



## FORCE MAIN DESIGN DATA CHECKLIST

To prevent the formation of hydrogen sulfide (H<sub>2</sub>S), a positive dissolved oxygen (D.O.) level must be carried through the force main. The amount of oxygen needed is determined by multiplying the longest hydraulic retention time (HRT) of the force main by a theoretical ~10 mg/L/hr oxygen uptake rate. The critical HRT is the longest period of time that wastewater is in the force main. For a continuous flow system, the critical HRT will occur during low flow conditions. For a fill/draw system, the critical HRT will occur during the longest period of time between pumping cycles. Once the critical HRT is determined and the oxygen requirement is calculated, the oxygen requirement is checked against the pressure inside the force main. For every one (1) foot of head pressure, one (1) mg/L of dissolved oxygen can be dissolved. If there is sufficient pressure in the force main to dissolve the amount of oxygen required, there is a technical fit for the ECO<sub>2</sub> system.

Anticipated Project Implementation Date: \_\_\_\_\_

Requested Response Date: \_\_\_\_\_

REQUIRED INFORMATION	<i>Example</i>	<i>Example</i>
Owner Information _____	<i>Fishers WWTP</i>	<i>Fishers WWTP</i>
Name of Pumping Station _____	<i>Hague Road</i>	<i>Hague Road</i>
Diameter of Force Main (in) _____	<i>18"</i>	<i>18"</i>
Length of Force Main (ft) _____	<i>5,200 ft</i>	<i>5,200 ft</i>
Dynamic Head on Pumps at Avg Flow (ft of head) _____	<i>85 ft</i>	<i>85 ft</i>
Static Head on Pumps (ft of head) _____	<i>25 ft</i>	<i>25 ft</i>
Force Main Pump Operation (Fill Draw / Continuous) _____	<i>Fill Draw</i>	<i>Continuous</i>
Daily Average Flow (gpm) _____	<i>1,500 gpm</i>	<i>1,500 gpm</i>
Hydraulic Retention Time (hrs) _____	<i>4</i>	<i>4</i>
Anticipated Days Use Per Year _____	<i>365</i>	<i>365</i>
Cost of Power _____	<i>\$0.08 / kwhr</i>	<i>\$0.08 / kwhr</i>
Number of Pumps _____	<b><i>Example</i></b>	<b><i>Example</i></b>
@ _____ Horsepower	<i>2 @ 30 HP</i>	Per Pump Flow Rate (gpm) _____
@ _____ Horsepower	<i>1 @ 50 HP</i>	Per Pump Flow Rate (gpm) _____
ADDITIONAL REQUESTED INFORMATION - if available	<b><i>Example</i></b>	<b><i>Example</i></b>
Force Main Pump Operation		
If Fill/Draw : Longest Pump Down Time (hrs) _____	<i>4 hrs</i>	
If Fill/Draw : Pump Run Time to Empty Wetwell (mins) _____	<i>5 mins</i>	
If Fill/Draw : Pump Runs per Hour (day/night) _____	<i>6/1</i>	
If Continuous: Longest Hydraulic Retention Time (hrs) _____		<i>4 hrs</i>
If Continuous: Low Flow (gpm) and Length of Time (hrs) _____		<i>1000 gpm/ 3 hrs</i>
Elevation Above Sea Level (ft) _____	<i>750 ft</i>	<i>750 ft</i>
Temperature of Sewage (°C) _____	<i>27° C</i>	<i>27° C</i>
BOD (mg/L) _____	<i>200 mg/L</i>	<i>200 mg/L</i>
Existing Sulfides _____	<i>1 mg/L</i>	<i>1 mg/L</i>
Salinity _____	<i>0 mg/L</i>	<i>0 mg/L</i>
Desired Residual D.O. After Force Main Discharge _____	<i>4 mg/L</i>	<i>4 mg/L</i>