2010 Assessment of Cruise Ship Environmental Effects in Washington

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For more information contact:

Water Quality Program
3190 160th Ave. SE
Bellevue, WA 98008-5452

Phone: 425-649-7000

Washington State Department of Ecology - www.ecy.wa.gov

o Headquarters, Olympia	360-407-6000
o Northwest Regional Office, Bellevue	425-649-7000
o Southwest Regional Office, Olympia	360-407-6300
o Central Regional Office, Yakima	509-575-2490
o Eastern Regional Office, Spokane	509-329-3400

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by
Amy Jankowiak

Water Quality Program
Washington State Department of Ecology
Bellevue, Washington

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Executive Summary

A Memorandum of Understanding (MOU) between Department of Ecology (Ecology), the North West & Canada Cruise Association (NWCCA) and the Port of Seattle was originally signed on April 20, 2004, and has been amended five times since. This MOU covers large passenger ships that are members of the NWCCA. It does not cover ships such as Alaska Marine Highway ferries, shipping vessels, small passenger ships or boats.

The MOU prohibits discharges of both blackwater and graywater to Washington state waters from all cruise ships except discharges treated with advanced wastewater treatment systems (AWTS) and when stringent requirements are met. Such systems have been and are being installed on some of the cruise ships serving the Alaska market. AWTS are installed to provide treatment that meets or exceeds Alaska's requirements under federal law.

The MOU defines the subject waters as being consistent with Washington marine waters. It requires sampling and monitoring of wastewater discharges and allows for vessel inspections by Ecology. The MOU includes additional elements, such as:

- Sewage sludge (biomass) discharges are prohibited within 12 nautical miles from shore and within the Olympic Coast National Marine Sanctuary.
- No discharges within a half a mile of shellfish beds.
- Specific sampling regimen, testing, and reporting are required.
- Continuous monitoring for turbidity and disinfection with capability to shut down immediately.
- Advanced notification and documentation are required from ships planning to discharge via an AWTS.
- Cruise ships must comply with Washington's more restrictive hazardous-waste laws, are prohibited from dumping garbage into state waters and may only discharge oily bilge water per regulation.

The MOU continues to be a valuable tool in meeting the goal of protecting Washington's marine waters from cruise-ship waste water. The requirement for discharges to be treated with AWTS ensures only high quality effluent is discharged. The requirement to allow vessels to be inspected leads to increased compliance. The need to understand the requirements of the MOU has called for increased communication between Ecology, and the cruise lines and vessel staff.

The cruise lines and vessels operating under the MOU were in compliance with MOU requirements throughout the 2010 season. Some notable successes include, sampling results for conventional pollutants continue to show excellent effluent quality, and increased waste minimization efforts.

The cruise-ship MOU has resulted in several benefits to Washington's environment:

- It ensures that we have a water-quality strategy in place for large passenger vessels.
- It increases Ecology's understanding of the operational practices of the cruise industry, and increases the cruise industry's understanding of the environmental concerns in Washington.
- It forges a new and valuable partnership between state regulators, the cruise industry and other interested parties.
- It retains the state's authority to enforce Washington's water quality laws.

Admittedly, the MOU also has its limitations:

- Compliance is voluntary.
- Enforceability is limited to those federal and state water quality laws that continue to apply to cruise ships.
- Applicability is limited. Cruise ships that do not make a port call while in Washington waters or are not a member of the North West & Canada Cruise Association are not covered by the MOU.

The Department of Ecology recommends that:

1. The MOU continues to be used as a complement to environmental regulations until state specific regulations for cruise ship waste management in Washington State are put in place.
2. Ecology continues to inspect ships that are subject to the MOU, including closely looking at wastewater management and the management of other waste streams.
3. The parties of the MOU continue to work together on evaluating discharges in MOU waters.
4. It is recommended that the parties of the MOU work together this year to re-evaluate the funding mechanism to provide for funding beyond 2011.
5. The cruise lines review their policies and procedures related to outside vessel maintenance activities while in port and to ensure that best management practices are being followed.
6. The cruise lines continue to conduct a thorough review of records on an on-going basis throughout the season as well as at the end of the season to evaluate compliance, and that all recommendations made in inspection reports are implemented.

1. Introduction

1.1 Assessment report

The purpose of this report is to assess the performance of the cruise industry for environmental impacts to state waters for the 2010 cruise season. The goals of this report are to:

1. Analyze the overall compliance with the Memorandum of Understanding.
2. Evaluate the performance of the advanced wastewater treatment systems.
3. Make recommendations in relation to the matters discussed in the report.

This report also presents general background information and detailed appendices of wastewater sampling data. Issues and concerns related to the discharge of bilge and ballast water are beyond the scope of this report.

1.2 Cruise industry operations in Washington State

North West & Canada Cruise Association's (NWCCA) Carnival Cruise Lines, Celebrity Cruises, Holland America Line, Norwegian Cruise Line, Princess Cruises, and Royal Caribbean International operated regularly scheduled cruises of large ships between Seattle and Alaska. Most of these large ships have a capacity of about 2,000 to 4,200 persons on board. There were also two calls to Port Angeles. There were no calls to ports in Washington from large cruise ships that are not part of NWCCA. Alaska's Marine Highway runs regular cruises out of Bellingham to Alaska. The ships have a passenger/crew capacity of about 175 to 225.

This report centers on the operations of the large cruise ships that are covered under a Memorandum of Understanding (MOU); however, smaller passenger vessels frequent areas such as the Columbia and Snake Rivers, Puget Sound, and the San Juan Islands. The Department of Ecology and the Department of Health are in the beginning stages of a process to petition EPA for no-discharge zone (NDZ) status for all or parts of Puget Sound. The purpose of the project is to prevent pathogen and nutrient loading from vessel sewage. The NDZ would apply to all types and sizes of vessels. The multi-year process will begin with an evaluation of current pump-out stations, vessel usage, costs and benefits, and will also include surveys and outreach to stakeholders.

Large cruise ships have operated out of Seattle since 1999. The cruise business is one of the fastest growing business segments at the Port of Seattle. The Port has had two berths suitable for large vessels at Terminal 91. There is one berth at Pier 66. Three vessels departed Seattle on Fridays, Saturdays, and Sundays, one vessel departed Seattle on Tuesdays, one vessel departed Seattle every other Monday and some additional calls. The figure below shows the rising number of passengers enjoying Alaska-bound cruises since 1999.

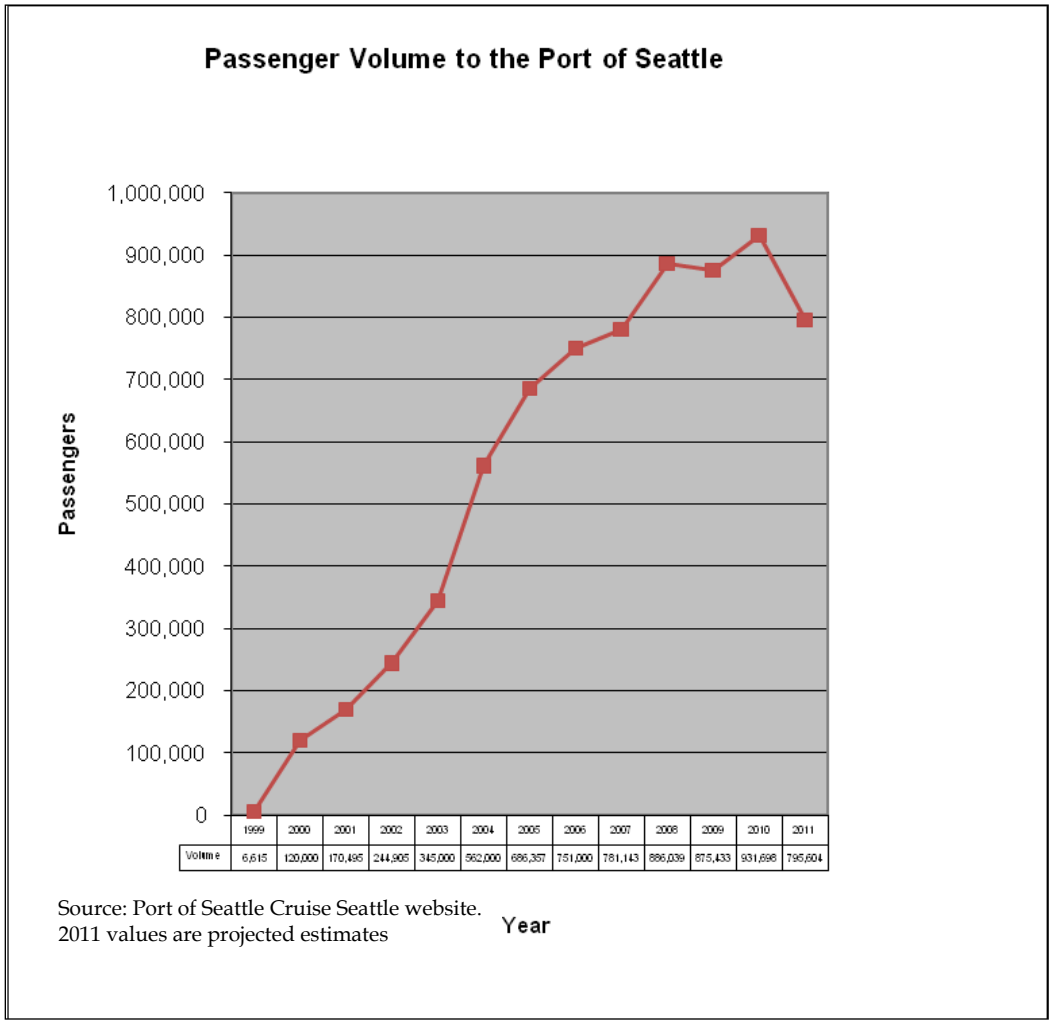

Figure 1. Passenger Volume

Cruise ships have been operating under a rather ambiguous set of environmental standards. Cruise ships and their wastewater treatment systems have been excluded from many of the U.S. environmental laws and regulations that land-based industries must meet. In 2008, the Environmental Protection Agency issued the Vessel General Permit (VGP) for commercial vessels greater than 79 feet. The permit covers various discharge types including, but not limited to, graywater, oily bilge, pool/spa water, and ballast water. The permit does not cover blackwater unless it is combined with graywater.

Several other environmental standards may apply to certain vessels. The United States Coast Guard (USCG) certifies marine sanitation devices to meet certain operational standards for performance but does not monitor wastewater effluent quality. Large ships operate under International Convention for the Prevention of Pollution from Ships (MARPOL), an environmental treaty drafted by the International Maritime Organization (IMO). Annex IV of MARPOL addresses the disposal of sewage. The U.S. did not sign Annex IV; therefore, it is not mandatory that ships follow Annex IV in the United States. Most large ships have adopted the "Cruise Industry Waste Management Practices and Procedures" put forth by the Cruise Lines International Association (CLIA).

The North West & Canada Cruise Association (NWCCA) consisted of the following member lines during the 2010 season:

1. Carnival Cruise Lines
2. Celebrity Cruises
3. Crystal Cruises
4. Disney Cruise Line
5. Holland America Line
6. Norwegian Cruise Line
7. Oceania Cruises
8. Princess Cruises
8. Regent Seven Seas Cruises
10. Royal Caribbean International
11. Silversea Cruises

In 2010, 100% of port calls by large vessels to Washington State ports were made by NWCCA member ships. Table 1 below depicts the member lines, the ships visiting Seattle, the number of port calls and the persons on board.

Table 1. 2010 Cruise Ships Calling to Ports in Washington

Vessel Operator	Vessel Name	2010 Number of Port Calls[1]	Total Persons on Board[2]
NWCCA MEMBERS			
Carnival Cruise Lines	CARNIVAL SPIRIT	19	3434
Celebrity Cruises	INFINITY	19	3379
Celebrity Cruises	MERCURY	1	2785
Celebrity Cruises	MILLENIUM	2	3450
Holland America Line	AMSTERDAM	14	2027
Holland America Line	OOSTERDAM	21	2716
Holland America Line	ROTTERDAM	18	2232
Holland America Line	STATENDAM	2*	1848
Holland America Line	VOLENDAM	1	2079
Holland America Line	ZAANDAM	21	2079
Holland America Line	ZUIDERDAM	1*	2758
Norwegian Cruise Line	NORWEGIAN PEARL	19	3494
Norwegian Cruise Line	NORWEGIAN STAR	20	3448
Princess Cruise Line	GOLDEN PRINCESS	20	3658
Princess Cruise Line	ROYAL PRINCESS	10	1062
Princess Cruise Line	SAPPHIRE PRINCESS	20	3916
Royal Caribbean International	RHAPSODY OF THE SEAS	18	3381
Total		224	
NON NWCCA MEMBERS			
None			

[1] Numbers come from Port of Seattle 2010 Cruise Ship Sailing Schedule and the Port of Seattle staff and annual reports from the cruise lines.
[2] Numbers come from Alaska DEC 2010 Large Commercial Vessel Discharge Status and research. Actual # of passengers/crew may vary.
*one call to Port Angeles

The Port of Seattle's schedule for 2011 includes a total of 195 port calls from the following vessels: Carnival Cruise Line's CARNIVAL SPIRIT, Celebrity Cruises CENTURY, Celebrity Cruises INFINITY, Celebrity Cruises MILLENNIUM, Crystal Cruises CRYSTAL SYMPHONY, Holland America Line's AMSTERDAM, OOSTERDAM, WESTERDAM, and ZAANDAM, Norwegian Cruise Line PEARL and STAR, Princess Cruises' GOLDEN

PRINCESS, and SAPPHIRE PRINCESS, and Royal Caribbean's RHAPSODY OF THE SEAS. P&O's ARCADIA is also making one port call. All of the scheduled port calls are from vessels that are part of the North West & Canada Cruise Association, except for the ARCADIA port call.

1.3 Memorandum of Understanding summary

On April 20, 2004, a Memorandum of Understanding (MOU) between Ecology, the North West & Canada Cruise Association (NWCCA) and the Port of Seattle was signed. The MOU covers ships that are members of the NWCCA, and therefore does not cover ships such as the Alaska Marine Highway ferries, or any of the small ships. The MOU bans cruise-ship wastewater discharges (blackwater and graywater), except from vessels with advanced treatment systems (AWTS). The MOU allows continuous discharge in Washington waters from these AWTS with stringent provisions. Sewage sludge (biomass) may only be discharged more than 12 nautical miles from shore and not within the Olympic Coast National Marine Sanctuary. The MOU specifies a sampling regime, testing, reporting and limit requirements, and requires advanced notification and documentation from ships planning to discharge. The MOU also specifies that the ships comply with Washington's more restrictive hazardous waste laws and stipulates that garbage may not be discharged in state waters.

The MOU and related documents are available on Ecology's website at:
http://www.ecy.wa.gov/programs/wq/wastewater/cruise_mou/index.html

A copy of the current MOU (Amendment No. 5) is included in Appendix A.

1.4 MOU funding

Ecology, the Port of Seattle, the NWCCA and its member lines finalized a process via an agreement to recover costs incurred by Ecology associated with implementing the MOU. A funding agreement for the 2006, 2007, 2008, 2009, 2010 and 2011 seasons were signed and employed.

The parties of the MOU will need to re-evaluate the funding mechanism to provide for funding beyond 2011.

2. MOU Requirements

2.1 Description of requirements

Applicability of MOU

The MOU applies to cruise ships that are part of the North West & Canada Cruise Association (NWCCA) and only to those member ships making a call at a port in Washington. NWCCA member ships that do not make a port call in Washington are not subject to the provisions of the MOU while transiting off the Washington coast. All the ships subject to the MOU are engaged in cruise itineraries greater than one-day duration.

The geographic area in which the terms of the MOU apply was developed with much consideration. Washington's definition of "waters of the state" reaches to the international border with Canada. The cruise industry agreed to recognize Washington's definition of state waters for the purposes of the MOU. The "Waters subject to this MOU" are defined as including the Puget Sound and the Strait of Juan de Fuca south of the international boundary with Canada. Off the west coast of Washington, "Waters subject to this MOU" include the belt of seas measured from the line of ordinary low water along that portion of the coast which is in direct contact with the open sea and the line marking the seaward limit of inland waters, and extending seaward a distance of three miles, as illustrated in Appendix iii of the MOU. The definition of the "waters subject to this MOU" is inclusive of the marine waters of the state as defined in Washington law. See figure 2 below.

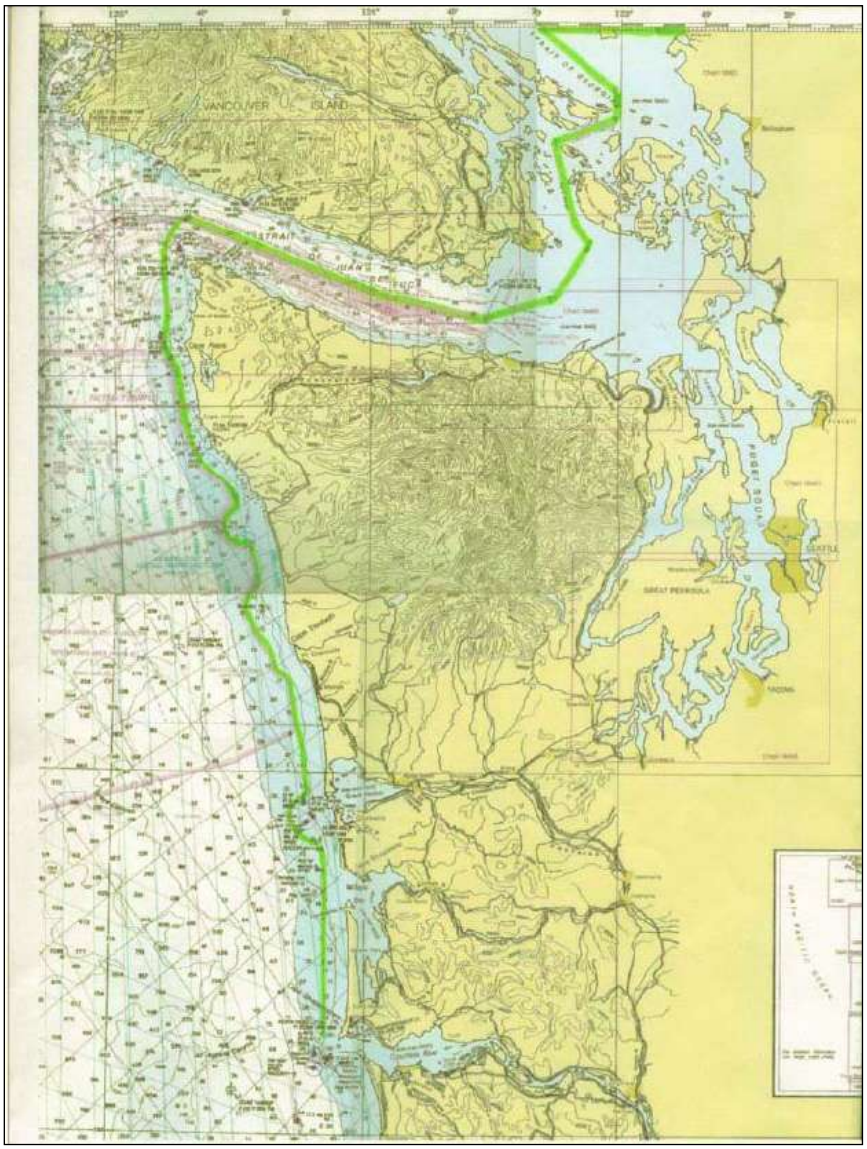

Figure 2. Map of "Waters" Subject to this MOU

Wastewater discharges

The MOU defines "blackwater" as wastes from toilets, urinals, medical sinks and other similar facilities, and "graywater" as including drainage from dishwasher, shower, laundry, bath, galley drains and washbasin drains.

Advanced wastewater treatment systems (AWTS) are systems that meet the higher standards and testing regime as set out in federal law, Title XIV, Certain Alaska Cruise Ship Operations, Section 1404(c). The AWTS are systems such as the Zenon and Hamworthy membrane biological reactor ultrafiltration system, the Scanship biological reactor and ultrafiltration system, and the Rochem reverse osmosis ultrafiltration system. Table 2 identifies the type of treatment in use during the 2010 season by NWCCA member ships.

Table 2. 2010 Vessels and Wastewater Treatment

Vessel Operator	Vessel Name	Blackwater (BW) Treatment System Manufacturer	Graywater (GW) Treatment System Manufacturer	Type of Treatment System
NWCCA MEMBERS				
Carnival Cruise Lines	CARNIVAL SPIRIT	Traditional MSD - Triton	None	Non AWTS: traditional Marine Sanitation Device with aeration, settling and chlorination
Celebrity Cruises	INFINITY	Zenon	Mixed with BW	AWTS: Zenon is a bioreactor and ultrafiltration system with UV disinfection.
Celebrity Cruises	MERCURY	Traditional MSD - Biopure	None	Non AWTS: traditional Marine Sanitation Device with aeration, settling and chlorination
Celebrity Cruises	MILLENIUM	Hydroxyl	Hydroxyl	AWTS: Hydroxyl is a biological reactor and ultrafiltration system with UV disinfection.
Holland America Line	AMSTERDAM	Traditional MSD	None	Non AWTS: traditional Marine Sanitation Device with aeration, settling and chlorination
Holland America Line	OOSTERDAM	Traditional MSD	None	Non AWTS: traditional Marine Sanitation Device with aeration, settling and chlorination
Holland America Line	ROTTERDAM	Traditional MSD	None	Non AWTS: traditional Marine Sanitation Device with aeration, settling and chlorination
Holland America Line	STATENDAM	Zenon	Mixed with BW	AWTS: Zenon is a bioreactor and ultrafiltration system with UV disinfection.
Holland America Line	VOLENDAM	Zenon	Mixed with BW	AWTS: Zenon is a bioreactor and ultrafiltration system with UV disinfection.
Holland America Line	ZAANDAM	Zenon	Mixed with BW	AWTS: Zenon is a bioreactor and ultrafiltration system with UV disinfection.
Holland America Line	ZUIDERDAM	Unknown	Unknown	Unknown
Norwegian Cruise Line	NORWEGIAN PEARL	Scanship	Mixed with BW	AWTS: Scanship is a biological reactor and ultrafiltration system with UV disinfection.
Norwegian Cruise Line	NORWEGIAN STAR	Scanship	Mixed with BW	AWTS: Scanship is a biological reactor and ultrafiltration system with UV disinfection.
Princess Cruise Line	GOLDEN PRINCESS	Hamworthy Bioreactor	Accommodations mixed with BW	AWTS: Hamworthy is a biological reactor and ultrafiltration system with UV disinfection.
Princess Cruise Line	ROYAL PRINCESS	Hamworthy Bioreactor	Accommodations mixed with BW	AWTS: Hamworthy is a biological reactor and ultrafiltration system with UV disinfection.
Princess Cruise Line	SAPPHIRE PRINCESS	Hamworthy Bioreactor	Accommodations mixed with BW	AWTS: Hamworthy is a biological reactor and ultrafiltration system with UV disinfection.
Royal Caribbean International	RHAPSODY OF THE SEAS	Hamman/NAVALIS	NAVALIS (under-going start-up)	Non AWTS: traditional Marine Sanitation Device with aeration, settling and chlorination + AWTS: biological ultrafiltration with oxidation and UV disinfection.
NON NWCCA MEMBERS				
None				

The MOU prohibits discharges of untreated blackwater and untreated graywater within waters subject to the MOU from any type of treatment system. The MOU also bans discharges of treated blackwater and treated graywater unless treated with an AWTS which meets the Alaska requirements and under these terms:

- The ships are allowed to discharge equal to or greater than one nautical mile away from its berth and equal to or greater than 6 knots with the submittal of documentation and provisions including 24-hour continuous monitoring for turbidity and UV disinfection, and emergency shutdown for treatment upsets.
- The ships are allowed to discharge within one nautical mile of berth with further documentation and provisions including 24-hour continuous turbidity or equivalent monitoring and UV disinfection, emergency shutdown for treatment upsets, and ultraviolet light disinfection immediately prior to discharge.

All ships discharging within waters subject to the MOU must:

- Not discharge within 0.5 miles of bivalve shellfish beds that are recreationally harvested or commercially approved to harvest. For the 2010 season, this includes three areas (President's Point, Apple Tree Cove, and Tyee Shoal).
- Immediately stop all discharges when high turbidity occurs and when a disinfection system upset occurs (and make appropriate notifications).
- Sample the effluent once per month while in Washington using a Washington state-certified laboratory.
- Meet the limitations on discharge as set in Alaska regulation.
- Split samples with Ecology upon request.
- Conduct Whole Effluent Toxicity (WET) testing once every two years for homeported vessels and once every 40 calls for other vessels (applies to continuous discharge approved vessels only).
- Provide test results provided to Alaska.
- Notify Ecology prior to sampling and allow Ecology to conduct inspections to verify compliance with the MOU (all vessels).
- Notify Ecology of any material changes made to the system.

The MOU prohibits the discharge of residual solids from the treatment system (sludge or biomass) in waters subject to the MOU, within 12 nautical miles from shore, and within the Olympic Coast National Marine Sanctuary. Residual solids are defined as including grit or screenings, ash generated during the incineration of sewage sludge and sewage sludge, which is solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works and includes scum or solids removed in advanced wastewater treatment processes.

The discharge of oily bilge water is prohibited if not in compliance with applicable federal and state laws. Vessels typically discharge at less than 15 parts per million, and some are more stringent at 10 or five parts per million.

Hazardous waste

Per the MOU, Washington and the NWCCA agreed to a uniform application procedure for the EPA national identification number under the Resource Conservation and Recovery Act (RCRA). The MOU details that Washington has the right to inspect all records upon request for hazardous waste management. NWCCA member lines shall provide an annual report regarding the total hazardous waste offloaded in Washington. NWCCA agrees to comply with the guidelines for certain waste streams per Washington regulations.

Solid waste

The discharge of solid waste (garbage) is prohibited in waters subject to the MOU.

2.2 Alaska requirements and certification

The U.S. Congress enacted Title XIV – Certain Alaskan Cruise Ship Operations in December 2000. The law creates wastewater standards for vessels. The regulations to implement the law (AS 46.03.460 – AS 46.03.490 and 18 AAC 69) became effective in July 2001 and November, 2002, and are enforced by the United States Coast Guard. Under the legislation, large cruise ships may discharge blackwater and graywater in Alaska while underway and law allows continuous discharge of blackwater and graywater that meet more stringent standards through a certification process. A ship approved by the U.S. Coast Guard to discharge continuously must sample their wastewater twice per month.

In August 2006, a ballot measure added new requirements to the Alaska Commercial Passenger Vessel Environmental Compliance Program. The new statute requires vessels to obtain a wastewater discharge permit for the discharge of any treated sewage, graywater, or other wastewater into marine waters of the state. The General Permit has stringent monitoring and reporting requirements as well as interim and final effluents limits.

All of the cruise ships subject to the Washington Cruise MOU are also subject to the Alaska requirements.

3. Documentation of Discharges from Advanced Wastewater Treatment Systems per the MOU

3.1 Documentation required

Discharges at least one nautical mile away from its birth at a port in Washington and traveling at a speed of at least six knots:

Documentation is required for discharges from an AWTS occurring at least one nautical mile away from its birth at a port in Washington and traveling at a speed of at least six knots. The documentation must identity the type of treatment system in use on the ship, include schematic diagrams of the system and show that the system is certified by the United States Coast Guard. Additional submissions include vessel specific information on how the ship's system meet 24-hour continuous turbidity or equivalent monitoring and UV monitoring, and documentation of system design that demonstrates emergency shut-down capacity.

Discharges continuously

The cruise ship operator is required to submit the above documentation when the discharge occurs continuously. Addition submissions include vessel specific information that all treated effluent will receive disinfection using an ultraviolet light system immediately prior to discharge, copies of water quality test results for the past six months and a vessel specific plan that identifies storage capacities and notification procedures.

3.2 2010 approvals

Ship(s) receiving approval to discharge at least one nautical mile away from birth and traveling at least six knots

The Norwegian Cruise Line NORWEGIAN PEARL and NORWEGIAN STAR submitted documentation that the systems were certified by the USCG for continuous discharge in Alaska for the 2010 season and requested approval to discharge one mile or more from berth while traveling at a speed of six or more knots. Schematics and other documentation had also been provided. Ecology staff reviewed the documentation and on May 4, 2010 sent a letter detailing approval for discharge one mile or more from berth while traveling at a speed of six or more knots.

Ships receiving approval to discharge continuously

There were no requests or approvals for continuous discharge.

Table 3. 2010 Approval to Discharge

Vessel Operator	Vessel Name	Discharging in Washington[1] ≥ 1nm from berth and ≥ 6 knots		Discharging in Washington[1] continuously (at berth or within 1 nm of berth)		Date Approved
		BW	GW	BW	GW	
Carnival Cruise Lines	CARNIVAL SPIRIT	NO	NO	NO	NO	NA
Celebrity Cruises	INFINITY	NO	NO	NO	NO	NA
Celebrity Cruises	MERCURY	NO	NO	NO	NO	NA
Celebrity Cruises	MILLENIUM	NO	NO	NO	NO	NA
Holland America Line	AMSTERDAM	NO	NO	NO	NO	NA
Holland America Line	OOSTERDAM	NO	NO	NO	NO	NA
Holland America Line	ROTTERDAM	NO	NO	NO	NO	NA
Holland America Line	STATENDAM	NO	NO	NO	NO	NA
Holland America Line	VOLENDAM	NO	NO	NO	NO	NA
Holland America Line	ZAANDAM	NO	NO	NO	NO	NA
Holland America Line	ZUIDERDAM	NO	NO	NO	NO	NA
Norwegian Cruise Line	NORWEGIAN PEARL	YES	YES	NO	NO	May 4, 2010
Norwegian Cruise Line	NORWEGIAN STAR	YES	YES	NO	NO	May 4, 2010
Princess Cruise Line	GOLDEN PRINCESS	NO	NO	NO	NO	NA
Princess Cruise Line	ROYAL PRINCESS	NO	NO	NO	NO	NA
Princess Cruise Line	SAPPHIRE PRINCESS	NO	NO	NO	NO	NA
Royal Caribbean	RHAPSODY OF THE SEAS	NO	NO	NO	NO	NA

BW = Blackwater; GW = Graywater; NA = not applicable

[1] Washington waters refers to the "waters subject to this Memorandum of Understanding (MOU)" as defined in the MOU signed April 20, 2004 and as amended.

4. Sampling per the MOU

4.1 Sampling required

Alaska requires twice-monthly sampling of conventional pollutants, as well as sampling of additional pollutants as part of the Alaska general permit. Per the MOU, the vessels that are approved for discharge are required to sample the quality of the treated effluent using a Washington state-certified laboratory at least one time per month while at port in Seattle during each cruise season. The cruise lines must use the sampling requirements set up by the USCG, Captain of the Port, Southeast Alaska Policy for conventional pollutants continued compliance monitoring regime. The MOU requires that the following parameters be sampled: pH, Biochemical Oxygen Demand (BOD), Fecal Coliform, Total Suspended Solids (TSS), and Total Residual Chlorine (TRC).

Whole effluent toxicity testing

Whole effluent toxicity (WET) testing is required for vessels that are approved to discharge continuously, once every 2 years for homeported vessels (20 or more calls/turnarounds per season) and once per 40 port calls or turnarounds for all other vessels. WET testing guidelines were developed specifically for cruise ships by Ecology and are available on Ecology's website on cruise ships.
http://www.ecy.wa.gov/programs/wq/wastewater/cruise_mou/WETtestguideMOU2008.pdf

For the 2010 season, there were no WET tests required nor submitted. A synopsis of previous results is included in annual reports for those seasons.

Copies of the cruise ship WET test reports can be provided upon request.

4.2 Sampling Data

Sampling results were received for the cruise ships that were approved for discharge in waters subject to the MOU:

- Norwegian Cruise Line's PEARL and STAR

Sampling results were compared to the limits established by Alaska/the Washington Cruise MOU and are also compared to Washington's water quality standards. Sampling results are summarized for all data received in Appendix B.

Table 4 below shows the results for the cruise ships during the approval period and within Washington/Alaska voyages.

Table 4. Sample Results - Cruise Ships Approved for Discharge into Washington Waters

SHIP: NORWEGIAN PEARL											
		pH	BOD[3]	TSS[4]	Chlorine Residual[5]	Fecal Coliform6	Ammonia	Copper (dissolved)	Nickel (dissolved)	Zinc (dissolved)	Comments
		St. Units	mg/l	mg/l	mg/l	#/100 ml	mg/l	ug/l	ug/l	ug/l	
MOU/Alaska Limits[1]		6-9	30/45	30/45	10 ug/l	20 / 40	Ammonia, Copper, Nickel and Zinc required in Alaska only.				
WA State Water Quality Standards[2]		7.0-8.5	NA	NA	13 / 7.5 ug/l	14 / 43					
Sample Date	Location/ Lab										
5/12/2010	Juneau/Admiralty/Microbac	6.81	ND	ND	ND	ND	0.52	21	3.5	83	
5/16/2010	Seattle/Spectra	7.1	6.2	6.4	ND	ND					
5/19/2010	Juneau/Admiralty/Microbac	6.77	2.9	ND	ND	2	11	5.3	4.9	100	unannounced
5/25/2010	Juneau/Admiralty/Microbac	6.56	3.1	11	ND	96	1.9	22	16	82	
6/2/2010	Juneau/Admiralty/Microbac	6.88	ND	ND	ND	15	12	5	4.6	64	
6/6/2010	Seattle/Spectra	6.76	ND	4.0	ND	ND					
6/9/2010	Juneau/Admiralty/Microbac	6.78	ND	ND	ND	ND	21	6.2	ND	200	
7/7/2010	Juneau/Admiralty/Microbac	6.79	2.1	ND	ND	2	22	7	1.9	45	
7/11/2010	Seattle/Spectra	6.74	2.7	4.0	ND	4					
7/14/2010	Juneau/Admiralty/Microbac	6.92	2.8	ND	ND	ND	26	7.8	4.8	54	
8/4/2010	Juneau/Admiralty/Microbac	7.14	6.6	10	ND	ND	14	5.7	6.5	35	
8/8/2010	Seattle/Spectra	6.75	4	10	ND	ND					
8/11/2010	Juneau/Admiralty/Microbac	6.86	4.3	5	ND	ND	26	9	5.2	25	
8/18/2010	Juneau/Admiralty/Microbac	6.94	3.3	11	ND	*	12	11	6.4	50	unannounced. Fecal coliform had invalid results and were re-sampled on 8/20 and 8/22
8/20/2010	Ketchikan/R&M	6.87	NA	NA	ND	ND					
8/22/2010	Seattle/Spectra	7.02	NA	NA	ND	ND					
9/8/2010	Juneau/Admiralty/Microbac	6.91	ND	ND	ND	ND	13	7.5	4.4	67	
9/12/2010	Seattle/Spectra	6.89	4	4.7	ND	10					
	MINIMUM	**6.56**	**ND**	**ND**	**ND (<0.1)**	**ND**	**0.5**	**5.0**	**ND**	**25**	met Seattle sampling requirement
	AVERAGE		**3.3**	**5.9**			**14.5**	**9.8**	**5.8**	**73**	
	MAXIMUM	**7.14**	**6.6**	**11**	**ND (<0.1)**	**96**	**26.0**	**22.0**	**16.0**	**200**	
	GEOMETRIC MEAN					**3.24**					

SHIP: NORWEGIAN STAR											
		pH	BOD[3]	TSS[4]	Chlorine Residual[5]	Fecal Coliform6	Ammonia	Copper (dissolved)	Nickel (dissolved)	Zinc (dissolved)	Comments
		St. Units	mg/l	mg/l	mg/l	#/100 ml	mg/l	ug/l	ug/l	ug/l	
MOU/Alaska Limits[1]		6-9	30/45	30/45	10 ug/l	20 / 40	Ammonia, Copper, Nickel and Zinc required in Alaska only.				
WA State Water Quality Standards[2]		7.0-8.5	NA	NA	13 / 7.5 ug/l	14 / 43					
Sample Date	Location/ Lab										
5/11/2010	Ketchikan/Admiralty/Microbac	6.92	14	ND	ND	ND	1.7	2.5	12	220	
5/18/2010	Ketchikan/Admiralty/Microbac	6.92	6.4	ND	ND	4	9.6	3	12	46	Unannounced
5/22/2010	Seattle/Spectra	7.04	5.2	3.3	ND	7					
5/25/2010	Ketchikan/Admiralty/Microbac	7.03	10	ND	ND	ND	29	6.6	14	69	
6/5/2010	Seattle/Spectra	6.96	17	7.3	ND	ND					
6/8/2010	Ketchikan/Admiralty/Microbac	6.98	9.8	8	ND	2	23	3.5	10	190	
6/15/2010	Ketchikan/Admiralty/Microbac	7.02	12	ND	ND	ND	30	2.4	10	70	
7/6/2010	Ketchikan/Admiralty/Microbac	6.87	7.5	4	ND	50	16	1.4	9.5	39	
7/24/2010	Seattle/Spectra	6.97	10	3.5	ND	ND					
7/27/2010	Ketchikan/Admiralty/Microbac	6.88	9.8	ND	ND	ND	23	3.0	11	81	
8/3/2010	Ketchikan/Admiralty/Microbac	6.6	9.8	12	ND	10	20	1.2	9.5	73	
8/7/2010	Seattle/Spectra	6.87	10	7	ND	ND					
8/10/2010	Ketchikan/Admiralty/Microbac	7.16	13	ND	ND	ND	28	2.1	8.9	30	
8/18/2010	Juneau/Admiralty/Microbac	7.15	10	4	ND	2	16	2.5	6.9	23	Unannounced
9/7/2010	Ketchikan/Admiralty/Microbac	7.13	5	ND	ND	ND	35	3.0	7.6	59	
9/11/2010	Seattle/Spectra	7.11	4.0	0.67	ND	ND					
9/14/2010	Ketchikan/Admiralty/Microbac	6.96	4.1	ND	ND	ND	30	ND	7.5	42	
	MINIMUM	**6.6**	**4.0**	**ND**	**ND (<0.1)**	**ND**	**1.7**	**ND**	**6.90**	**23**	met Seattle sampling requirement
	AVERAGE		**9.3**	**4.8**			**21.8**	**2.8**	**9.9**	**78.5**	
	MAXIMUM	**7.16**	**17**	**12**	**ND (<0.1)**	**50**	**35**	**7**	**14**	**220**	
	GEOMETRIC MEAN					**3.05**					

ND = Non Detect, value in box is the detection level. Unnanounced sampling includes other parameters not listed above.
NA = Not Applicable. Sample not required, nor taken.

BOD = Biochemical Oxygen Demand - or organics; TSS = Total Suspended Solids

mg/l = milligrams per liter; ug/l = micrograms per liter; #/100 ml = coliforms per 100 milliliters

[1]MOU/Alaska limits from Title XIV, Certain Alaska Cruise Ship Operations, Section 1404(c) /40CFR 133.102

BOD and TSS: 30-day average shall not exceed 30 mg/l, 7-day average shall not exceed 45 mg/l

Fecal Coliform: geometric mean of any 30-day period shall not exceed 20 fecal coliform/100 ml and not more than 10% of the samples exceed 40 fecal coliform/100 ml

[2]Washington State Water Quality Standards for Surface Waters of the State of Washington Chapter 173-201A WAC

Fecal Coliform: shall not exceed a geometric mean of 14 colonies/100 ml and not more than 10% of a samples shall exceed a geometric mean of 43 colonies/100 ml

pH: 7-8.5 with a human-caused variation within less than 0.2

chlorine: 13 µg/l is the acute limit (1-hour average); 7.5 µg/l is the chronic limit (4-day average)

For the ships that discharged from the AWTS's, the results were in compliance with the Washington MOU and Alaska limits. However, when the samples were compared to Washington's water quality standards, pH might have violated the standards at the point of discharge. Cruise-ship discharges are not allowed a mixing zone at the point of discharge. On-land sewage treatment plants are granted mixing zones around the stationary point of discharge. Most on-land sewage treatment plants discharging to marine waters are permitted for pH limits of 6.0-9.0 and must comply with the water quality standards at the boundary of the mixing zone. The results from the cruise ships for the parameters listed as above are generally as good as or better than most of the on-land plants.

Random unannounced samples were taken by the Alaska Department of Environmental Conservation in Alaska throughout the season. The samples taken included other parameters than the conventional pollutants detailed in Table 4. Copies of laboratory results received by Ecology can be obtained through Ecology's public disclosure office.

The sample results submitted by the lines included some results for other parameters required as part of the Alaska General Permit including copper, zinc, nickel, and ammonia. Ammonia ranged from 0.5 mg/l to 35 mg/l (avg = 18). Dissolved copper ranged from Non-detect to 22 µ/l. Dissolved nickel ranged from Non-detect to 16 µ/l. Dissolved zinc ranged from 23 µ/l to 220 µ/l. Ammonia, copper and zinc results were lower than previous seasons. These results are included in Appendix B.

5. Inspections

5.1 Inspections per the MOU

Eight different vessels were inspected by Ecology staff throughout the 2010 season. A list of vessels inspected is included in Table 6. The inspections were per the MOU and included a walkthrough of the wastewater systems, a review of discharge records, a review of notification and discharge procedures, and a review of other wastestreams. The inspections typically also included sampling for vessels approved to discharge. Results are included in the inspection reports.

In general, the ship's wastewater systems were operating well and produced high quality effluent. In addition to the required monitoring, there is more process control sampling being done on board the vessels to monitor system performance. Discharge protocols are thorough and include verifications.

Recommendations included statements to continue to work towards high functioning wastewater treatment systems.

It was noted that during the inspections, many of the vessels have greatly increased their efforts to minimization the generation of waste. Increased recycling rates, minimization of materials

used, decreased water usage, and reusing more items has all contributed to the overall minimization of wastes being burned or sent to a landfill.

Recommendations were also made to improve best management practices for outside vessel maintenance work in response to a reported complaint and concerns seen during a couple of inspections. Outside vessel maintenance includes items such as vessel washing, paint chipping and scraping, painting, refinishing and hull work. Requirements for preventing paint and other materials were presented to cruise lines during a meeting with representatives of the cruise lines after the cruise season.

As not all vessels could be inspected, copies of discharge documents were requested and received for all vessels from the date of inspection till the end of the season for those inspected and for the entire season for those not inspected. Upon review, no violations of the MOU were discovered.

Copies of the inspection reports are included in Appendix C.

Table 5. 2010 Vessel Inspections

Vessels Inspected	Date Inspected
RHAPSODY OF THE SEAS (Royal Caribbean)	June 18, 2010
CARNIVAL SPIRIT (Carnival Cruise Lines)	July 6, 2010
ROTTERDAM (Holland America Line)	July 31, 2010
ROYAL PRINCESS (Princess Cruises)	August 16, 2010
NORWEGIAN PEARL (Norwegian Cruise Line)	August 29, 2010
SAPPHIRE PRINCESS (Princess Cruises)	September 12, 2010
CELEBRITY MILLENNIUM (Celebrity Cruises)	September 20, 2010
AMSTERDAM (Holland America Line)	September 24, 2010

6. Compliance

6.1 Compliance with MOU requirements

There were no reported incidents of non-compliance with any provision of the MOU.

Letters detailing compliance with the MOU from member lines are included in Appendix D.

7. Shellfish and Viruses

In 2007, The Washington State Department of Health issued a report from a study to examine the potential human health impacts from virus discharges from large passenger vessels. Their results indicate that viral discharges from large cruise ships should not cause illness through shellfish

when AWTS are fully functional. However, virus discharges from cruise ships could reach some shellfish beds at levels that may lead to illness if the treatment systems malfunction. The Department of Health report recommends measures to reduce the risk to shellfish. Recommendations include:

- No discharge should occur within 0.5 nautical miles of bivalve shellfish beds that are recreationally harvested or commercially approved to harvest.
- Cruise ships should withhold discharge when a system upset occurs.
- DOH should be notified immediately in the event of an AWTS upset.

The full report can be found at: www.doh.wa.gov/ehp/sf/Pubs/cruise-ship-report.pdf

The recommendations were incorporated into the MOU via the 2008 amendments.

Norwegian Cruise Line was the only company with vessels approved for discharge in 2009 and 2010, and implemented discharge protocols to prevent discharges within 0.5 nautical miles from identified shellfish beds. No upsets of the treatment system or disinfection system occurred.

An additional shellfish bed has been added to the amended MOU effective for the 2011 cruise season.

8. Annual Review and Amendments

The MOU specifies that all of the parties agree to at least one annual meeting to review the effectiveness of the MOU. The annual meeting was held on January 13, 2011. The Port of Seattle, the Department of Ecology, representatives from the North West & Canada Cruise Association and some of its member lines (Norwegian Cruise Line, Princess Cruises, Holland America Line, and Royal Caribbean/Celebrity Cruises), the Department of Health, as well as other interested parties convened for the meeting. Agenda items included:

- Welcome and Introductions.
- Compliance with the 2010 season.
- Updates – EPA Vessel Discharge Permit, MOU funding, WET testing, No-Discharge Zones.
- MOU amendment on amendment process.
- Looking Ahead.
- Comments/Discussion from cruise lines and interested parties.

The meeting notes are included in Appendix E.

During 2010, the parties of the MOU reviewed and discussed the process for amending the MOU. The parties then proposed a new method for amending the MOU and for including public input. The proposed amendment to the MOU that lays out this process was presented during the annual meeting and then later adopted by amending the MOU. Section 9 of the MOU now includes a process for amending the MOU once every three years starting in 2012. A request for

proposed amendments will be posted on Ecology's and the Port's websites. There will be a review period and amendments that meet criteria laid out in the MOU will be posted for a 30-day public comment period. At the end of the comment period, MOU signatories will review the comments and decide on adoption by unanimous approval. The only exception to the process is an amendment proposed by one of the signatories and supported unanimously by the other two signatories.

The new MOU, amended on March 14, 2011 is available on Ecology's website.

9. Conclusions

9.1 Overall

The Memorandum of Understanding continues to be a key tool in protecting water quality by having requirements in place to allow only discharges from advanced wastewater treatment systems, to allow for inspections to verify compliance, and to increase communication and understand on the requirements of the MOU with the cruise lines and vessel staff.

The cruise lines and vessels operating with the MOU had a successful season and were in compliance with MOU requirements throughout. The sampling results for conventional pollutants continue to show excellent effluent quality.

Advantages to the MOU include having something in place to protect water quality, building a partnership with the cruise industry and other key stakeholders, and being able to inspect and evaluate the quality of treatment from the ships that discharge. Limitations of the MOU include the inability to effectively enforce upon a voluntary agreement, and the lack of coverage under the MOU for large passenger ships that are not members of the North West & Canada Cruise Association.

9.2 Recommendations

1. The Department of Ecology recommends that the MOU continue to be used as a complement to environmental regulations until state specific regulations for cruise ship waste management in Washington State are put in place.
2. Ecology recommends that Ecology continue to inspect ships that are subject to the MOU, including closely looking at wastewater management and the management of other waste streams.
3. It is recommended that the parties of the MOU continue to work together on evaluating discharges in MOU waters.
4. It is recommended that the parties of the MOU work together this year to re-evaluate the funding mechanism to provide for funding beyond 2011.
5. It is recommended that the cruise lines review their policies and procedures related to outside vessel maintenance activities while in port and to ensure that best management practices are being followed.

6. It is recommended that the cruise lines continue to conduct a thorough review of records on an on-going basis throughout the season as well as at the end of the season to evaluate compliance, and that all recommendations made in inspection reports be implemented.

Appendix A. Amendment No. 5 of the Memorandum of Understanding, Cruise Operations in Washington State

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Memorandum of Understanding
Cruise Operations in Washington State

Originally signed April 20, 2004
Amendment No. 5 dated March 14, 2011

Washington State Department of Ecology
North West & Canada Cruise Association
Port of Seattle

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding, originally signed on April 20, 2004 is amended by and between the State of Washington, the Port of Seattle, and the North West & Canada Cruise Association, hereinafter referred to as NWCCA, representing the international cruise lines identified in *Appendix i*.

Whereas the State of Washington is charged with the responsibility of protecting and conserving Washington's environmental resources in relation to the Cruise Industry's environmental practices in Washington; and

Whereas the United States Coast Guard, herein referred to as USCG, has Federal jurisdiction over environmental matters in navigable waters in the United States; and

Whereas the Port of Seattle is charged with providing the services and facilities to accommodate the transportation of passengers, including cruise ship passengers, while protecting and enhancing the environment of the Port of Seattle; and

Whereas, the NWCCA is a non-profit entity organized for the purpose of representing member cruise lines which operate in and about waters subject to this Memorandum of Understanding (MOU), whose current membership is identified in *Appendix i*; and

Whereas, the NWCCA has adopted the "**Cruise Industry Waste Management Practices and Procedures"** as promulgated by the Cruise Industry's trade association, the Cruise Lines International Association, herein referred to as CLIA, which practices and procedures are attached hereto as *Appendix ii*; and

Whereas, NWCCA cruise vessels operate in international waters and move passengers to destinations worldwide and, consequently, those cruise vessel waste management practices must take into account environmental laws and regulations in many jurisdictions and international treaties and conventions; and

Whereas, the NWCCA, the State of Washington as represented by the Washington Department of Ecology (Ecology), the USCG and the Port of Seattle have met to develop waste management practices that preserve a clean and healthy environment and demonstrate the Cruise Industry's commitment to be a steward of the environment; and

Whereas, research is ongoing to establish the impact of ships' wastewater discharges on the ocean environment, and the results of this research will be taken into account in periodic review of the wastewater discharge practices described in this Agreement; and

Whereas, the cruise industry recognizes Washington's fragile marine environment and is committed to help protect this environment;

Now therefore, based upon mutual understanding, the parties enter into this Memorandum of Understanding to implement the following environmental goals, policies and practices:

Definition of terms for the purpose of this agreement:

“blackwater” means waste from toilets, urinals, medical sinks and other similar facilities;

"cruise ship" means any vessel that is owned or operated by a member of the NWCCA;

“disinfection system upset” means disinfection below levels of four log (99.99%) inactivation of norovirus based on expected results assuming a minimum intensity of ultraviolet (UV) lights used for disinfecting effluent or other shipboard administrative controls as may be accepted by the Washington Department of Health..

“graywater” includes drainage from dishwasher, shower, laundry, bath, galley drains and washbasin drains;

“monitoring for disinfection effectiveness” means using measuring equipment to determine the intensity of ultraviolet (UV) lights used for disinfecting effluent, or other shipboard administrative controls as may be accepted by the Washington Department of Health.

“oily bilge water” includes bilge water that contains used lubrication oils, oil sludge and slops, fuel and oil sludge, used oil, used fuel and fuel filters, and oily waste.

“residual solids” includes grit or screenings, ash generated during the incineration of sewage sludge and sewage sludge, which is solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge.

“solid waste” means all putrescible and nonputrescible solid and semisolid wastes including, but not limited to, garbage, rubbish, ashes, industrial wastes, swill, sewage sludge, demolition and construction wastes and recyclable materials [RCW 70.95.030 (22), Solid Waste Management: Reduction and Recycling].

“waters subject to this Memorandum of Understanding (MOU)” include the Puget Sound and the Strait of Juan de Fuca south of the international boundary with Canada; and for off the west coast, the belt of the seas measured from the line of ordinary low water along that portion of the coast which is in direct contact with the open sea and the line marking the seaward limit of inland waters, and extending seaward a distance of three miles as illustrated in *Appendix iii*.

1. Applicability

1.1 The State of Washington agrees that the performance required by the NWCCA under the terms of this Memorandum of Understanding shall be directed only to its member cruise lines. The NWCCA acknowledges that its members operate cruise vessels engaged in

cruise itineraries greater than one day duration; and further that its members do not operate one-day attraction ships or casino gambling ships. This agreement only applies to voyages during which the commercial passenger vessel actually calls at a port in the State of Washington.

1.2 The State of Washington and Port of Seattle accepts the CLIA Industry Standard E-0l – 01, titled ***Cruise Industry Waste Management Practices and Procedures*** (updated at this link: [http://www2.cruising.org/industry/environment.cfm] and the latest version is attached) *(Appendix ii*) as CLIA member policy in the management of solid waste, hazardous wastes and wastewaters in waters subject to this MOU. In addition to the CLIA Practices, the member vessels of NWCCA operating in Washington agree to allow Ecology to conduct a minimum of one vessel inspection per season to verify compliance with the MOU and agree to comply with the following unique practices while operating in waters subject to this MOU:

2.1 Wastewater Management

In recognition of the sensitive nature of Washington's marine environment, the NWCCA agrees to the following:

2.1.1 to prohibit the discharge of untreated blackwater, untreated graywater, and solid waste within waters subject to this MOU (*Appendix iii*); and to prohibit the discharge of oily bilge water if not in compliance with applicable federal and state laws within waters subject to this MOU.

2.1.2 other than as set forth in section 2.1.3 below, to prohibit the discharge of treated blackwater and treated graywater in waters subject to this MOU.

2.1.3 the discharge of treated blackwater and treated graywater from ships equipped with advanced wastewater treatment systems (AWTS) which meet the higher standards and the testing regime set out in federal law, Title XIV, Certain Alaska Cruise Ship Operations, Section 1404 (c) (*Appendix vi*) is allowed under the following conditions:

A. For discharges if the ship is at least one nautical mile away from its berth at a port in Washington and is traveling at a speed of at least 6 knots:

1) No later than 60 days prior to the date the cruise ship wishes to commence discharge of AWTS-treated effluent, the cruise line shall submit the following vessel specific information to Ecology

a. Documentation on the type of treatment system in use on the ship including schematic diagrams of the system.
b. Documentation that the system is certified by the United States Coast Guard for continuous discharge in Alaska. If the certification has not yet been provided by the Coast Guard at the time the other documentation is submitted to Ecology, it may be submitted less than 60 days prior to

commencement of discharge but in no event less than 30 days prior to the commencement of discharge.

c. Provision for daily twenty-four hour continuous turbidity or equivalent monitoring of the quality of the effluent generated by the AWTS and, beginning in 2009, daily twenty-four hour continuous monitoring for disinfection effectiveness.
d. Documentation of system design that demonstrates the AWTS can be automatically shut down if monitoring of treated effluent indicates high turbidity or, beginning in 2009, a disinfection system upset; or documentation that demonstrates that operational controls exist to insure system shut down if monitoring of treated effluent indicates high turbidity or, beginning in 2009, a disinfection system upset. An example of an acceptable operational control is a system that has the continuous monitoring device alarmed as to immediately alert engineering staff on watch to shut down overboard discharges from the system in the event of high turbidity levels or disinfection ineffectiveness in the treated effluent.

