



EFFLUENT OUTFALL DIFFUSERS

For Discharging & Diffusing Treated Wastewater...

Wastewater, including once-through cooling water, can be discharged back into waterways using a variety of methods, including single-point discharges and outfall diffuser systems. The use of a diffuser-type discharge outfall allows the impacts of the effluent to be diffused or spread more efficiently within and across the water column rather than introduced at a single discharge point whereby a plume may develop. In this way, the effects of the wastewater on the water quality in the receiving stream are not so pronounced, but rather allowed to mix and gradually integrate.



The diffuser can be designed with a perforated pipe, with multiple pipe discharges from a central outfall pipe, or with discharge nozzles to help disperse the wastewater into the receiving water. If the chemical characteristics of the wastewater are similar and/or compatible with the quality of the receiving water, it may be possible to utilize a simple, open-end discharge pipe as the outfall diffuser.

The photograph above shows a simple at-grade completion of a caisson typical of the type that can be used as part of the outfall system, shown at right. The wastewater can be discharged into the caisson where pre-treatment, such as chemical addition, and mixing, can be performed before the wastewater enters the waterway. The caisson also provides a way to perform periodic inspection and maintenance of the outfall line, if needed. Construction of this style outfall can largely be done onshore minimizing in-stream impacts and often simplify the permitting process. The outfall line can be installed in such a way as to minimize shoreline disturbance and environmental impacts.

Outfall Applications:

Some of the applications where these systems can be used include:

- Pulp & Paper Mill Wastewater
- Steel Mill (& Mini Mill) Wastewater
- Once-through Cooling Water
- Industrial & Municipal Wastewater
- Storm Sewer/Runoff Discharges

System Specifications:

- Outfall capacities up to 150,000 gpm
- Discharge design diffuses wastewater more efficiently, usually in better mixing zone
- Offshore screen location moves point of discharge away from near shore environments-providing maximum protection to aquatic life
- Caisson offers pre-treatment/mixing site
- Caisson provides inspection/maintenance capability
- Simple operator requirements
- Dewatering, open excavation (trenching), or cofferdams are not required
- Minimum environmental impact since construction takes place away from the river
- Permitting is often simplified
- Caisson can be designed to provide preliminary cooling

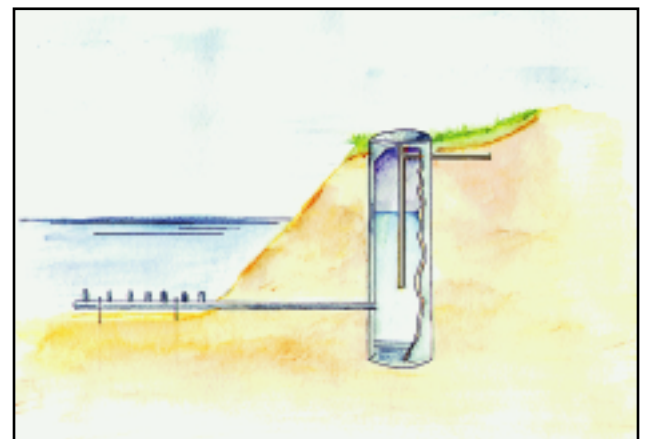


Diagram of Effluent Outfall Diffuser