LYNEMOUTH POWER

Lynemouth Power Ltd
On Site Fuel Handling System

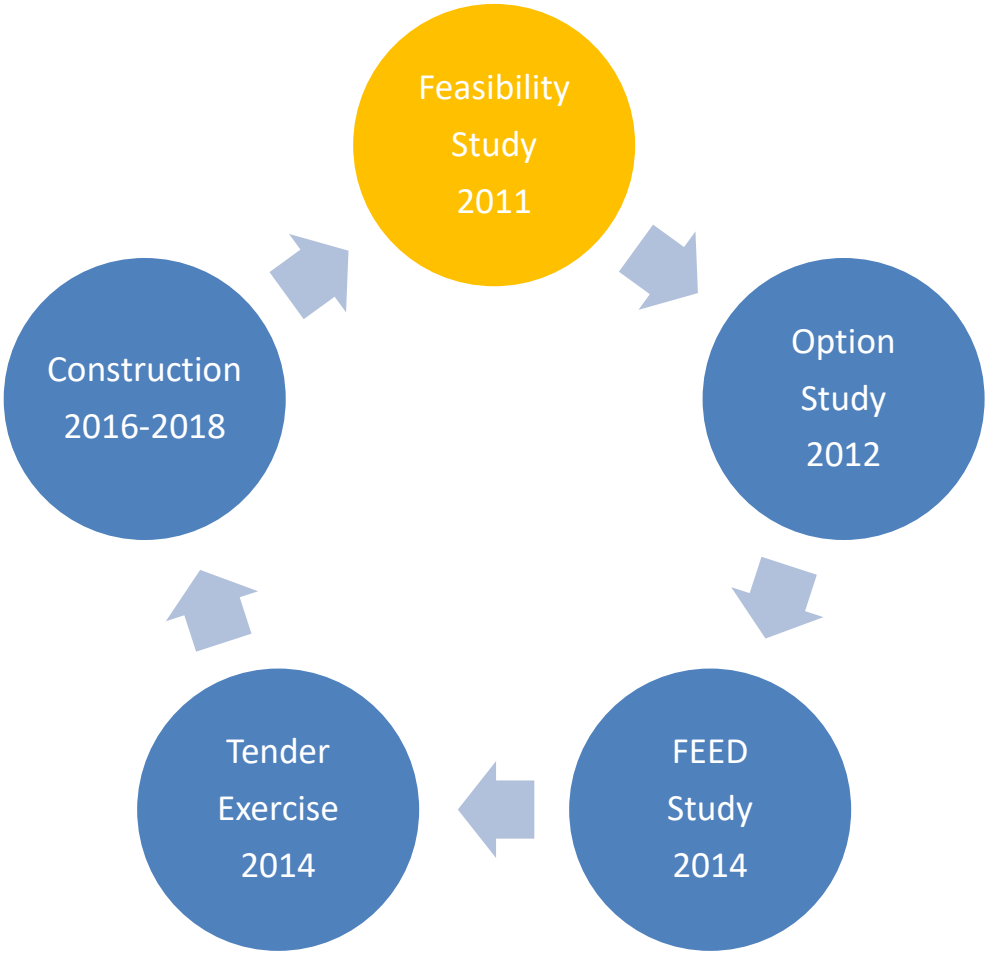
D Wharrier LPL Fuel Handling Manager

Personal Background

31
Years

15
Years

Project Timeline



Fact Finding Visits

- Tilbury
- DRAX
- Ironbridge
- Avedore & Herning
- Amer 8
- Atikokan & Thunder Bay
- Hull
- Immingham
- Port of Tyne

Lessons Learnt

Imperial Sugar, Georgia, USA

RWE, Tilbury

Lessons Learnt (2)

Ontario Power, Atikokan, Canada

Dong Energy, Avedore, Denmark

Lessons Learnt (3)

