

A Revolution in Airborne Odour Control

# VapourGard™



CleanaWater's unique VapourGard™ system is more effective than fragrance and neutralising oils. That's because its active deodorisation technology destroys odour particles - rather than just masking them. The vapours stay airborne for longer than traditional sprays - allowing for more effective odour treatment.

## Advantages of Vapour for Odour Treatment

- ☞ Deodoriser is delivered in lightweight particles, similar to the weight of the odours
- ☞ No water is needed
- ☞ Maintenance is minimal
- ☞ The deodoriser is unobtrusive
- ☞ The vaporisation system is relatively quiet, dry, and invisible
- ☞ Cost-effective to install and run
- ☞ Completely safe and environmentally friendly

Odours are compounds that have volatilised – transitioned to gaseous or vapour state. That is why we can smell them. We don't actually smell liquids or solids. We smell the portions of them that make the transition into the vapour state – making them light enough to travel in the air and into our nostrils.

The VapourGard™ System releases deodoriser converted to vapour form. The deodoriser vapour moves at the same speeds and in the same direction as odorous vapours. This allows the deodoriser to stay in the air for a much longer time, creating more opportunities for contact and deodorisation. The system uses a pipe to transport an air-stream filled with vaporised deodoriser around the perimeter of any area where deodorisation is desired. The type of pipe is determined by terrain and weather conditions.

The vapour is created by a unique system that moves air across a tank of deodoriser. The deodoriser is designed specifically to vaporise when subjected to air movement or minor turbulence. Heat is not used. The chemical is not "evaporated" in the normal sense of the word. The vaporiser unit contains only a motor and blower, a tank, and a vacuum system for creating the vapour and delivering it into the air-stream. While some heat is created by molecular vibration at the surface of the liquid, the amount is minimal. This allows vaporisation of the deodoriser without fractionation. The composition and functionality of the deodoriser are not compromised.

The ingredients are carefully designed to vaporise together, retaining their integrity. This is why heat is not used. Heating any blend of volatile ingredients results in a loss of integrity because each component will have a different evaporation rate and temperature threshold. Using heat to create vapour simply separates the deodoriser back into its component parts.

The deodoriser was created specifically for the process of vaporisation by turbulence. It contains no propellants or alcohols, and its component parts are all approved for cosmetic use or greater by the FDA. People use most of the components of VapourGard™ deodoriser every day in their homes.

## How VapourGard™ Works

We start with a cationic surfactant, blend a set of amine groups with anionic surfactants, and create sets of amino complexes with a high reactive affinity toward certain odorous groups. Many of these complexes are amino hydroxyl groups that will react in contact with organic acids, mercaptans, and other reduced sulphur compounds. With mercaptans for example the sulphur/hydrogen (SH) bond is displaced through a series of ionic reactions and replaced with the sulphur/oxygen (SO) bond of an odourless sulphate.

Some reactions involve the conversion of organic and short-chain fatty acids to esters and simple alcohols. Some complexes trap and adsorb odorous compounds, others use opposing ionic charges to combine with or displace sections of the odorous molecule. Most of the reactions are induced by ionic charge or pH differences. It is very similar to the deodorants and shampoos each of us uses daily. It simply performs in the vapour state rather than the liquid state. The system provides an environmentally and personally safe deodorisation method while conserving water and energy.

## VapourGard™ Construction

Our vapour systems consist of a blower, solution storage tank, piping and an electrical control box with an electronic level gauge. VapourGard™ systems are set up on the boundary of the facility, with holed tubing allowing the release of vapour into the air.

They come in a range of sizes to treat outdoor areas as large as 500 linear metres or 150 lineal metres suitable for indoor facilities.

