined for improved gas flow characteristics
- Over 939km, this is approximately 100,000 Tonnes of Linepipe
- Delivery to 13 stockpile sites via rail and road – next slide

QSN3 LINE PIPE LOGISTICS MAP



QSN3 Pipeline Looping

Some Numbers on Accommodation

- Four transportable camp cores utilising 12 camp sites
- Two main camps capable of accommodating c.350 personnel
- Two “fly” camps capable of accommodating c.150 personnel

Special Construction Sections

- Two HDDs – Maranoa and Warrego Rivers
- Bored crossings - numerous sealed roads and one rail crossing
- 15km Crossing of Cooper Flood Plain
- Two Open Cut crossings of Cooper Creek

QSN3 Pipeline Looping: Mainline Construction

- Approx 14 months front end to back end
- Average progress at >4km per day
- Average pipe length = 17.7m
⇒ Targeted average >200 joints per day



QSN3 Pipeline Looping: Mainline Construction

Programme Drivers – Build Direction

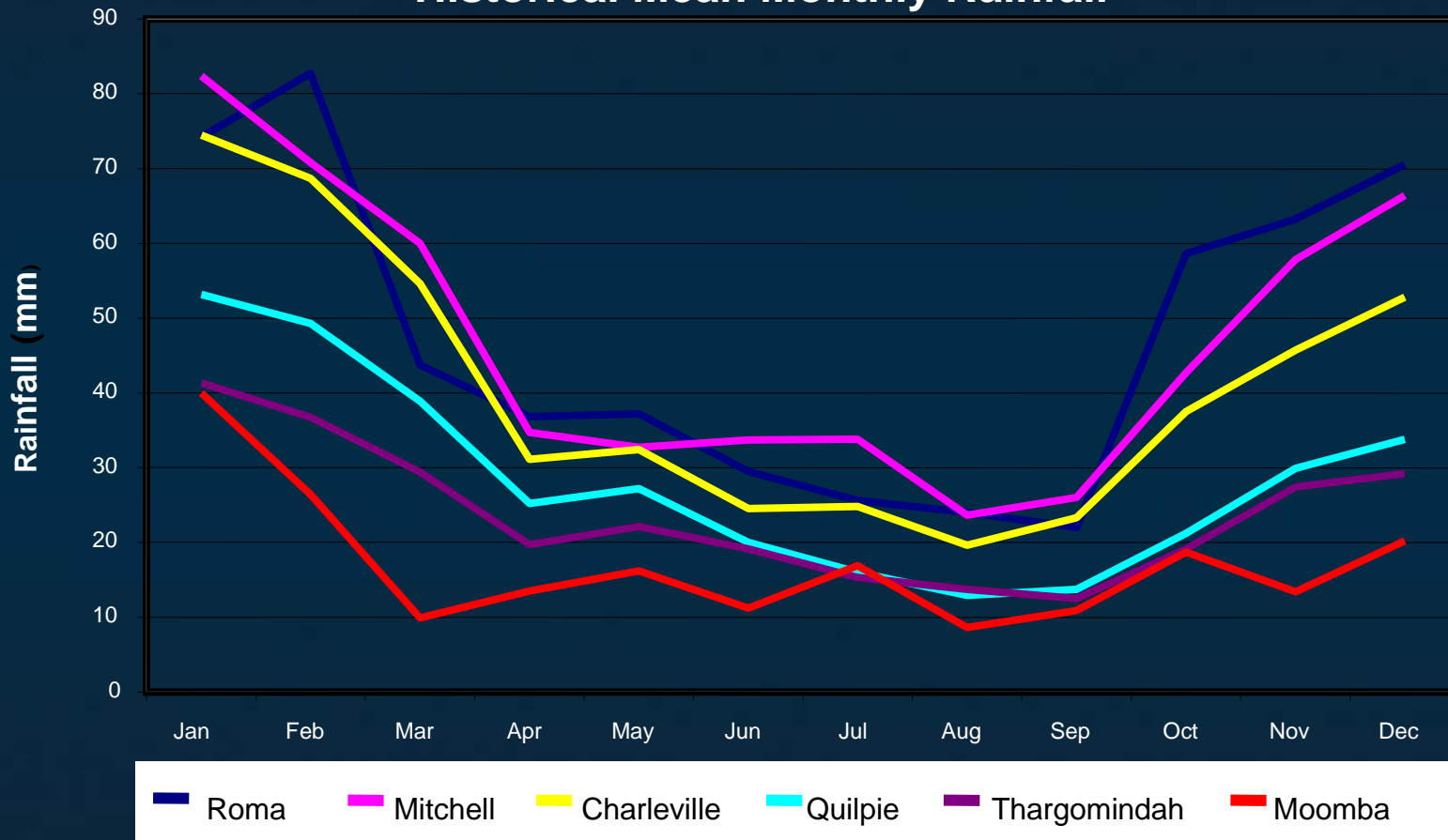
- QSN Loop to be constructed on south side of QSN Link
 - ⇒ QSN Loop will be constructed from west to east
- SQW Loop to be constructed on north side of SWQP
 - ⇒ SWQ Loop will be constructed from east to west

Depending on local conditions and available extra work space, reverse ROW may be implemented in isolated areas.



