PTTC Workshop on "Value-Added CCS: CO_2 EOR and CO_2 ECBM"

February 12, 2008
NRCCE Building, West Virginia University, Morgantown, WV

Co-Hosted by the Appalachian PTTC Center
and West Virginia University

Sponsors: Natural Energy Development Corporation
NGO Development Corporation
Abarta Oil & Gas Company, Inc.
Ansbro Petroleum

Instructor: **L. Stephen Melzer**
Melzer Consulting
Midland, Texas

Premise of the PTTC short course: The commercial applications of CO_2 injection have quietly become mainstream within the U.S. oil and gas industry. Experiences with the technology are primarily centered in the Permian Basin region of west Texas and with CO2 enhanced oil recovery, but the applications have spread to other regions and, most recently but to a very limited extent, enhanced coal bed methane production. The course is designed to review best practices and case histories while examining growth potential in new reservoirs as they may apply to coincident EOR, ECBM and CO_2 capture and storage (CCS).

Objective of the PTTC Workshop: This short course is designed to provide the audience with a look at modern day technologies and practices of CO_2 injection projects in an attempt to set the stage for more widespread application of CO2 EOR, ECBM and CCS.

Level of Instruction: The course is designed to provide information for technologists, practicing engineers and businessmen. The subject material is broad and diverse, covering historical development, reservoir concepts and operational practices in an intense day of instruction.

Instructor: Steve Melzer is a practicing geological engineer specializing in CO_2 applications. He has conducted research and operated oil and gas wells, and now spends a great deal of his time directing technology transfer events such as this short course and the annual CO_2 conference. Some of his recent research on residual oil zones has gathered international attention as it relates to incremental oil production and carbon capture and storage.

Workshop schedule: The short course will be an eight-hour course with lunch and two breaks provided.

DATE/COURSE AGENDA: February 12 – 8:00 am to 5:00 pm

8:00 am Introduction to Enhanced Oil Recovery and Commercial CO_2 Injection EOR
- CO_2 EOR Miscible and Immiscible Flooding
- Enhanced Coal Bed Methane (ECBM)
- CO_2 EOR and ECBM within the Spectrum of EOR Techniques

- The Necessary Components of a CO_2 Project
- Expected Incremental Production and Costs for CO_2 EOR

9:00 The Existing CO_2 EOR Projects and Data Base: a Geological Overview
- History of CO_2 Flooding
- Distribution of Current Floods
- Reservoir Properties of Current Floods
- Current Activities Related to Growth of CO_2 Floods
- Conventional and Unconventional CO_2 Flooding

9:40 A Review of Enhanced Coal Bed Methane (ECBM)

10:20 Morning Break

10:45 Value-Added CCS and EOR: The Convergence of Commercial CO_2 Projects and Carbon Capture and Storage

11:25 Current Operational Practices (Part I)

12:00 Lunch

1:00 Wrap-up of Operational Practices

1:30 Residual Oil Zones: Expanding the Scope of Floodable Intervals Beneath the Oil Water Contact: Transition Zones and ROZ's
- Hydrodynamic Forces and Residual Oil Zone Formation – "Mother Natures' Waterfloods
- Hydrodynamic Trapping: ROZ's Progeny
- Distribution of Known ROZs Intervals and Oil in Place – Examples

3:00 Afternoon Break

3:30 Getting Started: Cyclic CO_2 Gas Injection: Theory, Target Areas, Application, and Regional Examples

4:30 pm Questions and Answers/Course Wrap-up

DIRECTIONS:

The easiest access to NRCCE is from the Star City/WVU exit off I-79 north of the I-68 interchange. Turn right off the ramp if coming from the south, left if coming from the north. You will follow the signs for U.S. 19 south/ Rt. 7 East (Monongahela Blvd./Jerry West Blvd.). Go through 4 lights (the 4th is at the Coliseum). At the 5th light, turn left onto Evansdale Drive. The Creative Arts Center will be on your left. A map of WVU's Evansdale Campus is attached and should help you find your way to the NRCCE building once you turn into the campus.

HOTELS:

For workshop attendees who may wish to stay in Morgantown, the following is a list of hotels convenient to NRCCE. The first two are right off Monongahela Blvd./Jerry West Blvd. Directions to the hotels are given from the I-79 Star City exit:

Best Western – 800-528-1234 (turn left at the third traffic light from the Interstate, hotel is immediately on the right)
366 Boyers Ave.

Quality Inn - 599-1680 (hotel is just before the WVU Coliseum on the right after the third traffic light)
1400 Saratoga Ave.

Hampton Inn - 599-1200 (turn left at the 4th traffic light on Monongahela Blvd onto Patteson Drive; after the 3rd light when Patteson becomes Van Voorhis Rd., hotel is immediately on the left); 1053 VanVoorhis Rd.

Euro-Suites - 598-1000 (follow directions for Hampton Inn, but continue past Hampton Inn to the next light and turn right, the hotel is immediately on the left) 501 Chestnut Ridge Rd./Milan Puskar Blvd.

PARKING:

The following are suggestions for parking while attending the workshop:

Paid Parking is available in the short-term pay lot next to the WVU Greenhouse (see map; parking area #1). Rate is $1.00 per hour and the machine does not give change. It accepts only $1 bills and coins, so attendees need to arrive with at least 8 $1 bills in their possession. Attendees should arrive early to use this option.

