

## Potential Future Demand for Wastewater Treatment at Joint Base Cape Cod

Data Source: Shared Wastewater Management Study, Towns of Bourne, Falmouth, Mashpee, Sandwich and Joint Base Cape Cod, prepared November 2017 by Wright-Pierce

### Existing Conditions

The Joint Base Cape Cod (JBCC) wastewater treatment facility (WWTF) currently provides wastewater treatment and disposal service for on-base facilities. The facility is designed to treat 300,000 gallons per day (gpd, annual average) and permitted to discharge 360,000 gpd (annual average) through its rapid infiltration basins. Under current conditions the WWTF treats 143,000 gpd (which represents 48% of treatment capacity and 40% of disposal capacity).

The WWTF is designed to accommodate approximately 157,000 gpd additional flow on an annual average basis, however the system's ability to dispose of peak daily flows which can be nearly 4 times as large as average daily flows (peaking factor = 3.8) limits the available additional capacity to an annual average of 75,000 gpd. More of this additional capacity could be made available via several approaches to reduce that peaking factor without substantial modification to the WWTF itself.

### Short Term (2017-2020)

In the short term it is expected that Bourne could send up to 100,000 gallons of treated effluent per day from the Solid Waste Facility (ISWM) to the JBCC disposal system and Mashpee could send up to 200,000 gallons of sewage to JBCC for treatment.

This scenario remains within the current permitted treatment capacity but would necessitate 28% additional disposal capacity, which may be achieved through re-rating and re-permitting of the existing rapid infiltration basins.

### Mid-term (2020-2040)

In the mid-term, demand for additional sewage treatment may be expected from expanded sewerage in Bourne (259,000 gpd), and Sandwich (100,000 gpd). Additional effluent disposal demand may be expected from sewerage in Bourne that would be treated at the ISWM WWTF (generating 444,000 gpd total of treated effluent for disposal, which includes landfill leachate and the additional sewage), and from the Blacksmith Shop Road WWTF in Falmouth (490,000 gpd of effluent directed to the JBCC disposal system). Septage treatment for all four towns could be introduced in the mid-term, contributing an additional 46,000 gpd for treatment and disposal (note that septage is more concentrated than sewage and may require specific treatment consideration).

To meet these midterm needs, the size of the JBCC treatment facility would need to more than double (111% increase) and the disposal system more than quadruple (372% increase).

### Long-term (2040-)

Long-term projected increases in demand could include additional sewage treatment from continuing sewer expansion in Bourne (197,000 gpd) and Sandwich (240,000 gpd), and additional effluent disposal from the Bourne ISWM WWTF (207,000 gpd) and Falmouth WWTF (1,000,000 gpd).

Accommodating these additional flows will require further expansion of the treatment system (58% increase from mid-term) and subsequent near-doubling of the disposal system (97% increase from mid-term).

		Flow (gpd)	Capacity (gpd)	Increase over Current Conditions (%)
Current	Treatment Volume	147,000	360,000	--
	Disposal Volume	147,000	360,000	--
Short Term (2017-2020)	Treatment Volume	347,000	360,000	--
	Disposal Volume	447,000	460,000	28%
Mid-term (2020-2040)	Treatment Volume	745,000	760,000	111%
	Disposal Volume	1,679,000	1,700,000	372%
Long-term (2040-)	Treatment Volume	1,182,000	1,200,000	233%
	Disposal Volume	3,323,000	3,350,000	831%

<b>Sewage Treatment Demand (gpd)</b>				
Town	Existing	Short-term	Medium-term	Long-term
Bourne	-	-	259,000	456,000
Falmouth	-	-	-	-
Mashpee	-	200,000	200,000	200,000
Sandwich	-	-	100,000	340,000
JBCC	140,000	147,000	147,000	147,000

<b>Effluent Only Disposal Demand (gpd)</b>				
Town	Existing	Short-term	Medium-term	Long-term
Bourne	-	100,000	444,000	651,000
Falmouth	-	-	490,000	1,490,000
Mashpee	-	-	-	-
Sandwich	-	-	-	-
JBCC	-	-	-	-

<b>Septage Treatment Demand (gpd)</b>				
Town	Existing	Short-term	Medium-term	Long-term
Bourne	-	-	11,000	11,000
Falmouth	-	-	22,000	22,000
Mashpee	-	-	3,000	3,000
Sandwich	-	-	10,000	10,000
JBCC	-	-	-	-