CLAIMS

1. A tubular assembly adapted for downhole use in wells, the tubular assembly comprising:

an upstream manifold adapted to receive a gravel-laden slurry;

a gravel packing conduit in fluid communication with the upstream manifold and extending longitudinally away from the upstream manifold; wherein the gravel packing conduit is adapted to receive at least a portion of the gravel-laden slurry from the upstream manifold; wherein the gravel packing conduit is adapted to be in fluid communication with an annulus between a wellbore wall and the tubular assembly when the tubular assembly is disposed downhole in a well; wherein the gravel packing conduit is adapted to communicate gravel-laden slurry into the annulus during isolation forming operations; and wherein the gravel packing conduit is at least substantially isolated from direct fluid communication with a downstream flow path;

a transport conduit in fluid communication with the upstream manifold and in fluid communication with the downstream flow path; and

a leak-off conduit; wherein the leak-off conduit is in at least partially restricted fluid communication with the upstream manifold; wherein the leak-off conduit is in fluid and slurry communication with the downstream flow path in a region longitudinally spaced from the upstream manifold; and wherein the leak-off conduit is in fluid communication with the annulus through permeable media adapted to retain particles while communicating fluids providing fluid leak-off from the annulus during the isolation forming operations.

2. The tubular assembly of claim 1 wherein the gravel packing conduit includes at least one flow path adapted to gravel pack an interval of the wellbore.

3. The tubular assembly of claim 1 wherein the at least partially restricted fluid communication between the upstream manifold and the leak-off conduit and the fluid communication between the leak-off conduit and the downstream flow path maintains fluid pressure in the leak-off conduit below a pressure in the annulus and a pressure in the gravel packing conduit during at least a portion of the isolation forming operations.

4 The tubular assembly of claim 3 wherein fluid pressure in the leak-off conduit increases as isolation forming operations progress.

5 The tubular assembly of claim 4 wherein gravel-laden slurry enters the leak-off conduit from at least one of the downstream flow path and the transport conduit as isolation forming operations progress.

6. The tubular assembly of claim 5 wherein fluid in the gravel-laden slurry in the leak-off conduit exits the leak-off conduit into at least one of the annulus and a basepipe associated with the tubular assembly thereby gravel packing the leak-off conduit.

7. The tubular assembly of claim 6 wherein the fluid exits the leak-off conduit through at least one flow control valve.

8. The tubular assembly of claim 6 wherein the gravel packed leak-off conduit and the gravel-packed annulus together provide a zonal isolation assembly in the wellbore.

9. The tubular assembly of claim 1 wherein the leak-off conduit and the gravel packing conduit are adapted to provide a zonal isolation assembly in the wellbore in a region adjacent the tubular assembly.

10. The tubular assembly of claim 9 wherein the zonal isolation assembly is adapted to at least substantially isolate annular intervals on either side of the tubular assembly.

11. The tubular assembly of claim 9 wherein the zonal isolation assembly is formed during gravel packing operations.

12. The tubular assembly of claim 1 wherein at least one of the gravel packing conduit, the transport conduit, and the leak-off conduit is operatively associated with a base pipe.

13. The tubular assembly of claim 1 wherein at least one of the upstream manifold, the transport conduit, the leak-off conduit, and the gravel packing conduit are adapted to promote fluid flow from the upstream manifold into the gravel packing conduit.

14. The tubular assembly of claim 1 wherein the fluid communication between the leak-off conduit and the downstream flow path is through a double-U assembly.

15. A method for providing a gravel-based zonal isolation system in a hydrocarbon-related well, the method comprising:

providing a tubular assembly comprising:

an upstream manifold;

a gravel packing conduit in fluid communication with the upstream manifold and extending longitudinally away from the upstream manifold; wherein the gravel packing conduit is adapted to be in fluid communication with an annulus between a wellbore wall and the tubular assembly; and wherein the gravel packing conduit is at least substantially isolated from direct fluid communication with a downstream flow path;

a transport conduit in fluid communication with the upstream manifold and in fluid communication with the downstream flow path; and

