



A COMMERCIAL APPLICATION
OF VIROFLOW™ TECHNOLOGY

CASE STUDY: BIRDSALL LEATHER & CRAFT

“The use of ViroFlow™ Technology has resulted in all parameters being below the discharge requirements for Sydney Water. We have also found that the odour generation from our waste water system is considerably less since using ViroChrome™ reagent...”



Tannery effluent before and after treatment using ViroFlow™ Technology.

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PROBLEM

Birdsall Leather and Crafts is a finishing tannery operation that processes wet blue hides through to completed hides. As such, the effluent produced at Birdsall's usually has low concentrations of chromium and sulphate but exhibits high BOD₅ and oil and grease loads with corresponding odour problems.



Birdsall Leather and Crafts creates a range of products using cow, kangaroo, crocodile, and ostrich hides.

VIROTEC TOTAL SOLUTION

The use of ViroFlow™ Technology resulted in a vastly improved waste water quality that met all local water authority requirements. During the application of ViroFlow™ Technology there were substantial decreases in odour generation from the waste water system. The sludge produced as a result of the application of ViroFlow™ Technology was dense, stable and the chromium was bound sufficiently tightly for it to be classified as a non-hazardous, inert waste.

The Virotec technology components included design, engineering, application, monitoring and liaison with regulatory authorities.

BACKGROUND

Birdsall Leather and Craft's tannery is a small specialised finishing tannery that is unusual because it uses many different types of hides including cow, kangaroo, crocodile, and ostrich in its leather production. It has had significant success with using syntan, vegetable, and chrome combination tannins. The tanning operations produce approximately 20,000 litres of effluent every week.

Environmental regulations applicable to tannery effluent and sludge disposal vary widely throughout the world. As a result, leather industries in developed nations that enforce stringent environmental regulations are being out-competed by leather industries in less developed countries or those with poor or non-existent environmental regulations.

The high treatment and disposal costs associated with effluent and solid wastes, and the considerable variation in regulatory requirements applicable to effluent and sludge disposal indicate

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A tanning drum at Birdsall Leather and Crafts.

that current practices do not provide cost-effective treatment.

Current effluent treatment processes produce sludges that must be immediately covered with clean fill in a clay-lined landfill, because the mobility of contaminants found within the sludge is extremely pH dependent. This burial procedure will cause substantial environmental degradation when the clay lining of the landfill site deteriorates and becomes ineffective. Use of ViroFlow™ Technology for tannery effluent generates sludges that have very low TCLP (toxicity characteristic leaching procedure) characteristics that mean that they can be classified as “Inert” (e.g. in N.S.W.) or “Clean Fill” (e.g. in Victoria).

TREATMENT METHODS

ViroFlow™ Technology incorporates the use of ViroChrome™ reagent, a patented, environmentally safe reagent that is non-toxic and non-hazardous. ViroChrome™ reagent properties include a high metal binding efficiency, a high pH buffering efficiency, rapid flocculation and sediment settling, and reduced sludge volumes.

The Birdsall Leather and Crafts tanning operations produce approximately 20,000 litres of treated effluent every week, which is batch treated in two lots of 10,000 litres. ViroChrome™ reagent was mixed with the tannery effluent at a predetermined volume-to-mass ratio to ensure optimum



ViroChrome™ reagent was applied in powder form (it may be also applied as a slurry or in pellet form depending on the application).

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Mixing Vessel after addition of ViroChrome™ reagent.

contact time and treatment efficiency. This was accomplished via direct addition in a 10,000 L mixing and settling vessel. ViroFlow™ Technology replaced the conventional alkaline (lime) treatment and produced a dense, stable sediment that was easily recovered and dewatered.

ViroFlow™ Technology complemented the existing treatment method. There was no capital expenditure involved with the implementation.

RESULTS

ViroFlow™ Technology dramatically reduced the chromium concentration and the odour, and ensured that all other effluent concentrations in the waste liquid were well below the trade waste thresholds. An important finding was the ease with which ViroFlow™ Technology could be integrated with the existing treatment system.

The Table below summarises the results obtained using ViroFlow™ Technology.

	RAW EFFLUENT QUALITY BEFORE VIROFLOW™ TECHNOLOGY APPLICATION	EFFLUENT QUALITY AFTER VIROFLOW™ TECHNOLOGY APPLICATION	TRADE WASTE DISCHARGE LIMITS
<i>pH</i>	<i>4.5-6.0</i>	<i>9.3</i>	<i>6.0-10.0</i>
<i>Chromium</i>	<i>50-100 ppm</i>	<i>0.36 ppm</i>	<i>10 ppm</i>
<i>Sulphate</i>	<i>1,000-2,000 ppm</i>	<i>860 ppm</i>	<i>1,000 ppm</i>
<i>BOD₅</i>	<i>2,000-3,000 ppm</i>	<i>630 ppm</i>	<i>1,000 ppm</i>
<i>Total Suspended Solids</i>	<i>1,000-1,500 ppm</i>	<i>120 ppm</i>	<i>400 ppm</i>
<i>Phosphate</i>	<i>10-50 ppm</i>	<i>0.36 ppm</i>	<i>10 ppm</i>
<i>Oils & Grease</i>	<i>100-200 ppm</i>	<i>29 ppm</i>	<i>200 ppm</i>
<i>Odour Level</i>	<i>Very high odour</i>	<i>Non odourous</i>	<i>Non odourous</i>

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One of the key drivers for this ViroFlow™ Technology application was odour abatement. It was found that odour levels after application of ViroFlow™ Technology were extremely low when compared to the existing lime-based treatment system. Odour at the tannery treatment plant is now barely noticeable with employee and customer complaints being reduced significantly.

CONCLUSION

ViroFlow™ Technology consistently outperformed the current lime treatment processes and effectively treated the tannery effluent to a standard that was much better than that required by current regulatory requirements.

Used ViroChrome™ reagent is not a waste material and even after use in many applications it can successfully be reused in other applications.

The sediment produced as a result of using ViroFlow™ Technology was able to be re-classified so that it could be disposed of as an inert waste under the NSW guidelines for waste classification rather than managed as a hazardous waste as previously required.

It is concluded that ViroChrome™ reagents produce non-odorous waste water and are effective at treating wastes generated within the tannery to better than regulatory requirements and that ViroFlow™ Technology would be competitive in relation to alternative methods.

TESTIMONIAL

“Birdsall Leather has been using ViroChrome™ reagent for the last six months. Our decision to use ViroFlow™ Technology was based on field trials conducted by Virotec and also on the basis that ViroChrome™ reagent would be able to better control odour generation from our waste water process.

The use of ViroFlow™ Technology has resulted in all parameters being below the discharge requirements for Sydney Water. We have also found that the odour generation from our waste water system is considerably less since using ViroChrome™ reagent.

Virotec have been happy to provide technical backup and assistance where necessary. We look forward to continuing our association with Virotec in the future.”

IAN DIVER
Operations Manager
Birdsall Leather and Crafts