

ADVANTAGES OF THE PROPOSED INTERMITTENTLY DECANTED EXTENDED AERATION (IDEA) ACTIVATED SLUDGE SEWAGE TREATMENT SYSTEM

1. **Hybrid for Better Process Features.** The Intermittently Decanted Extended Aeration (IDEA) Activated Sludge System is a hybrid between conventional sequencing batch reactor (SBR) and extended aeration (EA) systems. IDEA system has been developed and modified based on the recognized advantages of conventional sequential batch reactor system and extended aeration system.
2. **Approved System.** The IDEA system is an approved system by Jabatan Perkhidmatan Pembetungan, Malaysia.
3. **Simple Layout.** The proposed sewage treatment plant and sludge treatment facilities are designed utilizing fully the reserve area. Multi-storey-high process structures are avoided to straight away eliminate the difficulty and inconveniences of material handling within such structures.
4. **Ease of Design and Construction.** The biological reactors, i.e: Demand Aeration Tanks & Intermittent Aeration Tanks consist of either square or rectangular tanks which are easy and fast to design, especially when plan and design the layout of the sewage treatment plant. This also a reason to make faster construction period possible.
5. **Less Area means Low Inventory Cost.** IDEA sewage treatment plants do not require equalization tank or secondary clarifier, this apparently will save plenty of area as compared with the conventional sequencing batch reactor (SBR) or circular-tank structures. Due to the above reasons, huge amount of inventory cost can also be saved.
6. **High and Consistent Effluent Quality.** IDEA system has been proven for its ability to produce high yet consistent treated effluent quality through many of the IDEA sewage treatment plants built in Australia, China, South Africa and South East Asia. Documented records of effluent quality are available to substantiate the efficient and effective operation of the IDEA process to meet the required effluent standard.
7. **Stabilized Sludge.** IDEA system is an extended aeration process which produces sludge with retention time or sludge age more than 20 days. As such, the sludge generated is well stabilized and does not require further digestion in a sludge digester.
8. **Inhibiting and Unaffected Constituents.** Being a biological process, the toxic substances in threshold concentrations, which inhibit the growth of the microorganisms so inhibit the process. This factor is common to all the biological processes. However, due to the relatively longer sludge age, IDEA sewage treatment plants can absorb the shock loads better than any other process, should a spill occurs.

9. **Biological Nutrient Removal Ability.** IDEA system is a cyclic process which consists of Aerate, Settle and Decant occur in 6 to 8 times a day, this enables sewage to nitrified and denitrified in many cycles and ensure the nitrogen gas liberated into the sewage has never exceeded the nitrogen solubility limit in the sewage. The characteristic of the cyclic process provide the system ability to remove nutrient, especially nitrogen and this also enable the IDEA system to avoid the commonly-known rising sludge problem as one can encounter in a secondary clarifier system.
10. **Set-It-And-Forget-It Sewage Treatment Plant.** With the aids of Programmable Logic Controller, the operation of IDEA process is fully automated.
11. **Simple and Straight Forward Control System.** IDEA system has been well-known for its control simplicity as there is no complicated–control and maintenance-intensive feed valves as ones can encounter in a Sequencing Batch Reactor (SBR) System.
12. **Energy Optimization.** One of the major equipment that constitutes major part of the total electricity consumption of the plant is the aeration device. Large IDEA sewage treatment plants are equipped with dissolved oxygen monitoring and controlling system to automatic-control the operation of the aeration device based on the actual oxygen requirement on filed. By adopting this capability, the electricity usage is optimized and thus reduced significantly.
13. **High Flexibility of Design.** IDEA system can use any type of aeration device for the purpose of aeration. The high flexibility of design enables that ten (10) sewage treatment plants were successfully converted from other types of the existing system to IDEA system under the Indah Water Consortium’s Major Treatment Performance Refurbishment Program.
14. **High Flexibility of Process Parameters Adjustment.** One of the very own features and advantages of IDEA system is the process parameter set points can always be easily adjusted to suit the uncertain incoming load to the sewage treatment plant. This can always be carried out through the adjustment of the aeration timer, ball floats’ levels, decanting volume, etc.
15. **Low SVI.** Sludge volume index as low as 100 ml/g is typically achieved for a well maintained and operated IDEA sewage treatment plant. Low SVI means good settling sludge; this will enable IDEA sewage treatment plant to have a higher MLSS operating level without incurring wash-over of suspended solid during decanting phase. Such a low SVI value is almost impossible in the SBR system.
16. **Designed To Cater For Peak Flow.** The IDEA process is able to give full treatment even during peak flow period by having Demand Aeration Tanks to be aerated continuously. The introduction of Demand Aeration Tanks preceding the Intermittent Aeration Tanks can handle typical shock loads without deteriorating the treated effluent and also eliminate short circuiting problem which might occur in other types of system and which is normal in a SBR system with the absence of equalization tank.

17. **Innovative Decant System with Minimum Maintenance.** One of the very own and unique component of IDEA system is its IDEA Syphon Decanter. This innovative decant system has the following advantages :
- No wet moving parts as it is fixed-arm decanter.
 - Automatic operation made possible with PLC.
 - Low weir loading rates, allow higher sludge concentration.
 - Simple valve operation to control flow of air (not the effluent) in decanter, unlike floating arm decanter in the SBR system which uses maintenance-intensive motor to drive the operation of the decanter.
 - Fixed point installation with negligible associated civil works as opposed with the floating arm decanter installation.
 - Cost effective, practical and robust.
18. **Quiet Operation.** Hydrojet aerators are adopted as the aeration device for the aeration tanks. This type of aerator has a minimum noise generated, as the only noise is contributed from the water splashing effect and it is negligible. If air blowers are adopted, proper designed acoustic treatment for the air blower room will normally be provided to ensure the noise generated measuring at the boundary will not exceed the gazetted level at all time.