



State of Washington Department of Ecology
Cruise Ship Memorandum of Understanding, Cruise Operations in Washington State Inspection Report

Northwest Regional Office
 P.O. Box 330316
 Shoreline, WA 98133
 Phone: (425) 213-4230


Inspection Date August 7, 2023	Permit Number NA	County King	Receiving Waters Marine Waters	Ecology Inspector Evan Dobrowski
Entry Time 9:30 am	Photos Taken <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Samples Taken <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Inspection Announced <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Discharges to: <input checked="" type="checkbox"/> Surface Water <input type="checkbox"/> Ground Water <input type="checkbox"/> Dewater <input type="checkbox"/> POTW
Exit Time 11:30 am				

Name and Location of Site Inspected: NORWEGIAN Sun, Norwegian Cruise Line Pier 66 Seattle, Washington	Additional Participants/Inspectors: Rose Propst, Ecology
On-Site Representative(s): Name/Title/Phone/e-mail Stefano Incao, Environmental Officer	
Responsible Official(s): Name/Title/Address/Phone/e-mail Sarah Ferguson-Brown, Director, Environmental Operations Norwegian Cruise Line Holdings, Ltd. 7665 Corporate Center Drive Miami, FL 33126 305-436-4349; sbrown@nclcorp.com	Other Facility Data: Notification made to Sarah Brown on July 25, 2023 Flag – Bahamas IMO #9218131

Section A: Areas Evaluated				
<input checked="" type="checkbox"/> Black/Gray Wastewater System	<input checked="" type="checkbox"/> Residual Solids	<input checked="" type="checkbox"/> Records/Reports	<input checked="" type="checkbox"/> Hazardous Waste/ Solid Waste	<input type="checkbox"/> Sampling/Monitoring
<input checked="" type="checkbox"/> Discharge Locations	<input checked="" type="checkbox"/> Operation & Maintenance	<input checked="" type="checkbox"/> Sludge Handling/ Disposal	<input checked="" type="checkbox"/> Oily Bilge Water	<input checked="" type="checkbox"/> Other

Section B: For Vessels Discharging ≥ 1nm from Berth and ≥ 6 Knots Only [2.1.3(A)]	
<input type="checkbox"/> Schematics Match Black/Gray Wastewater System	
<input type="checkbox"/> Operations as Described in Submitted Documentation	
<input type="checkbox"/> Daily 24-hour Continuous Monitoring for Turbidity or Equivalent Monitoring	
<input type="checkbox"/> Turbidimeter or Equivalent Monitoring Equipment Functioning Properly	
<input type="checkbox"/> Auto Shut Down or Operational Controls to Insure System Shut Down if High Turbidity Occurs	
Turbidity or Equivalent: Last Calibration: Trigger Level for Early Alarm: NOT APPLICABLE Trigger Level for Shutdown: Recorded Turbidity/Equivalent Levels Above Triggers:	
<input type="checkbox"/> Daily 24-hour Continuous Monitoring for Disinfection Effectiveness	
<input type="checkbox"/> Disinfection Effectiveness Monitoring Equipment Functioning Properly	
Disinfection Effectiveness Monitoring:	
<input type="checkbox"/> Auto Shut Down or Operational Controls to Insure System Shut Down if Disinfection System Upset Occurs	
<input type="checkbox"/> Disinfection System Operated and Maintained Properly	
Disinfection System:	

Section C: For Vessels Discharging Continuously [2.1.3(B)]

<input type="checkbox"/>	Schematics Match Black/Gray Wastewater System	
<input type="checkbox"/>	Operations as Described in Submitted Documentation	
<input type="checkbox"/>	Daily 24-hour Continuous Monitoring for Turbidity or Equivalent Monitoring	
<input type="checkbox"/>	Turbidimeter or Equivalent Monitoring Equipment Functioning Properly	
<input type="checkbox"/>	Auto Shut Down or Operational Controls to Insure System Shut Down if High Turbidity Occurs	
<u>Turbidity or Equivalent:</u> Last Calibration: Trigger Level for Early Alarm: _____ Trigger Level for Shutdown: Recorded Turbidity/Equivalent Levels Above Triggers:		
<input type="checkbox"/>	Daily 24-hour Continuous Monitoring for Disinfection Effectiveness	
<input type="checkbox"/>	Disinfection Effectiveness Monitoring Equipment Functioning Properly	
Disinfection Effectiveness Monitoring: 		
<input type="checkbox"/>	Auto Shut Down or Operational Controls to Insure System Shut Down if Disinfection System Upset Occurs	
<input type="checkbox"/>	Disinfection System Operated and Maintained Properly	
Disinfection System:		

