WHAT IS CLAIMED IS:

1. A method comprising:

contacting a composition with a caustic solution to produce a first mixture;

separating from the first mixture a caustic-treated composition and producing an aqueous water with a pH from 2.0 to 5.0;

combining the caustic-treated composition with silica particles to produce a slurry; and

removing the silica particles from the slurry to produce a treated composition;

wherein:

the composition comprises:

one or more of animal fats, animal oils, plant fats, plant oils, vegetable fats, vegetable oils, greases, and used cooking oil,

at least 10 wppm of total metals;

at least 8 wppm of phosphorus;

at least 10 wppm of chlorine;

at least 10 wppm of sulfur;

at least 20 wppm of nitrogen;

at least 5 wt.% of free fatty acids; and

has an acid number from about 10 mg KOH/g to about 150 mg KOH/g;

the treated composition comprises:

a wt.% of free fatty acids about that of the composiotion; and

less total metals, phosphorus, sulfur, and nitrogen than the composition; and

the silica particles have an average particle size from 10 microns to 50 microns and a BET surface area from 200 m^2/g to 1000 m^2/g.

2. The method of claim 1, wherein the composition comprises yellow grease, brown grease, floatation grease, poultry fat, inedible corn oil, used cooking oil, inedible tallow, floatation tallow, palm sludge oil, or a mixture of any two or more thereof.

3. The method of claim 1, wherein the total metals comprise one or more members selected from the group consisting of As, Ca, Cr, Cu, Fe, K, Li, Mg, Mn, Na, Ni, Pb, Sr, and Zn.

4. The method of claim 1, wherein the composition has an acid number from 10 mg KOH/g to 50 mg KOH/g.

5. The method of claim 1, wherein composition comprises 5 wt.% to 15 wt.% free fatty acids.

6. The method of claim 1, wherein prior to contacting the composition with the caustic solution, the composition undergoes a glycerolysis process to provide 5 wt.% to 15 wt.% free fatty acids in the composition.

7. The method of claim 1, wherein the method further comprises an acid-degumming step prior to contacting the composition with a caustic solution.

8. The method of claim 1, wherein the method further comprises an alkalinity reduction step prior to contacting the composition with a caustic solution.

9. The method of claim 1, wherein the method does not comprise contacting the composition with bleaching clays.

10. The method of claim 1, wherein the caustic solution comprises an aqueous ammonium hydroxide solution, aqueous potassium hydroxide solution, aqueous sodium hydroxide solution, or a combination of any two or more thereof.

11. The method of claim 1, wherein the silica particles comprise amorphous silica particles.

12. The method of claim 1, wherein the silica particles are combined with the caustic-treated composition about 0.1% (w/w) to about 0.8% (w/w) based on weight of the silica particles to weight of the caustic-treated composition.

13. The method of claim 1, wherein the silica particles have an aqueous solution pH of 2.0 to 6.0.

14. The method of claim 1, wherein the combining with silica particles is conducted at a temperature from about 150 °F to about 200 °F, and the slurry is subjected to an absolute pressure from about 100 Torr to about 500 Torr.

15. The method of claim 1, wherein the combining with silica particles is conducted in a continuous flow operation tank.

16. The method of claim 1, wherein the combining with silica particles comprises a residence time from 10 min to 90 min.

17. The method of claim 1, wherein the method further comprises combining the slurry with diatomaceous earth (DE), wherein a weight ratio of DE to silica particles is from 0.1:1 to 1.5:1.

18. The method of claim 1, wherein the removing comprises filtering the slurry with one or more filters.

19. The method of claim 18, wherein the one or more filters comprise pressure leaf filters, wherein the pressure leaf filters are optionally pre-coated with at least one or more of DE, cellulose, and perlite.

20. The method of claim 1, wherein the composition comprises

    5 wt.% to 10 wt.% free fatty acids; and

    the treated composition comprises:

    less than 10 wppm of total metals;

    less than 5 wppm of phosphorus;

    less than 5 wppm of chlorine;

    less than 5 wppm of sulfur;

    less than 100 wppm of nitrogen; and

    has an acid number from 10 mg KOH/g to about 20 mg KOH/g.