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**BULLETIN**
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# SHAC Ponder



## WATER QUALITY FACTS

- FACT:** Cloudy, odorous, discolored water is typically the result of a disruption or imbalance in the natural ecology of a water body.
- FACT:** Organic material such as leaves, branches, aquatic plants, and other aquatic organisms tend to accumulate and decompose in water, causing odors and discoloration.
- FACT:** Over time, accumulation results in a build-up of organic solids and nutrients that is often referred to as sludge. This organic build-up can result in an imbalanced system (i.e. nutrient accumulation) and overall poor water quality (i.e. algae growth).
- FACT:** Accumulation of nutrients in water can result in a proliferation of aquatic plants and algae blooms. When plants/algae die off, the oxygen in the water is consumed by microbes for decomposition. Water can then become low in oxygen, resulting in odors, incomplete decomposition of organic material, and dangerous conditions for fish and other aquatic organisms.
- FACT:** Disinfectant products and heavy metal based chemicals that are commonly used in water treatment may destroy microbial activity. As a result, these products often perpetuate the pre-existing ecological imbalance. In some cases, heavy or regular use of such chemicals may lead to the creation of treatment resistant algae and bacteria.
- FACT:** Accumulation of chemical treatments can cause water to become hazardous for consumption, harmful for animal production and inadequate for irrigation purposes.



## WATER QUALITY AND THE ENVIRONMENT

Water quality has a significant influence on the health of all living organisms. Our activities influence water quality and the environment in a variety of ways. In nature, each of the essential microbial families that break down organic matter are present and work in harmony. In an aquatic environment, these microbes act as a natural purification system to create clean, clear water. Resident microbes (i.e. naturally present) can be inhibited by chemicals, cleaners, fertilizers, and other toxins that are either purposely or unintentionally released into the environment. These microbes may also be hindered by a lack of trace minerals. If the resident microbial populations become imbalanced or dormant due to unsatisfactory environmental conditions, the result is often odorous, discolored and cloudy water, due to the build-up of organic solids. As a result, nutrients become more readily available, algae and aquatic vegetation may begin to grow in excess, and water quality continues to decline.

## WATER QUALITY AND ANIMAL HEALTH

In sources of surface water used for livestock production (e.g. dugouts), water quality issues can be of considerable concern. A supply of good quality water is essential for successful livestock production, as water quality impacts both water intake and weight gains in animals. There are many factors that can contribute to unpalatable or even unhealthy water. For example, high salinity is a common problem occurring in many livestock water sources. It is believed that waters that contain high levels of dissolved salts (TDS) can result in reduced performance in some livestock, particularly in young animals. Excessive algae growth (e.g. algae bloom) is another common problem related to unacceptable water quality. Toxins are often released into the water when certain algae populations die off. Under some circumstances, these toxins have the potential to reach lethal concentrations.

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## BENEFITS OF USING *PONDER*

- Reduces offensive odors in water.
- Reduces organic solids accumulation in ponds.
- Reduces turbidity in water (cloudiness), providing cleaner water for all uses.
- Creates an environment that stimulates microbial activity by providing trace minerals and nutrients.
- Acts as a stabilizer/neutralizer tying up toxins that would otherwise inhibit microbial activity, or harm livestock.
- Certified by the National Sanitation Foundation (NSF) Standard 61 (Note: *Ponder* treatment does not replace standard water treatment practices in sources intended for human consumption).
- Does not inhibit immediate water use for livestock or domestic purposes.

## HOW *PONDER* WORKS

*Ponder* is designed for surface water conditions found in farm dugouts and stormwater reservoirs, ornamental ponds, golf course ponds, municipal reservoirs and lakes. *Ponder* assists in the breakdown of organic matter by stimulating the various resident microbial communities present in water bodies. Stimulation of these microbial communities acts to balance microbial populations, resulting in the digestion of organic solids at optimum rates and thus reducing offensive odors and discoloration of water. Please note that *Ponder* is not an algacide and should not be used in conjunction with chemicals. The raw materials used to manufacture all SHAC products are acquired from one of the highest quality humate sources in the world. The active ingredients in *Ponder* include the following:

### • Activated Carbon

Activated carbon adsorbs and binds various toxins and inhibitory compounds that can be found in water, providing a more favorable environment for the growth of microbial populations.

### • Essential Trace Minerals

*Ponder* contains 32 essential trace minerals and other natural ingredients which are necessary nutrient sources for the growth and activity of resident microbial populations.

