

Public Executive Summary

Validation of incremental oil production via single well and reservoir field trials involving *in situ* stimulation of indigenous microorganisms

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Microbial populations can and do exist in virtually all oil bearing formations seemingly regardless of depth, temperature, or formation geology. It is suggested that these organisms are not naturally occurring, but rather the result of contamination from initial drilling operations, water-flooding or infiltration from aquifers underlying the oil bearing formation. Regardless of their origin, these down-hole populations derive metabolic energy through processes utilizing existing carbon sources and water-borne nutrients. For the purpose of this proposal they are all considered to be indigenous organisms.

Traditional Microbial Enhanced Oil Recovery [MEOR] treatment methods for stimulating oil production in single wells and reservoirs involves repetitive [cyclic] or continual injection of non-indigenous microorganisms plus substantial quantities of nutrient medium, usually molasses. These methods have proven to stimulate oil production which results from the production of biochemicals beneficial to oil recovery plus carbon dioxide that provides a gas drive mechanism. However, there are major drawbacks to this MEOR approach: 1) selection, culturing, and preparation of the requisite microorganisms to be injected requires specialized skills, 2) nutrient and shipping cost; 3) microorganisms can be filtered out at or near the formation face, resulting in severe flow restriction and little penetration into the formation, or even plugging; 4) failure of the injected microorganisms to become established and thrive in the down-hole environment.

This project seeks to validate the results of a novel approach to MEOR first undertaken by the applicant in 1988 which produces incremental oil by stimulating indigenous organisms in the formation [*in situ*] using low volumes of treatment fluid produced from brewing industry waste streams. Field trials to validate oil stimulation will be conducted on a number of single stripper well candidates in various oil-bearing strata. Single wells will be treated with low-volume slugs of treatment fluid via cyclic injection methods. Additionally, one or more enhanced water-flood projects involving mature fields will also be undertaken. Letters of Support from two oil producers have been received. They have agreed to assist the applicant in identifying candidate oil wells and one or more waterflood projects, and provide verifiable pre- and post-treatment data in exchange for stimulation fluid and technical assistance. Memoranda of Agreement to this effect will be executed upon receipt of grant funding.

The applicant seeks SWC co-funding to: 1) screen and select candidate wells and active water-floods; 2) manufacture and ship sufficient product to meet the needs of multiple single well field trials, and one or more enhanced water-flood projects; 3) analyze pre- and post-treatment data, and 4) generate a report of findings.