

ANAEROBIC DIGESTION

HARD TOP SIDE-BY-SIDE DIGESTER

Noblehurst Dairy, York, Livingston County



Extra electric is sold off site



Hard-top digesters can be hard to seal

“Our hope is that this digester will pay for itself and help us maintain good relations with our neighbors”

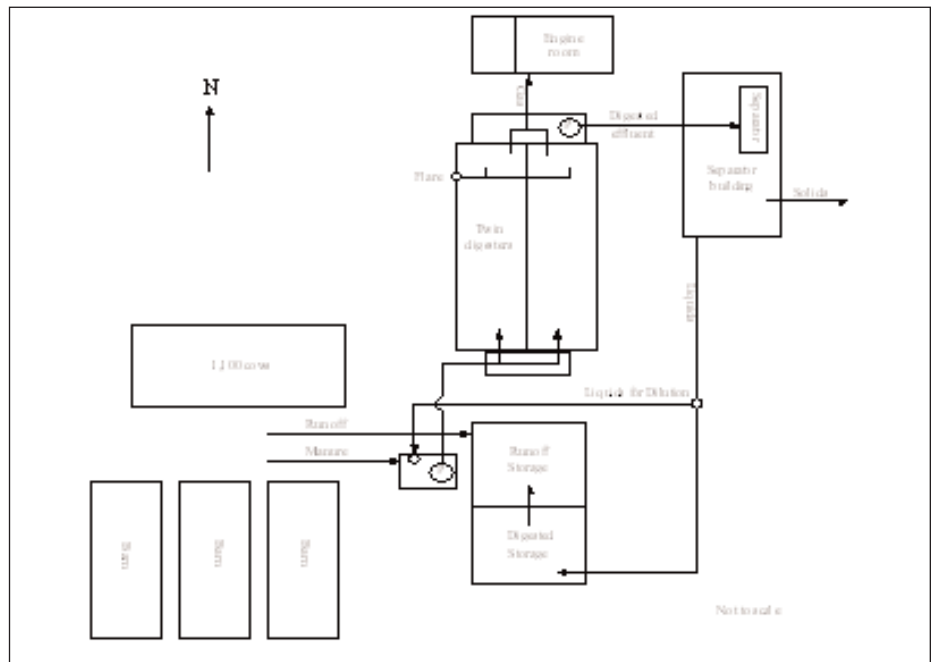
– Rob Noble
Farm Manager

COMBINED HEAT AND POWER (CHP) GENERATION:

Biogas production from the digester is about 72,000 ft³ per day, with a methane (CH₄) content of 60%, along with other byproducts such as carbon dioxide (CO₂), and trace gases like hydrogen sulfide (H₂S). Biogas is collected from the digesters and fed to the engine generator set. The engine generator uses biogas at a rate of approximately 60,000 ft³/day, or about 55 ft³/cow/day. The engine (Caterpillar 3406NA, 285 HP) is attached to a Marathon 447,130 kW generator.

Exhaust heat from the engine is used to maintain the digester temperature and for other domestic needs. The engine radiator releases excess heat.

Electricity output varies but since January 2003, the engine has averaged 85 kWh. During December 2003, output averaged 2,350 kWh/day (98 kWh).



LESSONS LEARNED

- Construction and digestion design can take longer than anticipated
- Sealing pressurized digesters is problematic
- Rain water dilution needs to be separated out
- Manure flow splitters (that feed the two digesters) need to be uniform
- Installation of the integrated control panel, gas treatment system, and engine-generator set, was less difficult compared to installing each piece separately from different manufactures.

