CLAIMS:

1. A method or process for hydraulically fracturing an underground hydrocarbon deposit comprising the steps of:

using as a source of water an underground aquifer which contains water which is stable and clear in the aquifer but which may include undesirable chemical compounds as soluble components that are not in solution when subjected to a relatively reduced pressure at atmospheric conditions, utilizing the water from the aquifer as a source of water for a hydrocarbon fracturing process, pumping the water under pressure at a predetermined level for the aquifer water and above a bubble point pressure for the water contained in the aquifer to prevent the undesirable chemical compounds in said water from separating out of solution, maintaining said water pressure above the bubble point pressure at all times during a fracturing operation, drilling a source well into the aquifer, drilling a disposal well into the aquifer, providing a pump capable of maintaining the water above the bubble point pressure, establishing a closed loop with a manifold, or a manifold and pumps, to keep the aquifer water circulating at all times until the fracturing operation begins when water will be supplied from that manifold, providing the fracturing operation with water from the manifold, or a manifold and pumps, so as to fracture the hydrocarbon deposit, wherein in using water from the aquifer in the fracturing operation and by maintaining said water above its bubble point pressure, said water remains stable and the undesirable chemical compounds remain in solution and the water remains clear.

2. The method of claim 1 wherein the soluble components in the water from the source aquifier are at about 22,000 ppm.

3. A method or process of high-pressure fracturing of a shale gas deposit comprising the steps of: using as a source of water an underground aquifer which contains sour water including hydrogen sulfide, utilizing the sour water from the aquifer as a source of water to be used on at least a clean side of a fracturing operation, pumping said sour water under pressure and above a bubble point pressure for the sour water contained in the aquifer to prevent hydrogen sulfide from falling out of solution, maintaining said sour water pressure above the bubble point pressure at all times during the fracturing operation, drilling a source well into the aquifer, drilling a disposal well into the aquifer, providing a pump capable of maintaining the water above the bubble point pressure, establishing a closed loop with a manifold, or a manifold and pumps, to keep the sour water circulating at all times until the fracturing operation begins when water will be supplied from that manifold, providing the clean side of the fracturing operation with sour water from the manifold, or a manifold and pumps, so as to fracture the shale gas deposit, wherein in using sour water from the aquifer for the fracturing operation and in maintaining said sour water above its bubble point pressure, said water remains stable and the constituents remain in solution and the water remains clear.

4. The method or process of claim 1 or 3 wherein said water source is utilized along with a sand on a dirty side of the hydrocarbon deposit or shale gas deposit fracturing operation.

5. The method or process of claim 1 or 3 further comprising providing a plurality of pumps and source wells and disposal water wells to enable the fracturing operation to occur on demand for each pad of a predetermined number of pads.

6. The method or the process of claim 1 or 3 wherein said water from the source aquifer is kept at an elevated temperature in relation to ambient surface water.

7. The method or process of claim 6 wherein the elevated temperature of the water from the source aquifier is about 38.degree. C.

8. The method or process of claim 1 or 3 further comprising providing an underground pipeline system including a water circulation line and a back pressure control valve located in the water circulation line wherein the pipeline system is in communication with the manifold or the manifold and pumps, and wherein when water is required, it will be withdrawn from the manifold, or the manifold and pumps.

9. The method or process of claim 1 or 3 further comprising providing a high pressure blender to maintain the water above its bubble point pressure.

10. The method or process of claim 1 or 3 wherein after pumping, the water is discharged at a pressure of about 6,000 to 10,000 psig.

11. The method or process of claim 10 wherein a suction pressure employed for a pump utilized in the process is about 15 to 600 psig.

CLAIMS:

1. A method or process of Hydraulic Fracturing a geological, underground hydrocarbon deposit on demand comprising the steps of:
using as a source of water an underground aquifer which contains water which is stable and clear in the aquifer but which may include undesirable chemical compounds as soluble components that are not in solution when subjected to reduced pressures at surface conditions such as hydrogen sulfide and other constituents,
utilizing the water from the aquifer as a source of water to be used in a hydrocarbon fracturing process and to pump the water under pressure at a predetermined level for the aquifer water and above the bubble point pressure for the water contained in a particular aquifer to prevent undesirable constituents (chemical compounds) of said water from separating out of solution,
maintaining said water pressure at a minimum required for each aquifer at all times during the fracturing process,
drilling a source well into the aquifer,
drilling a disposal well to the aquifer,
providing a pump capable of maintaining the required pressure needed to prevent the constituents of the aquifer water from coming out of solution only by maintaining the minimum pressure,
establishing a closed loop with a manifold, or a manifold and pumps, to keep the aquifer water circulating at all times until the fracturing operation begins when water will be supplied from that manifold,
providing the fracturing operation with water from the manifold, or a manifold and pumps, so as to fracture a hydrocarbon reserve,
wherein in using water from an aquifer in the fracturing process and by maintaining said water under pressure at a minimum at all times for the aquifer utilized, said water remains stable and the undesirable constituents remain in solution and the water remains clear thereby avoiding the necessity of preparing the water from the aquifer prior to using it in a fracturing processes.