Section D: General (Approved to Discharge)

<input type="checkbox"/>	No Discharges Within 1/2 Miles From Shellfish Beds/ Protocol (President's Point, Apple Tree Cove, Tye Shoal, Middle Point (near Pt Townsend))	
<input type="checkbox"/>	Discharges Immediately Stopped When High Turbidity Occurs	
<input type="checkbox"/>	Discharges Immediately Stopped When Disinfection System Upset Occurs	
<input type="checkbox"/>	Immediate Notifications Made to WA Department of Health for Disinfection System Upset	
<input type="checkbox"/>	Sampling Conducted 2/month, 1/month in Seattle (BOD, TSS, Fecal Coliform, pH, Chlorine Residual)	
<input type="checkbox"/>	Whole Effluent Toxicity Testing 1 per 2 Years (homeported) or 1/40 Calls for Continuous	

Section E: General

<input checked="" type="checkbox"/>	Wastewater Discharge Records Review	Discharge records were reviewed (blackwater/graywater/residual solids) and are maintained properly. No discharges found to be in the OCNMS, MOU waters or Washington state waters (MOU related waters). Further review will be done following the end of the season.
<input checked="" type="checkbox"/>	Wastewater Discharges protocol per MOU and managed properly	The discharge protocols are consistent with MOU requirements to not occur in MOU related waters.
<input checked="" type="checkbox"/>	Residual Solids Managed Properly/Disposal Protocol per MOU	Residual solids protocols are consistent with MOU requirements.
<input checked="" type="checkbox"/>	Hazardous Waste Managed Properly	Hazardous protocols are consistent with MOU requirements.
<input checked="" type="checkbox"/>	WA Hazardous Waste Guidelines Followed (Appendix vii)	Hazardous waste protocols are consistent with MOU requirements.
<input checked="" type="checkbox"/>	Solid Waste Managed Properly (zero garbage discharge)	Solid waste protocols are consistent with MOU requirements.

<input checked="" type="checkbox"/>	Photo/X-Ray Waste Managed Properly (fluids, cartridges,...) and landed ashore	Photo and x-ray waste protocols are consistent with MOU requirements
<input checked="" type="checkbox"/>	Dry-Cleaning Wastes and Byproducts (fluids, sludge, filter materials...) Managed Properly (PERC – haz waste – landed ashore)	Dry cleaning protocols are consistent with MOU requirements.
<input checked="" type="checkbox"/>	Unused/Outdated Pharmaceuticals Managed Properly (safely disposed of)	Unused or outdated pharmaceuticals management protocols are consistent with MOU requirements.
<input checked="" type="checkbox"/>	Fluorescent and Mercury Vapor Lamp Bulbs Managed Properly (prevent release of mercury)	Fluorescent and mercury vapor lamp bulbs protocols for management are consistent with MOU requirements.
<input checked="" type="checkbox"/>	Waste Reduction/Reuse/Recycling Opportunities Maximized (glass, cardboard, aluminum & steel cans)	Waste reduction/reuse/recycling opportunities appear to be maximized per MOU requirements.
<input checked="" type="checkbox"/>	Batteries Managed Properly (recycled, reclaimed, disposed of properly)	Batteries management protocols are consistent with MOU requirements.
<input checked="" type="checkbox"/>	Incinerator Ash Managed Properly and minimized volume (haz waste segregation and annual testing)	Incinerator ash management is consistent with MOU requirements.
<input checked="" type="checkbox"/>	Oily Bilge Water Managed Properly (<15 ppm, no visible sheen and underway)	Oily bilge water protocols are consistent with MOU requirements.
<input checked="" type="checkbox"/>	Ballast Water Managed Properly (per Wash regs –reporting, treated or if open sea exchange >200 nm from outside EEZ, 50nm if not EEZ)	The vessel employs ballast water exchange outside 200 nm and treatment.
<input checked="" type="checkbox"/>	OCNMS rules and regs followed	The discharge protocols are consistent with MOU requirements and are not to occur in OCNMS waters.

