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ionberg Tube Settler

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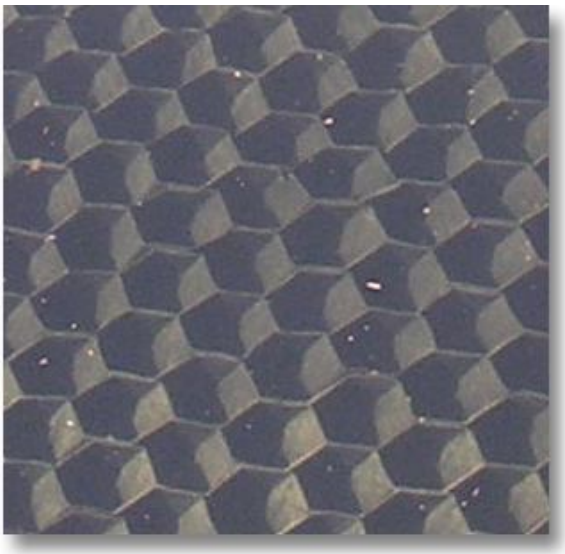
Finely divided hydroxide floc and high proportions of colloids are usually the rate determining factors for solids removal. Large solids settle quickly and easily after entering a clarifier. Fine solids tend to remain in suspension taking much longer to settle, if at all. Tube settlers arrange clarifier up flow through inclined segregated honeycomb tubes. Significantly, settlement is *with the flow* within each tube, allowing higher up flow rates and bringing about contact clarification of finer flocs within the tube settlers. Settled particles combine to form agglomerates, the larger and more settle able of which slough against the upward flowing incoming water.



A conventional water treatment plant clarifier's flow rate capacity and performance - notwithstanding the available surface area - is also limited by less than full utilization of its plan settlement area due to unstable hydraulic flow profiles.

Clarifier area utilization and hydraulic stability are usually related. Unstable hydraulic conditions may be brought about by poor design but is more often affected by raw water (influent) diurnal temperature variations.

Blue dotted line shows NTU at startup prior to tube settler installation, while the pink line shows NTU at startup after tube settlers were installed. The graph illustrates the benefit of tube settlers in reducing turbidity on plant startup and also shows a reduced turbidity during plant operation. Apparently minor water density differences between a clarifier's contents and incoming sedimentation type clarifiers. Throughput rates may typically be doubled with companying improved settled water quality realized. Better definition and control of sludge blankets or sludge zones provide process cost reduction opportunities and facilitates.

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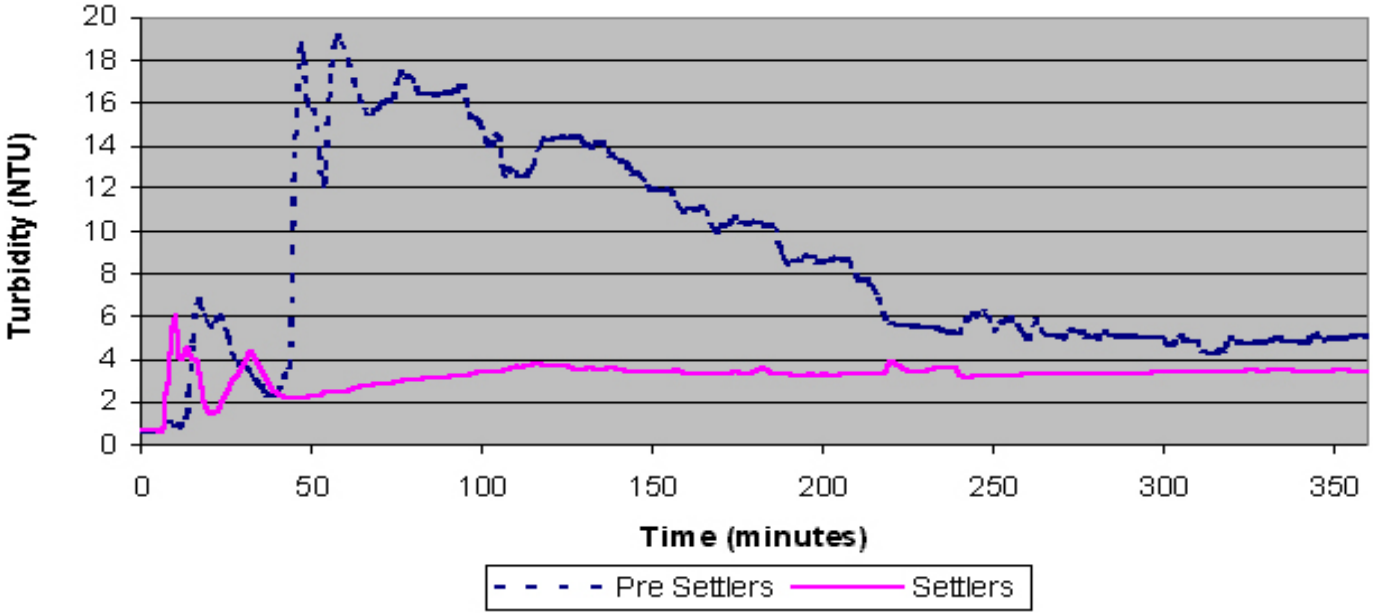
Significant plant up rating is achievable when tube settlers are retro-fitted to existing sedimentation type clarifiers. Throughput rates may typically be doubled with accompanying improved settled water quality realized. Better definition and control of



sludge blankets or sludge zones provide process cost reduction opportunities and facilitate process automation.