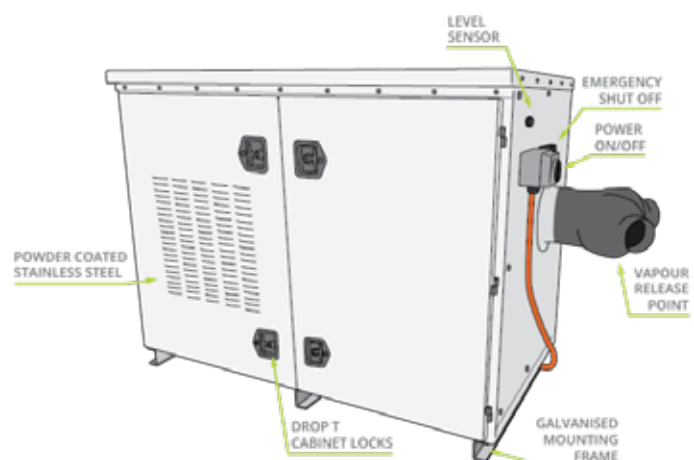
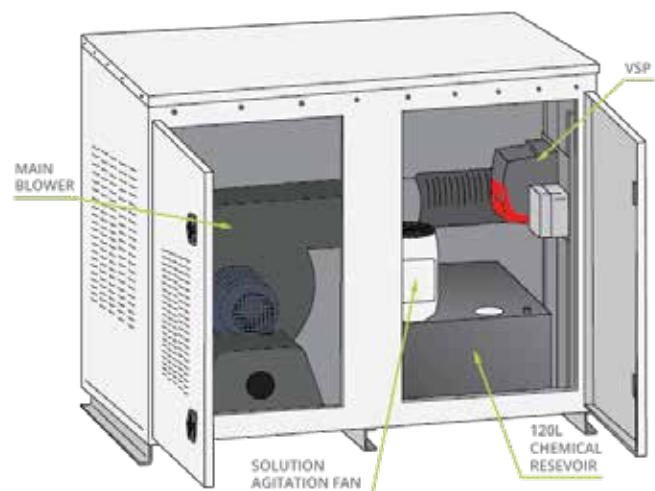
The power supply requirements for the VapourGard™ 150 are a single phase 240Vac while the VapourGard™ 500 requires a 3-phase 415Vac power supply.

## Vapour formulation

The odour vaporising solution QuikAir 0900V is an aqueous solution including non-ionic surfactant, and terpene/terpenoid blends. It has been formulated to work in the air phase on all commonly known groups of odorants. An ester, ketone, and cineole are used as preservatives and disinfectants, and help to discourage the growth of bacteria in the tank.

## Optional accessories

Optional accessories for these vapour systems include operational triggers - including timers, atmospheric conditions and remote tank level monitoring to ensure adequate vapour solution levels.



## Benefits to clients

CleanaWater's vapour systems are the lowest maintenance odour control products on the market. There are no nozzles to become blocked, and no portable water supply is needed. The active ingredients get to the very cause of odours, eliminating the particles. Our vapour systems are suited to large indoor and outdoor applications, especially effective on-site boundaries, aiding compliance with WHS and environmental regulations and eradicating odour complaints. The versatile design also helps you manage any site demands.

## Uses and applications

- Elimination of indoor and outdoor odours
- Large factories
- Processing facilities
- On-site perimeters
- Solid waste facilities
- Recycling facilities
- Waste processing and transfer stations

## Odour Control at Lucas Heights Resource Recovery Park with VapourGard™

### About Lucas Heights Resource Recovery Park

Located in Lucas Heights, Sydney, NSW, the Lucas Heights Resource Recovery Park is one of Australia's largest operating waste processing facilities, with its Renewable Energy Smart Cell® technology and additional ORRF organics facility processing over 625,000 tonnes of waste per year.

### The problem

As the facility expanded and increased capacity the surrounding suburbs also became larger and the facility has begun to encroach on densely populated residential and industrial zones. By the year 2018 complaints had become a regular occurrence, and regulatory authorities had issued the site with notices requiring them to take action and reduce the amount of diffuse odours that were being released by the facility.

### Our solution

Quite rapidly the situation escalated and the facility operators engaged CleanaWater's Odour Control Department to assist in coming up with a solution to ensure the facility could continue to operate while mitigating complaints from surrounding residents and businesses.

Initial enquiries from landfill management were for traditional misting systems that atomise diluted odour neutralisers into the air, although these systems can sometimes still be useful, due to the size of the operation and the importance of Select Civil, who manage the SUEZ owned facility, getting a comprehensive solution, CleanaWater recommended the facility managers take a different approach. That approach is a new technology rapidly gaining popularity in the US and Europe using vapour based neutralisers rather than atomised water-based solutions.



## What we did for our client

In the summer of 2018, CleanaWater installed two VapourGard™ VG 500 systems around the boundary of the active waste cells, using our QuikAir® 0900V vapourising odour neutralising solution. Combined, the 2 systems provided the Lucas Heights facility with 1 kilometre of diffuser pipe to install between the active waste cells and the complaining constituents, which constantly releases vapourised QuikAir® 0900V into the atmosphere.

