

# Oil & Natural Gas Technology

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## Quarterly Report

October 2012 to December 2012

### Liquid-Rich Shale Potential of Utah's Uinta and Paradox Basins: Reservoir Characterization and Development Optimization



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## EXECUTIVE SUMMARY

In the first quarter of 2013 (federal fiscal year), the Utah Geological Survey (UGS) began research on the National Energy Technology Laboratory (NETL) funded project *Liquid-Rich Shale Potential of Utah's Uinta and Paradox Basins: Reservoir Characterization and Development Optimization*. The contract was officially signed by NETL on November 21, 2012, and the Principal Investigator (PI) completed the Project Management Plan in December. Also in December, research efforts commenced with data collection and the initiation of important collaborations.

Since much of this project will be dependant on available core and cutting material, the project team contacted several companies working in both the Uinta and Paradox Basins. Several Uinta Basin operators (Anadarko, Berry, Bill Barrett, Newfield, QEP Resources) have already agreed to donate or grant access to their recently acquired Green River Formation cores, including the Uteland Butte Member and the black shale facies. These companies have also agreed to supply data acquired from these cores. Companies in the Paradox Basin have been harder to contact and efforts will continue during the next quarter.

In addition to starting the proposed research, the UGS has initiated several technology transfer activities to inform interested parties of the project's intended goals and objectives. The project was announced via a December press release that was picked up by several local and national media outlets. The PI has created a website that displays project details, recent project publications, and contact information. Furthermore, the PI submitted an abstract to the American Association of Petroleum Geologists (AAPG) annual meeting to be held in Pittsburgh, PA in May of 2013. This conference will be attended by hundreds of researchers and oil and gas operators and will be an excellent venue to announce our project and display preliminary results on the Green River Formation's Uteland Butte Member.

## PROGRESS, RESULTS, AND DISCUSSION

### Task 1.0: Project Management Plan

After the contract was signed on November 21, 2012, the PI wrote and submitted the Project Management Plan, which DOE accepted in mid-December. This plan outlines the research to be performed during the entire three-year project. Also in December, UGS set up a subcontract with its research partner, the Energy and Geoscience Institute at the University of Utah.

### Task 2.0: Technology Transfer

- A project website was created - [http://geology.utah.gov/emp/shale\\_oil](http://geology.utah.gov/emp/shale_oil)
- The PI co-wrote a press release announcing this project, along with a second oil and gas-related project funded by the Research Partnership to Secure Energy for America (RPSEA), to the media and general public. Several local and even national newspapers picked up the story. The press release is available on the UGS project website.
- An abstract was accepted to the AAPG annual meeting, which will be held in Pittsburgh, PA in May 2013. The PI and other members of the project team will present a poster detailing the new unconventional tight oil Uteland Butte play in the Uinta Basin, Utah. On display with the poster will be several boxes of Uteland Butte core. The abstract is available on the UGS project website.