B. For continuous discharge:

1) No later than 60 days prior to the date a cruise ship wishes to commence discharge of AWTS effluent, the cruise line shall submit the following vessel specific information to Ecology:

a. Documentation on the type of treatment system in use on the ship including schematic diagrams of the system.
b. Documentation that the system is certified by the United States Coast Guard for continuous discharge in Alaska. If the certification has not yet been provided by the Coast Guard at the time the other documentation is submitted to Ecology, it may be submitted less than 60 days prior to commencement of discharge but in no event less than 30 days prior to commencement of discharge.
c. Provision for daily twenty-four hour continuous turbidity or equivalent monitoring of the quality of the effluent generated by the AWTS and, beginning in 2009, daily twenty-four hour continuous monitoring for disinfection effectiveness.
d. Documentation of system design that demonstrates the AWTS can be automatically shut down if monitoring of treated effluent indicates high turbidity or, beginning in 2009, a disinfection system upset; or documentation that demonstrates that operational controls exist to insure system shut down if monitoring of treated effluent indicates high turbidity or, beginning in 2009, a disinfection system upset. An example of an acceptable operational control is a system that has the continuous monitoring device alarmed as to immediately alert engineering staff on watch to shut down overboard discharges from the system in the event of high turbidity levels or disinfection ineffectiveness in the treated effluent.
e. Documentation that all treated effluent will receive final polishing for disinfection immediately prior to discharge.

f. Copies of water quality tests results taken from the AWTS effluent during the preceding six months.
g. A vessel specific plan that: identifies how effluent will be stored until the AWTS is repaired and which indicates the storage capacity of holding tanks; and includes a notification protocol for notifying Ecology of system shut down which occurs while within waters subject to this MOU.

If Ecology determines that the documentation provided is insufficient, it shall so notify the cruise line. The cruise line shall provide supplemental documentation as requested by Ecology. If Ecology and the cruise line are unable to agree on the supplemental documentation and cruise line elects to discharge from the AWTS, cruise line understands that any such discharge will not have been approved by Ecology and further that Ecology may take appropriate action, including, but not limited to, publicizing, such fact.

Any cruise ship discharging from an AWTS in waters subject to this MOU operates within the shipping lanes and this effectively means that vessels are more than a half a mile from shellfish beds with the possible exception of President's Point, Apple Tree Cove and Tyee Shoal for the 2008 cruise season. For specific information relative to shellfish protection measures, see *appendix x*.

C. The vessels that have submitted documentation under A or B above agree to:

1) Not discharge within 0.5 nautical miles of bivalve shellfish beds that are recreationally harvested or commercially approved to harvest as identified annually by the Department of Ecology. This season's locations include President's Point, Apple Tree Cove and Tyee Shoal as referenced in *Appendix x*.
2) Immediately stop all discharges when high turbidity occurs and, beginning in 2009, when a disinfection system upset condition occurs.
3) Immediately notify the Washington State Department of Health in the event of a disinfection system upset at (360) 236-3330 during office hours or (360) 786-4183 after hours (24 hour pager). The agreement to provide this notice is based on the understanding by NWCCA that the Department of Health will not publicize the information provided unless it reasonably determines that a discharge presents a material public health risk.
4) Sample the quality of the treated effluent using a Washington state-certified laboratory at least one time per month while at port in Washington during each cruise season using the sampling requirements established per the United States Coast Guard, Captain of the Port, Southeast Alaska Policy for conventional pollutants continued compliance monitoring regime and as referenced in *Appendix vi*. Parameters sampled include pH, Biochemical Oxygen Demand (BOD), Fecal Coliform, Total Suspended Solids (TSS), and Residual Chlorine (RC).
5) Meet the limitations on discharge as set in Alaska regulations (*Appendix vi*) for BOD, TSS, pH, Fecal Coliform and Residual Chlorine.[1]

6) Split samples with Ecology upon Ecology's request when sampling is conducted in Washington waters.
7) For vessels that have submitted documentation under B above (continuous discharge), conduct Whole Effluent Toxicity (WET) Testing once every two years for vessels homeported[2] in Washington and once every 40 port calls or turnarounds to a port in Washington for all other vessels.
8) Provide Ecology with duplicates of test results obtained for and provided to the State of Alaska to enable Ecology to monitor the quality of the effluent from such systems.
9) Notify Ecology at least a week in advance of sampling and to allow Ecology staff access to the ship in order to observe sampling events.
10) Notify Ecology if any material changes are made to the system.

Note 1: There is a presumption that meeting Alaska's standards means that Washington's Water Quality Standards are likely being met and that if Alaska's standards are not being met, Washington's Water Quality Standards are not being met.
Note 2: A "homeported" vessel is a vessel that makes a call or does a turnaround at a port in Washington at least 20 times per year.

2.1.4 The discharge of residual solids from either a type 2 marine sanitation device or an advanced waste water treatment system is prohibited in waters subject to this MOU, within 12 nautical miles from shore, and within the entire boundaries of the Olympic Coast Marine Sanctuary. All parties acknowledge that most of the Olympic Coast National Marine Sanctuary lies beyond 3 miles of shore and therefore is outside the jurisdiction of the State of Washington.

2.2 Hazardous Waste Management

2.2.1 The CLIA in consultation with NWCCA has developed, in conjunction with the Environmental Protection Agency (EPA), a national practice for the assigning of an EPA Identification Number to each cruise ship as the "generator" of hazardous wastes, which recognizes the multi-jurisdictional itineraries of a cruise vessel. EPA also proposes that the state where company offices are located may issue the national identification numbers provided the criteria and information submitted required for obtaining the number is standard for the United States. The State of Washington and NWCCA agree to a uniform application procedure for the EPA national identification number in accordance with the Resource Conservation Recovery Act (RCRA) (*Appendix v*). The State of Washington shall have the right to inspect all such records upon written request to the cruise vessel operator. The State of Washington recognizes that in some cases EPA Identification Numbers may not be required under federal law for conditionally exempt small quantity generators.

2.2.2 *Appendix ii* includes the uniform procedure adopted by the NWCCA for the application of RCRA to cruise vessels disposing of hazardous wastes in the State of Washington. The State of Washington accepts this procedure as the appropriate process for vendor selection and management of hazardous wastes in Washington. NWCCA member lines agree to provide an annual report regarding the total hazardous waste offloaded in Washington by each cruise vessel.

2.2.3 The NWCCA acknowledges that the state of Washington regulates some hazardous wastes differently than EPA and agrees, within the waters subject to this MOU, to

comply with the guidelines for specific waste streams found in *Appendix vii*.

2.2.4 The State of Washington and NWCCA agree that all hazardous waste disposal records required by RCRA for cruise vessels entering a Washington port shall be available to the State of Washington upon written request to the cruise vessel operator.

3. The State of Washington and the NWCCA understand that the U.S. Coast Guard (USCG) has Federal jurisdiction over environmental matters in navigable waterways in the United States and conducts passenger ship examinations that include review of environmental systems, Safety Management System (SMS) documentation and such MARPOL-mandated documents as the Oil Record Book and the Garbage Record Book. Additionally, NWCCA member cruise vessels will integrate such industry standards into SMS documentation that ensure compliance through statutorily required internal and third party audits.

4. The USCG has developed guidelines relating to the inspection of waste management practices and procedures, which have been adopted by the cruise industry. The State of Washington accepts the USCG Navigation and Vessel Inspection Circular and Environmental Systems Checklist (*Appendix iv*), which will be incorporated into USCG 840 Guidebook as the procedure to conduct waste management inspections on board cruise vessels. To reduce administrative burden on the cruise ship industry, the State of Washington agrees to first request from the USCG any records for cruise vessels entering waters subject to this MOU to the extent that those records are covered by the Memorandum of Agreement, dated May 25th, 2001, between the State of Washington Department of Ecology and the USCG. Other USCG records will be provided to the State directly by the NWCCA member lines upon request.

5. The State of Washington recognizes that waste management practices are undergoing constant assessment and evaluation by cruise industry members. It is understood by the State of Washington and the NWCCA that the management of waste streams will be an on-going process, which has as its stated objectives both waste minimization and pollution prevention. Consequently, all parties agree to continue to work with each other in good faith to achieve the stated objectives. This may require additional meetings with the parties to this Agreement to discuss specific issues applicable to the cruise industry in the U.S.

6. The NWCCA acknowledges that its operating practices are required to comply with the applicable provisions of the Marine Mammal Protection Act, the Invasive Species Act and the State of Washington Ballast Water Management law, RCW Ch. 77.120. The NWCCA agrees to acknowledge and comply with appropriate rules and regulations related to the Olympic Coast National Marine Sanctuary, including but not limited to the regulations for implementing the National Marine Sanctuary Program (subparts A through E and subpart O of Title 15, Chapter IX, Part 922 of the Code of Federal Regulations) and the International Maritime Organization (IMO) "Area To Be Avoided" off the Washington Coast.

7. This agreement does not prohibit discharges made for the purpose of securing the vessel or saving life at sea, provided that all reasonable precautions have been taken for the purpose of preventing or minimizing the discharge.

8. All parties acknowledge that ongoing discussions of environmental goals are recognized as a necessary component to the successful implementation of management practices for waste minimization and reduction.

9. Compliance, Modification and Review of MOU: NWCCA members agree to immediately self-report non-compliance with any provision of this MOU to the Department of Ecology at the following 24-hour number: 425-649-7000. By December 1st of each year, a report shall be submitted to the Department of Ecology detailing the compliance with this MOU for each vessel within the NWCCA that calls to a port in Washington for the previous cruise season. The reports should follow the format included in *Appendix viii*. All parties acknowledge that this MOU is not inclusive of all issues, rules or programs that may arise in the future. The State of Washington reserves the right to enter into additional MOUs to address or refine such issues, to take enforcement action in response to violations of state law, or to pursue appropriate legislation. All parties agree to at least one annual meeting to review the effectiveness of the MOU, such meeting to be scheduled, if feasible, during October of each year. The State of Washington and NWCCA reserve the right to cancel this MOU upon 90 days written notice.

10. Amendments to the Memorandum of Understanding (MOU) will occur every three years starting in 2012. A request for proposed amendments will be posted on the Port of Seattle and Department of Ecology websites at the beginning of November of the year preceding the amendment adoption (e.g., in the beginning of November 2011 for 2012 adoption). All proposed amendments must be submitted within 21 calendar days of the posting.

A 45-day review period will follow for all of the MOU signatories to review and validate the proposed amendments (around mid January). This period is longer to account for the holiday period, if the timing is different, review periods may be adjusted accordingly.

Amendments that meet the criteria identified below will be then posted for a 30-day public comment period (around mid February).

At the end of the comment period, MOU signatories will review the comments and meet to decide which, if any, of the proposed amendments should be adopted.

Criteria for Proposed Amendments

All proposed amendments meeting the following criteria will be advanced for further review and comment:

- In order to be considered, proposed amendments must be submitted within three weeks of the posted request for proposed amendments.
- Proposed amendments should include only cruise ship activity within the boundaries of the MOU.

- The MOU, as amended, should not duplicate or replace existing regulations that govern cruise ships, however they may be more stringent.
- Proposed amendments must receive the sponsorship of one of the MOU signatories. *(Note: sponsorship does not necessarily mean that the signatory will support adoption of the proposed amendment.)*
- If none of the signatories support a proposed amendment, it will *not* be reviewed or considered for adoption.
- Proposed amendments must include
  - the basis for the amendment (e.g., what environmental concern it addresses)
  - how the amendment is applicable to or compatible with the MOU
  - the anticipated benefits of the amendment
  - potential impacts of the amendment
  - include scientific data that supports the proposed amendment as applicable
- In order for an amendment to be adopted, it must receive unanimous approval from the MOU signatories.

Exceptions

The only exception to this amendment process is an amendment proposed by one of the signatories and supported unanimously by the other two signatories.

11. The Port of Seattle and Ecology entered into an interagency agreement for the purpose of providing funding for Ecology personnel to further the intent of the MOU. The Port of Seattle is acting solely as a pass-through contracting entity to facilitate the collection of funds from the individual NWCCA members to provide payment to Ecology on behalf of the NWCCA members. The interagency agreement as included in *Appendix ix* may be amended or renewed separately from this MOU at any time by the parties of the agreement without amending the MOU.

Appendix xi includes a summary of amendments.

IN RECOGNITION OF THE MUTUAL UNDERSTANDINGS DISCUSSED HEREIN THE PARTIES HERETO AFFIX THEIR SIGNATURES. THIS AMENDMENT SHALL BE EFFECTIVE UPON THE DATE AND SIGNATURE OF THE FINAL SIGNING PARTY, THE DEPARTMENT OF ECOLOGY.

Washington State Department of Ecology — Date: 3/14/11

Port of Seattle

North West & Canada Cruise Association

APPENDICES
MEMORANDUM OF UNDERSTANDING

Appendix i	List of NWCCA Member Lines
Appendix ii	CLIA Standards
Appendix iii	Navigational Chart of the waters subject to this MOU
Appendix iv	USCG Navigation & Vessel Inspection Circular and Environmental Systems Checklist
Appendix v	Uniform application procedure for EPA National ID Number as per Resource Conservation Recovery Act.
Appendix vi	Alaska Regulations
Appendix vii	Washington Hazardous Waste Management Best Management Practices
Appendix viii	Boilerplate Compliance Letter
Appendix ix	Interagency Agreement (cost-recovery)
Appendix x	Bivalve Shellfish Beds
Appendix xi	Summary of Amendments

Appendix i

List of NWCCA Member Lines

Carnival Cruise Lines
Celebrity Cruises
Crystal Cruises
Disney Cruise Line
Holland America Line
Norwegian Cruise Line
Oceania Cruises
Princess Cruises
Regent Seven Seas Cruises
Royal Caribbean International
Silversea Cruises

Appendix ii

http://www2.cruising.org/industry/environment.cfm (for latest version)
CLIA INDUSTRY STANDARD

CRUISE INDUSTRY
WASTE MANAGEMENT
PRACTICES AND PROCEDURES

The members of the Cruise Lines International Association (CLIA) are dedicated to preserving the marine environment and in particular the pristine condition of the oceans and other waters upon which our vessels sail. The environmental standards that apply to our industry are stringent and comprehensive. Through the International Maritime Organization, the United States and flag and port states, CLIA has developed consistent and uniform international standards that apply to all vessels engaged in international commerce. These standards are set forth in the International Convention for the Prevention of Pollution from Ships (MARPOL). The international standards of MARPOL have in turn been adopted by the United States and augmented by additional national legislation and regulation. The U.S. has jurisdiction over both foreign and domestic vessels that operate in U.S. waters where U.S. laws, such as the Federal Water Pollution Control Act, the Act to Prevent Pollution from Ships, the Ports and Waterways Safety Act, and the Resource Conservation and Recovery Act - which applies to hazardous waste as it is landed ashore for disposal, apply. The U.S. Coast Guard enforces both international conventions and domestic laws.

The cruise industry commitment to protecting the environment is demonstrated by the comprehensive spectrum of waste management technologies and procedures employed on its vessels.

CLIA members are committed to:

a. **Designing, constructing and operating vessels, so as to minimize their impact on the environment;**

b. **Developing improved technologies to exceed current requirements for protection of the environment;**

c. **Implementing a policy goal of zero discharge of MARPOL, Annex V solid waste products (garbage) and equivalent US laws and regulations by use of more comprehensive waste minimization procedures to significantly reduce shipboard generated waste;**

d. **Expanding waste reduction strategies to include reuse and recycling to the maximum extent possible so as to land ashore even smaller quantities of waste products;**

e. **Improving processes and procedures for collection and transfer of hazardous waste; and**

f. Strengthening comprehensive programs for monitoring and auditing of onboard environmental practices and procedures in accordance with the International Safety Management Code for the Safe Operation of Ships and for Pollution Prevention (ISM Code).

INDUSTRY WASTE MANAGEMENT STANDARDS: **CLIA member cruise vessel operators have agreed to incorporate the following standards for waste stream management into their respective Safety Management Systems.**

1. **Photo Processing, Including X-Ray Development Fluid Waste:** ***Member lines have agreed to minimize the discharge of silver into the marine environment through the use of best available technology that will reduce the silver content of the waste stream below levels specified by prevailing regulations.***

2. **Dry-cleaning waste fluids and contaminated materials:** ***Member lines have agreed to*** **prevent** ***the discharge of chlorinated dry-cleaning fluids, sludge, contaminated filter materials and other dry-cleaning waste byproducts into the environment***

3. **Print Shop Waste Fluids:** ***Member lines have agreed to prevent the discharge of hazardous wastes from printing materials (inks) and cleaning chemicals into the environment.***

4. **Photo Copying and Laser Printer Cartridges:** ***Member lines have agreed to initiate procedures so as to maximize the return of photo copying and laser printer cartridges for recycling. In any event, these cartridges will be landed ashore.***

5. **Unused And Outdated Pharmaceuticals:** ***Member lines have agreed to ensure that unused and/or outdated pharmaceuticals are effectively and safely disposed of in accordance with legal and environmental requirements.***

6. **Fluorescent And Mercury Vapor Lamp Bulbs:** ***Member lines have agreed to prevent the release of mercury into the environment from spent fluorescent and mercury vapor lamps by assuring proper recycling or by using other acceptable means of disposal.***

7. **Batteries:** ***Member lines have agreed to prevent the discharge of spent batteries into the marine environment.***

8. **Bilge and Oily Water Residues:** ***Member lines have agreed to meet or exceed the international requirements for removing oil from bilge and wastewater prior to discharge.***

9. **Glass, Cardboard, Aluminum and Steel Cans:** ***Member lines have agreed to eliminate, to the maximum extent possible, the disposal of MARPOL Annex V wastes into the marine environment. This will be achieved through improved reuse and recycling opportunities. They have further agreed that no waste will be discharged into the marine environment unless it has been properly processed and can be discharged in accordance with MARPOL and other prevailing requirements.***

10. **Incinerator Ash:** ***Member lines have agreed to reduce the production of incinerator ash by minimizing the generation of waste and maximizing recycling opportunities.***

11. **Graywater**: **[*For ships traveling regularly on itineraries beyond the territorial waters of coastal states], member lines have agreed that graywater will be discharged only while the ship is underway and proceeding at a speed of not less than 6 knots[1]; that graywater will not be discharged in port and will not be discharged within 4 nautical miles from shore or such other distance as agreed to with authorities having jurisdiction or provided for by local law except in an emergency, or where geographically limited. Member lines have further agreed that the discharge of graywater will comply with all applicable laws and regulations. For vessels whose itineraries are fully within US territorial waters, discharge shall comply fully with U.S. and individual state legislation and regulations.***

12. **Blackwater**: ***CLIA members have agreed that all blackwater will be processed through a Marine Sanitation Device (MSD), certified in accordance with U.S. or international regulations, prior to discharge. For ships traveling regularly on itineraries beyond territorial coastal waters, discharge will take place only when the ship is more than 4 miles from shore and when the ship is traveling at a speed of not less than 6 knots.[1] For vessels whose itineraries are fully within US territorial waters, discharge shall comply fully with U.S. and individual state legislation and regulations.***

Some member cruise lines are field-testing wastewater treatment systems that utilize advanced technologies. These onboard wastewater treatment systems, which are currently being referred to as advanced wastewater purification (AWP) systems, are designed to result in effluent discharges that are of a high quality and purity; for example, meeting or surpassing secondary and tertiary effluents and reclaimed water. Effluents meeting these high standards would not be subjected to the strict discharge limitations previously discussed.

Each CLIA cruise vessel operator has agreed to utilize one or more of the practices and procedures contained in the attached "*Cruise Industry Waste Management Practices and Procedures*" in the management of their shipboard waste streams. Recognizing that technology is progressing at a rapid rate, any new equipment or management practices that are equivalent to or better than those described, and which are shown to meet or exceed international and federal environmental standards, will also be acceptable. Member lines have agreed to communicate to CLIA the use of equivalent or other acceptable practices and procedures. As appropriate, such practices and procedures shall be included as a revision to the attached document. As an example, when improved systems for treating blackwater and graywater are perfected and shown to meet the requirements for MSDs and accepted by appropriate authorities, the new systems and associated technology will be included in the attachment as a revision.

CLIA and its Environmental Committee will continue to work with the U.S. Coast Guard, the U.S. Environmental Protection Agency and other appropriate agencies to further implement the above commitments.

[1] For vessels operating under sail, or a combination of sail and motor propulsion, the speed shall not be less than 4 knots.

ATTACHMENT: *CRUISE INDUSTRY WASTE MANAGEMENT PRACTICES AND PROCEDURES*

Revised: November 12, 2006
Effective for non-prior ICCL members:July 1, 2007

Appendix ii (cont.)

Attachment to CLIA Standard

CRUISE INDUSTRY WASTE MANAGEMENT PRACTICES AND PROCEDURES

REVISED: (November 27, 2006)

The cruise industry is dedicated to preserving the marine environment and oceans upon which our ships sail. As a stated industry standard, CLIA members have adopted aggressive programs of waste minimization, waste reuse and recycling, and waste stream management set forth in the following. In addition, CLIA members are working in a number of areas to identify and implement new technologies in order to improve the environmental performance of their ships. CLIA member lines currently have agreed to utilize waste management practices and procedures, which meet or exceed the stringent standards as set forth in international treaties and applicable U.S. laws.

Introduction

The cruise industry is inextricably linked to the environment. Our business is to bring people to interesting places in the world, over the water. Recognizing the future of the industry depends on a clean and healthy environment; cruise industry senior management is committed to stewardship of the environment and establishing industry practices that will make CLIA member cruise ship operators leaders in environmental performance.

This document outlining member line practices has been developed under the auspice of the industry's professional organizations, the Cruise Lines International Association (CLIA), the Florida Caribbean Cruise Association (FCCA), and the Northwest Cruise Ship Association (NWCA). The purpose of this document is to set forth cruise industry waste management practices and procedures that CLIA member cruise vessel operators have agreed to incorporate into their respective Safety Management Systems.

In the development of industry practices and procedures for waste management, the members of the Cruise Lines International Association have endorsed policies and practices based upon the following fundamental principles:

- Full compliance with applicable laws and regulations;
- Maintaining cooperative relationships with the regulatory community;
- Designing, constructing and operating vessels, so as to minimize their impact on the environment;
- Embracing new technology;
- Conserving resources through purchasing strategies and product management;
- Minimizing waste generated and maximize reuse and recycling;
- Optimizing energy efficiency through conservation and management;
- Managing water discharges; and
- Educating staff, guests and the community.

Discussion

Just as on shore, ship operations and passengers generate waste as part of many daily activities. On ships, waste is generated while underway and in port. Because ships move, the management of these wastes becomes more complicated than for land-based activities, as the facilities and laws change with the location of the ship. Facilities on the ships as well as management practices must be designed to take into account environmental laws and regulations around the world and the various local and state laws and regulations. Moreover, because waste management ultimately becomes a local activity, the local port infrastructure, service providers, and local waste disposal vendors are factors in the decision-making processes.

On an international level, environmental processes are an important part of the International Maritime Organization's (IMO's) policies and procedures for the maritime industry. CLIA member lines have agreed to incorporate environmental performance into Safety Management Systems (SMS) and MARPOL mandated Waste Management Manuals. Under agreements and laws specific to many nations, these programs are routinely reviewed by Port States to ensure compliance. For example, in the United States, the US Coast Guard has jurisdiction over environmental matters in ports and waterways and conducts passenger ship examinations that include review of environmental systems, SMS documentation and such MARPOL-mandated documents as the Oil Record Book and the Garbage Record Book. Within the United States, environmental laws and regulations apply include the Clean Water Act, the Refuse Disposal Act, the Resource Conservation and Recovery Act, The Clean Air Act, the Oil Pollution Act of 1990, and the Pollution Prevention Act, to name a few, which apply to all ships within U.S. waters.

The industry effort to develop waste management practices and procedures has focused on the traditional high volume wastes (garbage, graywater, blackwater, oily residues (sludge oil) and bilge water), pollution prevention, and the small quantities of hazardous waste produced onboard. In the process, CLIA members have shared waste management strategies and technologies, while focusing on a common goal of waste reduction.

The process of waste reduction includes waste prevention, the purchasing of products that have recycled content or produce less waste (e.g. source reduction), incineration, and recycling or reuse of wastes that are generated. The ultimate goal is to have the waste management culture absorbed into every facet of cruise vessel operation. A fully integrated system beginning with the design of the vessel should address environmental issues at every step.

Management practices for waste reduction should start before a product is selected. Eco-purchasing and packaging are vital to the success of any environmental program, as are strategies to change packaging, processes and management to optimize the resources used.

The commitment of the industry to this cooperative effort has been quite successful, as companies have shared information and strategies.

Industry Standard Waste Handling Procedures

CLIA member lines have agreed that hazardous wastes and waste streams onboard cruise vessels will be identified and segregated for individual handling and management in accordance with appropriate laws and regulations. They have further agreed, hazardous wastes will not be discharged overboard, nor be commingled or mixed with other waste streams.

A. **Hazardous Waste Collection and Storage onboard Ship:** *CLIA member lines have agreed that specific procedures for hazardous waste collection, storage and crew training will be addressed in each ship's SMS or equivalent onboard instruction in the Case of US registry vessels.*

B. **Photo Processing, Including X-Ray Development Fluid Waste:** *CLIA member lines have agreed to eliminate the discharge of silver from these sources into the marine environment through the use of best available technology that will reduce the silver content of the waste stream below levels specified by prevailing regulations or by treating all photo processing and x-ray development fluid waste (treated or untreated) as a hazardous waste and landing ashore in accordance with RCRA requirements.*

There are several waste streams associated with photo processing operations that have the potential to be regulated under the Resource Conservation and Recovery Act (RCRA). These waste streams include spent fixer, spent cartridges, expired film and silver flake.

Photographic fixer removes the unexposed silver compounds from the film during the developing process. The spent fixer can have as much as 2000-3000 parts per million (ppm) of silver. Silver bearing waste is regulated by RCRA as a hazardous waste if the level of silver exceeds 5 ppm as determined by the Toxicity Characteristic Leaching Procedure (TCLP) test.

Silver recovery units may be used to reclaim the silver from the used fixer waste stream. There are two types of recovery units. These are active (with electricity) and passive (without electricity) units. The active unit uses electricity to plate silver onto an electrode. The passive unit uses a chemical reaction between steel wool and silver to remove most of the silver from solution. Utilizing the best available technology, the equipment currently onboard CLIA member cruise ships is conservatively estimated to reduce the silver content of this effluent below 4 mg/l (milligrams/l or ppm)

Handling Method 1 Employed by Member Lines:

Treat used photographic and x-ray development fluids to remove silver for recycling.

Verify that the effluent from the recovery unit is less than 5 parts per million (ppm) silver, as measured by EPA-approved methodology.

After treatment, the residual waste stream fluid is non-hazardous and landed ashore as industrial waste.

Handling Method 2 Employed by Member Lines:

Used photographic and x-ray development fluids, either treated or untreated, may be assumed to be a hazardous waste. In this event, they are landed ashore in accordance with the requirements of the Resource Conservation and Recovery Act (RCRA).

C. **Dry-cleaning waste fluids and contaminated materials**: *CLIA member lines have agreed to prevent the discharge of chlorinated dry-cleaning fluids, sludge, contaminated filter materials and other dry-cleaning waste byproducts into the environment.*

Shipboard dry cleaning facilities use a chlorinated solvent called perchlorethylene (also known as PERC or tetrachloroethylene) as a dry cleaning fluid. This is the approved dry cleaning solvent for these units. Operators must receive specific required training for the correct use of this chemical and its associated precautions. This solvent should be used in accordance with all safety procedures including appropriate personal protective equipment (PPE).

The dry cleaning units produce a small volume waste from condensate, the bottoms of the internal recovery stills, waste products from button and lint traps, spent perchloroethylene and filter media. This waste is comprised of dirt, oils, filters material, and spent solvent. Each ship utilizing these dry-cleaning units produces approximately two pounds of waste material weekly. However, the amounts may vary greatly by season and passenger load. This material is classified as hazardous waste under RCRA and must be disposed of accordingly.

Handling Method 1 Employed by Member Lines:

Perchloroethylene (PERC) and other chlorinated dry-cleaning fluids, contaminated sludge and filter materials are hazardous waste and landed ashore in accordance with the requirements of RCRA.

C. **Print Shop Waste Fluids:** *CLIA member lines have agreed to prevent the discharge of hazardous wastes from printing materials (inks) and cleaning chemicals into the environment.*

Print shop waste may contain hazardous waste. Printing solvents, inks and cleaners all may contain hydrocarbons, chlorinated hydrocarbons, and heavy metals that can be harmful to human and aquatic species. Recent advances in printing technology and substitution of chemicals that are less hazardous reduces the volume of print shop waste generated and reduces the impact of these waste products.

CLIA member lines have agreed to utilize, whenever possible, printing methods and printing process chemicals that produce both less volume of waste and less hazardous waste products, that shipboard printers will be trained in ways to minimize printing waste generated, and that alternative printing inks such as soy based, non-chlorinated hydrocarbon based ink products will be used whenever possible. The member lines have further agreed that all print shop waste including waste solvents, cleaners, and cleaning cloths will be treated as hazardous waste, if such waste contains chemical components that may be considered as hazardous by regulatory definitions, and that all other waste may be treated as non-hazardous.

Handling Method 1 Employed by Member Lines:

When using traditional or non-soy based inks and chlorinated solvents, all print shop waste is treated as hazardous, and discharged ashore in accordance with RCRA.

Handling Method 2 Employed by Member Lines:

Shipboard printing processes use non-toxic based printing ink such as soy based, non-chlorinated solvents, and other non-hazardous products to eliminate hazardous waste products.

D. **Photo Copying and Laser Printer Cartridges**: *CLIA member lines have agreed to initiate procedures so as to maximize the return of photocopying and laser printer cartridges for recycling, and in any event, have agreed that these cartridges will be landed ashore.*

Increased use of laser and photo copying equipment on shore as well as onboard ship results in the generation of increased volumes of waste cartridges, inks, and toner materials. CLIA member lines have agreed to use only such inks, toners and printing/copying cartridges that contain non-hazardous chemical components, and that none of these cartridges or their components should be disposed of by discharge into the marine environment. In recognition of the member lines' goal of waste minimization, they have further agreed these cartridges should, whenever possible, be returned to the manufacturer for credit, recycling, or for refilling.

Handling Method Employed by Member Lines:

CLIA member lines have agreed that wherever possible, photo copying and laser printer cartridges will be collected, packaged and returned for recycling and when this is not possible, that these materials will not be discharged into the sea or other bodies of water but will be handled as other shipboard waste that is landed ashore for further disposal.

F. **Unused And Outdated Pharmaceuticals**: *CLIA member lines have agreed to ensure that unused and/or outdated pharmaceuticals are effectively and safely disposed in accordance with legal and environmental requirements.*

In general ships carry varying amounts of pharmaceuticals. The pharmaceuticals carried range from over-the-counter products such as anti-fungal creams to prescription drugs such as epinephrine. Each ship stocks an inventory based on its itinerary and the demographics of its passenger base. CLIA member lines have agreed that all pharmaceuticals will be managed to ensure that their efficacy is optimized and that disposal is done in an environmentally responsible manner.

CLIA member lines have further agreed that when disposing of pharmaceuticals, the method used will be consistent with established procedures, and that pharmaceuticals and medications which are off specification or which have exceeded their shelf-life, and stocks that are unused and out of date, cannot be used for patients and therefore will be removed from the ship. Further, each regulatory jurisdiction has a posting of listed pharmaceuticals that must be considered hazardous waste once the date has expired or the item is no longer considered good for patient use.

Through onboard management of the medical facility, CLIA member lines have agreed that stocks of such listed pharmaceuticals are returned to the vendor prior to date of expiration. Pharmaceuticals that are being returned and which have not reached their expiration date are shipped using ordinary practices for new products.

Safety and Health

CLIA member lines have agreed that all expired listed pharmaceuticals will be handled in accordance with established procedures and all personnel handling this waste will receive

appropriate training in the handling of hazardous materials. As guidance, the US Environmental Protection Agency (EPA) has issued a report that clarifies the fact that residuals, such as epinephrine, found in syringes after injections are not considered an acutely hazardous waste by definition and may be disposed of appropriately in sharps containers. Member lines have agreed that all Universal Precautions will be adhered to when handling sharps.

Handling Method 1 Employed by Member Lines:

Establish a reverse distribution system for returning unexpired, unopened non-narcotic pharmaceuticals to the original vendor.

Handling Method 2 Employed by Member Lines:

Appropriately destroy narcotic pharmaceuticals onboard ship in a manner that is witnessed and recorded.

Handling Method 3 Employed by Member Lines:

Land listed pharmaceuticals in accordance with local regulations. Listed pharmaceuticals are a hazardous waste having chemical compositions which prevent them from being incinerated or disposed of through the ship's sewer system. Listing of such pharmaceuticals may vary from state to state.

Handing Method 4 Employed by Member Lines:

Dispose of other non-narcotic and non-listed pharmaceuticals through onboard incineration or landing ashore.

G. Fluorescent and Mercury Vapor Lamp Bulbs: *CLIA member lines have agreed to prevent the release of mercury into the environment from spent fluorescent and mercury vapor lamps by assuring proper recycling or by using other acceptable disposal methods.*

Fluorescent and Mercury Vapor lamps contain small amounts of mercury that could potentially be harmful to human health and the environment. To prevent human exposure and contamination of the environment, CLIA member lines have agreed that these lamps will be handled in an environmentally safe manner. Recycling of mercury from lamps and other mercury containing devices is the preferred handling method and is encouraged by various states. The recycling of fluorescent lamps and high intensity discharge (HID) lamps keeps potentially hazardous materials out of landfills, saves landfill space and reduces raw materials production needs.

The recycling of fluorescent and HID lamps is a proven technology capable of reliably recovering greater than 99 percent of the mercury in the spent lights. At the recycling facility, this is done by using a crush-and-sieve method. In this process, the spent tubes are first crushed and then sieved to separate the large particles from the mercury containing phosphor powder. The phosphor powder is collected and processed under intense heat and negative pressure, a process called retorting. The mercury is volatized and then recovered by condensation. The glass particles are segregated and recycled into other products such as fiberglass. Aluminum components are also recycled separately.

Storage and handling of used lamp bulbs pose no compatibility problems. Disposal of the glass tubes can be accomplished by (1) processing with shipboard lamp crusher units that filter and adsorb the mercury vapor through H.E.P.A. and activated carbon or (2) by keeping the glass tubes intact for recycling ashore. The intact lamps or crushed bulbs are classified as "Universal Waste" when they are shipped to a properly permitted recycling facility; as such, testing is not required. The filters are disposed of as a hazardous waste in accordance with applicable US EPA or other prevailing laws and regulations.

Handling Method Employed by Member Lines:

(1) Fluorescent and mercury vapor lamps are collected and processed aboard by lamp crusher units and disposed of as stated above; or

(2) Fluorescent and mercury vapor lamps are collected intact and landed for recycling or disposal in accordance with prevailing laws and regulations.

H. Other Mercury Containing Products: *CLIA Member lines have agreed to prevent the discharge of mercury containing products into the sea.*

Reduction in use: Where feasible, CLIA members will reduce the use of mercury containing products.

Disposal: Once mercury-containing products are no longer able to be used, or require disposal, these products shall be landed ashore as universal or hazardous waste as appropriate.

I. Batteries: *CLIA member lines have agreed to prevent the discharge of spent batteries into the marine environment.*

If not properly disposed of, spent batteries may constitute a hazardous waste stream. Most of the large batteries are on tenders and standby generators. Small batteries used in flashlights and other equipment and by passengers, account for the rest. There are four basic types of batteries used.

Lead-acid batteries – These are used in tenders and standby generators. They are wet, rechargeable, and usually six-celled. They contain a sponge lead anode, lead dioxide cathode, and sulfuric acid electrolyte. The electrolyte is corrosive. These batteries require disposal as a hazardous waste, unless recycled or reclaimed.

Lead-acid batteries use sulfuric acid as an electrolyte. Battery acid is extremely corrosive, reactive and dangerous. Damaged batteries will be drained into an acid-proof container. A damaged and leaking battery is then placed in another acid-proof container, and both the electrolyte and the damaged battery placed in secure storage for proper disposal as a hazardous waste.

Nickel-cadmium (NiCad) batteries – These are usually rechargeable, and contain wet or dry potassium hydroxide as electrolyte. The potassium hydroxide is corrosive and the cadmium is a characteristic hazardous waste. Therefore, NiCad batteries will be disposed of as hazardous waste, unless recycled or reclaimed.

Lithium batteries – These are used as a power source for flashlights and portable electronic equipment. All lithium batteries will be disposed of as hazardous waste, or sent out for reclamation.

Alkaline batteries – These are common flashlight batteries and are also used in many camera flash attachments, cassette recorders, etc. They should be recycled, properly disposed or reclaimed.

Handling Method Employed by Member Lines:

Spent batteries are collected and returned for recycling and/or disposal in accordance with prevailing regulations. Discarded batteries are isolated from the refuse waste stream to prevent potentially toxic materials from inappropriate disposal. The wet-cell battery-recycling program is kept separate from the dry battery collection process. Intact wet-cell batteries are sent back to the supplier. Dry-cell batteries are manifested to a licensed firm for recycling.

J. Bilge and Oily Water Residues: *CLIA member lines have agreed to meet or exceed the international requirements for removing oil from bilge and wastewater prior to discharge.*

The area of the ship at the very bottom of the hull is known as the bilge. The bilge is the area where water collects from various operational sources such as water lubricated shaft seals, propulsion system cooling, evaporators, and other machinery. All engine and machinery spaces also collect oil that leaks from machinery fittings and engine maintenance activities. In order to maintain ship stability and eliminate potential hazardous conditions from oil vapors in engine and machinery spaces, the bilge spaces should be periodically pumped dry. In discharging bilge and oily water residues, both international regulations (MARPOL) and United States regulations require that the oil content of the discharged effluent be less than 15 parts per million and that it not leave a visible sheen on the surface of the water.

All ships are required to have equipment installed onboard that limits the discharge of oil into the oceans to 15 parts per million when a ship is en route and provided the ship is not in a special area where all discharge of oil is prohibited. Regulations also require that all oil or oil residues, which cannot be discharged in compliance with these regulations, be retained onboard or discharged to a reception facility. The equipment and processes implemented onboard cruise ships to comply with these requirements are complex and sophisticated.

The term "*en route*" as utilized in MARPOL (73/78) Regulation 9(b) is taken to mean while the vessel is underway. The U.S. Coast Guard has informed CLIA that it agrees with this meaning of "*en route.*"

In accordance with MARPOL (73/78) Regulation 20 and as appropriate, US regulations (33CFR151.25), CLIA member lines have agreed that every cruise ship of 400 gross tons and above shall be provided with an oil record book which shall be completed on each occasion whenever any of numerous specified operations take place in the ship and that operations include:

a. Ballasting or cleaning of fuel oil tanks,
b. Discharge of dirty ballast or cleaning water from the fuel oil tanks above,
c. Disposal of oily residues,
d. And discharge of bilge water that accumulated in machinery spaces.

Requirements regarding the keeping of an Oil Record Book as well as the form of the Oil Record Book are also found in MARPOL and in U.S. Coast Guard regulations (33CFR151).

Handling Method Employed by Member Lines:

Bilge and oily water residue are processed prior to discharge to remove oil residues, such that oil content of the effluent is less than 15 ppm as specified by MARPOL Annex 1.

K. Glass, Cardboard, Aluminum and Steel Cans: *CLIA member lines have agreed to eliminate, to the maximum extent possible, the disposal of MARPOL Annex V wastes into the marine environment. This will be accomplished through improved reuse and recycling opportunities. They have further agreed that no waste will be discharged into the marine environment unless it has been properly processed and can be discharged in accordance with MARPOL and other prevailing requirements.*

Management of shipboard generated waste is a challenging issue for all ships at sea. This is true for cruise vessels, other commercial vessels, military ships, fishing vessels and recreational boats. Waste products in the past were made from natural materials and were mostly biodegradable. Today's packaging of food and other products present new challenges for waste management. A large cruise ship today can carry over three thousand passengers and crew. Each day, an average cruise passenger will generate two pounds of dry trash and dispose of two bottles and two cans.

A strategy of source reduction, waste minimization and recycling has allowed the cruise industry to significantly reduce shipboard generated waste. To attain this, CLIA member lines have agreed to adopt a multifaceted strategy that begins with waste minimization to decrease waste from provisions brought onboard. This means purchasing in bulk, encouraging suppliers to utilize more efficient packaging, reusable packaging, and packaging materials that are more environmentally friendly—those that can be more easily disposed of or recycled. In fact, through this comprehensive strategy of source reduction, total waste on passenger vessels has been reduced by nearly half over the past ten years.

Another important component of the industry's waste reduction strategy is product or packaging recycling. Glass, aluminum, other metals, paper, wood and cardboard are, in most cases, recycled. Wood and cardboard may be incinerated when appropriate.

Handling Method Employed by Member Lines:

MARPOL Annex V ship waste is minimized through purchasing practices, reuse and recycling programs, landing ashore and onboard incineration in approved shipboard incinerators. Any Annex V waste that is discharged at sea will be done in strict accordance with MARPOL and any other prevailing requirements.

L. Incinerator Ash: *CLIA member lines have agreed to reduce the production of incinerator ash by minimizing the generation of waste and maximizing recycling opportunities, and that the discharge of incinerator ash containing hazardous components will be prevented through a program of waste segregation and periodic ash testing.*

Incinerator ash is not normally a hazardous waste. Through relatively straightforward waste management strategies, items that would cause the ash to be hazardous are separated from the waste stream and handled according to accepted hazardous waste protocols. In general, source segregation for waste streams is foundational for onboard waste management and is incorporated into the waste management manual required by MARPOL. Waste management for onboard waste streams include the following: source reduction, minimization, recycling, collection, processing and discharge ashore. This allows the incinerator to be used primarily for food waste, contaminated cardboard, some plastics, trash and wood.

Member lines have agreed that incinerator ash will be tested at least once quarterly for the first year of operation to establish a baseline and that testing may then be conducted once a year. The member lines have further agreed that a recognized test procedure will be used to demonstrate that ash is not a hazardous waste. A recognized test procedure includes the following metals as indicators for toxicity - arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. Special attention is placed on the removal of batteries from the incinerator waste stream. The use of incinerators saves landfill space and prevents the build up of material onboard that could become the breeding ground for insects, rodents and other vermin.

Handling Method Employed by Member Lines:

Proper hazardous waste management procedures are to be instituted onboard each ship to assure that waste products, which will result in a hazardous ash, are not introduced into the incinerator. Non-hazardous incinerator ash may be disposed of at sea in accordance with MARPOL Annex V. Ash identified as being hazardous is disposed of ashore in accordance with RCRA.

M. Wastewater reclamation

Because of the amounts of fresh water involved, and its restricted availability onboard ship (all fresh water must be either purchased or generated onboard), fresh water is a valuable commodity. Therefore, water management is extremely important and takes the form of both minimizing water usage and the potential reclamation and reuse of water for non-potable purposes. Many CLIA companies are researching new technology and piloting graywater treatment systems onboard their vessels. CLIA member operators also take numerous steps in onboard water management. Water management techniques include:

a. Use of technical water (for example: air conditioning condensate) where possible.
b. Use of water recovery systems (for example: filtering and reuse of laundry water – last rinse use for first wash).
c. Reclamation and reuse as technical water (flushing toilets, laundry, open deck washing) of properly treated and filtered wastewaters.
d. Active water conservation (for example: use of reduced flow showerheads, vacuum systems for toilets, vacuum food waste transportation and laundry equipment that utilizes less water).

N. Graywater: *For ships traveling regularly on itineraries beyond the territorial waters of coastal states, CLIA member lines have agreed to discharge graywater only while the ship is underway and proceeding at a speed of not less than 6 knots[1]; that graywater will not be discharged in port and will not be discharged within 4 nautical miles from shore or such other distance as agreed to with authorities having jurisdiction or provided for by local law except in an emergency, or where geographically limited. The member lines*

have further agreed that the discharge of graywater will comply with all applicable laws and regulations. For vessels whose itineraries are fully within US territorial waters, discharge shall comply fully with U.S. and individual state legislation and regulations.

The term graywater is used on ships to refer to wastewater that is generally incidental to the operation of the ship. The International Maritime Organization (IMO) defines graywater as including drainage from dishwasher, shower, laundry, bath and washbasin drains. The US Clean Water Act (formally know as the Federal Water Pollution Control Act) includes galley, bath and shower water in its definition of graywater. The US regulations implementing this act do not include a further definition of gray water. However, the regulations do include a provision that exempts all of the wastewater included in the IMO definition and other discharges incidental to the operation of a ship from the Clean Water Act's permitting program (formally known as the National Pollution Discharge Elimination System (NPDES) program). Finally, the US Coast Guard regulations include provisions that essentially combine the two definitions from the IMO and the Clean Water Act. None of the definitions of graywater include blackwater (discussed below) or bilgewater from the machinery spaces. Recent U.S. Legislation places limits on the discharge of graywater in the Alaska Alexander Archipelago.

Handling Method Employed by Member Lines:

Graywater is discharged only while ships are underway and proceeding at a speed of not less than 6 knots, in recognition that dispersal of these discharges is desirable and that mixing of these waters, which are discharged approximately 10-14 feet below the surface, by the action of the propellers and the movement of the ship, provides the best dispersal available.

O. Blackwater: *Waste from toilets, urinals, medical sinks and other similar facilities is called "blackwater." CLIA members have agreed that all blackwater will be processed through a Marine Sanitation Device (MSD), certified in accordance with U.S. or international regulations, prior to discharge. For ships traveling regularly on itineraries beyond the territorial water of coastal states, discharge will take place only when the ship is more than 4 miles from shore and when the ship is traveling at a speed of not less than 6 knots.* [1]

For vessels whose itineraries are fully within US territorial waters, discharge shall comply fully with U.S. and individual state legislation and regulations.

P. Advanced Wastewater Purification Systems:

To improve environmental performance, cruise lines are testing and installing wastewater purification systems that utilize advanced technologies. These onboard wastewater treatment systems are designed to result in effluent discharges that are of a high quality and purity; for example, meeting or surpassing standards for secondary and tertiary effluents and reclaimed water. Effluents meeting these high standards would not be subjected to the strict discharge limitations previously discussed.

[1] For vessels operating under sail, or a combination of sail and motor propulsion, the speed shall not be less than 4 knots.

Q. Training and Educational Materials

Training is an important and ongoing part of every position and tasking onboard cruise ships. Not only is training necessary for the safe and economical operation of a ship, it is required by numerous international conventions and flag state regulations. The International Convention on Standards of Training Certification and Watchkeeping (STCW) for example, sets forth requirements for knowledge, experience and demonstrated competency for licensed officers of the deck and engineering departments and for ratings forming part of the navigation or engineering watch. Equivalent national standards apply to ships in United States registry. These detailed requirements address not only the navigation of the ship but also the proper operation of the shipboard machinery and knowledge of and ability to assure compliance with the environmental protection requirements of MARPOL and the safety regulations of The International Convention on Safety of Life at Sea (SOLAS). SOLAS also requires that the ship's training manual (which contents are prescribed by regulation) be placed in the crew messes and recreation rooms or in individual crew cabins.

CLIA member lines have developed programs that raise the level of environmental awareness on the part of both the passengers and the crew. Each ship's crew receives training regarding shipboard safety and environmental procedures. Advanced training in shipboard safety and environmental management procedures is provided for those directly involved in these areas. Those directly responsible for processing wastes are given specific instruction in their duties and responsibilities and in the operation of the various equipment and waste management systems. Specific actions that our member lines have taken to train employees and increase passenger awareness include:

a. Announcements over the public address system and notices in ship newsletters that caution against throwing any trash overboard,
b. Signage and colorful posters placed in crew and passenger areas encouraging environmental awareness and protection,
c. Safety and environmental information booklets in crew cabins and crew lounges,
d. Regular meetings of ship safety and environmental committees consisting of officers and crew from all departments to review methods of improving performance, including better and more effective environmental practices.

For ships on an international voyage, STCW, SOLAS, the International Management Code for the Safe Operation of Ships and for Pollution Prevention (ISM Code), require that training be fully documented. Individual training is documented in each crewmember's file. Ship training exercises, such as fire drills and emergency response exercises, are documented in the appropriate ship's logs. All of these training documents are required to be available for oversight examination by both the ship's flag state inspectors and by port state authorities such as the United States Coast Guard.

Placards warning of the prohibition of the discharge of oil are posted on all ships operating in the navigable waters of the United States as required by U.S. Coast Guard regulations (33CFR155.450). Additionally, as part of required shipboard waste management plans, both Coast Guard regulations (33CFR151.59) and MARPOL (Annex V Regulation 9) require the posting of placards that notify the passengers and the crew of the disposal requirements for garbage. These placards are to be written in the official language of the State whose flag the ship is entitled to fly and also in English or French if neither of these is the official

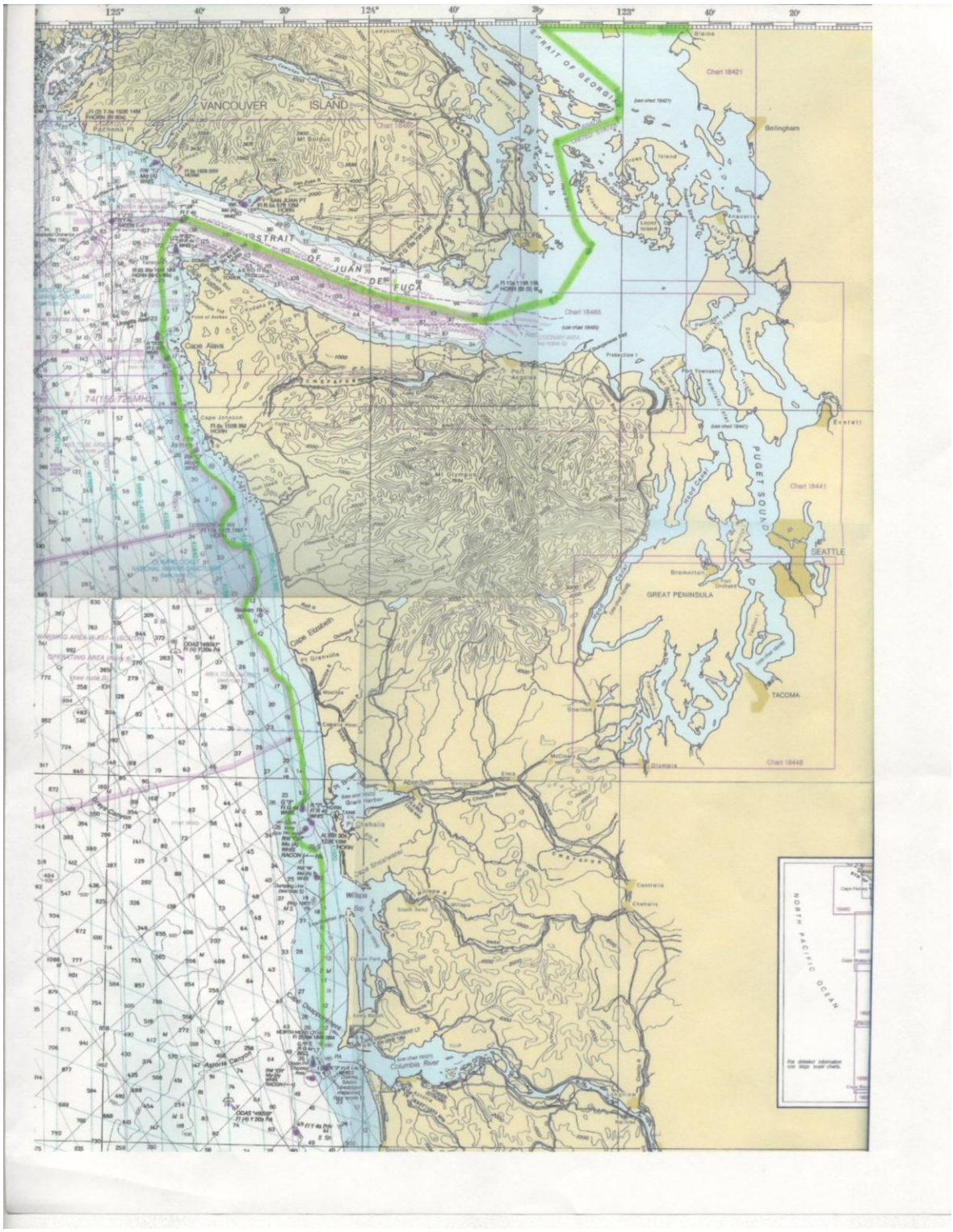
language. Once again, oversight of compliance with these requirements is conducted by ISM audits and frequent inspections by flag states and the United States Coast Guard.

For those ships on an international voyage, the Safety of Life at Sea Convention mandates compliance with the ISM Code. This comprehensive Code requires that each vessel operating company and each vessel participate in a_very strictly defined management program, under both internal and external audit and regulatory oversight that sets forth detailed procedures for assuring compliance with safety, environmental protection, emergency response and training mandates.

Equivalent equipment, practices and procedures

CLIA member lines have agreed that the use of equivalent or other acceptable practices and procedures shall be communicated to CLIA. As appropriate, such practices and procedures shall be included as a revision to this document. As an example, when improved systems for treating blackwater and graywater are perfected, shown to meet the requirements for MSDs and accepted by appropriate authorities for the treatment of graywater, the new systems and associated technology will be included together with their impact on the current standard of discharging graywater only while underway.

