

## **Natural Asphalts**

### **Trinidad Lake Asphalt**

*Adrian Blacker*  
Asphalt Associates Limited

Natural asphalt has been used in pavement construction for well over a hundred years. Although their role has changed, they still find a significant and growing market in the asphalt industry. Many sources of natural asphalt have been exploited over the years but perhaps the most famous is Lake Asphalt from Trinidad.

Trinidad Lake Asphalt is the oldest bituminous binder in regular use. It is sourced from a single deposit in the south west of Trinidad with proven reserves well in excess of 10 million tonnes. The material has a unique blend of properties which are attributable in part to the inclusion of an inert silicate filler. The material's properties have remained unchanged since detailed analysis began in the late 19<sup>th</sup> century.

On its own, the material has only limited uses so it is routinely blended with other binders, such as bitumen and polymers to achieve the required engineering features. Practical experience, later confirmed by laboratory and site testing, has shown that the addition of TLA will result in; Increased stability, fatigue resistance and binder adhesion amongst many other characteristics.

Although TLA shows many desirable traits, it also possesses some less desirable, such as difficult handling and high Relative Density. Despite this, the material is used on all types of asphalt pavement, including; long-span bridge deck surfacing, heavy duty applications, airports and racetracks. Difficult handling is also set to become a thing of the past with the introduction later this year of the pelletised version of the material.

Gilsonite is somewhat different and is obtained from a series of well defined mineral vein deposits located 40 miles from vernal, in the north east corner of Utah. The material is technically described as 'Uintaite' and is mined largely by hand from sometimes difficult to access narrow veins. The material is believed to have originated from the Green River Formation of oil rich shales which underlay the Uintah Basin. Deep vertical fissures were once filled with heavy, viscous hydrocarbon which lost its volatile components over millions of years and solidified.

Production began in 1885 and many uses have been found around the world, which include; printing inks, asphalt modification and drilling lubricants. Although Gilsonite is very pure as found, the properties vary throughout the deposits. The mined material is therefore subjected to a processing operation which produces a number of products for the market which are subjected to rigorous quality control.

Unlike TLA, Gilsonite is very hard at ambient temperature due to its higher softening point. This allows the material to be crushed and supplied as fine powder which ensures easy handling for the end-user. The asphalt industry is making increasing use of Gilsonite as a modifier as it will stiffen a mixture economically. Aggregate/binder adhesion properties are also demonstrably improved particularly in the presence of water. Another interesting characteristic is the ability to perform at very low temperatures due to the improved aggregate adhesion. This has recently been demonstrated at Helsinki Airport where testing has been carried out to 30 degrees below freezing.