## The outcome

Since installation, complaints all but ceased, and reports from operations have confirmed that odours are now minimal, noticing a substantial improvement in the air quality, even within the site premises.

The results were;

- ☞ Expert management of odour emissions
- ☞ Elimination of business and resident complaints
- ☞ Environmental regulation compliance
- ☞ Increased community approval

More Effective Than Misting Systems	✓
Economical	✓
Low Maintenance	✓
Odour Removal	90 - 100%

## Why use VapourGard™

The theory behind these systems is simple: if you want to catch or treat an airborne odour, you have to use a vapour. Water-based particles are simply too heavy to stay in the air long enough and the systems that release these solutions are maintenance heavy and at times unreliable. VapourGard™ solves these issues as the vapour produced with our specialised QuikAir® V solutions, disperse at the same consistency as the surrounding air, giving the active ingredients more time and opportunity to break down the odorous air and turn them into non-volatile and non-odorous compounds.

In addition, this also led to regulatory authorities being satisfied that Select Civil had taken a very proactive and effective approach to solve their issue and operations have continued uninterrupted for the past 3 years.

CleanaWater remains committed to maintaining a cooperative relationship with Select Civil, ensuring the systems installed have all compensatory and chemical to be operational 24/7, 365 days a week. CleanaWater is also very proud of our continued involvement in the SUEZ owned Select Civil managed operation of which produces enough renewable energy to power over 47,000 homes a year.



*"We have seen a fantastic improvement since the VapourGard™ system was installed 3 years ago. The system mitigates the heavy odours which are released from the site, which has improved conditions for our staff and almost completely eliminated complaints from local residents and businesses."*

**Glenn Claverie, Lucas Heights Landfill - Site Manager, Select Civil**



## The VapourGard™ Difference

- ☞ Vapour not water based neutralisers
- ☞ Minimal Maintenance
- ☞ No potable water supply needed for operation
- ☞ No blocked nozzles or nozzle replacement
- ☞ No spray means no airborne moisture or residue
- ☞ Fully automated system capabilities
- ☞ Vapourisation not atomisation
- ☞ Destroys odours, doesn't cover or mask them
- ☞ Suitable for large or small facilities
- ☞ Economical running costs
- ☞ No more odours means no more complaints

*"The VapourGard™ system is a great alternative to the other odour suppression systems out there. The unit is easy to use and maintain, does not need a portable water source to dilute the chemical and has a low chemical usage which cuts down on cost."*

Nicholas Bhugon, Compliance Officer, SITA Australia

### Basic Chemistry of QuikAir 0900V Vapourising Solutions

The product consists of an aqueous solution including non-ionic surfactant, and terpene/terpenoid blends. It has been formulated to work in the air phase on all commonly known groups of odorants.

An ester, ketone, and cineole are used as preservatives and disinfectants, and help to discourage the growth of bacteria in the tank. These are all FDA and EPA-approved for skin contact and inhalation and are used in many medicinal and cosmetic products and applications. They have been selected to avoid the commonly used products such as alkyl ammonium chloride and other quaternary ammonium compounds typically found in deodorisers.

Amino sucroate components are all either cosmetic, food, or medicinal grade and are also approved. Each amino sucroate is chosen based on the general molecular shape, stability, and reactivity of the specific amino/carbohydrate combination. Because of their specific shapes, they are able to act as catalysts in the breakdown of odorous compounds much as enzymes do, but with none of the concerns or problems associated with the use of actual enzymes found in misting technologies.



Surface Odour Control

## Bektra BIO-KEY 830F



# Bektra BIO-KEY 830F Topical Odour Control

CleanaWater's Topical Odour Control, Bektra BIO-KEY 830F, tackles odour at the source by combining several effective approaches for maximum performance in a convenient and environmentally responsible formulation.

We know that most problematic odours afflicting waste handling areas are biological in nature. Bio-Key 830F penetrates soils, oil and grease to tackle the source of the odor. Bio-Key 830F provides immediate odour relief in a pleasant neutralising foaming spray while dispersing the organic bio-stimulant components to naturally accelerate the digestion of offensive organics and deactivate the odor generating mechanism for long term relief.

Bio-Key 830F is a penetrating foam odor neutralising concentrate that cleans and prevents offensive odours in one easy step. It contains powerful detergents, to break up heavy soils and grease, natural bio-stimulants to deactivate odour producing mechanisms, and non-aldehyde odour elimination technology that has been optimised for reducing amines, terpenes and thiols. The concentrated formula is ideal for treating large surface areas that are heavily soiled with organics.

