



**WATER CLEAR GLOBAL**  
WATER PURIFICATION SPECIALISTS

**INTRODUCES**

**RUBICON**  
**AML**<sup>TM</sup>  
**Acid Mine Drainage**



# INTRODUCTION



**RUBICON water purification & sanitising powders** are a global breakthrough in inorganic water disinfectants.

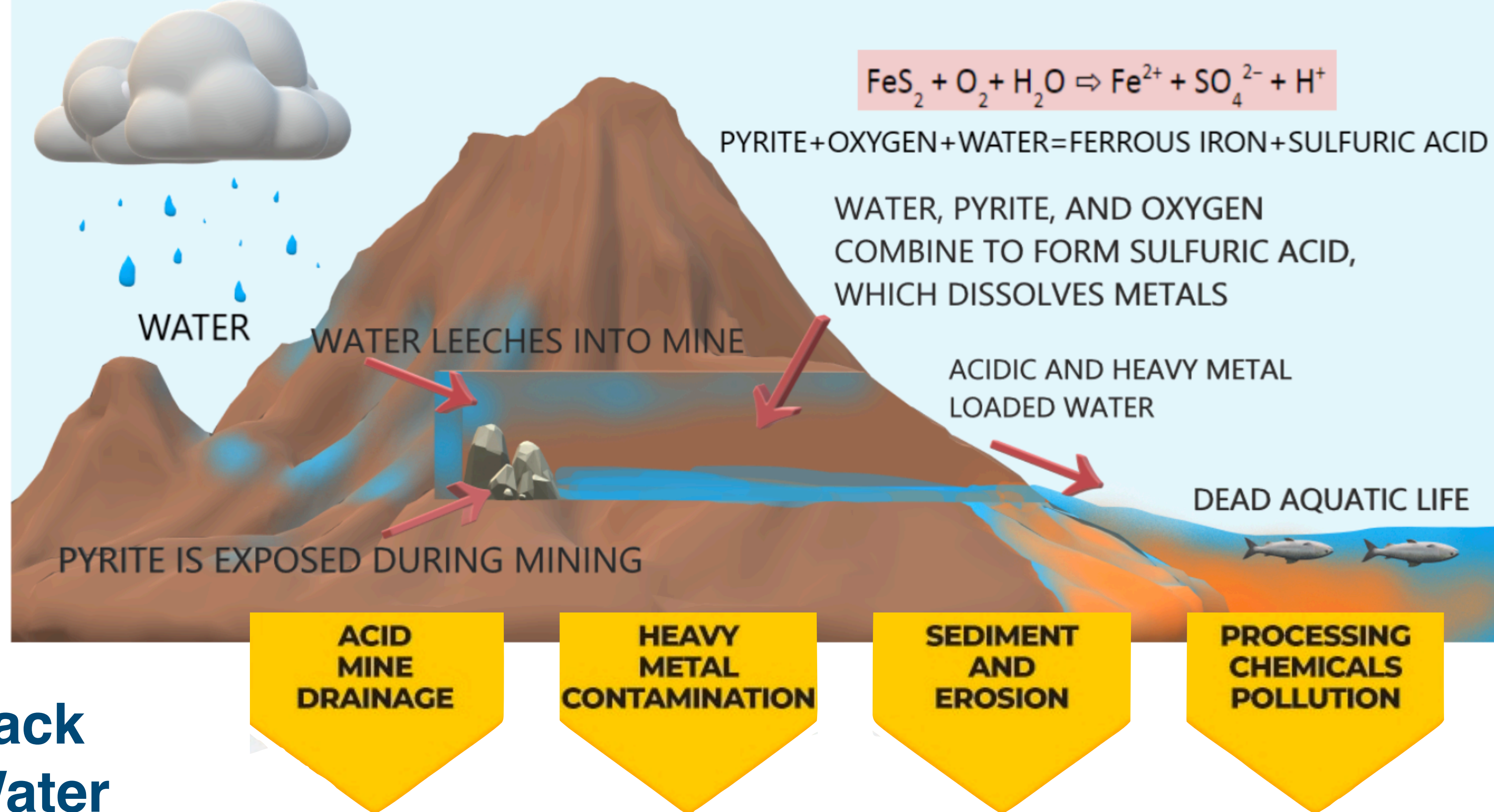
The zero chlorine, non toxic and highly effective treat sewerage, grey, black, swimming pool and Acid Mine Drainage.

**A lightweight & cost-effective white powder.**





**RUBICON  
AML**<sup>TM</sup>  
**Acid Mine Drainage  
+ PS-117 liquid**



## Treatment of Black Toxic Landfill Water

An environment-enriching purification & disinfectant powder. A site visit & recent raw water test result reading is required for calculating the perfect dosage equation.