### • Humic Acids

Humic acids stimulate resident microbial populations and chelate (bind) inhibitory compounds, including metals and organic contaminants, which may negatively impact microbial life. In addition, hydrogen peroxide,

which is believed to be formed in natural waters containing humic substances in the presence of sunlight, has been shown to inhibit the growth of algae.

## *PONDER* RESULTS

**FACT:** Up to 83% reduction in organic solids.

**FACT:** As high as 40% reduction in total dissolved solids.

**FACT:** As high as 99% reduction in total suspended solids.

**FACT:** Up to 81% increase in water clarity.

**FACT:** As much as 67% reduction in Phosphorus.

**FACT:** As high as 42-52% reductions in other nutrients such as Calcium, Magnesium, Sodium, and Sulphate.

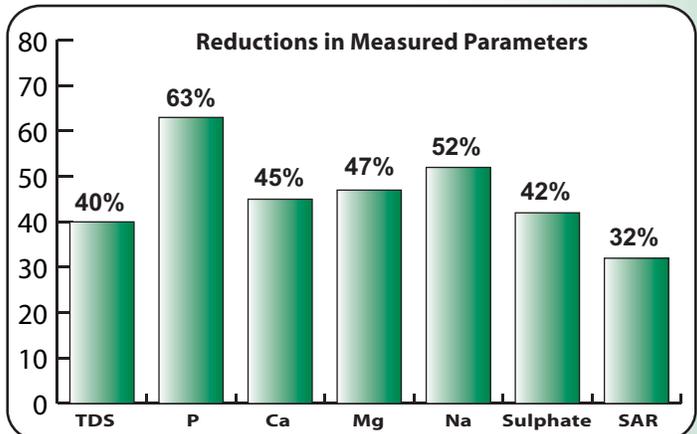
**FACT:** Up to 32% reduction in Sodium Absorption Ratio.

## *PONDER* CASE STUDIES

*Ponder* has been proven to improve overall water quality under a number of surface water conditions. The following examples illustrate the effects of *Ponder* on several key water quality parameters:

*Ponder* was used to treat a City of Saskatoon stormwater retention pond. Water quality parameters were monitored over a period of approximately 2 ½ months during the summer. The following results were observed:

- 40% decrease in Total Dissolved Solids
- Reduction in nutrients such as Phosphorus, Calcium, Magnesium, Sodium and Sulphates
- 32% decrease in Sodium Absorption Ratio



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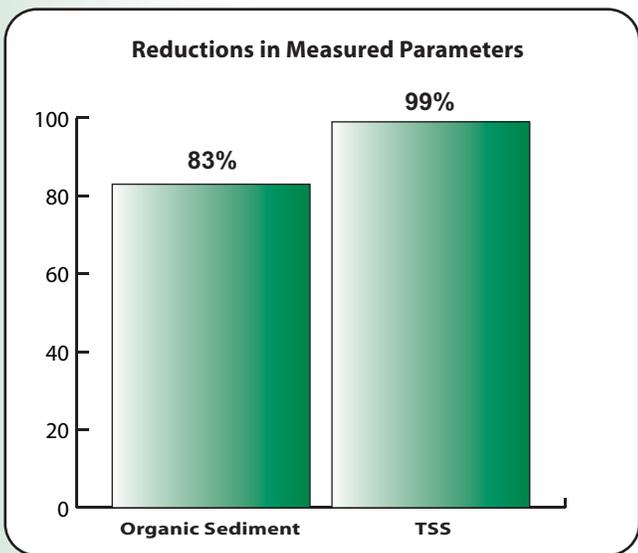
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In a study conducted at a water storage and treatment facility in Barnwell, AB, *Ponder* was applied to investigate the effects of treatment on water quality and to determine the potential for increased Trihalomethane\* precursors (e.g. Dissolved or suspended solids). Quality parameters were monitored for approximately 14 months. During the course of the study the following results were observed:

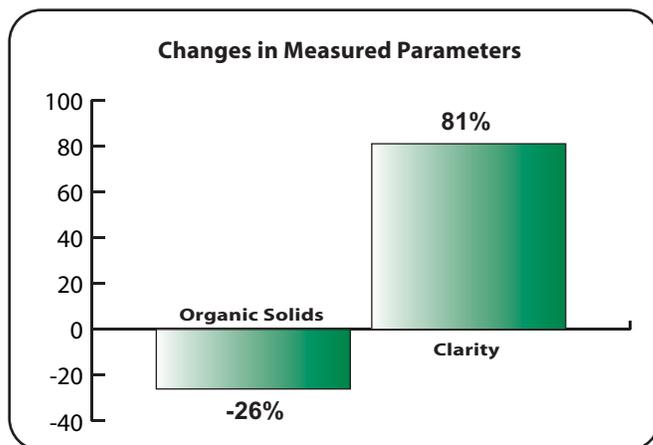
- 83% reduction of organic sediment
- Nearly 100 % reduction in Total Suspended Solids (TSS)
- NO elevation in other Trihalomethane precursors

\*Trihalomethanes are of concern to many municipalities due to water sanitation practices. Trihalomethanes (THM) form after addition of chlorine to water containing dissolved or suspended organic material. THM's are considered toxic and carcinogenic. TSS and organic carbon are both considered to be THM precursors.