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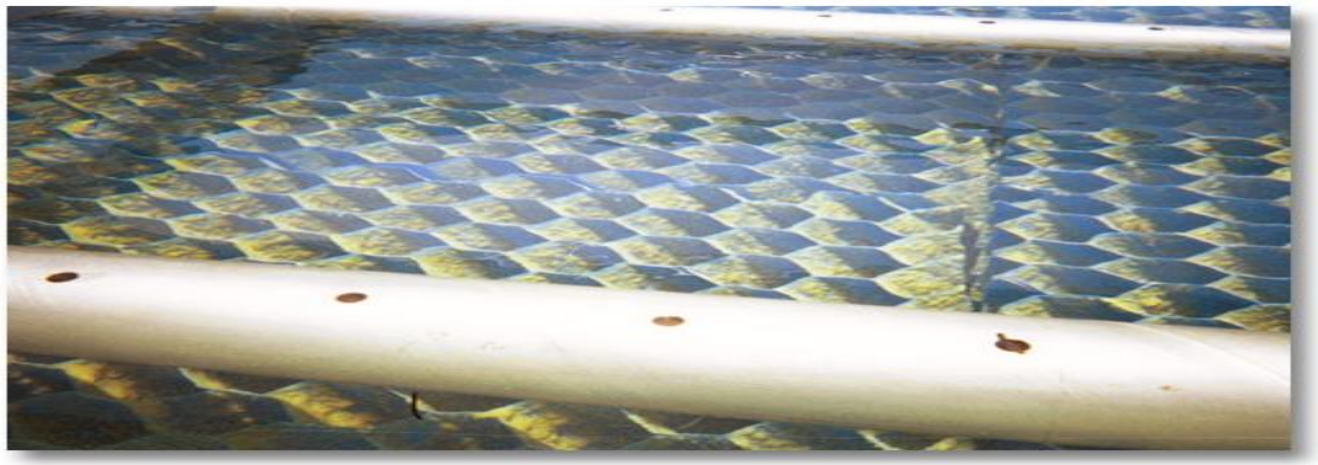
Clarifier fit-outs include use of a purpose built band saw to pie-cut the settlers for circular tanks and for profiling around superstructure columns, pipe work, etc.

With circular clarifiers, the tube settlers are radially arranged with flow directed towards the centre of the clarifier to maximize the reversal of the suspended solids flow path and



to maximize the *effective area* of a tube settler installation.

Contents; this is usually characterized by low levels of "floc carry-over" during early morning, with worsening floc carry-over conditions throughout the remainder of the day.

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Tube settlers introduce a distributing resistance to flow which improves flow distribution and so improves clarifier area utilization. Improved clarifier inlet distribution uniformity

stabilizes the hydraulic flow profile and effectively dampens any localized hydraulic instability or "boils".

Improved clarifier inlet distribution uniformity also brings about a much denser and better defined sludge blanket yielding higher underflow sludge concentrations and lower (to one third) underflow waste volumes. This provides significant reductions in sludge management costs, water and wastewater volumes, pumping costs and brings about conditions where sludge blanket levels can be reliably detected hence facilitates effective automation of underflow wastage.

The modular and cubical self-supporting settler design aids handling during installation and any subsequent maintenance. Settler tube sheet is extruded, vacuum formed and assembled in Australia. Tube sheet wall thickness of 0.8mm provides robustness and durability.