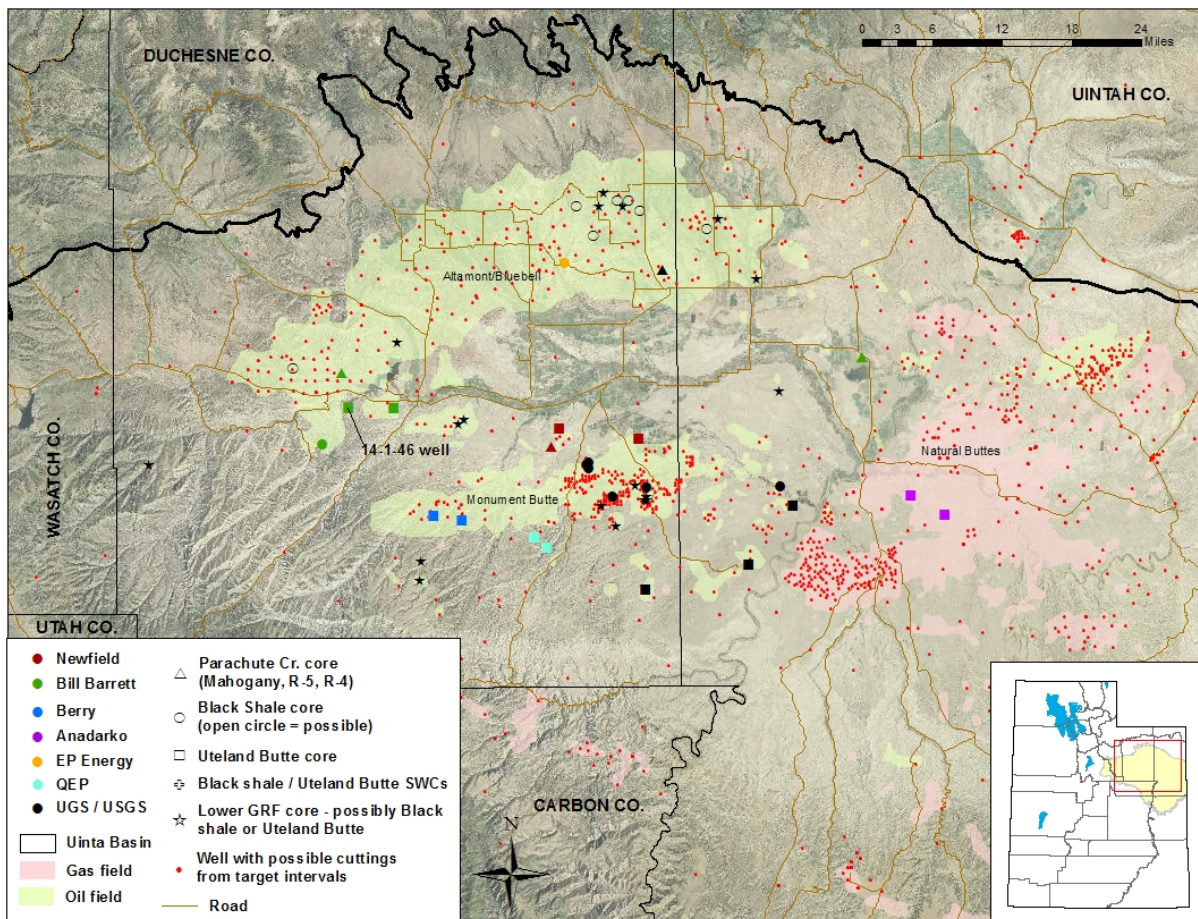
### Task 3.0: Data Compilation

The first research-related task performed in the first quarter was to begin contacting oil and gas companies to see what type of information, including cores, are available for use with this project. The PI contacted several companies operating in the Uinta Basin, all of which agreed to help in some capacity. Anadarko, Berry, Bill Barrett, Newfield, and QEP Resources have already agreed to either donate