# THE PROBLEM

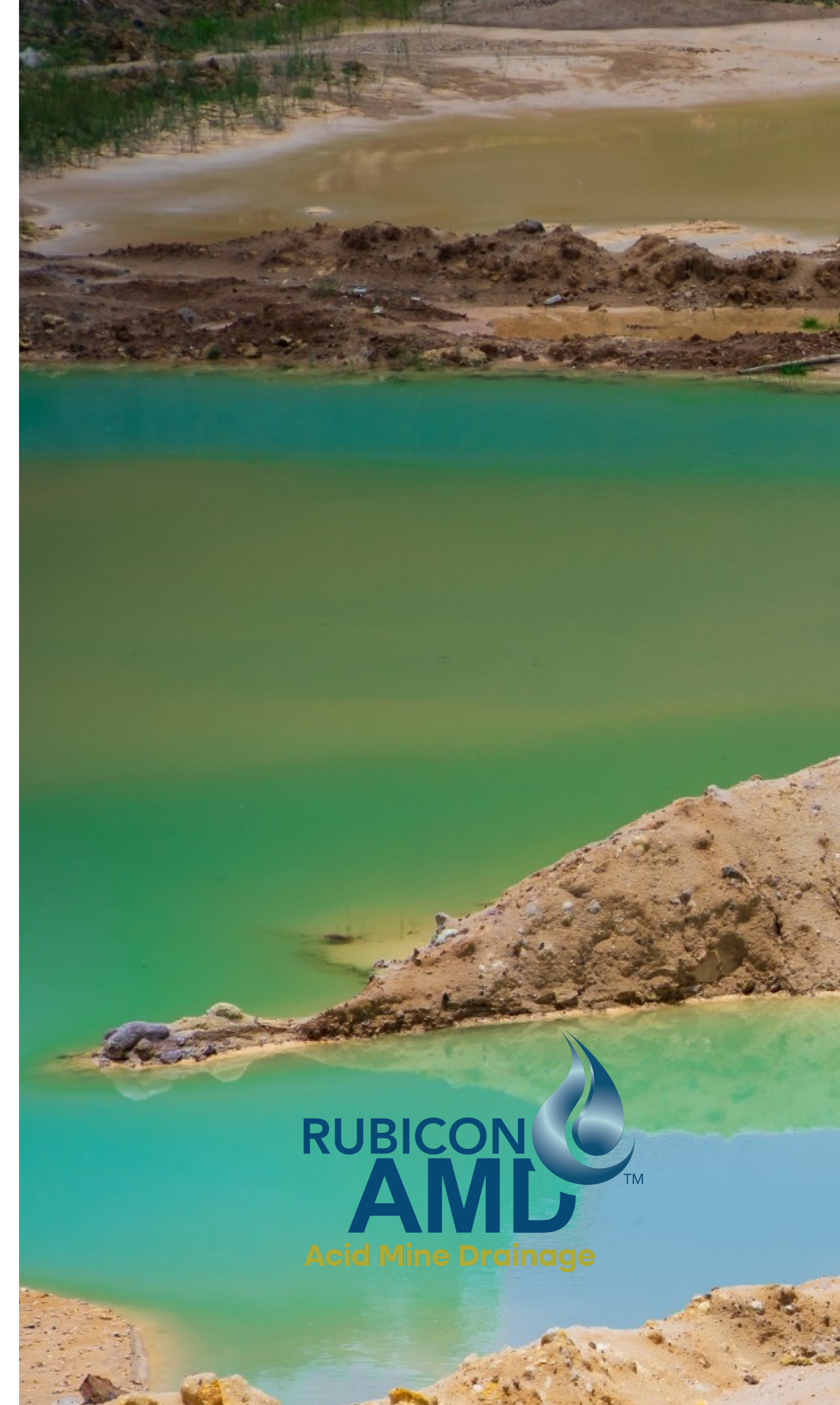
Wastewater treatment and **heavy metal pollution** as a result of industrial activities are significant issues faced by many countries, especially developing ones. When heavy metals, such as **arsenic, cadmium, chromium, copper, lead, nickel and zinc**, contained in wastewater discharge into rivers and trenches without proper treatment, the result is severe pollution, leading to environmental impacts on aquatic life, plants and ecology.

Many heavy metals are biologically accumulated and cannot be easily decomposed, jeopardising human health through the food chain.

## **Sources of industrial wastewater containing heavy metals include:**

Complex organic chemicals, electric power plants, electronics manufacturing, electroplating, iron and steel, and mines and quarries.