QSN3 Pipeline Looping: Mainline Construction

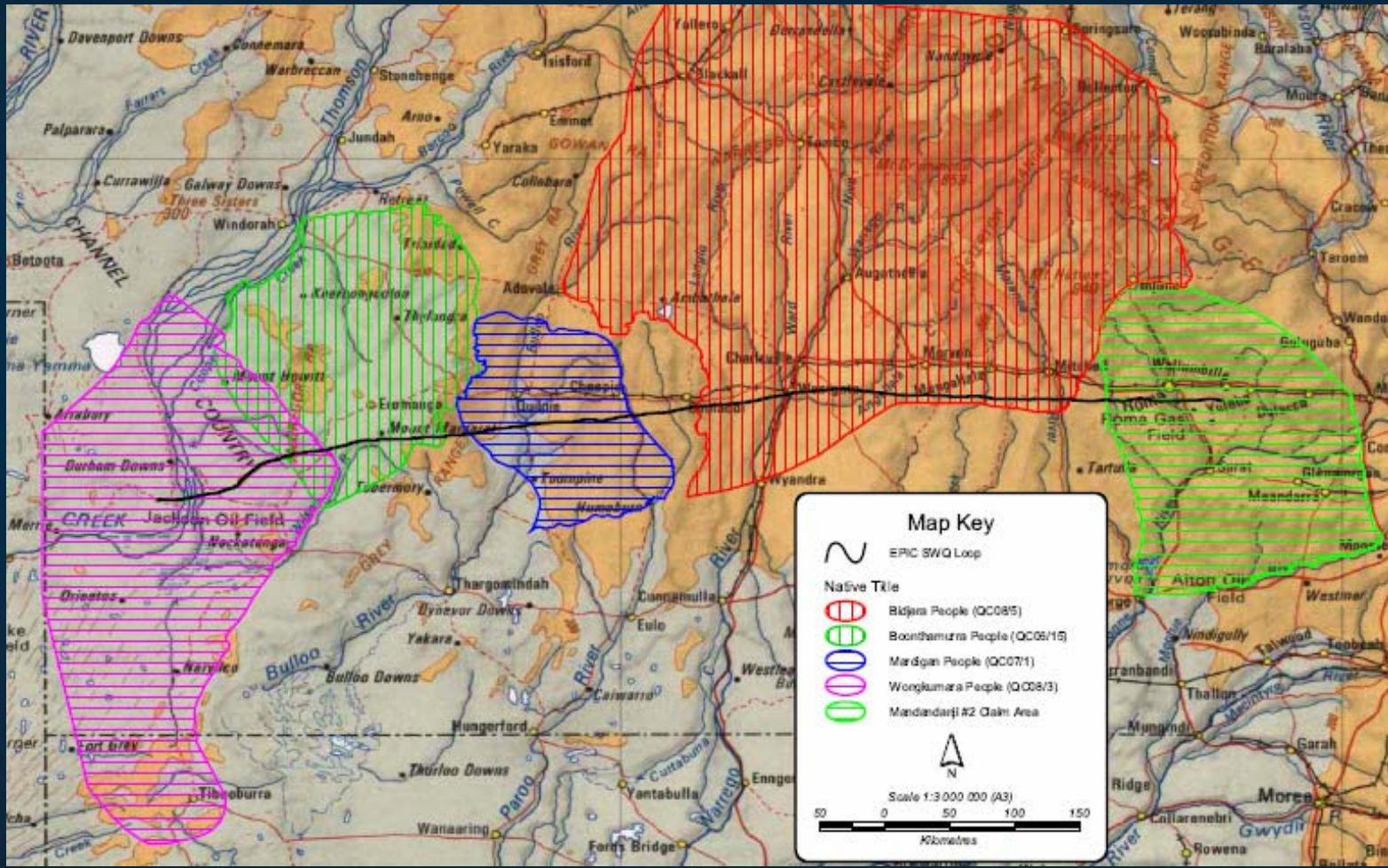
Historical Mean Monthly Rainfall



Programme Drivers - Timing

- Higher annual rainfall in Charleville, Mitchell and Roma areas
 - Peak rainfall in Charleville, Mitchell and Roma between October to March
 - Steadier, and less, year-round rainfall west of Charleville
- ⇒ Desirable to construct between Charleville and Roma from April to September
- ⇒ As Cooper Basin is prone to flooding from high rainfall in northern Queensland, attempt this crossing as early as possible
- Provides contingency for a second attempt if flooded on first programmed attempt

