What is claimed is:

1. A submersible barrier fluid supply system for a submersible well fluid system for operating submerged in a body of water, comprising:

an inlet adapted to intake a barrier fluid;

a filter in communication with the inlet adapted to filter the barrier fluid;

a barrier fluid outlet in communication with the filter adapted to couple to a barrier fluid inlet of the submersible fluid system and to supply the filtered barrier fluid to the barrier fluid inlet of the submersible fluid system; and

one or more seals of a fluid end of the submersible well fluid system;

a pump upstream of the filter that pumps barrier fluid towards the filter; and

a reject passage downstream of the pump and fluidically coupled to a passage between the inlet and the filter that receives barrier fluid from the inlet and directs it to the body of water by a reject valve that controls the flow of barrier fluid through the reject passage;

wherein the barrier fluid outlet is in communication with the one or more seals of the fluid end, and the submersible barrier fluid supply system supplies barrier fluid to the one or more seals of the fluid end.

2. The submersible barrier fluid supply system of claim 1, comprising a submerged barrier fluid supply tank coupled to the inlet and comprising a barrier fluid.

3. The submersible barrier fluid supply system of claim 1, where the inlet comprises a water inlet that intakes water from the surrounding body of water.

4. The submersible barrier fluid supply system of claim 1, where the filter comprises a multi-stage filter.

5. The submersible barrier fluid supply system of claim 4, where the multi-stage filter comprises a reverse osmosis membrane filter downstream from a coarse filter.

6. The submersible barrier fluid supply system of claim 1, further comprising a membrane downstream of the filter, the membrane configured to further filter the barrier fluid.

7. The submersible barrier fluid supply system of claim 6, further comprising a pump downstream of the membrane and configured to move fluid that has passed through the membrane to the barrier fluid outlet.

8. The submersible barrier fluid supply system of claim 6, further comprising a second reject passage fluidically coupled to an upstream side of the membrane and configured to direct fluid that has not passed through the membrane to a solids settling chamber.

9. The submersible barrier fluid supply system of claim 8, comprising:

a first fluid circuit comprising the filter;

a second fluid circuit, in fluidic parallel to the first fluid circuit, and comprising a second filter.

10. The submersible barrier fluid supply system of claim 9, comprising a clean-out circuit comprising:

a bypass crossover passage fluidically coupling the first fluid circuit and the second fluid circuit downstream of the filter and the second filter, the bypass crossover passage configured to supply a back flush flow of fluid to the second filter; and

a third reject passage fluidically coupled to a passage between the inlet and the second filter to receive the back flush flow of fluid from the second filter.

11. The submersible barrier fluid supply system of claim 9, comprising a clean-out circuit comprising:

a bypass fluidically coupling the first fluid circuit and the second fluid circuit downstream of the filter and the second filter, the bypass configured to supply a back flush flow of fluid to one or both of the filter and the second filter; and

a third reject passage fluidically coupled to a passage between the inlet and the second filter to receive the back flush flow of fluid from the second filter.

12. The submersible barrier fluid supply system of claim 1, where the barrier fluid outlet is in fluid communication with a bellows chamber, the bellows chamber comprising a bellows, and where the submersible barrier fluid supply system is configured to supply barrier fluid to the bellows chamber upon expansion of the bellows.

13. The submersible barrier fluid system of claim 1, comprising an electric machine connected with the fluid end, wherein the electric machine includes an adjustable speed drive having an active power factor correcting front end that comprises an input power line filter and an active power factor correcting rectifier configured to switch at a frequency greater than 60 Hertz.

What is claimed is:

1. A submersible barrier fluid supply system for a submersible well fluid system for operating submerged in a body of water, comprising:

an inlet adapted to intake a barrier fluid;

a filter in communication with the inlet adapted to filter the barrier fluid;

a barrier fluid outlet in communication with the filter adapted to couple to a barrier fluid inlet of the submersible fluid system and to supply the filtered barrier fluid to the barrier fluid inlet of the submersible fluid system.

2. The submersible barrier fluid supply system of claim 1, comprising a submerged barrier fluid supply tank coupled to the inlet and comprising a barrier fluid.

