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Independent Science Study on Oil Recovery Techniques Released *First of Three Volumes Explores Scope, Types of Oil Recovery in California*

SACRAMENTO, Calif. – Following months of considered, peer-reviewed scientific research, the California Natural Resources Agency, the California Council on Science & Technology (CCST) and Lawrence Berkeley National Laboratory (LBNL) today released Volume I of the independent scientific assessment of well stimulation, including hydraulic fracturing, in California, as required by Senate Bill 4.

“This assessment represents the consensus findings of this diverse group of scientists on the future of oil and gas production in California and on the types of well stimulation treatments occurring in the state,” said Dr. Steven Bohlen, State Oil and Gas Supervisor and a former researcher at Lawrence Livermore National Laboratory and former Associate Chief Geologist for Science at the U.S. Geological Survey. “With this data we can provide greater focus on the potential environmental impacts of these activities, and the main concerns of our strong oversight will be to work towards ensuring these techniques are conducted transparently, based on sound science and in ways that protect the environment and public safety.”

Some of the key conclusions and findings in the assessment include:

- **Almost all hydraulic fracturing in California occurs in the southwestern portion of the San Joaquin Basin.** Hydraulic fracturing could continue to enable oil and gas production in this region for the foreseeable future, in and around existing oil fields that currently use the technology.
- **Current hydraulic fracturing activities in California differ from those in other states and, as such, recent experiences with hydraulic fracturing in other states do not necessarily apply to current hydraulic fracturing in California.** Hydraulic fracturing in California tends to be performed in shallower wells that are vertical as opposed to horizontal and requires much less water per well, but uses fluids with more concentrated chemicals than hydraulic fracturing in other states.
- **Geologic assessment indicates that large unconventional natural gas resources on a large, basin-wide scale (such as the Marcellus (OH, WV, PA, NY) or Barnett shales (TX) or in the Piceance basin (CO) which produce using hydraulic fracturing) probably do not exist in California.** Most of the

remaining undiscovered natural gas reservoirs in California are likely to be similar to reservoirs in production today that currently do not use well stimulation technology.

- **Oil resource projections for production from deep source rocks in the Monterey Formation are highly uncertain.** Investigators found no reports of significant production from the Monterey Formation or other source rocks to date in California. If and when operators attempt production in these reservoirs, they will need innovative technology to make recovery economically feasible.

This independent scientific assessment is required by SB 4 (Pavley, 2013) and is organized in three major areas that will be documented in three separate report volumes. Volume I provides the factual basis describing what well stimulation treatments (WST) are, how they are conducted in general and practiced in California, and where they have been and are being used for oil and gas production in the state.

The selection of CCST and LBNL to conduct the study was based on the expertise it and its partners have developed on well stimulation treatment issues. On behalf of the federal Bureau of Land Management (BLM), CCST and LBNL conducted an independent scientific and technical assessment of well completion techniques primarily focused on hydraulic fracturing in California on lands administered by BLM and which was published in August 2014. CCST was also selected for its tried-and-proven study process that will maintain the level of independence this study deserves and which is required under SB 4. CCST uses a process modeled on the National Academy of Sciences in conducting peer-reviewed reports that incorporates quality checks at every step.

Final peer-reviewed copies of Volume II and Volume III will be submitted to the Natural Resources Agency on or before July 1, 2015. Volume II will assess the potential impacts of WST with respect to water, air quality and greenhouse gas emissions, as well as induced seismicity, ecology, traffic and noise. Volume III will present case studies to assess environmental issues and qualitative hazards for specific geographic regions, based on findings in Volume I and Volume II.

To view and download the report, please visit:

http://www.ccst.us/projects/hydraulic_fracturing_public/SB4.php.

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