WHAT IS CLAIMED IS:

1. A seal assembly, comprising:

a first member, the first member formed of a first material;

a second member overlapping with the first member, the second member formed of a second material, the first and second members defining an overlapping fluid leakage path;

a primary seal positioned in the overlapping fluid leakage path, the primary seal configured to prevent fluid from passing from a first side of the overlapping fluid leakage path to a second side of the overlapping fluid leakage path; and

an expandable metal backup seal positioned in the second side of the overlapping fluid leakage path,

wherein the expanded metal backup seal includes expanded micron-scale metal particle and residual unreacted metal configured to expand in response to the hydrolysis.

2. The seal assembly as recited in Claim 1, wherein the first member is a first tubular member and the second member is a second tubular member positioned within the first tubular member.

3. The seal assembly as recited in Claim 2, further including a first groove located in one of the first tubular member or the second tubular member, the primary seal positioned within the first groove.

4. The seal assembly as recited in Claim 3, wherein the primary seal is a ring shaped primary seal, or optionally wherein the ring shaped primary seal is an O-ring seal, X-ring seal, or a T-ring seal, or optionally wherein the ring shaped seal is a chevron seal, or optionally wherein the primary seal is a polymeric or elastomeric seal, or optionally wherein the primary seal is a metal seal.

5. The seal assembly as recited in Claim 3, further including a second groove located in one of the first tubular member or the second tubular member, the expandable metal backup seal positioned within the second groove, or optionally wherein the expandable metal

backup seal includes one or more solid rings of expandable metal, or optionally wherein the expandable metal backup seal includes two or more wraps of expandable metal.

6. The seal assembly as recited in Claim 1, wherein the first member and the second member are fixed relative to one another.

7. The seal assembly as recited in Claim 1, wherein the first member and the second member move relative to one another, or optionally wherein the first member and the second member translate relative to one another, or optionally wherein the first member and the second member rotate relative to one another.

8. The seal assembly as recited in Claim 1, wherein a cross-sectional area of the expandable metal backup seal is no more than 30 cm^2, or optionally wherein the cross-sectional area of the expandable metal backup seal ranges from 3 cm^2 to 20 cm^2.

9. The seal assembly as recited in Claim 1, wherein the expandable metal backup seal is in an unexpanded state that does not provide a fluid tight seal to the overlapping fluid leakage path.

10. The seal assembly as recited in Claim 1, wherein the expandable metal backup seal is in an expanded state that does provide a fluid tight seal to the overlapping fluid leakage path.

11. A seal assembly, comprising:

a first member, the first member formed of a first material;

a second member overlapping with the first member, the second member formed of a second material, the first and second members defining an overlapping fluid leakage path;

a primary seal positioned in the overlapping fluid leakage path, the primary seal configured to prevent fluid from passing from a first side of the overlapping fluid leakage path to a second side of the overlapping fluid leakage path; and

an expanded metal backup seal positioned in the second side of the overlapping fluid leakage path, wherein the expanded metal backup seal includes expanded micron-scale metal particle and residual unreacted metal configured to expand in response to the hydrolysis .

12. The seal assembly as recited in Claim 11, wherein a cross-sectional area of the expanded metal backup seal is no more than 60 cm^2, or optionally wherein the cross-sectional area of the expanded metal backup seal ranges from 7 cm^2 to 52 cm^2.

13. A well system, comprising:

a wellbore located in a subterranean formation; and

a seal assembly positioned within the wellbore, the seal assembly including:

a first member, the first member formed of a first material;

a second member overlapping with the first member, the second member formed of a second material, the first and second members defining an overlapping fluid leakage path;

a primary seal positioned in the overlapping fluid leakage path, the primary seal configured to prevent fluid from passing from a first side of the overlapping fluid leakage path to a second side of the overlapping fluid leakage path; and

an expandable metal backup seal positioned in the second side of the overlapping fluid leakage path, wherein the expanded metal backup seal includes expanded micron-scale metal particle and residual unreacted metal configured to expand in response to the hydrolysis.

14. The well system as recited in Claim 13, wherein the seal assembly forms at least a portion of a completion string located within the wellbore, or optionally wherein the seal assembly forms at least a portion of a drill string, a stimulation string, a workover string located within the wellbore.