

PIPELINE CAPACITY DETERMINATION OF THE NEW ZEALAND GAS TRANSMISSION SYSTEM

- Rob Kulkarni



- New Zealand's gas transmission network
 - The relevance of a Capacity Determination process to the industry
 - Pipeline Capacity Determination methodology
 - Process of determining pipeline capacity
 - Results
 - Conclusions
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New Zealand's gas transmission network

New Zealand's gas transmission network

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New Zealand's gas transmission network

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First Gas Statistics:

- 2,523 kilometres of high pressure pipe
- 9 compressor stations
- 119 Delivery Points
- Approximately 229 Petajoules per year

The relevance of a Capacity Determination process to the industry

The relevance of a Capacity Determination process to the industry

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Why should the industry care about the First Gas Capacity Determination process?



Capacity Determination Methodology

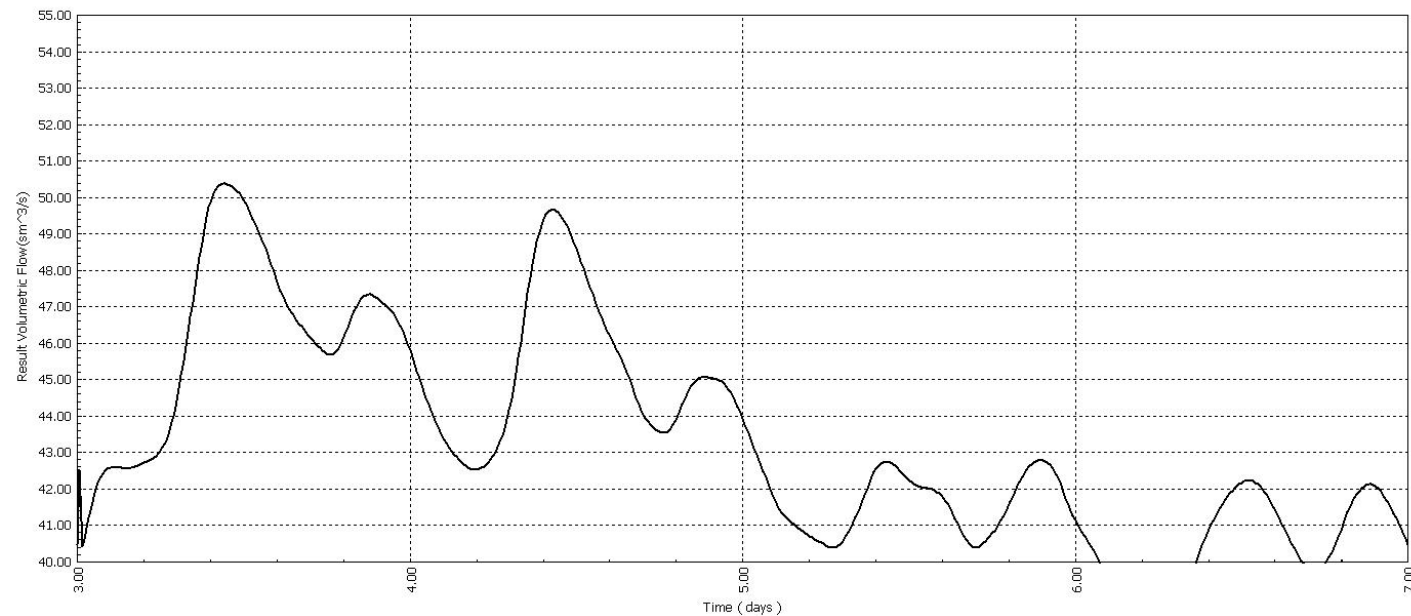
Things we need to know:

- Physical configuration of the pipeline
- Operating pressure/flow limits

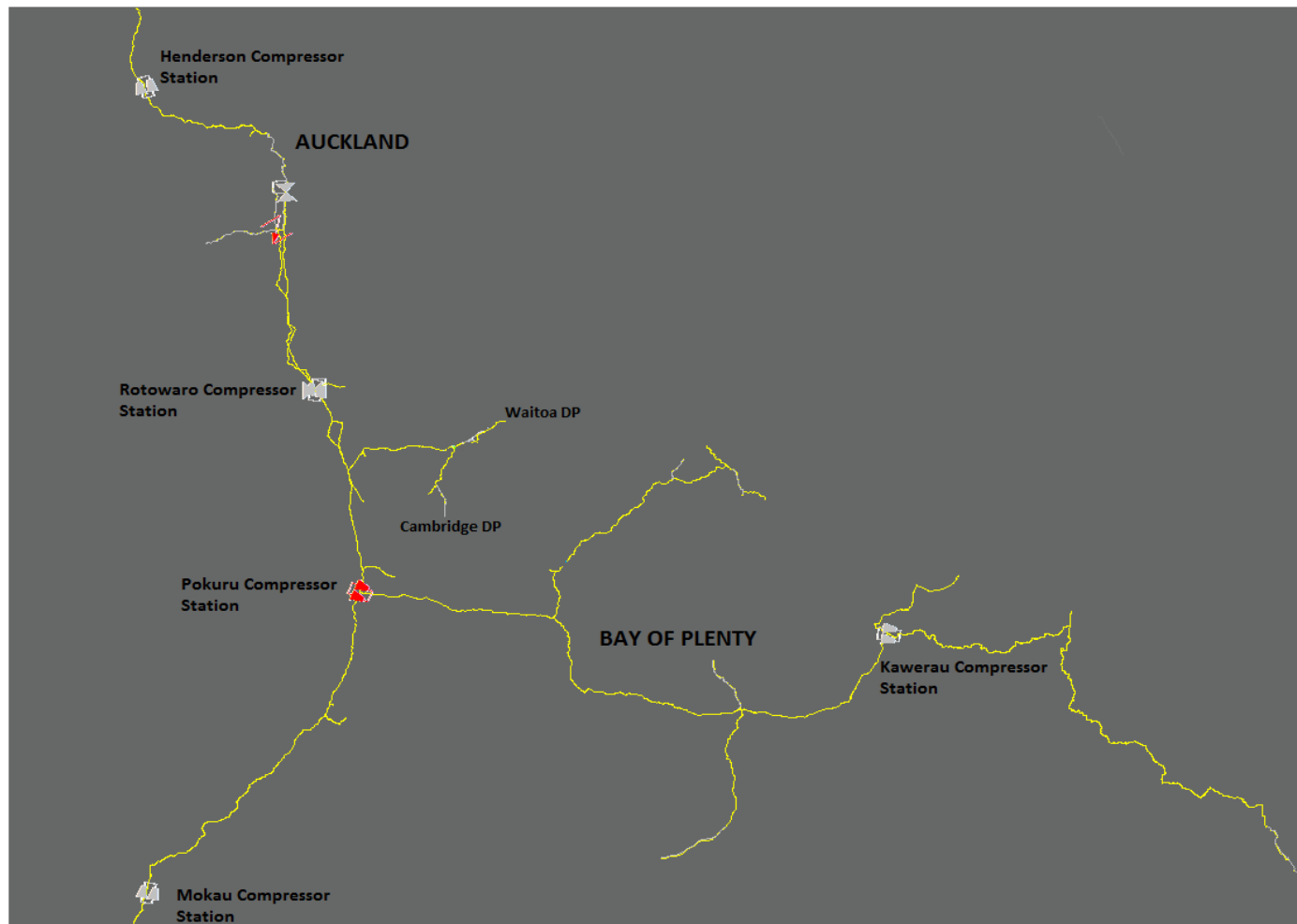


Things we need to know:

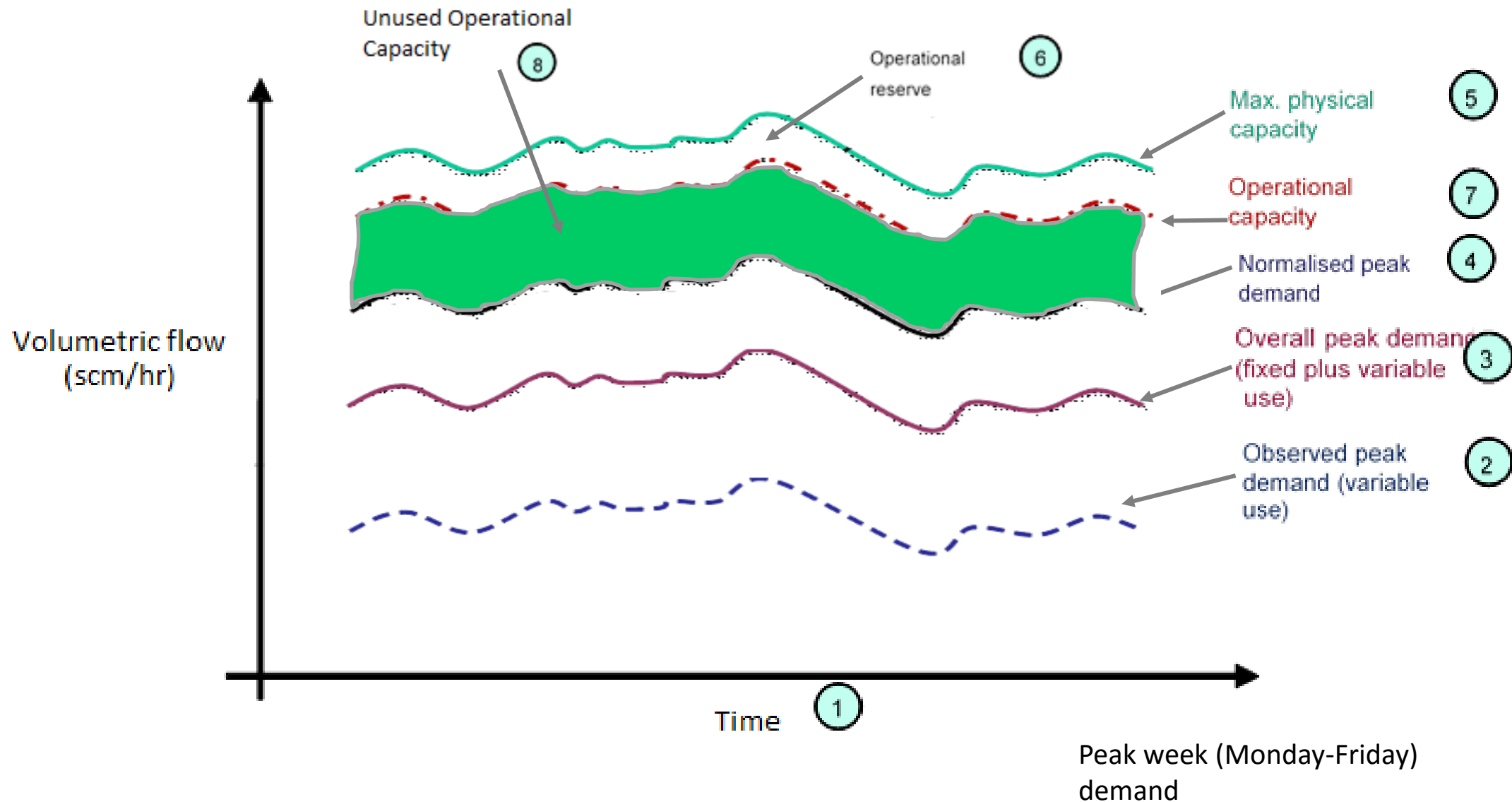
- Physical configuration of the pipeline
- Operating pressure/flow limits
- Peak historical gas use
- Likely future gas use



Modelling tool:



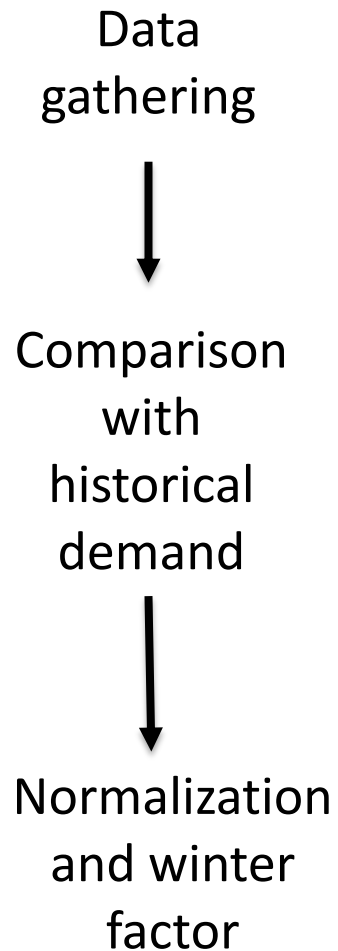
- Synergi (version 4.8)
- Validated
- Unsteady State analysis
- compressors



