Cambridgeshire Biomethane Plan

28 Sept 2023

John Baldwin
Managing Director
CNG Services Ltd

john.baldwin@cngservices.co.uk
www.cngservices.co.uk
07831 241217

cng services ltd

CNG Services Ltd

- CNG Services Limited (CSL) provides consultancy, design and build services to the biomethane industry, all focused on reducing Greenhouse Gas (GHG) emissions
- In the past 10 years our efforts have produced a material impact with an estimated 20 year project life reduction in CO2 emissions of 17,500,000 tonnes through:
  - Biomethane injection into the gas grid
  - Running trucks on Bio-CNG
  - Acting as developer and design and build contractor for the Highlands CNG Project
- Working on a number of Biomethane, H2 and CCUS innovation projects including:
  - Biomethane from manure with CCS
  - Biomethane direct into the NTS
  - Green H2 into the NTS and Hydrogen Business Model Projects
  - Reverse Compression to Create Capacity for Biomethane Injection
- CSL is an ISO 9001, 14001 and 45001 approved company and has also achieved Achilles certification. CSL is GIRS accredited for design and project management and has been certified as a competent design organisation for high pressure UK onshore natural gas works by DNVGL

cng services ltd

Innovation pack, which must contain (but is not limited to):

1. *The following items in relation to the overall Innovation project*

a. The overall objective of the project - **see slide 5**

b. Impact Analysis – **see slide 5**

c. Project Timeline, Funding stream evidence/approval - **indicative schedule on slides 11/12, aim is to be operational by 1st April 25. Estimated capex of £2.5 million and funding discussions underway with the first biomethane projects (aim is for the launch projects to fund the phase 1 capex and then subsequent projects fund a proportionate share which is then rebated to the launch projects)**

d. Approval/awareness from BEIS/The Authority - **DESNZ (Mark Davis) and Ofgem (Peter Bingham) are aware of the project**

2. The following items in relation to the trial/demonstration etc that the derogation is to relate to

a. Communication Plan - **subject to the Derogation being in place and a suitable site being secured, the intention is to work with Cadent and NGT to communicate to potential AD plants in the Cambridgeshire area (slide 5) that capacity is being made available to allow expansion of existing plants and development of new ones)**

b. Risk Assessment - **there are no security of supplier risks from taking gas out of the LTS and injecting into the NTS. The removal of odorant is not considered to be technically challenging but will have to be completed to the satisfaction of NGT in order for the project to go 'live'**

c. Risk Management plan – **the connection to the LTS and NTS is well established with no material issues from this proposal. In each case the connection will be approved and supervised by Cadent/NGT**

d. Impacted parties – **the main impacted parties are the biomethane project developers who will be able to go ahead with their projects. There are no impacts on gas shippers or gas consumers. Cadent is impacted and would be requested to modify the pressure in the LTS to allow operation of the compressors. NGT is impacted and will have to be assured there are no risk to the NTS**

