

We claim:

1. A method of blasting in high temperature ground, reactive ground, or both, the method comprising:

placing an explosive composition comprising an emulsion explosive including a continuous organic fuel phase and a discontinuous oxidizer phase in ground to be blasted, wherein the explosive composition comprises about 3% to about 35% by weight of one or more Group I or Group II nitrates, and wherein the ground contains reactive ground, high temperature ground, or both; and

detonating the emulsion explosive in a controlled manner.

2. The method of claim 1, further comprising determining that the ground to be blasted contains reactive ground.
3. The method of claim 2, wherein the reactive ground includes a sulfidic mineral.
4. The method of claim 2 or claim 3, wherein the reactive ground includes iron pyrite, marcacites, chalcopyrites, or combinations thereof.
5. The method of any one of claims 1–4, wherein the one or more Group I or Group II nitrates comprise sodium nitrate, potassium nitrate, calcium nitrate, or combinations thereof.
6. The method of claim 5, wherein the one or more Group I or Group II nitrates consists of one or more Group I nitrates.

7. The method of any one of claims 1–4, wherein placing the explosive composition in the ground comprises loading a blast hole with the explosive composition.
8. The method of any one of claims 1–7, further comprising determining that the ground to be blasted is high temperature ground.
9. The method of claim 8, wherein the high temperature ground is greater than 100 °C, 120 °C, 150 °C, or 180 °C.
10. The method of any one of claims 1–9, wherein the one or more Group I or Group II nitrates comprise about 3% to about 35%, about 5% to about 25%, about 5% to about 18%, about 10% to about 35%, or about 10% to about 25% of the oxidizer phase by weight.
11. The method of claim 10, wherein the oxidizer phase further comprises ammonium nitrate and a ratio of ammonium nitrate to the one or more Group I or Group II nitrates is about 2:1 to about 14:1 or about 6:1 to about 9:1 by weight.
12. The method of claim 10 or claim 11, wherein the oxidizer phase further comprises water at about 5% to about 30% or about 12% to about 25% by weight.

13. The method of any one of claims 1–11, further comprising letting the explosive composition sleep for at least 3 hours at an average ground temperature of 150 °C or more.
14. The method of any one of claims 1–13, further comprising letting the explosive composition sleep for at least 3 hours at an average ground temperature of 180 °C or more droplets.
15. The method of any one of claims 1–11, further comprising letting the explosive composition sleep in the ground for at least one day longer than an emulsion explosive that is substantially free of Group I or Group II nitrates in the discontinuous oxidizer phase would be allowed to sleep in the ground.
16. The method of any one of claims 1–15, wherein the oxidizer phase further comprises an inhibitor.
17. The method of claim 16, wherein the inhibitor comprises urea, zinc oxide, ammonia, soda ash, or combinations thereof.
18. The method of claim 16 or claim 17, wherein the inhibitor comprises urea, and the urea is present at about 0.5% to about 35%, about 0.5% to about 10%, or about 0.5% to about 5%, by weight of the oxidizer phase.

19. The method of any one of claims 1–18, wherein the explosive composition further comprises a sensitizing agent.
20. An explosive composition comprising an emulsion comprising:
a continuous organic phase comprising fuel oil;
a discontinuous oxidizer phase comprising:
urea, wherein the urea is about 0.5% to about 35% of the discontinuous oxidizer phase by weight;
a non-Group I or Group II nitrate; and
one or more Group I or Group II nitrates, wherein the Group I or Group II nitrates are about 3% to about 35% of the discontinuous oxidizer phase by weight.
21. The explosive composition of claim 20, wherein water in the discontinuous aqueous phase is between 10% and 30% of the discontinuous aqueous phase by weight.
22. The explosive composition of claim 20 or claim 21, wherein the urea is about 1% to about 25% or about 2% to about 5% of the discontinuous oxidizer phase by weight.
23. The explosive composition of any one of claims 20–22, wherein the one or more Group I or Group II nitrates are about 5% to about 25%, about 5% to about

18%, about 10% to about 35%, or about 10% to about 25% of the discontinuous oxidizer phase by weight.

24. The explosive composition of any one of claims 20–23, wherein the emulsion is at least 30% of the explosive composition by weight.

25. The explosive composition of any one of claims 20–24, wherein the one or more Group I or Group II nitrates comprise sodium nitrate, potassium nitrate, calcium nitrate, or combinations thereof.

26. The explosive composition of any one of claims 20–25, wherein the emulsion further comprises a sensitizer.

27. The explosive composition of any one of claims 20–27, for use in reactive ground, high temperature ground, or both.

28. A method of forming a blend, the method comprising:

mixing a slurry comprising ammonium nitrate and fuel oil with an emulsion, the emulsion comprising:

a continuous organic phase comprising fuel oil; and

a discontinuous oxidizer phase comprising:

urea, wherein the urea is about 0.5% to about 35% of the discontinuous oxidizer phase by weight;

a non-Group I or Group II nitrate; and

one or more Group I or Group II nitrates, wherein the one or more Group I or Group II nitrates are about 3% to about 35% of the discontinuous oxidizer phase by weight.

29. The method of claim 28, wherein the emulsion is at least 30% of the blend by weight.