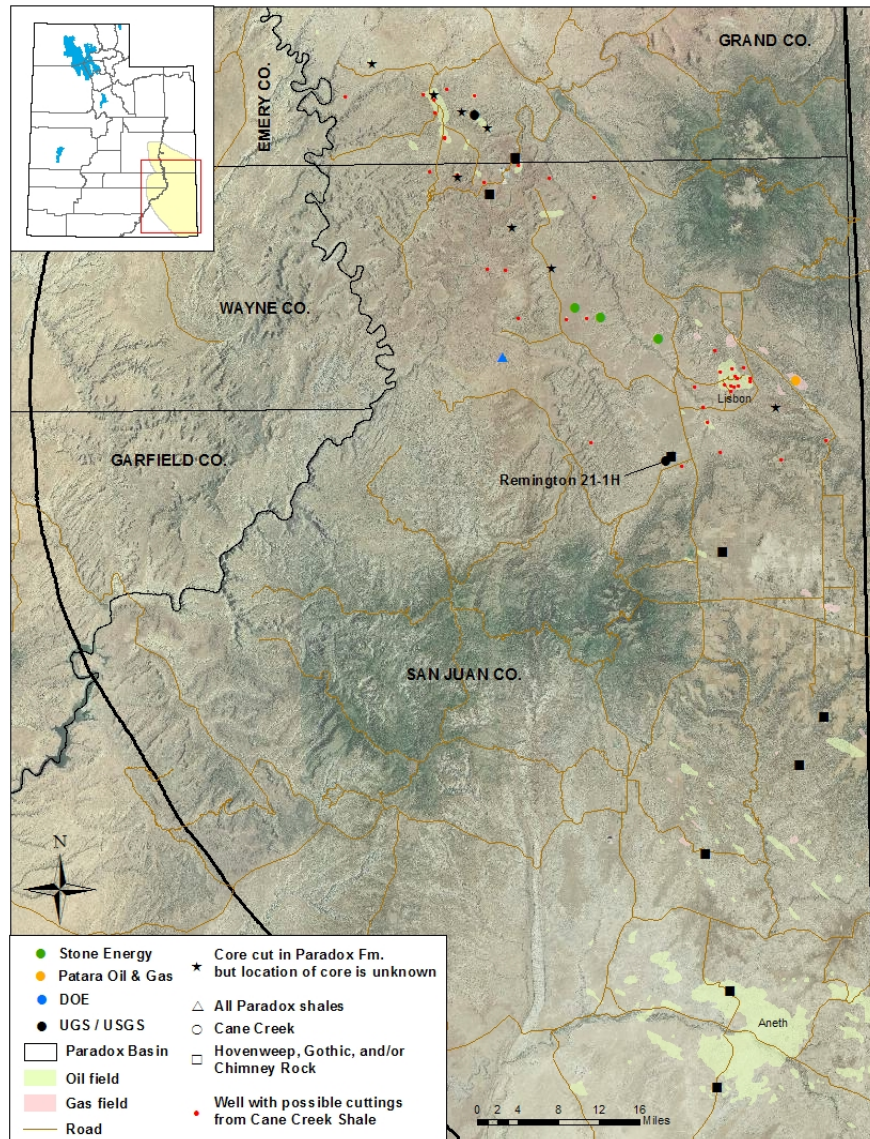
available Green River Formation core or make cores available to the project team to study (figure 1). Several of these companies have also agreed to share data collected on the core including geochemistry, rock properties, geomechanics, photographs, mineralogy, and digital log files.

In addition, several companies (Fidelity, Patara, and Stone Energy) in the Paradox Basin were contacted, but responses have thus far been rather limited. Data compilation for the Cane Creek shale has focused more on information available from other state or federal core repositories (figure 2).

The project team will continue to contact operators and search for cores/data during Quarter 2 (January to March 2013). A preliminary well database, containing all available cores/cuttings and other significant wells, will be compiled by the end of Quarter 2, as well as a bibliography of relevant publications.



**Figure 1.** Map of the Uinta Basin, Utah, showing the location of available Green River Formation (GRF) cores and cuttings.