Appendix iii:
Navigational Chart of Waters Subject to this MOU



Appendix iv

U.S. Department of Homeland Security

United States Coast Guard

Commandant
United States Coast Guard

2100 Second Street, S.W.
Washington, DC 20593-0001
Staff Symbol: G-MOC-2
Phone: (202) 267-2978
Fax: (202) 267-0506
Email: fldr-g-moc@comdt.uscg.mil

COMDTPUB P16700.4
NVIC 04-04

13 FEBRUARY 2004

NAVIGATION AND VESSEL INSPECTION CIRCULAR NO. 04-04

Subj: ENVIRONMENTAL INSPECTION CHECKLIST; ADDENDUM TO FOREIGN PASSENGER VESSEL EXAMINATION BOOK, CG-840

Ref: (a) General Accounting Office (GAO) Report of February 2000 on "MARINE POLLUTION - Progress Made to Reduce Marine Pollution by Cruise Ships, but Important Issues Remain."
(b) Title XIV "Certain Alaskan Cruise Ship Operations" contained in Section 1(a)(4) of Public Law 106-554 enacted on December 21, 2000
(c) 33 CFR 159, Subpart E – Discharge of Effluents in certain Alaskan Waters by Cruise Vessel Operations
(d) Memorandum of Understanding (MOU) dated March 14, 2000 entered between Florida Department of Environmental Protection (FDEP) and the Florida-Caribbean Cruise Association (FCCA), a representative of the cruise industry in Florida
(e) International Council of Cruise Lines (ICCL) Industry Standard E-01-01, "Waste Management Practices and Procedures"

1. PURPOSE. As the result of a GAO report and Bluewater Network petition, the FCCA, FDEP, and the Coast Guard began discussing the means to improve and ensure the compliance of large passenger vessels with existing Federal and state environmental standards. These discussions have resulted in the checklist contained in Enclosure 1. This checklist is an extensive list of possible inspection items related to pollution prevention equipment, operation, plans and records. It is intended as a job aid to be used by Coast Guard personnel during certificate of compliance examinations onboard foreign-flagged passenger vessels. Additionally, this document does not change or establish new Coast Guard authorities, but is intended to provide

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	a	b	c	d	e	f	g	h	l	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z
A																										
B	*	1	1											1				1								1
C					1							1	1	1												
D	1										1															
E														1	1											
F																										
G																										
H																										

NON-STANDARD DISTRIBUTION: B:a G-MOC, G-MO-1, G-MSE (1)

a framework and focus on responsibilities currently possessed. This checklist will be incorporated into a future revision of the existing Foreign Passenger Vessel Examination Book, CG-840.

2. ACTION. Officers in Charge Marine Inspections (OCMIs) and their designated marine inspectors should:

   a. Bring this circular to the attention of appropriate individuals in the marine industry within their zones, especially those in the industry who are not members of ICCL. This circular is available on the world-wide web at: **http://www.uscg.mil/hq/g-m/nvic/index.htm.** Internet release authorized.

   b. Follow the guidance in this circular while conducting Certificate of Compliance examinations on foreign-flag passenger vessels, choosing one of the five waste streams to inspect.

   c. If any non-conformities are noted between the procedures listed in the vessel's Safety Management System (SMS) documentation and the actual procedures being followed on the ship, notify the Company immediately and follow the guidance contained in NVIC 4-98. If major non-conformities are identified, an OCMI should use risk-based decision-making and exercise discretion with regard to the level of control action utilized on the vessel.

   d. If deficiencies or discrepancies are noted in the execution of the hazardous waste management program, notify the applicable Environmental Protection Agency (EPA) office or the State Resource Conservation and Recovery Act (RCRA) program office immediately.

3. DIRECTIVES AFFECTED. The existing Foreign Passenger Vessel Examination Books CG-840, CV1, CV2 and CV3 will be revised to include the checklist contained in Enclosure (1), as soon as practicable.

4. BACKGROUND.

   a. From 1993 to 1998, nearly 2400 documented cases of pollution by foreign-flagged vessels were investigated, of which nearly four percent involved passenger vessels. As a result, Congress requested the GAO to examine the nature and extent of cruise ship involvement in these incidents; current and planned federal agency enforcement efforts; and cruise company actions to prevent future recurrences of pollution incidents. On February 1, 2000, the GAO completed a report to Congress, reference (a), recommending that the Coast Guard initiate discussions with the cruise ship industry, other federal and state agencies, and environmental groups as appropriate, on the need for improved water quality standards for gray water and black water discharged from cruise ships and other vessels. In addition, the report recommended an assessment of the need to periodically monitor the water quality of these discharges. This GAO report is available on the world-wide web for review at **http://frwebgate. access.gpo.gov/cgi-bin/useftp.cgi?IPaddress=162.140.64.21 &filename=rc00048.pdf&directory=/diskb/wais/data/gao.**

b. At the time reference (a) became public, federal responsibilities were in place for various vessel waste stream control systems including effluent from the oily water separators, effluent from the sewage treatment plants, hazardous waste, and garbage. Subsequently, legislation was passed and regulations were promulgated (see references (b) and (c)) that expanded federal responsibilities to include requirements for gray water discharge and for monitoring and sampling of black water and gray water waste streams on cruise ships in Alaska[1].

c. On March 14, 2000, the Florida Caribbean Cruise Association (FCCA) signed a MOU with the Florida Department of Environmental Protection (FDEP), reference (d), that is available for review on the world-wide web at **http://www.iccl.org/resources/fdep_mou.htm.** Under this MOU, the FDEP recognized ICCL's Industry Standard E-01-01, "Waste Management Practices and Procedures," reference (e), as meeting or exceeding the standards set forth in Florida laws and applicable regulations. Though not a party to the MOU, the Coast Guard participated in discussions that resulted in the MOU. In the MOU, the FDEP recognized the Coast Guard as the primary federal agency with responsibility for examining passenger vessel waste streams. As a result, the Coast Guard worked in conjunction with FDEP and ICCL to develop a checklist related to monitoring of hazardous waste and disposal.

5. DISCUSSION. The enclosed checklist reflects the collective work of the USCG, FCCA and FDEP and has been tested for use by several Coast Guard Marine Safety Offices. The checklist is not a listing of all items to be inspected; rather the marine inspector should use it as a reminder of the various items that may be examined during a certificate of compliance examination of a foreign passenger vessel. As always, the marine inspector's experience, knowledge, and judgment will determine the depth and scope of each examination. However, each marine inspector should select at least one waste stream for a thorough and detailed inspection during every annual or periodic foreign passenger vessel examination. The stream selection will be based on the marine inspector's discretion, taking into account the inspector's impression about the condition of the various waste stream systems on board the vessel. The selection will also be based on the need to inspect all systems over a reasonable period of time, whether a particular waste stream is applicable for examination (e.g. there may be no requirement applicable to gray water at the port of examination or the vessel does not discharge/offload hazardous waste), and maintaining randomness so that the operator has no advance knowledge of the waste stream that may be selected. During the examination, the operator should be able to present to the marine inspector a clear description of the practices and procedures for handling each waste stream and also to produce such records, as the inspector might need to verify compliance with these guidelines. In performing pollution prevention examinations, inspectors should be especially familiar with the contents of the Marine Safety Manual (MSM), Volume II, Material Inspection, Section B, Chapter 6, "Pollution Prevention," and Section C, Chapter 2, Paragraph K, "Marine Sanitation Devices" and this NVIC. Marine inspectors should also be familiar with ICCL's Industry Standard E-01-01 "Waste Management Practices and Procedures", reference (e), and the vessel's Safety Management System (SMS) documentation, which should address all the elements discussed in

1 Presently, there are no other federal requirements **applicable to the control or filtering of gray water discharge from foreign-flagged passenger ships.**

this standard. Note reference (e) is available at the ICCL website at **http://www.iccl.org/resources/exhibit a.pdf.** If any elements are not addressed there should be a rationale for its omission. The different waste streams may be categorized as follows:

a. Oil pollution prevention systems: include the oily water separator, the fuel/lubricating oil transfer, and sludge containment system. The marine inspector should verify that the oily water separator is operating within the desired range; that the alarms are working; that crew is knowledgeable and operating instructions are posted; and that maintenance is carried out at regular intervals. Actual piping may be verified against the approved piping diagram if the marine inspector notices modifications made to the system.

b. Black water system: includes marine sanitation devices (MSDs) and other systems to treat, store, and discharge sewage. The checklist is designed to guide the marine inspector through some basic questions to ascertain whether the system is working as designed and that the crew is properly trained in its operation. For example, does the MSD appear to be properly installed? Is the MSD approved for use on this particular vessel (USCG Approved, IMO or Administration Approved to MARPOL Annex IV)? Is there adequate capacity or throughput for the number of persons on board? Are maintenance procedures being followed, including procedures outlined in the vessel's SMS? Are there records of expendables being ordered: filters, chemicals, et cetera? Are the units operating within the manufacturer's design specifications? Are there clear and simple operating instructions? Is the crew knowledgeable in the use of the equipment/system?

c. Hazardous waste: includes dry cleaning (containing Perchloroethylene, or commonly-called "PERC") waste, used paints and thinners that contain hazardous substances, silver-bearing photo-processing waste, cleaning solutions and other items that contain hazardous substances. Each vessel may vary in both the type and volumes of hazardous waste generated depending on the technology and processes used aboard. This checklist is designed to evaluate onboard management of hazardous waste streams, to ensure that hazardous constituents are not released into the environment, and that accountability is demonstrated via adequate waste disposal records.

d. Non-hazardous waste: includes shipboard garbage including plastics and synthetic material, medical waste, food wastes and recyclables such as glass, cardboard, aluminum and metal cans. Items to be checked should include: disposal and incineration records; waste sorted to prevent hazardous waste from entering the non-hazardous waste stream; no plastics or synthetics discharge overboard; separate and proper disposal of hazardous and non-hazardous incinerator ash; and proper disposal of cooking grease from grease traps.

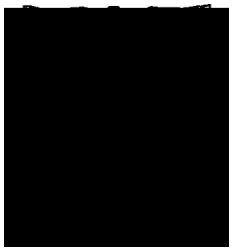
e. Gray water system: includes discharges from galley, sinks, washbasin drains, showers, and baths, excluding drains and sinks from medical spaces. These may be held in large tanks before being pumped overboard. The handling and discharge of gray water will *vary* from ship to ship and the inspector should ensure the procedures followed by the ship correspond to those described in its SMS documentation. If gray water is directed to MSD systems, the marine inspector shall ensure that combined gray water/black water throughput does not exceed the throughput of the MSD systems. Other waste streams such as hazardous waste

or medical waste must also not be mixed with gray water. Drains from hospitals, photo labs (if hazardous substances are used and stored therein), and slops, must be separate from the gray water system.

T. H. GILMOUR
Rear Admiral, U. S. Coast Guard
Assistant Commandant for Marine Safety,
Security, and Environmental Protection

Encl: (1) Foreign Passenger Vessel Pollution Survey Exam Book (CG-840 PSEB)

United States Coast Guard



FOREIGN PASSENGER VESSEL POLLUTION SURVEY EXAM BOOK

(FOR ALL PASSENGER VESSELS)

Name of Vessel	**Flag** ☐ No Change
IMO Number	**Case Number**
Date Completed	
Location	
Senior Marine Inspectors / Port State Control Officers	
1.	5.
2.	6.
3.	7.
4.	8.

Use of Foreign Passenger Vessel Pollution Survey Exam Book

This Checklist is an extensive list of possible examination items related to pollution prevention equipment, operation, plans and records. It is intended as a job aid to be used by Coast Guard senior marine inspectors during boardings of foreign-flagged passenger vessels. It is not the Coast Guard's intention to inspect all the items listed in the checklist at every exam; rather the inspector should use it as a reminder of the various items that may be examined during a foreign passenger vessel certificate of compliance examination. As always, the inspector's experience, knowledge, and judgment will determine the depth and scope of each examination; however, the inspector should select at least one waste stream for a thorough and detailed inspection. The stream selection will be based on the marine inspector's discretion, taking into account the inspectors impression about the condition of the various waste stream systems on board the vessel, weighing the need to inspect all systems over a reasonable period of time, and maintaining randomness so that the operator has no advance knowledge of the waste stream that may be selected.

It is incumbent on the vessel operator to be familiar with this checklist. The individuals responsible for different segments of the various waste streams should be able to present to the inspector a clear description of the practices and procedures for handling each waste stream and also to produce such records, as the marine inspector might need, to verify compliance with these guidelines. Inspectors should obtain a clear picture about the selected waste stream(s) and associated environmental processes by observing onboard practices and through questioning of the individuals that perform these practices. Inspectors should avoid circumstances in which a shore-side representative is the sole company liaison during the environmental inspection.

As a port state responsibility, marine inspectors and port state control officers must verify that the vessels and their crews are in substantial compliance with international conventions and applicable U.S. laws. The marine inspectors and port state control officers, based on their observations, must determine the depth and scope of the examination.
This document does not establish or change Federal laws or regulations. References given are only general guides. Refer to IMO publications, United States Code, Code of Federal Regulations, the Port State Control Job Aid, NVIC's, and any locally produced guidance for specific regulatory references. Marine inspectors should be especially familiar with all equipment standards and the contents of the Marine Safety Manual (MSM), Volume II, Material Inspection, Section B, Chapter 6, "Pollution Prevention," Section C, Chapter 2, Paragraph K, "Marine Sanitation Devices," and Volume IV, Technical, Chapter 3, Section K, "Special Engineering Applications for Pollution Prevention".

NOTE: *Guidance on how to examine foreign passenger vessels for compliance with pollution prevention equipment standards, can be found in NVIC _-04.*

Conducting the exam

- ❑ Complete Certificates/Equipment Data/Records information (Section A).
- ❑ Review SMS Environmental Procedures (Section B).

❑ Examine MSD, OWS, Garbage logs, Oil Record Book as per CG-840 Exam books.

❑ Determine if gray water requirements apply in the vessel's AOR and in inspection zone (If not, do not select C2)

❑ Make waste stream selection for a detailed exam (Section C)
Section
C1 Oil Pollution Handling Waste Stream (Bilge, Sludge, Fuel, Lube Oil etc)
C2 Gray Water Waste Stream
C3 Black Water/Sewage Waste Stream
C4 Hazardous Waste Stream
C5 Non-hazardous Waste Stream

NOTE: Many items listed are not mandatory requirements, but fall under the umbrella of "Management Policy". Marine inspectors should be familiar with ICCL's Industry Standard E-01-01 "Waste Management Practices and Procedures," and SMS documentation on all cruise ships should address all the elements discussed in this standard. If any elements are not addressed there should be a rationale for its omission. If the areas listed are corporate policy as set out in the company's SMS documentation, then the vessel should be held accountable for the actions as required in 33 CFR 96 and SOLAS Chapter IX. If state or local laws exist that are more stringent than U.S. or international law, then the local or state laws must be followed. These vessels are not exempt simply because they are a foreign-flagged vessel.

Pre-inspection Items

- Review MISLE records
- Deficiency History
  - Critical Profile
- Review Court-ordered requirements and environmental audit reports, if applicable
  CG Activity History
  Print Center for Disease Control Green Sheet
  http://www2. cdc.gov/nceh/vsp/vspmain. asp

Post-inspection Items

- Issue letters/certificates to vessel
- Issue Port State Control Report of Inspection-Form A
- Issue Port State Control Report of Inspection-Form B (if needed)
- Complete COC endorsement (include "Waste Stream" area inspected)
- MISLE activity case

Certificates / Reports (complete at annual exam or to update MISLE Certificate data)

Name of Certificate	Issuing Agency	ID #	Port Issued	Issued Date	Expiration Date	No Change	Endorsement Date
International Oil Pollution Prevention (leave blank if completed in the CVE 840 book							
International Sewage Pollution Prevention Certificate (if issued)							
International Anti-Fouling System Certificate (if issued)							
State Certificates of Emission (only if applicable)							
State Certificates of Ballast Water (only if applicable)							

Equipment Data

Equipment Name	Capacity		US or MEPC Approval Nr	Authority/Agency	No Change	Date of approval/acceptance
Oily Water Separator	Throughput					
Oily Water Separator	Throughput					
Oily Water Separator	Throughput					
Waste Oil Holding Tank(s) Capacity(ies)						
Marine Sanitation Device Certificate of Type Test	Volume/day					
Marine Sanitation Device Certificate of Type Test	Volume/day					
Marine Sanitation Device Certificate of Type Test	Volume/day					
Black Water Tank Capacity						
Gray Water Tank Capacity						

Pollution Records

	Date	Location	Amount
Last time bunkers were taken on			
Next time bunkers will be taken on			
Last time sludge/oily bilge water pumped ashore			
Last operation of OWS or overboard discharge			
Garbage incinerated			
Garbage discharged overboard at sea			
Garbage discharged ashore			
Required U.S. Ballast Water Report			

SECTION A
Certificates/Equipment Data/Records Information

Section B
Environmental Procedures

Environmental Procedures can be found in the ship's Safety Management System (SMS) documentation or in company polices and maintenance manuals, inspection logs, oil record books, etc. Marine inspectors should question the ship staff on procedures and normal operations, and compare the answer to what is written in procedures and manuals. For each waste stream, persons with specific responsibilities should be questioned at each step in the waste handling process. Inspectors should require being shown specific process step by the person responsible for that step. Inspectors should ask extensive questions regarding availability of documents and supporting material relevant to the individual performing the specific activity in the waste handling process. Other questions should focus upon training provided and reporting procedures when problems with waste management processes are identified. — 33 CFR 155.700

❑ Current pollution prevention records	33 CFR 156.150
• Person-in-charge designated and qua lified(certificated/licensed)	33 CFR 156.170
• Transfer equipment tests and inspections	ISM Code/SMS
• Declaration of Inspection (available and retained for at least one month)	33 CFR 96
• Ship to provide PMS logs and required PMS activities for the selected waste stream for verification.	
• Verify SMS incorporates PMS activities and logs for all Waste Streams.	
• Court required logs to track oil usage in systems having oil to sea interfaces (if applicable)	
• Recent environmental audit reports when available	
❑ Oil Record book (Part 1) (spot-check)	
• Each operation signed by person-in-charge	
• Each complete page signed by master	
• Book maintained for 3 years	MARPOL Annex. 1/20
• Use of proper codes and version for vessel	33 CFR 151.25
• Transfer receipts/manifest match oil record book entries	
• OWS rates not exceeding design criteria	
• Incinerator rates not exceeding design criteria	
• Consistent bilge water management patterns	
• Comparison of oil record book entries to vessel's daily tank sounding book	
❑ Shipboard Oil Pollution Emergency Plan	MARPOL Annex.
• Approved by Administration (class society)	1/26.1
• Updated and current	33 CFR 151.26
• In English and working language of crew	
• Correct contact numbers for National and Local Authorities (Port Authorities for ports visited not every COTP)	
• Immediate Actions List	
• Non Mandatory Provisions (if listed in SOPEP). Spill kits located and inspected	
❑ MARPOL Annex V	
• Placard posted	
• Record book	
• Garbage management plan	MARPOL Annex V/9
❑ Non-Hazardous Waste Disposal Documentation (if applicable)	
• EPA Generator ID#_____ (if applicable)	
• Records	
• Non-Hazardous Waste Manifests	U.S. Local Regulations as applicable
❑ Recycling policy being followed (requires a detailed assessment)	
❑ Hazardous Waste Disposal Documentation (if applicable)	
• EPA Generator ID#_____ (if applicable)	Shipboard policy SMS
• Records	
• Uniform Hazardous Waste Manifests	40 CFR 262
• Land Disposal Restriction Notification Certification Forms (LDR)	Shipboard policy SMS
• Shipping Document for Regulated Medical Waste	
• Interview Person(s) responsible for landing of wastes	
• Specialized training for Responsible person(s) and related documentation	
• Evidence of disposal in other countries to bona fide receivers documented	

Oil pollution prevention systems include, but are not limited to, the oily water separator, other filtering or flocculation devices, bilge water management, fuel/lubricating/waste oil transfer, purifier and lantern space sludge collection, transfer and containment systems. Marine inspectors should verify that the oily water separator is operating within the required range; that the alarms are working and sound at appropriate levels; that crew is knowledgeable and operating instructions are posted; that maintenance is carried out at regular intervals and repairs are documented; and that system operation and maintenance are in accordance with the vessel's SMS. Marine inspectors should verify the actual pollution prevention system piping against vessel's approved piping diagrams, if modifications such as blanked off tees, connections points, hoses, or temporary piping segments associated with these systems are observed.

- ❑ Oily Water Separator (OWS) — MARPOL Annex 1/16, 33 CFR 155.360/370
  - Verify bilge piping, no modifications & matches approved diagram (direct to OWS, to holding tank, etc.)
  - No blanked flanges, pipe caps, or dead-ended valves, or tees on inlet or outlet piping
  - Evidence of bolting/unbolting of associated piping segments
  - Recent paint on pipe segments
  - Observe general housekeeping and cleanliness
  - Witness operational test of OWS, evaluate operator competency. System operating in published ranges
  - Verify unit is processing contaminated source. Operate system for sufficient time (15 minute minimum) to identify reduction in contaminated source
  - Test 15 ppm Oil Content Meter and alarm
  - On units with multiple Oil Content Meters, compare readings
  - Ensure sample analyzed by Meter is OWS output (Trace sample line for presence of unacceptable clean water connection)
  - Verify no electrical bypasses, jumpers, extra switches on or within unit or Meter control panel
  - Verify system automatically re-circulates (3-way valve) or shuts down when >15ppm. Verify proper operation of valve
  - Verify proper operation of system backflush or oil purge cycle
  - Visually sample processed water for gross contamination (sheen or visible oil)
  - Compare ship's operational maintenance routine with actual Preventative Maintenance conducted. Request proof/documentation of maintenance completed (used consumables from OWS, receipts of service, technician reports, contractor disposal records)
  - Review meter calibration records
  - Review strip charts if fitted
  - Examine other machinery space overboard piping for unusual connections
  - Review records pertaining to system repairs
- ❑ Oil Pollution placard posted — 33 CFR 155.450
- ❑ Oil Transfer Procedures — 33 CFR 154.340
  - Posted / available in crew's language — 33 CFR 155.720
  - Person in Charge (PIC) fluent in English or language mutually agreed upon w/ shoreside PIC — 33 CFR 155.750
  - Format in CFR order or cross reference index page — 33 CFR 154.310
  - List/description of products carried by vessel
  - Description of transfer system including a line diagram of piping system (pumps, vents, valves, alarms,
  - shutoffs, etc.)
  - Number of persons required on duty
  - Duties by title of each person
  - Means of communication (two-way voice)
  - Procedures to top off tanks and disconnect
  - Procedures to report oil discharges
  - Emergency response procedures (fire, spill, human exposure)
- ❑ Standard discharge connection — MARPOL Annex 1/19
- ❑ Fuel/lube/sludge oil fill, vent & overflow discharge containment — 33 CFR 155.430, 33 CFR 155.320
  - Size (<1600GT'/2 bbl, >1600GT 1 bbl)
  - Fixed (Built after 30Jun74) or Portable (before 30Jun74)
  - Drains
  - Scupper closures
- ❑ Prohibited oil spaces (no oil/hazardous substances carried fwd of collision bulkhead) — 33 CFR 155.470

- ❑ Lighting at each Transfer Operations Work Area — 33 CFR 155.790
  - Adequate
  - Located/Shielded to not interfere with navigation
- ❑ Oil transfer hose (if vessel uses to transfer in U.S. waters) including LifeboatlTender Hoses — 33 CFR 155.800/805
  - Condition — 33 CFR 154.500
  - Markings (MAWP, Mfg. Date, Test date) - — 33 CFR 156.170
  - Hose assembly requirements (blanked off if not new, gas free or in use)
  - Tests and inspections
- ❑ Bilge Water Management — MARPOL Annex I
  - Examine machinery space bilges (stem to stem)
  - Contamination / oily residues in bilges on bulkheads, piping, structures, within roseboxes
  - Leakage from systems and engines into machinery spaces (may not be seen during port ops)
  - Engine oil usage, quantities, where lost, consumed or in bilges
  - Evidence of recent cleaning of systems, equipment and components
  - Status of oily bilge water tanks, last cleaned, at capacity
  - Adequate capacity all tanks
  - Levels of tanks during inspection — high or low?
  - If tanks near full — what are the vessel's processing plans?
  - Evidence of detergent usage (Note- emulsions cannot separate in gravity separator and are likely to result in discharges over 15 PPM)
  - Other methods to discharge bilge water
  - Evidence of excess water ingress, pump glands, seals, valve glands
  - Portable (diaphragm /other) pumps present
  - Hoses, fittings, and connections in areas — usage unknown
  - Unlocked overboard valves on bilge, bilge & ballast, salt water service
  - Seal management program-used
  - Designated clean or exempted areas — oil free status
  - Lifeboat / Security / Tender vessel engineering systems leak free
  - Lifeboat / Security / Tender vessel bilges clean
  - Lifeboat / Security / Tender vessel- oily bilge handling when leakages present (when in use off vessel or once reloaded)
- ❑ Waste/Sludge oil incineration
  - Tests and inspections
  - Record keeping
  - Incinerator operates with sludge / waste oils
  - Clean / dirty furnace, evidence of use
  - Operators capable & prove operation
  - Purifier sludge tanks full / empty
  - Connections to bilge main or other areas
  - Transfer pump operable
  - Transfer pump to sludge system, ashore, incinerator settler only
  - Estimated quantities of sludge produced — normal or excessive (fuel sludge production can exceed 2% of total fuel used)
- ❑ Systems with Oil to Sea Interfaces
  - Oil lubricated stern tubes, bow and stern thruster seals, fin stabilizer seals, etc.
  - Exterior examination in way of systems for evidence of leaking seals
  - Presence of barrels, drums, hoses, pumps, and other equipment/supplies/arrangements necessary to refill systems at equipment.
  - Check consumption records if SMS or environmental compliance programs require such records.

Section C2
Gray Water Waste Stream

Gray water system includes discharges from galley, sinks, washbasin drains, showers, and baths. These may be held in large tanks before being pumped overboard. The handling and discharge of gray water will vary from ship to ship and the marine inspector should ensure the procedures followed by the ship correspond to those described in its SMS documentation. If gray water is pumped through a/the Marine Sanitation Device(s) (MSD), ensure that the total volume does not exceed the MSD's capacity. Other waste streams such as hazardous waste or medical waste (RCRA biomedical wastes) must not be mixed with gray water. Drains from hospitals (U.S. restriction), photo labs (if commingled with hazardous wastes), slops, must be separate from the gray water system.

(Clean Water Act)
33 USC 1251 et seq.
33 CFR 159.300
Subpart E for (D17)
Local Regulations
ISM Code
33 CFR 96

- ❑ Sources
  - Galley (ex. Dishwashers, floor drains, sinks)
  - Showers/Baths & washbasin drains
  - Laundry
  - Deck drains throughout vessel
- ❑ Prohibited Sources (hazardous materials, bilges, photo shop & print shop if hazardous wastes are commingled, hospital spaces (U.S. only), etc.)
- ❑ Evidence of other drained fluids into scuppers or other entry points (photo lab, hospital, specialty spaces)
- ❑ Drains from spaces containing machinery (fan rooms, hotel equipment, etc.) oil free or segregated
- ❑ Connections to the Black Water System (if permitted in MSD Operation Manual, if so, is MSD capacity sufficient?)
- ❑ Connections to Ballast Water System
- ❑ Number of tanks
- ❑ Total tank capacity _____m3
- ❑ Volume Produced_____ (m3 per day)
- ❑ Maximum number of days in port without discharging.
- ❑ Current capacity sufficient for persons on board and time in port?
- ❑ Review vessel's gray water handling procedures (SMS).
- ❑ Ensure that Quality Assurance / Quality Control Plan is vessel specific.
- ❑ Is Gray water processed and discharged?
- ❑ What are Gray water disposal procedures: Shore and at Sea. (company policy)
- ❑ Does vessel have sampling procedures? (if so, review)
- ❑ Types of tests performed, equipment and useable testing supplies readily available?
- ❑ Sampling equipment/supplies useable and available?
- ❑ How often do they take samples? Review samples record book.
- ❑ What are the state, federal and local regulations for gray water discharge?
- ❑ Responsible crew interviewed
- ❑ Disposal and Records
  - Shore (receipts available)
  - At sea (logs maintained)
  - Sampling/Testing (logs maintained)
  - Note some gray water treatment employs advanced ultra-filtration systems, these systems claim to reduce gray water waste by 85% - 90%, or more.
  - Alaska - Effective July 2001, Operators of cruise vessels carrying 500 or more passengers & transiting applicable waters of Alaska are restricted in where they may discharge effluents & will be required to perform testing of sewage & gray water discharges. The Coast Guard will inspect, monitor, & oversee this process to ensure compliance with applicable water quality laws & regulations. (33 CFR 159)

Section C3
Black Water/Sewage Waste Stream

Black water system includes MSDs and other systems to collect, treat, store, and discharge sewage. This checklist is designed to guide the marine inspector through some basic questions to ascertain whether the system is working as designed and that the crew is properly trained in its operation. For example, does the MSD appear to be properly installed? Is there adequate capacity for the number of persons on board? Are maintenance procedures, including SMS procedures, being followed? Are there records of expendables being ordered: filters, chemicals, et cetera? Are the units operating within the manufacturer's design specifications? Are there clear and simple operating instructions? Is the crew knowledgeable in the use of the equipment/system?

	MARPOL Annex IV*
❑ Sources	40 CFR 140.3 & .4
• Toilets, Urinals, scuppers	33 CFR 159.57
• All Drainage from Medical Premises (U.S. restriction)	33 CFR 159.7
• System installed, maintained and operated in accordance with approved plans and manufacturers specifications.	33 CFR 159.55 33 CFR 159.59
• Tank Capacity and Volume Produced	MARPOL Annex IV/9*
• Current volume in tanks	40 CFR 140.3
• Modifications documented	MARPOL Annex IV/11 * Resolution MEPC.2(VI) 33 CFR 159.65
❑ Operations and Treatment (new section)	NVIC 9-82
• Chemical/Biological treatment & protective equipment	ISM Code
• Chemical Treatment Level	33 CFR 96
• Sufficient chemicals, additives, approved cleaning materials onboard. (enzymes, "Gamazyme", chlorine)	
• Compressors operating, inlet filters maintained	33 CFR 159
• Vacuum system operable, if applicable	
• Flow indicators clear — indicating flow	
• Last system cleaning	
• Macerator operating maintenance	
• Methods to dilute discharge?	
• Operating instructions/SMS procedures	
❑ U.S. Marine Sanitation Device Requirements	
• Type (II, III)	
• Nameplate (Should be designed to resist efforts of removal or efforts to alter the information)	
• Placard	MARPOL Annex IV/2*
• Proper operation (macerators, treatment chemicals) and structural integrity, no leaks	MARPOL Annex IV/10*
• Certificate of Type Test. <u>For Foreign Flag Vessels in U. S. Waters</u> A foreign flag vessel that has a "Certificate of Type Test" under MARPOL Annex IV indicating that its sewage treatment plant meets the test requirements of Resolution MEPC.2 (VI) of the International Maritime Organization (IMO) will be accepted by the Coast Guard as being in compliance with 33 CFR 159.7(b) or (c). The Certificate of Type Test must be issued by or on behalf of a government that is a party to the MARPOL convention. Such a plant will be considered as fully equivalent to a Coast Guard certified Type II MSD as long as the unit is in operable condition. However, the unit may not be labeled as USCG certified. U.S. registered vessels will continue to be required to have Coast Guard certified MSDs per 33 CFR 159.	MARPOL Annex IV* 33 CFR 159.7 40 CFR 140.4 40 CFR 136
❑ Standard Discharge Connection (NLT 27 Sep 03)	
• New ships 200 gross tons and above	
• New ships less than 200 gross tons and carry more than 10 persons.	
• Existing ships 200 gross tons and above and exiting ship less than 200 gross tons and carry more than 10 persons after 27 Sep 13 (10 years after the date entry into force of Annex IV)	
❑ Disposal	
• Shore (last done, reasons?)	
• Overboard valves secured	
• MSD bypass piping noted? (Condition of valves, pipe tees and caps, evidence of frequent usage)	
• At sea (provide proof of discharge location)	
• Logged position, speed (if required by management) MARPOL Annex IV*	
• When comminuted and disinfected greater than 3 miles. 33 CFR 159	
• Company policy followed?	
• When not comminuted or disinfected greater than 12 miles.	
• Both to be discharged while ship is underway at greater than 4 knots. Locations of discharges compared to deck logs.	
• Not in EPA "No Discharge Zones"	
• Connections to the gray water system (effluent routed to gray water system to dilute effluent?)	

- Alaskan Waters:
  Effective July 2001, Operators of cruise vessels carrying 500 or more passengers and transiting applicable waters of Alaska are restricted in where they may discharge effluents and will be required to perform testing of sewage and gray water discharges. The Coast Guard will inspect, monitor, and oversee this process to ensure compliance with applicable water quality laws and regulations. (33 CFR 159).

❑ Sampling/Testing

- Lab analysis of fecal coliform/total suspended solids in effluent (recorded on ISPP if issued)
- Results of residual chlorine content in effluent testing
- Calibration records for dosing pump/proportioner

* Although the United States is not signatory to MARPOL Annex IV, the requirements of Annex IV may be enforced for those vessels that have committed to comply with Annex IV requirements in addition to 33 CFR Part 159 requirements as part of the vessels' SMS. This commitment is typical for ICCL Member vessels and many other cruise ships.

Hazardous waste must be handled in accordance with the ship's SMS. If such waste is disposed of in U. S. waters, the SMS hazardous waste handling procedures must meet or exceed 40 CFR Part 262 requirements. Hazardous waste includes dry cleaning (PERC) waste, used paints and thinners that contain hazardous substances, silver-bearing photo-processing waste, cleaning solutions and other similar items. Each vessel may vary in both the type and volumes of hazardous waste generated depending on the technology and processes aboard ship. This checklist is designed to evaluate on-board management of hazardous waste streams and to ensure that hazardous constituents are not released into the environment, disposed of properly and that accountability is demonstrated via adequate waste disposal records.

❑ Hazardous Waste

40 CFR 262
49 CFR 173
RCRA
SARA Title III
42 USC 11002(a)(3) 40 CFR 355 App A / B ISM Code
33 CFR 96

- Has the company conducted a waste determination? Through Process Knowledge or Waste Analysis (circle one)? If not, hazardous waste may not be landed.
- Have responsible personnel received initial and refresher training? Has the training been documented?
- Is there any evidence that hazardous wastes are being incinerated, diluted, neutralized, or evaporated as a means of disposal.
- Is there any evidence (e.g. lack of disposal records) of hazardous material being discharged overboard?
- Are hazardous wastes being properly stored, maintained, labeled, and placarded? Note any observations made of deficiencies, dates and nature of repairs.
- Are proper storage devices available?
- Waste not commingled
- Quantities on board consistent with receipt/disposal documentation?
- Does the crew have ready access to spill control and decontamination equipment?
- Are records maintained and manifests completed for potential hazardous waste streams, for example:
  - Silver Bearing Photo Processing Waste (developers, wash water, Silver Recovery Units)
  - X-Ray equipment
  - Print Shop Waste (inks, dyes, cleaning solvents)
  - Used Solvents, Paints & Thinners
  - Fluorescent/Mercury Vapor Bulbs
  - Batteries (universal wastes): Nickel Cadmium (Nicad); Lead Acid; Lithium; Alkaline
  - Certain Pharmaceuticals/Narcotics
  - Dry Cleaning Waste (PERC, lint, sludge, filters, condensate water)
- Aerosol Cans
- Cleaning Solutions (de-scalers, acids, bases, other corrosives)
- Expired pyrotechnics (from safety equipment and entertainment use)
- Rags contaminated with hazardous wastes (also - in approved storage containers?)
- Incinerator ash if contaminated with toxic/hazardous substances (plastics containing heavy metals)
- Do records reflect reasonable accumulations of waste with respect to the capacity of the vessel, its age, technologies onboard, and amounts of repair/maintenance?
- Used lead acid batteries not mixed and kept dry?

❑ Records of hazardous consumables kept updated
Used and unused

Shipboard Records
ISM Code
33 CFR 96

The following excerpt from 40 CFR 262 regarding Resource Conservation and Recovery Act (RCRA) requirements is provided for background information only. The Federal or State RCRA program office must be consulted if any clarifications are needed for a particular situation.

HAZARDOUS WASTE HANDLING REQUIREMENTS

§ **262.11 Hazardous waste determination.**
A person who generates a solid waste, as defined in 40 CFR 261.2, must determine if that waste is a hazardous waste using the following method: (a) Determine if the waste is listed as a hazardous waste in subpart D of 40 CFR part 261.

(c) Or if not listed in subpart D of 40 CFR part 261, generator must determine if the waste is identified in subpart C of 40 CFR part 261 by either:

(1) Testing the waste according to the methods set forth in subpart C of 40 CFR part 261

(2) Applying knowledge of the hazard characteristic of the waste in light of the materials or the processes used.

262.12 EPA identification numbers.
(a) A generator must not treat, store, dispose of, transport, or offer for **transportation,** hazardous waste without having received an EPA identification number from the Administrator.

262.20 General requirements.

(a) A generator who transports, or offers for transportation, hazardous waste for offsite treatment, storage, or disposal must prepare a Manifest OMB control number 2050-0039 on EPA form 8700-22, and, if necessary, EPA form 8700-22A, according to the appendix to part 262.

(b) Generator must designate on manifest one facility that is permitted to handle the waste described on the manifest.

262.23 Use of the manifest.
(a) The generator must:
(1) Sign the manifest certification by hand; and
(2) Obtain the handwritten signature of the initial transporter and date of acceptance on the manifest; and
(3) Retain one copy, in accordance with § 262.40(a) and give the transporter the remaining copies of the manifest.

262.30, .31, .32 & .33 Packaging, Labeling, Marking and Placarding.
Before transporting hazardous waste or offering hazardous waste for transportation off-site, a generator must package, label, mark and placard the waste in accordance with the applicable Department of Transportation regulations on packaging under 49 CFR parts 172, 173, 178, and 179. Before transporting hazardous waste or offering hazardous waste for transportation off-site, a generator must mark each container of 110 gallons or less used in such transportation with the following words and information displayed in accordance with the requirements of 49 CFR 172.304: **HAZARDOUS WASTE Federal Law Prohibits Improper Disposal. If found, contact the nearest police or public safety authority or the U.S. Environmental Protection Agency. Generator's Name and Address ----------. Manifest Document Number ----------.**

262.34 Accumulation time.
A generator may accumulate hazardous waste on-site for 90 days or less for large quantity generator and 180 days or less for small quantity generator, without a permit or without having interim status.
The date upon which each period of accumulation begins must be clearly marked and visible for inspection on each container and while being accumulated on-site, each container and tank is labeled or marked clearly with the words, "Hazardous Waste."

§ **262.40 Recordkeeping.**
(a) A generator must keep a copy of each manifest signed in accordance with § 262.23(a) for three years or until he receives a signed copy from the designated facility which received the waste. This signed copy must be retained as a record for at least three years from the date the waste was accepted by the initial transporter.
(b) A generator must keep a copy of each Biennial Report and Exception Report for a period of at least three years from the date of the report.
(c) A generator must keep records of any test results, waste analyses, or other determinations made in accordance with § 262.11 for at least three years from the date that the waste was last sent to on-site or off-site treatment, storage, or disposal.

Non-hazardous wastes include shipboard garbage containing plastics and synthetic material, certain medical wastes, food wastes and recyclables such as glass, cardboard, aluminum and metal cans. Items to be checked should include waste sorted to prevent hazardous waste from entering the non-hazardous waste stream; no plastics or synthetics are to be discharged overboard, separate; proper disposal of hazardous (i.e. containing residual plastics or un-burnt food waste) and non-hazardous incinerator ash; and proper disposal of cooking grease from grease traps.

- ❑ Shipboard Garbage Management Plan — 33 CFR 151.63
  - Shipboard garbage properly handled in accordance with Garbage Management Plan — MARPOL Annex V
  - Garbage Record Book entries — MARPOL Annex V/9
    - Type, amount, location, date/time — MARPOL Annex V/3
    - Receipts — 7 CFR 330.400
    - Each entry signed by Officer-in-Charge and each page by Master
    - Any reports of alleged inadequacy of port reception facilities for garbage on file
  - Person-in-Charge Designated
  - No plastics or synthetics discharged overboard
  - Waste sorted to prevent hazardous waste entering non-hazardous waste stream or incinerated. Separate defined storage areas for hazardous/non-hazardous — no commingled waste.
  - Signage in working language of crew and in English, French or Spanish
  - Incinerator ash if discharged overboard free of plastic residue (clinkers) or free of unburned food wastes if landed ashore.
  - Trash chutes clean, free from oil residue (No oil stains on decks, side of hull adjacent to trash chutes)
  - Foreign Food Wastes handled per APHIS regulations
  - Medical Wastes-incinerated or manifested as Bio-Hazardous Waste.
  - Discharged outside of special areas only (when special area restrictions are in effect)
  - Incinerator operation observed (if in operation)
- ❑ Garbage Pollution Placards posted — MARPOL Annex V/ 33 CFR 151
- ❑ Procedures to minimize amount of potential garbage
  - Is vessel encouraging ship suppliers to consider alternate means of packing, use of other than plastics? Examine stores being loaded.
  - Is vessel using reusable packing? Examine stockpiles for use
  - Is waste generated while in port disposed to shore reception facility prior to sailing? Examine waste being offloaded.
- ❑ Recycling
  - Is ships crew following policy for recycling. Interview crewpersons in varied work areas, casino, galley, housekeeping, etc. with recycling responsibilities for procedures used.
- ❑ Maintenance and repair conducted on equipment
  - Incinerator
  - Grinders
  - Valves and flappers on chutes
- ❑ Human factors
  - Warning signs posted around equipment.
  - Master and crew familiar with essential shipboard garbage handling procedures.
  - Personal protective equipment available, functioning and in place (ILO 134).
  - Sanitation, from a health standpoint, being maintained (ILO 147).

AGENT
Vessel representative hired by the ship's owners. Ship's agent may be tasked with various jobs such as: ensuring proper vessel documentation and compliance.

AUTOMATIC STOPPING DEVICE
Is a control mechanism that ensures discharge of an oily water separator is stopped when the oil content of the effluent exceeds 15 parts per million (PPM). The automatic stopping device may be initiated by the operation of the oil content meter.

BALLAST
Used to improve the stability and control the draft of a ship. (In Ballast - having only ballast for a load)

BLACK OIL
A viscous and black or very dark brown colored oil. Depending on the quantity spilled, oil tends to quickly spread out over the water surface to a thickness of about one-millimeter.

BLACK WATER (sewage)
Examples - possible sources toilets, urinals and drainage from medical facilities (U.S. restriction).

COC

Certificate of Compliance, CG Form 3585.

COTP
Captain of the Port.

CWA
Clean Water Act.

CVE
Control Verification Examination is the examination of vessel for compliance with SOLAS requirements and applicable U. S. regulations. More properly referred to as the Passenger Vessel Certificate of Compliance Examination.

DISPERSION
The breaking up of an oil slick into small droplets which are mixed into the water column as a result of breaking waves and other sea surface turbulence.

EFFLUENT
To flow out. (Waste material, refuse, and sewage)

EMULSIFICATION
The formation of a water - in - oil mixture. In the environment, the tendency for emulsification to occur varies with different oils and is much more likely to occur under high-energy conditions (wind and waves). Emulsions may also be formed by surfactants, including detergents, which cause the oil and water to mix, or by mechanical means such as pressure washing or pump action.

EPA
Environmental Protection Agency

EQUIPMENT HAVING AN OIL TO SEA INTERFACE
Equipment that uses a seal to prevent leakage of oil into the sea. Examples, oil-lubricated stern tube seals, hydraulically-driven stabilizer fin seals, bow and stern thruster seals. An indicator that system seals are leaking to the sea may be evidence of frequent filling of system reservoirs, presence of barrels, drums, hoses, pumps, and other equipment/supplies/arrangements necessary to refill systems. Some ships' SMS or environmental compliance programs may require that records of refilling such systems are kept. If so, these records should be checked.

15 PPM ALARM
An alarm that activates when the effluent passing though oil-filtering equipment exceeds 15 parts per million (ppm) of oil.

GRAY WATER
Includes discharges from galley, sinks, washbasins, drains, showers and baths. These may be held in large tanks prior to being discharged overboard (State, Fed, regulation permitting).

HSSC
International Convention to Harmonized System of Survey and Certification.

ICCL
International Council of Cruise Lines, a cruise ship industry association which participates in industry standards and policy development process to promote all measures that foster a safe, secure, healthy cruise ship environment.

ICLL
International Convention for Load Lines.

IMO
International Maritime Organization; a specialized agency of the United Nations concerned solely with maritime affairs. IMO is responsible for international treaties, conventions, resolutions and codes to improve maritime safety.

ISM Code
International Safety Management Code. (Chapter IX of SOLAS)

MARPOL
The International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978.

MSC
Maritime Safety Committee. One of five technical committees of the IMO which deals with issues such as aids to navigation, vessel equipment and construction, manning requirements, handling dangerous cargoes, hydrostatic and marine casualty information.

MSD
Marine Sanitation Device.

OIL CONTENT METER
An instrument used to measure continuously the oil content of the effluent in the OWS output line, in parts per million, to ensure that the operation does not contravene the convention.

OIL FILTERING EQUIPMENT
Equipment that uses any combination of a separator, filter or coalescer, and also a single unit designed to produce an effluent with oil content less than 15 parts per million (ppm). (MARPOL Annex I, Reg 16)

OILY WATER SEPARATOR (OWS)
The basic principle of oil / water separation is their difference in specific gravity. The specific gravity of most oils is less than water; therefore, it will naturally float to the top of an oil and water solution. Small droplets of oil float to the top much slower than large droplets. This is due to the large surface area to mass ratio. To speed up the process of separation, OWS units form larger oil droplets out of smaller ones, thus decreasing the surface area to mass ratio. The increased mass of the oil droplet increases its buoyancy, thus causing it to rise more quickly. Gravitational-based systems are not effective processors of oil-water emulsions formed by detergents or mixtures containing high specific gravity oils.

PASSENGER SHIP
A ship which carries more than 12 passengers.

PMS
Preventative Maintenance System

QUALIFIED INDIVIDUAL (QI)
The person authorized by the responsible party to act on their behalf, authorize expenditures and obligate organization's resources.

RCRA

Resource Conservation and Recovery Act (RCRA), was enacted by the U.S. in 1976 to address the issue of how to safely manage and dispose of the huge volumes of municipal and industrial hazardous waste generated nationwide.

RECOVERABLE OIL

Oil that is in a thick enough layer on the water to be recovered by conventional techniques and equipment. Only black or dark brown oil, mousse, and heavy sheens (dull brown) are generally considered thick enough to be effectively recovered by skimmers.

SEPARATION EQUIPMENT

A device designed to remove enough oil from an oil-water mixture to provide a resulting mixture with an oil content of less than 100ppm, or 15ppm, such as an Oily Water Separator (OWS).

SLICK

Oil spilled on the water, which absorbs energy and dampens out the surface waves making the oil appear smoother or slicker than the surrounding water.

SHEEN

A sheen is a very thin layer of oil (less than 0.0001 inches or 0.003mm) floating on the water surface and is the most common form of oil seen in the later stages of a spill. According to their thickness, sheens vary in color ranging from dull brown for the thicker layers to rainbows, grays silvers and almost transparent for the thinnest layers.

SLUDGE TANKS

Tanks used to contain sludge formed by fuel and lube oil purifiers and from other sources or cleaning activities. Sludge is not readily processed by many oily water separators and frequently requires treatment ashore or incineration. Every ship of 400 GT or more must be provided with a tank or tanks of adequate capacity, in regard to type of machinery and length of voyage, to receive the oil residues (sludge) that cannot be dealt with otherwise in accordance with MARPOL Annex I.

SMS

Safety Management System (sometimes referred to as an SQM). Required by the ISM Code and Chapter IX of SOLAS.

SOLAS

Safety of Life at Sea. The International Convention for the Safety of Life at Sea.

SOPEP

Shipboard Oil Pollution Emergency Plan. (MARPOL Annex I, Reg. 26)

STCW

The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers.

TANKER

Is a self-propelled vessel constructed or adapted for the carriage of bulk liquid cargoes of oil or hazardous materials.

TRANSFER

Any movement of oil or hazardous material to, from or within a vessel by means of pumping, gravitation, or displacement.

Appendix v

MEMORANDUM SUBJECT: Cruise Ship Identification Numbers and State Required Annual Reporting Components

FROM: Elizabeth Cotsworth, Director Office of Solid Waste
TO: RCRA Senior Policy Managers

Regions 1-10

Over the last several months, the Environmental Protection Agency (EPA), Office of Solid Waste has been working with Region 4, Region 9, Region 10, and ten states having cruise ship traffic to facilitate national acceptance of one EPA hazardous waste identification (ID) number per individual cruise ship. This came about because the ships were receiving different numbers from each state in which hazardous waste was off-loaded. Having multiple identification numbers causes the ships to create and maintain duplicate copies of hazardous waste management records, leading to an increased paperwork burden.

Through meetings and conference calls, the participants on this project reached an agreement on the issue. Today, we are asking that individual cruise ships be assigned only one EPA hazardous waste identification number as a generator of hazardous waste for purposes of the Resource Conservation and Recovery Act. The following procedures would apply:
a) A cruise ship would determine its American-based home port state (the state in which it has corporate offices or its main port of call).
b) After determining the home port state, the cruise line will notify the selected state or corresponding EPA regional office of its hazardous waste activities. c) The cruise ship will identify its hazardous waste generator size in accordance with 40 CFR 261.5(c).
d) The home port state or EPA regional office will issue an EPA hazardous waste identification number for each individual cruise ship using the current established procedure. The number will reflect the home port state initials and ten alphanumeric characters.

We are recommending that the state or region consider using a ship = s registry number, which is known as the International Maritime Organization (IMO) number, as part of the EPA hazardous waste identification number. The IMO number is generally a five to seven digit number; zeros can be added before or after the number to reach the ten characters required for the EPA hazardous waste identification number. Using the IMO number will allow for coordination with the Coast Guard, as this is the number they use most often.

After the identification number is assigned, it will remain with that ship and be used on all hazardous waste manifests regardless of where the waste is off-loaded in the U.S. The assignment of the EPA ID number will not impact the applicability of state-specific RCRA requirements. For example, when waste is off-loaded in a state, the cruise ship will comply with that particular state = s RCRA requirements whether or not that state assigned the ID number. The ship will be required to provide records to the individual state as required by state law.

Many of the states who will not be issuing the ID number expressed an interest in obtaining

information provided by the cruise ship in either an annual or biennial report to its home port state. This request for annual report information can be addressed through the existing Biennial Reporting System (BRS). The attachment to this memo provides more specific information on how the ID numbers and annual reports will be incorporated into the EPA = s BRS databases.

If you have any questions, please contact Teena Wooten at (703) 308-8751.

Attachment (1)

cc: Key RCRA Contacts, Regions 1 - 10
RCRA Enforcement Contacts, Regions 1 - 10
RCRA Data Management Contacts, Regions 1-10
Tom Kennedy, Association of State and Territorial Solid Waste
Management Officials (ASTSWMO)
Anne Dobbs, Texas Natural Resource Conservation Commission (TNRCC)

Dangerous Waste Site Identification Form

Site ID

Washington State Department of Ecology
Hazardous Waste Information
P.O. Box 47658
Olympia, WA 98504-7658
(800) 874-2022 (within state)
(360) 407-6170

Web site: www.ecy.wa.gov/programs/hwtr

For Ecology Use Only	Date Received:		
Form	Reviewed	Entered	Verified
Site ID			
GM			
WR			
OI			

1. Reason for Submittal

- ☐ To provide **New** Notification of Regulated Waste Activity (complete entire form)
- ☐ To provide **Revised** Site Identification information (complete entire form)
- ☐ To **Withdraw** Site Identification Number (skip sections 10 and 11)
- ☐ To **Reactivate** Site Identification Number (complete entire form) Effective Date: _____ (mm/dd/yyyy)
- ☐ A component of the **Dangerous Waste Annual Report** (skip section 11) Reporting Year: _____ (yyyy)

2. RCRA Site ID Number:

3. Site Location Information

Company Name: _____
Site Address: _____
City/State/Zip: _____
County: _____
Tax Registration Number: _____
NAICS Code: _____
Type of Business: _____

4. Company Mailing Address

Name: _____
Mail Address: _____
City/State/Zip: _____
Country: _____

5. Legal Owner

Name: _____
Mail Address: _____
City/State/Zip: _____
Phone Number (Ext): (_____) _____
Owner Since: _____ (mm/dd/yyyy)
Owner Type: ☐ Federal ☐ State ☐ County ☐ Municipal
☐ District ☐ Private ☐ Tribal ☐ Other

6. Land Owner

Name: _____
Mail Address: _____
City/State/Zip: _____
Phone Number (Ext): (_____) _____
Owner Type: ☐ Federal ☐ State ☐ County ☐ Municipal
☐ District ☐ Private ☐ Tribal Land
☐ Puyallup Trust ☐ Other

Dangerous Waste Site Identification Form (continued)

Site ID

RCRA Site ID Number:

7. Site Operator

Name: _____

Mail Address: _____

City/State/Zip: _____

Phone Number (Ext): (_____) _____

Operator Since: _____ (mm/dd/yyyy)

Operator Type: ☐ Federal ☐ State ☐ County ☐ Municipal

☐ District ☐ Private ☐ Tribal ☐ Other

8. Site Contact

Name: _____

Mail Address: _____

City/State/Zip: _____

Phone Number (Ext): (_____) _____

Email Address: _____

9. Form Contact

Name: _____

Mail Address: _____

City/State/Zip: _____

Phone Number (Ext): (_____) _____

Email Address: _____

10. Type of Regulated Waste Activity (Mark the appropriate boxes for activities that apply to your site)

***A.* Hazardous Waste Activities**

1. Generator of Hazardous Waste
(Choose only one of the following four categories)

☐ *a. LQG: Large Quantity Generator (Greater than 2,200 lbs/mo)*

☐ *b. MQG: Medium Quantity Generator (Between 220 – 2,200 lbs/mo)*

☐ *c. SQG: Small Quantity Generator (Less than 220 lbs/mo)*

☐ *d. XQG: No Regulated Waste Generated*

2. Frequency of Generation
(Choose only one of the following three types)

☐ *a. Monthly*

☐ *b. Batch*

☐ *c. One-time only*

3. Transporter of Hazardous Waste

☐ *a. Transport own waste*

☐ *b. Transport for commercial purposes*

☐ *4.* **Recycler of On-Site Waste**
(i.e., on-site use, reuse or reclamation of a waste after it has been generated)

☐ ***5.* Transfer Facility of Hazardous Waste**

☐ **6. Permit-by-Rule (PBR)**

☐ **7. Treatment-by-Generator (TBG)**

☐ **8. Generator of Mixed Radioactive Waste**

☐ **9. Importer of Hazardous Waste**

☐ 10. **Treatment, Storage, Disposal or Recycling (TSDR) Facility**
(Note: A RCRA Permit is required for this activity)

☐ **11. 24-Hour Recycler of Off-Site Waste**
(i.e., Immediate Recycler)

12. Dangerous Waste Fuel Activity

☐ a. Generator of dangerous waste fuel

☐ b. Generator marketing to burner

☐ c. Other marketers (i.e., blender, distributor, etc.)

d. Burner (indicate type of combustion unit)

☐ 1. Utility boiler

☐ 2. Industrial boiler

☐ 3. Industrial furnace

e. Deferrals/Exemptions (in federal registry only)

☐ 1. Smelter deferral

☐ 2. Small quantity exemption

☐ 3. Other (specify):

Dangerous Waste Site Identification Form (continued)

Site ID

RCRA Site ID Number:

B. Universal Waste Activities

1. Large Quantity Handler of Universal Waste (Mark all boxes that apply)

	Generate	Accumulate
a. Batteries	☐	☐
b. Mercury containing thermostats	☐	☐
c. Lamps	☐	☐

☐ **2. Destination Facility for Universal Waste**
(Note: A RCRA Permit is required for this activity)

C. Used Oil Activities

1. **Off-specification used oil burner** Indicate type(s) of combustion devices
   - ☐ 1. Utility boiler
   - ☐ 2. Industrial boiler
   - ☐ 3. Industrial furnace

2. Used oil transporter Indicate type(s) of activity(s)
   - ☐ a. Transporter
   - ☐ b. Transfer facility

3. **Used oil processor/re-refiner** Indicate type(s) of activity(s)
   - ☐ a. Process
   - ☐ b. Re-refine

4. Used Oil Fuel Marketer
   - ☐ a. Directs shipment of used oil to used oil burner
   - ☐ b. First claims the used oil meets the specifications

11. Description of Hazardous Wastes

A. Waste Codes for Federally Regulated Hazardous Wastes: Identify those codes that best describe your waste. (e.g., D001 – Ignitable, D002 – Corrosive, D003 – Reactive, etc.)