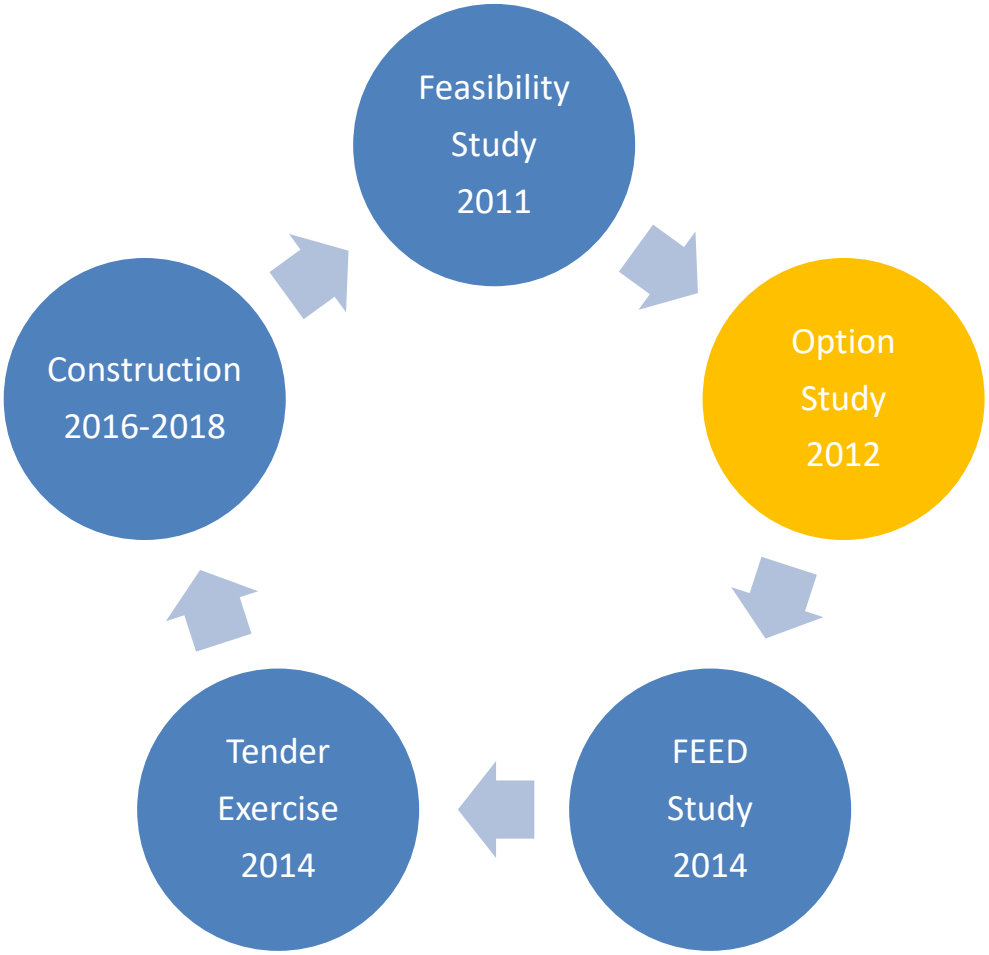
Dong, Herning, Denmark , <1mg/m3

Lessons Learnt (4)