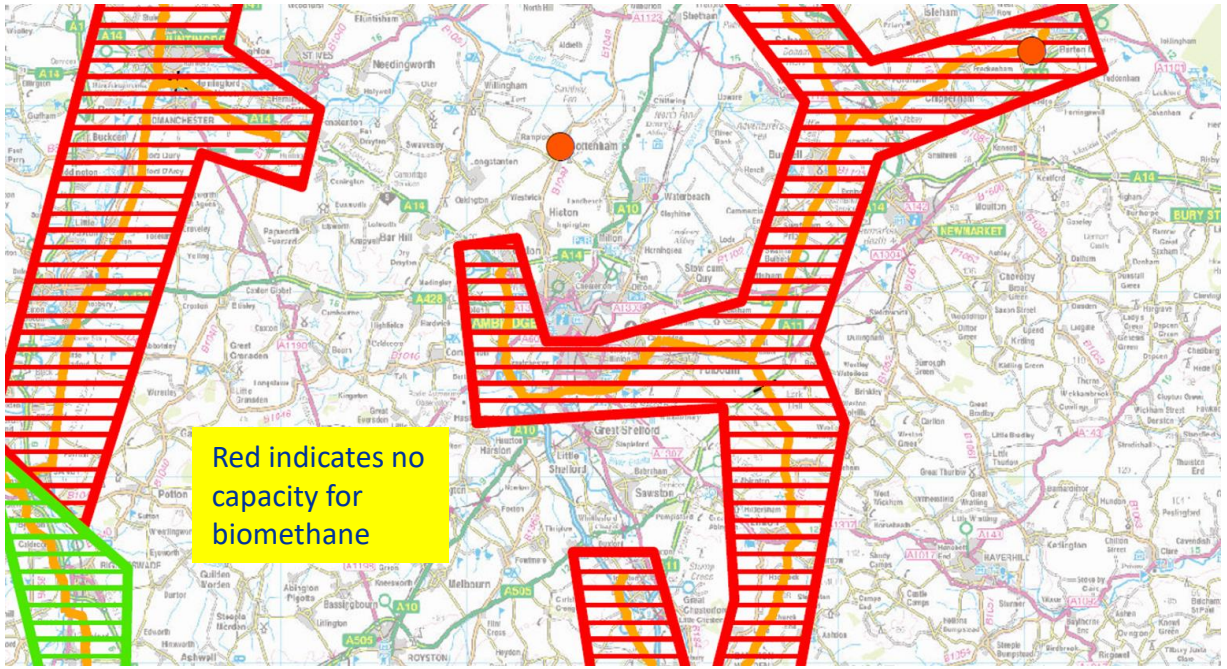
e. Mitigation plan for impacted parties – **both Cadent and NGT will have to be satisfied with all the technical arrangements and the HSE will have to approve the IGT safety Case for the RC facility**

f. A statement from the CDSP confirming any required system changes are known and able to be carried out (at the proposer's cost), including any exit plan.

g. Confirmation as to whether or not any IGT or Direct Connect sites are included in the derogation – **an IGT (CNG Services, IGT Licence not yet granted but Ofgem Consultation has been completed) is involved in the project**

The Grid Capacity Issue and the Objective of the Project

1. There are 5 other potential projects each looking for capacity in this area
2. Red indicates that there is no capacity for biomethane and within DN RC will not be successful as there is no DN pipeline with the capacity
3. The objective of the Cambridgeshire Biomethane Project is to utilise Reverse Compression (RC) from the Cadent 19 bar LTS into the NTS to provide capacity for new and expanded biomethane projects