B. Waste Codes for State Regulated (i.e., non-Federal) Hazardous Wastes: Identify those codes that best describe your waste. (e.g., WT02 – Toxic, WP02 – Persistent, WL02 – Labpack, WSC2 – Solid Corrosive, etc.)

12. Comments

Additional sheets may be attached for comments if needed.

13. Certification — **This form cannot be processed without a signature**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature _____ **Date** _____

Name (print or type) _____ **Title** _____

If you have special accommodation needs or require this document in an alternative format, please contact the Hazardous Waste and Toxics Reduction Program at 1-800-833-6388 (TTY) or quick dial 711-833-6388 (TTY).

14. Electronic Submittals

☐ I am interested in the electronic filing of my Dangerous Waste Annual Reporting and Site Identification information to Ecology over the Internet. Ecology will issue a PIN number, along with electronic filing instructions, in a letter addressed to the Form Contact in Section 9 on this form.

Appendix vi

Alaska Regulations

Title XIV – Certain Alaskan Cruise Ship Operations

SEC. 1404. LIMITATIONS ON DISCHARGE OF TREATED SEWAGE OR GRAYWATER.

……

(c) Until such time as the Administrator promulgates regulations under paragraph (b) of this section, treated sewage and graywater may be discharged from vessels subject to this Title in circumstances otherwise prohibited under paragraphs (a)(1) and (a)(2) of this section, provided that—

(1) the discharge satisfies the minimum level of effluent quality specified in 40 CFR 133.102, as in effect on the date of enactment of this Section;

(2) the geometric mean of the samples from the discharge during any 30-day period does not exceed 20 fecal coliform/100 ml and not more than 10% of the samples exceed 40 fecal coliform/100 ml;

(3) concentrations of total residual chlorine may not exceed 10.0 µg/l; and,

(4) prior to any such discharge occurring, the owner, operator or master, or other person in charge of a cruise vessel, can demonstrate test results from at least five samples representative of the effluent to be discharged, taken from the vessel on different days over a 30-day period, conducted in accordance with the guidelines promulgated by the Administrator in 40 CFR Part 136, which confirm that the water quality of the effluents proposed for discharge is in compliance with paragraphs (1), (2) and (3) of this subsection. To the extent not otherwise being done by the owner, operator, master or other person in charge of a cruise vessel pursuant to section 1406, the owner, operator, master or other person in charge of a cruise vessel shall demonstrate continued compliance through periodic sampling. Such sampling and test results shall be considered environmental compliance records that must be made available for inspection pursuant to section 1406 (d) of this Title.

Title 40 CFR 133.102 Secondary treatment.

The following paragraphs describe the minimum level of effluent quality attainable by secondary treatment in terms of the parameters—BOD5, SS and pH. All requirements for each parameter shall be achieved except as provided for in §§ 133.103 and 133.105.

(a) *BOD*5.

(1) The 30-day average shall not exceed 30 mg/l.

(2) The 7-day average shall not exceed 45 mg/l.

(3) The 30-day average percent removal shall not be less than 85 percent.

(4) At the option of the NPDES permitting authority, in lieu of the parameter BOD5 and the levels of the effluent quality specified in paragraphs (a)(1), (a)(2) and (a)(3), the parameter CBOD5 may be substituted with the following levels of the CBOD5 effluent quality provided:

(i) The 30-day average shall not exceed 25 mg/l.

(ii) The 7-day average shall not exceed 40 mg/l.

(iii) The 30-day average percent removal shall not be less than 85 percent.

(b) *SS.*

(1) The 30-day average shall not exceed 30 mg/l.

(2) The 7-day average shall not exceed 45 mg/l.

(3) The 30-day average percent removal shall not be less than 85 percent.

(c) *pH.* The effluent values for pH shall be maintained within the limits of 6.0 to 9.0 unless the publicly owned treatment works demonstrates that: (1) Inorganic chemicals are not added to the waste stream as part of the treatment process; and (2) contributions from industrial sources do not cause the pH of the effluent to be less than 6.0 or greater than 9.0.

Appendix vii

Hazardous Waste Management

This Appendix is to be used as guidance for hazardous waste discharged in Washington State waters or landed ashore in Washington. The following is a list of Resource Conservation Recovery Act (RCRA) and Washington State Criteria hazardous waste that may be found on cruise ships, and appropriate guidance for its discharge or offloading from the ship.

Terms

Hazardous Waste – Includes all hazardous waste as defined by RCRA and Chapter 173-303 of the Washington Administrative Code (WAC), where Washington State Criteria hazardous waste is defined.

Publicly Owned Treatment Works (POTW) - Ecology's Hazardous Waste Toxics Reduction (HWTR) Program will acknowledge Advanced Wastewater Treatment Systems (AWTS) as a substitute for a POTW. Type 2 Marine Sanitation Devices (MSDs) are not considered a POTW for purposes of this MOU.

WASTE STREAMS

Antifreeze- Excluded as a hazardous waste if recycled. (WAC 173-303-522)

Aqueous Degreasing - If the resulting waste is hazardous it can be treated to remove the hazard and the resulting effluent can be sent to the AWTS or Oily Water Separator. If no treatment is performed it can be landed ashore for proper disposal.

Batteries & Mercury Containing Thermostats - These are universal waste if sent for recycling. (Ecology Publication Number 98-407, Universal Waste Rule for Batteries and Mercury Containing Thermostats)

Spent Lead Acid Batteries - Spent lead-acid batteries are conditionally excluded if recycled. (WAC 173-303-520)

Cathode Ray Tubes (CRTs) - Excluded if recycled, otherwise are to be managed as a hazardous waste. (Ecology Publication Number 02-04-017, Interim Enforcement Policy Conditional Exclusion for Cathode Ray Tubes* and Related Electronic Wastes)

Dry Cleaner – Perchloroethylene (PERC) and other chlorinated dry cleaning fluids, contaminated sludge and filter materials are hazardous waste and must be landed ashore in accordance with RCRA requirements.

Florescent Tubes - Handling procedures for fluorescent tubes do not allow for crushing of the bulbs. (WAC 173-303-573 and Ecology Focus Sheet, Publication # 00-04-020, Universal Waste Rule for Dangerous Waste Lamps)

HVAC - CFC's or HCFC's are excluded as a hazardous waste if recycled. (WAC 173-303-506)

Filters from HVAC units that use Halogenated Organic Compounds (HOC's) as fire retardants would be a State Criteria hazardous waste and must be managed as such.

Mercury Switches - Are a hazardous waste and must be managed as such.

Painting - Discarded Paints & Cleanup Solvents. All spent paints and solvents must be properly designated and if hazardous waste, managed as such.

PCB's - Regulated as a state hazardous waste if they come from transformers, capacitors and bushings if PCB's are from 2ppm to 50ppm. If PCB's are above 50 ppm they must be managed as a TSCA waste. (WAC 173-303-9940)

Pharmaceuticals - Drugs that designate as RCRA waste, but that are not controlled substances must be sent ashore as hazardous waste. If the drug is a RCRA waste and a controlled substance, contact the US Drug Enforcement Agency (DEA) about suitable destruction methods and then manage the residue from destruction as a hazardous waste (disposal to water, regular garbage or incineration would be illegal). If the drug is not a RCRA waste, regardless whether it is a controlled substance or not, it can be incinerated on board or sent ashore for incineration at a facility permitted to incinerate municipal solid waste. (WAC 173-303-071(nn))

Photo Waste - Silver can be removed from fixer and the resulting effluent would be allowed to go to an advanced wastewater treatment system (AWTS), but not to graywater or to a Type 2 MSD. If the fluids can not go to the AWTS, they must be landed ashore in accordance with RCRA requirements. (Ecology Publication 94-138R, A Guide For Photo Processors)

Printer Wastes - Inks, solvents and rags, used for cleaning, will need to be properly designated, and if hazardous waste, managed as such.

Spray Cans – Cans that are not empty must be properly designated, and if hazardous waste, managed as such.

Solvent Degreasing - Solvents, when used, must be properly designated, and if hazardous waste, managed as such.

Appendix viii

Regional Director
Washington State Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5452

Dear Director:

Re: Washington Cruise MOU Compliance Report: XXXX (enter year) Cruise Season

Section 9 of the Memorandum of Understanding for Cruise Operations in Washington State (signed XXX (enter signature date)), requires an annual submittal detailing the compliance with the MOU for the each vessel within the NWCCA that calls to a port in Washington for the previous cruise season. Please accept this letter on behalf of XXX (name your cruise line) for the XXXX (enter year) cruise season.

The following ships operated Washington waters during XXXX (enter year):

- Name the ship or ships; list the port of call and the dates.

XXX's operations in Washington State addressed the following key provisions of the MOU as follows:

Section 2.1 Wastewater Management. XXX managed its wastewater in compliance with this section as follows:

[Choose one or more options as appropriate]

- In compliance with Section 2.1.1 and 2.1.2, XXX held all treated and untreated gray and black water while in Washington waters and did not discharge solid waste or oily bilge water if not in compliance with applicable federal and state laws while in Washington waters. List the ships that held their effluent and describe the type of treatment system each ship in this category has. Based on a thorough review of ships' logs and records we certify that our ship(s) complied with these provisions of the MOU. XXX will make these records available to Ecology upon request.

- In compliance with Section 2.1.3 (A), XXX submitted the information required to allow discharge of treated wastewater one mile from berth to Ecology on XX date for the following ship(s): -------. Describe the type of treatment system each ship in this category has. Approval of the information was received from Ecology on XX date.

- In compliance with Section 2.1.3 (B), XXX submitted information supporting its request to discharge treated wastewater continuously to Ecology on XX date for the following ship(s) --

---. Describe the type of treatment system each ship in this category has. Approval to discharge while at berth was received from Ecology on XX date.

Section 2.1.3 (C)(1-3) Shellfish and "upset" conditions. Based on a review of XXX ship's logs and records, XXX certifies that we complied with the prohibition on discharging within 0.5 nautical miles of bivalve shellfish beds that are recreationally harvested or commercially approved to harvest as identified annually by the Department of Ecology and that any "upset" conditions were stopped and immediately reported to the Washington State Department of Health.

Section 2.1.3 (C)(4-10) Other discharge approval requirements. Based on a review of XXX ship's logs and records and other knowledge, XXX certifies that the requirements in this section were met.

Section 2.1.4 Discharge of Residual Solids. Based on a review of XXX ships' logs and records, XXX certifies that we complied with the prohibition on discharging residual solids coming from any type of treatment system within 12 nautical miles from shore and within the Olympic Coast National Marine Sanctuary. XXX will make these records available to Ecology upon request.

Section 2.2.1 through 2.2.4 Hazardous Waste Management. Based on a review of XXX ship's logs and records, XXX certifies that Hazardous Wastes were managed in accordance with these sections of the MOU. XXX will make these records available to Ecology upon request. Add a description of how hazardous waste is managed while in Washington.

Section 6. Marine Mammal Protection Act, Invasive Species Act, and the Washington Ballast Water Management Act. Based on a review of XXX ship's logs and records, XXX certifies that the provisions of the above laws were implemented as required by these laws. XXX will make these records available to Ecology upon request. Add a description of how compliance with these laws was achieved.

Section 9. Immediate self-reporting to Ecology of any incidences of non-compliance with any provisions of the MOU. Describe any incidences of non-compliance and when they were reported to Ecology and any corrective actions taken.

I hereby certify that the above information is true and can be verified through documentation. If you have any questions or concerns, please call me at XXX-XXX-XXXX.

Sincerely,

Name
Position/Title
Company

Appendix ix

INTERAGENCY AGREEMENT NO. 9F73-02

BETWEEN

THE STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

AND

PORT OF SEATTLE

THIS AGREEMENT is made and entered into by and between the DEPARTMENT OF ECOLOGY, hereinafter referred to as "Ecology", and the Port of Seattle, hereinafter referred to as the PORT.

IT IS THE PURPOSE OF THIS AGREEMENT to provide the funding for Ecology personnel to further the intent of the *Memorandum of Understanding, Cruise Operations in Washington State* (the "Cruise MOU") which was entered into between the Department of Ecology, the Port of Seattle, and the Northwest Cruiseship Association ("NWCA"). The parties further acknowledge that the Port is acting solely as a pass-through contracting entity to facilitate the collection of funds from the individual NWCA members and to provide payment to Ecology on behalf of the NWCA members.

THEREFORE, IT IS MUTUALLY AGREED THAT:

STATEMENT OF WORK

Ecology shall furnish the necessary personnel, equipment, material and/or service(s) and otherwise do all things necessary for or incidental to the performance of the work set forth in Attachment "A" attached hereto and incorporated herein.

PERIOD OF PERFORMANCE

Subject to its other provisions, the period of performance of this Agreement shall commence on January 1, 2010, and be completed on December 31, 2010, unless terminated sooner as provided herein.

PAYMENT

The parties have determined that the cost of accomplishing the work herein will not exceed $32,613.00 payment for satisfactory performance of the work shall not exceed this amount unless the parties mutually agree to a higher amount. Compensation for service(s) shall be based on the following rates or in accordance with the following terms, or as set forth in accordance with the budget in Attachment "B" which is attached hereto and incorporated herein.

Notwithstanding anything to the contrary in this Agreement, the Port's obligation to pay for the work set forth on Attachments A and B is expressly contingent on payment to the Port by NWCA and/or its members for such work.

BILLING PROCEDURE

Ecology shall submit an invoice to the Port for work accomplished during the year by March 1, 2011. Payment to Ecology for approved and completed work will be made by payment from excess funds from previous cruise seasons.

RECORDS MAINTENANCE

The parties to this Agreement shall each maintain books, records, documents and other evidence which sufficiently and properly reflect all direct and indirect costs expended by either party in the performance of the service(s) described herein. These records shall be subject to inspection, review or audit by personnel of both parties, other personnel duly authorized by either party, the Office of the State Auditor, and federal officials so authorized by law. All books, records, documents, and other material relevant to this Agreement will be retained for six years after expiration and the Office of the State Auditor, federal auditors, and any persons duly authorized by the parties shall have full access and the right to examine any of these materials during this period.

Records and other documents, in any medium, furnished by one party to this agreement to the other party, will remain the property of the furnishing party, unless otherwise agreed. The receiving party may be required to disclose records and documents, but will not disclose or make available this material to any third parties without first giving notice to the furnishing party and giving it a reasonable opportunity to respond. Each party will utilize reasonable security procedures and protections to assure that records and documents provided by the other party are not erroneously disclosed to third parties.

RIGHTS IN DATA

Unless otherwise provided, data which originates from this Agreement shall be "works for hire" as defined by the U.S. Copyright Act of 1976 and shall be owned by Ecology. Data shall include, but not be limited to, reports, documents, pamphlets, advertisements, books, magazines, surveys, studies, computer programs, films, tapes, and/or sound reproductions. Ownership includes the right to copyright, patent, register, and the ability to transfer these rights.

INDEPENDENT CAPACITY

The employees or agents of each party who are engaged in the performance of this Agreement shall continue to be employees or agents of that party and shall not be considered for any purpose to be employees or agents of the other party.

AGREEMENT ALTERATIONS AND AMENDMENTS

This Agreement may be amended by mutual agreement of the parties. Such amendments shall not be binding unless they are in writing and signed by personnel authorized to bind each of the parties.

TERMINATION

Either party may terminate this Agreement upon 30 days' prior written notification to the other party. If this Agreement is so terminated, the parties shall be liable only for performance rendered or costs incurred in accordance with the terms of this Agreement prior to the effective date of termination.

TERMINATION FOR CAUSE

If for any cause, either party does not fulfill in a timely and proper manner its obligations under this Agreement, or if either party violates any of these terms and conditions, the aggrieved party will give the other party written notice of such failure or violation. The responsible party will be given the opportunity to correct the violation or failure within 15 working days. If failure or violation is not corrected, this Agreement may be terminated immediately by written notice of the aggrieved party to the other.

DISPUTES

In the event that a dispute arises under this Agreement, it shall be determined by a Dispute Board in the following manner: Each party to this Agreement shall appoint one member to the Dispute Board. The

members so appointed shall jointly appoint an additional member to the Dispute Board. The Dispute Board shall review the facts, agreement terms and applicable statutes and rules and make a determination of the dispute. The determination of the Dispute Board shall be final and binding on the parties hereto. As an alternative to this process, either of the parties may request intervention by the Governor, as provided by RCW 43.17.330, in which event the Governor's process will control.

GOVERNANCE

This Agreement is entered into pursuant to and under the authority granted by the laws of the state of Washington and any applicable federal laws. The provisions of this Agreement shall be construed to conform to those laws.

In the event of an inconsistency in the terms of this Agreement, or between its terms and any applicable statute or rule, the inconsistency shall be resolved by giving precedence in the following order:

a. Applicable state and federal statutes and rules;
b. Statement of work; and
c. Any other provisions of the agreement, including materials incorporated by reference.

ASSIGNMENT

The work to be provided under this Agreement, and any claim arising thereunder, is not assignable or delegable by either party in whole or in part, without the express prior written consent of the other party, which consent shall not be unreasonably withheld.

WAIVER

A failure by either party to exercise its rights under this Agreement shall not preclude that party from subsequent exercise of such rights and shall not constitute a waiver of any other rights under this Agreement unless stated to be such in a writing signed by an authorized representative of the party and attached to the original Agreement.

SEVERABILITY

If any provision of this Agreement or any provision of any document incorporated by reference shall be held invalid, such invalidity shall not affect the other provisions of this Agreement which can be given effect without the invalid provision, if such remainder conforms to the requirements of applicable law and the fundamental purpose of this agreement, and to this end the provisions of this Agreement are declared to be severable.

ALL WRITINGS CONTAINED HEREIN

This Agreement contains all the terms and conditions agreed upon by the parties. No other understandings, oral or otherwise, regarding the subject matter of this Agreement shall be deemed to exist or to bind any of the parties hereto.

COUNTERPARTS

This Agreement may be executed in counterparts, each of which may have the signature of only one Party, but each of which shall be deemed to be an original, and all of which, when taken together, shall be deemed to be a single Agreement.

CONTRACT MANAGEMENT

The program manager for each of the parties shall be responsible for and shall be the contact person for all communications and billings regarding the performance of this Agreement.

The Contract/Program Manager for Ecology is: Kevin Fitzpatrick
Department of Ecology

Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5452
(425) 649-7033
E-mail: kfit461@ecy.wa.gov

The Contract/Program Manager for Port of Seattle is:

Michael McLaughlin
General Manager, Cruise and Dock Services
Port of Seattle
P.O. Box 1209
Seattle, WA U.S.A. 98111
Phone:(206)728-3453
E-mail: mclaughlin.m@portseattle.org

IN WITNESS WHEREOF, the parties have executed this Agreement.

State of Washington
Department of Ecology

2/9/10
Kelly Susewind, P.E., P.G. Date
~~Interim~~ Water Quality Program Manager

Port of Seattle

Tay Yoshitani, Date
Chief Executive Officer

APPROVED AS TO FORM:

ATTORNEY GENERAL'S OFFICE

Susan Ridgley, Senior Port Counsel

ATTACHMENT A

Department of Ecology/Port of Seattle

Cruise Ship Memorandum of Understanding Scope of Work

The Department of Ecology (Ecology), the Port of Seattle, and the NorthWest CruiseShip Association (NWCA) are signatory to the *Memorandum of Understanding, Cruise Operations in Washington State* (MOU). Originally the MOU was signed April 20, 2004 and thereafter annually amended. The member cruise lines of the NWCA agree to comply with practices, while operating in waters subject to the MOU, pertaining to the management of solid and hazardous wastes and wastewaters. Ecology is charged with protecting and conserving Washington's environmental resources in relation to the cruise industry's environmental practices in Washington. The NWCA has agreed to fund Ecology's costs to implement the MOU and to accomplish the tasks listed herein.

Task 01

Compliance Work:
Work with stakeholders on drafting necessary amendments to cruise MOU. Provide technical assistance for cruise lines and vessel staff. Field questions from the public, press, environmental groups, and cruise lines. Monitor compliance with the MOU. Work with other programs within Ecology on hazardous waste, biosolids, solid waste, spill prevention, and other MOU elements. Work with Ecology policy and fiscal staff on cruise related issues. Research issues related to vessel discharges. Evaluate, draft and update guidance on Whole Effluent Toxicity (WET) testing for cruise ships and evaluate WET testing results. Work with Department of Health Shellfish program on shellfish and virus related studies and issues. Manage and update Ecology's cruise ship website.

Task 02

Inspections:
Conduct annual inspections of cruise vessels to verify the operation of the treatment systems and to evaluate compliance with the MOU. Write up inspection reports and provide recommendations for improvement. Take samples from vessels and evaluate results.

Task 03

Wastewater Discharge Approvals:
Verify documentation submitted for approval of discharges. Evaluate documentation and treatment systems for requirements of MOU to discharge and based on the information submitted and an engineering review, provide approval for discharges as appropriate.

Task 04

Annual Reports:
Draft annual assessment of cruise ship environmental effects report. Evaluate monthly sampling data results and summarize annually.

Task 05

Project Management:
Oversee the cruise ship MOU program and assist as needed. Provides Administrative oversight for compliance with the MOU, represents senior program management in duties related to protection of water quality from cruise ship discharges including negotiations.

Task 06

Additional tasks may become part of this agreement by mutual concurrence of Ecology and the Port of Seattle, or upon extension of the agreement.

2010 Agreement

Attachment B

Department of Ecology / Port of Seattle

Cruise Vessel Wastewater Treatment Inspections
Budget, by Object

The following is a detail breakdown of the salary, benefits and other costs of the Department of Ecology staff who will be funded under this agreement.

OBJECT		COST
1. Salary:		
Environmental Specialist 5 (ES5) $66,420 x .25 FTE =		$16,605
WMS Band 2 (WMS2) 90,084 x .01 FTE =		$ 901
Total Salary:		$17,506
2. Benefits @ 28.3% of Salary:		$ 4,954
3. FY10 Indirect Costs @ 36.8% of Salary & Benefits (1):		$ 4,133
4. FY11 Indirect Costs @ ???% of Salary & Benefits (1):		$ 4,132
NOTE: The indirect rate for FY11 will probably be different from the FY10 amount but that has not been determined yet. For the purposes of this agreement let us assume the 36.8% rate for the full year. We'll have to amend the agreement once the indirect rate is determined.		
5. Goods & Services @ $4,377 per budgeted FTE:		
ES5 4,377 x .25 FTE =		$ 1,094
WMS2 4,377 x .01 FTE =		$ 44
Lab costs =		$ 750
Total Goods & Services:		$ 1,888
	TOTAL	$ 32,613

(1) Ecology's indirect rate, as approved by the federal cognizant agency (United States Environmental Protection Agency) will apply. The current rate for 7/1/09 through 6/30/2010 is 36.8% of salaries and benefits.

(2) Ecology's indirect rate, as approved by the federal cognizant agency (United States Environmental Protection Agency) will apply. The current rate for 7/1/10 through 6/30/2011 is ???% of salaries and benefits. (See note above)

Appendix x
Bivalve Shellfish Beds

Cruise ships that discharge treated sewage into Puget Sound under this MOU employ advanced systems that treat sewage to a very high degree using a combination of filtration, biological treatment, ultra-filtration, and disinfection. These systems are called Advanced Wastewater Treatment Systems (AWTS). The ultra-filtration process effectively removes nearly all bacteria from the treated sewage. However, viruses which tend to be smaller organisms may pass through the ultra-filtration membranes but are typically destroyed by the disinfection unit.

The Centers for Disease Control & Prevention reported 18 norovirus outbreaks on cruise ships in the Pacific Northwest since 2000. Cruise ships discharge into shallow waters along the shipping lanes, near some commercial shellfish beds. Today, national standards provide little guidance on setting shellfish closure zones based on viral risk and there is no reliable viral indicator standard in part due to difficulties in sampling and testing for norovirus.

Because shellfish in Puget Sound and Admiralty Inlet are valuable resources for Washington State, the Washington State Legislature commissioned the Washington State Department of Health (DOH) Office of Shellfish and Water Protection (OSWP) to study the potential risk to shellfish beds from virus contamination associated with cruise ship waste water discharges. DOH contracted with the University of Washington School of Public Health and Community Medicine to perform a risk assessment, which was completed in November 2007. The study used a quantitative microbial risk assessment method coupled with water quality modeling in Puget Sound. Some key findings of the study include:

- *When advanced wastewater treatment systems (AWTS) are functioning well, there is low concern for viral illness. Adequate disinfection is the key to effective norovirus inactivation.*
- *Loss of disinfection could lead to potentially unacceptable virus levels in water over shellfish beds, even with the large dilution provided by ships under sail. However, using minimum dilution factors for when ships are moving at least 6 knots along the current route, dilution is estimated at 1,500,000:1 between the ship and the shore.*
- *The UW study did not gather samples of norovirus concentrations in treated sewage from cruise ships or in the salt water over shellfish beds. Norovirus remains non-culturable, so there is very limited environmental data that is "norovirus specific." In response, UW researchers used data for norovirus "surrogates" from other studies in their analysis.*
- *Consumption data from Tribes that use shellfish beds closest to the path of cruise ships was used in the risk analysis. These rates are higher than for the general population. Raw oyster consumption rates were used as a conservative assumption for these areas.*

The study included many conservative assumptions, but nonetheless concluded that well functioning AWTSs would not lead to norovirus accumulation in shellfish beds such that the median annual risk of potential illness to shellfish consumers from cruise ship discharges in Puget Sound is less than 10,000,000:1. This compares quite favorably with the calculated annual risk of norovirus illness from consumption of raw oysters in the general population, which the UW researchers calculated as about 1,000:1.

As described above, the potential risk of viral contamination of shellfish beds from cruise ship is extremely low when AWTS systems are functioning well. Additionally the geography of Puget Sound and the configuration of shipping lanes provide most shellfish beds some protection from potential contamination from passing ships. However, the signatories to the MOU understand the importance of shellfish resources to Washington State and have agreed to take the actions outlined on page ___ of the MOU to protect shellfish beds and human health while operating in Washington MOU waters.

Appendix x
continued
Bivalve Shellfish Beds
2011 Season

2011 Cruise Season Boundary Points

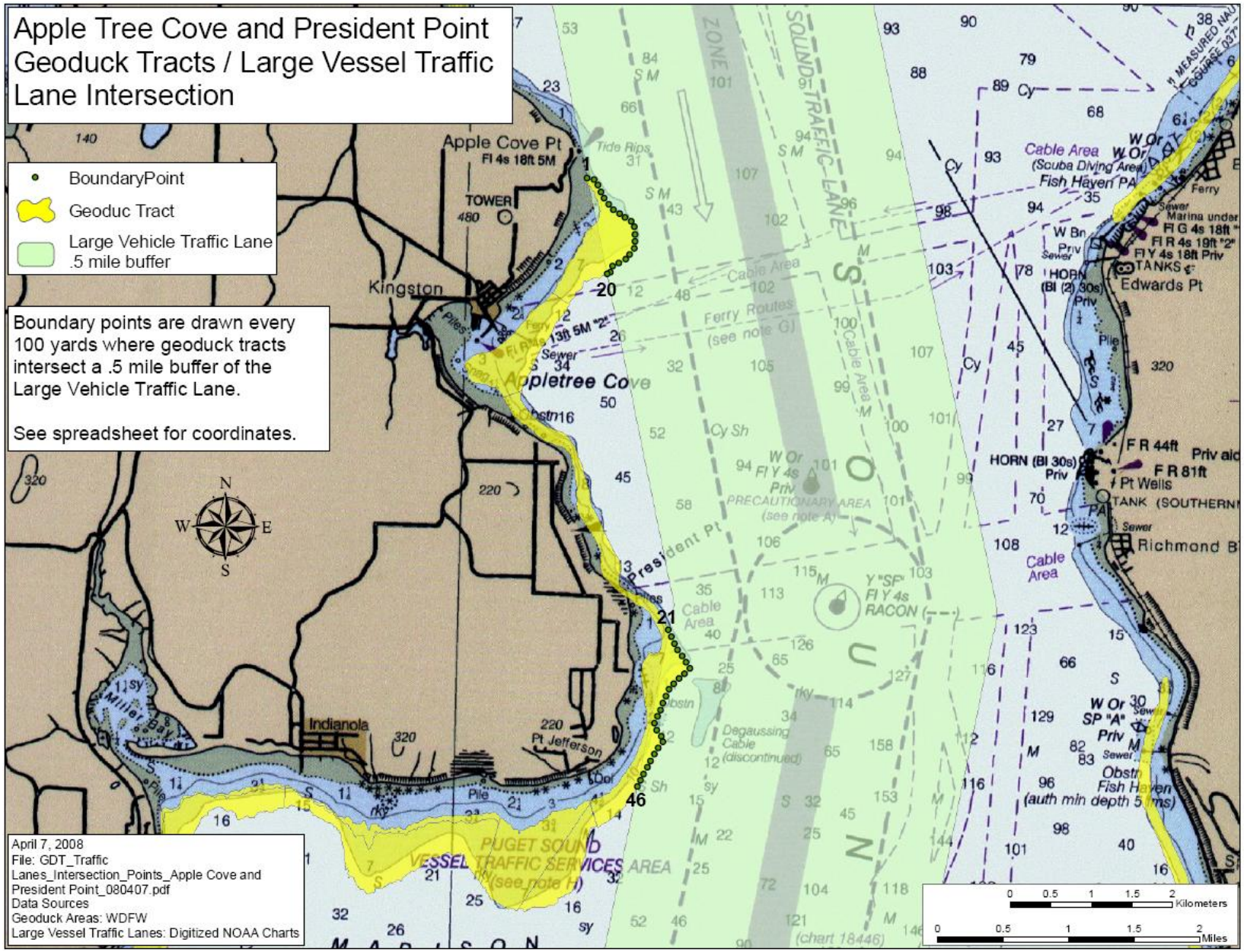
Id	Tract Name	LATITUDE	LONGITUDE
1	Apple Tree Cove	47.81274089040	-122.48047265700
2	Apple Tree Cove	47.81255672180	-122.47941651600
3	Apple Tree Cove	47.81197112760	-122.47872458000
4	Apple Tree Cove	47.81129443870	-122.47812835500
5	Apple Tree Cove	47.81056937740	-122.47758747000
6	Apple Tree Cove	47.80992145700	-122.47684781100
7	Apple Tree Cove	47.80931916930	-122.47604614700
8	Apple Tree Cove	47.80895286530	-122.47498673900
9	Apple Tree Cove	47.80852971000	-122.47419683400
10	Apple Tree Cove	47.80812779070	-122.47315426700
11	Apple Tree Cove	47.80748647770	-122.47257436300
12	Apple Tree Cove	47.80668065230	-122.47239303200
13	Apple Tree Cove	47.80586169470	-122.47237830900
14	Apple Tree Cove	47.80507505630	-122.47246917900
15	Apple Tree Cove	47.80443177020	-122.47321819700
16	Apple Tree Cove	47.80389497510	-122.47389983000
17	Apple Tree Cove	47.80348525790	-122.47492954200
18	Apple Tree Cove	47.80310261180	-122.47598949400
19	Apple Tree Cove	47.80237402570	-122.47638256900
20	Apple Tree Cove	47.80219450150	-122.47688158400

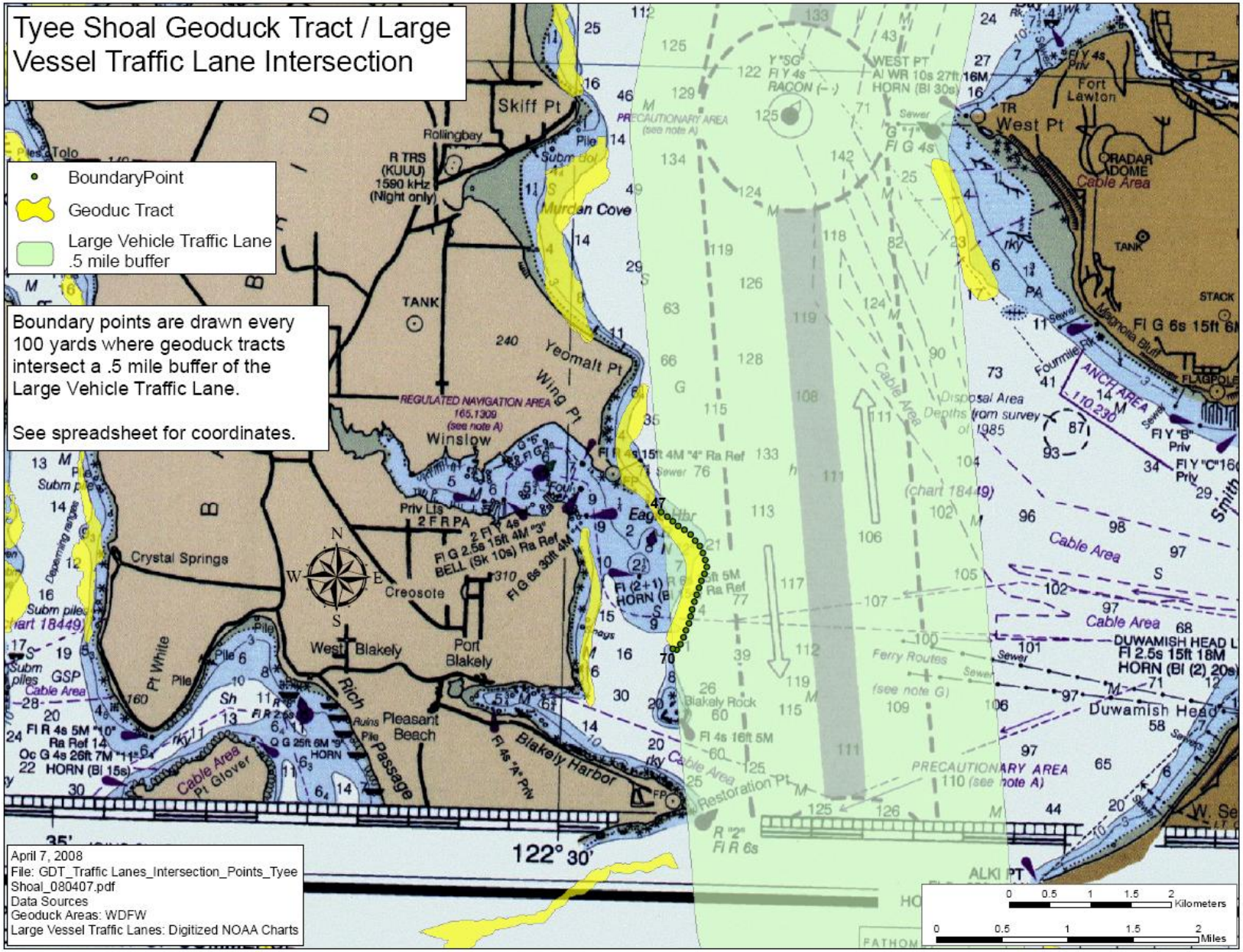
Id	Tract Name	LATITUDE	LONGITUDE
21	President Point	47.76301811440	-122.46531995900
22	President Point	47.76227795780	-122.46478860500
23	President Point	47.76153965240	-122.46425163200
24	President Point	47.76079984240	-122.46372318400
25	President Point	47.76012732540	-122.46302154800
26	President Point	47.75945808780	-122.46231363200
27	President Point	47.75877611500	-122.46163224400
28	President Point	47.75821701680	-122.46249970800
29	President Point	47.75769964180	-122.46344179800
30	President Point	47.75709757920	-122.46424411400
31	President Point	47.75642784290	-122.46495166300
32	President Point	47.75568013190	-122.46545052600
33	President Point	47.75491428200	-122.46589325600
34	President Point	47.75413762450	-122.46629389900
35	President Point	47.75340374390	-122.46683607100
36	President Point	47.75266140050	-122.46720422800
37	President Point	47.75189295980	-122.46684018600
38	President Point	47.75123556490	-122.46610769300
39	President Point	47.75058390610	-122.46579489800
40	President Point	47.74994707310	-122.46656628000
41	President Point	47.74921684450	-122.46711888700
42	President Point	47.74848682750	-122.46768011900
43	President Point	47.74775279740	-122.46822961800
44	President Point	47.74701858040	-122.46877863300
45	President Point	47.74627675290	-122.46930377000
46	President Point	47.74561278720	-122.46984543000

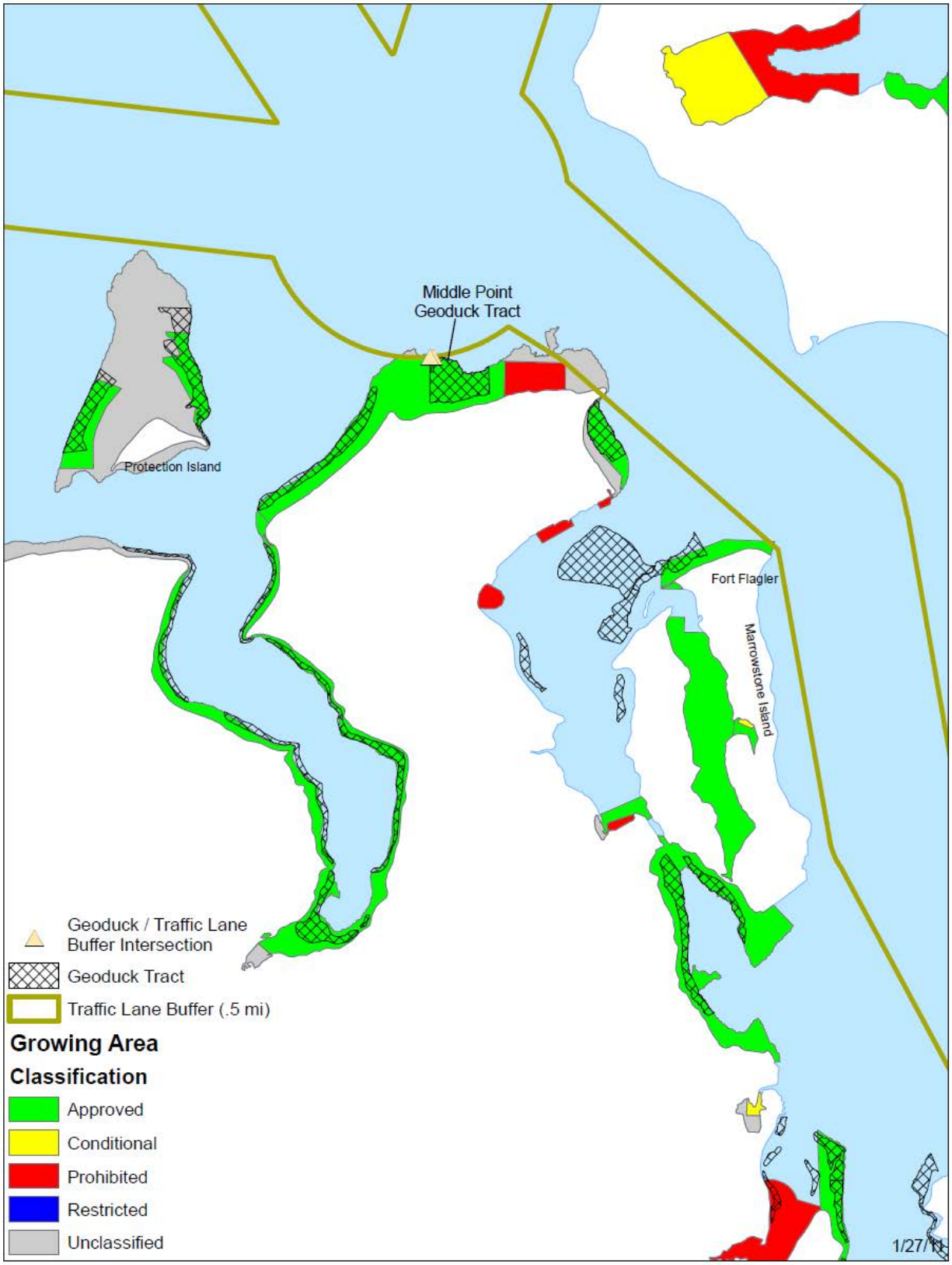
2011 Cruise Season Boundary Points continued

Id	Tract Name	LATITUDE	LONGITUDE
47	Tyee Shoal	47.61916098460	-122.48420272400
48	Tyee Shoal	47.61865190330	-122.48324910700
49	Tyee Shoal	47.61814655430	-122.48229042500
50	Tyee Shoal	47.61761807860	-122.48135871800
51	Tyee Shoal	47.61718007830	-122.48033341700
52	Tyee Shoal	47.61670845870	-122.47935532600
53	Tyee Shoal	47.61609072620	-122.47855854300
54	Tyee Shoal	47.61543441750	-122.47782569300
55	Tyee Shoal	47.61469777070	-122.47729421200
56	Tyee Shoal	47.61394668260	-122.47679893700
57	Tyee Shoal	47.61317098590	-122.47657100600
58	Tyee Shoal	47.61237442300	-122.47686659800
59	Tyee Shoal	47.61162109430	-122.47735159900
60	Tyee Shoal	47.61083929010	-122.47772883400
61	Tyee Shoal	47.61005751060	-122.47810617700
62	Tyee Shoal	47.60927581650	-122.47848390200
63	Tyee Shoal	47.60847990770	-122.47877353100
64	Tyee Shoal	47.60766507680	-122.47893589300
65	Tyee Shoal	47.60687831460	-122.47927979300
66	Tyee Shoal	47.60609769090	-122.47964967100
67	Tyee Shoal	47.60531536900	-122.48000498600
68	Tyee Shoal	47.60457213290	-122.48052049900
69	Tyee Shoal	47.60398226870	-122.48118881300
70	Tyee Shoal	47.60407102430	-122.48180079600
71	Middle Point	48.15109017620	-122.82296755300
72	Middle Point	48.15156870030	-122.82260588400
73	Middle Point	48.15125511720	-122.82167106000

DATUM =
HARN 83


Apple Tree Cove and President Point Geoduck Tracts / Large Vessel Traffic Lane Intersection
BoundaryPoint
Geoduc Tract
Large Vehicle Traffic Lane .5 mile buffer
Boundary points are drawn every 100 yards where geoduck tracts intersect a .5 mile buffer of the Large Vehicle Traffic Lane.
See spreadsheet for coordinates.
April 7, 2008
File: GDT_Traffic Lanes_Intersection_Points_Apple Cove and President Point_080407.pdf
Data Sources
Geoduck Areas: WDFW
Large Vessel Traffic Lanes: Digitized NOAA Charts
Apple Cove Pt
Fl 4s 18ft 5M
Kingston
Appletree Cove
President Pt
Indianola
Pt Jefferson
Miller Bay
PUGET SOUND VESSEL TRAFFIC SERVICES AREA
SOUND TRAFFIC LANE
Edwards Pt
Pt Wells
Richmond
Fish Haven
Kilometers
Miles


Tyee Shoal Geoduck Tract / Large Vessel Traffic Lane Intersection
BoundaryPoint
Geoduc Tract
Large Vehicle Traffic Lane .5 mile buffer
Boundary points are drawn every 100 yards where geoduck tracts intersect a .5 mile buffer of the Large Vehicle Traffic Lane.
See spreadsheet for coordinates.
April 7, 2008
File: GDT_Traffic Lanes_Intersection_Points_Tyee Shoal_080407.pdf
Data Sources
Geoduck Areas: WDFW
Large Vessel Traffic Lanes: Digitized NOAA Charts
Skiff Pt
Rolling bay
West Pt
Fort Lawton
Murden Cove
Yeomalt Pt
Wing Pt
Winslow
Crystal Springs
Creosote
West Blakely
Port Blakely
Pt White
Pleasant Beach
Blakely Harbor
Blakely Rock
Duwamish Head
Cable Area
Ferry Routes
PRECAUTIONARY AREA
122° 30'
Kilometers
Miles


Middle Point
Geoduck Tract
Protection Island
Fort Flagler
Marrowstone Island
Geoduck / Traffic Lane
Buffer Intersection
Geoduck Tract
Traffic Lane Buffer (.5 mi)
Growing Area
Classification
Approved
Conditional
Prohibited
Restricted
Unclassified
1/27/11

Appendix xi

MEMORANDUM OF UNDERSTANDING
CRUISE OPERATIONS IN
WASHINGTON STATE
SUMMARY OF AMENDMENTS

AMENDMENT NO. 1

Signed July 8, 2005

1. Changing references to the Seattle being the only port berthed to all ports in Washington.
    - While the ships typically call only to Seattle, there is potential for port calls to other ports.
2. Adding a requirement for all vessels within the NWCCA to submit an annual report of compliance with MOU.
    - This requirement is being added due to the need to know if ships complied with the MOU whether or not they go through the process of authorization to discharge. For ships that choose to hold their discharge while in Washington waters, it is important to know if they complied.
3. Adding regulation language referenced in Appendix vi to show all effluent limits required for discharge.
    - Ships that discharge must meet the higher standards as set in Alaska which is referenced in the MOU and in appendix vi.

AMENDMENT NO. 2

Signed April 28, 2006

1. Adding a requirement to prohibit the discharge of oily bilge water and a definition was also added. The purpose of this addition is to include specific prohibition language on all major sources of potential pollutants from the vessels.

2. Adding a definition for residual solids. Residual Solids has gone undefined although we have had the requirement to prohibit the discharges. This has been added to clarify exactly what types of residual solids are being managed per this MOU.

3. Adding specific language about what limits must be met for monitoring results. The purpose of this addition is to make it clear to the cruise lines and to the public what limits need to be met.

4. Changing the requirement on WET testing from once per 2 years to once per 40 port calls or turnarounds for vessels that are not homeported due to the fact that vessels come and go from this route from year to year.

5. Other minor changes for organization of the document.

Appendix xi
continued

AMENDMENT NO. 3
Signed May 25, 2007

1. Changing all references and the appendix from the International Council of Cruise Lines (ICCL) to the Cruise Line International Association (CLIA) as the association changed.

2. Adding language about the interagency agreement for cost recovery and referencing the appendix.

3. Changing where residual solids (sludge) can be discharged to disallow any residual solids discharges in the entire Olympic Coast National Marine Sanctuary.

4. Clarifying the language to allow for inspections of all vessels, whether approved for discharge or not for compliance with the MOU. The language currently only allows for inspections of vessels discharging.

5. Clarifying the language to say that all vessels approved for discharge, not just those actually discharging agree to the sampling requirements set out in the MOU. The current language has been confusing for some vessels approved for discharge, but mostly holding discharges anyways.

AMENDMENT NO. 4

1. Incorporating recommendations from the Washington State Department of Health virus report:
    a) Not allow discharges within a half mile of shellfish beds. Include an appendix identifying the areas where bivalve shellfish beds that are recreationally harvested or commercially approved within half a mile of the shipping lanes and update annually. And include an appendix with background information on the virus related elements.
    b) Define a "disinfection system upset" condition as a disinfection below levels of four log (99.99%) inactivation of norovirus.
    c) Require immediate shutdown capability from an upset condition of disinfection below levels of four log (99.99%) inactivation of norovirus for all vessels that have submitted documentation to discharge.
    d) Require immediate notification to the Department of Health for an upset condition.

2. Require whole effluent toxicity testing for only those vessels that are have submitted documentation for continuous discharge.

3. Other minor changes for organization of the document.

AMENDMENT NO. 5

1. Including a process for amending the MOU including a public review process. Proposed amendments will be accepted for the 2012 cruise season and then every three years thereafter.
2. Updating the name of the cruise association. In 2010, the NorthWest CruiseShip Association changed its name to the North West & Canada Cruise Association (NWCCA).
3. Including an additional shellfish area to Appendix X.

Appendix B. Sampling Data for Compliance

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Appendix B: Sample Results - Cruise Ships Approved for Discharge into MOU Waters

SHIP: NORWEGIAN PEARL											
		pH	BOD[3]	TSS[4]	Chlorine Residual[5]	Fecal Coliform6	Ammonia	Copper (dissolved)	Nickel (dissolved)	Zinc (dissolved)	Comments
		St. Units	mg/l	mg/l	mg/l	#/100 ml	mg/l	ug/l	ug/l	ug/l	
MOU/Alaska Limits[1]		6-9	30/45	30/45	10 ug/l	20 / 40					
WA State Water Quality Standards[2]		7.0-8.5	NA	NA	13 / 7.5 ug/l	14 / 43					
Sample Date	Location/ Lab										
5/12/2010	Juneau/Admiralty/Microbac	6.81	ND	ND	ND	ND	0.52	21	3.5	83	
5/16/2010	Seattle/Spectra	7.1	6.2	6.4	ND	ND					
5/19/2010	Juneau/Admiralty/Microbac	6.77	2.9	ND	ND	2	11	5.3	4.9	100	unannounced
5/25/2010	Juneau/Admiralty/Microbac	6.56	3.1	11	ND	96	1.9	22	16	82	
6/2/2010	Juneau/Admiralty/Microbac	6.88	ND	ND	ND	15	12	5	4.6	64	
6/6/2010	Seattle/Spectra	6.76	ND	4.0	ND	ND					
6/9/2010	Juneau/Admiralty/Microbac	6.78	ND	ND	ND	ND	21	6.2	ND	200	
7/7/2010	Juneau/Admiralty/Microbac	6.79	2.1	ND	ND	2	22	7	1.9	45	
7/11/2010	Seattle/Spectra	6.74	2.7	4.0	ND	4					
7/14/2010	Juneau/Admiralty/Microbac	6.92	2.8	ND	ND	ND	26	7.8	4.8	54	
8/4/2010	Juneau/Admiralty/Microbac	7.14	6.6	10	ND	ND	14	5.7	6.5	35	
8/8/2010	Seattle/Spectra	6.75	4	10	ND	ND					
8/11/2010	Juneau/Admiralty/Microbac	6.86	4.3	5	ND	ND	26	9	5.2	25	
8/18/2010	Juneau/Admiralty/Microbac	6.94	3.3	11	ND	*	12	11	6.4	50	unannounced. Fecal coliform had invalid results and were re-sampled on 8/20 and 8/22
8/20/2010	Ketchikan/R&M	6.87	NA	NA	ND	ND					
8/22/2010	Seattle/Spectra	7.02	NA	NA	ND	ND					
9/8/2010	Juneau/Admiralty/Microbac	6.91	ND	ND	ND	ND	13	7.5	4.4	67	
9/12/2010	Seattle/Spectra	6.89	4	4.7	ND	10					
	MINIMUM	6.56	ND	ND	ND (<0.1)	ND	0.5	5.0	ND	25	met Seattle sampling requirement
	AVERAGE		3.3	5.9			14.5	9.8	5.8	73	
	MAXIMUM	7.14	6.6	11	ND (<0.1)	96	26.0	22.0	16.0	200	WA port calls: 5/9-9/12
	GEOMETRIC MEAN					3.24					

SHIP: NORWEGIAN STAR											
		pH	BOD[3]	TSS[4]	Chlorine Residual[5]	Fecal Coliform6	Ammonia	Copper (dissolved)	Nickel (dissolved)	Zinc (dissolved)	Comments
		St. Units	mg/l	mg/l	mg/l	#/100 ml	mg/l	ug/l	ug/l	ug/l	
MOU/Alaska Limits[1]		6-9	30/45	30/45	10 ug/l	20 / 40					
WA State Water Quality Standards[2]		7.0-8.5	NA	NA	13 / 7.5 ug/l	14 / 43					
Sample Date	Location/ Lab										
5/11/2010	Ketchikan/Admiralty/Microbac	6.92	14	ND	ND	ND	1.7	2.5	12	220	
5/18/2010	Ketchikan/Admiralty/Microbac	6.92	6.4	ND	ND	4	9.6	3	12	46	Unannounced
5/22/2010	Seattle/Spectra	7.04	5.2	3.3	ND	7					
5/25/2010	Ketchikan/Admiralty/Microbac	7.03	10	ND	ND	ND	29	6.6	14	69	
6/5/2010	Seattle/Spectra	6.96	17	7.3	ND	ND					
6/8/2010	Ketchikan/Admiralty/Microbac	6.98	9.8	8	ND	2	23	3.5	10	190	
6/15/2010	Ketchikan/Admiralty/Microbac	7.02	12	ND	ND	ND	30	2.4	10	70	
7/6/2010	Ketchikan/Admiralty/Microbac	6.87	7.5	4	ND	50	16	1.4	9.5	39	
7/24/2010	Seattle/Spectra	6.97	10	3.5	ND	ND					

SHIP: NORWEGIAN STAR											
		pH	BOD[3]	TSS[4]	Chlorine Residual[5]	Fecal Coliform6	Ammonia	Copper (dissolved)	Nickel (dissolved)	Zinc (dissolved)	Comments
		St. Units	mg/l	mg/l	mg/l	#/100 ml	mg/l	ug/l	ug/l	ug/l	
MOU/Alaska Limits[1]		6-9	30/45	30/45	10 ug/l	20 / 40					
WA State Water Quality Standards[2]		7.0-8.5	NA	NA	13 / 7.5 ug/l	14 / 43					
Sample Date	Location/ Lab										
7/27/2010	Ketchikan/Admiralty/Microbac	6.88	9.8	ND	ND	ND	23	3.0	11	81	
8/3/2010	Ketchikan/Admiralty/Microbac	6.6	9.8	12	ND	10	20	1.2	9.5	73	
8/7/2010	Seattle/Spectra	6.87	10	7	ND	ND					
8/10/2010	Ketchikan/Admiralty/Microbac	7.16	13	ND	ND	ND	28	2.1	8.9	30	
8/18/2010	Juneau/Admiralty/Microbac	7.15	10	4	ND	2	16	2.5	6.9	23	Unannounced
9/7/2010	Ketchikan/Admiralty/Microbac	7.13	5	ND	ND	ND	35	3.0	7.6	59	
9/11/2010	Seattle/Spectra	7.11	4.0	0.67	ND	ND					
9/14/2010	Ketchikan/Admiralty/Microbac	6.96	4.1	ND	ND	ND	30	ND	7.5	42	
*fecal coliform analysis demonstrated confluent growth, so results not quantifiable. Re-sample ordered.											
	MINIMUM	**6.6**	**4.0**	**ND**	**ND (<0.1)**	**ND**	**1.7**	**ND**	**6.90**	**23**	met Seattle sampling requirement
	AVERAGE		**9.3**	**4.8**			**21.8**	**2.8**	**9.9**	**78.5**	
	MAXIMUM	**7.16**	**17**	**12**	**ND (<0.1)**	**50**	**35**	**7**	**14**	**220**	
	GEOMETRIC MEAN					**3.05**					WA port calls: 5/15-9/25

ND = Non Detect, value in box is the detection level. Unnanounced sampling includes other parameters not listed above.

