

stimulation of fractures **518** within the isolated open-hole interval **514**, the tubing string **528** is raised from within the scab liner **522** and a temporary plug is installed below the polished bore receptacle **526** to seal off the isolated open-hole interval **514**. The temporary plug may be a “NO-GO” or other plug known in the art for internally plugging scab liners.

A plurality of scab liners may be deployed in the subterranean well **502** and positioned proximate a plurality of selected open-hole intervals to hydraulically isolate the selected open-hole intervals for fracture stimulation. A polished bore receptacle, packer or other internal plugging device is installed inside the scab liner adjacent to a selected open-hole interval to provide hydraulic isolation within the scab liner and to hydraulically isolate the selected open-hole interval from the remainder of the subterranean well **502**. The tubing string **528** is stabbed through the polished bore receptacle and treatment fluid is injected down the tubing string **528** or the annulus **524** to stimulate fractures within open-hole intervals above and/or below the scab liner **522** without propagating stimulated fractures. After stimulation of fractures within a plurality of open-hole intervals, a temporary plug may be installed below the polished bore receptacle to seal off the isolated open-hole interval. Temporary plugs such as “NO-GO” plugs installed below one or more polished bore receptacles in one or more scab liners may be retrieved with a wire line, a coiled tubing rig or conventional drill pipe and a drill rig to maximize energy recovery from a plurality of open-hole intervals after fracture stimulation is complete.

In accordance with the present disclosure, the methods herein disclosed for isolating an open-hole interval including the injection of a temporary fracture sealant, the injection of a high viscosity fluid, the use of high pressure jet nozzles, the deployment of an open-hole packer and the deployment of a scab liner may be used alone or in combination to isolate one or more selected open-hole intervals for fracture stimulation.

During fracture stimulation, a micro-seismic monitoring system may be installed to detect the location of micro-fractures real-time as they are stimulated during fracture stimulation. A fiber optic temperature and/or pressure monitoring system may also be installed to provide temperature and pressure data for determining downhole parameters real-time during stimulation. These detection systems are used to determine downhole parameters including, but not limited to, the propagation of fractures, the pressure within the subterranean well, the temperature within the subterranean well, the flow rate and flow pattern of treatment fluid in the subterranean well and the flow rate and flow pattern of treatment fluid within fractures in the subterranean formation.

Example embodiments have been described hereinabove regarding improved systems and methods for maximizing energy recovery from a subterranean formation. Various modifications to and departures from the disclosed example embodiments will occur to those having ordinary skill in the art. The subject matter that is intended to be within the spirit of this disclosure is set forth in the following claims.

What is claimed is:

1. A method comprising:

stimulating at least one fracture within an unisolated subterranean open-hole interval;

isolating a selected subterranean open-hole interval by blocking the fracture with a temporary fracture sealant, wherein the temporary fracture sealant degrades after a predetermined period of time under a geostatic temperature; and

stimulating at least one fracture within the isolated subterranean open-hole interval.

2. The method as recited in claim 1, wherein stimulating at least one fracture within the isolated open-hole interval comprises pressurizing the isolated open-hole interval with a treatment fluid.

3. The method as recited in claim 2, wherein stimulating at least one fracture in the isolated subterranean open-hole interval comprises projecting treatment fluid from a high pressure jet nozzle against the isolated subterranean open-hole interval.

4. The method as recited in claim 3, wherein the treatment fluid comprises a granular material.

5. The method as recited in claim 2, wherein isolating the selected subterranean open-hole interval comprises at least partially filling at least one fracture in the unisolated subterranean open-hole interval with a high viscosity fluid.

6. The method as recited in claim 2, further comprising detecting the stimulation of fractures real-time with a micro-seismic monitoring system.

7. The method as recited in claim 2, further comprising detecting a downhole parameter real-time.

8. The method as recited in claim 7, wherein the downhole parameter is at least one of pressure of the selected open-hole interval, temperature of the selected open-hole interval, the flow rate of the treatment fluid in the selected open-hole interval, the flow pattern of treatment fluid in the selected open-hole interval, the flow rate of the treatment fluid in a fracture in the selected open-hole interval and the flow pattern of the treatment fluid in a fracture in the selected open-hole interval.

9. The method as recited in claim 1, wherein isolating the selected subterranean open-hole interval comprises sealing at least one fracture within the unisolated subterranean open-hole interval with the temporary fracture sealant.

10. The method as recited in claim 1, further comprising removing the temporary fracture sealant.

11. The method as recited in claim 10, wherein removing the temporary fracture sealant comprises at least one of chemically degrading at least a portion of the temporary fracture sealant, thermally degrading at least a portion of the temporary fracture sealant and dissolving at least a portion of the temporary fracture sealant.

12. The method as recited in claim 1, wherein isolating the selected subterranean open-hole interval comprises positioning an isolation tool adjacent to the selected subterranean open-hole interval.

13. The method as recited in claim 12, wherein stimulating at least one fracture within the isolated subterranean open-hole interval comprises injecting a treatment fluid down a tubing string.

14. The method as recited in claim 13, further comprising stimulating at least one fracture in an unisolated subterranean open-hole interval by injecting the treatment fluid down an annulus between the tubing string and the unisolated subterranean open-hole interval.

15. The method as recited in claim 14, wherein the isolation tool is a high temperature inflatable open-hole packer.

16. The method as recited in claim 14, wherein the isolation tool is a high temperature expandable open-hole packer comprising an expandable element and a sealing element.

17. The method as recited in claim 1, wherein isolating the selected subterranean open-hole interval comprises positioning a scab liner proximate the selected subterranean open-hole interval.

18. The method as recited in claim 17, wherein stimulating at least one fracture within the isolated subterranean open-hole interval comprises injecting a treatment fluid down a tubing string.