Impact of the Project

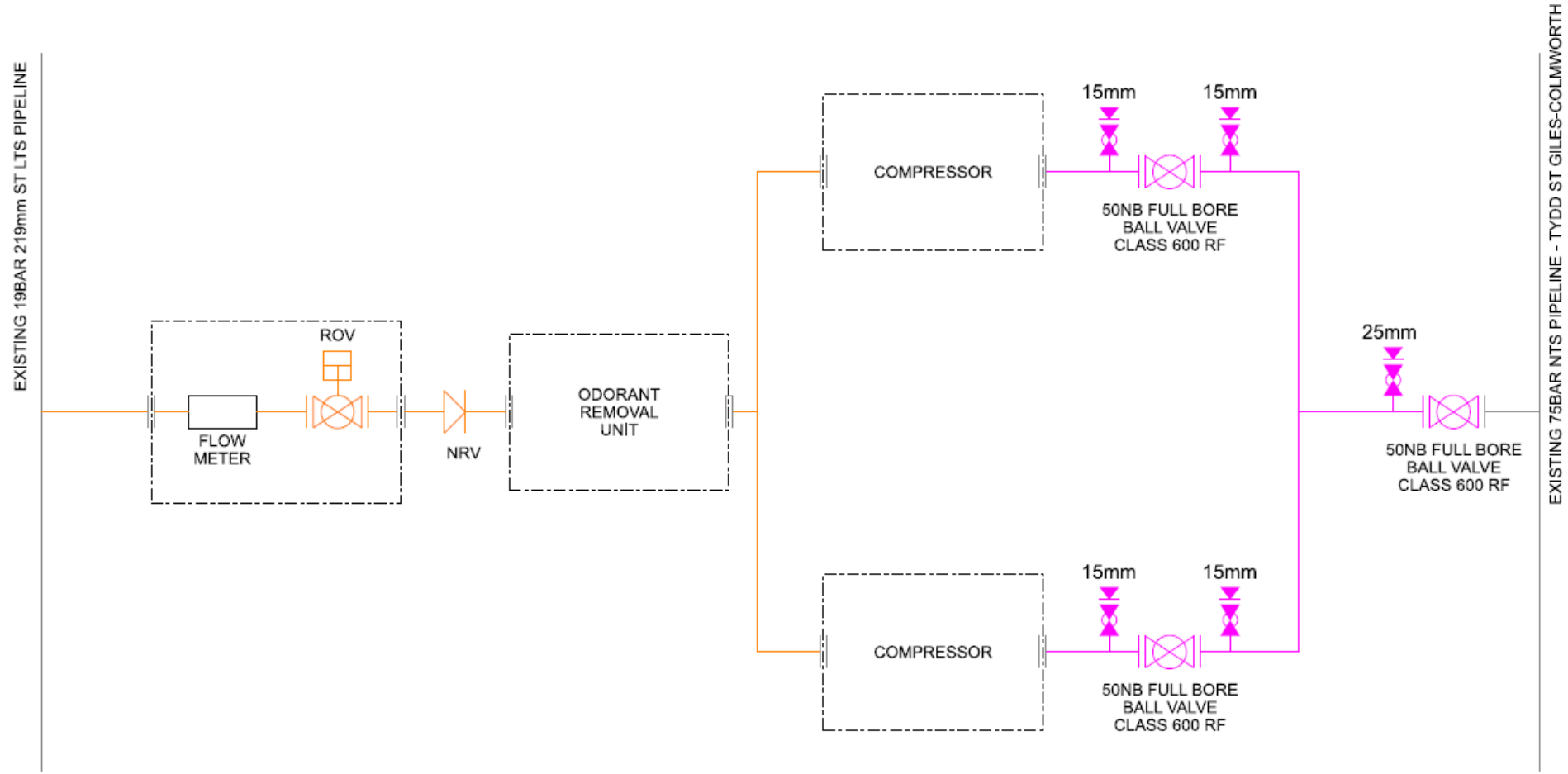
1. To allow 5 or more biomethane projects to go ahead
2. Potential investment of around £150 million
3. Potential biomethane of around 200 – 300 million kWh facilitated
4. No impact on gas shippers

The Reverse Compression Site

1. Gas will leave the Cadent LTS at around 18.5 bar, be metered, then have odorant removed, before injecting into the 75 bar NTS
2. 4 locations have been identified where the Cadent LTS connects to or crosses the NGT NTS and these are being evaluated
3. The aim is for NTS and LTS Connection pipelines to be on the RC site
4. There will be near zero CH4 to air emissions (a small compressor will be used to capture any gas passing seals and compress back into the inlet of the compressor) and there will be an acoustic enclosure with minimal noise
5. Electricity connections are close to all 4 candidate locations
6. RC to be operated by operators of similar compressors that already operate in GB with a 24 hour control room
7. To be built by 1 April 2025 to support all 5 projects
8. There are likely to be other biomethane projects in this area

