## **Description of Additional Supplementary Files:**

**Supplementary Data 1** | Key features of the metagenome (short-read and long-read sequencing) and metatranscriptome datasets generated for the enrichment culture, and the 59 draft genomes recovered from the metagenomic data (≥70% completeness and ≤10% contamination). Assessments of the genomes were based on the CheckM program.

**Supplementary Data 2** | Genes encoding enzymes for propane activation and complete oxidation in *'Ca.* A. nitratireducens'.