Free Parking is available in the WVU Coliseum parking lots (see map). Attendees may park at the Coliseum and ride the free university shuttle bus to the Mineral and Energy Resources Building and from there walk (5 minutes) over to NRCCE. Attendees also may choose to walk directly from the Coliseum parking lot to NRCCE. Attendees who choose one of these options should allow an extra 20 minutes to park, catch a bus/walk to NRCCE. Buses depart from the Coliseum Blue Gate every 10 minutes from 7:30 a.m. until 5:00 p.m., and every 15 minutes from 5:00 pm until 10:00 pm.

Access to the NRCCE Building is through the front (first floor) entrance for those who park at the Coliseum and take the short walk from the drop off point, or through the rear (ground floor) entrance for those who park in the pay lot next to the Greenhouse and walk to the NRCCE building. The workshop room will be immediately on the left as one enters the front entrance to the building.

NAME: _____

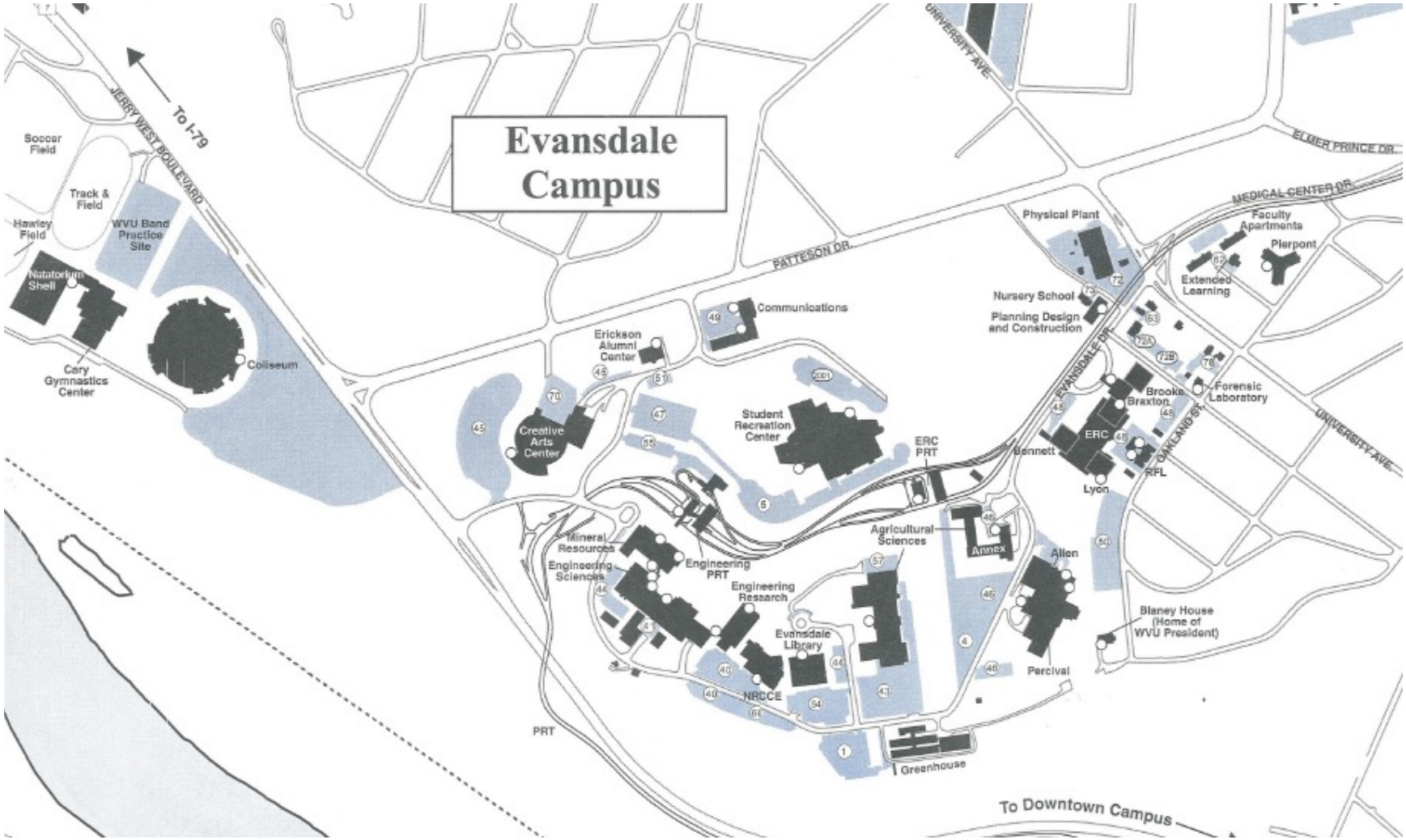
COMPANY: _____

ADDRESS: _____

CITY: _____ STATE: ____ ZIP CODE: _____

E-MAIL: _____

The registration fee for this workshop is $100. This fee covers the entire workshop, continental breakfast, morning and afternoon breaks and lunch. Please make checks payable to "West Virginia University" and return with this form by February 5, 2008 to: Douglas Patchen, P.O. Box 6064, Morgantown, WV 26506-6064.


Evansdale Campus
To I-79
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Cary Gymnastics Center
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Communications
Creative Arts Center
Student Recreation Center
ERC PRT
Physical Plant
Nursery School
Planning Design and Construction
Faculty Apartments
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Brooke
Braxton
Forensic Laboratory
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Agricultural Sciences
Annex
Allen
Mineral Resources
Engineering Sciences
Engineering PRT
Engineering Research
Evansdale Library
NRCCE
Percival
Blaney House (Home of WVU President)
PRT
Greenhouse
To Downtown Campus