a leak-off conduit; wherein the leak-off conduit is in at least partially restricted fluid communication with the upstream manifold; wherein the leak-off conduit is in fluid and slurry communication with the downstream flow path in a region longitudinally spaced from the upstream manifold; and wherein the leak-off conduit is in fluid communication with the annulus through permeable media adapted to retain particles while communicating filtrate fluids providing fluid leak-off from the annulus during isolation forming operations;

positioning the tubular assembly at a predetermined position within a well;

pumping gravel-laden slurry to the upstream manifold;

flowing at least a portion of the gravel-laden slurry to the gravel packing conduit to gravel pack an annulus between the tubular assembly and a wellbore wall;

dehydrating the gravel pack in the annulus through at least the permeable media of the leak-off conduit; wherein the filtrate through the permeable media flows through the leak-off conduit to the downstream flow path; and

gravel packing the leak-off conduit with gravel laden slurry from at least one of the upstream manifold, the downstream flow path, and the transport conduit; wherein the leak-off conduit gravel pack is dehydrated to at least one of the annulus and a basepipe associated with the tubular assembly; and wherein the

leak-off conduit gravel pack and the annular gravel pack are adapted to provide a zonal isolation system.

16. The method of claim 15 wherein the tubular assembly is coupled to downhole equipment when positioned at a predetermined position within the well.

17. The method of claim 16 wherein the downhole equipment comprises one or more equipment selected from annular coiled tubing, production tubing basepipe, sand control equipment, and gravel pack equipment.

18. The method of claim 15 wherein flowing at least a portion of the gravel-laden slurry to the gravel packing conduit comprises flowing at least a majority of the gravel-laden slurry in the upstream manifold to the gravel-packing conduit.

19. The method of claim 15 wherein the gravel packing conduit comprises at least two gravel packing conduits in fluid communication with the upstream manifold and the annulus.

20. The method of claim 15 wherein the gravel packing conduit is in direct fluid communication with only the upstream manifold and the annulus.

21. The method of claim 15 wherein dehydrating the gravel pack in the annulus includes dehydrating fluids through the wellbore wall to a formation.

22. The method of claim 15 wherein the permeable media of the leak-off conduit comprises a plurality of openings.

23. The method of claim 22 wherein the leak-off conduit comprises a slotted tube.

24. The method of claim 22 wherein the leak-off conduit comprises a sand screen.

25. The method of claim 15 further comprising gravel packing distal regions of the well with gravel-laden slurry; wherein at least a portion of the gravel-laden slurry used to gravel pack distal regions of the well flowed through the transport conduit.

26. The method of claim 25 wherein gravel packing distal regions of the well utilizes at least one of non-shunted gravel packing technology and shunted gravel packing technology.

27 The method of claim 25 wherein gravel packing distal regions comprises providing at least one additional gravel-based zonal isolation assembly.

28. A method of operating a hydrocarbon-related well, the method comprising:

conducting gravel packing operations in a wellbore utilizing at least one sand screen;

forming a gravel-based zonal isolation system in the wellbore while conducting gravel packing operations; and

conducting at least one additional operation in the wellbore utilizing the gravel-based zonal isolation device.

29. The method of claim 28 wherein forming a gravel-based zonal isolation system utilizes a tubular assembly comprising:

an upstream manifold;

a gravel packing conduit in fluid communication with the upstream manifold and extending longitudinally away from the upstream manifold; wherein the gravel packing conduit is adapted to receive a gravel-laden slurry from the upstream manifold; wherein the gravel packing conduit is adapted to be in fluid communication with an annulus between a wellbore wall and the tubular assembly when the tubular assembly is disposed downhole in a well; wherein the gravel packing conduit is adapted to communicate the gravel-laden slurry into the annulus during isolation forming operations; and wherein the gravel packing conduit is at least substantially isolated from direct fluid communication with a downstream flow path;

a transport conduit in fluid communication with the upstream manifold and in fluid communication with the downstream flow path; and

a leak-off conduit; wherein the leak-off conduit is in at least partially restricted fluid communication with the upstream manifold; wherein the leak-off conduit is in fluid and slurry communication with the downstream flow path in a region longitudinally spaced from the upstream manifold; and wherein the leak-off conduit is in fluid communication with the annulus through permeable media adapted to retain particles while communicating fluids providing fluid leak-off from the annulus during the isolation forming operations.