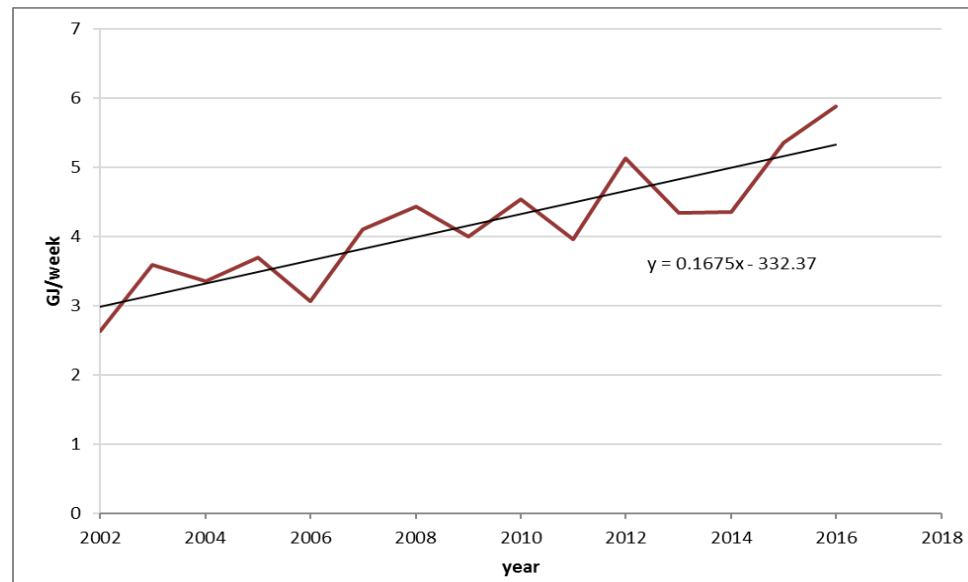
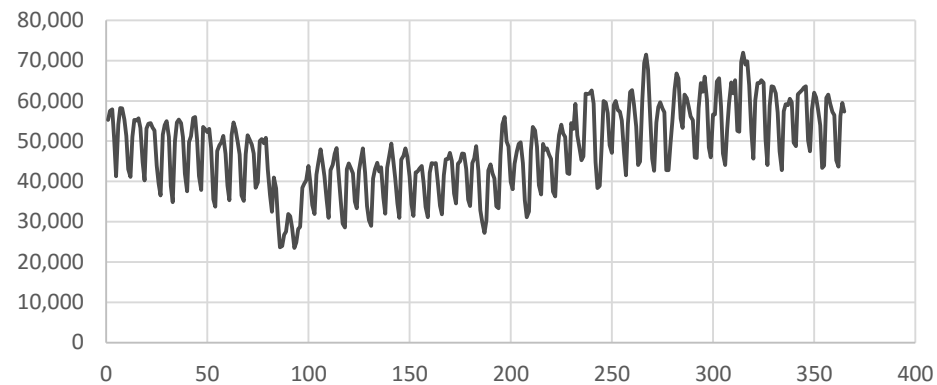
Process of determining pipeline capacity

Process of determining pipeline capacity

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2015-2016 North pipeline throughput (GJ/day)