Bio-Key 830F combines Bektra's newest odour inhibiting technologies in a formula offering a rich, long lasting foam for maximum at source retention and treatment.

- ☞ **Triple Action**, reduces a broad spectrum of malodours by neutralising existing odour and preventing odour generation while leaving a fresh keynote behind.
- ☞ **Easy To Use**, spray and walk away while the product continues to work, soaking into cracks and crevices for deep penetrating effect.
- ☞ **Safe**, contains biodegradable, non-toxic, NPE-free, components that are non-hazardous to humans and animals.



## Application Areas

- ☞ Tipping floors and pits
- ☞ Garbage room floors, bins & chutes
- ☞ Dog runs, kennels and vets
- ☞ Driveways and loading areas
- ☞ Agri-food Processing
- ☞ Composting
- ☞ Material Recovery Facilities

## Advantages

- ☞ Eliminates soaked-in odour sources
- ☞ Reduces clean-up time and costs
- ☞ Effective and long lasting
- ☞ Natural, safe and non toxic

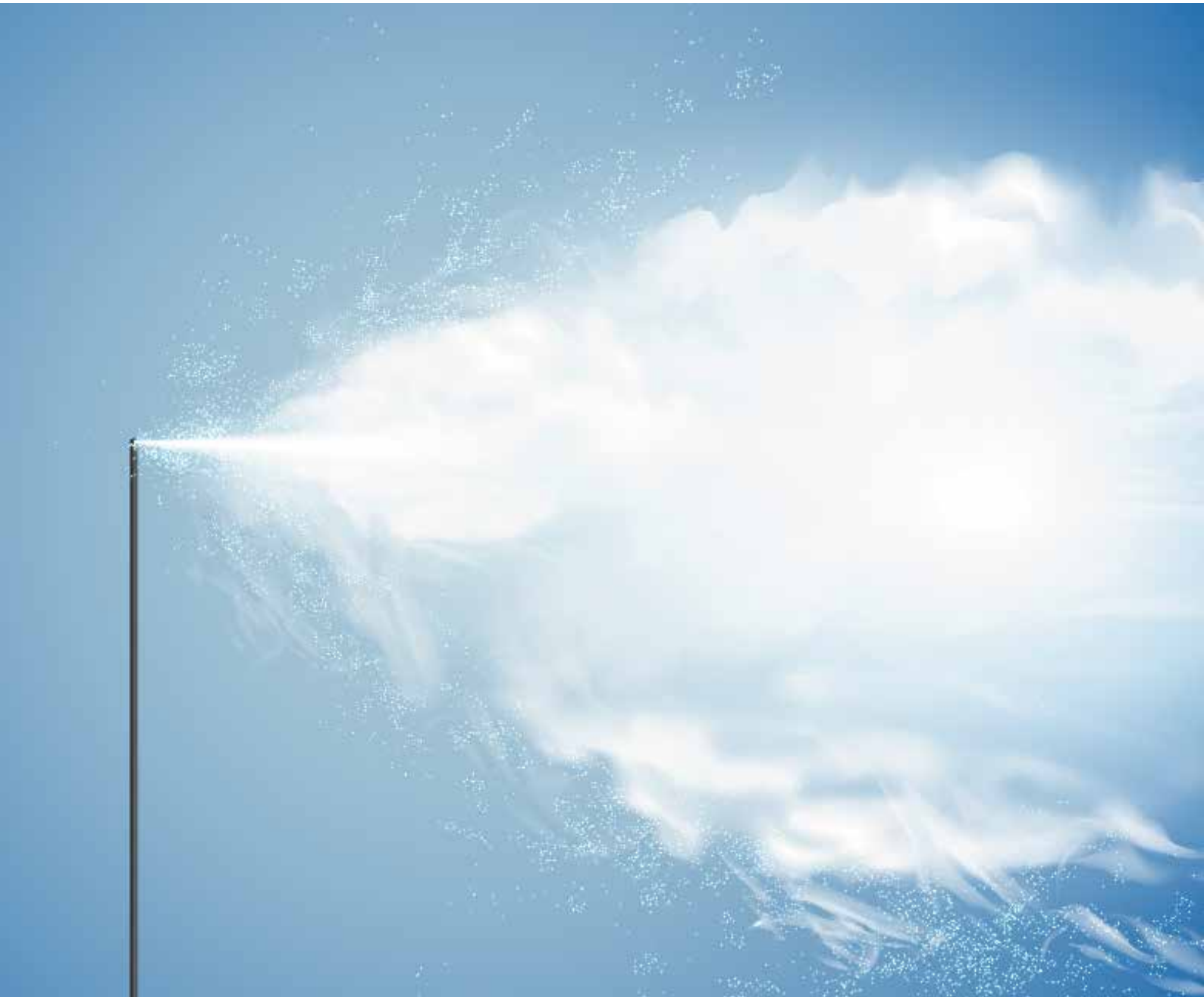
## Usage Instructions

Appearance	Slightly viscous brown liquid
Odour	Slight with product specific key notes
Flash Point (CC)	Not applicable
Freezing Point (°C)	-0°C



Don't Just Cover Up Odours, Eliminate Them

## Misting Systems



CleanaWater's misting systems effectively neutralise odours at the source - ideal where the source is diffuse. Essential oils and organic plant compounds convert odour molecules into non-volatile compounds - eradicating the chemical cause of odours.

Our range of odour neutralising systems combines state-of-the-art pneumatic and hydraulic delivery systems with odour neutralising products. These products have been developed over the past thirty years to reflect changes in industry needs. The delivery systems are durable, economical, performance driven, fully automated and offer exceptional quality.