30. The method of claim 29 wherein the gravel packing conduit comprises at least two gravel packing conduits in fluid communication with the upstream manifold and the annulus.

31. The method of claim 29 wherein the gravel packing conduit is in direct fluid communication with only the upstream manifold and the annulus.

32. The method of claim 29 wherein forming a gravel-based zonal isolation system further comprises:

positioning the tubular assembly at a predetermined position within a well;

pumping gravel-laden slurry to the upstream manifold;

flowing at least a portion of the gravel-laden slurry to the gravel packing conduit to gravel pack an annulus between the tubular assembly and a wellbore wall;

dehydrating the gravel pack in the annulus through at least the permeable media of the leak-off conduit; wherein filtrate through the permeable media flows through the leak-off conduit to the downstream flow path;

gravel packing the leak-off conduit with gravel laden slurry from at least one of the upstream manifold, the downstream flow path and the transport conduit; wherein the leak-off conduit gravel pack is dehydrated to at least one of the annulus and a basepipe associated with the tubular assembly; and wherein the leak-off conduit gravel pack and the annular gravel pack are adapted to provide a zonal isolation system.

33. The method of claim 32 wherein flowing at least a portion of the gravel-laden slurry to the gravel packing conduit comprises flow at least a majority of the gravel-laden slurry in the upstream manifold to the gravel-packing conduit.

34. The method of claim 32 wherein dehydrating the gravel pack in the annulus includes dehydrating fluids through the wellbore wall to a formation.

35. The method of claim 32 further comprising gravel packing distal regions of the well with gravel-laden slurry; wherein at least a portion of the gravel-laden slurry used to gravel pack distal regions of the well is flowed through the transport conduit.

36. The method of claim 35 wherein gravel packing distal regions of the well utilizes at least one of un-shunted and shunted gravel packing technology.

37. The method of claim 35 wherein gravel packing distal regions comprises providing at least one additional gravel-based zonal isolation assembly.

CLAIMS

1. A tubular assembly adapted for downhole use in wells, the tubular assembly comprising:

an upstream manifold adapted to receive a gravel-laden slurry;

a gravel packing conduit in fluid communication with the upstream manifold and extending longitudinally away from the upstream manifold; wherein the gravel packing conduit is adapted to receive at least a portion of the gravel-laden slurry including both fluid and gravel simultaneously from the upstream manifold; wherein the gravel packing conduit is adapted to be in simultaneous fluid and gravel communication with an annulus between a wellbore wall and the tubular assembly when the tubular assembly is disposed downhole in a well; wherein the gravel packing conduit is adapted to communicate gravel-laden slurry into the annulus during isolation forming operations; and wherein the gravel packing conduit is at least substantially isolated from direct fluid communication with a downstream flow path;

a transport conduit in fluid communication with the upstream manifold and in simultaneous fluid and gravel communication with the downstream flow path; and

a leak-off conduit; wherein the leak-off conduit is in at least partially restricted gravel-laden slurry communication with the upstream manifold; wherein the leak-off conduit is in simultaneous fluid and gravel communication with the downstream flow path in a region longitudinally spaced from the upstream manifold; and wherein the leak-off conduit is in fluid communication with the annulus through permeable media adapted to retain particles while communicating fluids providing fluid leak-off from the annulus during the isolation forming operations.

2. The tubular assembly of claim 1 wherein the gravel packing conduit includes at least one flow path adapted to gravel pack an interval of the wellbore.

3. The tubular assembly of claim 1 wherein the at least partially restricted fluid communication between the upstream manifold and the leak-off conduit and the fluid communication between the leak-off conduit and the downstream flow path maintains fluid pressure in the leak-off conduit below a pressure in the annulus and a pressure in the gravel packing conduit during at least a portion of the

isolation forming operations.

4. The tubular assembly of claim 3 wherein fluid pressure in the leak-off conduit increases as isolation forming operations progress.

5. The tubular assembly of claim 4 wherein gravel-laden slurry enters the leak-off conduit from at least one of the downstream flow path and the transport conduit as isolation forming operations progress.

6. The tubular assembly of claim 5 wherein fluid in the gravel-laden slurry in the leak-off conduit exits the leak-off conduit into at least one of the annulus and a basepipe associated with the tubular assembly thereby gravel packing the leak-off conduit.