Use of heavy metals is unavoidable in numerous branches of industry and industrial applications. Because heavy metals are usually extremely toxic to man and environment alike, strict environmental regulations are often enforced to limit their concentration in wastewater (and exhaust air). In order to comply with these regulations, the wastewater is usually neutralised with **caustic soda solution or lime**. The heavy metals precipitate as insoluble hydroxides and can thus be removed. However, these methods frequently fail, due to the presence of complexing agents that interfere with the precipitation of hydroxides, or even completely prevent it.





# RESULT/SOLUTION/PRODUCT

**THE RESULT** - Heavy metal limits cannot be achieved.

Heavy metals are defined as metals with a high density ( $> 3,5\text{-}5\text{ g/cm}^3$ ). They are natural elements that can't be degraded or destroyed. Only their chemical and physical properties can change (such as by forming soluble or insoluble compounds).

Complexing agents are substances that are capable of keeping metals in solution.

## THE SOLUTION

Precipitation with PS-117

PS-117 reacts with heavy metals to form extremely stable, virtually insoluble heavy metal-PS-117 compounds. It forms a solid that is easy to separate. PS-117 also produces good results when hydroxide precipitation exhibits little or no effect.

THE RESULT: Heavy metal limits can be achieved

## THE PRODUCT - PS-117

PS-117 is a ready-to-use aqueous solution of a blend of different Trisodium salts, and organosulfide that represents the active agent. PS-117 is used to precipitate monovalent and bivalent heavy metals from wastewater (including Cadmium, Copper, Lead, Mercury, Nickel, Zinc, Arsenic and Silver) that are dissolved and bound in complexes. It can be used effectively even where the complexing agent prevents these metals from precipitating as hydroxides





# POSSIBLE APPLICATIONS

## Waste Incineration/Thermal Utilisation

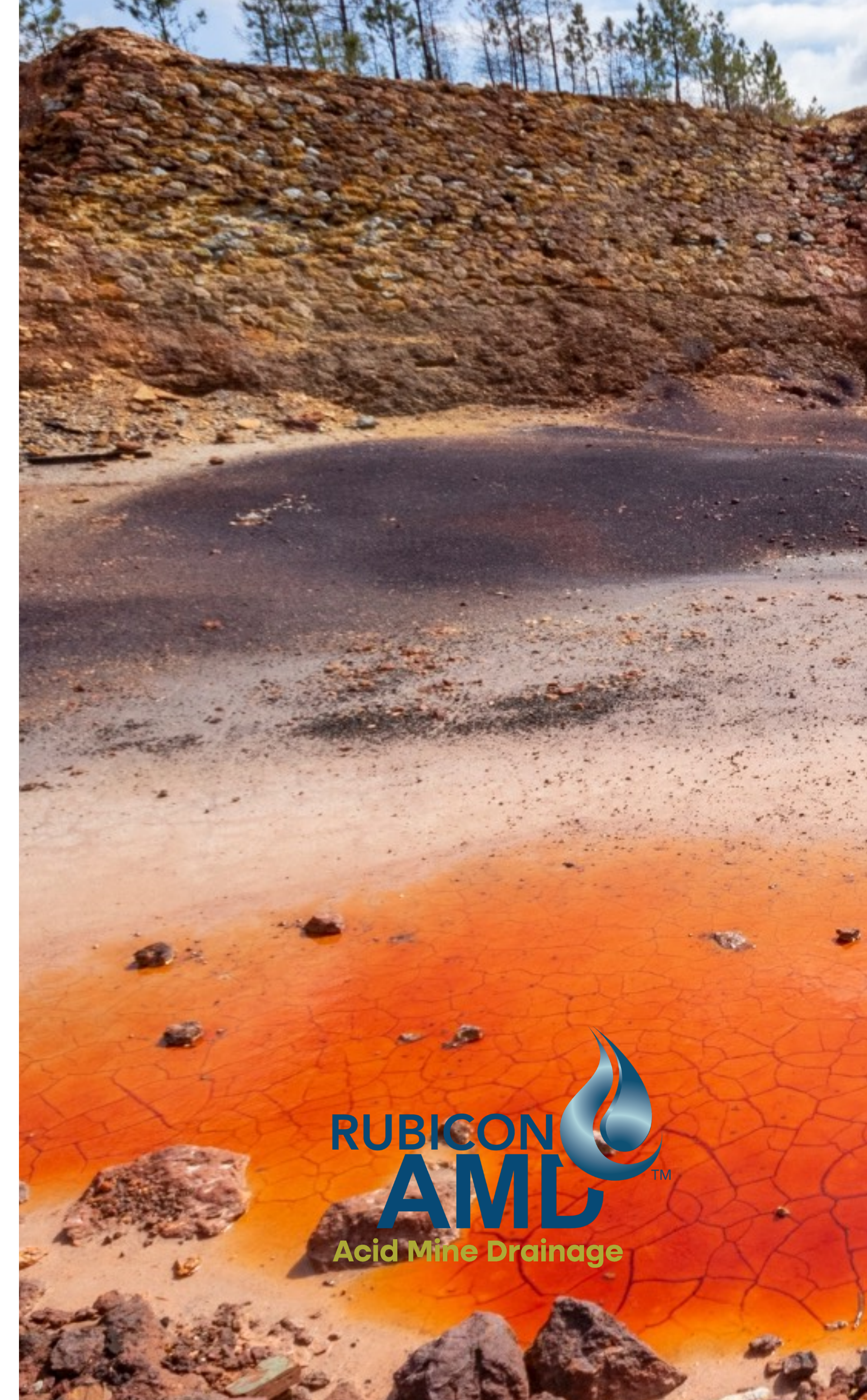
Heavy metals are present in incinerators that burn municipal and industrial wastes. The high combustion temperatures cause heavy metals to be transferred to the flue gas, especially the heavy metals which are easily volatile (e.g. mercury and cadmium). Purification measures, such as flue gas scrubbing, will remove these and other hazardous substances. However, they generate large quantities of scrubber water that is highly contaminated with heavy metals.