cng services ltd

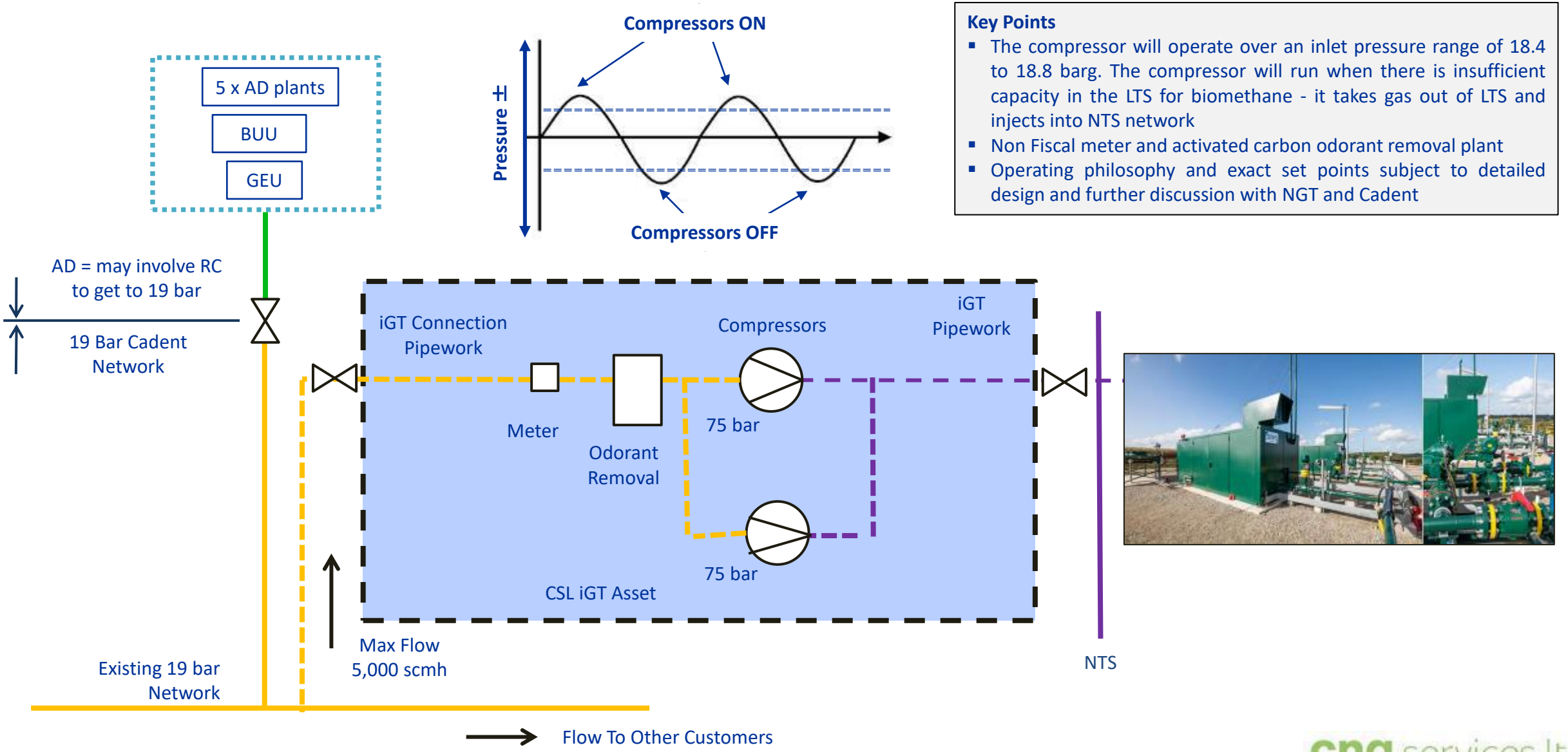
Summary Engineering Line Diagram



Indicative Layout

- Aim is to have the connections to the LTS and NTS on the same site as the RC and so no pipelines off site
- For the indicative layout to the left, a secure fence will be around the compressors and electrical kiosk and odorant removal plant with a timber rail fence around the part of the site that has the connections to the LTS and NTS