Additional General Questions

<input checked="" type="checkbox"/>	How is deck runoff and hull cleaning handled (scuppers...) (non-toxic/phosphate free cleaners, biodegradable)	Deck runoff and hull cleaning protocols are consistent with MOU requirements.
<input checked="" type="checkbox"/>	How is maintenance performed on the outside of the vessel (paint chipping, painting, etc)	Outside vessel maintenance protocols are consistent with MOU requirements.
<input checked="" type="checkbox"/>	Sculleries and Galleys – type of detergents and degreasers used (phosphate free and non-toxic)?	Restaurants and galleys use detergents and degreasers that are non-toxic and phosphate free.
<input checked="" type="checkbox"/>	How are food waste discharges handled (prevention of erroneous materials)?	Food waste discharge protocols are consistent with MOU requirements and records reviewed show no discharges in MOU related waters.
<input checked="" type="checkbox"/>	Medical sinks/floor drains, chem. stor areas wastes go where (plugged, blackwater, bilge)?	Medical sinks/floor drains are reported as connected to Blackwater.
<input checked="" type="checkbox"/>	Where is pool and spa water discharged? Dechlorinated/debrominated and underway?	Pool and spa water protocols are consistent with MOU requirements.
<input checked="" type="checkbox"/>	What type of fuel is used and percent sulfur content?	<0.1% sulfur fuel content used when in MOU waters or EGCS treated equivalent is used throughout the route.

Other:

Section F: Sampling Results

Parameter	Results
Biochemical Oxygen Demand 5-Day (BOD ₅)	NOT APPLICABLE
Total Suspended Solids (TSS)	
Fecal Coliform	
Residual Chlorine	
pH	
Ammonia, Nitrogen	

Section G: Summary of Findings/Comments

Introduction

Evan Dobrowski, Washington State Department of Ecology (Ecology) Northwest Regional Office, Water Quality Program (NWRO-WQ) conducted the inspection of the Norwegian Cruise Line’s NORWEGIAN SUN on August 7, 2023. Rose Propst, Ecology NWRO-WQ, assisted in conducting the inspection. The main contact on board the NORWEGIAN SUN was Stefano Incao, Environmental Officer (EO) for the vessel. Prior notification of the visit was given on July 25, 2023, for security protocol. The purpose of the inspection was to evaluate compliance with the *Memorandum of Understanding Cruise Operations in Washington State* (MOU), as amended. The NORWEGIAN SUN is not approved to discharge wastewater in MOU waters.

The NORWEGIAN SUN launched in 2001 and is 848 feet long with about a 26-foot draft. The passenger capacity is approximately 1,976 with a crew capacity of about 906. The vessel has six engines and two azipods. NORWEGIAN SUN is scheduled for 18 port calls in Seattle for cruises to Alaska between May 11, 2023 and October 30, 2023.

Inspection

We arrived and boarded the ship at 8:30 am and began with introductions and a plan for the day with Stefano Incao, EO. We headed to the Engine Control Room and discussed the vessel itinerary and locations where discharges and fuel transitions occur. We reviewed electronic logs for various waste streams, saw the fuel transfer operations occurring, and went over the plan for the day with NORWEGIAN SUN engineering staff. After this we discussed various waste streams and discharge protocols as well as fuel transfer protocols. We then toured the blackwater marine sanitation devices, the oily bilge treatment, and the Exhaust Gas Cleaning Systems with the engineering staff and the environmental officer. We then headed to the incinerator room and then to the garbage room. We finished with a debrief in the Environmental

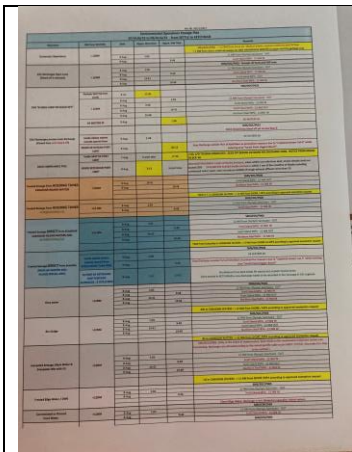


Photo #01 8/7/23 Image: IMG_0588
By: Dobrowski
Description: Environmental Operations
Passage Plan

Photo #02 8/7/23
Image: IMG_0587
By: Dobrowski
Description: navigational chart.

Officers office reviewing discharge and offload protocols we disembarked the vessel at 11:30 am.

Discharge Types and Protocols in MOU waters, Washington State waters or the Olympic Coast National Marine Sanctuary (OCNMS) (MOU related waters):

The discharge protocols start with voyage plans for each itinerary prior to that route. A matrix is developed for each route upon a detailed review of locations for allowed discharges. The matrix for the Seattle/Alaska route details no discharges in MOU related waters, for

- bilge water;
- blackwater;
- graywater;
- food waste;
- ballast water; and
- pool and spa water.

The matrix also shows that Puget Sound is a designated No Discharge Zone for sewage with a link to our website. The matrix is overlaid onto the navigational screen (Photo #02) to show the location where fuel switch overs and discharges stop just before the OCNMS and start upon entering Canadian waters when leaving Seattle.