Atikokan, Canada

Amercentrale September 2014

Project Timeline



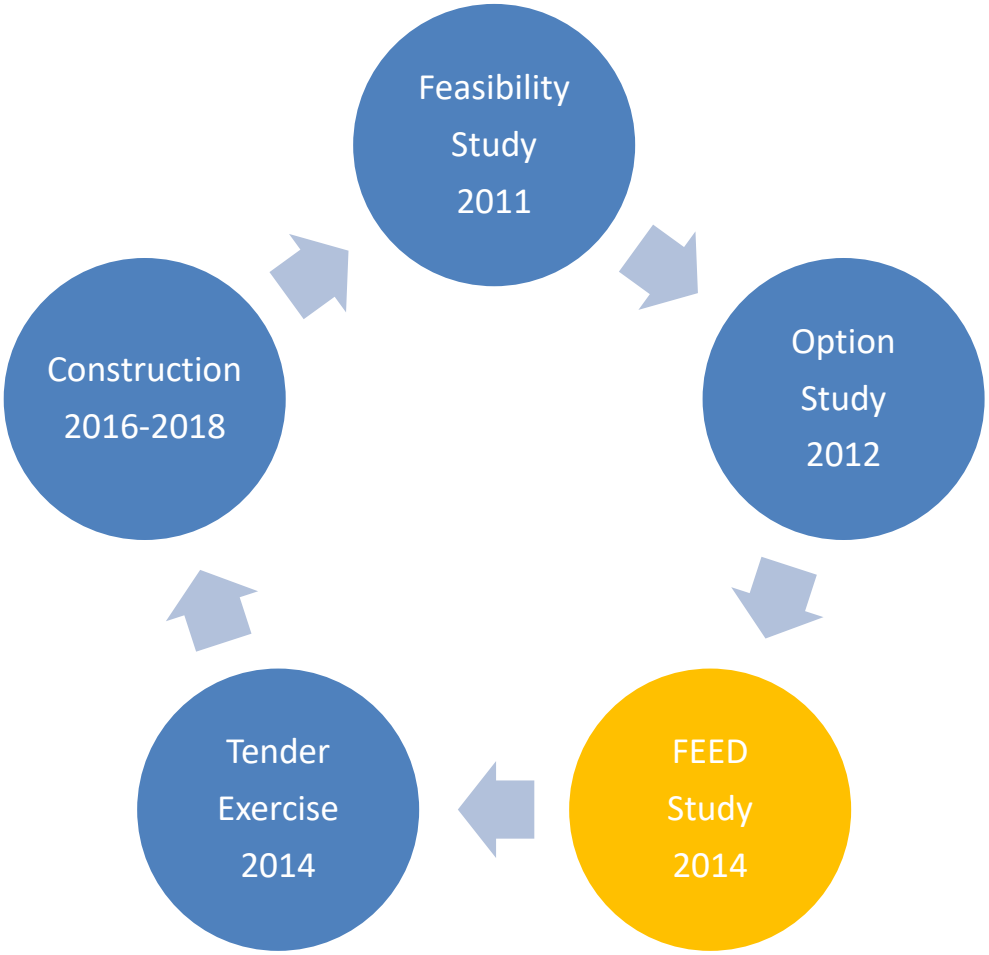
Fuel Options

Storage Options

Reclaim Options

Conveying Options

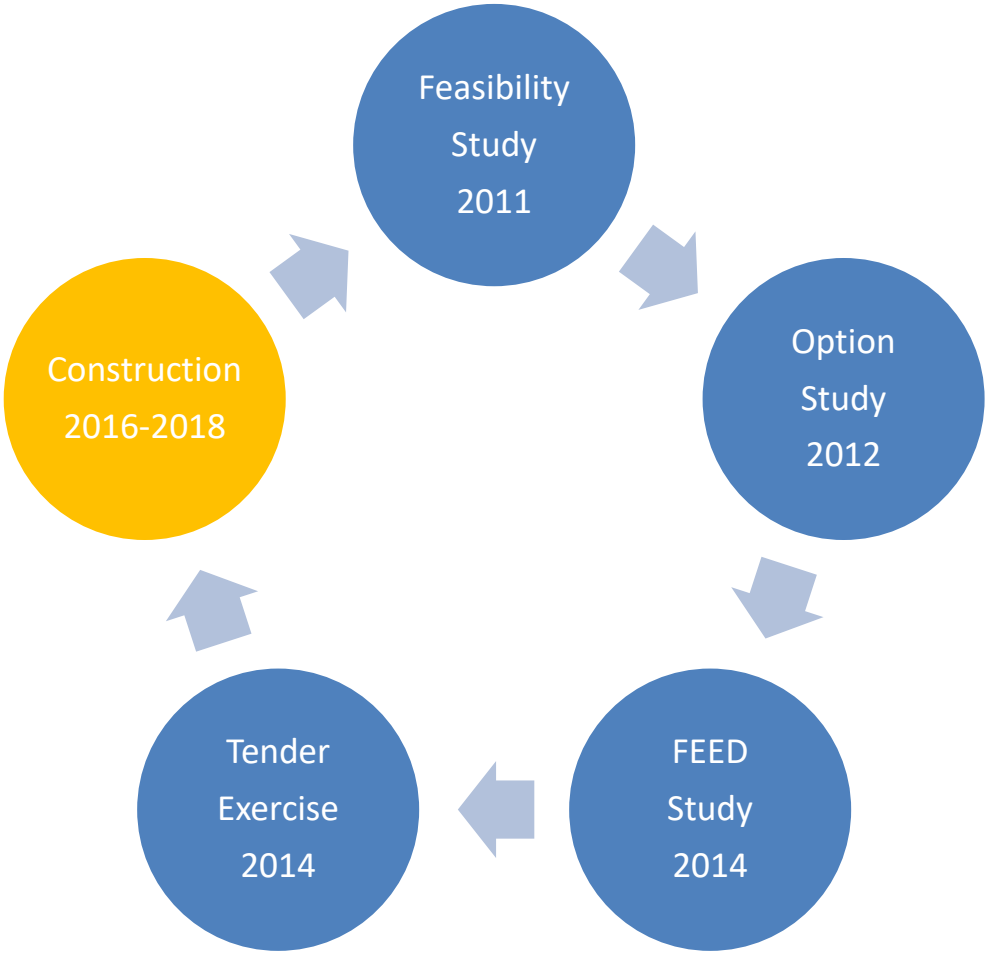
Project Timeline



Basis of Scheme

- The Fuel Handling System is not a Biomass Conversion Project.
- The installation has delivered a new purpose designed Biomass Handling System
- The installation utilises the equipment that has achieved excellent standards in other plants including Air Supported Conveyors and Pneumatic Handling from intermediate silos direct to mils
- The installation provides a Safe, Reliable and Efficient Biomass Handling System
- The proposed 6 x 8400te Silos give the greatest flexibility of operation combined with reasonable storage to cater for Road and Rail delivery interruptions based on the experiences of this site with coal deliveries of 4 trains per day and up to 100 lorries per day

