1.   METHODOLOGY

The effective management of a water treatment system is strongly supported by the comprehensive understanding of the existing treatment system and infrastructure, the type and magnitude of hazards and risks, the knowledge of how to manage the hazards and risks, and good communication between all role players.

1.   *System Assessment* - Assemble W$_S$P team. A comprehensive review and description of existing infrastructure and the treatment system was performed.

2.   *Risk Assessment* - Identification of hazards and the determination of the associated risk. The impact of each of the hazards or hazardous events were characterised by assessing the severity of the likely health outcome and the probability of occurrence. A risk is the likelihood of the identified hazard/s causing harm to exposed populations in a specified timeframe including the magnitude of that harm and / or the consequences. The following hazard assessment matrix was used to score the existing risks associated with the management of collection, treatment and disposal of wastewater in order to establish priorities.

Table 2.1: Hazard assessment matrix used to score existing risks			
Likelihood	**Rating**	**Consequence**	**Rating**
Almost certain (Once a day or permanent feature)	1	Catastrophic (Death expected from exposure)	100
Likely (Once per week)	0.8	Major (Population exposed to significant illness)	70
Moderately likely (Once per month)	0.5	Moderate (Large aesthetic impact)	20
Unlikely (Once per year)	0.2	Minor (Small aesthetic impact)	2
Rare (1 in 5 years)	0.1	Insignificant (No impact)	1

The table below gives an overview of the risk profile based on the score calculated from the risk assessment matrix.

Table 2.2: Overview of the risk profile based on the score calculated from the risk assessment matrix	
Score	**Risk Profile**
0 – 9	**Low:** These are systems that operate with minor deficiencies. Usually the systems meet the water quality parameters specified by the appropriate guidelines (SANS 241:2006)
10 – 20	**Medium:** These are systems with deficiencies which individually or combined pose a high risk to the quality of water and human health. These systems would not generally require immediate action but the deficiencies could be more easily corrected to avoid future problems.
21 – 100	**High:** These are systems with major deficiencies which individually combined pose a high risk to the quality of water and may lead to potential health and safety or environmental concerns. Once systems are classified under this category, immediate corrective action is required to minimize or eliminate efficiencies.

Likelihood is determined by "how often" or "how likely" a hazard or a hazardous event occurs. It must take into account hazards that have occurred in the past and their likelihood of re-occurrence and must also predict the likelihood of hazards and events that have not occurred to date.

Consequence determines the severity of the results of the hazard / hazardous event and the seriousness or intensity of the impact of the hazard to human health.

Risk Rating = Likelihood × Consequence

3. ***Risk Management*** - Establishment of control measures through operational monitoring, management procedures (corrective actions, emergency protocol etc.) documentation and communication through management levels. Supporting programs, validation and verification of control measures.