Cultural Heritage Management (CHM)



CHM:

Requires a co-operative approach with local Native Title holders

- 5 Native Title Claims on SWQP
- One area is even subject to a claim by two separate groups
- Also subject to legislative requirements

QSN3 Pipeline Looping: Stakeholder Management

Other Stakeholders

- Government (local, state, federal) and private landholders
- Likelihood of obtaining approval is often dependent on land use
 - Camps? Pipe Stockpiles? Borrow Pits?
 - Extra working space outside easement
 - Truck turnaround bays
 - Spoil stockpiles at watercourse and road crossings, and sand dunes
- Santos
 - Strong presence in Cooper Basin
 - Extensive infrastructure, some of which needs to be utilised in order to complete the project

QSN3 Pipeline Looping: Stakeholder Management

Other Stakeholders

- Roads: state road authorities and local shires
 - Significantly increased traffic volumes, especially heavy haulage
 - Concerned about road safety and damage to road infrastructure
- Owners of other infrastructure – pipes / cables

And of course, the environment!!!

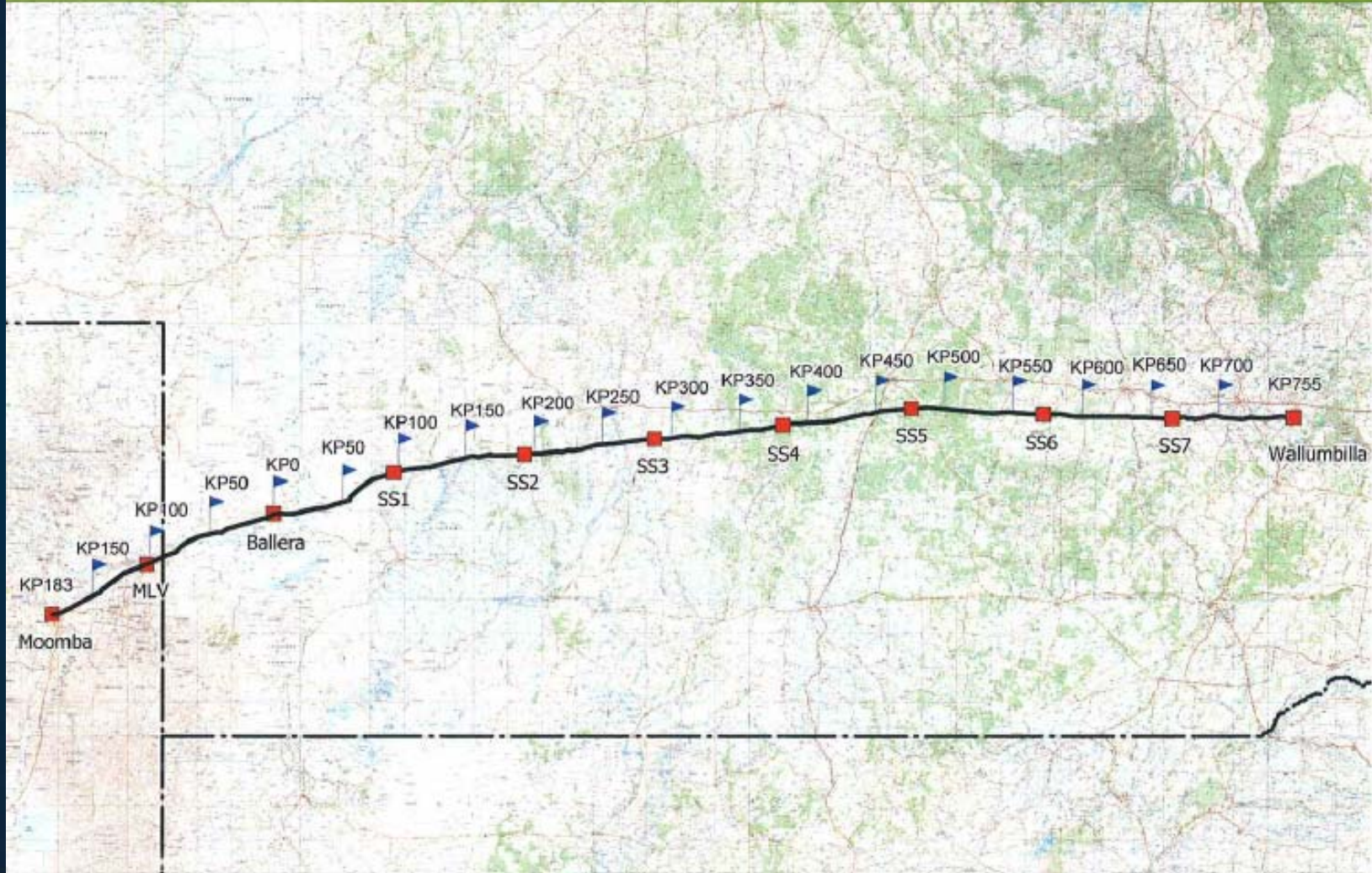
QSN3 Pipeline Looping: Stakeholder Management

