



COASTAL EFFLUENT DISCHARGE CONSULTANCY

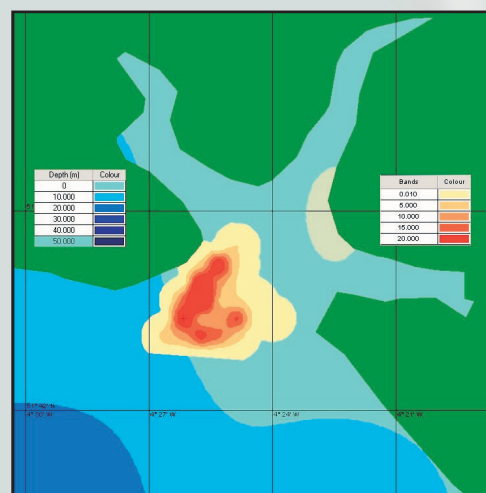
BMT Cordah Limited

BMT Cordah Ltd. has successfully provided discharge consultancy services for more than 15 years to clients including many major oil and gas companies, environmental consultancies and government bodies. We can provide a range of services, including all modelling requirements from pipeline leakage scenarios to effluent dispersion modelling from an outfall. Coastal, estuarine and riverine conditions can be modelled and consultancy services can cover issues from ecological risk assessment to the production of Environmental Statements.

BMT Cordah's PROTEUS model can be configured in-house for use as a coastal zone discharge modelling tool. It has been used in the past to simulate the dispersion and dilution of aqueous discharges in canals, estuaries and bays and is fully configurable to simulate a range of scenarios. It can also be used in conjunction with other 3rd party tools to provide a complete range of modelling services.

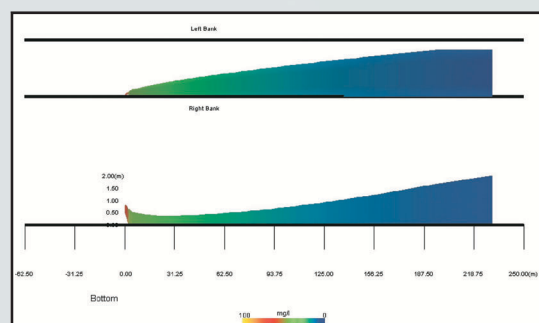
Key PROTEUS Features include:

- 3-D dispersion modelling of aqueous plumes in coastal zones
- Configuration of most discharge scenarios, including complete characterisation of pipe design, effluent and ambient conditions
- Dispersion within channels, estuaries, lagoons, bays and harbours
- Characterisation of 3-D tidal and residual current regimes and variable bathymetry
- Applies to sewage outfalls, produced waters, chemical cocktails and oil-in-water releases
- Applies to positively, negatively or neutrally buoyant effluents, chemical concentrations, dilution factors, BOD, COD and other water quality indicators
- Thermal modelling, pH modelling and DO modelling
- Tidal flushing and box modelling.



Example contour plot of coastal effluent plume under tidal influence

At BMT Cordah we understand the diverse requirements of our clients, and can tailor our models to meet the specific needs of the project.

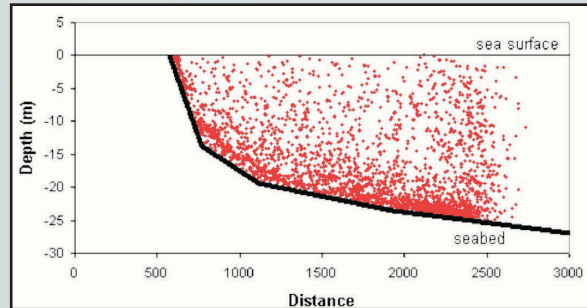


Plan and cross-section of typical temperature variation within receiving body of water (from Cornell University's CORMIX model)

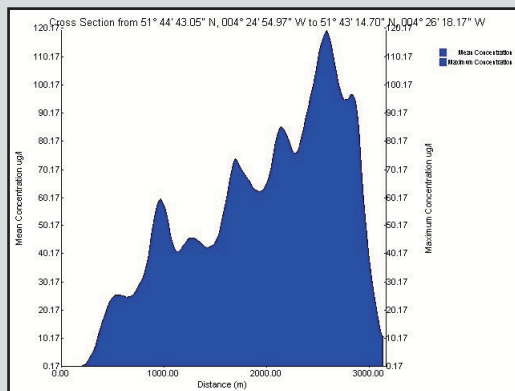
Coastal Effluent Discharge Consultancy

At BMT Cordah we are able to interpret model outputs and provide clear conclusions and recommendations. Our modelling reports typically include:

- Full background to scenarios chosen
- Presentation of results as contour plots, graphs and tables (as required by the client)
- Discussion of results, conclusions and recommendations
- Appendices including full description of models used.



Dispersion of effluent plume within water column



Cross-section of effluent concentration from BMT's PROTEUS model

Environmental Compliance

BMT Cordah provides advice and assistance to help clients with issues relating to regulatory requirements and compliance in UK and other national waters.

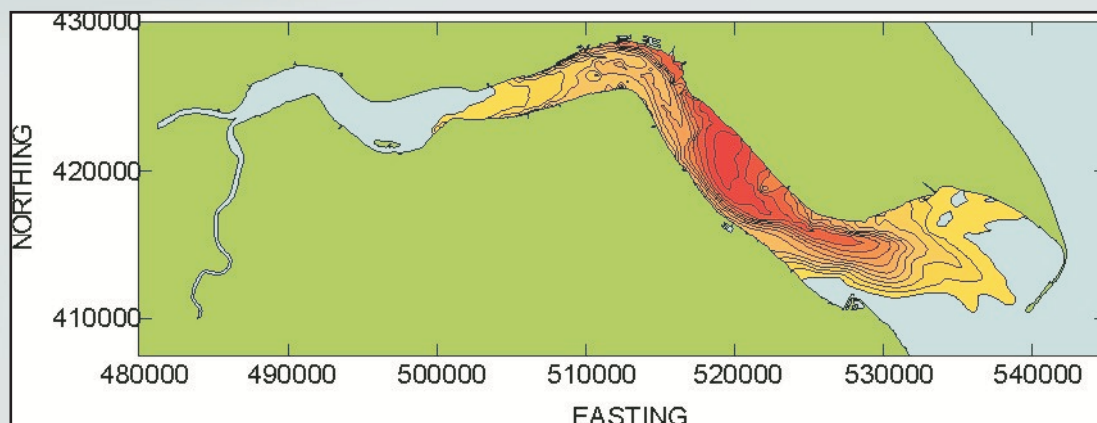
Complementary Services

Environmental Impact Assessment

BMT Cordah provides a range of EIA consulting services, for example, scoping studies, baseline surveys and prediction of impacts. Discharge modelling reports can be submitted independently or as part of an Environmental Statement.

Ecological Risk Assessment

BMT Cordah offers ecological risk assessment with all discharge modelling using a range of methods including PEC:PNEC, CBR and WET schemes.



Contour plot of effluent plume concentration in the Humber Estuary



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