The protocol for discharges is a closed-loop process. There is communication between the ECR Officer on Watch and the Bridge staff for approval from the Bridge that the vessel is in an area authorized for discharge. The overboard valves have a lock which has to be manually controlled. The keys for the locks are found in the engine control room and are controlled by a badge and then finger print. The badge and finger print control will only allow that person to access certain keys allowed to them. For the discharge valves only engineering and environmental officers have access to these keys. The discharge valves are then controlled electronically after the locks are removed and the discharges are logged into the NAPA system. Any change to the logs shows who made the change by staff passcode. Any changes are reviewed by the Bridge. The GPS system is connected to the log for accurate logging of the discharge location. The discharges all to occur outside of MOU related waters (Washington State waters, the Strait of Juan de Fuca up to the border with Canada and the OCNMS). For black water and gray water, the latitude and longitude coordinates are recorded in the NAPA system along with all other logs. The date, time and location of both the start and the stop of the discharges are recorded, along with port location, effluent type, speed, tank name and volume, valve name, and status of valve. The maker of the entry and reviewer/signer is also included, along with any notes. The vessel protocol is to not discharge blackwater or graywater in Canadian waters on this route. Navigation on the bridge shows clearly marked electronic maps indicating discharges to stop 13 miles outside the OCNMS (12 miles from shore and a one mile buffer).

Discharge Types:

Blackwater includes toilet waste and medical drains and is sent by vacuum/jet to the Scanship marine sanitation devices (photo #03). Description paraphrased from the schematic on the MSD system (Photo #04): Black water enters from the inlet into the aeration tank where the bacteria present in this section decomposes the blackwater in the presence of oxygen which is supplied by the aeration nozzles. A continuous supply of oxygen is necessary. The blackwater then enters into the settling section where settling takes place and flocs of activated sludge settles down along with other settleable matter. Sludge is returned back to the aeration section. The settled blackwater then enters into the disinfection section where chlorine is added (photo #03). Flow then goes to dedicated holding tanks if not in an area of discharge. Blackwater is not discharged in MOU related waters and all blackwater is treated. Settleable solids are monitored periodically and chlorine availability checked. Once per year, each MSD is taken off-line for a full maintenance cleaning. Solids are removed at this time, drummed and sent ashore.

Graywater, which includes accommodation and crew sink and shower water, galley water, laundry and possibly spa water is held treated discharged outside of MOU related waters.

Dirty bilge water collected and is sent to one of two oily bilge tanks. Liquid moves to one centrifugal oily water separators (OWS).. The system includes two stages of filtration and recirculates at >5 parts per million (ppm) oil content with the oily content meter (photo # 05). Oily sludge is collected from the system and sent ashore by truck. Maintenance on the OWS's includes regular cleaning of the filters and other regular checks and maintenance. Prior to discharge, the liquid is sent through a white box which only allows discharges <15 ppm. The discharge protocol for this route is outside the MOU related waters.



Photo #03 8/7/23 Image: IMG_0623
By: Dobrowski
Description: Scanship Tank



Photo #04 8/7/23 Image: IMG_0634
By: Dobrowski
Description: MSD aeration tanks

The white box (photo #06). The Chief Engineer and the EO have the two separate keys and both need to be present to open the white box. There is a record each time the white box door is opened and a video camera on OWS equipment. The chief Engineer and the EO have the ability to review camera recordings. All portable pumps are logged and only used for certain equipment. The EO confirmed that he is not aware of any rerouting of oily bilge. The OWS was off and recirculating during the inspection and not discharging. If graywater tanks overflow or come in contact with oily bilge, the content is considered as oily bilge and treated through the OWS and the Captain and Chief Engineer are notified.



Photo #05 8/7/23 Image:
IMG_0618 By: Dobrowski
Description: OWS oil treatment



Photo #06 8/7/23
Image: IMG_0616 By: Dobrowski
Description: OWS White Box

The NORWEGIAN SUN uses graywater in various tanks for ballast and therefore does not do ballast water exchanges. Stability has not been an issue.

The NORWEGIAN SUN has 2 fresh water pools, and 5 jacuzzies/spas which are also fresh water. The pools are discharged >12nm and outside of MOU related waters and the water can be sent to the graywater collection tanks for discharge outside of MOU related waters.

Food waste is segregated into soft and hard foods. Soft foods are fed into a pulper. The effluent from the food waste pulper is deposited into the grey water tanks and is discharged outside of MOU related waters. Hard foods are either incinerated or landed ashore as

USDA waste in Seattle. Used cooking oil (photo #09) is sent ashore for recycling. The EO and Food Operations staff inspect the biodigesters typically daily. There is no food chute on board.