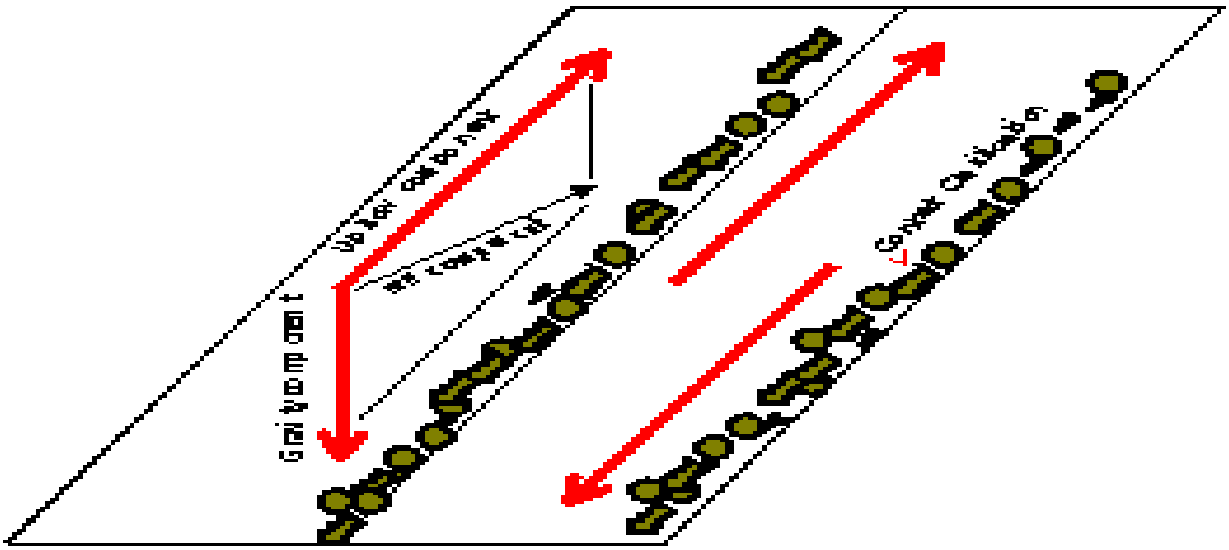

Figure 1

PVC materials are avoided for potable water installations. UV-stabilized ABS provides excellent protection against environmental degradation which normally determines product life.

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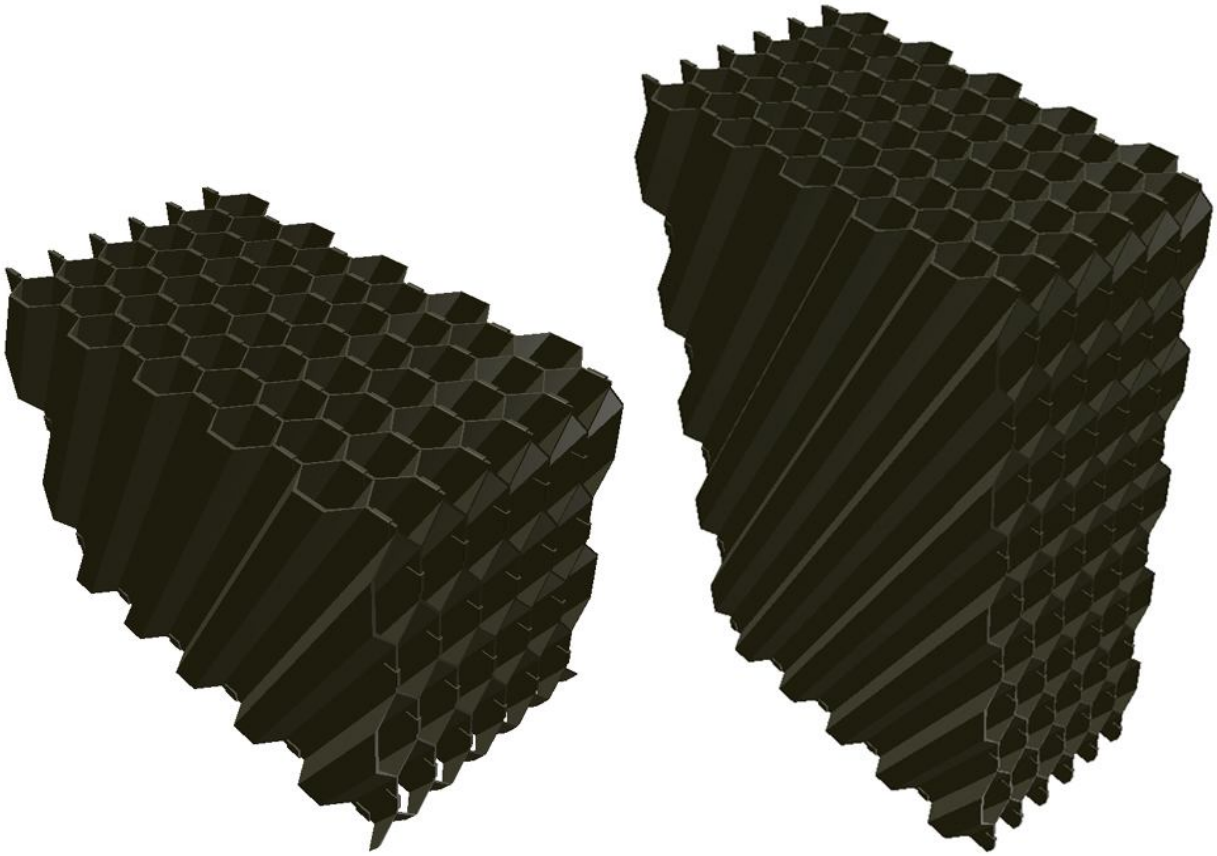
Ultrasonically-welded formed sheets provide particular advantages, i.e. tube settler module stiffness, robustness and durability.

Over so many installations have defined this product as an industry standard. Many of these installations have delivered more than expected years of continuous service while exposed to the harsh environmental conditions experienced in Australia.



*Tube Settler Module **990** L x **480** W x **670** H Tube Settler Module **990** L x **480** W x **1480** H*

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