

III. Executive Summary (limited to one page)

The announcement in April, 2008 by the US Geological Survey that the original oil in place (OOIP) in the Bakken Formation in the Williston Basin lies between 200-400 billion barrels and the recoverable oil reserves (ROR) are approximately at 3.65 billion barrels promises to energize North Dakota's petroleum industry to a new level and signifies an enormous opportunity for economic development. The University of North Dakota is in the unique position of being able to assist the State through establishment of a Center of Excellence in Petroleum Engineering Research, Education and Entrepreneurship. Two years prior to the USGS announcement of the OOIP, the School of Engineering and Mines and the Department of Geology and Geological Engineering began planning to increase petroleum-related research and education at UND. In this pursuit, we have developed a curriculum for a petroleum engineering focus within our current geological engineering program. We have applied to the University to establish a Petroleum Research Center, and we have received a gift of \$1,000,000 from an SEM alumnus to build a petroleum engineering laboratory. The combination of our plans, the USGS announcement of OOIP, and the State's Center of Excellence program offers an excellent opportunity to enhance economic development of the enormous energy potential of the Williston Basin. The mission of the Center is to: 1) improve our understanding of the geology, geophysics, and petroleum engineering characteristics of the Williston Basin, with special attention to Bakken Fm., 2) develop enhanced oil recovery (EOR) techniques for the entire Williston Basin, with focus on Bakken Fm., 3) develop techniques for CO₂ sequestration in the Williston Basin, 4) develop engineering enhanced geothermal systems (EEGS) using oil field waters to generate electrical power, 5) address environmental and policy issues of petroleum exploration and production, and 6) help entrepreneurs develop new businesses and industry. The Educational focus will be on training UND students and industry professionals to meet the challenges of these six areas. The Entrepreneurship focus will utilize both the recently established Jodsass Center and the Center for Innovation at UND.

Item	Rate(\$)	Qunatity	CoE (\$)	Match (\$)	Year	CoE by year
Personnel						
Salary						
Gosnold (PI)	8,708	4	17,416	17,416		
Zeng (Co-PI)	6,927	4	13,854	13,854		
LeFever	8,553	4	17,106	17,106		
Mann	9,973	2	9,973	9,973		
SalehFar	9,320	2	9,320	9,320		
Visiting Prof	5,750	12	69,000	0		
Res Asso	4,500	12	54,000	0		
Post Doc	4,000	12	48,000	0		
Lab Tech	3,590	12	43,080	0		
Office Asst	1,000	12	12,000	0		
GRA x 6	1,875	72	135,000	0		
BS asst x 6	875	72	63,000	0		
Tuition	14,795	6	88,770	0		
Fringe benefits						
Gosnold	27% (20%,Su)	4	3,483	4,702		
Zeng	27% (20%,Su)	4	2,771	3,741		
LeFever	27% (20%,Su)	4	3,421	4,619		
Mann	27% (20%,Su)	2	1,995	2,693		
SalehFar	27% (20%,Su)	2	1,864	2,516		
Visiting Prof	27% (20%,Su)	12	13,800	0		
Res Asso	35%	12	10,800			
Post Doc	35%	12	9,600			
Lab Tech	35%	12	8,616			
Office Asst	35%	12	2,400			
GRA x 6	750/12-mo	72	4,500			
BS asst x 6	10%(Summer)	72	3,600			
Personnel Y1			647,369	85,940	Yr1	
Personnel Y2	5% up from Y1		679,737	90,237	Yr2	
Personnel Y3	5% up from Y2		713,724	94,748	Yr3	
Personnel taotal			2,040,830	270,925		
Operatonal						
Infrastructure	1,000,000	1		1,000,000	Yr1	
Hardware						
PC and peripherals	2,000	10	20,000		Yr1	
Petrophysics lab	370,000	1	370,000		Yr1	
Geomechanics testing machine	350,000	1	350,000		Yr2	
Miscellaneous	40,000	3	120,000		Yr1-3	
Software						
SLB reservoir packages	4,875,224	1		4,875,224	Yr1	
IHS Engrg sol packages	647,175	1		647,175	Yr1	
API standards	20,232	1		20,232	Yr1	
Travel	3,000	33	99,000		Yr1-3	
Operational total			959,000	6,542,631		
Direct			2,999,830	6,813,556		Yr1=\$110,369
F & A	35%		699,994	444,824		Yr2=\$1,102,737
Indirect (all from UND)				1,144,818	Yr1-3	Yr3=\$786,724
Total	10,958,203		2,999,830	7,958,373		