## Coal-Fired Power Stations

In addition to Sulphur, coal contains small quantities of toxic heavy metals that are released during combustion. Resalable gypsum and polluted wastewater result from the processes which coal-fired power plants conventionally use to desulfurise flue gas. PS117 precipitates the heavy metals out of AMD, and can be used to treat AMD waste water.

## Plating and Surface Finishing

Many processes, such as electroplating and circuit board production, require the use of solutions, which contain heavy metals. Such processes generate wastewater and used process solutions, which contain heavy metals. The extensive variation in the wastewater matrix poses a special problem in this branch of industry: heavy metals, which are bound in complexes, can be present in extremely different concentrations.



**RUBICON**  
**AML**  
Acid Mine Drainage



# THE ADVANTAGES

## PS-117 IS EFFICIENT

Effective over a wide pH-range, in both alkaline and acidic environments.  
Easy and inexpensive to integrate into existing wastewater treatment plants.  
Avoids expensive secondary treatments. The thermally stable heavy metal - **PS-117** compounds are suitable for spray-drying processes.

## PS-117 IS SAFE TO HANDLE

Ready-to-use solution that is safe to store  
No decomposition products  
Odourless  
No dangerous substances

## PS-117 IS ENVIRONMENTALLY FRIENDLY

Favourable toxicological and ecological characteristics  
Forms compounds that are difficult to elute and safe to dump in landfills  
Adding small amounts (50ml/m<sup>3</sup> - 100ml/m<sup>3</sup> depending on the level of heavy metals) of the organosulphide **PS-117** to the heavy metal waste water solves this problem: The precipitation will be completed, and the remaining residues of e.g. cadmium, copper, lead, mercury, nickel, or silver are reduced to an extremely low level. In order to achieve the best performance, the pH-value of the treated waste water should be adjusted to a neutral/slightly alkaline range. The precipitate of **PS-117** with heavy metals can be easily flocculated and separated, similar to the corresponding hydroxides.





# KEY FEATURES

Sustainable

Cost effective

Non-toxic & safe

100% Chlorine Free

Odourless & tasteless

Unaffected by UV degradation

Decompose into water and oxygen

Fast dissolving & very easy to dose





# BENEFITS

## 100% KILLS

**E.coli, cholera, bacterias, fungi, viruses and other pathogenic organisms, phenols and other spores**

Does not create Trihalomethane's (THM's) or HAA's disinfection by-products (DBPs)