**Figure 2.** Map of the Paradox Basin, Utah, showing the location of available Paradox Formation cores and cuttings.

## CONCLUSION

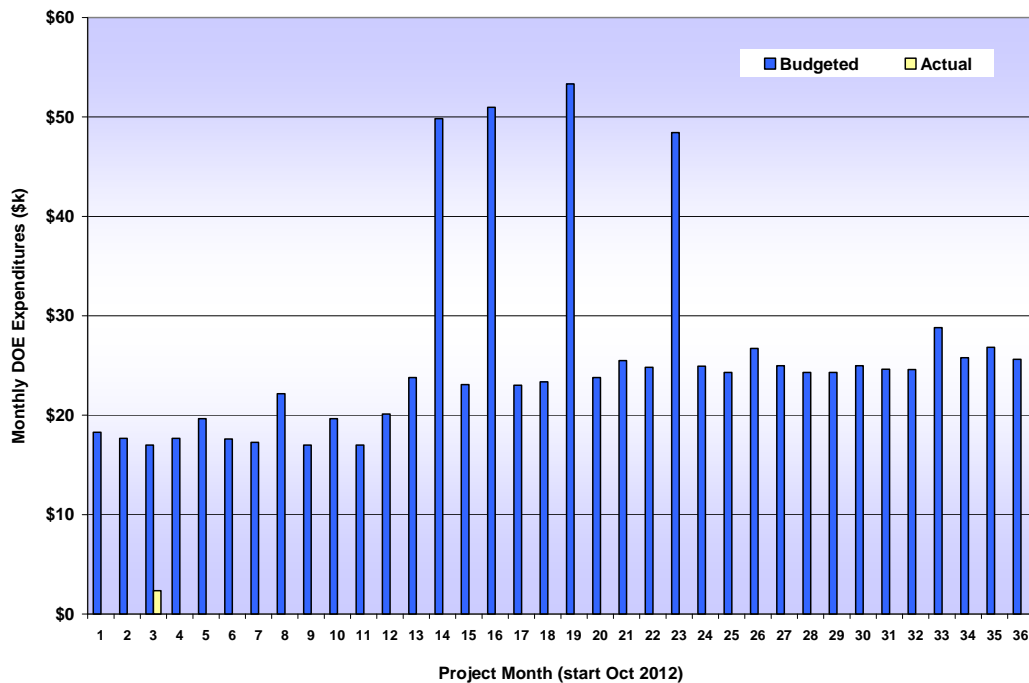
The project contract was signed on November 21, 2012 by NETL. The first efforts were to prepare a Project Management Plan and set up a subcontract with our project partner, the Energy and Geoscience Institute. Also during December, project team members began contacting companies about possible cores and data available for use by the project. Several companies in the Uinta Basin have core and data that they are willing to share, but it has been harder to reach the smaller operators in the Paradox Basin. Efforts were also made to determine what data might be available at other state and federal core repositories.

## COST STATUS

**Table 1. Project costing profile for Budget Period 1.**

	Oct 2012		Nov 2012		Dec 2012	
	Plan	Actual	Plan	Actual	Plan	Actual
UGS-personnel	\$7,607	\$0	\$7,607	\$0	\$7,607	\$1,671
Travel Expenses	\$961	\$0				
Analyses						
Miscellaneous <sup>1</sup>			\$500	\$0		\$80
<b>SUBTOTALS</b>	<b>\$8,568</b>	<b>\$0</b>	<b>\$8,107</b>	<b>\$0</b>	<b>\$7,607</b>	<b>\$1,751</b>
<b>UGS OVERHEAD (34.44%)</b>	<b>\$2,951</b>	<b>\$0</b>	<b>\$2,792</b>	<b>\$0</b>	<b>\$2,620</b>	<b>\$603</b>
<b>SUBCONTRACTS</b>						
EGI	\$6,771	\$0	\$6,771	\$0	\$6,771	\$0
Eby						
<b>GRAND TOTALS</b>	<b>\$18,289</b>	<b>\$0</b>	<b>\$17,669</b>	<b>\$0</b>	<b>\$16,997</b>	<b>\$2,354</b>

<sup>1</sup>Registration for two UGS geologists to go to the Utah Governor's Energy Development Summit