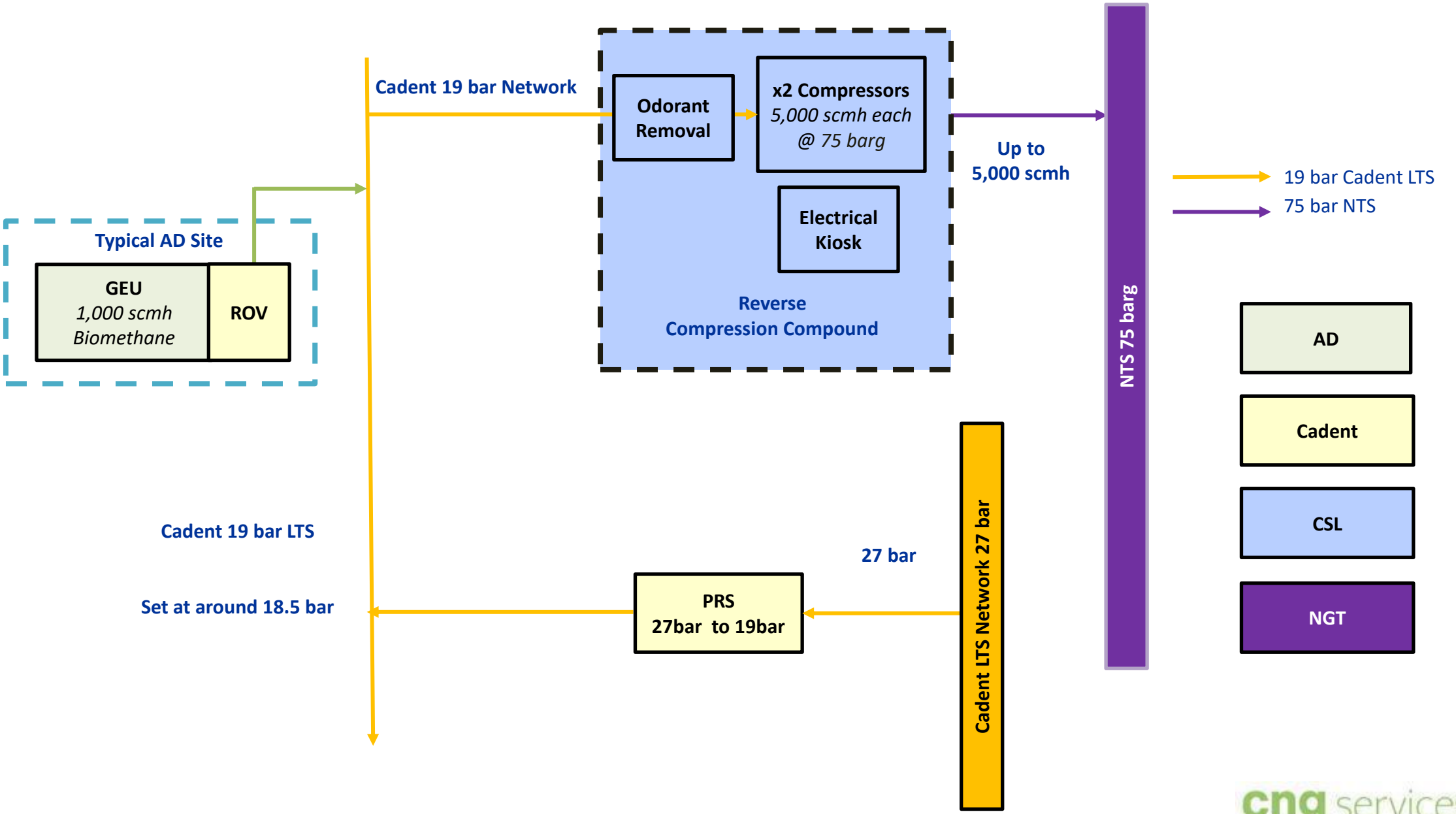
19 bar LTS to NTS Network – Reverse Compression Plant Schematic