Project Timeline

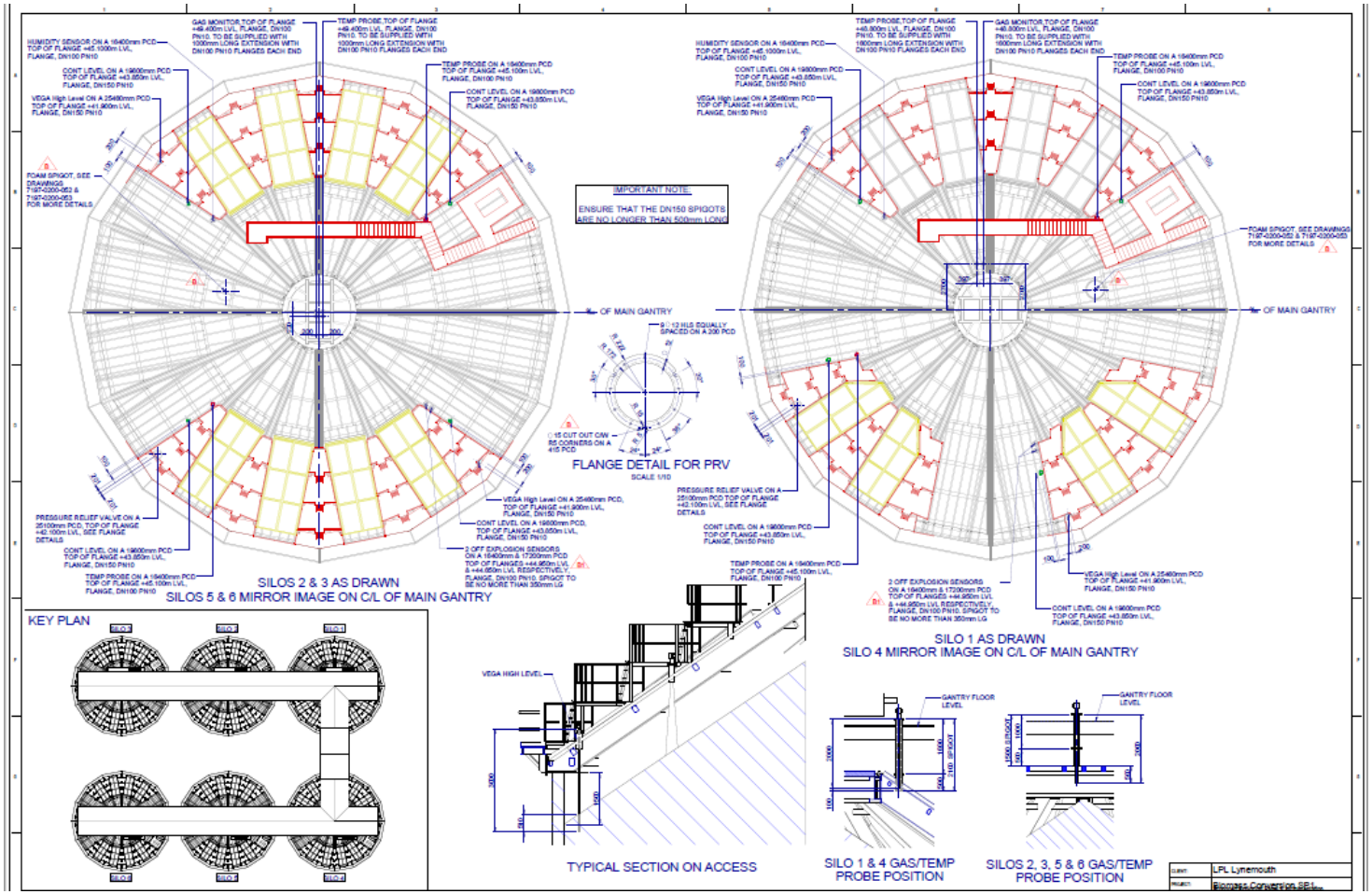


Site Overview

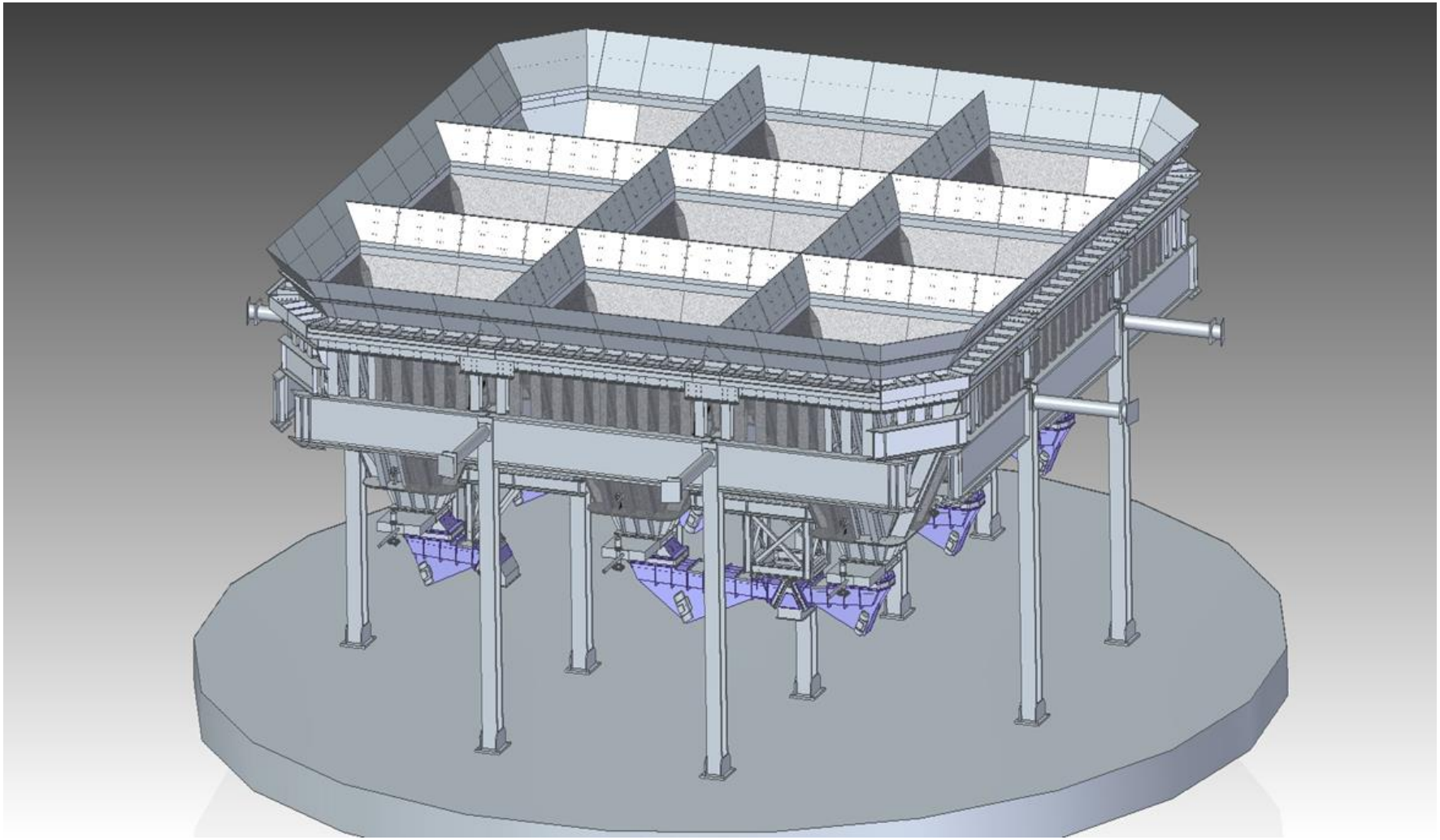
Silos

Silos

Silo Roof Explosion Panels



Waffle Bottom



Waffle Bottom

Nitrogen Injection

Return

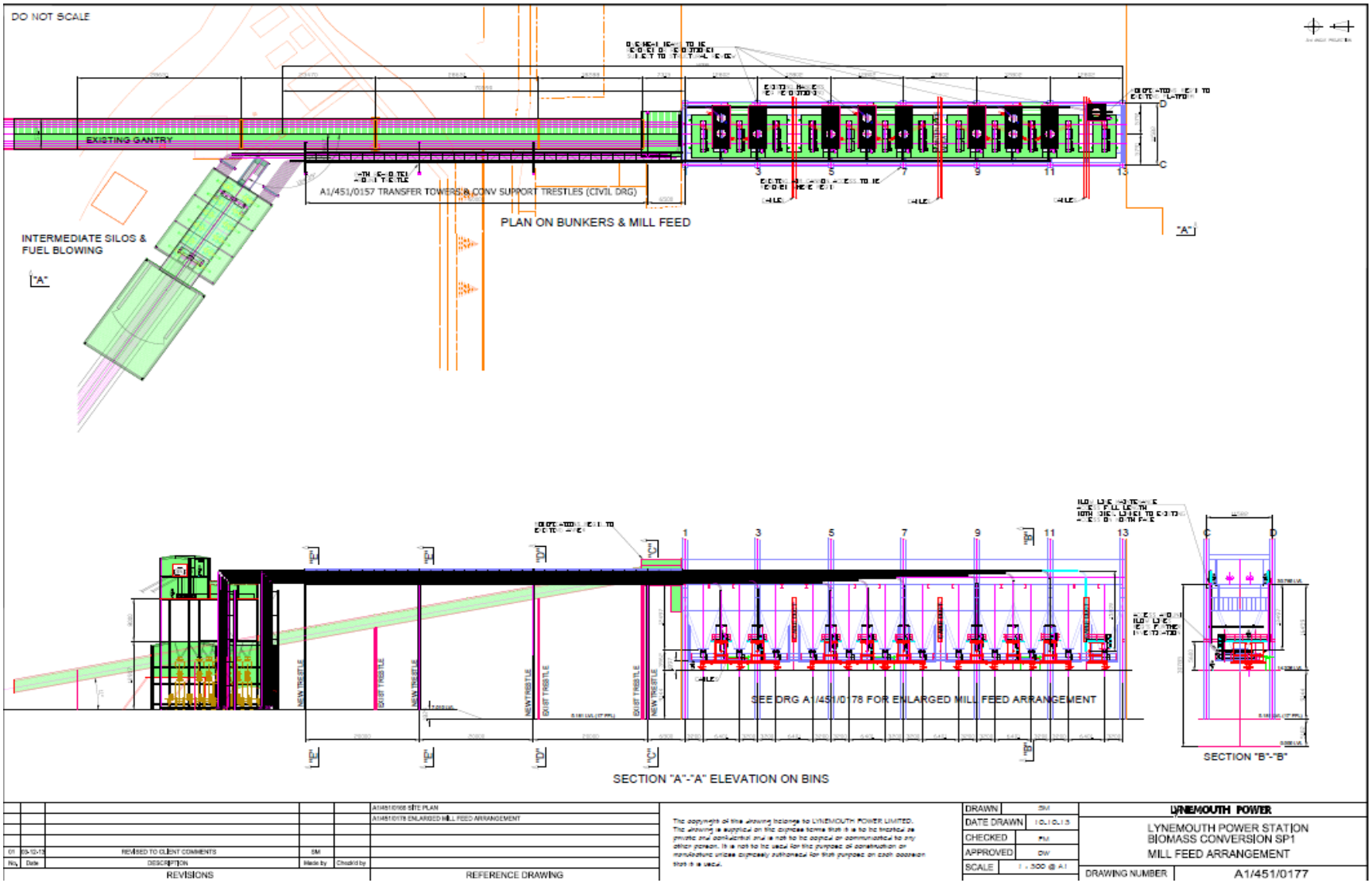
Safety Systems (1)

- Incoming fuel details supplied on arrival
- Screening grids 70mm x 70mm on road and rail hoppers
- Baffles fitted below hopper grids on road and rail
- Lorry earthing system
- Ferrous detection by use of fixed magnet
- Non ferrous detection and dump
- Silo bypass route to dump or direct to intermediate silos

Safety Systems (2)

- Sprinkler systems
- Black body infrared cameras
- Bearing temperature monitoring
- Hot particle detection and suppression