**Figure 3. Project costing profile.**

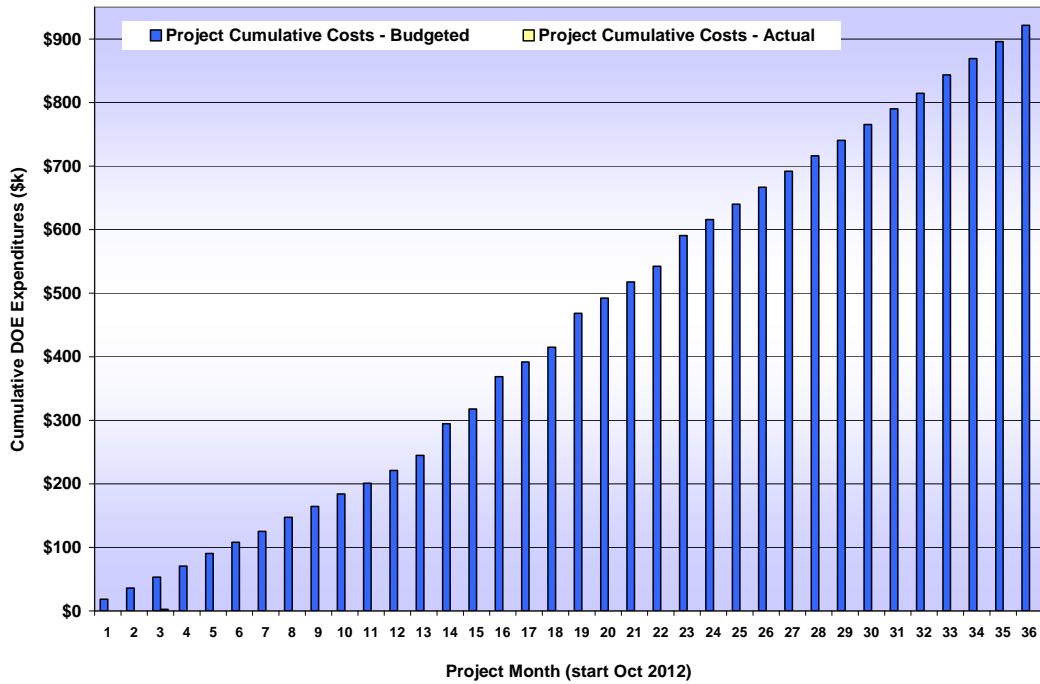


Figure 4. Project cumulative costs.

## MILESTONE STATUS

Table 2. Milestone log for Budget Period 1.

	Title	Related task or subtask	Completion Date	Update/comments
Milestone 1	Project Management Plan	Task 1	12/21/2012	Completed and approved by DOE
Milestone 2	Establish project website	Subtask 2.1	12/31/2012	Website is up and running
Milestone 3	Quarterly updates of website	Subtask 2.1	Quarterly	
Milestone 4	Quarterly reports	Subtask 2.2	Quarterly	Completed
Milestone 5	Select bibliography	Subtask 3.1	3/31/2013	Started compiling relevant papers
Milestone 6	Prelim. Well database – cores/cuttings info	Subtask 3.2	3/31/2013	Started creating core and cuttings database
Milestone 7	Technical presentations at National AAPG	Subtask 2.4, 2.5	5/20/2013	Abstract on Uteland Butte was accepted to National AAPG in Pittsburgh (May 2013)
Milestone 8	Updated select bibliography	Subtask 3.1	9/30/2013	
Milestone 9	Final well database	Subtask 3.2	9/30/2013	
Milestone 10	Core descriptions	Subtask 4.1	9/30/2013	
Milestone 11	First debriefing meeting	Subtask 2.3	9/2013	
Milestone 12	Technical presentations at Regional AAPG	Subtask 2.4, 2.5	9/2013	
Milestone 13	BP 1 decision point	Task 1	9/30/2013	

## ACCOMPLISHMENTS

- Contract signed on November 21, 2012
- Project Management Plan written and accepted
- Set-up subcontract with Energy and Geoscience Institute, University of Utah
- Abstract was accepted to AAPG annual meeting, Pittsburgh, PA, May 2013
- Wrote press release announcing project to the media

## PROBLEMS OR DELAYS

The official start of the project was October 1, 2012, even though the contract was not signed by NETL until November 21, 2012. Budget Period 1 will still consist of 12 months and end on September 30, 2013, but no work was completed during October or November 2012.

## PRODUCTS AND TECHNOLOGY TRANSFER ACTIVITIES

- Project Management Plan
  - Accepted by NETL in December 2012
- Project website
  - A project website was set up outlining the project objectives
  - Provides access to published reports and project updates
  - [http://geology.utah.gov/emp/shale\\_oil](http://geology.utah.gov/emp/shale_oil)
- Press release
  - Distributed a press release announcing project (as well as a second water disposal related project funded by RPSEA) to the media and general public.
  - Press release is available on the UGS project website
- Abstract – AAPG 2013 annual meeting – Pittsburgh, PA, May 19-22, 2013
  - An abstract was submitted and accepted to the AAPG 2013 annual meeting entitled, “The Uteland Butte Member of the Eocene Green River Formation: An Emerging Unconventional Carbonate Tight Oil Play in the Uinta Basin, Utah”
  - The poster presentation and Uteland Butte core display will be on the afternoon of May 20 in the “Unconventional Carbonate Reservoirs” session.
  - Abstract is available on the UGS project website



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