

# PROJECT FACT SHEET

**CONTRACT TITLE:** Geo-Engineering Modeling Through Internet Informatics

**ID NUMBER:** DE-FC26-00BC15310

**CONTRACTOR:** Univeristy of Kansas

**B&R CODE:** AC1005000

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**PROJECT SITE**

**CITY:** Lawrence                      **STATE:** KS  
**CITY:**                                      **STATE:**  
**CITY:**                                      **STATE:**

**CONTRACT PERFORMANCE PERIOD:**

10/1/2000 to 9/30/2003  
**PROGRAM:** Exploration & Production  
**RESEARCH AREA:**  
**PRODUCT LINE:** ADIS

**CO-PARTICIPANTS:**

<b>PERFORMER:</b>	<b>CITY:</b>	<b>STATE:</b>	<b>CD:</b>
<b>PERFORMER:</b>	<b>CITY:</b>	<b>STATE:</b>	<b>CD:</b>
<b>PERFORMER:</b>	<b>CITY:</b>	<b>STATE:</b>	<b>CD:</b>
<b>PERFORMER:</b>	<b>CITY:</b>	<b>STATE:</b>	<b>CD:</b>

FUNDING (1000'S)	DOE	CONTRACTOR	TOTAL
<b>PRIOR FISCAL YRS</b>	809	242	1051
<b>FY 2002 CURRENT OBLIGATIONS</b>	0	120	120
<b>FUTURE FUNDS</b>	68	0	68
<b>TOTAL EST'D FUNDS</b>	877	362	1239

**OBJECTIVE:** Identify and select additional Kansas plays that can be used to expand the Northern Mid- continent Petroleum Atlas. Undertake selected field studies for each play. Complete overview synthesis for each play. Develop and improve the structure and navigation tools that can be used to provide online access to petroleum information and technology. Improve query, display and analysis tools.

**PROJECT DESCRIPTION:**

**Background:** Utilization of improved recovery technologies could add significantly to the U.S. energy supply. In reservoir management, consistent, quantitative characterization and modeling of reservoirs are essential to make decisions on application of the most appropriate technology. Implementing this type of modeling is often not practical because of limitation of software, staff, and expertise. GEMINI (Geo-Engineering Modeling through Internet Informatics) will harness existing expertise and resources of the Kansas Geological Survey to provide efficient, interactive access to data and software modeling tools when and wherever it is needed. GEMINI will integrate extensive petroleum and petrophysical databases associated with the DOE-funded Northern Mid-Continent Digital Petroleum Atlas (DPA) (<http://crude2.kgs.ukans.edu/DPA/dpaHome.html>). GEMINI is being built on experience gained in software development provided through the DOE-funded PfeFFER (Petrofacies Evaluation of Formations for Engineering Reservoirs) software (<http://crude2.kgs.ukans.edu/PRS/software/pfeffer1.html>). GEMINI will resolve reservoir parameters that control well performance; characterize subtle reservoir properties important in understanding and modeling hydrocarbon pore volume and fluid flow; expedite recognition of bypassed, subtle, and complex oil and gas reservoirs at regional and local scale; differentiate commingled reservoirs; build integrated geologic and engineering model based on real-time, iterative solutions to evaluate reservoir management options for improved recovery; provide practical tools to assist the geoscientist, engineer, and petroleum operator in making their tasks more efficient and effective; enable evaluations to be made at different scales, ranging from individual well, through lease, field, to play and region (scalable information infrastructure); and provide training and technology transfer to elevate capabilities of the client.

**Work to be Performed:** The proposed program, for development and methodologies, is a 3-year interdisciplinary effort to develop an interactive, integrated Internet Website named GEMINI (Geo-Engineering Modeling through Internet Informatics) that will build real-time geo-engineering reservoir models for the Internet using the latest technology in Web applications. The client would be able to retrieve databases, upload information, and run software interactively using the intelligent interfaces that will efficiently assemble a project based on the definition of a three-dimensional data volume. Analytical software operating on the assembled data and results will be delivered to the client through the web pages. System informatics, consisting of the network, software, data, and tutorial components, will permit the client to develop any number of projects. Analytical components of GEMINI include assembling fluid and rock parameters, basic and enhanced wireline log interpretation, spatial analysis and visualization, volumetrics, material balance, and specific parameterization and formatting of these results suited for input into reservoir simulation software. A tutorial module will instruct clients on theory, application of analytical tools, and operation of GEMINI. Participating major and independent companies will provide information and expertise to provide feedback during the development process.

**PROJECT STATUS:**

**Current Work:** Well Profile Module is being released. PfeFFER (petrophysical) modules have been coded and being linked to assemble modeling parameters. Oil and gas production history plots are being completed using links to DPA (Digital Petroleum Atlas) information. Prototype on-line user's manual and tutorial are under development. Accessing and analysis of company datasets is being implemented. Engineering modules including PVT (Pressure-volume temperature) and drill stem test analysis are being developed.

**Scheduled Milestones:**

Evaluate needs of user and define software options	Cmplt
Parameter definition	Cmplt
Develop basic petrophysical and geomodel modules	Ongoing
Subtask 3.1. Program volumetrics module.	Ongoing
Geo-engineering modeling	Ongoing
Apply and test GEMINI modules	Ongoing
Develop tutorial interface	Ongoing

**Accomplishments:** Second prototype and links to presentations and reports of GEMINI were implemented on the website <http://crude2.kgs.ukans.edu/Gemini/index.html>. Well Profile Module was substantially refined to permit uploading of LAS files from remote locations and integrated viewing of information and interactive add and modify formation tops and intervals for petrophysical and volumetric analysis. Digital Rock Catalog prototype has been completed permitting relational search, assembly, and integration of core information with other GEMINI modules. Code for petrophysical program modules have been written. Oracle tables have been built and refined including cross reference to stratigraphic nomenclature and log types, and management of core, digital logs, and drill stem information. Digital camera and computer network is in place to routinely capture core photos. Three oral presentations and 2 workshops presented on GEMINI in 2001. GEMINI featured in Petroleum Technology Transfer Network News v. 7, no. 3, p.4. GEMINI exemplified in GeoInformatics discussions with National Science Foundation.

**TECHNOLOGY TRANSFER:**

**Technology/Information Transfer:**

**Public Relations:**