Water

- Uses:
 - Road maintenance
 - ROW maintenance
 - Camps and stockpiles
 - Hydrostatic testing
- Significant amount of project area is desert – Moomba average annual rainfall <200mm. Possible water sources:
 - Private bores and dams
 - Catchment Authorities' bores and watercourses
 - Santos bores
- Disposal:
 - Sometimes water is treated prior to use as hydrotest fluid
 - How this is treated may significantly impact disposal method

QSN3 Pipeline Looping: Facilities

QSN3 PIPELINE FACILITY SITES



QSN3 Pipeline Looping: Facilities

Summary of QSN3 Pipeline Looping Facilities

- **Scraper Facilities**
 - Facilitate operation and maintenance of the pipeline by allowing the insertion and removal of internal cleaning and inspection tools
- **Mainline Valves**
 - Allow isolation in sections for maintenance, or in case of rupture
- **Stations**
 - For control, inter alia, of pressure and flow, and metering and filtering

Facilities are usually set up for future connections to allow expansion of system capacity

QSN3 Pipeline Looping: Facilities

SWQ Loop

- Inlet facility at Wallumbilla with scraper launcher
- SWQP has seven scraper facilities:
 - However, latent effect of internally lining QSN3 to increase flow characteristics means better scraper efficiency
 - Therefore three new QSN3 scraper facilities will be constructed as they are only required at every second SWQP scraper facility
 - SS4 will also be cross-connected to SWQP and existing compressor station CS4
 - Four Mainline Valves located at existing SS1, SS3, SS5 and SS7

Ballera Scraper Facility

- Original inlet facility and scraper launcher for QSN Link, with gas sourced via a hot tap into SWQP
- Completed by Nacap in 2008
- Upgrades for QSN3:
 - New scraper receiver and scraper launcher for QSN3 Pipeline
 - Cross connection of QSN3 Pipeline with SWQP / QSN Link

QSN3 Pipeline Looping: Facilities

Existing QSN Link Mainline Valve



- New QSN3 mainline valve at same location
- New, joint pressure regulating station for QSN3 and QSN Link

QSN3 Pipeline Looping: Facilities

Moomba Metering and Pressure Reduction Station



- Existing QSN Link Moomba Station completed by Nacap in 2008

Moomba Metering and Pressure Reduction Station

- Existing Moomba Station is insufficient for new QSN system capacity
- New Moomba Station will be a “big brother” of the existing Moomba Station and will comprise:
 - Scraper receiver
 - Filter; so the gas is of saleable quality
 - Dual Metering runs – the “cash register” for gas entering MAP and MSP
 - Duty and standby pressure reduction skids for both MAP and MSP supply
 - QSN System is Class #900;
 - MAP and MSP are Class #600

QSN3 Pipeline Looping: Facilities

5 Hot Taps

- 2 on QSN Link at mainline valve
 - To tie QSN Link into new pressure regulation facility at the same site
- 1 on QSN Link at Kp180; why?
 - Gas from QSN System will supply MAP and MSP via existing and new Moomba Stations
 - Cross connection will enable pressure equalisation of QSN3 / QSN Link prior to entering both Moomba Stations.
- 1 on MSP
- 1 on MAP



In closing ... QSN3 & beyond

To Date:

- QSN Link has provided the missing link in the eastern Australian gas transmission network.

QSN3 Project:

- Strategic “gas highway” between Coal Seam Methane resources in SE Qld and Southern States’ Demand.

Beyond... further expansion...

- SWQP/QSN capacity can be expanded further by installing additional looping and/or compression on SWQP
- Incremental expansion in 2 or 3 stages up to around **700TJ/d** (255 PJ/a) is feasible

QSN3 Project

Thankyou for your attention

Questions?