

## 2016 Commercial Passenger Vessels Discharge Status and Wastewater Treatment

Vessel Operator	Vessel Name	Total Persons on Board <sup>1</sup>	Number of Port Calls <sup>2</sup>	Blackwater (BW) Treatment System Manufacturer	Graywater (GW) Treatment System Manufacturer	Approved for Discharge in Washington <sup>3</sup> ≥ 1nm from berth and ≥ 6 knots		Approved for Discharge in Washington <sup>3</sup> continuously		Type of Treatment System <sup>4</sup>
						BW	GW	BW	GW	
<b>North West &amp; Canada Cruise Association Vessels</b>										
Carnival Cruise Lines	<i>CARNIVAL LEGEND</i>	3125	16	Triton-Format	None	NO	NO	NO	NO	Traditional MSD - Triton-Format - aeration, settling, chlorination
Celebrity Cruises	<i>CELEBRITY INFINITY</i>	3169	2	Hydroxyl	Hydroxyl	NO	NO	NO	NO	AWTS: Hydroxyl is a AWTS.
Celebrity Cruises	<i>CELEBRITY SOLSTICE</i>	4350	17	Kruger/Wabaag	Mixed with BW	NO	NO	NO	NO	AWTS: Kruger/Wabag is a biological reactor and ultrafiltration system
Crystal Cruises	<i>CRYSTAL SERENITY</i>	1725	3	unknown	unknown	NO	NO	NO	NO	unknown
Holland America	<i>AMSTERDAM</i>	2027	19	Traditional MSD	None	NO	NO	NO	NO	Traditional MSD - aeration, settling, chlorination
Holland America	<i>MAASDAM</i>	1838	10	Zenon	Zenon	NO	NO	NO	NO	AWTS: Zenon is a biological reactor and ultrafiltration system.
Holland America	<i>NIEUW AMSTERDAM</i>	3035	2	Hamworthy Bioreactor	Accomodations mixed with BW	NO	NO	NO	NO	AWTS: Hamworthy is a biological reactor and ultrafiltration system
Holland America	<i>WESTERDAM</i>	2648	22	Rochem Bio-filtration	none	NO	NO	NO	NO	AWTS: Rochem is a reverse osmosis or ultrafiltration system.
Holland America	<i>ZAANDAM</i>	2079	1	Zenon	Zenon	NO	NO	NO	NO	AWTS: Zenon is a biological reactor and ultrafiltration system.
Norwegian Cruise Lines	<i>NORWEGIAN JEWEL</i>	3467	20	Scanship	Mixed with BW	NO	NO	NO	NO	AWTS: Scanship is a biological reactor flocculation/flotation & UV disinfection system
Norwegian Cruise Lines	<i>NORWEGIAN PEARL</i>	3494	20	Scanship	Mixed with BW	NO	NO	NO	NO	AWTS: Scanship is a biological reactor flocculation/flotation & UV disinfection system
Oceania	<i>REGATTA</i>	1150	9	Triton	Triton (some)	NO	NO	NO	NO	AWTS: Triton Water MBR is a biological reactor and ultrafiltration system
Princess Cruise Line	<i>CROWN PRINCESS</i>	4270	19	Hamworthy Bioreactor	Accomodations mixed with BW	NO	NO	NO	NO	AWTS: Hamworthy is a biological reactor and ultrafiltration system
Princess Cruise Line	<i>RUBY PRINCESS</i>	4285	20	Hamworthy Bioreactor	Accomodations mixed with BW	NO	NO	NO	NO	AWTS: Hamworthy is a biological reactor and ultrafiltration system
Princess Cruise Line	<i>STAR PRINCESS</i>	3750	1	Hamworthy Bioreactor	Accomodations mixed with BW	NO	NO	NO	NO	AWTS: Hamworthy is a biological reactor and ultrafiltration system
Royal Caribbean	<i>EXPLORER OF THE SEAS</i>	5209	22	unknown	unknown	NO	NO	NO	NO	unknown
<b>NON North West &amp; Canada Cruise Association Vessels<sup>5</sup></b>										
NONE										

Total Calls: 203

<sup>1</sup>Numbers come from the Alaska Discharge Status Report and information gathered from the cruise industry and research. Most values include both passengers and crew. Actual number of passenger aboard varies dependent upon sales.

<sup>2</sup>Number of Port calls comes from Port of Seattle Cruise Schedule for 2016

<sup>3</sup>Washington waters refers to the "waters subject to this Memorandum of Understanding (MOU)" as defined in the MOU

<sup>4</sup>Information on the types of treatment systems comes from the Alaska Discharge Status Report and information from the cruise industry updated to the best of our knowledge.

<sup>5</sup>Non Cruise Lines International Association North West & Canada vessels are not party to the MOU and the requirements of the MOU.

<sup>6</sup>Unknown refers to the fact that the type of treatment system has not been confirmed during an inspection or verified.