Enhances ECO plant life and conditions the human body

Byproduct enhances soil and plant life

Long lasting residue effect and NON flammable

Removes arsenic, cyanide & fluoride

**Reducing single use plastic!**





**CHL  RINE**

**VS**

**RUBICON**  
**AML**  <sup>TM</sup>  
**Acid Mine Drainage**



Rubicon	Chlorine
One treatment	Pretreatment and sanitizing (Multiple treatments)
High Residual Value (active 72 hours after application)	Low residual value
Potent Sanitiser, Odour Control, Cyanide Removal, Arsenic Remediation, Removes Fluoride.	Disinfectant By-Products (DBP's) such as THM's, HAA's, MX-Factor, DCA's
Arsenic remediation: elimination of toxic As (III) from contaminated soil & groundwater. Rapid oxidation of As(III) to As(V) Arsenic.	No
Reduces COD / TOC ( COD = Chemical Oxygen Demand; TOC = Total Organic Carbon)	No
Treats water for Pharmaceuticals, Home & personal care, Food processing, Wood processing, Distilleries, Paper mills, Textiles / dyes	No
Degrades Large Organic Compounds (Pharmaceuticals)	No
No	Requires Stabilisers
No	Harmful to the eyes
No	Irritating the skin
No	Forms Disinfection By-Products (see above)



Rubicon	Chlorine
Safe for human consumption, harmless, tasteless, and non-toxic	Toxic / Poisonous
No	Dangerous To Store
No	Flammable Reactive
No	Bleach Spots
Increases oxygen	Depletes Oxygen
Odourless	Noxious Odour
No	Allergenic
No, 100% Environmentally Friendly	Toxic to aquatic life
Eco not affected by turbidity	Chlorine provide lower disinfection effectiveness in turbid waters
Un-effected by UV degradation	Degraded by Sunlight



All claims are scientifically substantiated by various Internationally accredited institutions and approved by the department of health in South Africa to be safe for Human consumption.

Listed with the United Nations, World Health Organisation, Unicef, UNIDO, UNRWA and various other international bodies.

**Rubicon water purification treatment is manufactured and produced in South Africa.**

A white free flowing granular solid, soluble in water and **contains no chlorine or any halogen, based products.**





# ACCREDITATIONS & PARTNERS

Official documentations available on request



**World Health Organization**



**health**  
Department:  
Health  
REPUBLIC OF SOUTH AFRICA



**agriculture, forestry & fisheries**  
Department:  
Agriculture, Forestry and Fisheries  
REPUBLIC OF SOUTH AFRICA



**science & technology**  
Department:  
Science and Technology  
REPUBLIC OF SOUTH AFRICA





# Test Report

## LABORATORY SERVICES DEPARTMENT

Test Report Number: 2024-0261

Page Number: 2 of 4

Sample ID			2180663	2180664	Uncertainty of Measurement (UoM)	General Authorisation:2013 Discharge of wastewater into a water resource limits
Sample Description			Tank Sample 2 -Untreated	Tank Sample 2 -Treated (1.5g)		
Method Number	Determinands	Units	Results	Results		
154	Arsenic (soluble)*	µg As/L	<2.00	<2.00	±2.9%	≤20
30	Boron*	µg B/L	85.8	95.8	±3.4%	≤1000
102	Cadmium (soluble)*	µg Cd/L	<1.00	<1.00	±6.7%	≤5
16	Chlorine Free*	mg Cl <sub>2</sub> /L	0.15	0.20	not available	≤0.25
153	Chemical Oxygen Demand*	mg O <sub>2</sub> /L	<b>266</b>	<b>264</b>	not available	≤75
21	Conductivity@ 25°C	mS/m	84.1	123	±1.9%	no more than 70-150 mS/m above intake
95	Hexavalent Chromium (soluble)*	µg Cr/L	to follow	to follow	not available	≤50
30	Copper (soluble)*	mg Cu/L	<0.05	<0.05	±3%	≤0.01
121	<i>E. coli</i> *	MPN /100mL	<b>920800</b>	0	±8%	≤1000
94	Fluoride	µg F/L	246	254	±5.3%	≤1000
30	Iron (soluble)*	mg Fe/L	<b>0.43</b>	<b>0.31</b>	±3.2%	≤0.3
162	Mercury*	µg Hg/L	<0.50	<0.50	±8.3%	≤5



