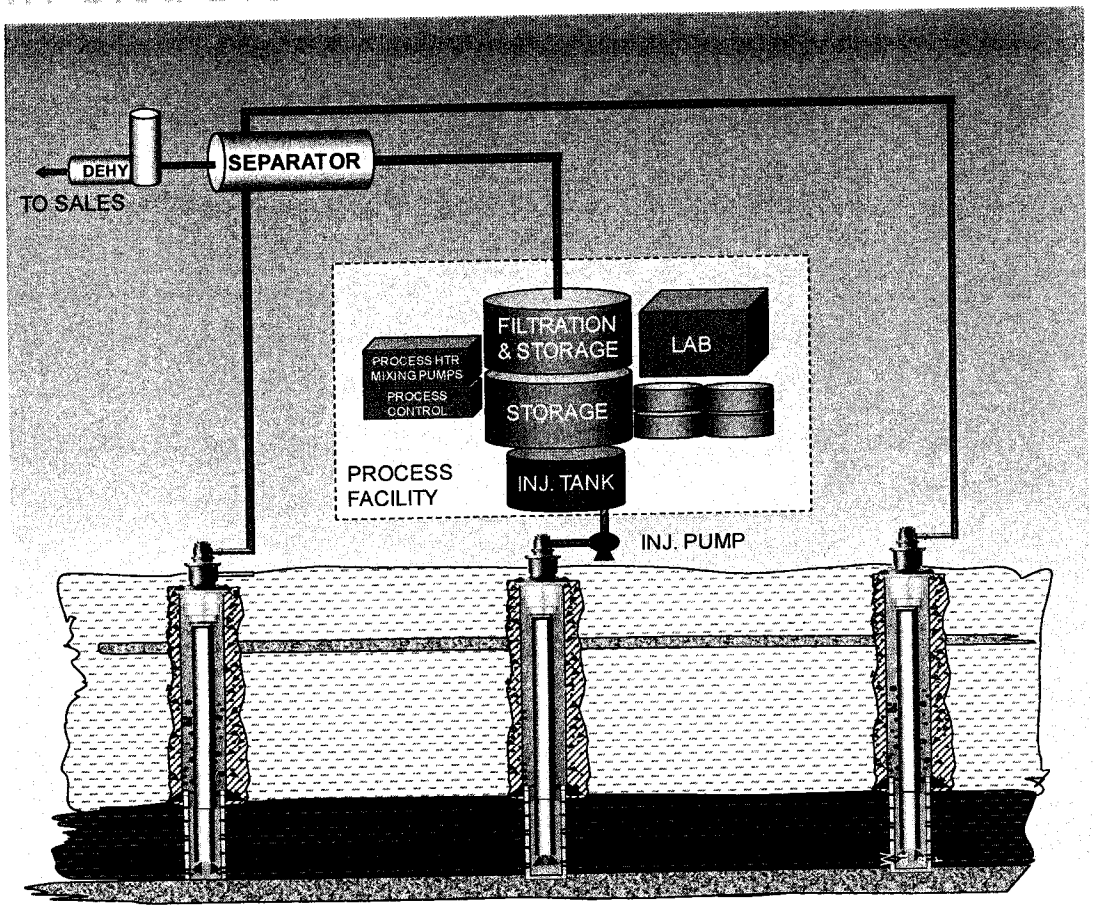
Senate Energy & Telecommunication
Exhibit No. 1
Date 3/17/2011
Bill No. HB 479

In-Situ Biochemical Conversion "ISBC": Overview



Low concentration chemicals are continuously injected into buried coalseams in an engineered process

Solutions stimulate growth of indigenous methanogenic microbes, which convert carbon in coal to methane