The odour neutralising products are made from a complex blend of essential oils and odoriferous organic compounds found in plants. The odour removal process works through a variety of absorption and decomposition processes, converting odour molecules into non-volatile compounds. This process helps to reduce both the odour concentration and its intensity. All CleanaWater's AMS products are designed to be sprayed safely into the air. They are non-corrosive and non-toxic, making them ideal for a wide range of applications.

Our proprietary solutions designed to eliminate airborne and surface odours. All of our products are formulated using all natural organic compounds and essential oils, making them environmentally friendly and completely safe to use. Unlike simple masking agents, our misting odour neutralisers contain powerful odour neutralisers made from essential oils, surfactants and aromatics. Airborne droplets attract and neutralise odours through active chemical processes. These highly concentrated and widely versatile formulations are water soluble and non-toxic, making them ideal for use both indoors and out.



## Types of Odours Treated

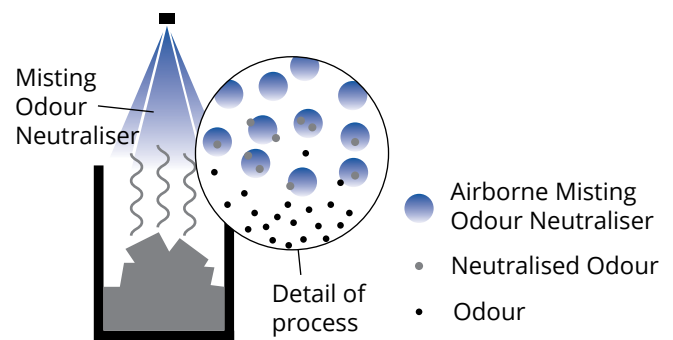
- ☞ Organic Sewage Odours
- ☞ Mercaptans
- ☞ Amine Compounds
- ☞ Phenol Odours
- ☞ Organic Acid Odours
- ☞ Grease Odours
- ☞ Low Level H<sub>2</sub>S (open areas)

## Average Feed Rate Guideline

Topical	Dilute RTU solution 100:1
Fogging Treatment	9ml to 15ml of RTU per nozzle per hour
In-duct Treatment	30ml of RTU per 43-85 m <sup>3</sup> per minute airflow per hour
Misting Treatment	1 x 20L drum of concentrate makes 2000L RTU

## Product Specifications

QuikAir 0900 Counteractant is a complex blend of essential oils, odoriferous organic compounds found in plants. QuikAir 0900 works through the process of odour counteraction to reduce odour complaints. QuikAir 0900 is optimised to eliminate the odours created by wastewater treatment and collection systems and is a broad spectrum odour neutraliser.



# CleanaWater®

**HEAD OFFICE:**

4 Channel Rd, Mayfield West NSW 2304

Free Call: 1800 353 788

Fax: 02 4952 8575

[info@CleanaWater.com.au](mailto:info@CleanaWater.com.au)

[CleanaWater.com.au](http://CleanaWater.com.au)



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