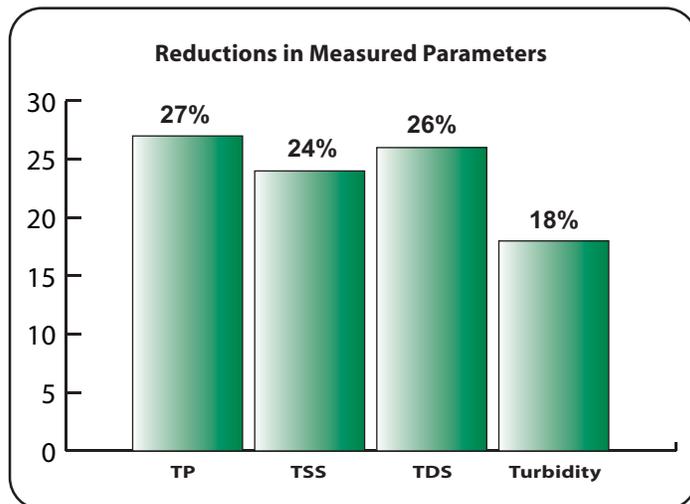
*Ponder* was used to treat Lake Horney in Lakeland, Florida. Water quality was monitored over a period of approximately 4 months to determine efficacy of the product. The following results were observed by the Madrid Engineering Group:

- 26% reduction in organic solids
- 81% increase in water clarity, reflecting a combined reduction in algae, suspended solids, and dissolved solids



*Ponder* was applied to Lake Wade in Florida. Water quality was monitored by Environmental Research and Design Ltd. over a period of approximately 3 months to determine the efficacy of the product. The following results were observed:

- 27% reduction of Total Phosphorus
- 24% reduction of Total Suspended Solids
- 26% reduction of Total Dissolved Solids
- 18% reduction in Turbidity



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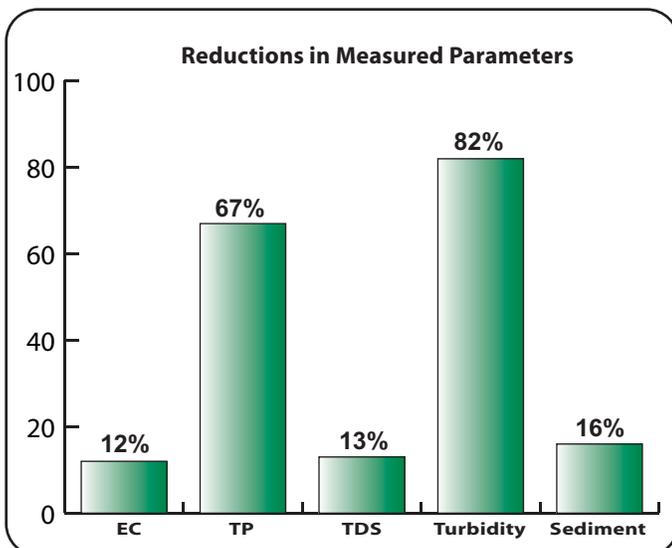
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Ponder was used to treat McCall Lake in Calgary, Alberta. Water quality was monitored over a period of approximately 9 months. The following results were observed:

- 12% reduction in Electrical Conductivity
- 67% reduction in Total Phosphorus
- 13% reduction in Total Dissolved Solids
- 82% reduction in Turbidity
- 16% reduction in Organic Sediment



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## Literature Sources Cited

- Alberta Agriculture, Food and Rural Development. *Agricultural Impacts on Water Quality in Alberta: An Initial Assessment*. Lethbridge, Alberta. Published on behalf of CAESA - Canada Alberta Environmentally Sustainable Agriculture Agreement, 1998.
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- Wandruszka, Ray von. *The Secondary Structure of Humic Acid and its Environmental Implications*. University of Idaho, 1999.
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*Additional information regarding the research and/or case studies summarized in this document may be requested from SHAC Head Office.*

