I need to show what the pump does to the water in the tank. I can provide velocity details and also temperature gradients etc. eed to model the impact of a surface floating pump on the mixing of a tank.  
  
Tank Dimensions  
Cylindrical design  
12metres high  
48.5metres diameter  
Full of water  
  
Fluid is fresh water, filled to within 0.9 metre of the ceiling. Do not model the air layer.   
Ceiling, walls and floor of the reservoir are insulated (adiabatic simulation)   
Properties:  
• Material Description = Water (liquid)  
• Thermodynamic State = Liquid  
•Thermal Expansivity = 2.57 x 10-4 [K-1]  
•Dynamic Viscosity = 8.899 x 10-4 [kg.m-1.s-1]  
•Refractive Index = 1.0 [m.m-1]  
•Scattering Coefficient = 0.0 [m-1]  
•Absorption Coefficient = 1.0 [m-1]  
•Thermal Conductivity = 0.6069 [W.m-1.K-1]  
•Density = 997 [kg.m-3]  
•Molar Mass = 18.02 [kg.kmol-1]  
•Specific Heat Type = Constant Pressure  
•Specific Heat Capacity = 4181.7 [J.kg-1.K-1]  
•Reference Pressure = 1 [atm]  
•Reference Temperature = 25 [C]  
Stratification information  
Tank is stratified at the start of the modelling into three layers the top layer is 28 degrees Celsius and the middle layer is 24 degrees Celsius and the bottom layer is 20 degrees Celsius. Each layer is four meters high in a cross sectional view/depth   
  
Pump information  
Pump sits in the middle of the tank and floats on the surface. Pump is 1800mm high and sits 1500mm in water. It is a cylinder and draws water in from the top 300mm of the tanks water and discharges down at 5,500liters per minute.   
  
Outputs expected  
Model simulation Time – 3 hours – presented in a 30 second video per output.   
2 outputs – Similar to the youtube clip that I sent you but the dimensions are different   
Cross Sectional  
Birds eye – top   
Any other useful outputs you think are relevant.   
Wanting to show the warmer water as red, the medium water as orange and the cooler water as blue. Expecting that the result will be a fully mixed tank at what ever the model outputs the temps at for a mixed tank at the input temps. If this is less than 3 hours can you please advise.   
  
How the pumps work in reality – for feeding model  
Surface water is drawn into the mixing chamber and thrust to the bottom of the tank at approx. .65m per second  
5,500 litres per min moved by pump in pumped flow, laminar flow assumptions at approx. 7 times pumped flow amount including gravity currents