7. The tubular assembly of claim 6 wherein the fluid exits the leak-off conduit through at least one flow control valve.

8. The tubular assembly of claim 6 wherein the gravel packed leak-off conduit and the gravel-packed annulus together provide a zonal isolation assembly in the wellbore.

9. The tubular assembly of claim 1 wherein the leak-off conduit and the gravel packing conduit are adapted to provide a zonal isolation assembly in the wellbore in a region adjacent the tubular assembly.

10. The tubular assembly of claim 9 wherein the zonal isolation assembly is adapted to at least substantially isolate annular intervals on either side of the tubular assembly.

11. The tubular assembly of claim 9 wherein the zonal isolation assembly is formed during gravel packing operations.

12. The tubular assembly of claim 1 wherein at least one of the gravel packing conduit, the transport conduit, and the leak-off conduit is operatively associated with a base pipe.

13. The tubular assembly of claim 1 wherein at least one of the upstream manifold, the transport conduit, the leak-off conduit, and the gravel packing conduit are adapted to promote fluid flow from the upstream manifold into the gravel packing conduit.

14. The tubular assembly of claim 1 wherein the fluid communication between the leak-off conduit and the downstream flow path is through a double-U assembly.

15. A method for providing a gravel-based zonal isolation system in a hydrocarbon-related well, the method comprising:

providing a tubular assembly comprising:

an upstream manifold;

a gravel packing conduit in fluid communication with the upstream manifold and extending longitudinally away from the upstream manifold; wherein the gravel packing conduit is adapted to receive at least a portion of the gravel-laden slurry including both fluid and gravel simultaneously from the upstream manifold; wherein the gravel packing conduit is adapted to be in simultaneous fluid and gravel communication with an annulus between a wellbore wall and the tubular assembly; and wherein the gravel packing conduit is at least substantially isolated from direct fluid communication with a downstream flow path;

a transport conduit in fluid communication with the upstream manifold and in simultaneous fluid and gravel communication with the downstream flow path; and

a leak-off conduit; wherein the leak-off conduit is in at least partially restricted fluid communication with the upstream manifold; wherein the leak-off conduit is in fluid and slurry communication with the downstream flow path in a region longitudinally spaced from the upstream manifold; and wherein the leak-off conduit is in fluid communication with the annulus through permeable media adapted to retain particles while communicating filtrate fluids providing fluid leak-off from the annulus during isolation forming operations;

positioning the tubular assembly at a predetermined position within a well;

pumping gravel-laden slurry to the upstream manifold;

flowing at least a portion of the gravel-laden slurry to the gravel packing conduit to gravel pack an annulus between the tubular assembly and a wellbore wall;

dehydrating the gravel pack in the annulus through at least the permeable media

of the leak-off conduit; wherein the filtrate through the permeable media flows through the leak-off conduit to the downstream flow path; and

gravel packing the leak-off conduit with gravel laden slurry from at least one of the upstream manifold, the downstream flow path, and the transport conduit; wherein the leak-off conduit gravel pack is dehydrated to at least one of the annulus and a basepipe associated with the tubular assembly; and wherein the leak-off conduit gravel pack and the annular gravel pack are adapted to provide a zonal isolation system.

16. The method of claim 15 wherein the tubular assembly is coupled to downhole equipment when positioned at a predetermined position within the well.

17. The method of claim 16 wherein the downhole equipment comprises one or more equipment selected from annular coiled tubing, production tubing basepipe, sand control equipment, and gravel pack equipment.

18. The method of claim 15 wherein flowing at least a portion of the gravel-laden slurry to the gravel packing conduit comprises flowing at least a majority of the gravel-laden slurry in the upstream manifold to the gravel-packing conduit.

19. The method of claim 15 wherein the gravel packing conduit comprises at least two gravel packing conduits in fluid communication with the upstream manifold and the annulus.

20. The method of claim 15 wherein the gravel packing conduit is in direct fluid communication with only the upstream manifold and the annulus.

21. The method of claim 15 wherein dehydrating the gravel pack in the annulus includes dehydrating fluids through the wellbore wall to a formation.