- Multi gas detection and monitoring in silos
- High expansion foam injection to silos
- Nitrogen injection in silos
- Explosion venting
- Fast acting slam shut doors with chemical suppression

Dense Phase Pneumatic Handling



Dust Control

- Pellet specification details fines and dust limits
- Dust extraction at transfer points (designed for <1mg/m3 but a guarantee of <2mg/m3 where persons may work is included in the contract). All transfer points under negative pressure
- Top Strand of Air supported conveyors fully enclosed.
- Fully enclosed pneumatic delivery within boiler house
- Totally man less train unloading (safe dust free haven provided for guard)
- Road unloading (driver does not leave cab)
- All areas of the plant equipped with ATEX rated Vacuum system
- No man access is required into the silos at any time

Dust Control

Dust Control

Dust Control

- **The Control of Substances Hazardous to Health Regulations 2002**
  - ***Exposure limits****. Both hardwood and softwood dusts have a* ***Workplace Exposure Limit*** *(WEL) of 3mg/m3 which must not be exceeded. These are* ***limits*** *placed on the amount of* ***dust*** *in the air, averaged over an eight-hour working day. However, you must reduce* ***exposure*** *to* ***wood dust*** *to as low as 'reasonably practicable'.*
  - LPL Contract Guarantee Limit <2mg/m^3
  - LPL Design Criteria <1mg/m^3
  - **Maximum readings taken to date 1.47 mg/m^3**
  - **Geometric Mean 0.41mg/m^3**

Biggest Single Challenge

Questions