BOD = Biochemical Oxygen Demand - or organics; TSS = Total Suspended Solids

mg/l = milligrams per liter; ug/l = micrograms per liter; #/100 ml = coliforms per 100 millileters

[1]MOU/Alaska limits from Title XIV, Certain Alaska Cruise Ship Operations, Section 1404(c) /40CFR 133.102

BOD and TSS: 30-day average shall not exceed 30 mg/l, 7-day average shall not exceed 45 mg/l

Fecal Coliform: geometric mean of any 30-day period shall not exceed 20 fecal colifrom/100 ml and not more than 10% of the samples exceed 40 fecal coliform/100 ml

[2]Washington State Water Quality Standards for Surface Waters of the State of Washington Chapter 173-201A WAC

Fecal Coliform: shall not exceed a geometric mean of 14 colonies/100 ml and not more than 10% of a samples shall exceed a geometric mean of 43 colonies/100 ml

pH: 7-8.5 with a human-caused variation within less than 0.2

chlorine: 13 ug/l is the acute limit (1-hour average); 7.5 ug/l is the chronic limit (4-day average)

[3]BOD detection level = 2 mg/l

[3]TSS detection level = 4 mg/l

[3]Chlorine Residual detection level = 0.1 mg/l

[3]Fecal Coliform detection level = 2 #/100 ml

Appendix C. Inspection Reports

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DEPARTMENT OF ECOLOGY
State of Washington

State of Washington Department of Ecology

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

Northwest Regional Office
3190 160th Ave SE
Bellevue, WA 98008
Phone: (425) 649-7000
Fax: (425) 649-7098

Inspection Date	Permit Number	County	Receiving Waters	Ecology Inspector
06/18/2010	NA	King	Marine Waters	Amy Jankowiak, Compliance Specialist
Entry Time 9:02 am Exit Time 11:20 am	Photos Taken ☒ Yes ☐ No	Samples Taken ☐ Yes ☒ No	Inspection Announced ☒ Yes ☐ No	Discharges to: ☒ Surface Water ☐ Ground Water ☐ Dewater ☐ POTW

Name and Location of Site Inspected:
RHAPSODY OF THE SEAS, Royal Caribbean International
Passenger Vessel
Pier 91, Seattle

Additional Participants/Inspectors:

On-Site Representative(s): *Name/Title/Phone/e-mail*
Lizel De Bruin, Environmental Officer
RH_EnvironmentalOfficer@rccl.com

Responsible Official(s): *Name/Title/Address/Phone/e-mail*
Rich Pruitt, Director Environmental Programs
Royal Caribbean Cruises Ltd
1080 Caribbean Way, Miami, FL 33132
Office: 305-982-2179; cell: 305-495-2845; RPruitt@rccl.com

Other Facility Data:
Notification made to Rich Pruitt, June 15, 2010

Section A: Areas Evaluated

☒ Black/Gray Wastewater System	☒ Residual Solids	☒ Records/Reports	☒ Hazardous Waste/ Solid Waste	☐ Sampling/Monitoring
☒ Discharge Locations	☒ Operation & Maintenance	☒ Sludge Handling/ Disposal	☒ Oily Bilge Water	☒ Other

Section B: For Vessels Discharging ≥ 1nm from Berth and ≥ 6 Knots Only [2.1.3(A)]

☐ Schematics Match Black/Gray Wastewater System	
☐ Operations as Described In Submitted Documentation	
☐ Daily 24-hour Continuous Monitoring for Turbidity or Equivalent Monitoring	
☐ Turbidimeter or Equivalent Monitoring Equipment Functioning Properly	
☐ 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: Trigger Level for Shutdown:

Recorded Turbidity/Equivalent Levels Above Triggers:

☐ Daily 24-hour Continuous Monitoring for Disinfection Effectiveness	
☐ Disinfection Effectiveness Monitoring Equipment Functioning Properly	

Disinfection Effectiveness Monitoring:

☐ Auto Shut Down or Operational Controls to Insure System Shut Down If Disinfection System Upset Occurs	
☐ Disinfection System Operated and Maintained Properly	

Disinfection System:

Section C: For Vessels Discharging Continuously [2.1.3(B)]		
☐	Schematics Match Black/Gray Wastewater System	
☐	Operations as Described in Submitted Documentation	
☐	Daily 24-hour Continuous Monitoring for Turbidity or Equivalent Monitoring	
☐	Turbidimeter or Equivalent Monitoring Equipment Functioning Properly	
☐	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: Trigger Level for Shutdown: Recorded Turbidity/Equivalent Levels Above Triggers:	
☐	Daily 24-hour Continuous Monitoring for Disinfection Effectiveness	
☐	Disinfection Effectiveness Monitoring Equipment Functioning Properly	
	Disinfection Effectiveness Monitoring:	
☐	Auto Shut Down or Operational Controls to Insure System Shut Down if Disinfection System Upset Occurs	
☐	Disinfection System Operated and Maintained Properly	
	Disinfection System:	
Section D: General (Approved to Discharge)		
☐	No Discharges Within ½ Miles From Shellfish Beds/ Protocol (President's Point, Apple Tree Cove, Tyee Shoal)	
☐	Discharges Immediately Stopped When High Turbidity Occurs	
☐	Discharges Immediately Stopped When Disinfection System Upset Occurs	
☐	Immediate Notifications Made to WA Department of Health for Disinfection System Upset	
☐	Sampling Conducted 2/month, 1/month in Seattle (BOD, TSS, Fecal Coliform, pH, Chlorine Residual)	
☐	Whole Effluent Toxicity Testing 1 per 2 Years (homeported) or 1/40 Calls for Continuous	
Section E: General		
☒	Wastewater Discharge Records Review	Discharge records were reviewed (black water/gray water/residual solids) and are maintained properly. All discharges occurred outside of MOU waters (reviewed from 9/4/2009, last inspection, to date). Policy is to only discharge black water or gray water 13nm from land, at sea. This includes a 1nm buffer from company policy of 12nm, and CLIA guidelines.
☒	Residual Solids Managed Properly/Disposal Protocol per MOU	Sewage sludge is currently collected from the Haaman black water treatment system, drummed and landed ashore (only needs to be done periodically). Screened materials are incinerated.
☒	Hazardous Waste Managed Properly	Hazardous waste is typically off-loaded in Seattle or in Victoria about once every six months. Hazardous waste records were reviewed and appear to be consistent with MOU requirements. In Seattle, Clean Harbors is currently used for off-loads. The last off-load was May 21, 2010.
☒	WA Hazardous Waste Guidelines Followed (Appendix vii)	Hazardous waste is typically off-loaded in Seattle or in Victoria about once every six months. Hazardous waste records were reviewed and

	appear to be consistent with MOU requirements. In Seattle, Clean Harbors is currently used for off-loads. The last off-load was May 21, 2010.
☒ Solid Waste Managed Properly	Solid waste appears to be managed properly. The various solids waste streams are collected, sorted, stored, and sent ashore for proper disposal or incinerated where appropriate. Incineration occurs at sea only (>13nm). Records reviewed showed only food waste being discharged and only outside of MOU waters.
☒ Oily Bilge Water Managed Properly	Oily bilge water is treated and discharged at less than 5ppm (federal standard is 15ppm) and outside of MOU waters (>13nm).

Other:

Section F: Sampling Results

Parameter	Results
Biochemical Oxygen Demand 5-Day (BOD_5)	
Total Suspended Solids (TSS)	
Fecal Coliform	
Residual Chlorine	
pH	
Ammonia, Nitrogen	

Section G: Summary of Findings/Comments

Introduction

Amy Jankowiak, Washington State Department of Ecology (Ecology) Northwest Regional Office, Water Quality Program, conducted the inspection of the Royal Caribbean RHAPSODY OF THE SEAS on June 18, 2010. The main contact on board the RHAPSODY OF THE SEAS included Lizel De Bruin, Environmental Officer. Prior notification of the visit was given on June 15, 2010 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 RHAPSODY OF THE SEAS (photo #01) arrived on May 14th, 2010 at the Port of Seattle to begin the 2010 cruise season which consists of 18 calls to Seattle. They currently have both a traditional marine sanitation device for black water that includes screening, aeration and chlorination and have recently installed a new advanced wastewater treatment system for both black and gray water. The new AWTS underwent start-up last year, but experienced some problems and is now being revamped. No discharges are occurring from the system in MOU waters. The new AWTS is a NAVALIS Environmental Systems® treatment system includes equalization, aeration, solids separation, ultrafiltration, advanced oxidation and ultraviolet light disinfection. Approval for continuous discharge from Ecology has not been requested nor issued. The vessel has been holding effluent and not discharging in MOU waters since the beginning of the season.

The RHAPSODY OF THE SEAS' maiden voyage was in 1997, and is 915 feet long with a width of 105.6 feet. The vessel is not equipped for shore power, but does use two different types of low-content sulfur fuel (IFO380 with variance around 1.4% sulfur content or MDO with a range of 5-8 ppm).

Inspection

I arrived and boarded the ship at 9:02 am and began with introductions and a plan for the day with Lizel De Bruin, the Environmental Officer. Ms. De Bruin is new to the vessel, but has been an environmental officer for a number of years. We first discussed the various waste streams and discharge protocols. We then reviewed discharge records for hazardous waste, garbage and black water and gray water. A copy of the current MOU was available. We then headed to the control room for a discussion of the two wastewater treatment systems. We then viewed the black water and gray water systems. We then toured the oily water separator, the hazardous waste storage and garbage and recycling areas, and the dry cleaning system. The inspection was then finalized and we disembarked the vessel at about 11:20 am.

Discharge Types and Protocols:

All wastewater discharges occur outside of 13 nautical miles (they add a one mile buffer beyond their normal policy) and out at sea. The vessel has sufficient holding capacity for a typical turnaround in Seattle. The vessel is also currently

holding discharges while in Alaska and is closer to holding capacities for the time frame in Alaskan waters. The discharge ports (photos #26 and #27) have padlocks on them and the keys are kept in the control room under the Watchkeeper's eye. There is also an electronic reporting of discharges that occurs automatically and prints out. The electronic recording (Norcontrol) is a recording of each action and alarm on all technical machinery. All discharges are logged in the respective log books. All entries are checked by the log writer, Environmental Officer and the Chief Engineer to minimize discrepancies.

For black water and gray water, the latitude and longitude coordinates are recorded in the *Sewage and Graywater Discharge Record Book* and in the deck log. The date, time and location of both the start and the stop of the discharges are recorded, along with port location, effluent type, and volumes. All wastewater discharge records that were reviewed appeared to be in compliance with the MOU and did not occur in MOU waters. Records were reviewed for the time period since the last inspection, September 4, 2009 to date.

The vessel currently has both a traditional marine sanitation device (MSD) for black water that includes screening, aeration and chlorination and in 2009 installed a new advanced wastewater treatment system, NAVALIS®, for both black and gray water. The new AWTS was undergoing start-up in 2009 with the manufacturers. The system experienced some problems and is currently being revamped. The system is operating for the purposes of testing, but no discharges are occurring. All black water is going through the Hamann traditional MSD.

Black water includes toilet waste and infirmary drains. Gray water includes sink and shower water, laundry water, spa water and galley water. Gray water is collected and held separately from black water and is then discharged outside of MOU waters, and outside of 13 nautical miles (nm) from shore along with the MSD treated black water. Screenings from the MSDs is collected and incinerated. Bioresidue, or sewage sludge collected from the treatment systems are currently collected, drummed and sent ashore for proper treatment via drums. Once the NAVALIS® black and gray water advanced wastewater treatment system is fully operating, the bioresidue can be dried and incinerated.

Food waste is collected in various locations and is sent to the pulping system. Water in the pulper is recycled and occasionally discharged along with galley water as gray water more than 13 nm and out at sea. Some silverware and other metal pieces were recently found in the pulping system pipes and caused a leak. The leak was contained and the system was operating. Pulped food waste is discharged outside of 13 nm. Used water from the pulpers is sent to the black water collection tanks. Some food wastes such as pineapple rinds, banana peels, coffee, cake and breads which clog up the pulpers is sent to the incinerators or sent ashore per USDA. Used cooking oil (photo #18) is landed ashore for biodiesel recycling.

Oily bilge water is treated with a Marinfloc® sytstem (photo #15) and discharged at less than 5 ppm at greater than 13 nm. A white box is used for additional monitoring assurance. The white box (photo #16) is programmed to prevent discharge at less than 5 ppm. When the white box is opened, the effluent is routed back to the dirty bilge tank. The white box is padlocked and requires two keys. The Engineer on Watch has one key and the Chief Engineer has the other. Sink water from the engine area goes to the oily bilge water system. Oily sludge (photo #21) is drummed and offloaded in Victoria for proper disposal.

Pool water, which is salt water with chlorine can be held for about 7 days and is discharged overboard outside of MOU waters and is pH controlled. If the pool needs to be emptied while in MOU waters, the pool is closed and covered until they are out at sea. If there sanitation incidents on deck, the area is sanitized and steam units are used. Spa water is drained and cleaned daily. Prior to draining the system, the water is chlorinated to at least 10ppm, circulated for one hour and then the filters back-flushed. After back-flushing, the spas are cleaned with soap and chlorine rinse o fat least 10ppm. They are then drained to the gray water system and processed as such.

Potable water is either bunkered or produced by desalinization when out at sea. One of two evaporators is used for desal and the brine is discharged. The evaporators can produce 600 cubic meters per day, per unit.

Oily rags, medical waste (except sharps), food-contaminated cardboard, some plastics, some paper and wastewater system screenings are all incinerated (photos #24 and #25).

Plastics, paper, cardboard, glass, pallets, aluminum, tin, scrap metals, and batteries are all recycled (photos #22 and #23). Fluorescent lamps are recycled after being crushed in a "bulb eater" that has a mercury vapor removal system. Recycling currently takes place in Canada. Dry garage is offloaded as non-hazardous waste. Some materials are also donated when feasible. Garbage records looked to be in good order. Chemical containers are returned to the vendor for reuse (photo #17). Unitor chemicals are used for cleaning and phosphate-free Ecolab® products are used for the laundry.

Dry cleaning no longer uses Perchloroethylene (PERC). The newer system (photo #28) uses a hydrocarbon solvent called Exxon DF 2000 Fluid (photo #29). It is less toxic than its predecessor and produces much less volume of waste.

The liquid waste is drummed and off-loaded as non-hazardous waste. Other hazardous waste materials (photo #19) include photo waste filters (photo liquid waste from the silver recovery system is sent off as non-hazardous waste), spent chemicals, paints and paint thinners, aerosol condensate and filters from the fluorescent bulb mercury removal system. Hazardous waste is typically off-loaded in Seattle or in Victoria about once every six months. Hazardous waste records were reviewed and appear to be consistent with MOU requirements. In Seattle, Clean Harbors is currently used for off-loads. The last off-load was May 21, 2010.

Medical drains drain to the black water system. Medical sharps are collected in sharps containers and are off-loaded as bio-hazardous waste. Other medical wastes are collected in color-coded bags and are off-loaded or incinerated.

Photo waste is collected and run through a silver recovery system. Once the waste is less than 5 ppm, it is drummed and off-loaded as non-hazardous waste (photo #20). X-rays are now done digitally and do not have any waste materials. The old x-ray machine and chemicals is readied for off-loading as hazardous waste.

Cleaning of the outside of the vessel is done with phosphate-free cleaners and fresh water. When spot painting and chipping is to occur on the ships side, a request is submitted to the ports for approval for proposed work alongside if not able to do the work during sea days. Canvas, catchers, scoops and protection is rigged before work is started and the Boatswain and 1st Officer Deck Maintenance take charge of the actions with checks done by the Staff Captain and Environmental Officer to ensure procedures are followed and carried out in accordance with work permits.

HAMANN® Black water System traditional marine sanitation device (photo #13):
Black water or bioresidue is collected by vacuum. The liquid is coarsely screened and then screened by a drum screen. All solids collected are either incinerated or drummed and off-loaded. The screened liquid is sent to one of two treatment tanks where it is mixed with seawater. The type I marine sanitation device (MSD) consists of aeration, baffles, a minimizing pump and then chlorination by sodium hypochlorite (photo #14). The liquid is then held for discharge. Any solids collected from the MSD is also collected into the drums for shore side off-loading.

NAVALIS® Black and Gray water Advanced Wastewater Treatment System:

When the NAVALIS® system (photo #02) is operating, it operates as follows: Black water first goes through one of two shaker screens removing solids and foreign objects. Solids (photo #12) are separated and taken to the solids tank (photo #6), where they are burned in the incinerators or landed ashore as bio-residuals. The liquid is gravity fed to the roughing reactor, Aerated Equalization Tank (AET) (photos #03 and #04).

Gray water also goes through a shaker screen and then combines (photo #07) with black water in the AET. Liquid from the AET is pumped to the hydraulic separator (photo #05) where polymer is introduced and helps with the combination of any remaining sludge. The material in the upper layer of the hydraulic separator is pumped to the sludge reduction tank (SRT). The liquid from the bottom layer of the hydraulic separator is pumped to the Intermediate Tank. From there it is pumped through the Tubular Filter to the membrane feed tank.

The water in the SRT is left to settle; the water is reintroduced to the system while the remaining residuals are pumped to the residual holding tank (photo #06). From the membrane feed tank (photo #08), the effluent is then put through the ceramic membrane ultrafilters (photo #09) and then onto the Reactor where it is treated with ozone (photo #10). The ultrafilters are inside-out filters where liquid enters through the center and then is filtered outwards through the ceramic.

Effluent is then circulated through the ultraviolet disinfection system (photo #11). The treated effluent is then either discharged while in sea condition or placed in holding tanks when not at sea.

Conclusions and Recommendations
Staff was very knowledgeable of the protocols and systems for treatment and discharges. Discharge protocols were clear.

The installation of an advanced purification system is applauded for the overall environmental benefits that it will provide. Hopefully, the issues with the advanced system will be resolved and the system can be used on a continuous basis. And keeping the traditional MSD on board for additional bioresidue treatment is also an advantage.

Attachments: Photographs

Copies to:

Rich Pruitt, RCCL
Lizel De Bruin, RCCL
Mark Toy, Department of Health
John Hansen, NorthWest CruiseShip Association
Karen Burgess, Ecology
Kevin Fitzpatrick, Ecology
Amy Jankowiak, Ecology
Central Files: Royal Caribbean – RHAPSODY OF THE SEAS; WQ 6.1

Section H: Signatures

Name and Signature of Inspector:	Agency/Office/Telephone:	Date
Amy Jankowiak	Department of Ecology Northwest Regional Office Water Quality Program Municipal Compliance Specialist 425-649-7195	7/22/10
Name and Signature of Reviewer:	**Agency/Office/Telephone:**	**Date**
Kevin C. Fitzpatrick	Department of Ecology Northwest Regional Office Water Quality Section Manager 425-649-7033	7/22/10

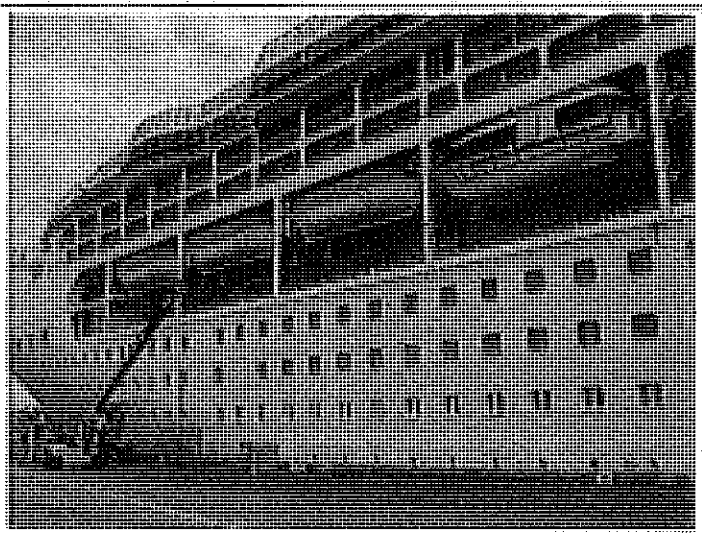


PHOTO #:01 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P0180032
DESCRIPTION:

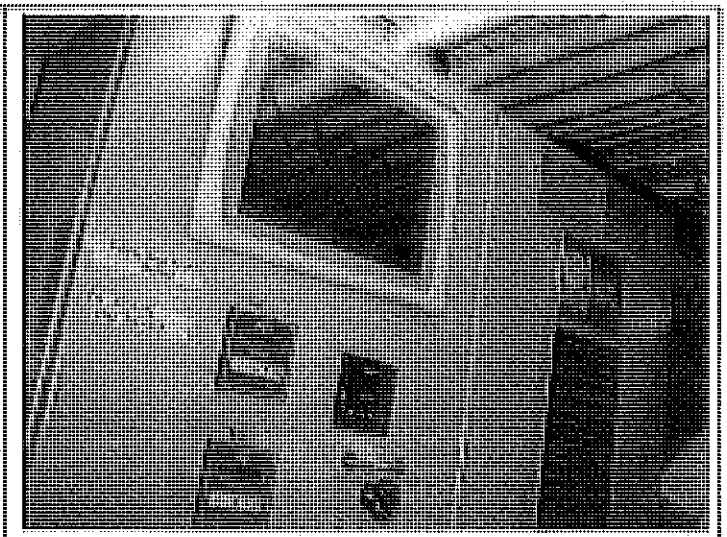


PHOTO #:02 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P0180024
DESCRIPTION: NAVALIS® SYSTEM CONTROLS

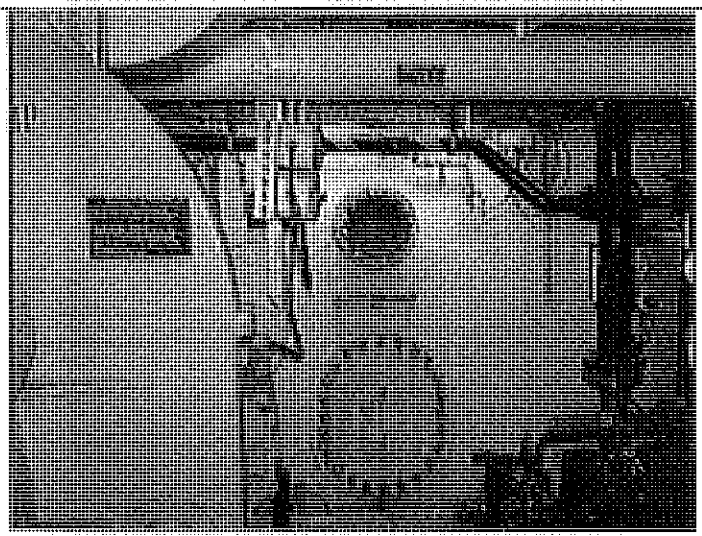


PHOTO #:03 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P0180026
DESCRIPTION: NAVALIS® SYSTEM BIO TANK

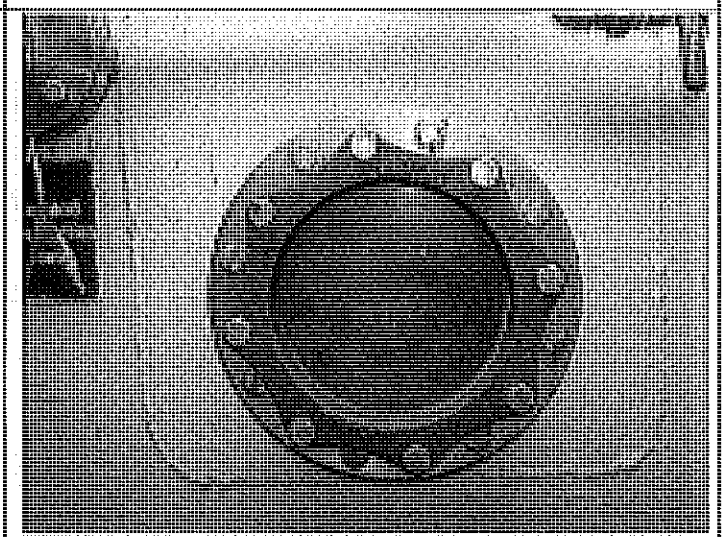


PHOTO #:04 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P0180026
DESCRIPTION: NAVALIS® SYSTEM BIO TANK

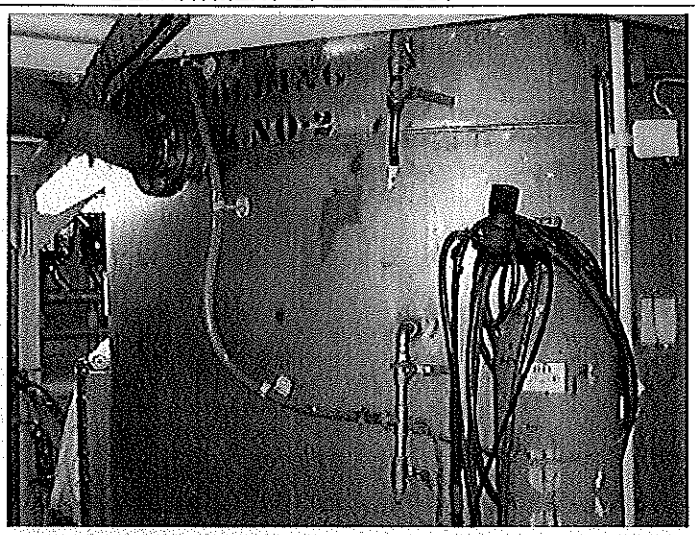


PHOTO #:05 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P6180027
DESCRIPTION: NAVALIS® SYSTEM BLACK WATER TANK – SOLIDS SEPARATION (POLYMER ADDED)

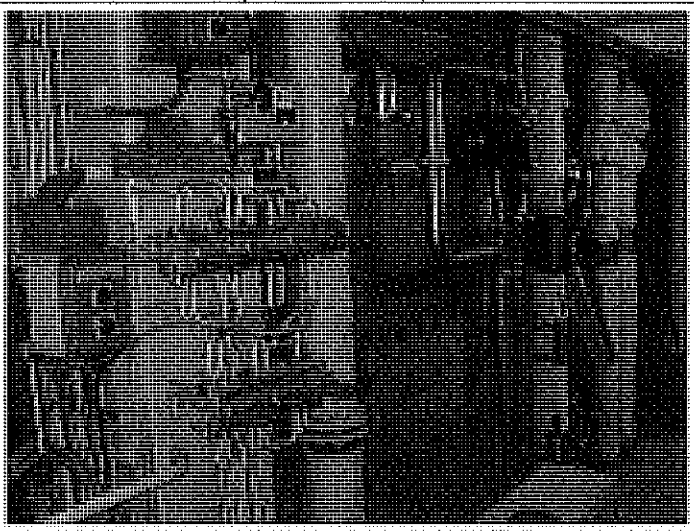


PHOTO #:06 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P6180028
DESCRIPTION: NAVALIS® SYSTEM RESIDUE HOLDING TANK

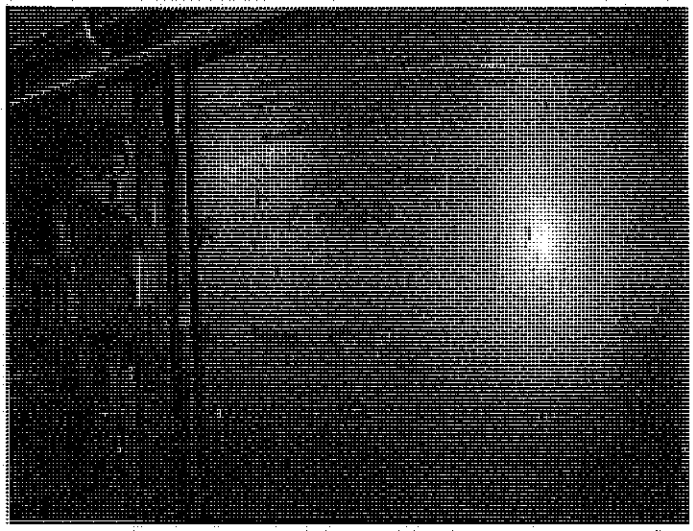


PHOTO #:07 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P6180029
DESCRIPTION: NAVALIS® SYSTEM GRAY WATER COMBINES WITH BLACKWATER

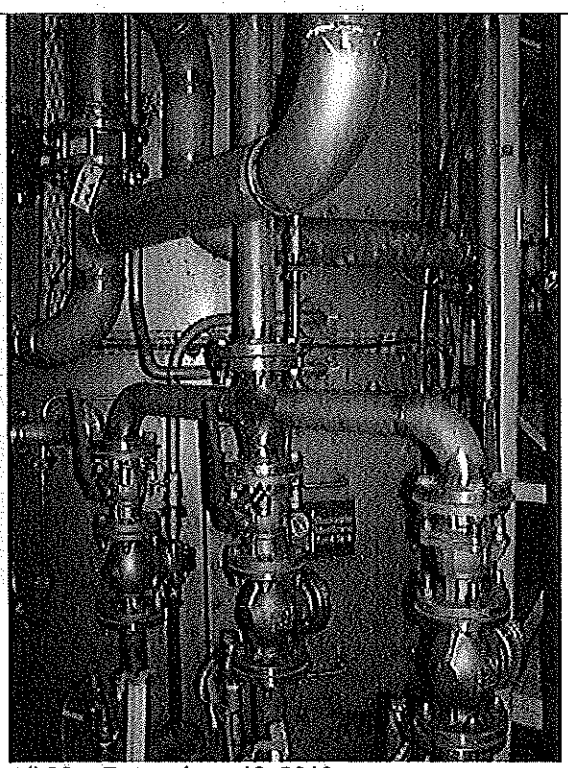


PHOTO #:08 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P6180030
DESCRIPTION: NAVALIS® SYSTEM MEMBRANE FEED TANK (JUST PRIOR TO FILTERS)

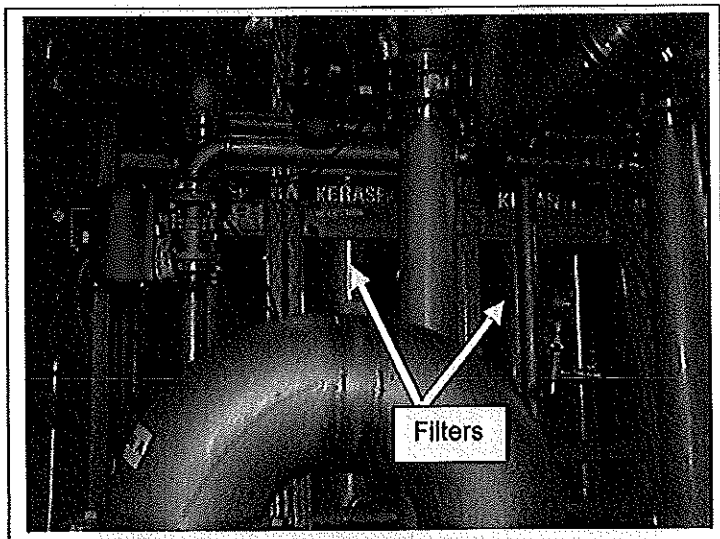


PHOTO #:09 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P6180032
DESCRIPTION: NAVALIS® SYSTEM FILTERS

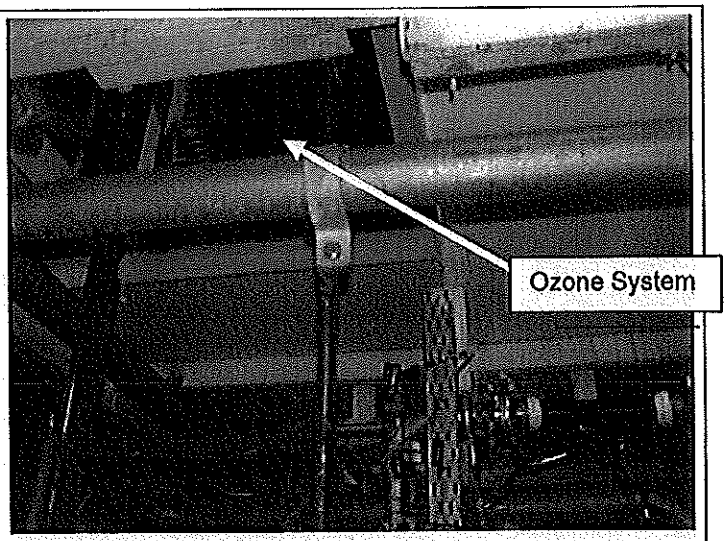


PHOTO #:10 DATE; JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P6180033
DESCRIPTION: NAVALIS® SYSTEM OZONE (STEEL BOX AT TOP OF LADDER)

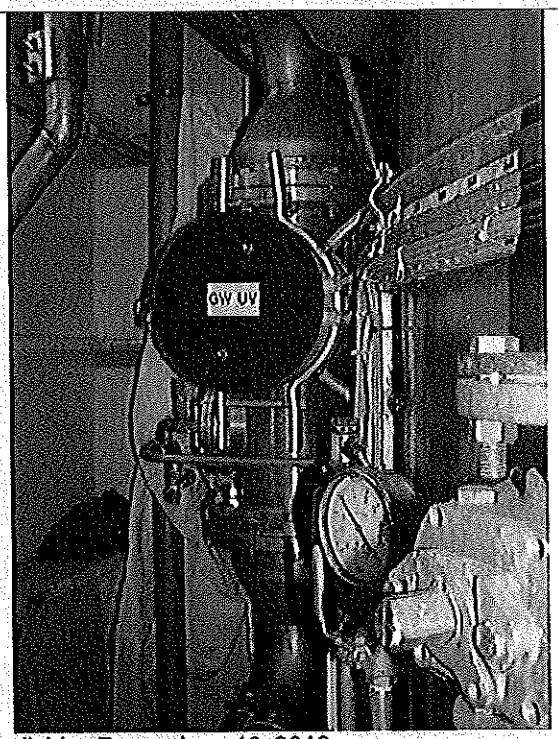


PHOTO #:11 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P6180035
DESCRIPTION: NAVALIS® SYSTEM ULTRAVIOLET DISINFECTION SYSTEM

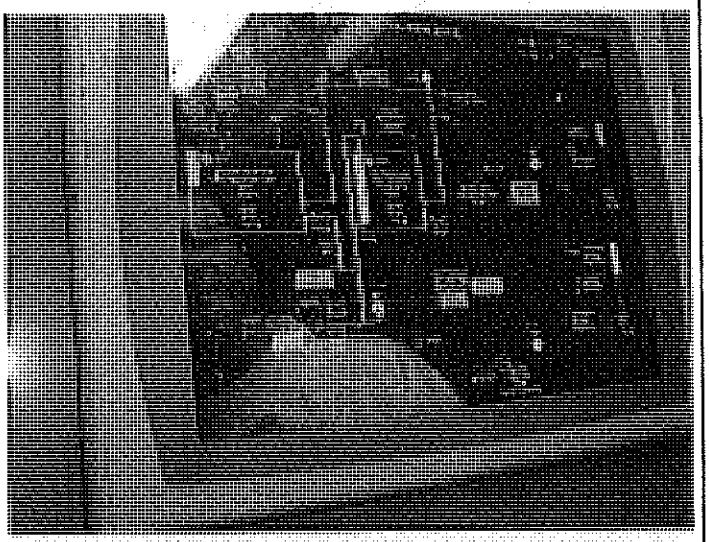


PHOTO #:12 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P6180036
DESCRIPTION: NAVALIS® SYSTEM CONTROLS FOR SOLIDS STREAM

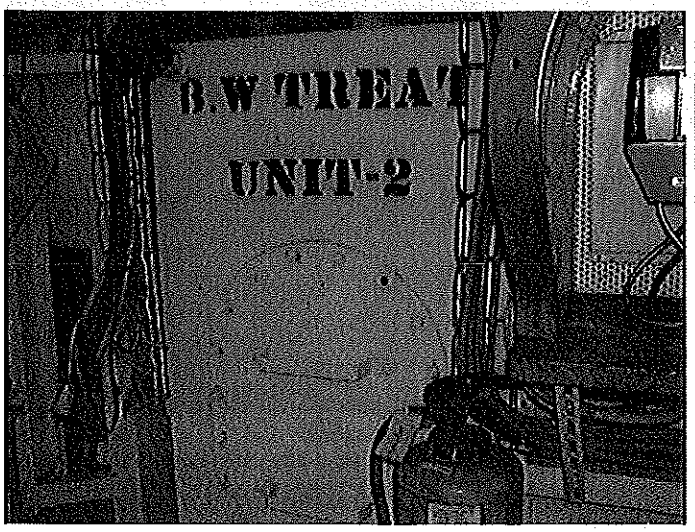


PHOTO #:13 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P6180037
DESCRIPTION: HAAMAN TRADITIONAL MSD BLACKWATER TREATMENT TANK

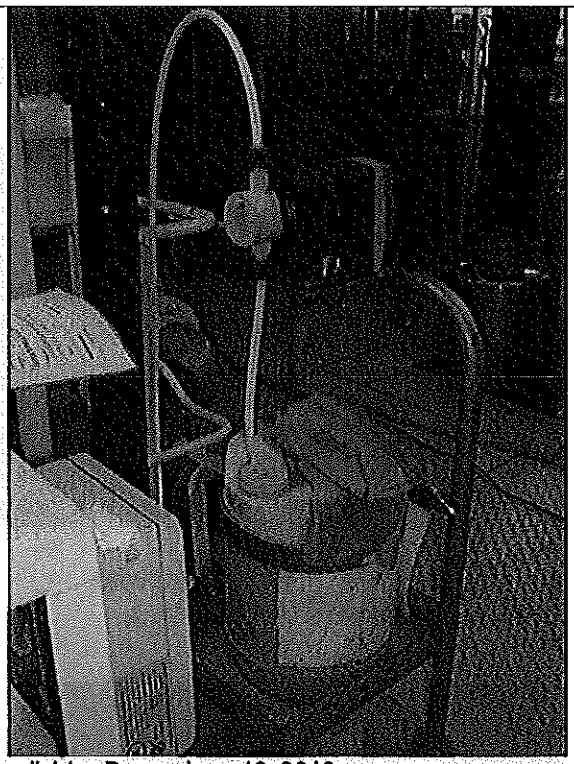


PHOTO #:14 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P6180038
DESCRIPTION: HAAMAN TRADITIONAL MSD CHLORINE ADDITION

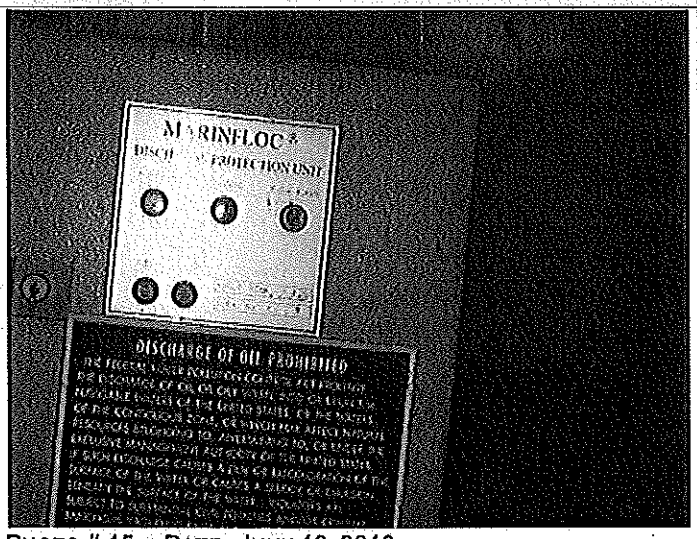


PHOTO #:15 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P6180040
DESCRIPTION: OILY WATER SEPARATOR SYSTEM (OWS)

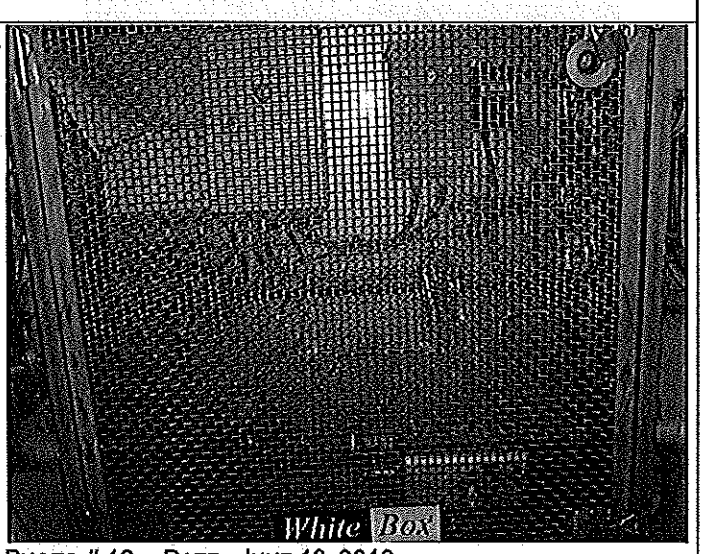


PHOTO #:16 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P6180041
DESCRIPTION: OWS WHITE BOX

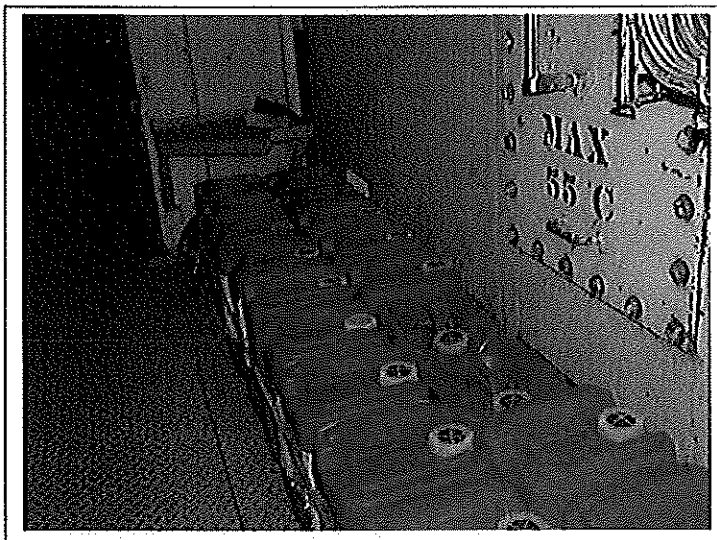


PHOTO #:17 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P6180043
DESCRIPTION: EMPTY CONTAINERS TO BE RETURNED

PHOTO #:18 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P6180045
DESCRIPTION: USED COOKING OIL

PHOTO #:19 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P6180047
DESCRIPTION: HAZARDOUS WASTE (INCLUDING OLD X-RAY EQUIPMENT)

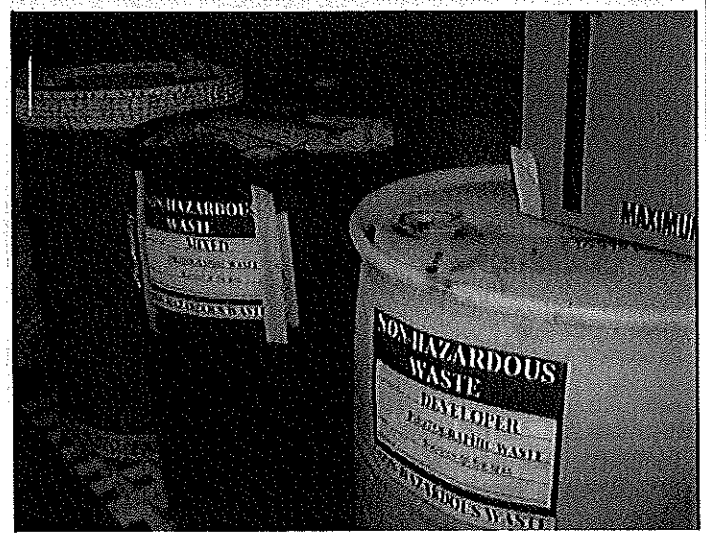


PHOTO #:20 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P6180048
DESCRIPTION: PHOTO WASTE

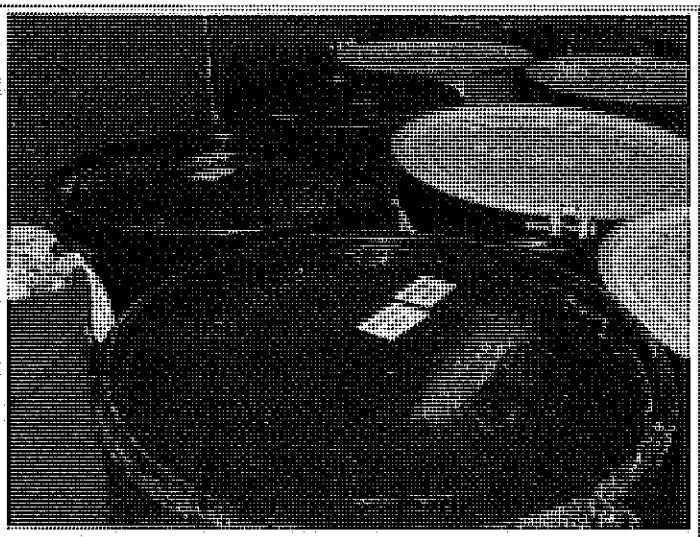


PHOTO #:21 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P6180049
DESCRIPTION: OILY SLUDGE FOR OFF-LOADING

PHOTO #:22 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P6180050
DESCRIPTION: GARBAGE/RECYCLE AREA

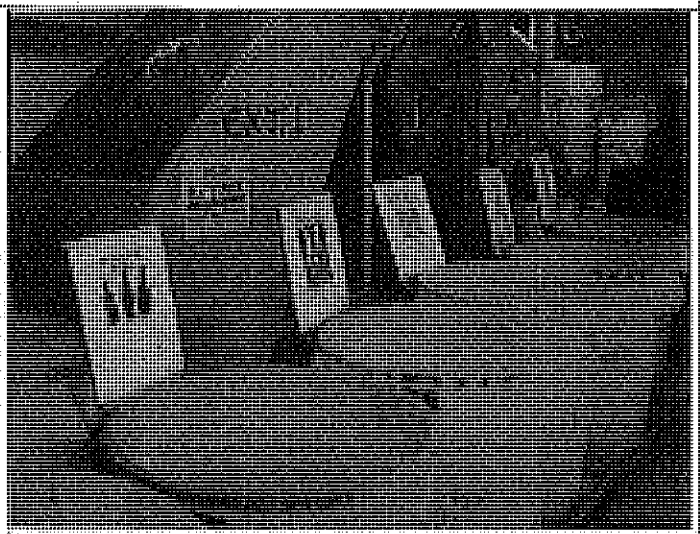


PHOTO #:23 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P6180052
DESCRIPTION: RECYCLING SEPARATION AREA (YELLOW BINS); FOOD WASTE PULPERS (STEEL EQUIPMENT)

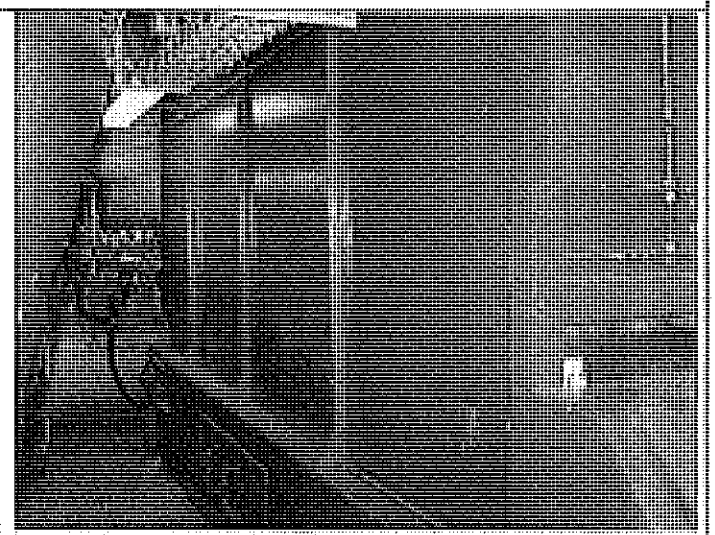


PHOTO #:24 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P6180055
DESCRIPTION: INCINERATORS

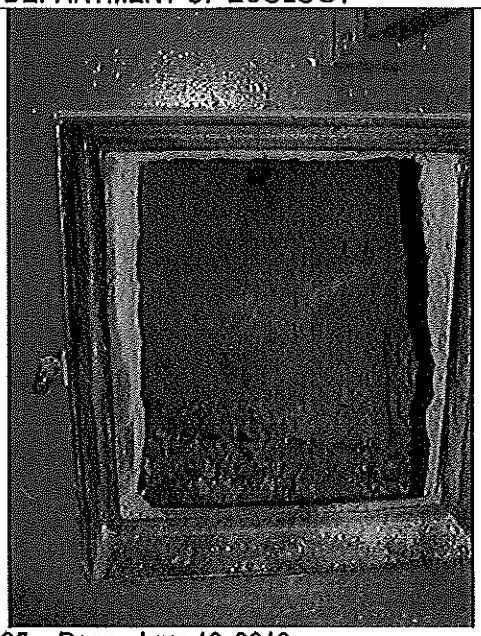


PHOTO #:25 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P6180056
DESCRIPTION: INSIDE OF INCINERATOR

PHOTO #:26 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P6180057
DESCRIPTION: PORT LOCK

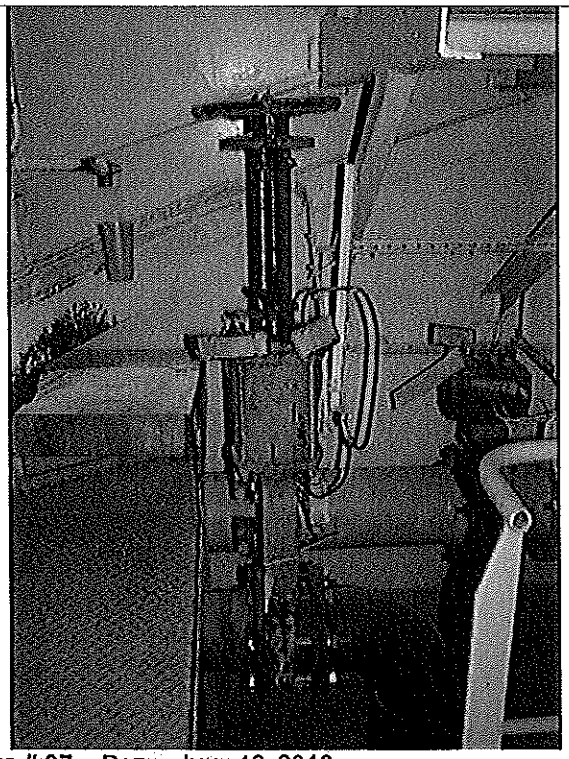


PHOTO #:27 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P6180058
DESCRIPTION: GRAYWATER DISCHARGE PORT

PHOTO #:28 DATE: JUNE 18, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P6180060
DESCRIPTION: DRY CLEANING SYSTEM

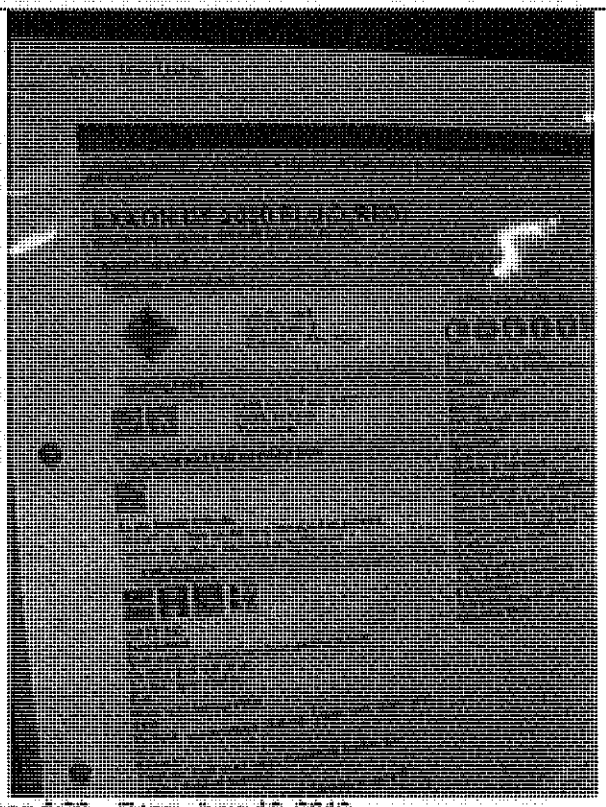


Photo #:29 Date: June 18, 2010
Taken By: Amy Jankowiak File No.: P0180091
Description: Dry Cleaning System Chemical MSDS (Exxon DF 2000 Fluid)

DEPARTMENT OF ECOLOGY
State of Washington

State of Washington Department of Ecology

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

Northwest Regional Office
3190 160th Ave SE
Bellevue, WA 98008
Phone: (425) 649-7000
Fax: (425) 649-7098

Inspection Date	Permit Number	County	Receiving Waters	Ecology Inspector
July 6, 2010	NA	King	Marine Waters	Amy Jankowiak, Compliance Specialist
Entry Time 9:02 am **Exit Time** 10:55 am	**Photos Taken** ☒ Yes ☐ No	**Samples Taken** ☐ Yes ☒ No	**Inspection Announced** ☒ Yes ☐ No	**Discharges to:** ☒ Surface Water ☐ Ground Water ☐ Dewater ☐ POTW

Name and Location of Site Inspected:
CARNIVAL SPIRIT, Carnival Cruise Lines
Passenger Vessel
Pier 91, Seattle

Additional Participants/Inspectors:
Tonya Lane, Municipal Engineer, Ecology

On-Site Representative(s): *Name/Title/Phone/e-mail*
Kristijan Belanek, Environmental Officer
spenvoff@carnival.com

Responsible Official(s): *Name/Title/Address/Phone/e-mail*
Michelle Matejka
MSOP 307N
Carnival Cruise Lines
3655 NW 87th Avenue, Miami, FL 33178
MMatejka@carnival.com

Other Facility Data:
Notification made to Michelle Matejka on July 2, 2010.