Process of determining pipeline capacity

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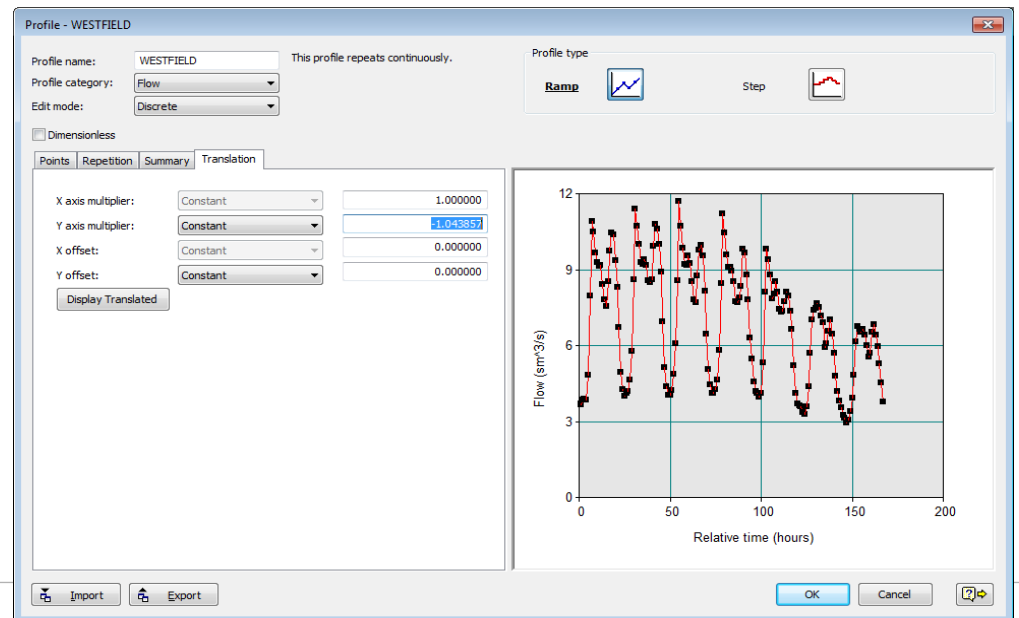
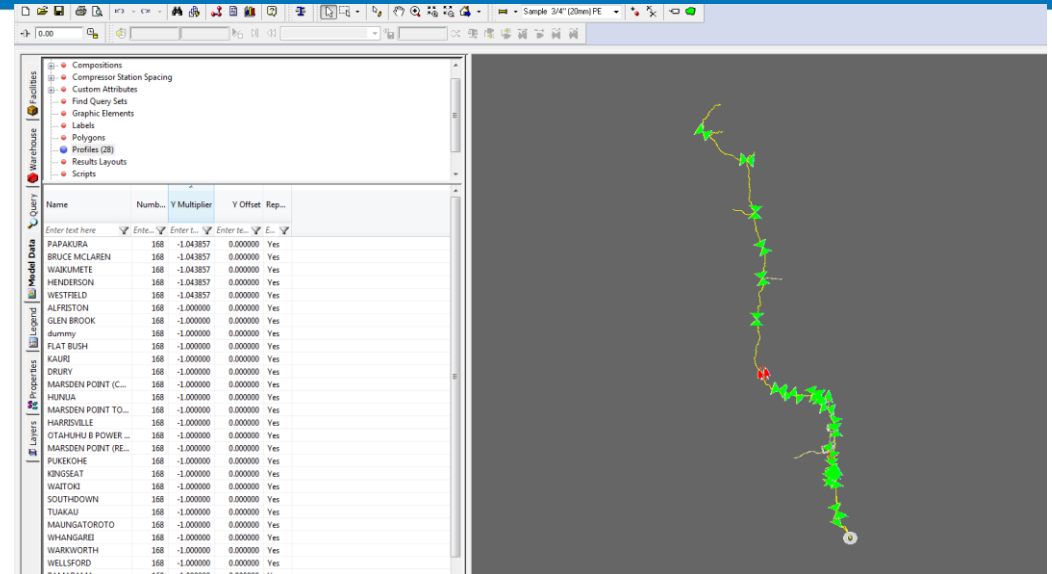
Import data
into Synergi