3. The submersible barrier fluid supply system of claim 1, where the inlet comprises a water inlet adapted to intake water from the surrounding body of water.

4. The submersible barrier fluid supply system of claim 3, comprising a housing internally defining a solids settling chamber exterior to and around the water inlet, the housing comprising a water inlet adapted to intake water from the surrounding body of water into the solids settling chamber.

5. The submersible barrier fluid supply system of claim 1, where the filter comprises a multi-stage filter.

6. The submersible barrier fluid supply system of claim 5, where the multi-stage filter comprises a reverse osmosis membrane filter downstream from a coarse filter.

7. The submersible barrier fluid supply system of claim 1, further comprising a pump configured to move fluid from the inlet to the barrier fluid outlet and across the filter.

8. The submersible barrier fluid supply system of claim 1, further comprising a membrane downstream of the filter, the membrane configured to further filter the barrier fluid.

9. The submersible barrier fluid supply system of claim 8, further comprising a pump downstream of the membrane and configured to move fluid that has passed through the membrane to the barrier fluid outlet.

10. The submersible barrier fluid supply system of claim 8, further comprising a reject passage fluidically coupled to an upstream side of the membrane and configured to direct fluid that has not passed through the membrane to a solids settling chamber.

11. The submersible barrier fluid supply system of claim 1, comprising:

a first fluid circuit comprising the first mentioned filter;

a second fluid circuit, in fluidic parallel to the first fluid circuit, and comprising a second filter.

12. The submersible barrier fluid supply system of claim 11, where the first fluid circuit comprises a first pump and the second fluid circuit comprises a second pump; and

where the submersible barrier fluid supply system comprises:

a first crossover passage fluidically coupling the first fluid circuit and the second fluid circuit downstream of the first and second pumps, between the pumps and the first mentioned filter and second filter;

a second crossover passage fluidically coupling the first fluid circuit and the second fluid circuit at a location downstream of the first mentioned filter and the second filter.

13. The submersible barrier fluid supply system of claim 11, comprising a clean-out circuit comprising:

a bypass crossover passage fluidically coupling the first fluid circuit and the second fluid circuit downstream of the first mentioned filter and the second filter, the bypass crossover passage configured to supply a back flush flow of fluid to the second filter; and

a reject passage fluidically coupled to a passage between the inlet and the second filter to receive the back flush flow of fluid from the second filter.

14. The submersible barrier fluid supply system of claim 1, further comprising a reject passage fluidically coupled to a passage between the inlet and the first mentioned filter to receive the back flush flow of fluid from the first mentioned filter.

15. The submersible barrier fluid supply system of claim 1, further comprising a reject passage fluidically coupled to a passage between the inlet and the first mentioned filter to receive fluid from the inlet and direct it to the body of water.

16. The submersible barrier fluid supply system of claim 1, where the submersible barrier fluid supply system is configured to supply barrier fluid to one or more seals of a fluid end of the submersible well fluid system.

17. The submersible barrier fluid supply system of claim 1, comprising a clean-out circuit comprising:

a bypass fluidically coupling the first fluid circuit and the second fluid circuit downstream of the first mentioned filter and the second filter, the bypass crossover configured to supply a back flush flow of fluid to one or both of the first mentioned filter and the second filter; and

a reject passage fluidically coupled to a passage between the inlet and the second filter to receive the back flush flow of fluid from the second filter.

18. The submersible barrier fluid supply system of claim 1, where the barrier fluid outlet is in fluid communication with a bellows chamber, the bellows chamber comprising a bellows, and where the submersible barrier fluid supply system is configured to supply barrier fluid to the bellows chamber upon expansion of the bellows.

19. A submersible barrier fluid supply system for a submersible fluid system for operating submerged in a body of water, comprising:

an inlet adapted to intake a barrier fluid from the body of water;

a barrier fluid outlet in communication with a barrier fluid inlet of the submersible fluid system and to supply the barrier fluid to the barrier fluid inlet of the submersible fluid system.

~~20. The submersible barrier fluid supply system of claim 19, comprising a filter downstream of the inlet and configured to filter the barrier fluid.~~