Section A: Areas Evaluated

☒ Black/Gray Wastewater System	☒ Residual Solids	☒ Records/Reports	☒ Hazardous Waste/ Solid Waste	☐ Sampling/Monitoring
☒ Discharge Locations	☒ Operation & Maintenance	☒ Sludge Handling/ Disposal	☒ Oily Bilge Water	☒ Other

Section B: For Vessels Discharging ≥ 1nm from Berth and ≥ 6 Knots Only [2.1.3(A)]

☐ Schematics Match Black/Gray Wastewater System	
☐ Operations as Described in Submitted Documentation	
☐ Daily 24-hour Continuous Monitoring for Turbidity or Equivalent Monitoring	
☐ Turbidimeter or Equivalent Monitoring Equipment Functioning Properly	
☐ 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: Trigger Level for Shutdown:

Recorded Turbidity/Equivalent Levels Above Triggers:

☐ Daily 24-hour Continuous Monitoring for Disinfection Effectiveness	
☐ Disinfection Effectiveness Monitoring Equipment Functioning Properly	

Disinfection Effectiveness Monitoring:

☐ Auto Shut Down or Operational Controls to Insure System Shut Down if Disinfection System Upset Occurs	
☐ Disinfection System Operated and Maintained Properly	

Disinfection System:

Section C: For Vessels Discharging Continuously [2.1.3(B)]	
☐ Schematics Match Black/Gray Wastewater System	
☐ Operations as Described in Submitted Documentation	
☐ Daily 24-hour Continuous Monitoring for Turbidity or Equivalent Monitoring	
☐ Turbidimeter or Equivalent Monitoring Equipment Functioning Properly	
☐ 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: Trigger Level for Shutdown: Recorded Turbidity/Equivalent Levels Above Triggers:	
☐ Daily 24-hour Continuous Monitoring for Disinfection Effectiveness	
☐ Disinfection Effectiveness Monitoring Equipment Functioning Properly	
Disinfection Effectiveness Monitoring:	
☐ Auto Shut Down or Operational Controls to Insure System Shut Down if Disinfection System Upset Occurs	
☐ Disinfection System Operated and Maintained Properly	
Disinfection System:	
Section D: General (Approved to Discharge)	
☐ No Discharges Within ½ Miles From Shellfish Beds/ Protocol (President's Point, Apple Tree Cove, Tyee Shoal)	
☐ Discharges Immediately Stopped When High Turbidity Occurs	
☐ Discharges Immediately Stopped When Disinfection System Upset Occurs	
☐ Immediate Notifications Made to WA Department of Health for Disinfection System Upset	
☐ Sampling Conducted 2/month, 1/month in Seattle (BOD, TSS, Fecal Coliform, pH, Chlorine Residual)	
☐ Whole Effluent Toxicity Testing 1 per 2 Years (homeported) or 1/40 Calls for Continuous	
Section E: General	
☒ Wastewater Discharge Records Review	Discharge records were reviewed (black water/gray water/residual solids) and are maintained properly. All discharges occurred outside of MOU waters (reviewed from beginning of cruise season, to date). Policy is to only discharge black water at greater than 12nm and outside of MOU waters and gray water at greater than 4nm and outside of MOU waters.
☒ Residual Solids Managed Properly/Disposal Protocol per MOU	Sewage sludge and screenings are currently collected from the Triton black water treatment system, drummed and landed ashore (only needs to be done periodically).
☒ Hazardous Waste Managed Properly	Hazardous waste is typically off-loaded in Seattle. Hazardous waste records were reviewed and appear to be consistent with MOU requirements. In Seattle, Clean Harbors is currently used for off-loads.
☒ WA Hazardous Waste Guidelines Followed (Appendix vii)	Hazardous waste is typically off-loaded in Seattle. Hazardous waste records were reviewed and appear to be consistent with MOU requirements. In Seattle, Clean Harbors is currently used for off-

	loads.
☒ Solid Waste Managed Properly	Solid waste appears to be managed properly. The various solids waste streams are collected, sorted, stored, and sent ashore for proper disposal. Records reviewed showed only food waste being discharged and only outside of MOU waters.
☒ Oily Bilge Water Managed Properly	Oily bilge water is treated and discharged at less than 15ppm and outside of MOU waters.

Other:

Section F: Sampling Results

Parameter	Results
Biochemical Oxygen Demand 5-Day (BOD_5)	
Total Suspended Solids (TSS)	
Fecal Coliform	
Residual Chlorine	
pH	
Ammonia, Nitrogen	

Section G: Summary of Findings/Comments

Introduction

Amy Jankowiak, Washington State Department of Ecology (Ecology) Northwest Regional Office (NWRO), Water Quality Program, and Tonya Lane, Ecology, NWRO, Water Quality Program, conducted the inspection of the Carnival Cruise Line, CARNIVAL SPIRIT on July 6, 2010. The main contact on board the CARNIVAL SPIRIT was Kristijan Belanek, Environmental Officer. Prior notification of the visit was given on July 2, 2010 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 CARNIVAL SPIRIT (photo #01) arrived on May 11th, 2010 at the Port of Seattle to begin the 2010 cruise season which consists of 18 calls on Tuesdays to Seattle. This is the first season that the cruise line is calling to Seattle. They currently have both a traditional marine sanitation device for black water that includes screening, aeration and chlorination and an advanced wastewater treatment system (AWTS) installed for gray water, which is not currently used. The AWTS is not functioning and producing results to the levels required, and is therefore not used, except for brief times in Alaskan waters. No discharges are occurring from either system in MOU waters. Approval for discharge from Ecology has not been requested nor issued. The vessel has been holding effluent and not discharging in MOU waters since the beginning of the season.

The CARNIVAL SPIRIT was built in 2001 and is 963 feet long with an estimated capacity of 2680 passengers and 961 crew.

Inspection

We arrived and boarded the ship at 9:02 am and began with introductions and a plan for the day with Kristijan Belanek, the Environmental Officer. We first discussed the various waste streams and discharge protocols. We then reviewed discharge records for hazardous waste, garbage and black water and gray water. A copy of the current MOU was available. We then discussed the two wastewater treatment systems. We then viewed the oily water separator system, and the black water and gray water systems. We then toured the hazardous waste storage and garbage and recycling areas, and the food pulper system. The inspection was then finalized and we disembarked the vessel at about 10:55 am.

Discharge Types and Protocols:

All black water discharges occur more than 12 nautical miles (nm) from the nearest land and outside of MOU waters. All gray water discharges occur more than 4nm from the nearest land and outside of MOU waters. Logs of discharges occur electronically. When the vessel is greater than 3nm from land, the bridge contacts the engineers in the control room, and again at 4nm and 12 nm. The valves are then opened upon confirmation of location. There are padlocks on discharge ports and the Engineer on Duty has control of the keys. Residual solids from the black water system, also known as biomass, bioresidue or sewage sludge, are drummed and landed ashore for proper treatment. Screenings from the

wastewater system are also drummed and landed ashore for proper disposal. The month of May included two offloads of bioresidue to Clean Harbors in Seattle, Washington.

For black water and gray water, the latitude and longitude coordinates are recorded in the *Sewage and Graywater Discharge Record Book* and in the deck log. The date, time and location of both the start and the stop of the discharges are recorded, along with port location, effluent type, and volumes. All wastewater discharge records that were reviewed appeared to be in compliance with the MOU and did not occur in MOU waters. Some of the locations of the discharges were later confirmed on the Bridge as being outside of MOU waters. Records were reviewed for the time period since the beginning of the cruise season to date.

Black water includes toilet waste and infirmary drains. Black water is treated with a Triton system, a traditional marine sanitation device (photos #04, #05, #06 and #07) that includes screening, aeration and chlorination. There are four of the units on board the vessel. Gray water includes sink and shower water, laundry water, hair salon water, spa water and galley water. Gray water is collected and held separately from black water and is then discharged more than 4nm from the nearest land and outside of MOU waters. When the vessel is operating the AWTS, a Rochem reverse osmosis system, the system collects accommodation gray water only and processes through the system. Gray water is collected (photo #08) and run through a pre-filter SWECO system (photos #09 and #10). Water is sent to a Pre-Reverse Osmosis tank (photo #11) and then onto the Reverse Osmosis filters (photo #12). The solids from the SWECO filter are collected, drummed (photo #15) and off-loaded. The liquid from the filters then goes to a permeate tank (photo #13) prior to disinfection with ultraviolet light (photo #14). The AWTS does not operate while in MOU waters. The vessel is typically able to hold black water for about 5 days and gray water for about 4-5 days.

Food waste is collected in various locations and is sent to the pulping system (photo #20). Water in the pulper is recycled and occasionally discharged along with galley water as gray water more than 4 nm from the nearest land and outside of MOU waters. Some food wastes such as pineapple rinds, banana peels, and coffee, which clogs up the pulpers, is sent to the incinerators. Used cooking oil is reused as biofuel by being burned with heavy fuel.

Oily bilge water is treated with a Hamworthy oily water separator system (photo #02) and discharged at less than 15 ppm outside of MOU waters. A white box (photo #03) is used for additional monitoring assurance. Oily sludge is drummed and offloaded for proper disposal.

Pool water, which is salt water with chlorine is recirculated if inside of MOU waters and is discharged at sea. PH is controlled automatically. Pool water can be held for about 7 days and is discharged overboard outside of MOU waters and is pH controlled. Spa water is drained to the gray water holding tanks and discharged along with gray water.

Potable water is either bunkered or produced by desalinization with evaporators when out at sea. The brine is discharged.

Medical waste (except sharps), food-contaminated cardboard, some plastics, some food, and some paper are all incinerated. The incinerators (photo #16) are only used when outside of MOU waters at greater than 12nm. The incinerator ash is tested regularly and has passed all tests. Narcotics are sent to the black water system and discharged outside of MOU waters. Tablets are crushed. Some medications are returned to the vendor.

Plastics, some paper, some cardboard, glass (photo #17), pallets, aluminum (photo #22), tin, scrap metals, laundry bins, and batteries are all recycled. Fluorescent lamps are also recycled. They are not crushed on board. Some materials are also donated when feasible. Garbage records looked to be in good order. Food waste is the only solid material being discharged out at sea.

Dry cleaning is not offered on the vessel. Laundry uses Eco-Lab products. Photo waste has been reduced to about 20% of what it used to be by the use of more digital technologies. The photo waste is offloaded as hazardous waste. X-ray's are done digitally, and do not have a waste product. Other hazardous waste materials (photo #19) including paints and thinners, and batteries, and aerosol condensate (photo #21), are off-loaded, typically in Seattle. Hazardous waste records were reviewed and appear to be consistent with MOU requirements. In Seattle, Clean Harbors is currently used for off-loads.

Cleaning of the outside of the vessel is done with fresh water. Spot painting and chipping does not occur in Seattle and tarps are used when work does occur.

Conclusions and Recommendations

Staff was very knowledgeable of the protocols and systems for treatment and discharges. Discharge protocols were clear.

The installation of an advanced purification system is applauded for the overall environmental benefits that it could provide. Hopefully, the issues with the advanced system will be resolved and the system can be used on a continuous basis.

Staff was very aware of the requirements of the MOU, even as this is the first season for the cruise line in Washington State waters.

Attachments: Photographs

Copies to:

Michelle Matejka, Carnival Cruise Lines
Kristijan Belanek, Carnival Cruise Lines
Mark Toy, Department of Health
John Hansen, NorthWest CruiseShip Association
Karen Burgess, Ecology
Kevin Fitzpatrick, Ecology
Amy Jankowiak, Ecology
Central Files: Carnival Cruise Lines – CARNIVAL SPIRIT; WQ 6.1

Section H: Signatures

Name and Signature of Inspector:	Agency/Office/Telephone:	Date
Amy Jankowiak	Department of Ecology Northwest Regional Office Water Quality Program Municipal Compliance Specialist 425-649-7195	8/3/10
Name and Signature of Reviewer:	**Agency/Office/Telephone:**	**Date**
Kevin C. Fitzpatrick	Department of Ecology Northwest Regional Office Water Quality Section Manager 425-649-7033	8/3/10

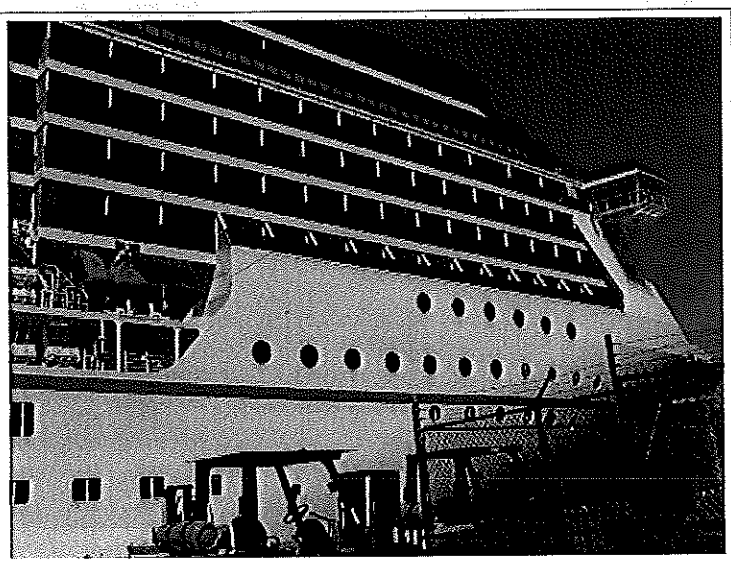


PHOTO #:01 DATE: JULY 6, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P7060083
DESCRIPTION: CARIVAL SPIRIT PASSENGER VESSEL

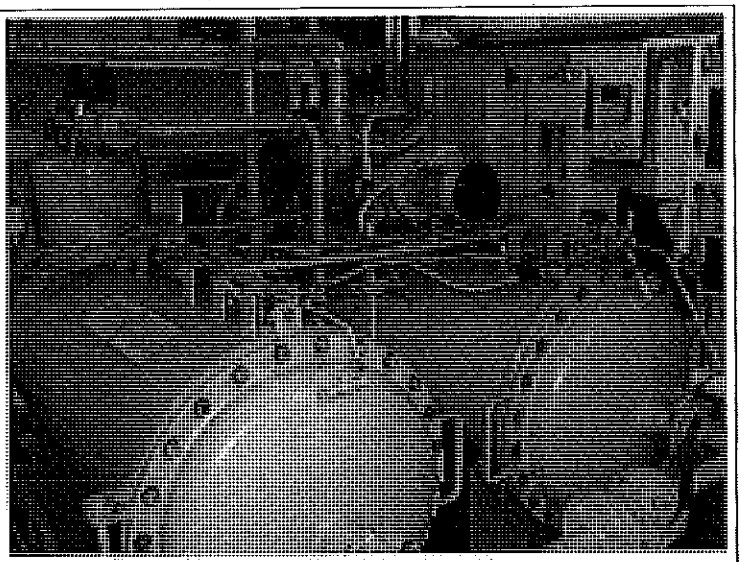


PHOTO #:02 DATE: JULY 6, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P7060061
DESCRIPTION: OILY WATER SEPARATOR

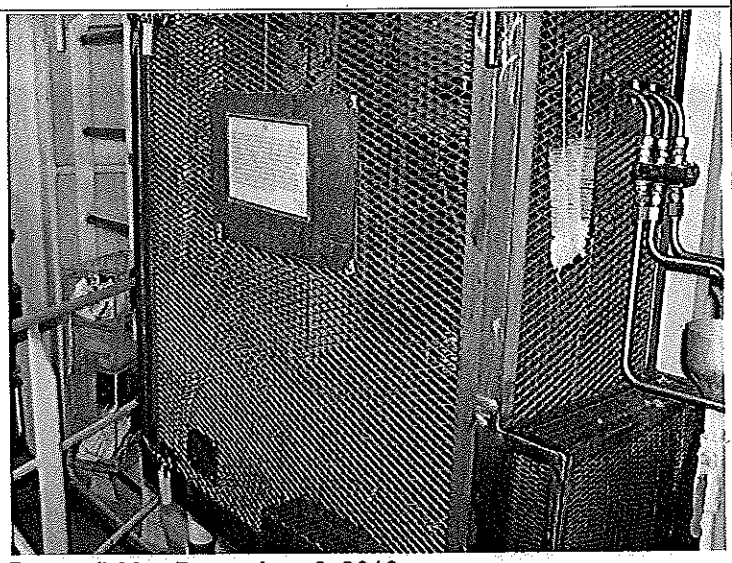


PHOTO #:03 DATE: JULY 6, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P7060062
DESCRIPTION: OILY WATER SEPARATOR WHITE BOX

PHOTO #:04 DATE: JULY 6, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P7060063
DESCRIPTION: BLACK WATER TREATMENT SYSTEM (TRITON) (1 OF 4)

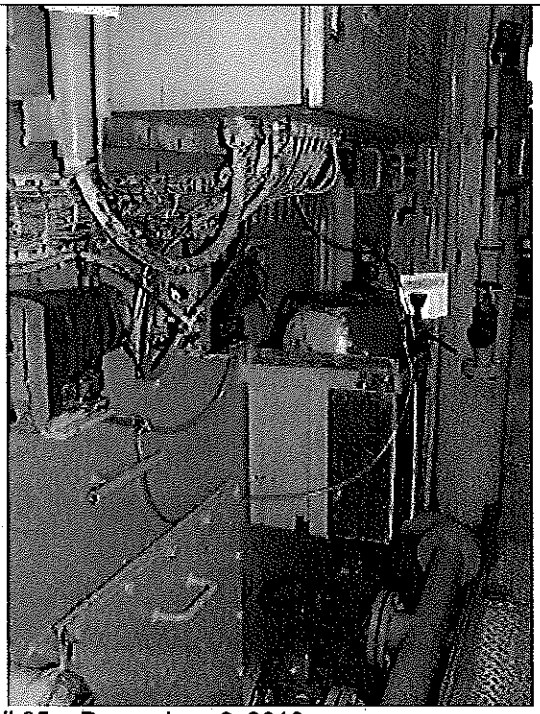


PHOTO #:05 DATE: JULY 6, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P7060064
DESCRIPTION: BLACK WATER TREATMENT SYSTEM (TRITON) (1 OF 4)

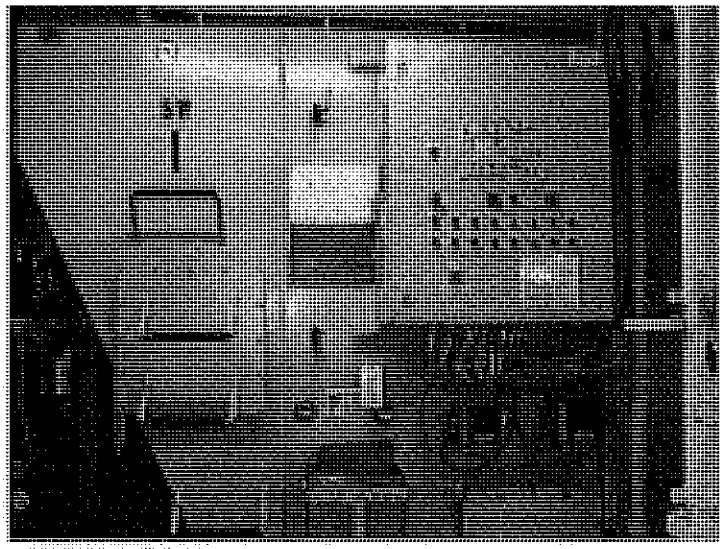


PHOTO #:06 DATE: JULY 6, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P7060065
DESCRIPTION: BLACK WATER TREATMENT SYSTEM (TRITON) (2 OF 4)

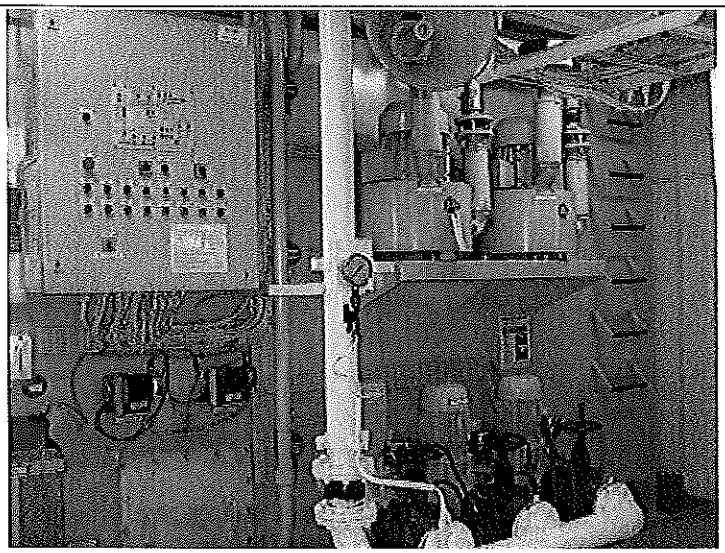


PHOTO #:07 DATE: JULY 6, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P7060066
DESCRIPTION: BLACK WATER TREATMENT SYSTEM (TRITON) (2 OF 4)

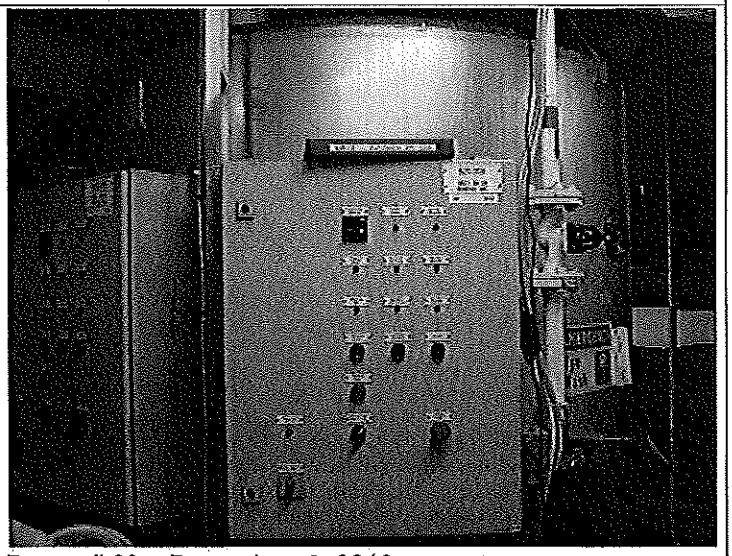


PHOTO #:08 DATE: JULY 6, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P7060067
DESCRIPTION: GRAY WATER TREATMENT SYSTEM TANK FOR NON-WORKING AWTS

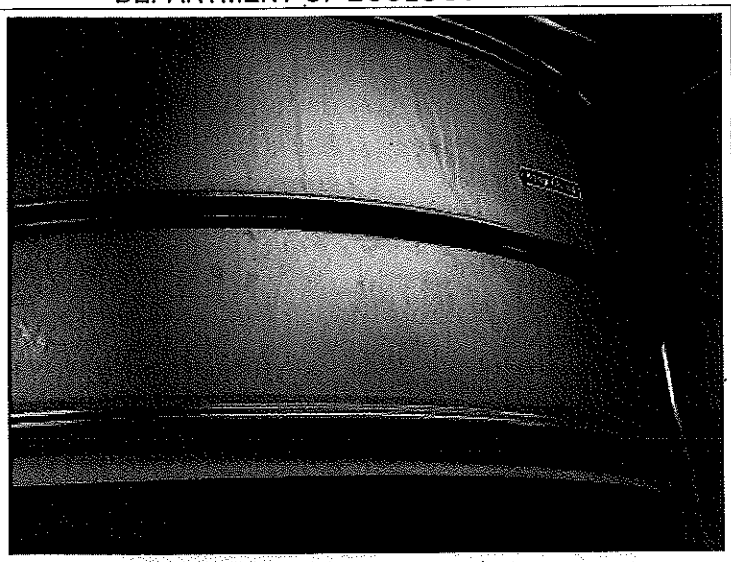


PHOTO #:09 DATE: JULY 6, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P7060068
DESCRIPTION: GRAY WATER TREATMENT SYSTEM SWECO (PRE-FILTER) FOR NON-WORKING AWTS

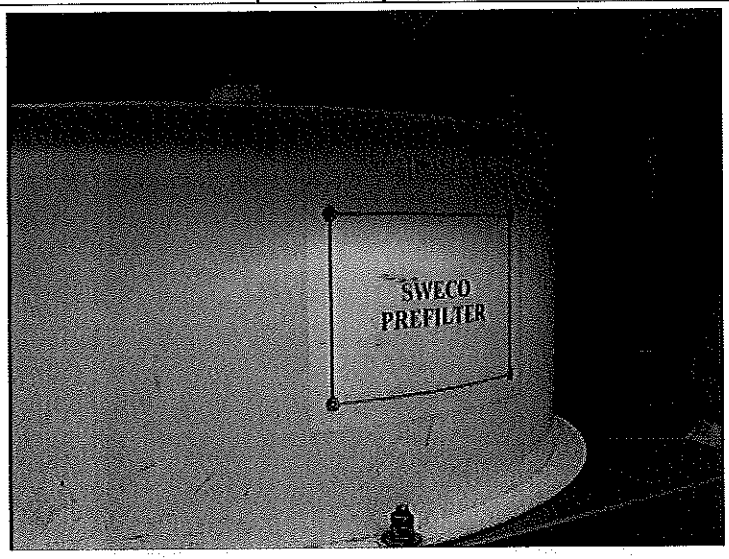


PHOTO #:10 DATE: JULY 6, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P7060069
DESCRIPTION: GRAY WATER TREATMENT SYSTEM SWECO (PRE-FILTER) FOR NON-WORKING AWTS

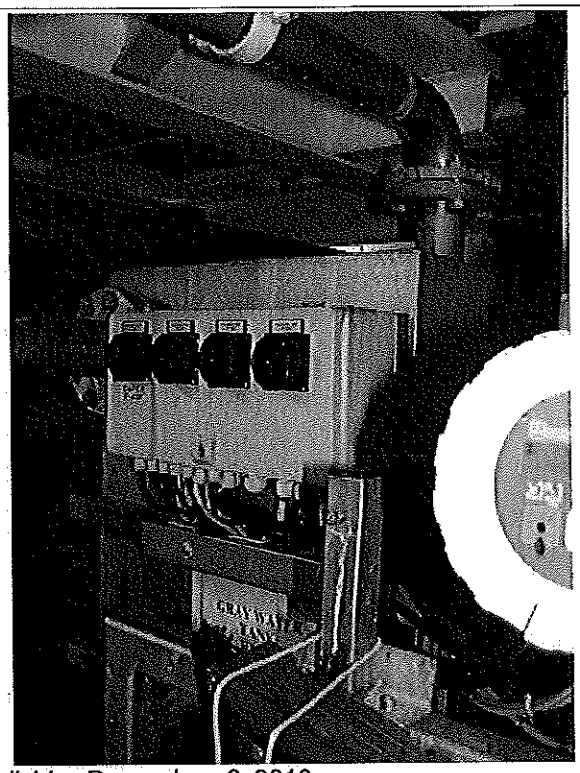


PHOTO #:11 DATE: JULY 6, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P7060070
DESCRIPTION: GRAY WATER TREATMENT SYSTEM PRE-RO TANK (FOR NON-WORKING AWTS)

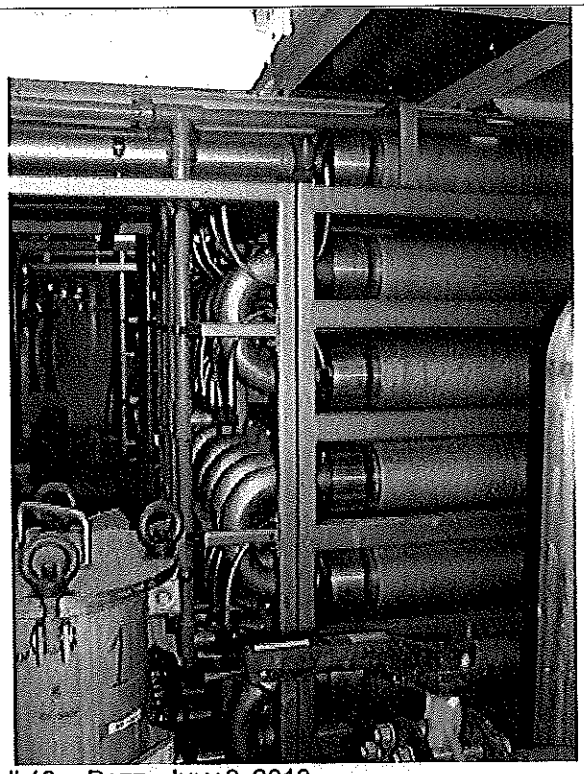


PHOTO #:12 DATE: JULY 6, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P7060071
DESCRIPTION: GRAY WATER TREATMENT SYSTEM REVERSE OSMOSIS FILTERS (FOR NON-WORKING AWTS)

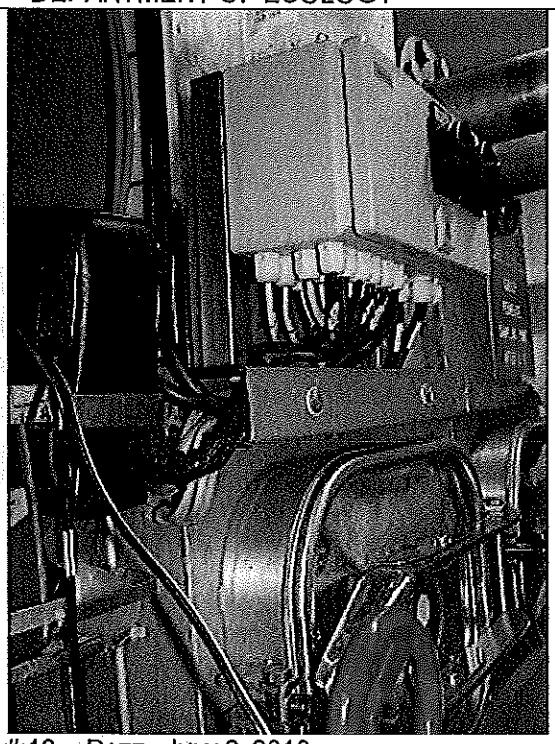


PHOTO #:13 DATE: JULY 6, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P7060072
DESCRIPTION: GRAY WATER TREATMENT SYSTEM PERMEATE TANK (FOR NON-WORKING AWTS)

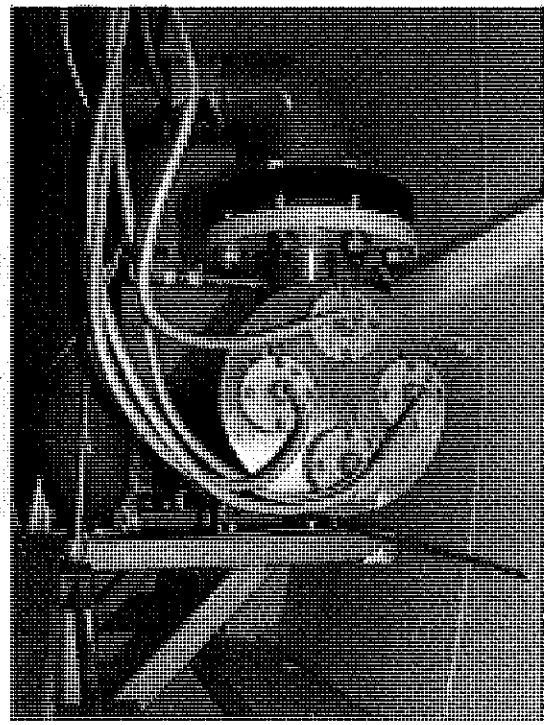


PHOTO #:14 DATE: JULY 6, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P7060073
DESCRIPTION: GRAY WATER TREATMENT SYSTEM ULTRAVIOLET LIGHT DISINFECTION SYSTEM (FOR NON-WORKING AWTS)

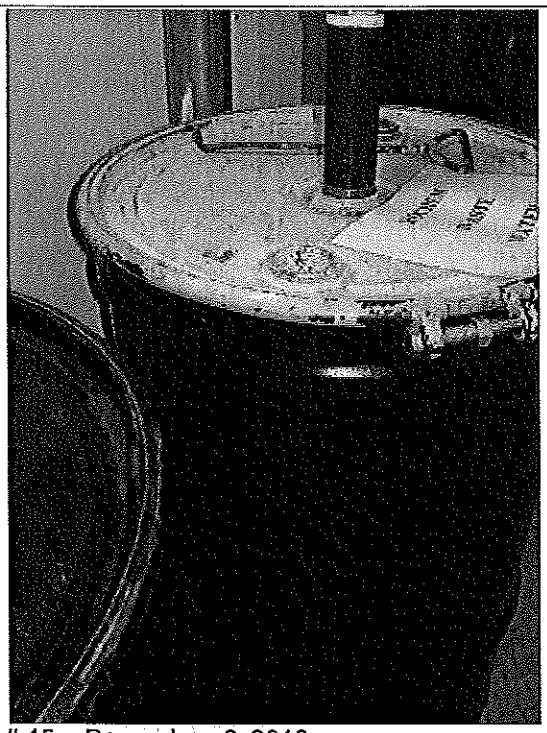


PHOTO #:15 DATE: JULY 6, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P7060075
DESCRIPTION: SCREENINGS FROM GRAY WATER TREATMENT SYSTEM

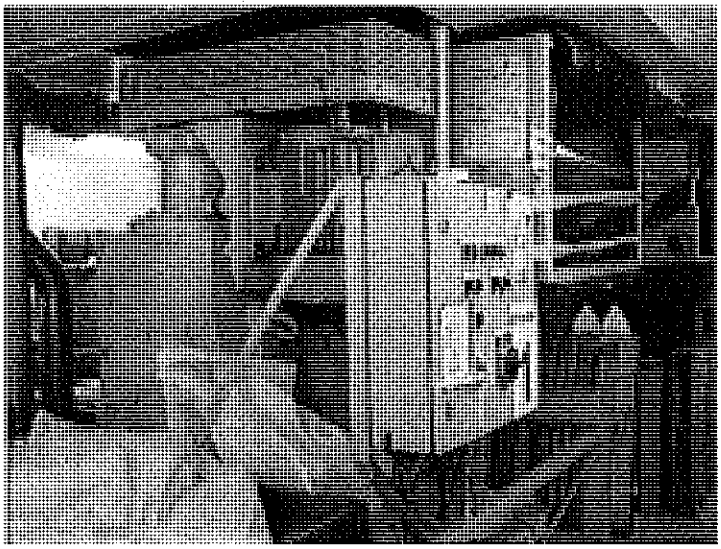


PHOTO #:16 DATE: JULY 6, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P7060076
DESCRIPTION: SHREDDER FOR THE INCINERATOR

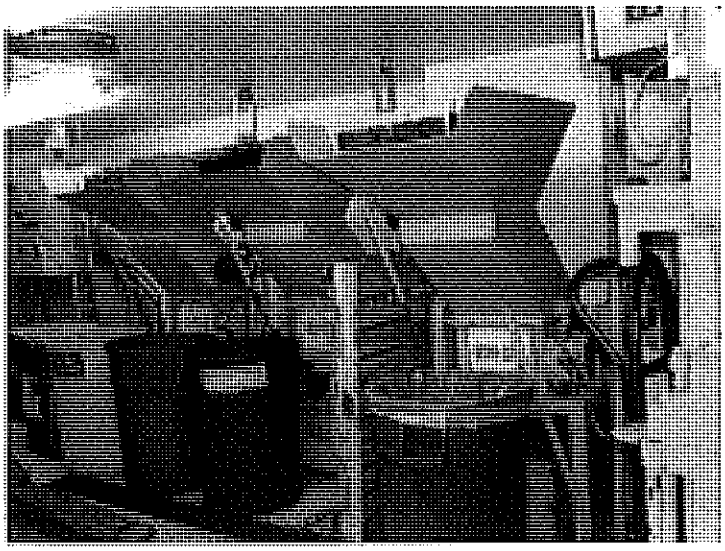


PHOTO #:17 DATE: JULY 6, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P7060077
DESCRIPTION: GLASS RECYCLING

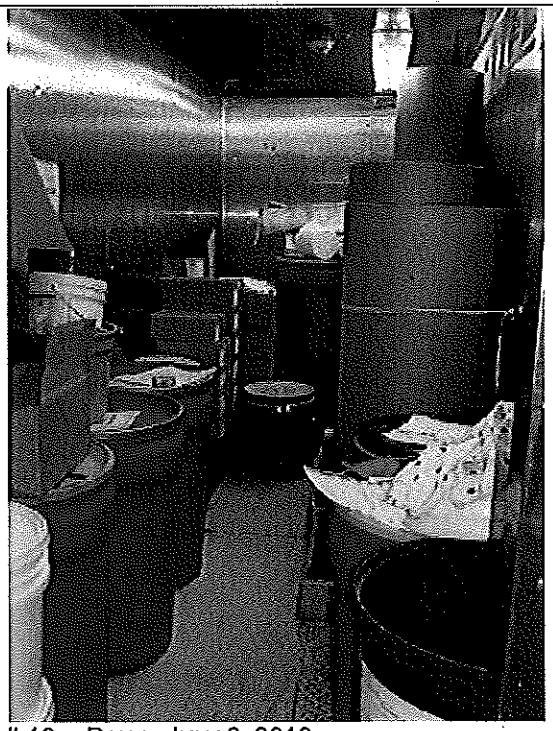


PHOTO #:18 DATE: JULY 6, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P7060078
DESCRIPTION: HAZARDOUS WASTE STORAGE

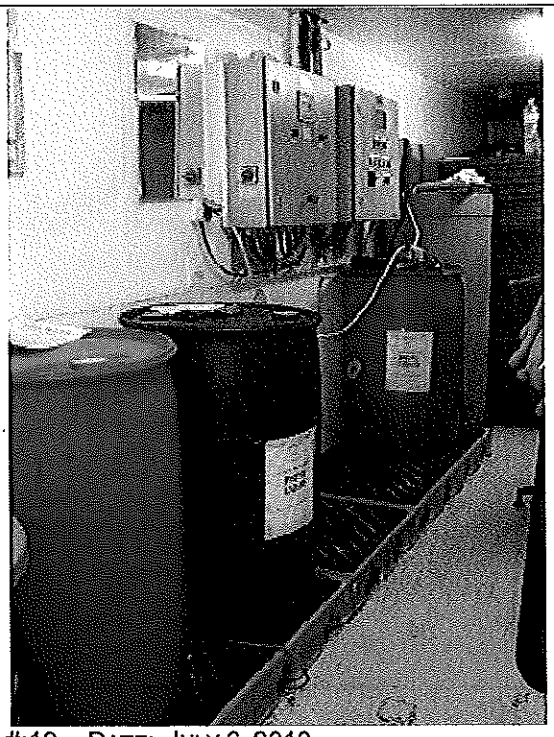


PHOTO #:19 DATE: JULY 6, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P7060079
DESCRIPTION: PHOTO WASTE

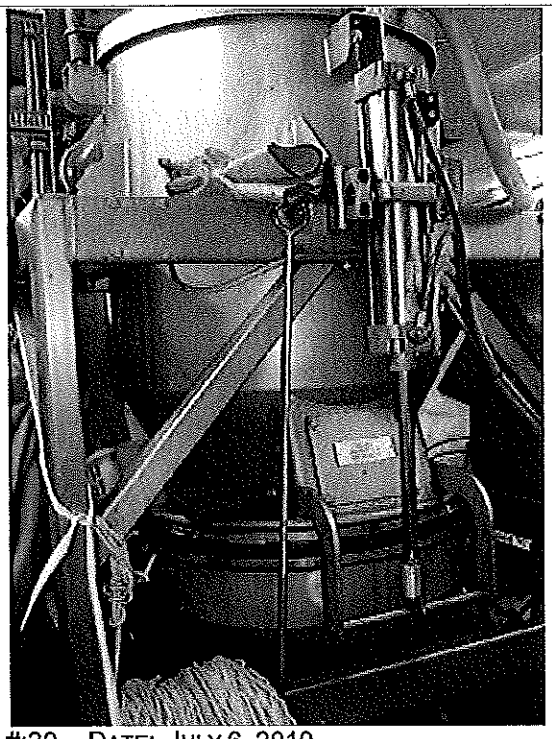


PHOTO #:20 DATE: JULY 6, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P7060080
DESCRIPTION: FOOD PULPER SYSTEM

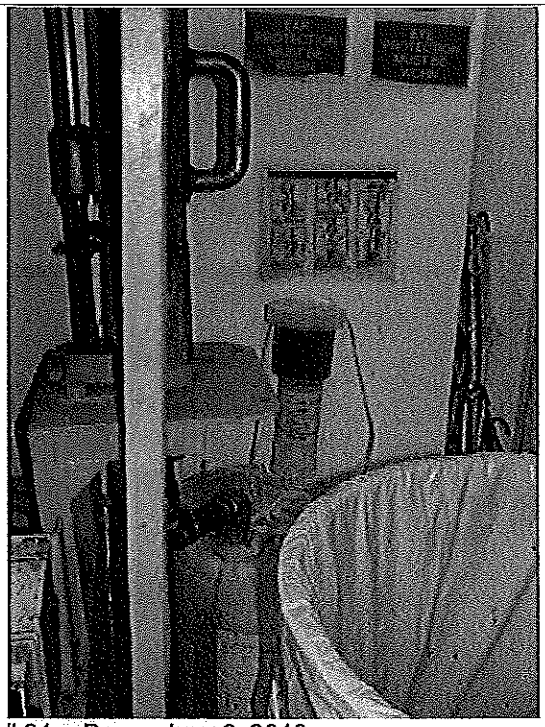


PHOTO #:21 DATE: JULY 6, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P7060081
DESCRIPTION: AEROSOL WASTE COLLECTION SYSTEM

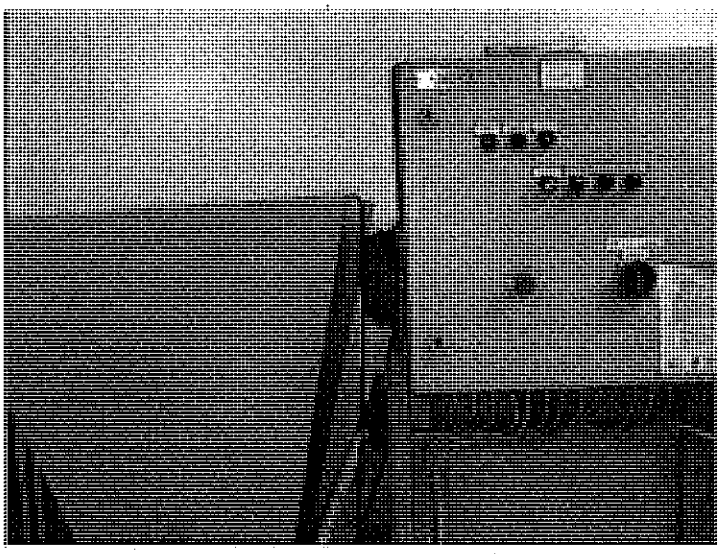


PHOTO #:22 DATE: JULY 6, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P7060082
DESCRIPTION: ALUMINUM CAN "DENSIFIER"

DEPARTMENT OF ECOLOGY
State of Washington

State of Washington Department of Ecology

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

Northwest Regional Office
3190 160th Ave SE
Bellevue, WA 98008
Phone: (425) 649-7000
Fax: (425) 649-7098

Inspection Date	Permit Number	County	Receiving Waters	Ecology Inspector
July 31, 2010	NA	King	Marine Waters	Amy Jankowiak, Compliance Specialist
Entry Time 9:03 am Exit Time 11:10 am	Photos Taken ☒ Yes ☐ No	Samples Taken ☐ Yes ☒ No	Inspection Announced ☒ Yes ☐ No	Discharges to: ☒ Surface Water ☐ Ground Water ☐ Dewater ☐ POTW

Name and Location of Site Inspected:
ROTTERDAM, Holland America Line
Passenger Vessel
Pier 91, Seattle

Additional Participants/Inspectors:
Kevin C. Fitzpatrick, Water Quality Program Section Manager, Ecology

On-Site Representative(s): *Name/Title/Phone/e-mail*
Roger Walker, Safety Environment Health Officer
Jon Turvey, Senior Manager, Auditing, Training and ISO 14001 Coordination
206-298-3849

Responsible Official(s): *Name/Title/Address/Phone/e-mail*
William J. Morani Jr., Vice President – Environmental Management Systems
Holland America Line
300 Elliott Ave. West, Seattle WA 98119
206-281-3535

Other Facility Data:
Notification made to Jon Turvey on July 22, 2010

Section A: Areas Evaluated

☒ Black/Gray Wastewater System	☒ Residual Solids	☒ Records/Reports	☒ Hazardous Waste/ Solid Waste	☐ Sampling/Monitoring
☒ Discharge Locations	☒ Operation & Maintenance	☒ Sludge Handling/ Disposal	☒ Oily Bilge Water	☒ Other

Section B: For Vessels Discharging ≥ 1nm from Berth and ≥ 6 Knots Only [2.1.3(A)]

☐ Schematics Match Black/Gray Wastewater System	
☐ Operations as Described in Submitted Documentation	
☐ Daily 24-hour Continuous Monitoring for Turbidity or Equivalent Monitoring	
☐ Turbidimeter or Equivalent Monitoring Equipment Functioning Properly	
☐ 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: Trigger Level for Shutdown:

Recorded Turbidity/Equivalent Levels Above Triggers:

☐ Daily 24-hour Continuous Monitoring for Disinfection Effectiveness	
☐ Disinfection Effectiveness Monitoring Equipment Functioning Properly	

Disinfection Effectiveness Monitoring:

☐ Auto Shut Down or Operational Controls to Insure System Shut Down if Disinfection System Upset Occurs	
☐ Disinfection System Operated and Maintained Properly	

Disinfection System:

Section C: For Vessels Discharging Continuously [2.1.3(B)]	
☐ Schematics Match Black/Gray Wastewater System	
☐ Operations as Described in Submitted Documentation	
☐ Daily 24-hour Continuous Monitoring for Turbidity or Equivalent Monitoring	
☐ Turbidimeter or Equivalent Monitoring Equipment Functioning Properly	
☐ 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: Trigger Level for Shutdown: Recorded Turbidity/Equivalent Levels Above Triggers:	
☐ Daily 24-hour Continuous Monitoring for Disinfection Effectiveness	
☐ Disinfection Effectiveness Monitoring Equipment Functioning Properly	
Disinfection Effectiveness Monitoring:	
☐ Auto Shut Down or Operational Controls to Insure System Shut Down if Disinfection System Upset Occurs	
☐ Disinfection System Operated and Maintained Properly	
Disinfection System:	
Section D: General (Approved to Discharge)	
☐ No Discharges Within ½ Miles From Shellfish Beds/ Protocol (President's Point, Apple Tree Cove, Tyee Shoal)	
☐ Discharges Immediately Stopped When High Turbidity Occurs	
☐ Discharges Immediately Stopped When Disinfection System Upset Occurs	
☐ Immediate Notifications Made to WA Department of Health for Disinfection System Upset	
☐ Sampling Conducted 2/month, 1/month in Seattle (BOD, TSS, Fecal Coliform, pH, Chlorine Residual)	
☐ Whole Effluent Toxicity Testing 1 per 2 Years (homeported) or 1/40 Calls for Continuous	
Section E: General	
☒ Wastewater Discharge Records Review	Discharge records were reviewed (black water/gray water/residual solids) and are maintained properly. All discharges occurred outside of MOU waters (reviewed from beginning of cruise season, to date). Policy is to only discharge black water at greater than 12nm and outside of MOU waters and gray water at greater than 4nm and outside of MOU waters.
☒ Residual Solids Managed Properly/Disposal Protocol per MOU	Sewage sludge and screenings are currently collected from the Triton black water treatment system, drummed and landed ashore or are discharged outside of 12 nm and outside of MOU waters. (only needs to be done about once every six months).
☒ Hazardous Waste Managed Properly	Hazardous waste is off-loaded in Victoria, Canada, and not in Washington State. Hazardous waste records were reviewed and appear to be consistent with MOU requirements.
☒ WA Hazardous Waste Guidelines Followed (Appendix vii)	Hazardous waste is off-loaded in Victoria, Canada, and not in Washington State. Hazardous waste records were reviewed and appear to be consistent with MOU requirements.

☒ Solid Waste Managed Properly	Solid waste appears to be managed properly. The various solids waste streams are collected, sorted, stored, and sent ashore for proper disposal. Records reviewed showed only food waste and crushed glass as being discharged and only outside of MOU waters.
☒ Oily Bilge Water Managed Properly	Oily bilge water is treated and discharged at less than 15ppm and outside of MOU waters.

Other:

Section F: Sampling Results

Parameter	Results
Biochemical Oxygen Demand 5-Day (BOD_5)	
Total Suspended Solids (TSS)	
Fecal Coliform	
Residual Chlorine	
pH	
Ammonia, Nitrogen	

Section G: Summary of Findings/Comments

Introduction

Amy Jankowiak, Washington State Department of Ecology (Ecology) Northwest Regional Office (NWRO), Water Quality Program, and Kevin C. Fitzpatrick, Ecology, NWRO, Water Quality Program Section Manager, conducted the inspection of the Holland America Line, ROTTERDAM on July 31, 2010. The main contact on board the ROTTERDAM was Roger Walker, Safety, Environmental and Health Officer. Jon Turvey, Senior Manager, Auditing, Training and ISO 14001 Coordination for Holland America Line also joined us for the inspection. Prior notification of the visit was given on July 22, 2010 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 ROTTERDAM (photo #01) arrived on May 15th, 2010 at the Port of Seattle to begin the 2010 cruise season which consists of 18 calls on Saturdays to Seattle. This is the first season that this vessel is calling to Seattle. The vessel has a traditional marine sanitation device for black water that includes screening, aeration and chlorination. Gray water is held and discharged without treatment. No discharges of black water or gray water are occurring in MOU waters. Approval for discharge from Ecology has not been requested nor issued. The vessel has been holding effluent and not discharging in MOU waters since the beginning of the season.

The ROTTERDAM was built in 1997 and is 778 feet long with an estimated capacity of 1316 passengers and 593 crew.

Inspection

We arrived at the ship boarding area at 9:03 am, met with Jon Turvey. Prior to boarding the vessel, we noticed that vessel crew was conducting painting in the anchor area on the outside, above water line area (photo #02). Upon a closer look, there was a tarp under the cherry picker basket, however, the basket and tarp was a fair distance from the vessel. The crew was using long-handles for painting and there was a potential for paint drips to fall in the water. Mr. Turvey asked the crew to stop their work. The 5-gallon paint bucket was sitting directly on the metal screen of the basket overtop the tarp, without secondary containment. We discussed the need for some more appropriate best management practices (BMPs) and Jon requested that the crew stop their work until he could speak with the Chief Officer. We then boarded the vessel and met with Roger Walker, the SEH Officer. Jon filled in Mr. Walker on the paint practices and then spoke with the Chief Officer. The Chief Officer had the crew suspend the work until new BMPs could be implemented.

We then sat down to discuss the various waste streams and discharge protocols and reviewed discharge records (photos #03 and #04) for hazardous waste, oily bilge water, garbage and black water and gray water. We then verified some of the discharge locations with Bridge navigation. We then viewed the garbage and recycling area (photo #07) and hazardous waste storage. We also looked at the food waste pulping system. We then toured the Triton black water treatment system and oily water separators. We finished the inspection with a tour and discussion of food waste source separation and management. The inspection was then finalized and we disembarked the vessel at about 11:10 am.

Discharge Types and Protocols:

Ballast water exchanges do not occur in Washington Straits. Ballast tanks are sometimes used as gray water tanks and are cleaned out prior to a change in use out at Sea.

Paint chipping for the outside of the vessel is restricted once inside MOU waters. If needed, paint is peeled off by hand.