2. A method or process of high-pressure fracturing a shale gas deposit on demand comprising the steps of:
using as a source of water an underground aquifer such as the Debolt aquifer or the like which contains sour water including hydrogen sulfide and other constituents,
utilizing the sour water from the aquifer as a source of water to be used preferably on at least the clean side of a gas fracturing process and to pump said sour water under pressure at a minimum

of for example 2310 kPa for Debolt water at about 38 degrees Celsius (which varies with temperature of source water for each applicable aquifer) and above the bubble point pressure for the sour water contained in a particular aquifer to prevent hydrogen sulfide and other constituents of said sour water from falling out of solution,

maintaining said sour water pressure at a minimum required for each aquifer, for example for Debolt of 2310 kPa, at all times during the fracturing process,

drilling a source well into the aquifer,

drilling a disposal well into the aquifer,

providing a pump capable of maintaining the required pressure needed to prevent the constituents of the sour water from coming out of solution only my maintaining the minimum pressure required, for example for Debolt 2310 kPa at 38 degrees Celsius,

establishing a closed loop with a manifold, or a manifold and pumps, to keep the sour water circulating at all times until the gas fracturing operation begins when water will be supplied from that manifold,

providing the clean side of a gas fracturing operation with sour water from the manifold, or a manifold and pumps, so as to fracture a gas reserve,

wherein in using sour water from an aquifer, such as Debolt or the like, for the gas fracturing process and maintaining said sour water under pressure at a minimum as an example for Debolt of 2310 kPa at 38 degrees Celsius, said water remains stable and the constituents remain in solution and the water remains clear thereby avoiding the necessity of stripping out the hydrogen sulfide and other constituents as is required by other gas fracturing processes.

3. The method or process of claim 1 or 2 wherein said water source and method or process is utilized along with sand on the dirty side of the fracturing operation with the addition of a high-pressure blender since the water must be maintained above its bubble point pressure, at all times thereby avoiding the constituents from falling out of solution.

4. The method or process of claim 1 or 2 wherein the necessary number of pumps and source wells and disposal water wells are provided with the method or process to enable a high-pressure fracturing operation on demand for a target for each pad for a predetermined number of pads annually.

5. The method or the process of claims 1 or 2 wherein said water from the source aquifer is at an elevated temperature, for example for Debolt a temperature under normal situations of 38°C, which therefore requires no additional heating, or insulated pipes, and which may be used

as a source of water for the pressurized fracturing on demand process even during the colder winter months experienced in, for example, western Canada or the like at a considerable savings when compared to utilizing surface water.

6. The method or process of claims 1 or 2 when utilizing water from the aquifer and continuously circulated said water at a pressure above the bubble point pressure from the source well to the disposal well in an underground pipeline system accomplished by a back pressure control valve located in the water circulation line wherein when water is required for frac operations, water will be withdrawn from a manifold, or a manifold and pump, centrally and strategically located on this circulation line thereby feeding water to the frac operation under pressure.

7. The method or process of claim 1 or 2 wherein the water is maintained at a pressure above its saturation pressure (bubble point pressure, BPP) and continuously using it for fracing so that as long as the water is kept at a high enough pressure to keep the solution gas entrained in the water, then the water remains stable, with no precipitates and is the least corrosive requiring that all frac operations (at least on the clean side) must be conducted at pressures above the aquifer water BPP which is the basis for a successful Pressurized-Frac-on-Demand (PFOD) process.

8. The method or process of claim 1 or 2 further comprising materials selected for material performance criteria for an HPHPS frac pump or equivalent from well known recommendations published by for example NACE, ASTME or ANSI for trim packaging or the like and capable of providing a discharge pressure of about 69 MPa.

9. The method or process of claim 8 wherein said pump is manufactured with construction materials in alignment with the recommendations published for well known material performance criteria from for example NACE, ASTME, ANSI standards for trim packaging or the like in view of the corrosive nature of the fluids being pumped.