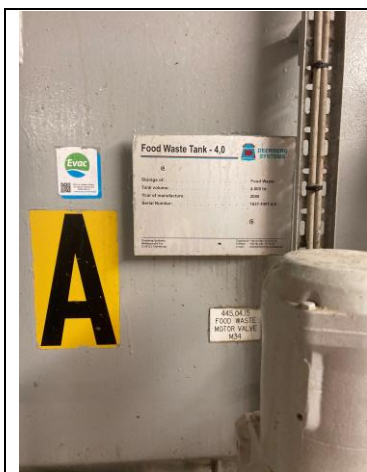


Photo #07 8/7/23 Image: IMG_0603
By: Dobrowski
Description: Food pulper tank



Photo #08 8/7/23
Image: IMG_0601 By: Dobrowski
Description: Glass Crusher



Photo #09 8/7/23
Image: IMG_0594 By: Dobrowski
Description: Tote of cooking oil.

Deck runoff goes directly overboard. The VGP requirements are followed for prevention of any materials off the deck. Only non-toxic, phosphate free cleaners are used. Outside vessel maintenance such as paint chipping and painting is sometimes done at the Port of Seattle. Work does not occur if too windy and is done with permission of the Port.

Laundry water is sent to the graywater collection tanks and discharged outside MOU related waters. Dry cleaning is done on the vessel, the (PERC) chemical used is DF_2000.

No photo waste is generated onboard this vessel. X-rays are done digitally without any waste. Fluorescent bulbs are crushed on board, and held for offloading ashore as hazardous waste. Hazardous waste materials are stored separately in various dedicated locations throughout the vessel and include items such as paints, thinners, oily rags and debris, incinerator ash, chemicals, aerosols photo waste, and some batteries. Bio-medical waste is incinerated with sharps being offloaded as biomedical waste ashore. Hazardous waste is mostly offloaded in Victoria on this route.

Unused or outdated pharmaceuticals and narcotics are either destroyed onboard through incineration or are landed ashore via red medical bag waste. When medical waste is incinerated the Lead Nurse is required to transport the medical waste and witness incineration. Expired IV fluids, saline solution, and injectables are discarded down medical drains.

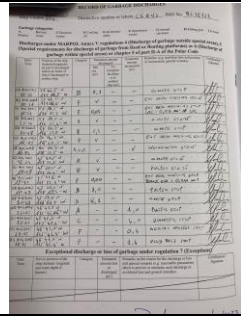


Photo #10 8/7/23
 Image: IMG_0607 By: Dobrowski
 Description: Garbage/Hazardous Waste Record Example Log

Garbage such as domestic and operational waste is offloaded in Seattle. Some USDA wastes, some food waste, biomedical bagged waste, some plastics, food contaminated cardboard, and some paper is incinerated. Ash is tested annually and offloaded as hazardous waste. The garbage record book was reviewed (photo # 10) and showed consistency with requirements.

Glass, heavier plastics, most cardboard, aluminum, tin and steel cans, batteries, used cooking oil and other items are recycled in Seattle.

A wet scrubber for exhaust is installed on the NORWEGIAN SUN, there are total of 5 scrubbers on diesel generators 1, 2, 3, 5, and 6. The wet scrubbers use bag filters that are disposed of as needed with use. While in MOU waters the vessel is switching over to MGO fuel < 0.1% sulfur. The wet scrubbers uses filters (photo #12, and photo #13) and discharges are diluted and monitored before discharge.



Photo #11 8/7/23 Image: IMG_0620
 By: Dobrowski
 Description: overboard discharge lock



Photo #12 8/7/23
 Image: IMG_0639 By: Dobrowski
 Description: EGCS pump



Photo #13 8/7/23
 Image: IMG_0643 By: Dobrowski
 Description: EGCS Filter

The vessel has a clear process for notifications for any non-compliance incident.

Conclusions and Recommendations

The protocols for discharges are clear. Records were orderly and appeared consistent with the MOU.

Copies to:
 Stefano Incao, Environmental Officer, NORWEGIAN SUN
 Alex Adams, Port of Seattle
 Amy Jankowiak, Ecology
 Central Files: Norwegian Cruise Line – NORWEGIAN SUN; WQ 6.1

Section H: Signatures

Name and Signature of Inspector:
 Evan Dobrowski, Compliance Specialist

Evan Dobrowski

Agency/Office/Telephone:
 Department of Ecology
 Northwest Regional Office
 Water Quality Program
 206-594-0175

Date

 October 30, 2023