All black water discharges occur more than 12 nautical miles (nm) from the nearest land and outside of MOU waters. No discharges occur in the Olympic Coast National Marine Sanctuary. Black water is treated with a traditional Type II marine sanitation device. The Triton system includes screening, aeration and chlorination. There are three tanks of about 46 cubic meters each. All gray water discharges occur more than 4nm from the nearest land and outside of MOU waters.

Logs of discharges occur electronically. The bridge and the Engine Control Room crew communicate about locations to confirm areas for discharge. The vessel uses a 3 light indicator system to indicate the status of discharge location.

Residual solids from the black water system, also known as biomass, bioresidue or sewage sludge, are currently collected from the Triton black water treatment system, drummed and landed ashore or are discharged outside of 12 nm and outside of MOU waters. (only needs to be done about once every six months).

For black water and gray water, the latitude and longitude coordinates are recorded in the *Sewage and Graywater Discharge Record Book* and in the deck log. The date, time and location of both the start and the stop of the discharges are recorded, along with port location, effluent type, and volumes. All wastewater discharge records that were reviewed appeared to be in compliance with the MOU and did not occur in MOU waters. Some of the locations of the discharges were later confirmed on the Bridge (photo #05) as being outside of MOU waters. Records were reviewed for the time period since the beginning of the cruise season to date.

Black water includes toilet waste and infirmary drains. Black water is treated with a Triton system (photos #12 and #13), a traditional marine sanitation device that includes screening, aeration and chlorination (photo #14). There are three units on board the vessel. Gray water includes sink and shower water, laundry water, hair salon water, spa water and galley water. Gray water is collected and held separately from black water and is then discharged more than 4nm from the nearest land and outside of MOU waters.

Food waste is collected in various locations and is sent to the pulping system (photo #09). The food is separated in the main kitchens into three bins, garbage (gray), recycle (blue) and food (yellow) (photos #21 and #22). The Environmental Officer oversees the source separation and training. Some food wastes such as pineapple rinds, banana peels, and coffee, which clogs up the pulpers, is sent to the incinerators. The pulped food waste is discharged out at Sea. Used cooking oil (photo #06) is reused as biofuel by being burned with heavy fuel.

Oily bilge water is treated with a FACET and SERAP two-part oily water separator system (photos #16 and #19). The FACET system brings the oil content down to less than 50ppm and the SERAP filter (photos #15, #17 and #18) brings the content down to less than 15 ppm. Discharges occur at less than 15 ppm and outside of MOU waters. A white box is used for additional monitoring assurance. Oily sludge is drummed and offloaded for proper disposal.

Pool water, with bromine is sent to the gray water tanks and is then discharged outside of MOU waters. Spa water is also drained to the gray water holding tanks and discharged along with gray water.

Potable water is either bunkered or produced by exhaust heat from the engines and a steam evaporator. The brine is then discharged. The water is only made when out at Sea.

Food-contaminated cardboard, some plastics, some food, and some dry waste are all incinerated. The incinerators are only used when outside of four nautical miles and 90 minutes after departure; 1 hour before arrival. Narcotics are incinerated with witness. Many medications are returned to the vendor for credit.

Plastics, some paper, some cardboard, aluminum, tin, and scrap metals, are all recycled (photo #10). Glass is crushed and discharged out at sea. Fluorescent lamps are crushed on board with a mercury vapor removal system (photo #11). Some materials are also donated when feasible. Garbage records looked to be in good order. Food waste and crushed glass are the only solid materials being discharged out at sea. Holland America Line has been working with Costco on methods to minimize packaging material for materials brought on board. Materials off-loaded for recycling are off-loaded in Victoria, Canada.

Dry cleaning no longer uses PERC, instead, a Miele system is used. Miele is a no-solvent based cleaner. Photo waste goes through a silver recovery system and is then off-loaded at less than 5ppm. X-ray's are done digitally, and do not have a waste product. Other hazardous waste materials (photo #08) including paints and thinners, and batteries, and

aerosol condensate, are off-loaded in Victoria, Canada. Hazardous waste records were reviewed and appear to be consistent with MOU requirements.

Conclusions and Recommendations
Staff was very knowledgeable of the protocols and systems for treatment and discharges. Discharge protocols were clear.

It is recommended that the crew continue to take care with implementing best management practices when conducting any ship painting or maintenance while in port.

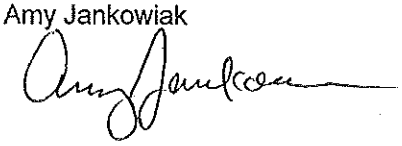
Staff was very aware of the requirements of the MOU.

Attachments: Photographs

Copies to:

Roger Walker, HAL
Jon Turvey, HAL
William Morani, Jr., HAL
Bob Diaz, HAL
Mark Toy, Department of Health
John Hansen, NorthWest CruiseShip Association
Karen Burgess, Ecology
Kevin Fitzpatrick, Ecology
Amy Jankowiak, Ecology
Central Files: Holland America Line - ROTTERDAM; WQ 6.1

Section H: Signatures

Name and Signature of Inspector:	Agency/Office/Telephone:	Date
Amy Jankowiak 	Department of Ecology Northwest Regional Office Water Quality Program Municipal Compliance Specialist 425-649-7195	9/9/10
Name and Signature of Reviewer:	Agency/Office/Telephone:	Date
Kevin C. Fitzpatrick 	Department of Ecology Northwest Regional Office Water Quality Section Manager 425-649-7033	9/9/10

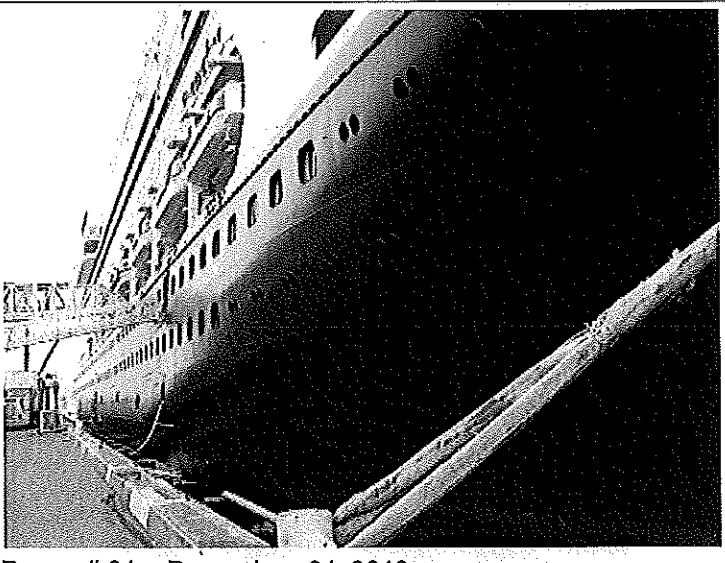


PHOTO #:01 DATE: JULY 31, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P7310002
DESCRIPTION: ROTTERDAM VESSEL

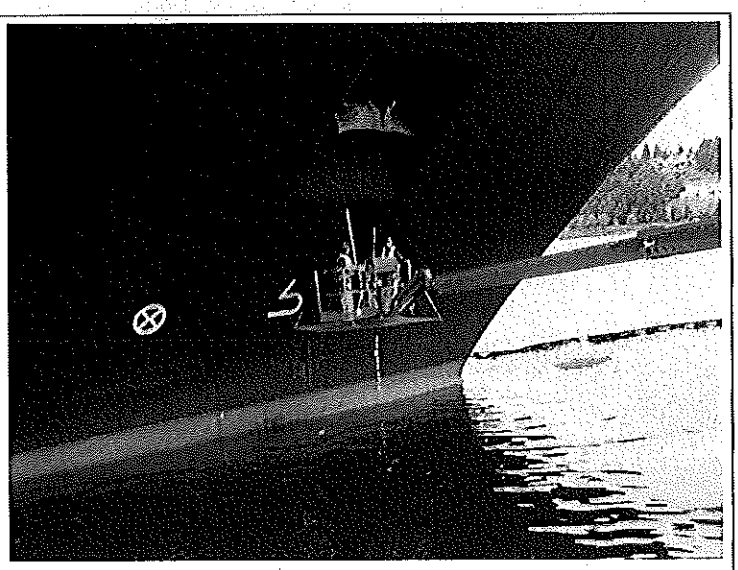


PHOTO #:02 DATE: JULY 31, 2010
TAKEN BY: KEVIN C. FITZPATRICK FILE NO.: P7310001
DESCRIPTION: PAINTING ON ROTTERDAM WITH CHERRY PICKER AND TARP

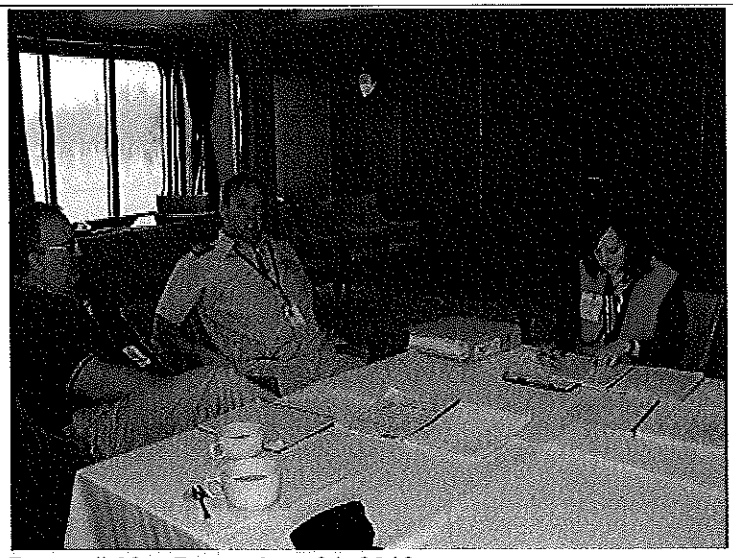


PHOTO #:03 DATE: JULY 31, 2010
TAKEN BY: KEVIN C. FITZPATRICK FILE NO.: P7310005
DESCRIPTION: RECORDS REVIEW WITH ROGER WALKER, SEH OFFICER, JON TURVEY, HAL HQ, AND AMY JANKOWIAK, ECOLOGY

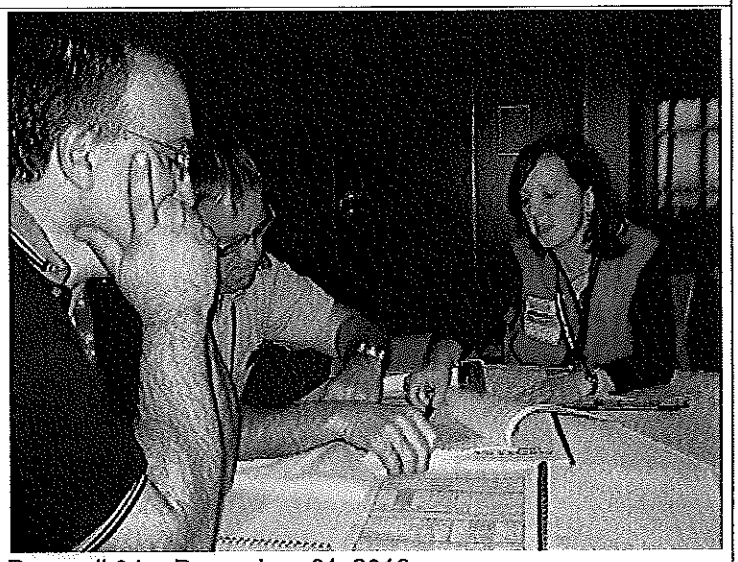


PHOTO #:04 DATE: JULY 31, 2010
TAKEN BY: KEVIN C. FITZPATRICK FILE NO.: P7310006
DESCRIPTION: RECORDS REVIEW AND LOCATION VERIFICATION

PHOTO #:05 DATE: JULY 31, 2010
TAKEN BY: KEVIN C. FITZPATRICK FILE NO.:P7310008
DESCRIPTION: NAVIGATION/DISCHARGE LOCATION VERIFICATION ON BRIDGE

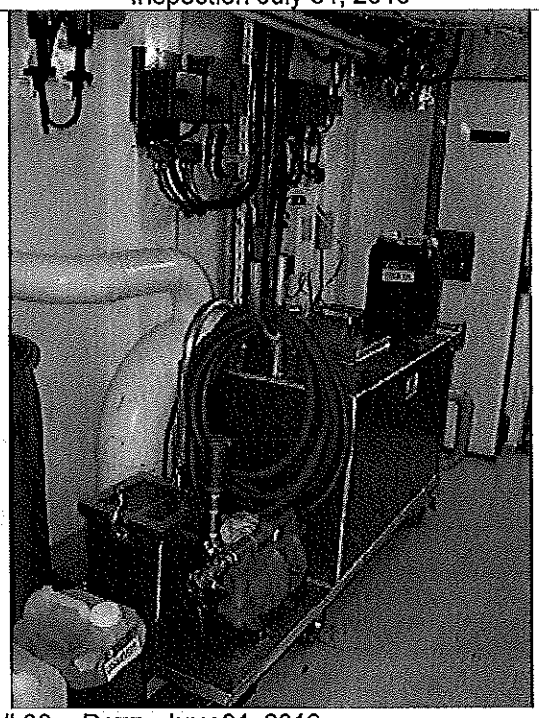


PHOTO #:06 DATE: JULY 31, 2010
TAKEN BY: KEVIN C. FITZPATRICK FILE NO.: P7310009
DESCRIPTION: USED COOKING OIL FILTER SYSTEM

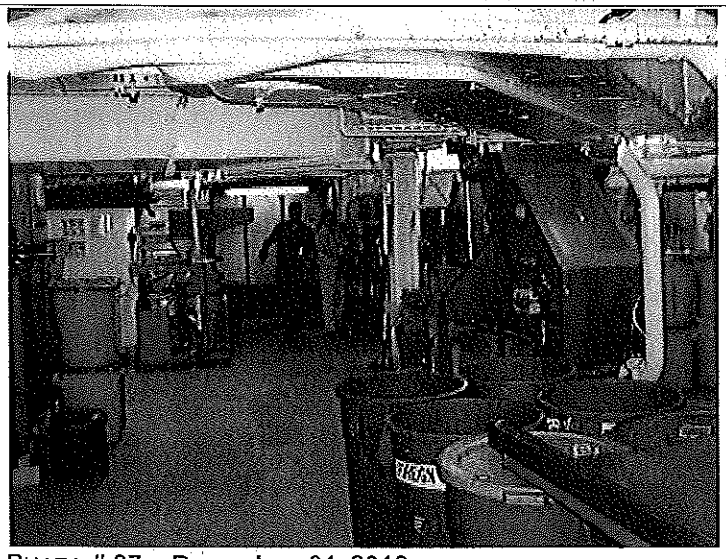


PHOTO #:07 DATE: JULY 31, 2010
TAKEN BY: KEVIN C. FITZPATRICK FILE NO.: P7310011
DESCRIPTION: GARBAGE/RECYCLING ROOM

PHOTO #:08 DATE: JULY 31, 2010
TAKEN BY: KEVIN C. FITZPATRICK FILE NO.: P7310012
DESCRIPTION: HAZARDOUS WASTE STORAGE

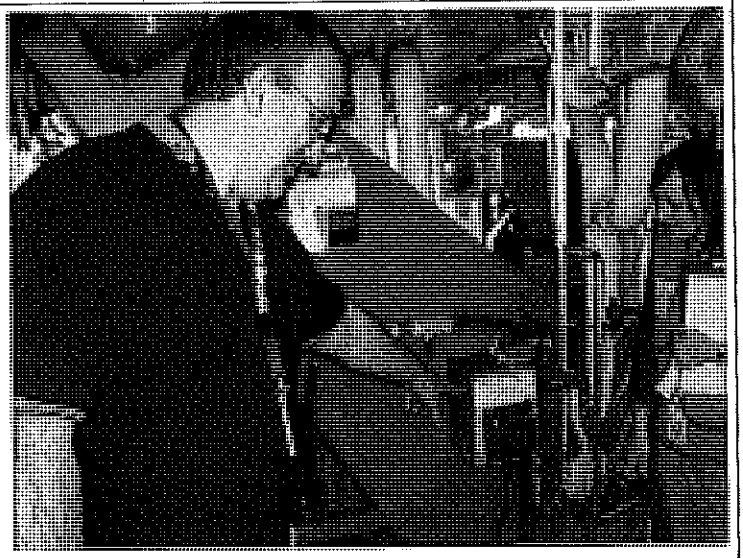


PHOTO #:09 DATE: JULY 31, 2010
TAKEN BY: KEVIN C. FITZPATRICK FILE NO.:P7310013
DESCRIPTION: FOOD WASTE PRESS

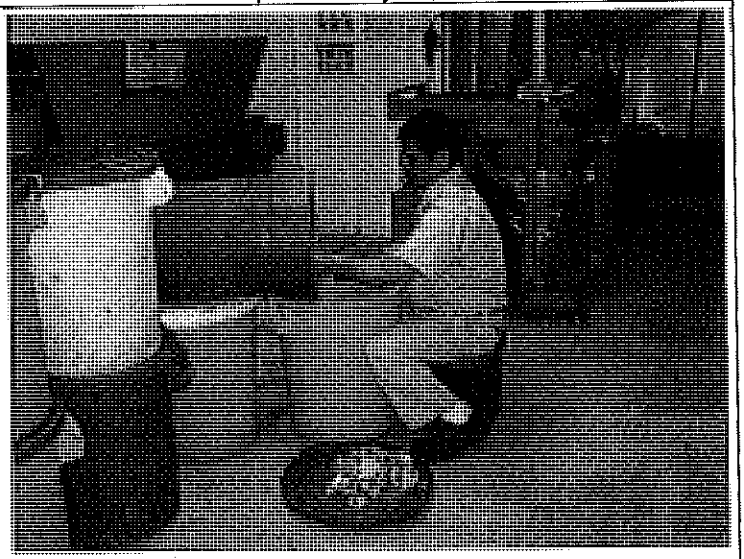


PHOTO #:10 DATE: JULY 31, 2010
TAKEN BY: KEVIN C. FITZPATRICK FILE NO.: P7310014
DESCRIPTION: GARBAGE/RECYCLING SORTING

PHOTO #:11 DATE: JULY 31, 2010
TAKEN BY: KEVIN C. FITZPATRICK FILE NO.: P7310015
DESCRIPTION: FLUORESCENT BULB CRUSHER AND MERCURY VAPOR REMOVAL SYSTEM.

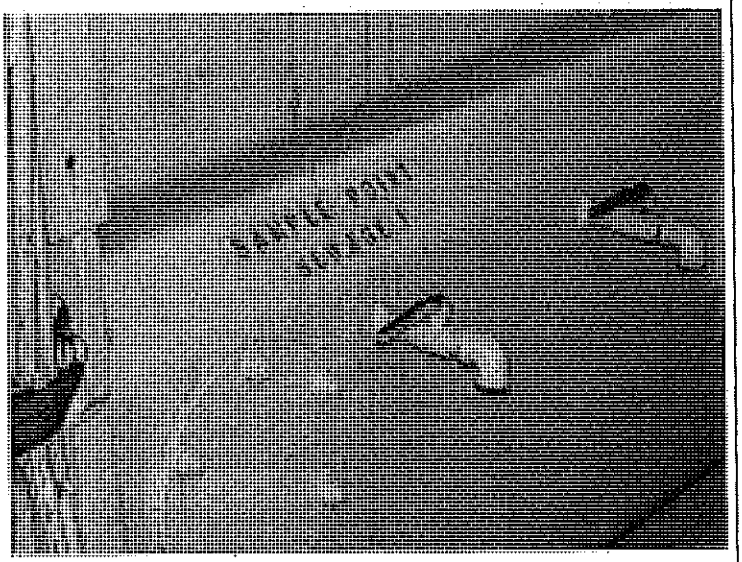


PHOTO #:12 DATE: JULY 31, 2010
TAKEN BY: KEVIN C. FITZPATRICK FILE NO.: P7310017
DESCRIPTION: TRITON BLACK WATER TREATMENT SYSTEM SAMPLE POINT.

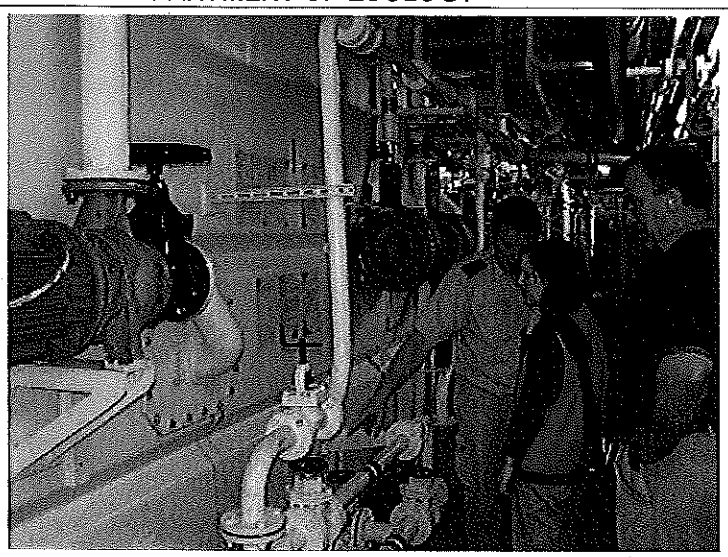


PHOTO #:13 DATE: JULY 31, 2010
TAKEN BY: KEVIN C. FITZPATRICK FILE NO.:P7310018
DESCRIPTION: TRITON BLACK WATER TREATMENT SYSTEM

PHOTO #:14 DATE: JULY 31, 2010
TAKEN BY: KEVIN C. FITZPATRICK FILE NO.: P7310019
DESCRIPTION: TRITON CHLORINE ADDITION

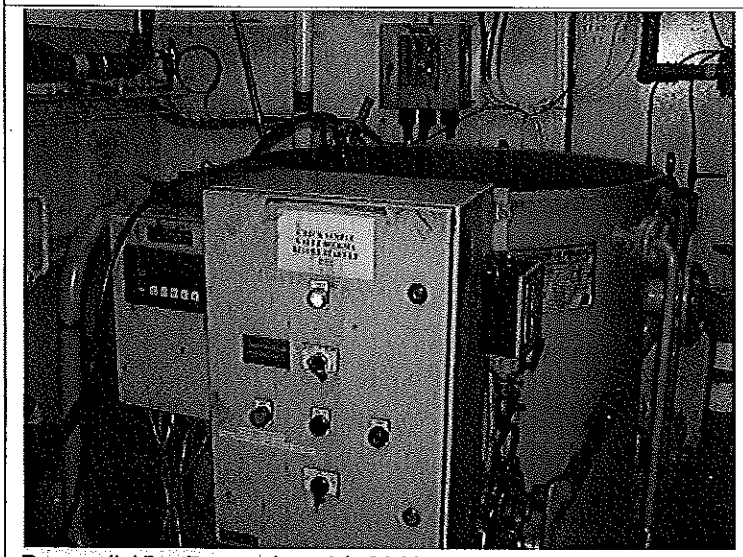


PHOTO #:15 DATE: JULY 31, 2010
TAKEN BY: KEVIN C. FITZPATRICK FILE NO.: P7310020
DESCRIPTION: OILY WATER SEPARATOR (OWS) SERAP FILTER SYSTEM

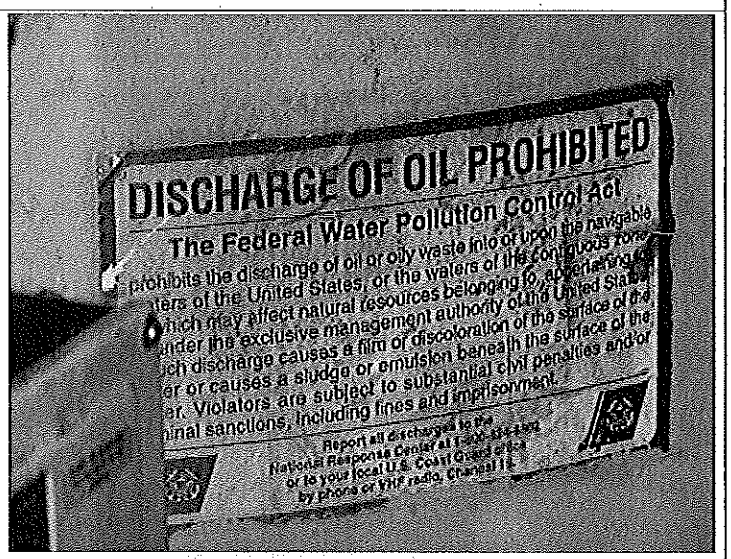


PHOTO #:16 DATE: JULY 31, 2010
TAKEN BY: KEVIN C. FITZPATRICK FILE NO.: P7310021
DESCRIPTION: OWS SIGNAGE

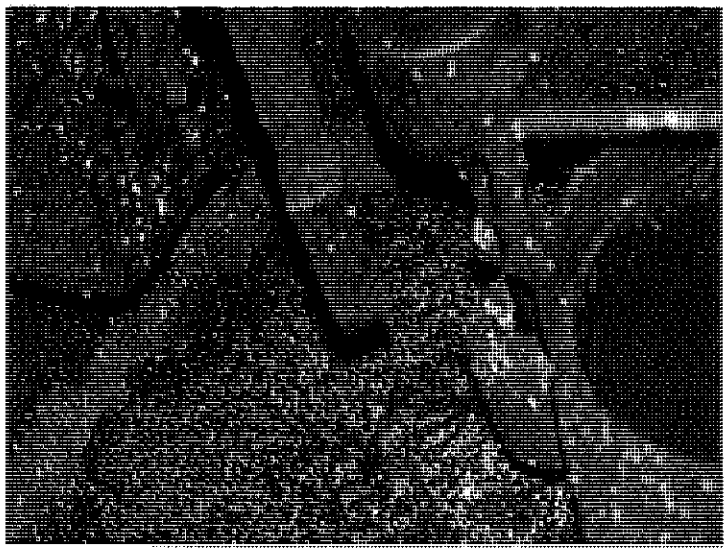


PHOTO #:17 DATE: JULY 31, 2010
TAKEN BY: KEVIN C. FITZPATRICK FILE NO.:P7310023
DESCRIPTION: INSIDE OF OWS SERAP FILTER SYSTEM (DURING AERATION CYCLE)

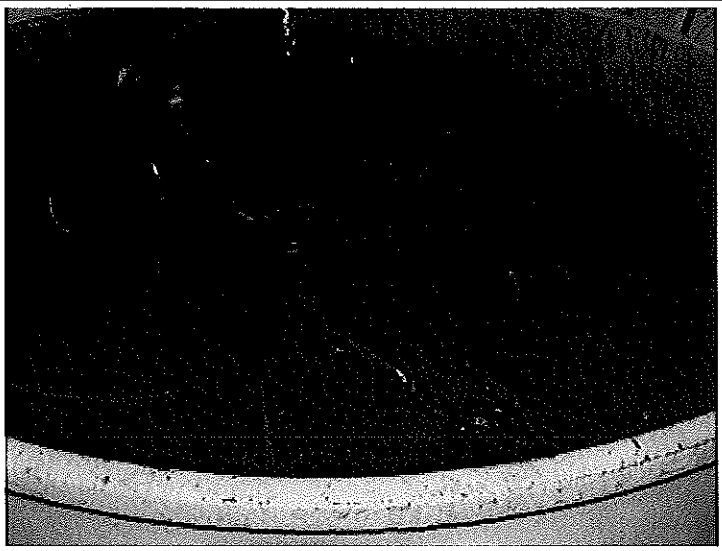


PHOTO #:18 DATE: JULY 31, 2010
TAKEN BY: KEVIN C. FITZPATRICK FILE NO.: P7310025
DESCRIPTION: INSIDE OF OWS SERAP FILTER SYSTEM (DURING AERATION CYCLE)

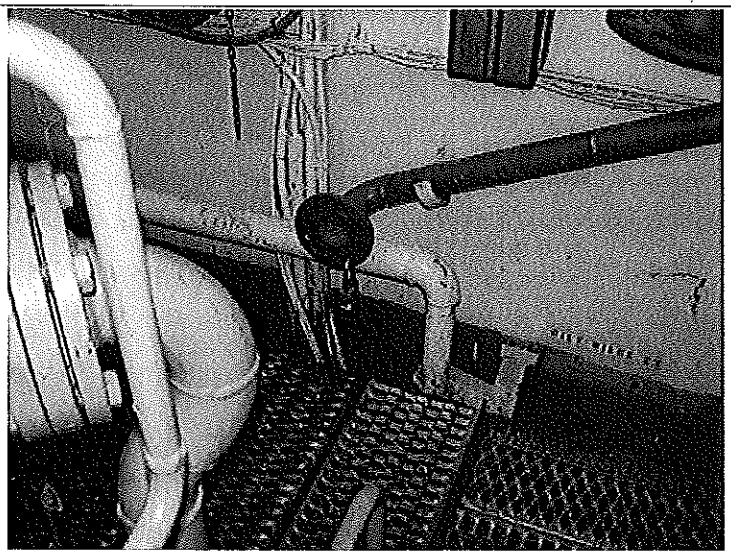


PHOTO #:19 DATE: JULY 31, 2010
TAKEN BY: KEVIN C. FITZPATRICK FILE NO.: P7310024
DESCRIPTION: OWS PIPING

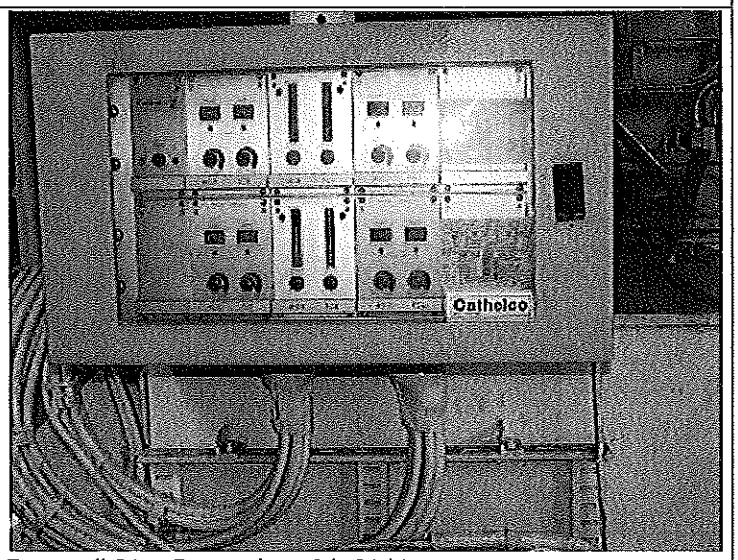


PHOTO #:20 DATE: JULY 31, 2010
TAKEN BY: KEVIN C. FITZPATRICK FILE NO.: P7310026
DESCRIPTION: CATHELCO ANTI-FOULING SYSTEM

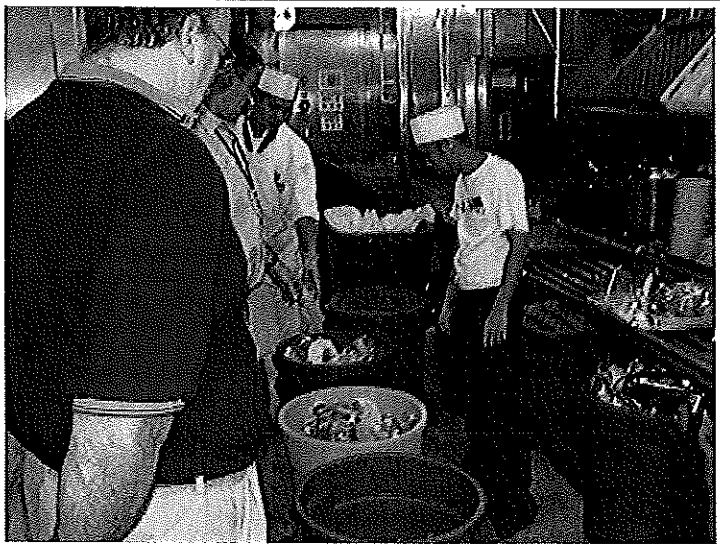


PHOTO #:21 DATE: JULY 31, 2010
TAKEN BY: KEVIN C. FITZPATRICK FILE NO.:P7310027
DESCRIPTION: FOOD WASTE SEPARATION AT THE SOURCE

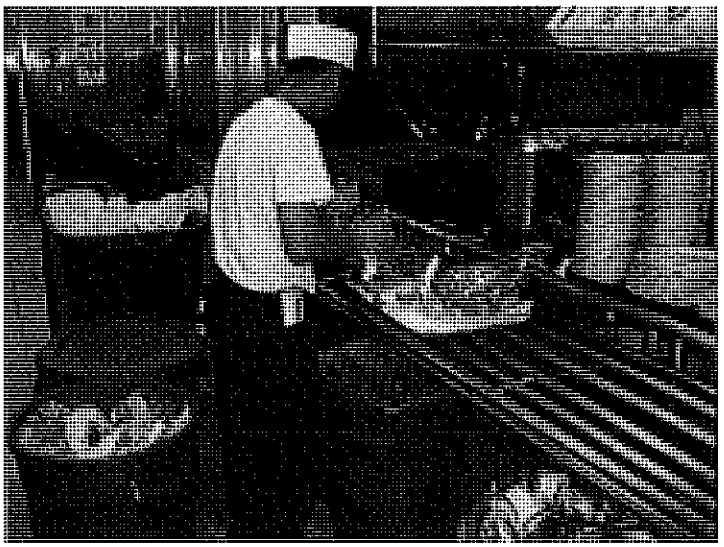


PHOTO #:22 DATE: JULY 31, 2010
TAKEN BY: KEVIN C. FITZPATRICK FILE NO.: P7310028
DESCRIPTION: FOOD WASTE SEPARATION AT THE SOURCE

DEPARTMENT OF ECOLOGY
State of Washington

State of Washington Department of Ecology

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

Northwest Regional Office
3190 160th Ave SE
Bellevue, WA 98008
Phone: (425) 649-7000
Fax: (425) 649-7098

Inspection Date	Permit Number	County	Receiving Waters	Ecology Inspector
08/16/2010	NA	King	Marine	Amy Jankowiak
Entry Time 9:05 am Exit Time 11:21 am	Photos Taken ☒ Yes ☐ No	Samples Taken ☐ Yes ☒ No	Inspection Announced ☒ Yes ☐ No	Discharges to: ☒ Surface Water ☐ Ground Water ☐ Dewater ☐ POTW

Name and Location of Site Inspected:
ROYAL PRINCESS, Princess Cruises
Pier 91
Seattle, Washington

Additional Participants/Inspectors:
Nathan Hasselblad, Intern, Ecology
Alice Opalka, Intern, Ecology

On-Site Representative(s): *Name/Title/Phone/e-mail*
Dario Scala, Environmental Officer
Rpdoseo1@princescruises.com

Responsible Official(s): *Name/Title/Address/Phone/e-mail*
Andrew Lorenzana, Environmental Operations Manager
Princess Cruises
24200 Magic Mountain Parkway, Santa Clarita, CA 91355-1283
661-753-2755; alorenzana@princesscruises.com

Other Facility Data:
Notification made to Andrew Lorenzana on August 12, 2010

Section A: Areas Evaluated

☒ Black/Gray Wastewater System	☒ Residual Solids	☒ Records/Reports	☒ Hazardous Waste/ Solid Waste	☒ Sampling/Monitoring
☒ Discharge Locations	☒ Operation & Maintenance	☒ Sludge Handling/ Disposal	☒ Oily Bilge Water	☐ Other

Section B: For Vessels Discharging ≥ 1nm from Berth and ≥ 6 Knots Only [2.1.3(A)]

☐ Schematics Match Black/Gray Wastewater System	
☐ Operations as Described in Submitted Documentation	
☐ Daily 24-hour Continuous Monitoring for Turbidity or Equivalent Monitoring	
☐ Turbidimeter or Equivalent Monitoring Equipment Functioning Properly	
☐ 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: Trigger Level for Shutdown:

Recorded Turbidity/Equivalent Levels Above Triggers:

☐ Daily 24-hour Continuous Monitoring for Disinfection Effectiveness	
☐ Disinfection Effectiveness Monitoring Equipment Functioning Properly	

Disinfection Effectiveness Monitoring:

☐ Auto Shut Down or Operational Controls to Insure System Shut Down if Disinfection System Upset Occurs	
☐ Disinfection System Operated and Maintained Properly	

Disinfection System:

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

☐	Schematics Match Black/Gray Wastewater System	
☐	Operations as Described in Submitted Documentation	
☐	Daily 24-hour Continuous Monitoring for Turbidity or Equivalent Monitoring	
☐	Turbidimeter or Equivalent Monitoring Equipment Functioning Properly	
☐	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: Trigger Level for Shutdown: Recorded Turbidity/Equivalent Levels Above Triggers:	
☐	Daily 24-hour Continuous Monitoring for Disinfection Effectiveness	
☐	Disinfection Effectiveness Monitoring Equipment Functioning Properly	
	Disinfection Effectiveness Monitoring:	
☐	Auto Shut Down or Operational Controls to Insure System Shut Down if Disinfection System Upset Occurs	
☐	Disinfection System Operated and Maintained Properly	
	Disinfection System:	
	Section D: General (Approved to Discharge)	
☐	No Discharges Within ½ Miles From Shellfish Beds/ Protocol (President's Point, Apple Tree Cove, Tyee Shoal)	
☐	Discharges Immediately Stopped When High Turbidity Occurs	
☐	Discharges Immediately Stopped When Disinfection System Upset Occurs	
☐	Immediate Notifications Made to WA Department of Health for Disinfection System Upset	
☐	Sampling Conducted 2/month, 1/month in Seattle (BOD, TSS, Fecal Coliform, pH, Chlorine Residual)	
☐	Whole Effluent Toxicity Testing 1 per 2 Years (homeported) or 1/40 Calls for Continuous	
	Section E: General	
☐	Wastewater Discharge Records Review	Discharge records were reviewed (blackwater/graywater/residual solids) and are maintained properly. No discharges in MOU waters were present from the beginning of the 2010 cruise season to present.
☐	Residual Solids Managed Properly/Disposal Protocol per MOU	Residual solids are either incinerated or held to be discharged at greater than 12 nautical miles and outside of MOU waters and the Olympic Coast National Marine Sanctuary.
☐	Hazardous Waste Managed Properly	All hazardous waste that is collected is being sent off-shore in Victoria, Canada. Records were reviewed for hazardous waste discharges.
☐	WA Hazardous Waste Guidelines Followed (Appendix vii)	All hazardous waste that is collected is being sent off-shore in Victoria, Canada. Records were reviewed for hazardous waste discharges.
☐	Solid Waste Managed Properly	Solid waste is being managed properly. The various solid waste streams are collected, sorted, stored, and sent ashore or incinerated as appropriate. Records were reviewed for garbage off-loads.
☐	Oily Bilge Water Managed Properly	Oily bilge water is treated and discharged at less than 15 ppm and outside of MOU waters.
Other:		

Section F: Sampling Results	
Parameter	Results
Biochemical Oxygen Demand 5-Day (BOD_5)	
Total Suspended Solids (TSS)	
Fecal Coliform	
Residual Chlorine	
pH	
Ammonia, Nitrogen	

Section G: Summary of Findings/Comments

Introduction

Amy Jankowiak, Washington State Department of Ecology (Ecology) Northwest Regional Office, Water Quality Program (NWRO-WQ) conducted the inspection of the Princess Cruises ROYAL PRINCESS on August 16, 2010. Nathan Hasselblad and Alice Opalka, both interns with the Department of Ecology also attended the inspection. The main contact on board the ROYAL PRINCESS was Dario Scala, Environmental Officer for the ROYAL PRINCESS. Prior notification of the visit was given on August 12, 2010 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 ROYAL PRINCESS is not approved to discharge in MOU waters. The vessel has not been discharging and is holding effluent until outside MOU waters.

The ROYAL PRINCESS was built in 2001 and has been in service with Princess cruises since 2007. The vessel is 592 feet long with a passenger capacity of 710 and a crew capacity of 374.

The ROYAL PRINCESS is scheduled for 10 port calls in Seattle and conducts two week cruises to Alaska turning around on Mondays between May 24, 2010 through September 13, 2010. The itinerary includes: Seattle – Ketchikan – Juneau – Icy Strait Point – Glacier Bay – Seward – Kodiak – Skagway – Tracy Arm – Victoria – Seattle.

Inspection

We arrived and boarded the ship (photo #01) at about 9:05 am and began with introductions and a plan for the day with Dario Scala, the Environmental Officer. Mr. Scala has been an Environmental Officer for about 7 years and is also an engineer. We met with other staff on the Bridge and viewed the navigation system. We then discussed various waste streams, and the discharge protocols. We then reviewed the various discharge and environmental records. We then toured the garbage and recycling area and the hazardous waste storage. Next, we discussed the Hamworthy advanced wastewater treatment system (AWTS) and then viewed the system. We then viewed the discharge valving and ports for the Hamworthy system and the oily water separator white box. The inspection was then finalized with a debriefing and we disembarked the vessel at about 11:21 am.

Discharge Types and Protocols:

No discharges of any kind occur in Washington state waters. Prior to entering Washington waters and within 12 miles from land, every discharge port is closed. Discharges of treated wastewater from the advanced wastewater treatment system is allowed in Canadian waters with permission. If the vessel is in an area where a discharge is allowed, the Bridge and the staff in the Engine Control Room (ECR) (photo #09) communicate by phone and with written verification by e-mail prior to any discharges. The Watchkeepers have the authority to then discharge and have "key" access for the overboard ports. There are hydraulic and solenoid valves. For blackwater and graywater, the latitude and longitude coordinates are recorded in the *Sewage and Graywater Discharge Record Book* and in the deck log. The date, time and location of both the start and the stop of the discharges are recorded, along with port location, effluent type, and volumes. All wastewater discharge records that were reviewed appeared to be in compliance with the MOU and also did not occur in MOU waters. Some coordinates that appeared to be possibly in or near MOU waters were written down and later verified to be in Canadian waters near the Canada/US border across from Victoria. In Juneau Alaska, the vessel sometimes offloads gray water and some AWTS permeate. The vessel has approximately 3 days of holding capacity. The AWTS treats combined black water and gray water, with the exception of laundry and galley water which is held separately and not treated. It is then discharged outside of MOU waters and greater than 12 nautical miles from land.

Ballast water exchanges occur outside of MOU waters.

Screenings and grit from the Hamworthy system are collected and incinerated. The solids separated out by the bioreactors is discharged outside of MOU waters, >12 nautical miles from shore, and outside of the Olympic Coast National Marine Sanctuary.

Pool and spa water is discharged outside of 12 nautical miles.

Food waste is collected in various locations, is sent through a pulper (photo #07). The water is recirculated and eventually held and sent to the galley gray water holding tank and discharged outside of MOU waters. The solid food material from the pulpers is discharged outside of 12 nautical miles and outside MOU waters. Records reviewed were consistent with this protocol. Used cooking oil, is collected (photo #08) and recycled for biodiesel.

Oily bilge water is treated with an oily water separator and discharged at less than 15 ppm after first going through a white box (photo #21) for monitoring. The vessel typically meets 4-5 ppm. The chief Engineer has the keys for the white box and it was locked during the inspection.

Some potable water is bunkered, while the rest is produced by desalination with two evaporators. The brine is discharged.

The vessel does not offer dry cleaning services. Phosphate-free detergents are used in the laundry. Silver is captured from the photo and x-ray waste, and is treated to less than 5 ppm and is then incinerated. Hazardous wastes include chemicals, oily rags, printer cartridges, paints, batteries, bulbs (no crusher on board), sludge oil, aerosols (punctured), and sharps. All hazardous waste (photos #04 and #05) is off-loaded in Victoria.

Expired medications and narcotics are incinerated (narcotics with witness). Most cardboards, paper and some food waste is also incinerated (photo #03). Incineration occurs once the vessel is going 6 knots.

Plastics, garbage, and other materials are collected and sorted on a sorting table (photo #02). Most materials are then condensed and recycled on-shore. Glass, aluminum (photo #06), tin, and plastics are all recycled along with other materials.

Black water and Gray water System:
Blackwater, which includes toilet waste (and the medical drains) and graywater which includes sink and shower water is treated with a Hamworthy advanced wastewater treatment system and is currently discharged outside of MOU waters. The Hamworthy system, which was just installed in the spring of 2010, consists of two separate membrane bioreactors (MBRs). Both MBRs are typically run at the same time, although one of the MBRs can go off-line for maintenance. Black water, which includes toilet waste and the medical drains is collected by vacuum (photo #10) to one of two collection tanks and then combines with gray water which includes sink and shower water and has been piped to one of the collection tanks. Combined gray and black water flow moves to the screen press (photo #13). The solids are screened into bags (photos #15 and #16) and are then sent to the incinerator. The liquid moves to the 1st stage (photo #12) of the membrane bioreactor where aeration occurs. From the 1st stage, flow moves to the inter-stage filters (photo #14). The inter-stage filtered solids are returned back to the screen press. The liquid moves onto the 2nd stage of the MBR for further aeration. From the 2nd stage MBR, flow is sent to the membrane modules for ultrafiltration (2 banks with 6 membranes each) (photo #11). Effluent from the membrane modules are sent to a permeate tank where turbidity is monitored. Flow then combines with the other two MBR's for ultraviolet (UV) disinfection (photo #17). Disinfected effluent either goes directly overboard (photo #19) or to a holding tank (photo #20) if not in an approved area for discharge. The held effluent will eventually go back through the UV system before discharge. Currently, effluent is held and discharged outside of MOU waters. There is a sample port for treated effluent after UV disinfection (photo #18).

Turbidity is measured continuously on each of the MBR permeate tanks. The meters are alarmed at 40 NTU maximum. The UV system consists of 6 bulbs which are alarmed. If the bulbs fail or the power goes out, the system alarms. There are spare bulbs available on board. The maintenance system provides details of when all maintenance is needed. Representatives from Hamworthy visit the ship periodically.

The staff have a small laboratory on board where they sample for such parameters as chlorine, total suspended solids (TSS), and fecal coliform. The on-board sampling allows for immediate results and a chance for immediate corrections to the system.

Conclusions and Recommendations

It is recommended that staff continue to work towards high functioning wastewater treatment systems. The staff on board

the vessel were very knowledgeable of the systems and protocols.

The laboratory testing on-board is an excellent way to monitor and make needed adjustments to the system. Having a laboratory on-board for the testing is ideal.