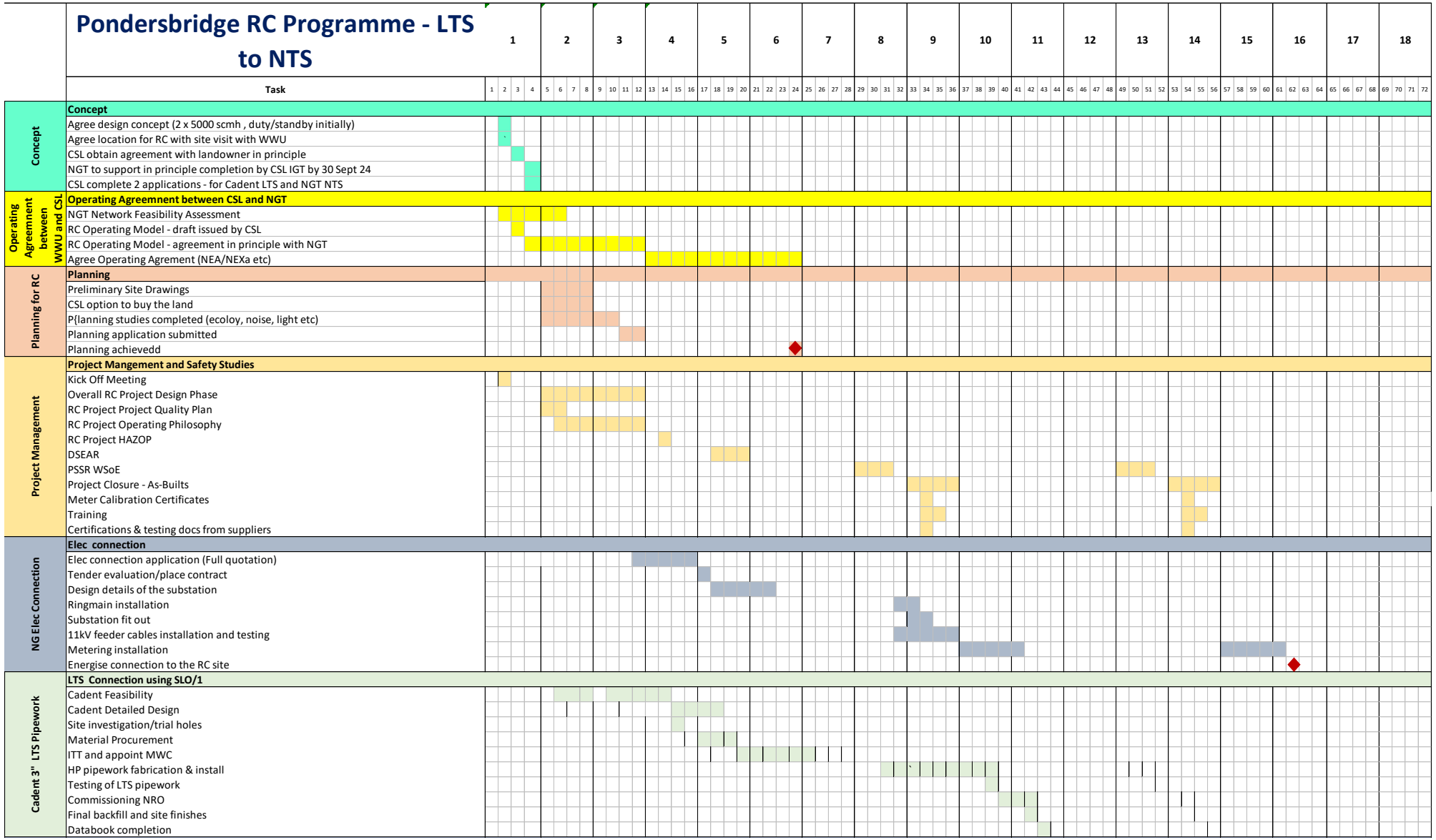
Key Points

- The compressor will operate over an inlet pressure range of 18.4 to 18.8 barg. The compressor will run when there is insufficient capacity in the LTS for biomethane - it takes gas out of LTS and injects into NTS network
- Non Fiscal meter and activated carbon odorant removal plant
- Operating philosophy and exact set points subject to detailed design and further discussion with NGT and Cadent

