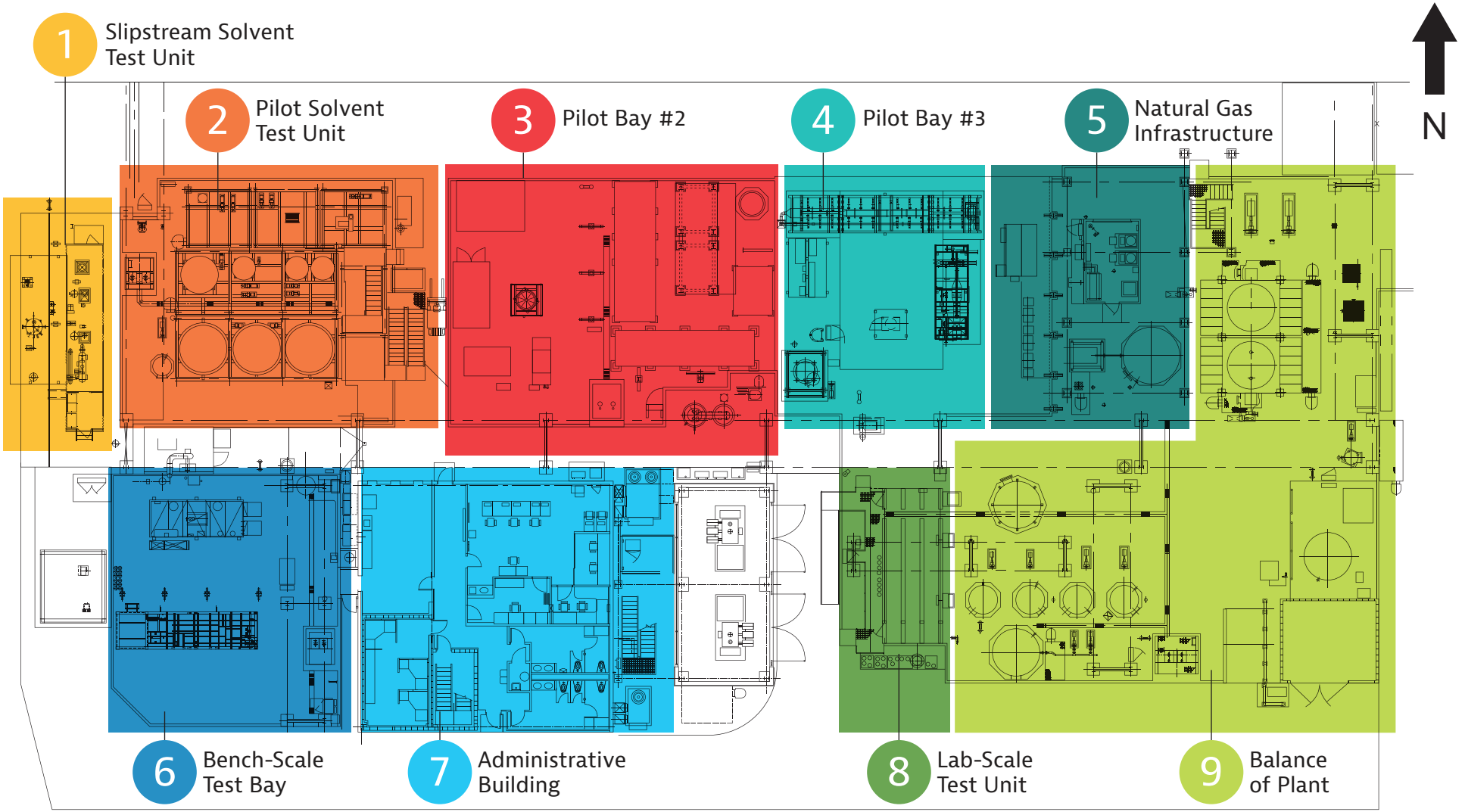
National Carbon Capture Center Infrastructure



» Provides: 1) 4.0-MWe natural gas flue gas, or 2) 3.5-MWe coal flue gas
» No CO_2 stored – gas returned to: 1) natural gas boiler stack, or 2) Gaston scrubber inlet
» Steam for regeneration: 1) natural gas boiler, or 2) Gaston Unit 5 cold reheat
» Independent from Gaston operation
» 4,116 instrument data tags

NATIONAL CARBON CAPTURE CENTER

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February 2024

1. Slipstream Solvent Test Unit

» Solvent-based system similar in arrangement to the Pilot Solvent Test Unit, but one-tenth the scale (~0.05-MWe)

» Advantageous for developers who cannot manufacture enough solvent for the Pilot Solvent Test Unit (~200 gallons needed), but contains less instrumentation

2. Pilot Solvent Test Unit

» ~0.5-MWe solvent-based system capturing ~10 tons per day CO_2 on coal-derived flue gas

» Can operate on natural gas-derived (4% - 9% CO_2) or coal-derived (10.5% - 12.5% CO_2) flue gases

» Absorber: 60′ of Mellapak Plus 252Y packing separated into three beds with intercooling

» Regenerator: 40′ of Mellapak Plus 252Y packing separated into two beds using steam to heat solvent for regeneration

» Two other regeneration options: advanced flash stripper and continuous stirred-tank reactor

» Requires ~2,000 gallons minimum solvent volume to operate

» ExxonMobil and MHI are preparing to perform solvent testing in the unit

3. Pilot Bay #2

» Can host systems up to 1.0-MWe. Carbon America FrostCC™ (cryogenic capture system) occupies the east side. Aircapture (direct air capture technology) occupies the west site

» Total pilot area 50′ x 70′; can be divided into two or three tests

4. Pilot Bay #3

» Can host systems up to 0.5-MWe. Currently awaiting UCLA/CarbonBuilt test, a system for CO_2 utilization in concrete

5. Natural Gas Infrastructure

» Provides steam and natural gas-derived flue gas for testing from a boiler unit with exiting CO_2 concentrations in the 4% - 9% range

» Produces up to 37,000 lb/hr of 150 psig steam at 366 °F

» At 100% firing rate, can provide a maximum heat output of 37 MBtu/hr operating at 83.31% efficiency

» Allows for independent testing operation from Gaston Unit 5

6. Bench-Scale Test Bay

» Equipment scale: 0.005-MWe to 0.1-MWe; up to four developers can occupy simultaneously

» Utility connections for flue gas, cooling water, steam, nitrogen, demineralized water and instrument air

» Total area 40′ x 50′; average module size 15′ x 25′

» Coming soon: CORMETECH - Monolithic contactor made with amine-based sorbent with thermal desorption and CO_2 collection

7. Administrative Building

» Contains control room wet lab for liquids analysis and lab for gas analyzers

» Provides cubicle space, conference room and common breakroom for multiple developer teams

8. Lab-Scale Test Unit

» Trailer-sized laboratory space for small, tabletop-sized units that are not rated for outdoor duty, along with gas/liquid analyzers

9. Balance of Plant

» Provides cooling water, nitrogen, tankage for process liquids (solvents, caustic, wastewater) and instrument air (provided from Gaston compressors)