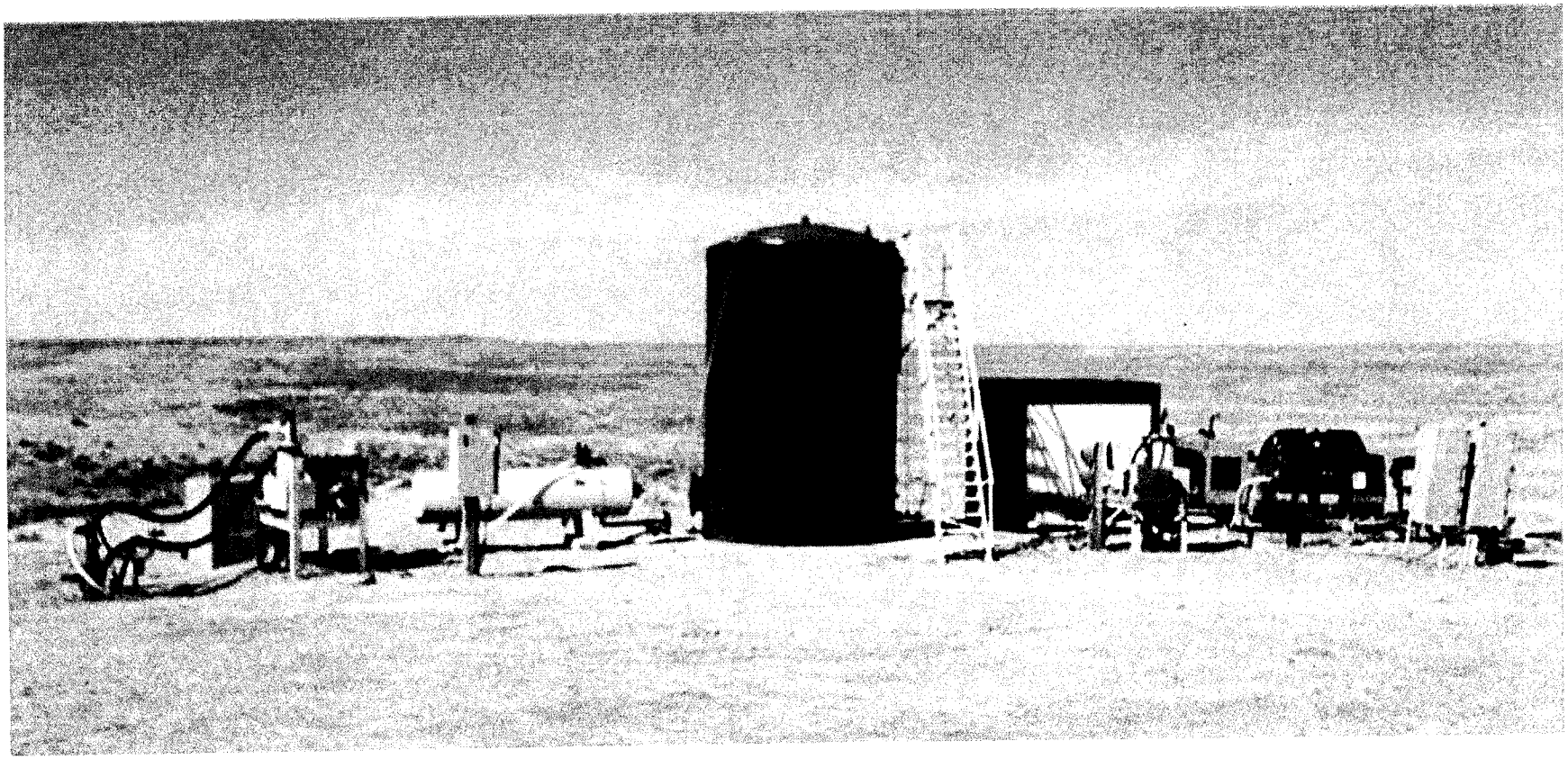
Solutions also solubilize coal to increase amount of bio-available carbon, further enhancing bioconversion process

Gas and water are produced from offset wells

- Gas is separated out, dehydrated and sold
- Water is recycled – NO WATER DISPOSAL

20-80x yield of conventional CBM fields

Sustained gas production over long timeframe (+20 years)



ISBC = Long-term, high yield

Low concentration chemicals are injected into buried coalseams to increase the amount of bio-available carbon in coal and stimulate indigenous microbes, enhancing natural gas production by 20x – 80x the yields of a CBM reservoir.[1]

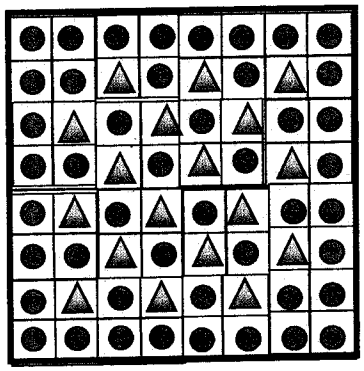
ISBC technology can extend field life by generating gas from producing or depleted wells, and also access coal resources that are too deep to mine.

ISBC: Comparison to Conventional CBM

	ISBC	Conventional CBM
Gas Yield	• 3,500 SCF/ton over 20 years • 50 – 170 SCF/ton/year	• 30 – 100 SCF/ton over 15 years
Estimated Economic Life	• > 20 years	• 5 – 15 years
Produced Water	• Zero cost; no disposal	• Massive quantities

● *Producer*

▲ *Injector*



640-Acre ISBC Project

Multiple wells 660 feet apart; 18 Injectors, 46 Producers
Annual avg amount of gas generated: ~ 7,346,700 MCF
Annual avg. amount of gas produced: ~ 6,612,000 MCF
Gas recovery: 90%
Gas production rate: ~ 182 SCF/ton/year