Process Flow Diagram

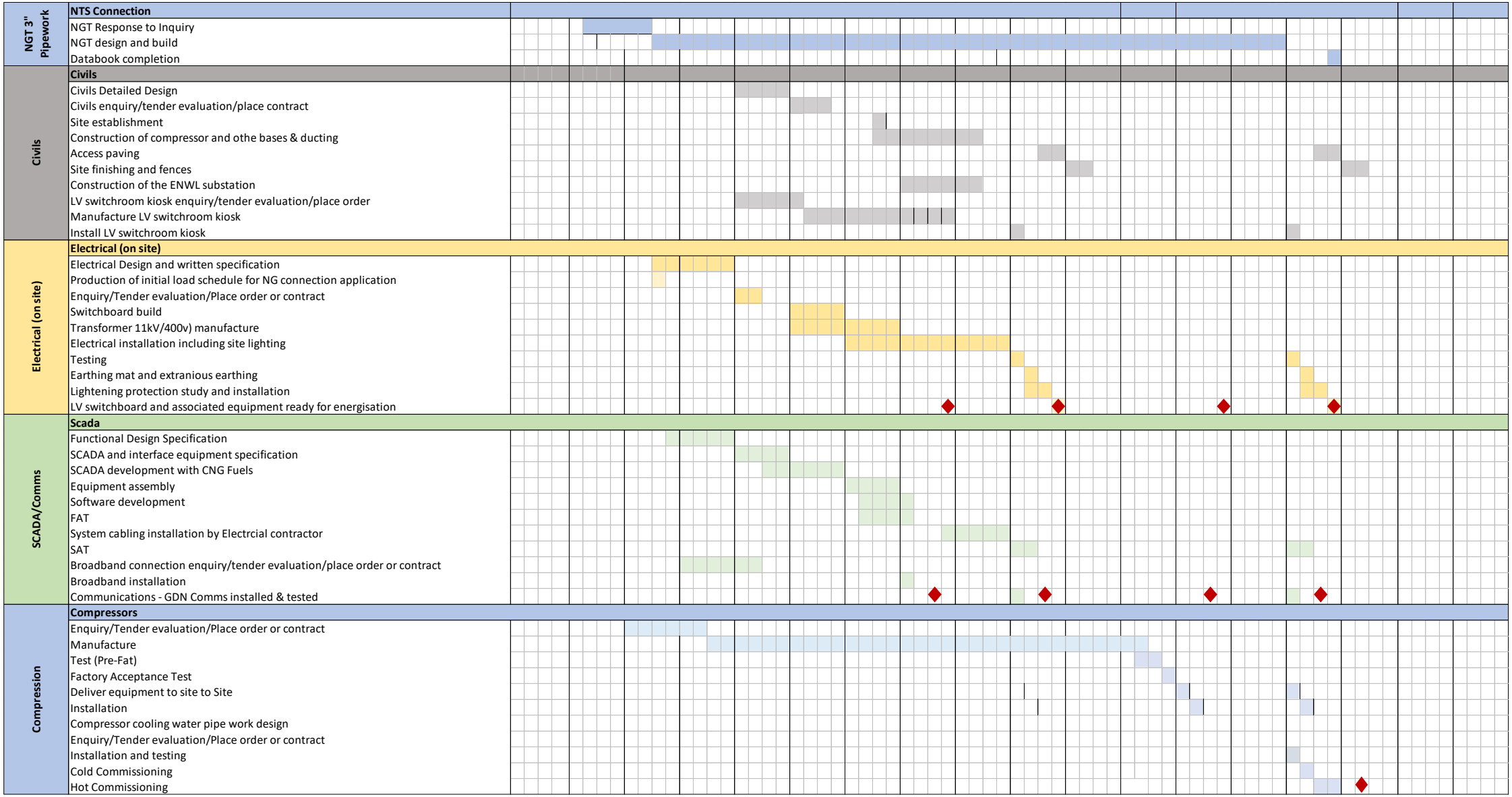


Draft Programme (1) – 18 months start to commissioning



cng services ltd

Draft Programme (2)



cng services ltd