# BULK APPLICATION

The RUBICON product application method is so simple

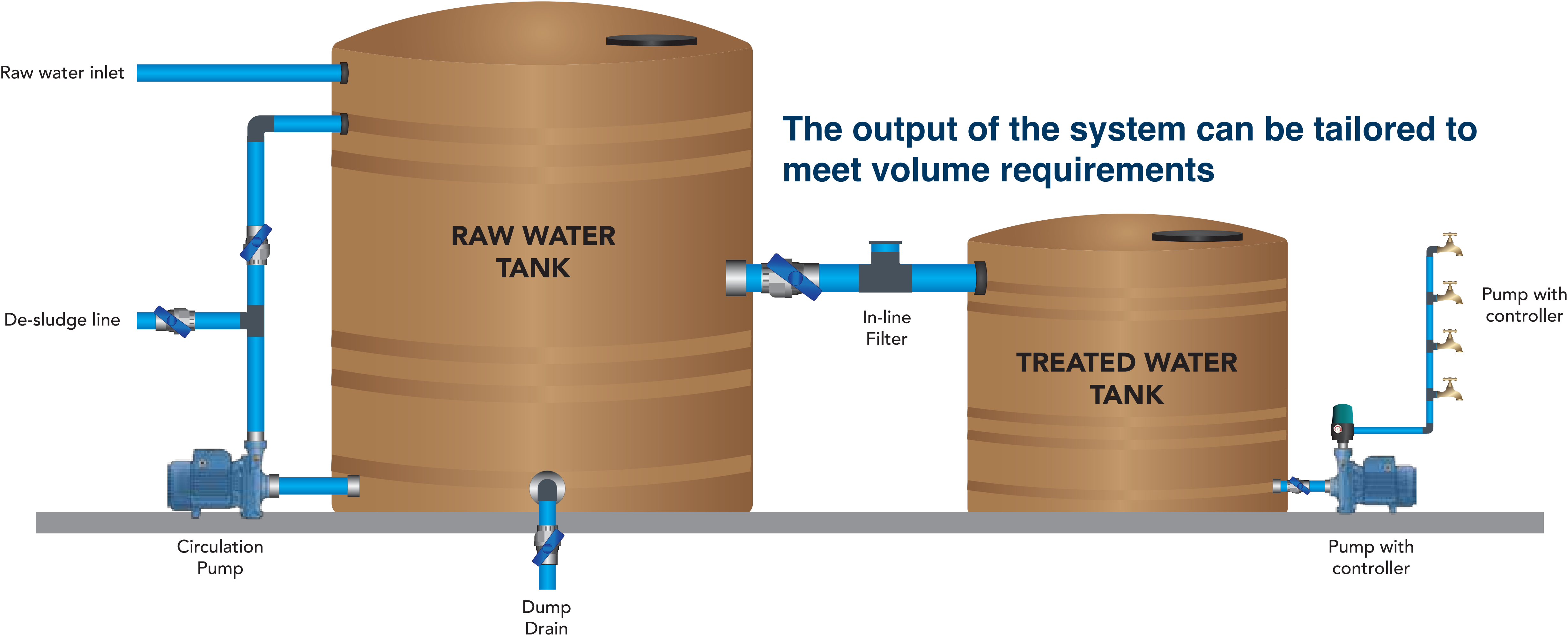
If the raw water tank filling process is gravity-based, the treatment method does not necessarily require electricity. At most, a small solar panel.

Any natural water source, borehole or on-site water supply would be used and treated with RUBICON purification powders before distribution.

Systems can be fully containerised, secure and in chilled ventilation. Minimal maintenance costs.