Obtain
appropriate
scaling factor



UN
O
CAPACITY



Results

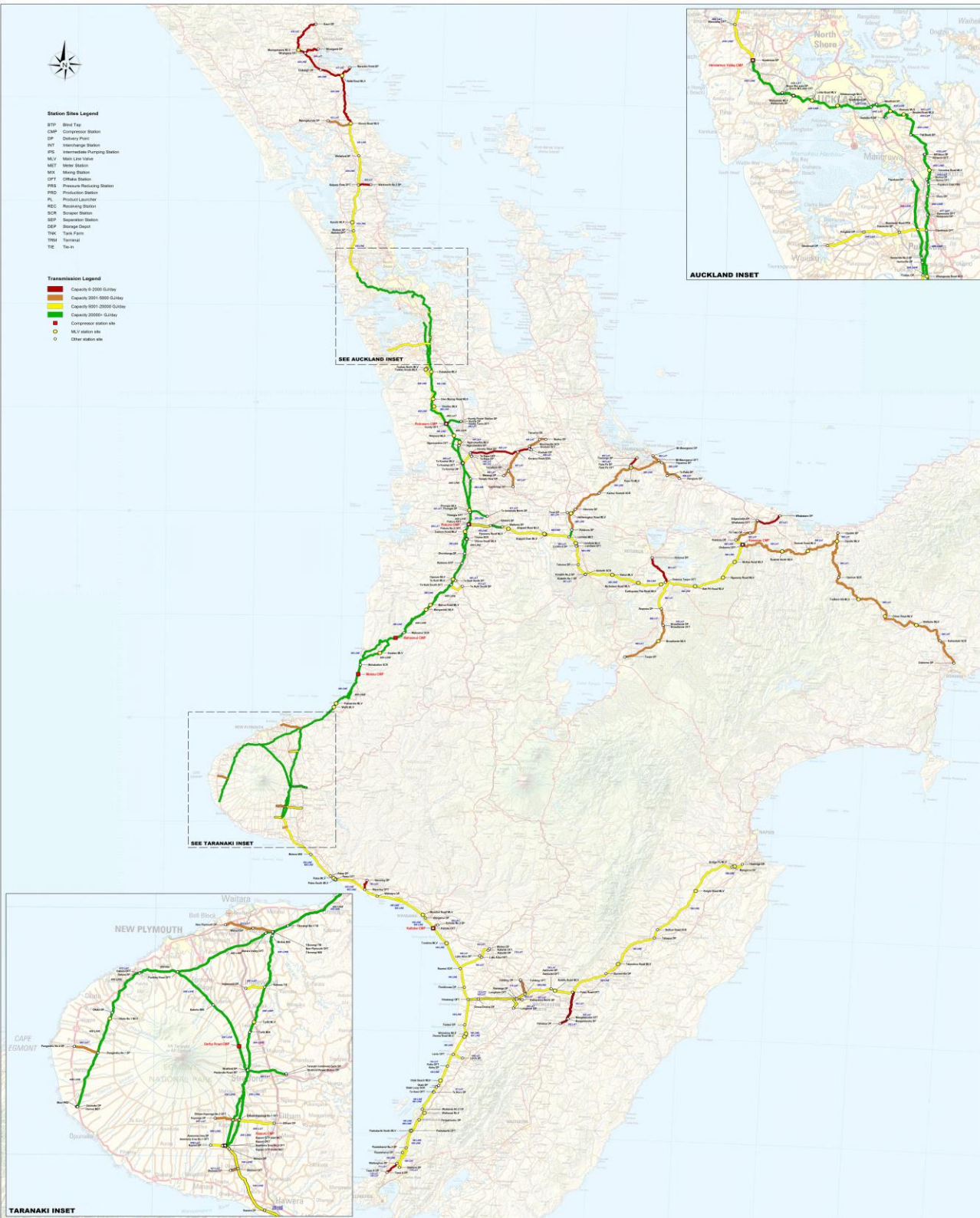


Station Siles Legend

STP: Blend Tank
CSP: Compression Station
DP: Delivery Point
IT: Interchange Station
IPS: Intermediate Pumping Station
MLV: Main Line Valve
MET: Meter Station
MX: Mixing Station
OPT: Offtake Station
PRS: Pressure Reducing Station
PSS: Production Station
PL: Product Launcher
RSC: Receiving Station
SCR: Storage Station
SEP: Separation Station
SEP: Storage Depot
TAK: Tank Farm
TMS: Terminal
TIE: Tie-in

Transmission Legend

Capacity 0-2000 GJ/day
Capacity 2001-5000 GJ/day
Capacity 5001-20000 GJ/day
Capacity 20000+ GJ/day
Compressor station site
MLV station site
Other station site



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Key to available capacity

- 0-2,000 GJ/day
- 2,001 - 5,000 GJ/day
- 5,001 - 20,000 GJ/day
- Greater than 20,000 GJ/day

- Gave me an appreciation for the complexity in determining pipeline capacity. It is however, a necessary outcome.
 - Gave me an in-depth understanding of the capacity characteristics of the First Gas high pressure gas network.
 - Helped me identify areas for growth generation.
 - Helped me identify areas that may need medium-long term reinforcement, if future growth in those areas was to take place.
 - Allows industry stakeholders to efficiently identify suitable locations for expansion or development.
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