Collaborative Aggregates LLC commercializes high performing, cost-competitive, easy-to-use construction and infrastructure materials that are noninvasive to human health and the environment. In partnership with the Warner Babcock Institute—a green chemistry invention lab—we are developing a pipeline of products that meet or exceed product performance of our competitors at a realistic price-point that avoids the use of ingredients or processes which are harmful to consumers, producers, workers, and the environment.

Our first commercialized product is Delta S — a non-toxic asphalt additive that acts as a rejuvenator to recycled asphalt binder and as a warm mix additive to asphalt mixes.
The incorporation of too much aged recycled asphalt results in brittle pavement that prematurely fractures and cracks. As a result, most standard asphalt mix products on the market today do not incorporate more than 20% of recycled asphalt pavement (RAP) and most do not use any recycled asphalt shingles (RAS).

To compensate for the stiffness found in recycled asphalt Collaborative Aggregates offers a green rejuvenation process with Delta S, a liquid plant based additive that reverses aging and oxidation in recycled asphalt creating exceptional performance and longevity.

Delta S is a dispersion of small molecules in a carrier oil. Oxidation is reversed through a carrier matrix which solvates aged asphalt binder to allow the antioxidant properties of the suspended small molecules to react with the oxidized components of the aged binder. Delta S’ affinity for asphalt molecules is such that no special treatment (heating, agitation, etc.) is required to stabilize the production process. As a plant based solution, Delta S is 100% safe for the environment and humans.

Delta S is successfully introduced through every method commonly used to mix asphalt—leveraging as high as 40% RAP and 5% RAS including; inline blending, added to the binder in an asphalt storage tank where it will remain incorporated without heating or agitation, and applied through a spray bar over the belt or bin of the recycled product.

**The Delta S Advantage**

- May be used in any traditional hot mix, with RAP and RAS, or in-place recycling or warm mix asphalt application
- Enables the use of higher ratios of RAP and RAS in asphalt mix designs
- Is an effective warm mix additive (lowers mixing & placement temps), anti-strip agent (helps binder and aggregate bind stronger), compaction aid, and binder modifier
- Allows for single tank storage for dual purpose warm mix asphalt and recycled asphalt rejuvenator
- May be added during any phase of asphalt mix production
- Worker safe and environmentally friendly
- Significantly lowers paving temperatures, therefore reduces energy usage
- Third-party test data shows comparable performance to virgin asphalt

Please visit our website for detailed information about Collaborative Aggregates LLC and our Delta S asphalt rejuvenator and warm mix additive product.

www.collaborativeaggregates.com