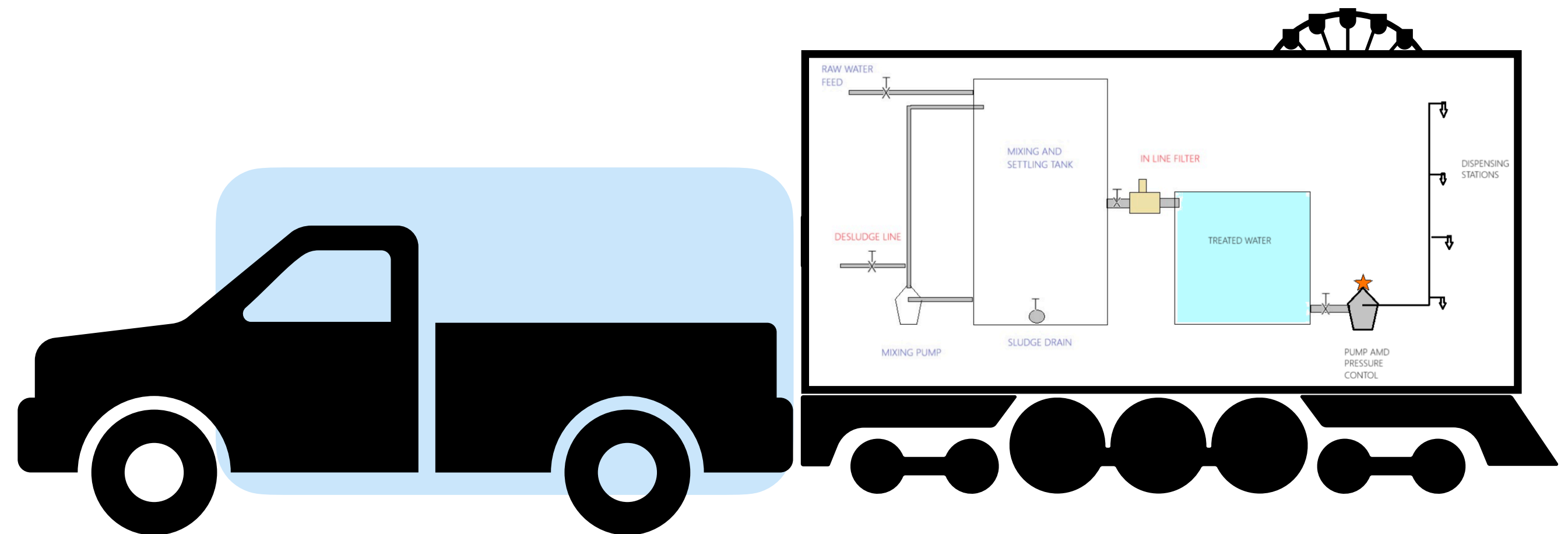
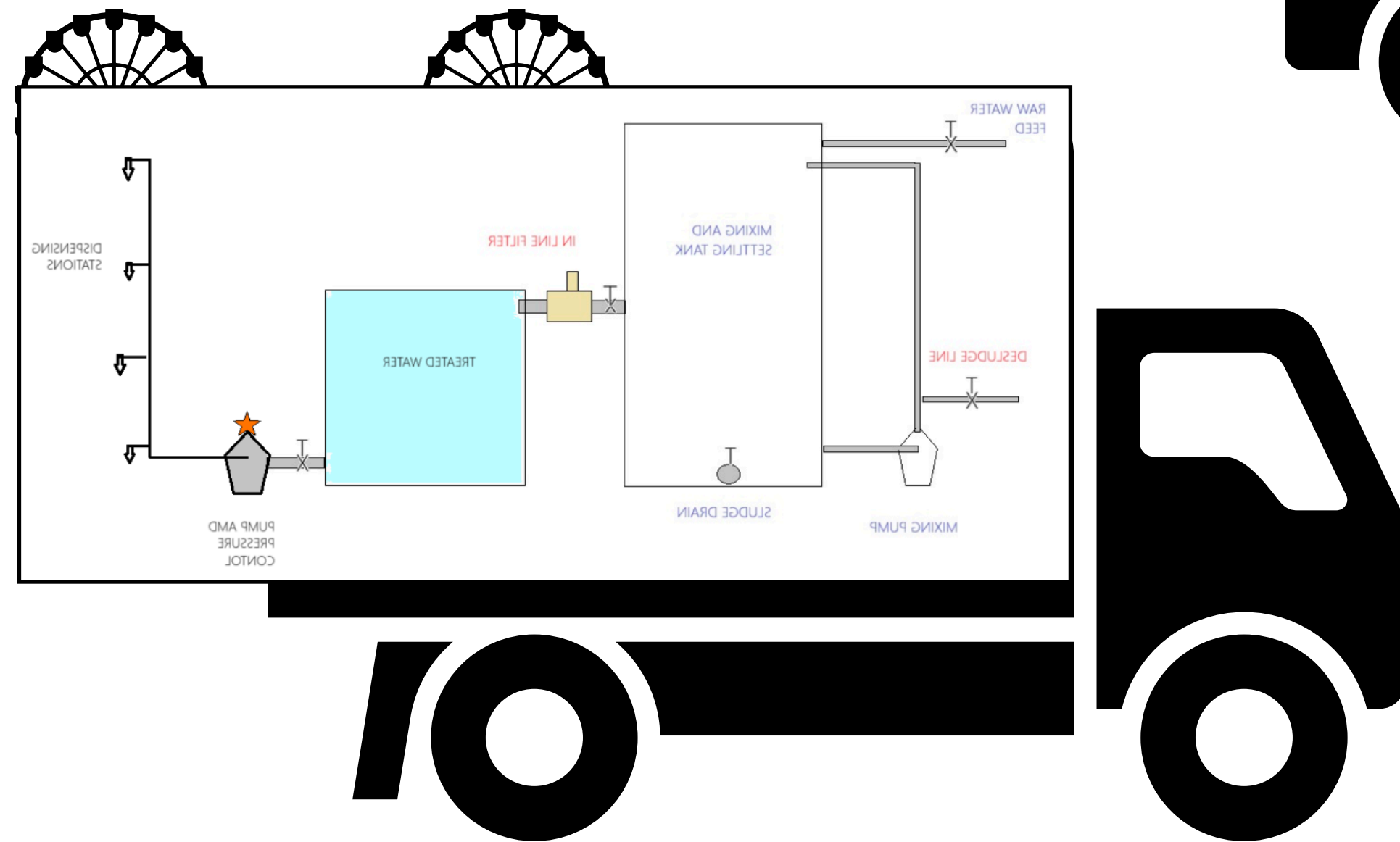
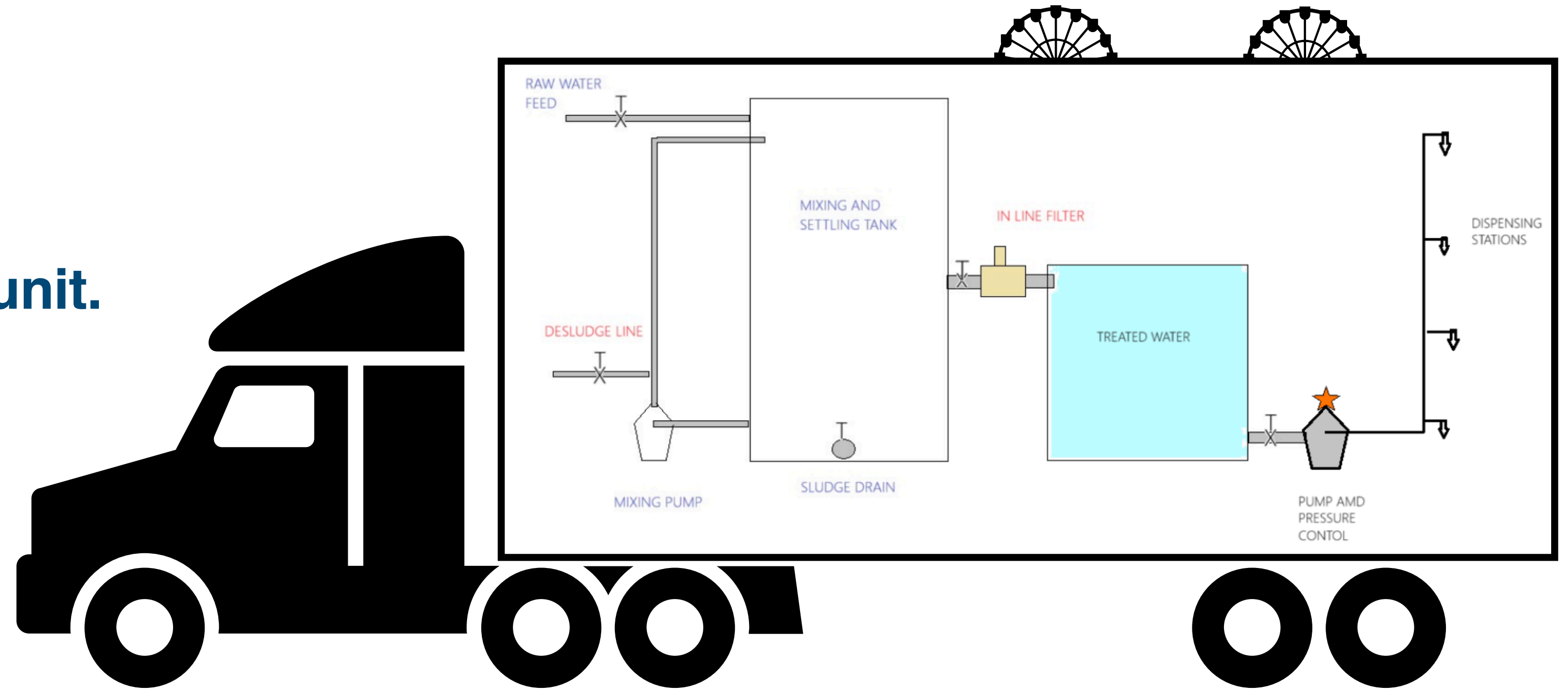
# SIMPLE BULK INDUSTRIAL SYSTEM DESIGN





# “PLUG & PLAY” SYSTEMS

Suitable for onsite use in a secure container, or on the go as a mobile unit.





# QUANTITY OF DOSES WITHIN AN ORDER

Product Quantity	Total Amount in Grams	Total Litres Treated	Total # of Doses / Order
1000 x sachets	3500	25 000	1 000
Full Batch	550000	3 928 571	157 143
1/2 Batch	275000	1 964 286	78 571
1 x 25kg bucket	25000	178 571	7 143



# VOLUME / SUPPLY OPTIONS



**3.5g Sachets** - for personal and domestic use

**25kg Bucket** - for domestic and corporate use

**250 kg (1/2 Batch)** - for corporate & industrial

**500 kg (Full Batch)** - for industrial & municipalities





# CHEERS