22. The method of claim 15 wherein the permeable media of the leak-off conduit comprises a plurality of openings.

23. The method of claim 22 wherein the leak-off conduit comprises a slotted tube.

24. The method of claim 22 wherein the leak-off conduit comprises a sand screen.

25. The method of claim 15 further comprising gravel packing distal regions of the well with gravel-laden slurry; wherein at least a portion of the gravel-laden slurry used to gravel pack distal regions of the well flowed through the transport

conduit.

26. The method of claim 25 wherein gravel packing distal regions of the well utilizes at least one of non-shunted gravel packing technology and shunted gravel packing technology.

27. The method of claim 25 wherein gravel packing distal regions comprises providing at least one additional gravel-based zonal isolation assembly.

28. A method of operating a hydrocarbon-related well, the method comprising:

conducting gravel packing operations in a wellbore utilizing at least one sand screen;

forming a gravel-based zonal isolation system in the wellbore while conducting gravel packing operations wherein forming a gravel-based zonal isolation system utilizes a tubular assembly comprising;

(i) an upstream manifold;

(ii) a gravel packing conduit in fluid communication with the upstream manifold and extending longitudinally away from the upstream manifold; wherein the gravel packing conduit is adapted to receive a gravel-laden slurry including both the fluid and gravel simultaneously from the upstream manifold; wherein the gravel packing conduit is adapted to be in simultaneous fluid and gravel communication with an annulus between a wellbore wall and the tubular assembly when the tubular assembly is disposed downhole in a well; wherein the gravel packing conduit is adapted to communicate the gravel-laden slurry into the annulus during isolation forming operations; and wherein the gravel packing conduit is at least substantially isolated from direct fluid communication with a downstream flow path;

(iii) a transport conduit in fluid communication with the upstream manifold and in simultaneous fluid and gravel communication with the downstream flow path; and

(iv) a leak-off conduit; wherein the leak-off conduit is in at least partially restricted fluid communication with the upstream manifold; wherein the leak-off conduit is in fluid and slurry communication with the downstream flow path in a region longitudinally spaced from the upstream manifold; and wherein

the leak-off conduit is in fluid communication with the annulus through permeable media adapted to retain particles while communicating fluids providing fluid leak-off from the annulus during the isolation forming operations; and

conducting at least one additional operation in the wellbore utilizing the gravel-based zonal isolation device.

29. The method of claim 28 wherein the gravel packing conduit comprises at least two gravel packing conduits in fluid communication with the upstream manifold and the annulus.

30. The method of claim 28 wherein the gravel packing conduit is in direct fluid communication with only the upstream manifold and the annulus.

31. The method of claim 28 wherein forming a gravel-based zonal isolation system further comprises:

positioning the tubular assembly at a predetermined position within a well;

pumping gravel-laden slurry to the upstream manifold;

flowing at least a portion of the gravel-laden slurry to the gravel packing conduit to gravel pack an annulus between the tubular assembly and a wellbore wall;

dehydrating the gravel pack in the annulus through at least the permeable media of the leak-off conduit; wherein filtrate through the permeable media flows through the leak-off conduit to the downstream flow path;

gravel packing the leak-off conduit with gravel laden slurry from at least one of the upstream manifold, the downstream flow path and the transport conduit; wherein the leak-off conduit gravel pack is dehydrated to at least one of the annulus and a basepipe associated with the tubular assembly; and wherein the leak-off conduit gravel pack and the annular gravel pack are adapted to provide a zonal isolation system.

32. The method of claim 31 wherein flowing at least a portion of the gravel-laden slurry to the gravel packing conduit comprises flow at least a majority of the gravel-laden slurry in the upstream manifold to the gravel-packing conduit.

33. The method of claim 31 wherein dehydrating the gravel pack in the annulus

includes dehydrating fluids through the wellbore wall to a formation.

34. The method of claim 31 further comprising gravel packing distal regions of the well with gravel-laden slurry; wherein at least a portion of the gravel-laden slurry used to gravel pack distal regions of the well is flowed through the transport conduit.

35. The method of claim 34 wherein gravel packing distal regions of the well utilizes at least one of un-shunted and shunted gravel packing technology.

36. The method of claim 34 wherein gravel packing distal regions comprises providing at least one additional gravel-based zonal isolation assembly.