



## A COMMERCIAL APPLICATION OF VIROSOIL™ TECHNOLOGY

### CASE STUDY: MAJOR AUSTRALASIAN CIVIL CONTRACTING COMPANY, HYDROCARBON TREATMENT

*By using ViroSoil™ Technology the site at Yatala successfully reached the target limits whereby the site was no longer classified as contaminated.*



*ViroBind™ reagent being added to the contaminated site prior to mixing*

## &gt;&gt;&gt; CASE STUDY: HYDROCARBON TREATMENT



*Figure 1 - Soil contaminated by hydrocarbons such as oils is just one of the many serious waste streams identified worldwide.*

#### PROBLEM

A major Australasian civil contracting company, closed one of their Gold Coast depots and urgently required site contamination for hydrocarbons (TPH and PAH). The hydrocarbon contamination in the soil was due to the long term storage and related activities of bitumen and diesel onsite. Standard bioremediation of hydrocarbon-contamination soils normally makes use of natural breakdown processes, but this method takes approximately 18 months. The company wanted a treatment solution within a three-month period due to the imminent sale of their site in Yatala, Queensland.

#### VIROTEC TOTAL SOLUTIONS

This civil company contracted Virotec to remediate the site in Yatala. By conducting a field trial Virotec was able to prove the effectiveness of ViroSoil™ Technology utilising the “Rapid Sequestro-Degradation” (RSD) method of hydrocarbon destruction, an advanced form of bioremediation. The rate of destruction of the hydrocarbons was increased using an inoculum of naturally occurring petrophilic microbes and nutrients to enhance natural degradation processes and to establish healthy microbial populations in the soil.

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This Technology was an effective and convenient solution to hydrocarbon treatment onsite as opposed to digging up the contaminated soil and disposing of it at an offsite landfill facility or leaving it to degrade using standard bioremediation processes, which for this type of soil could take 12-24 months. ViroSoil™ Technology is a proven solution to hydrocarbon and heavy metal contamination.

**BACKGROUND**

Hydrocarbons, such as fuels, oils, grease, solvents, lubricants and coolants, are recognised as the common types of contaminants in industrial applications. Contaminated soils have been identified as top of the four main priority waste streams in several countries.

This major resourced based civil contracting company, providing a broad range of products and services to customers in the road construction, quarrying, civil construction, infrastructure maintenance and land development sectors. Their operations include asphalt production and placement, road construction and surfacing, water blasting and cleaning pavement rehabilitation, pumping stations and flow control facilities and commercial site works.

Sustainable development is critical to this civil company's strategic direction and is implemented across all levels of the company. Their site in Yatala was contaminated with hydrocarbons (TPH and PAH) due to the long term storage of asphalt, diesel and bitumen onsite. Aware of the potential risk this caused to the surrounding environment the civil company committed to remediating this site with the use of ViroSoil™ Technology to permanently remove the hydrocarbons from the soil.



*Figure 2 - Contaminated area at the Yatala site*

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**Figure 3 - ViroBind™ reagent (left) being added to the contaminated site prior to mixing (right).**

**TREATMENT METHOD**

The Yatala site was treated using ViroSoil™ Technology. The RSD method employed involves adding a patented mixture of bacteria, enzymes, nutrients and surfactants to condition the soil prior to mixing.

The contaminated soil was excavated from the contaminated source, scraped and piled using a bobcat loader into large piles in designated treatment areas and irrigated on a regular basis to optimize the dispersion and aeration of enzymes and to provide both the indigenous and introduced microbes with optimal growth and performance conditions

As each pile was treated, a sample was taken and analysed to ensure the successful degradation of hydrocarbons. Treatment targets are listed in Table 1.

**TABLE 1: TREATMENT TARGETS**

Component	Treatment Targets (mg/kg)
Total PAH	<20 mg/kg
Total TPH	<1000 mg/kg
C10 - C14	<100 mg/kg
C15 - C28	<1000 mg/kg
C29 - C36	<1000 mg/kg

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**RESULTS**

The results presented in Table 2 show that ViroSoil™ Technology using the RSD Methodology, is an effective solution to treat hydrocarbon contaminated soils

**TABLE 2: BEFORE AND AFTER TREATMENT RESULTS**

Component	Before Treatment (mg/kg)	After Treatment 2 weeks (mg/kg)	After Treatment 3 weeks (mg/kg)	After Treatment 4 weeks (mg/kg)
Total TPH	5,136	391	267	81
C10 – C14	271	25	81	29
C15 – C28	2,349	186	100	84
C29 – C36	2,516	205	124	100
Total PAH	< 0.5	< 0.5	NA	NA

**CONCLUSION**

By using ViroSoil™ Technology the site at Yatala successfully reached the target limits whereby the site was no longer classified as contaminated. This project was completed within the timeline allocated and contributed towards the successful sale of the property in Yatala. It should be noted that the amazing reduction of hydrocarbons reported here was achieved in just two weeks of treatment, due to the rapid acceleration of hydrocarbon destruction which, has been reported when the RSD method is employed as part of the overall ViroSoil™ Technology application.