Attachments:
Photographs

Copies to:
Andrew Lorenzana, Princess Cruises
Dario Scala, Environmental Officer
Amy Jankowiak, Ecology
Karen Burgess, Ecology
Mark Toy, Health
Kevin Fitzpatrick, Ecology
Central Files: Princess Cruises – ROYAL PRINCESS; WQ 6.1

Section H: Signatures

Name and Signature of Inspector:	Agency/Office/Telephone:	Date
Amy Jankowiak	Department of Ecology Northwest Regional Office Water Quality Program Municipal Compliance Specialist 425-649-7195	9/16/10
Name and Signature of Reviewer:	Agency/Office/Telephone:	Date
Kevin C Fitzpatrick	Department of Ecology Northwest Regional Office Water Quality Section Manager 425-649-7033	9/16/10

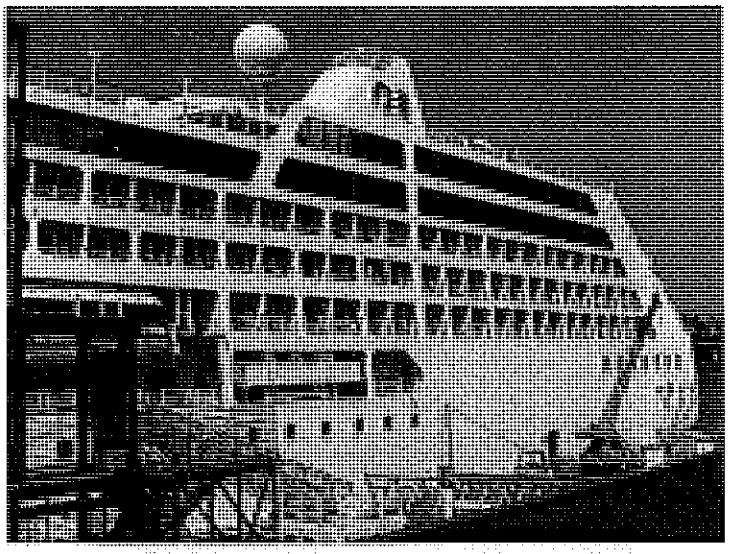


PHOTO #:01 DATE: AUGUST 16, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P8160027
DESCRIPTION: ROYAL PRINCESS VESSEL

PHOTO #:02 DATE: AUGUST 16, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P8160002
DESCRIPTION: GARBAGE AND RECYCLING ROOM

PHOTO #:03 DATE: AUGUST 16, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P8160003
DESCRIPTION: INCINERATOR RECEPTION

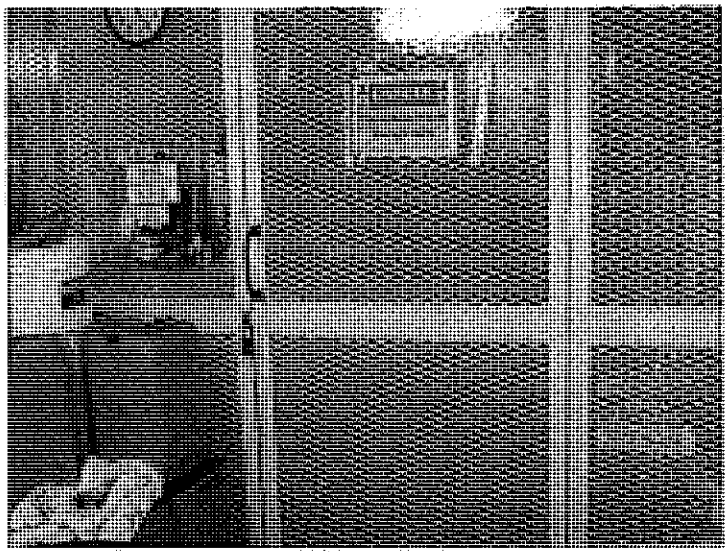


PHOTO #:04 DATE: AUGUST 16, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P8160004
DESCRIPTION: HAZARDOUS WASTE STORAGE LOCKER

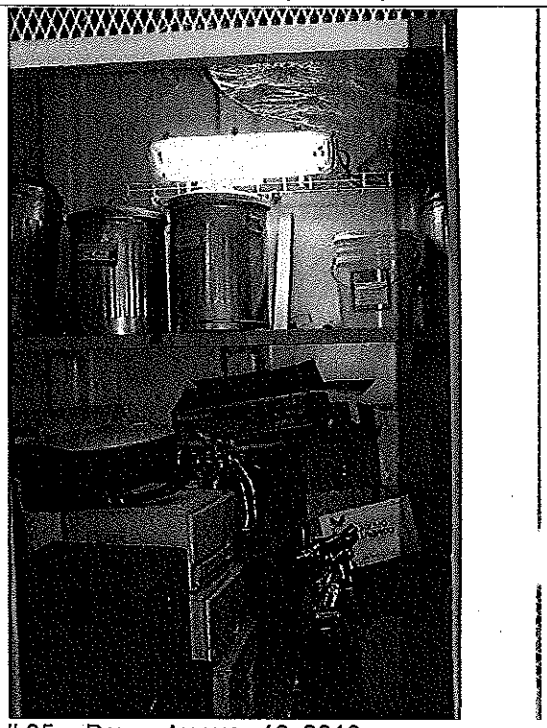


PHOTO #:05 DATE: AUGUST 16, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P8160005
DESCRIPTION: HAZARDOUS WASTE MATERIALS

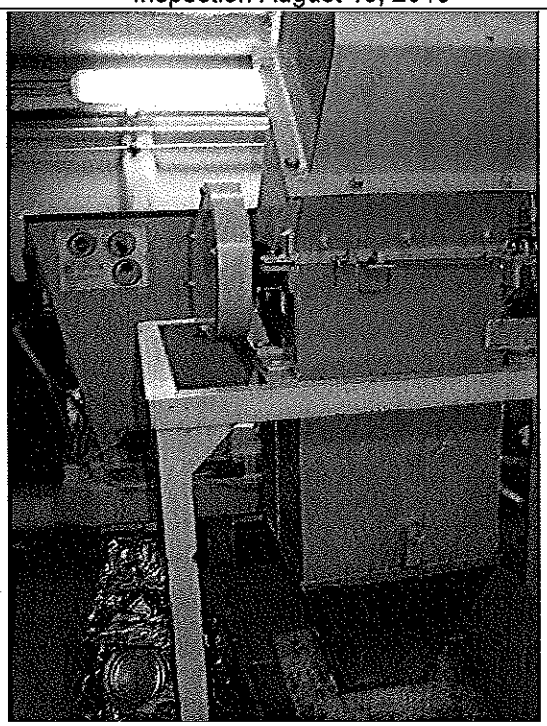


PHOTO #:06 DATE: AUGUST 16, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P8160006
DESCRIPTION: ALUMINUM CRUSHER (FOREGROUND), GLASS CRUSHER (BACK LEFT)

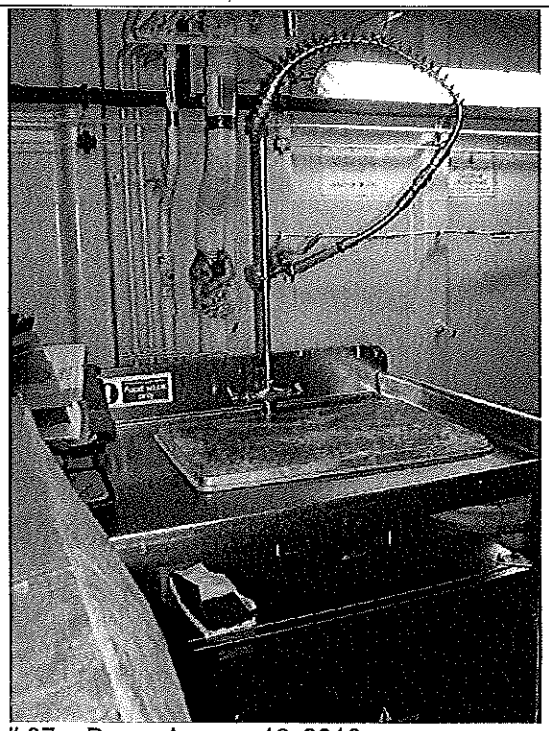


PHOTO #:07 DATE: AUGUST 16, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P8160007
DESCRIPTION: FOOD WASTE/PULPER (BELOW)

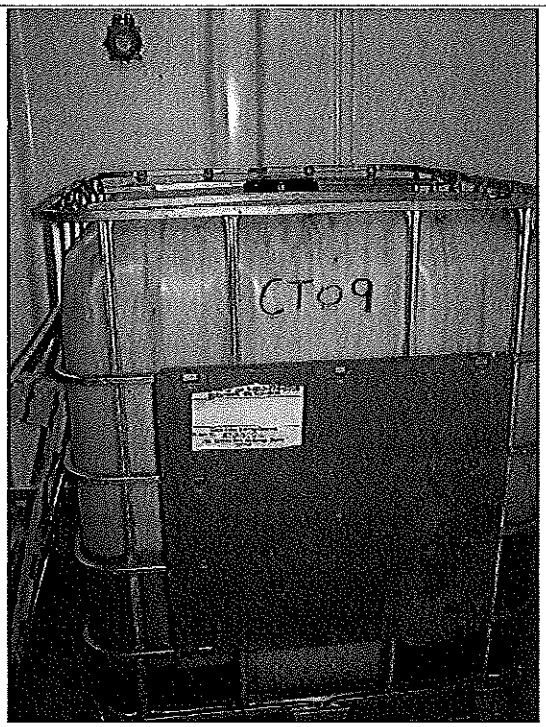


PHOTO #:08 DATE: AUGUST 16, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P8160008
DESCRIPTION: USED COOKING OIL

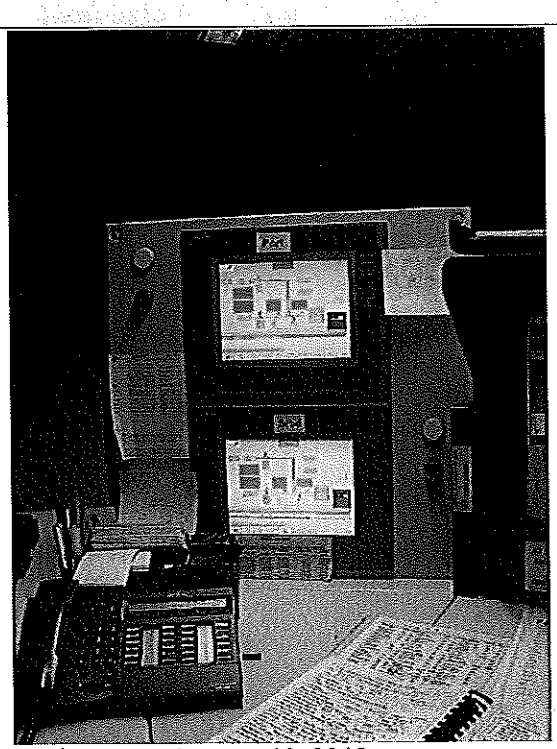


PHOTO #:09 DATE: AUGUST 16, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P8160009
DESCRIPTION: MBR TREATMENT SYSTEM DIAGRAMS IN ENGINE CONTROL ROOM

PHOTO #:10 DATE: AUGUST 16, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P8160011
DESCRIPTION: BLACK WATER VACUUM COLLECTION TANK

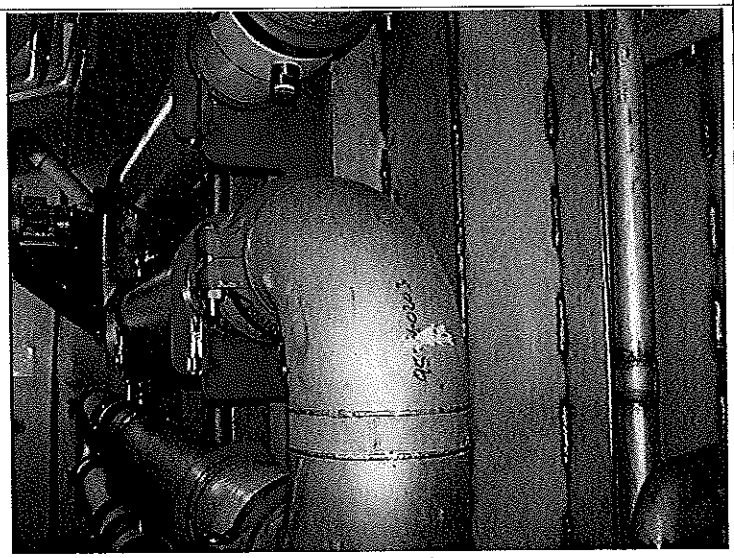


PHOTO #:11 DATE: AUGUST 16, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P8160012
DESCRIPTION: MBR FILTERS

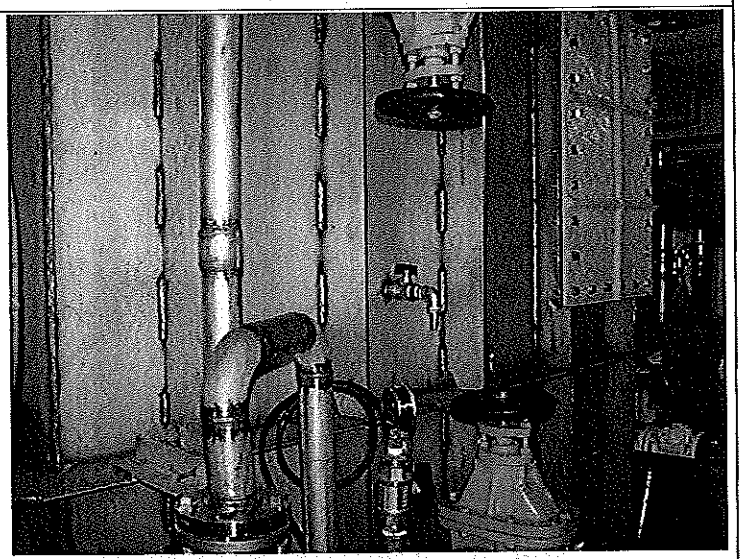


PHOTO #:12 DATE: AUGUST 16, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P8160013
DESCRIPTION: HAMWORTHY TREATMENT TANKS (1ST AND 2ND STAGE)

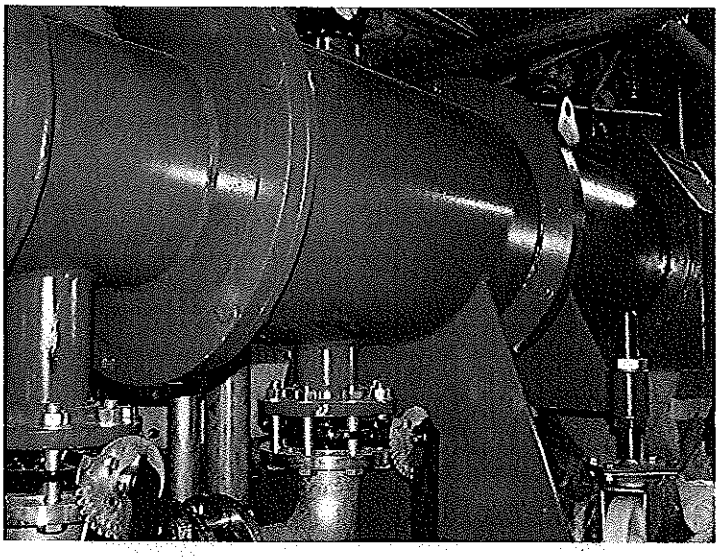


PHOTO #:13 DATE: AUGUST 16, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P8160014
DESCRIPTION: HAMWORTHY FILTER PRESS

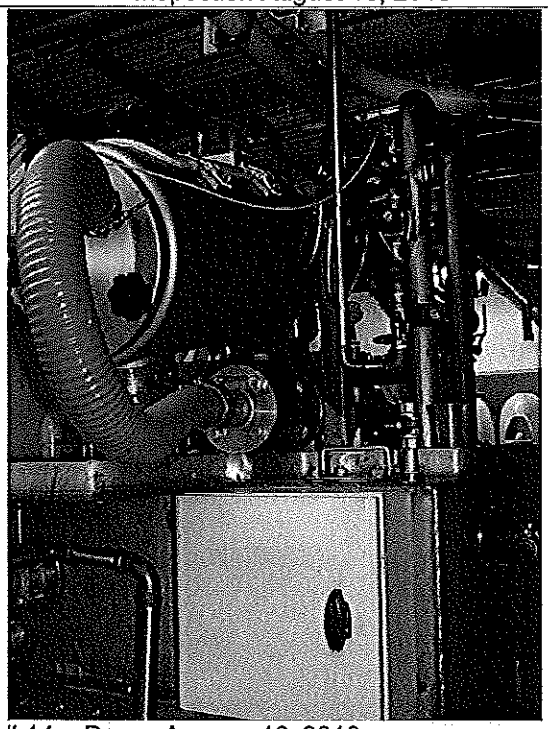


PHOTO #:14 DATE: AUGUST 16, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P8160015
DESCRIPTION: HAMWORTHY 1ST STAGE FILTER

PHOTO #:15 DATE: AUGUST 16, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P8160016
DESCRIPTION: HAMWORTHY FILTER PRESS SCREENINGS

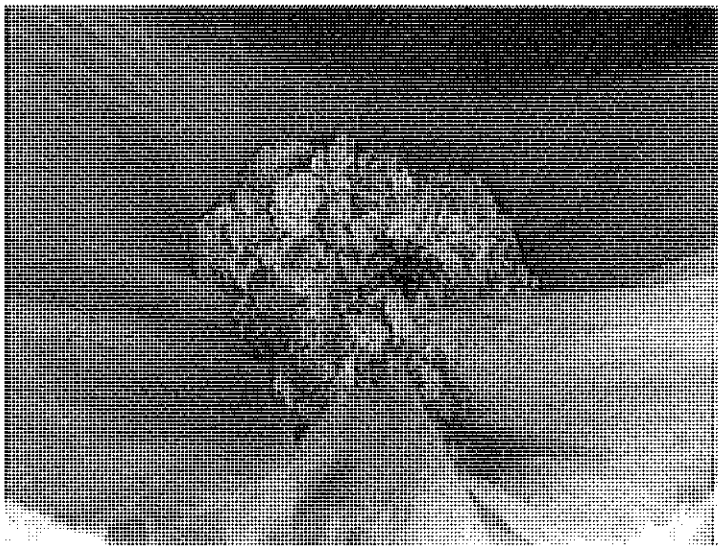


PHOTO #:16 DATE: AUGUST 16, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P8160019
DESCRIPTION: HAMWORTHY FILTER PRESS SCREENINGS

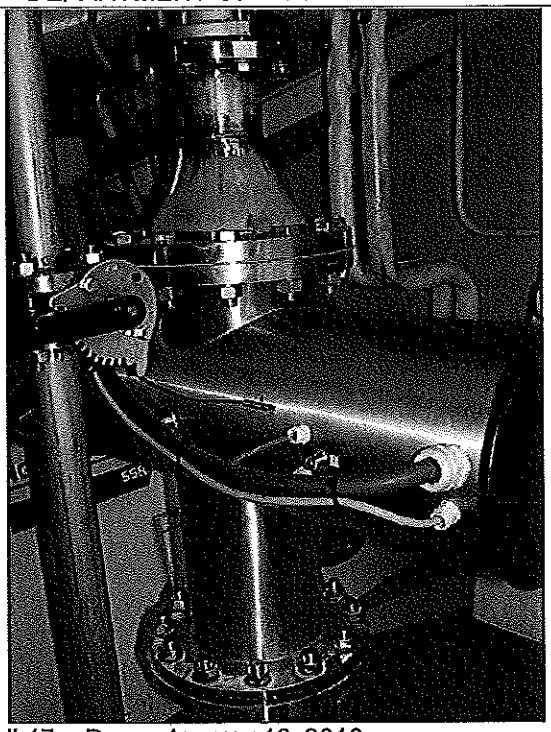


PHOTO #:17 DATE: AUGUST 16, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P8160020
DESCRIPTION: HAMWORTHY ULTRAVIOLET DISINFECTION UNIT

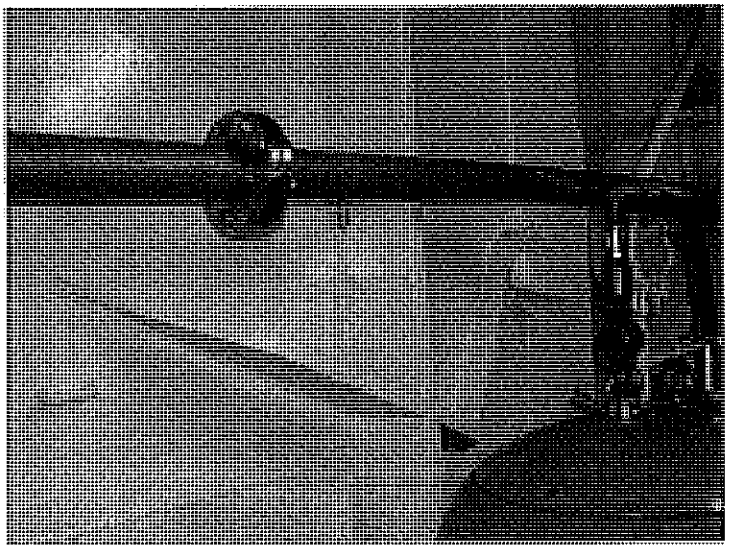


PHOTO #:18 DATE: AUGUST 16, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P8160021
DESCRIPTION: HAMWORTHY DISCHARGE SAMPLE POINT

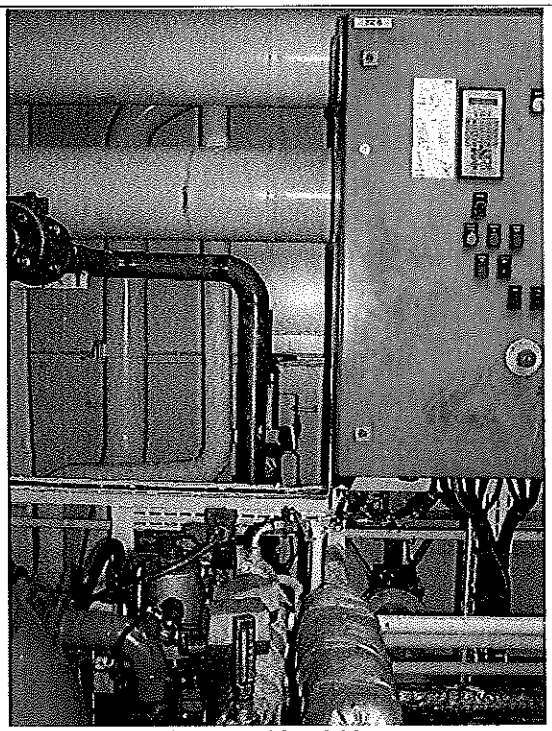


PHOTO #:19 DATE: AUGUST 16, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P8160022
DESCRIPTION: HAMWORTHY DISCHARGE PORT

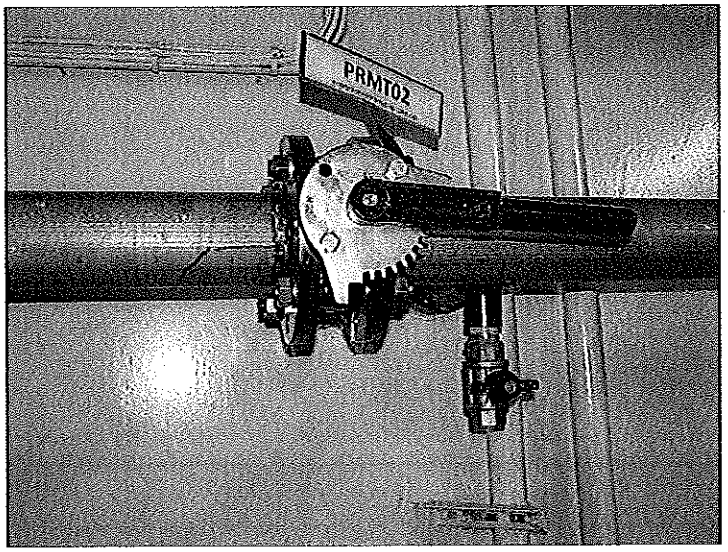


PHOTO #:20 DATE: AUGUST 16, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.: P8160023
DESCRIPTION: VALVING FROM HAMWORTHY FROM PERMEATE TO HOLDING OR DISCHARGE

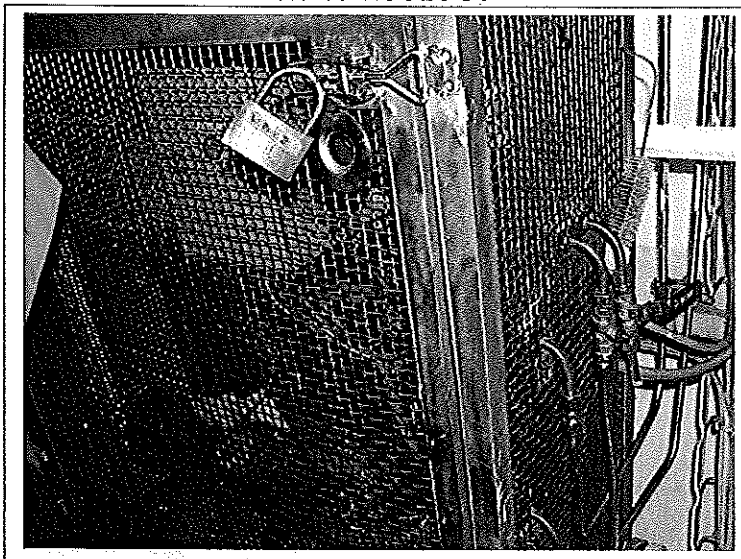


PHOTO #:21 DATE: AUGUST 16, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P8160024
DESCRIPTION: WHITE BOX FOR OILY WATER SEPARATOR

DEPARTMENT OF ECOLOGY
State of Washington

State of Washington Department of Ecology

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

Northwest Regional Office
3190 160th Ave SE
Bellevue, WA 98008
Phone: (425) 649-7000
Fax: (425) 649-7098

Inspection Date	Permit Number	County	Receiving Waters	Ecology Inspector
08/29/2010	NA	King	Marine	Amy Jankowiak
Entry Time 9:05 am **Exit Time** 12:38 pm	**Photos Taken** ☒ Yes ☐ No	**Samples Taken** ☒ Yes ☐ No	**Inspection Announced** ☒ Yes ☐ No	**Discharges to:** ☒ Surface Water ☐ Ground Water ☐ Dewater ☐ POTW

Name and Location of Site Inspected:
NORWEGIAN PEARL, Norwegian Cruise Line
Pier 66, Seattle

Additional Participants/Inspectors:
Lori LeVander, Ecology
Mark Henderson, Ecology

On-Site Representative(s): *Name/Title/Phone/e-mail*
Matilda Ivanova, Environmental Officer

Responsible Official(s): *Name/Title/Address/Phone/e-mail*
Randall R. Fiebrandt, Director, Environmental Operations
Norwegian Cruise Line
7665 Corporate Center Drive, Miami, FL 33126
rfiebrandt@ncl.com 305-436-4956

Other Facility Data:
Notification made to Randy Fiebrandt on August 25, 2010

Section A: Areas Evaluated

☒ Black/Gray Wastewater System	☒ Residual Solids	☒ Records/Reports	☒ Hazardous Waste/ Solid Waste	☒ Sampling/Monitoring
☒ Discharge Locations	☒ Operation & Maintenance	☒ Sludge Handling/ Disposal	☒ Oily Bilge Water	☒ Other

Section B: For Vessels Discharging ≥ 1nm from Berth and ≥ 6 Knots Only [2.1.3(A)]

☒ Schematics Match Black/Gray Wastewater System	Schematics appeared to be consistent with they system on board.
☒ Operations as Described in Submitted Documentation	Operations were as described.
☒ Daily 24-hour Continuous Monitoring for Turbidity or Equivalent Monitoring	Has continuous TSS monitoring.
☒ Turbidimeter or Equivalent Monitoring Equipment Functioning Properly	Appears to be functioning properly.
☒ Auto Shut Down or Operational Controls to Insure System Shut Down If High Turbidity Occurs	A value of 28 mg/l or greater triggers to hold and 30 mg/l for automatic shut down of discharge and recirculation back to mixing tank.

Turbidity or Equivalent:

Last Calibration: per AMOS

Trigger Level for Early Alarm: 25 mg/l Trigger Level for Shutdown: 30 mg/l

Recorded Turbidity/Equivalent Levels Above Triggers: not recently

☒ Daily 24-hour Continuous Monitoring for Disinfection Effectiveness	Monitors for alarm intensity.
☒ Disinfection Effectiveness Monitoring Equipment Functioning Properly	Appears to be functioning properly.
☒ Auto Shut Down or Operational Controls to Insure System Shut Down If Disinfection System Upset Occurs	Discharge is stopped and recirculates back to mixing tank when intensity does not meet set points.
☒ Disinfection System Operated and Maintained Properly	Appears to be functioning properly.

Disinfection System:

There are three UV units, of which two are typically used in series with 14 bulbs each, and the third is kept in standby. The UV unit not being used goes though a cleaning cycle with Metal Bright cleaner and is then rotated in for use. There is typically about one set (14 bulbs) of spare bulbs on board. The UV system is alarmed for bulb failure and intensity. The alarm level is set at 10 W/m2. Pressure and temperature are also monitored with alarms. The UV sleeves are cleaned by dosing Metal Bright cleaner automatically. Flow from the UV units is either discharged directly overboard via the discharge port, or is re-circulated to the mixing tank.

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

☐ Schematics Match Black/Gray Wastewater System	

☐	Operations as Described in Submitted Documentation	
☐	Daily 24-hour Continuous Monitoring for Turbidity or Equivalent Monitoring	
☐	Turbidimeter or Equivalent Monitoring Equipment Functioning Properly	
☐	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: Trigger Level for Shutdown: Recorded Turbidity/Equivalent Levels Above Triggers:	
☐	Daily 24-hour Continuous Monitoring for Disinfection Effectiveness	
☐	Disinfection Effectiveness Monitoring Equipment Functioning Properly	
	Disinfection Effectiveness Monitoring:	
☐	Auto Shut Down or Operational Controls to Insure System Shut Down If Disinfection System Upset Occurs	
☐	Disinfection System Operated and Maintained Properly	
	Disinfection System:	
	Section D: General (Approved to Discharge)	
☐	No Discharges Within ½ Miles From Shellfish Beds/ Protocol (President's Point, Apple Tree Cove, Tyee Shoal)	
☐	Discharges Immediately Stopped When High Turbidity Occurs	
☐	Discharges Immediately Stopped When Disinfection System Upset Occurs	
☐	Immediate Notifications Made to WA Department of Health for Disinfection System Upset	
☐	Sampling Conducted 2/month, 1/month in Seattle (BOD, TSS, Fecal Coliform, pH, Chlorine Residual)	
☐	Whole Effluent Toxicity Testing 1 per 2 Years (homeported) or 1/40 Calls for Continuous	
	Section E: General	
☒	Wastewater Discharge Records Review	Discharge records were reviewed (black water/gray water/residual solids) and are maintained properly.
☒	Residual Solids Managed Properly/Disposal Protocol per MOU	Residual solids are collected, dried and incinerated.
☒	Hazardous Waste Managed Properly	All hazardous waste that is collected is being sent off-shore in Victoria, Canada. Records were reviewed for hazardous waste discharges.
☒	WA Hazardous Waste Guidelines Followed (Appendix vii)	All hazardous waste is being off-loaded outside of Washington.
☒	Solid Waste Managed Properly	Solid waste is being managed properly. The various solid waste streams are collected, sorted, stored, and sent ashore or incinerated as appropriate.
☒	Oily Bilge Water Managed Properly	Oily bilge water is treated and discharged at less than 15 ppm (usually less than 1 ppm) and outside of MOU waters.
Other:		

Section F: Sampling Results

Parameter	Results
Biochemical Oxygen Demand 5-Day (BOD_5)	2.6 mg/l

Total Suspended Solids (TSS)	15 mg/l
Fecal Coliform	2 CFU/100 ml
Residual Chlorine	Non Detect (<0.1 mg/l)
pH	6.77 standard units
Ammonia, Nitrogen	29.5 mg/l

Section G: Summary of Findings/Comments

Introduction

Amy Jankowiak, Washington State Department of Ecology (Ecology) Northwest Regional Office, Water Quality Program (NWRO-WQ) conducted the inspection of the Norwegian Cruise Line NORWEGIAN PEARL on August 29, 2010 along with Lori LeVander, Ecology NWRO-WQ and Mark Henderson, Ecology Bellingham Field Office. The main contact on board the NORWEGIAN PEARL was Matilda Ivanova, Environmental Officer. Prior notification of the visit was given on August 25, 2010 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. A copy of the current MOU was on-board. The NORWEGIAN PEARL received approval to discharge at greater than one nautical mile and greater than six knots on May 4, 2010.

The NORWEGIAN PEARL was built in 2005, is 965 feet long with 15 guest decks, with about a 27-foot draft. There are typically about 2700-3000 passengers and 1000-1100 crew this season.

Inspection

We arrived and boarded the ship (photo #27) at about 9:05 am and began with introductions and a plan for the day with Matilda Ivanova, Environmental Officer in the Engine Control Room (ECR) area and discussed various waste streams, and the discharge protocols. Ms. Ivanova is an experienced Environmental Officer with Norwegian Cruise Line. Discharge records were reviewed for black water and gray water discharges, garbage and recycling, and hazardous waste. We then discussed the black water and gray water system. Next, we viewed garbage and recycling area, the food waste pulper system, the cold garbage and storage areas and the photo laboratory. We then visited the Bridge and reviewed notification procedures and navigation (photos #21, #22, #23, #24, #25 and #26). Next we viewed the laundry area. We then went to the bottom deck to view the Scanship advanced wastewater treatment system (AWTS). Samples of the black and gray water effluent were taken before debriefing and finalizing the inspection at about 12:38 pm.

Discharge Types and Protocols:

The Bridge staff notifies the ECR staff 30 minutes in advance of entering shellfish areas to stop discharges. The bridge then notifies the ECR when discharges are again allowed. Discharges do not occur again until the vessel is underway and outside of the shellfish areas. The Environmental Officer confirms the discharge locations. Only the Environmental Officer and the Captain have the keys for discharge ports which are padlocked. The latitude and longitude coordinates are recorded in the *Sewage and Graywater Discharge Record Book* and in the deck log for black water, gray water and untreated wastewater as well as other types of discharges including food waste and oily bilge outside of 12 miles. The date, time and location of both the start and the stop of the discharges are recorded, along with port location, effluent type, and volumes. All discharge records that were reviewed appeared to be in compliance with the MOU. Discharges typically stop when coming into MOU waters around 3:30am and begin again at about 7:30 or 8:00 pm on the way back out.

Black water, which includes toilet waste, galley waste and infirmary drains and gray water which includes sink and shower water and laundry water is treated with a Scanship advanced wastewater treatment system and is discharged per the above protocol. Food pulper water is separated and sent to the biosludge tank.

Screenings and grit as well as the biomass (sewage sludge) from the Scanship system is collected, dried (photos #01 and #02) and incinerated along with some food waste. The Scanship dryers and incinerator process are working well. The system produces approximately two cubic meters of biomass per week and six cubic meters of food waste to the dryer/incinerator per week.

Other materials that are incinerated (photo #05) include some plastics, contaminated cardboard, some paper, oily rags, and biohazardous waste. The ash is landed ashore and tested once a year. Fuel use while in Port is MGO only.

The food waste is collected and pulped (photos #07 and #08). The reject water is recycled. The liquid from the pulper is sent to the biosludge tank and is then dried and incinerated. Some of the solid food waste is held and discharged outside of 12 nautical miles and outside of MOU waters and the Olympic Coast National Marine Sanctuary. Cooking oil is collected (photo #11) and recycled as biodiesel. Biogel, an enzyme is used for the grease traps.

Oily bilge water is treated with two Marinfloc systems for separating oil. The oily bilge is treated to less than 15 part per

million (ppm) oil content, although the results are typically less than one ppm. From the oily water separator, the oil content is again measured in the locked "white box". The treated oily bilge water is then discharged outside of MOU waters and greater than 12 nautical miles.

Potable water that is regularly bunkered. Water is also produced by desalination using a reverse osmosis system and evaporators. The salt that is collected through the production process is sent back to the salt water. A descaler chemical is used on the evaporators and is adjusted for pH before discharge at sea. Discharges occur when underway at a minimum of six knots.

Pool water uses salt water and chlorine for disinfection. Approximately twice a week, the pool water is typically discharged directly overboard when greater than 12 nautical miles. The discharges usually occur on Mondays and Friday nights, therefore usually not in MOU waters. If a discharge needs to occur within 12 nautical miles, the discharge is dechlorinated first to non-detect levels. Spa water is freshwater with chlorine for disinfection. When emptied, they go to the graywater tanks for treatment first. If there are accidents in the pools or spas, they are shut down until the material is removed, chlorinated and dechlorinated to appropriate levels and logged.

Laundry uses a number of different chemicals and all laundry wastewater is sent to graywater for Scanship treatment. Dry cleaning (photo #28) uses PERC which is off-loaded as hazardous waste in Canada.

Silver is captured from the photo waste (photos #14 and #18), treated with a silver recovery system (photo #16) to less than 5 ppm (photo #15) and is off-loaded (photo #19) as regulated waste in Victoria. X-ray/developer waste is off-loaded untreated (can not combine with photo waste) as hazardous waste. The photo laboratory has a regular sink for cleaning (photo #17). The sink has signage (photo #20) to remind staff not to put any chemicals into the sink. There is a stringent policy on board for handling chemicals properly and is enforced.

Other hazardous wastes include some batteries, paints, mercury filters, some aerosols (punctured), and medical sharps. Fluorescent bulbs are crushed with a system that removes mercury (photos #12 and #13). The bulbs are then off-loaded as regulated waste. Narcotics are incinerated with witnesses and expired medications are off-loaded. All hazardous wastes are off-loaded in Canada.

Plastics, garbage (photo#09), and other materials are collected and sorted on a sorting table (photos #03 amd #06). Most materials are then condensed and recycled on-shore. Some recycling is off-loaded in Seattle. Crushed glass, aluminum, tin, scrap metal, some plastics, some cardboard, wood pallets and some paper are all recycled along with other materials. Some chemical containers are also reused or recycled (photo#10). Some other materials such as blankets are donated.

Records were reviewed for black water and gray water discharges, as well as for garbage/incineration/sea discharges and hazardous waste. All records appeared to be in compliance with the MOU.

Paint chipping, painting and any outside vessel work is only done occasionally in port. If conducting any of this maintenance, the line first asks for permission from the Port Agent/Terminal Manager, and this is usually not done in Seattle as the turnaround is already so busy.

Black water and Gray water System (Scanship System):
Black water, which includes toilet waste, galley waste and infirmary drains moves by vacuum to a collection tank. From the collection tanks, it goes to the drum screens. There are two drum screens which provide pre-screening (photos #29 and #30). Solids from the drum screens go to the sludge tank. Liquid flow from the drum screens then enters the mixing tank where it combines with the gray water. Gray water consists of sink, shower, and laundry water. From the mixing tank, the liquid moves to the biostep (photos #31 and #34) for biological treatment (biofilm on rotating plastic pieces – 2 tanks in series, air added (photo #32)). A defoamer can be used to control foam (photo #33).

After the biostep, liquid moves to a buffer tank where coagulant and a decoagulant are added. Liquid then moves to the flocculation tanks (photo #35). Coagulant is injected and then polymer (photo #40) is injected in the second cylinder of the flocculation tank. Clarification then occurs via flotation tanks (photos #36 and #37). An air and water mixture is added to the bottom of the flotation tanks to keep turbulence at the bottom and to allow the solids to rise to the top, along with the help of the chemical addition. Skimmers on the top skim the solids into a sludge pocket which is then pumped to the sludge tank. Liquid flow then moves to the polishing filters for ultrafiltration (photos #38 and #39).

Flow then moves to ultraviolet (UV) light disinfection (photo #45). There are three UV units, of which two are typically used in series with 14 bulbs each, and the third is kept in standby. The UV unit not being used goes though a cleaning cycle with Metal Bright cleaner and is then rotated in for use. There is typically about one set (14 bulbs) of spare bulbs on board. The UV system is alarmed for bulb failure and intensity. The alarm level is set at 10 W/m2. Pressure and temperature are also monitored with alarms. The UV sleeves are cleaned by dosing Metal Bright cleaner automatically.

Flow from the UV units is either discharged directly overboard via the discharge port (photo #42), or is re-circulated to the mixing tank.

The cleaning chemicals used on board were recently switched and now produce better results with the Scanship system.

The cruise line uses a system called AMOS for work orders and maintenance. Manufacturer recommendations for maintenance of each piece of equipment is included in the AMOS system which triggers staff when maintenance is required. Scanship also monitors maintenance on the system. Any needed calibrations, cleaning, and other needed maintenance would be included in AMOS. Total suspended solids (TSS) (equivalent to turbidity) is monitored continuously at UV disinfection (photo #41). If TSS exceeds 25 mg/l, the system alarms and staff responds to investigate. If the TSS is at > 28 mg/l for less than one minute, it only alarms. If the TSS is greater than 30 mg/l, the system automatically stops discharging and holds. When the TSS returns to less than 25 mg/l, the system starts discharging again. PH is also monitored for adjustments. The pH levels also trigger the chemical additions of coagulant and polymer. There are several monitors (photo #04) throughout the system that are used to access controls as well as in the ECR.

Samples were taken (photos #44 and #46) for Biochemical Oxygen Demand (BOD 5-Day), Total Suspended Solids (TSS), pH, chlorine residual, fecal coliform and ammonia from the combined effluent of the Scanship system after UV disinfection. The sample port was disinfected by heat prior to pulling samples (photo #43). The samples were put on ice immediately and were transported to AmTest laboratory in Kirkland, Washington that morning. Chain of Custody and sampling procedures were followed. All results are in Section F. The results are typical of the results submitted to Ecology thus far for 2010.

Conclusions and Recommendations

The staff on board the vessel were very knowledgeable of the systems and protocols.

It is recommended that staff continue to work towards a high functioning wastewater treatment system.

Attachments:
Photographs
Laboratory Report

Copies to:
Randy Fiebrandt, NCL
Matilda Ivanova, NCL
Amy Jankowiak, Ecology
Karen Burgess, Ecology
Mark Toy, Health
Kevin Fitzpatrick, Ecology
Central Files: Norwegian Cruise Line – NORWEGIAN PEARL; WQ 6.1

Section H: Signatures

Name and Signature of Inspector:	Agency/Office/Telephone:	Date
Amy Jankowiak Amy Jankowiak	Department of Ecology Northwest Regional Office Water Quality Program Municipal Compliance Specialist 425-649-7195	9/30/10
Name and Signature of Reviewer:	**Agency/Office/Telephone:**	**Date**
Kevin C Fitzpatrick Kevin C Fitzpatrick	Department of Ecology Northwest Regional Office Water Quality Section Manager 425-649-7033	9/30/10

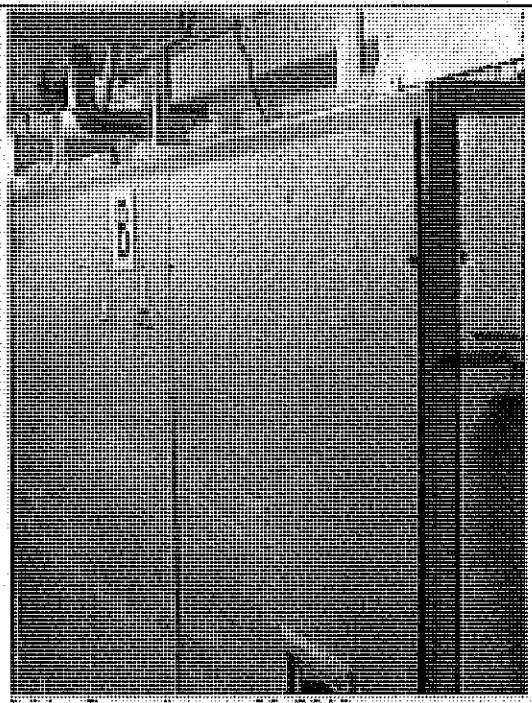


PHOTO #:01 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.:P0290050
DESCRIPTION: DRYERS FOR SCANSHIP BIOMASS

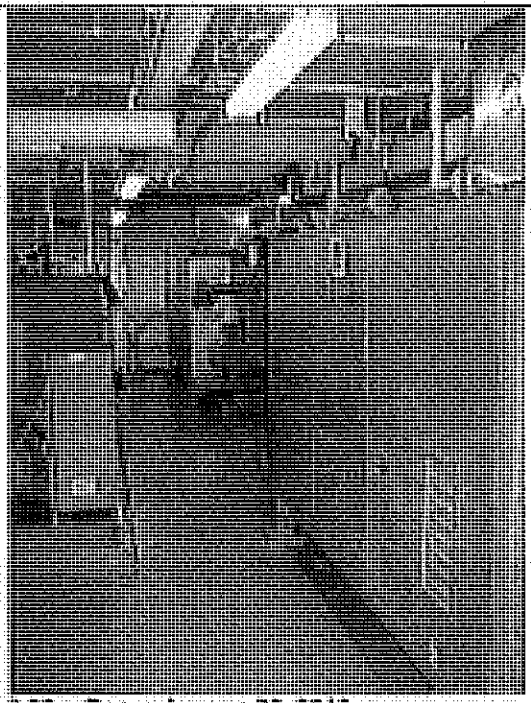


PHOTO #:02 DATE: AUGUST 29, 2010
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DESCRIPTION: DRYERS FOR SCANSHIP BIOMASS

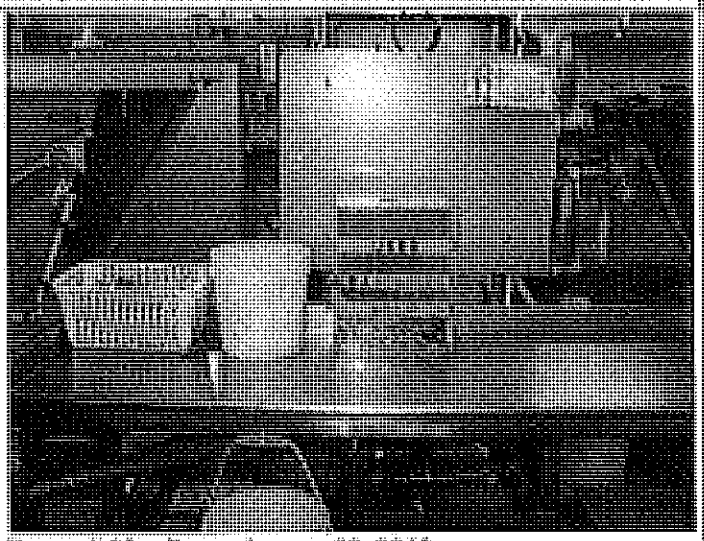

PHOTO #:03 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.: P0290055
DESCRIPTION: GARBAGE AND RECYCLING SORTING AREA

PHOTO #:04 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.: P0290056
DESCRIPTION: ALARM SETTINGS FOR SCANSHIP SYSTEM

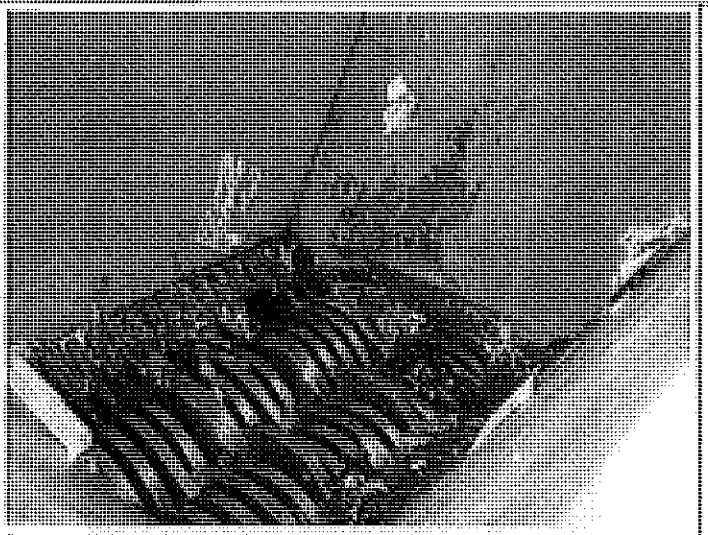

PHOTO #:05 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.: P8290058
DESCRIPTION: INCINERATOR BLD

PHOTO #:06 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.: P8290059
DESCRIPTION: GARBAGE AND RECYCLING SORTING

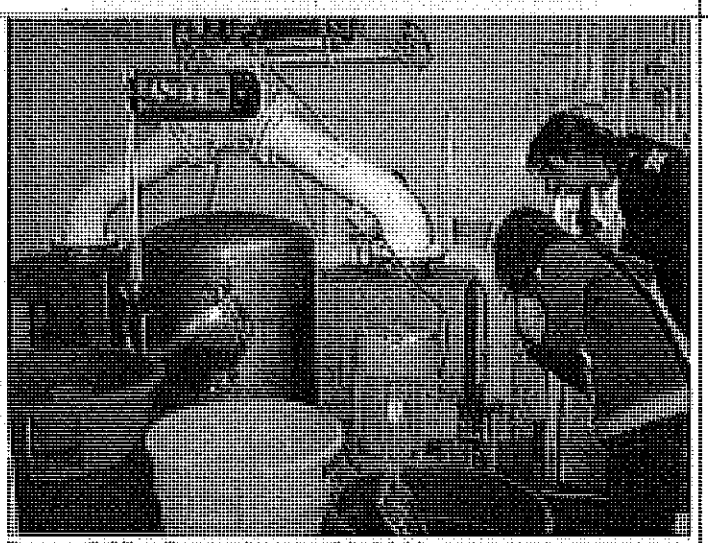

PHOTO #:07 DATE: AUGUST 29, 2010
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DESCRIPTION: FOOD WASTE PULPER SYSTEM

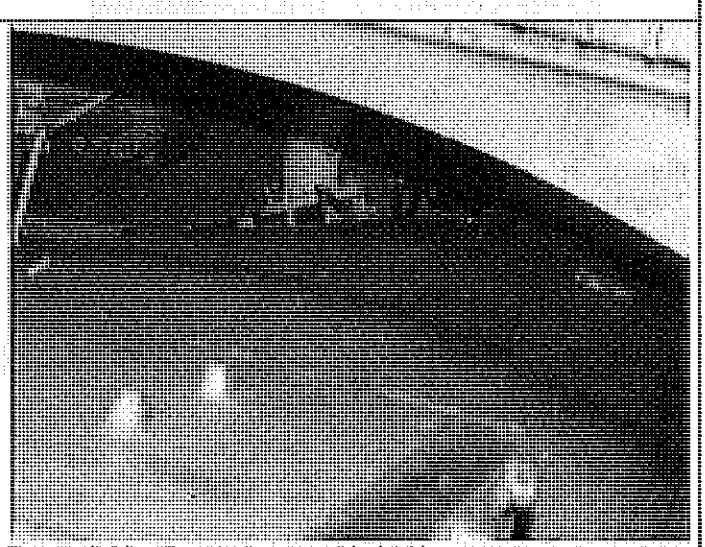

PHOTO #:08 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.: P8290064
DESCRIPTION: FOOD WASTE PULPER TANK

PHOTO #:09 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.:P8290067
DESCRIPTION: COLD STORAGE - GARBAGE

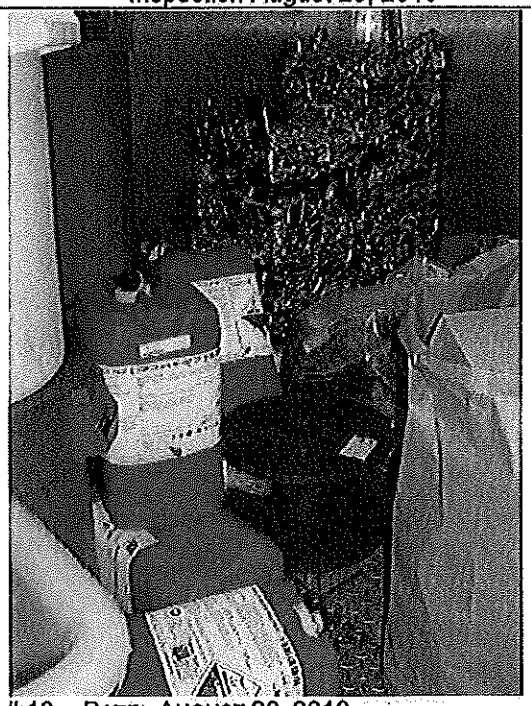

PHOTO #:10 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.: P8290069
DESCRIPTION: COLD STORAGE – CHEMICAL CONTAINERS FOR RECYCLING

PHOTO #:11 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.: P8290073
DESCRIPTION: USED COOKING OIL CONTAINER (FRONT LEFT) AND STORAGE ROOM

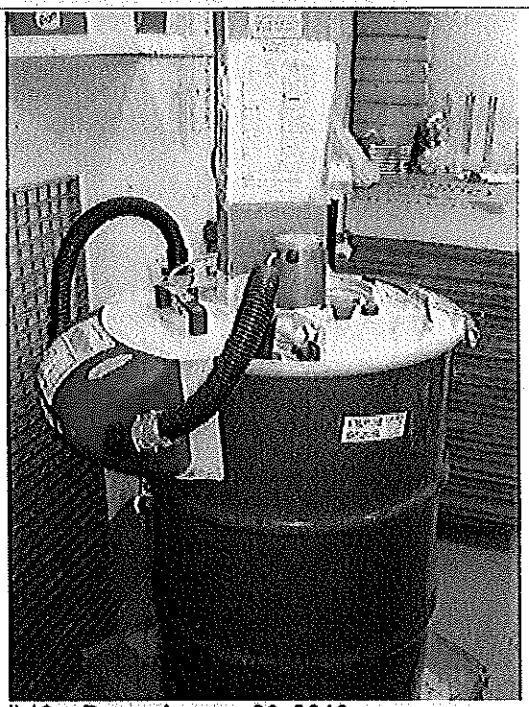

PHOTO #:12 DATE: AUGUST 29, 2010
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DESCRIPTION: FLUORESCENT BULB CRUSHER AND MERCURY VAPOR REMOVAL SYSTEM (BULB EATER)

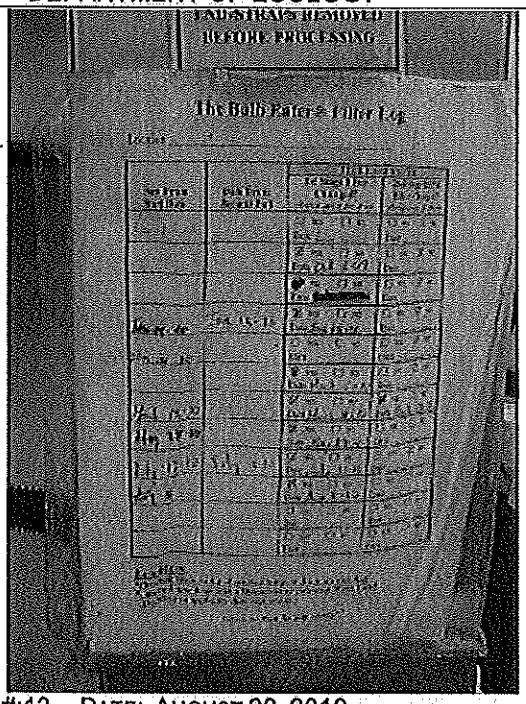

PHOTO #:13 DATE: AUGUST 29, 2010
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DESCRIPTION: BULB EATER LOG

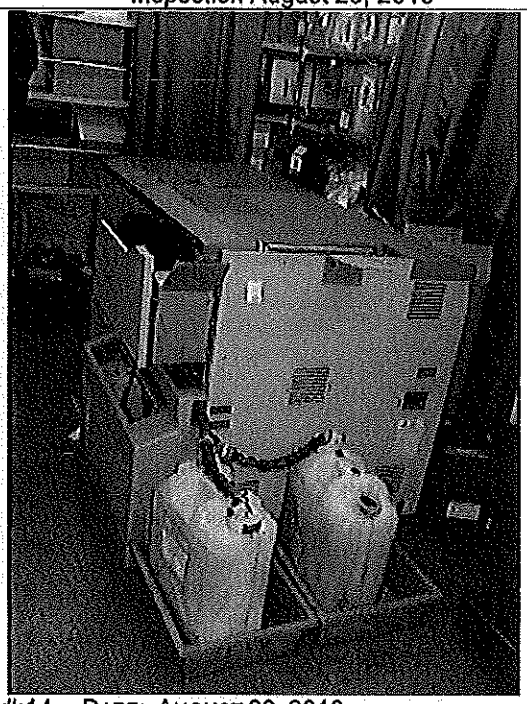

PHOTO #:14 DATE: AUGUST 29, 2010
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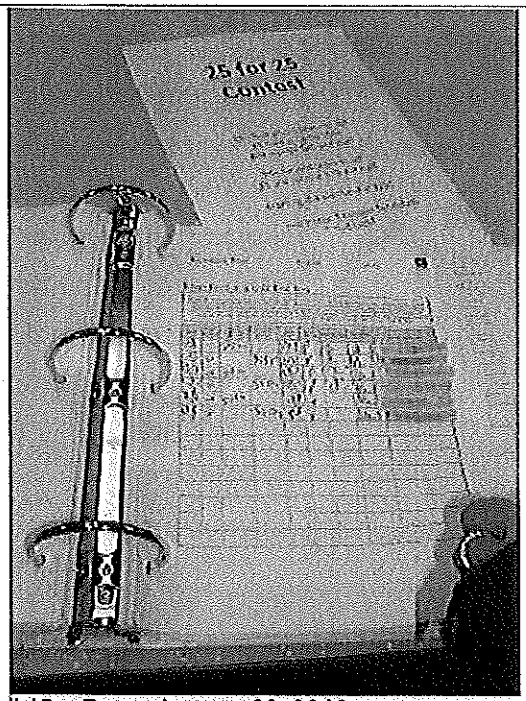

PHOTO #:15 DATE: AUGUST 29, 2010
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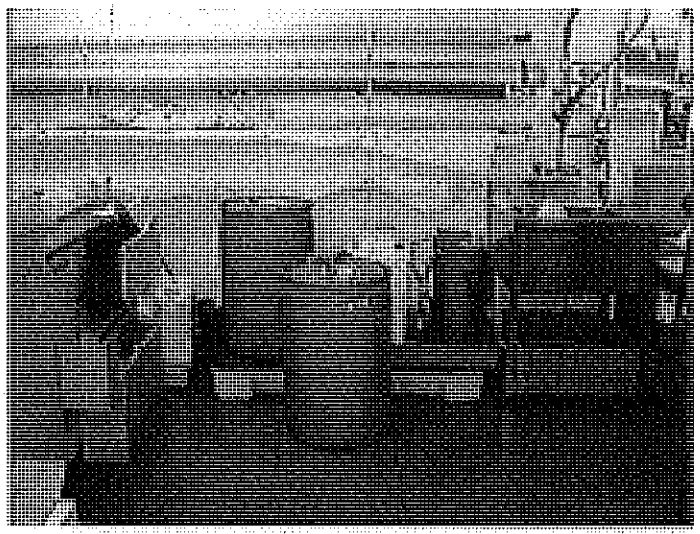

PHOTO #:16 DATE: AUGUST 29, 2010
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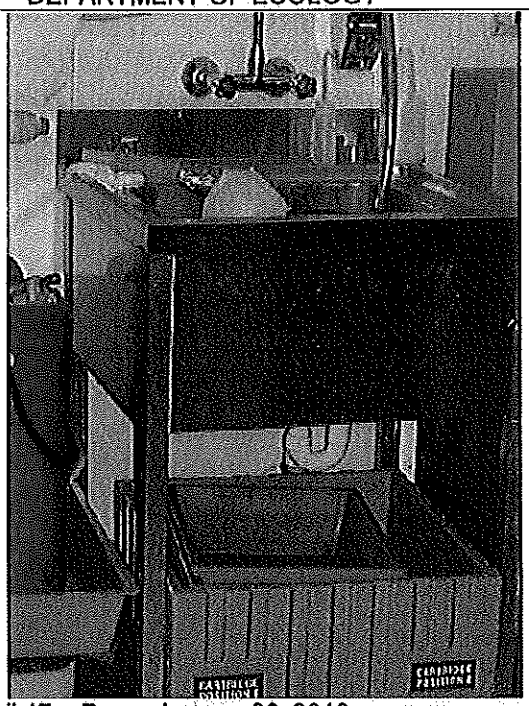
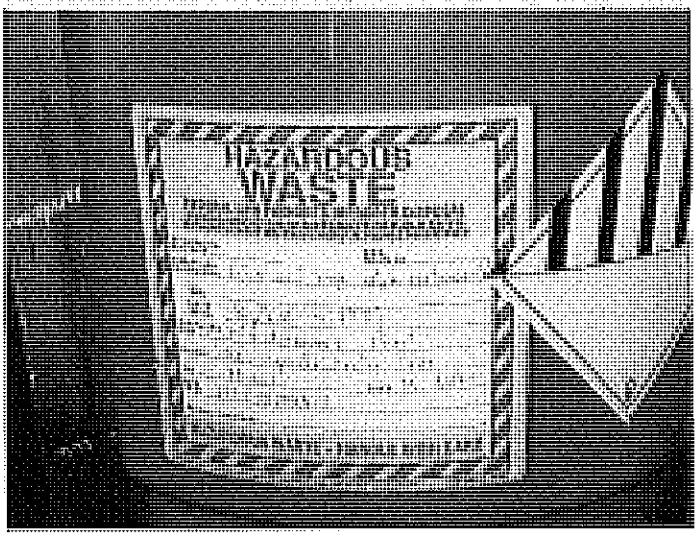


PHOTO #:17 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.:P8290089
DESCRIPTION: PHOTO ROOM SINK

PHOTO #:18 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.: P8290090
DESCRIPTION: PHOTO CHEMICALS



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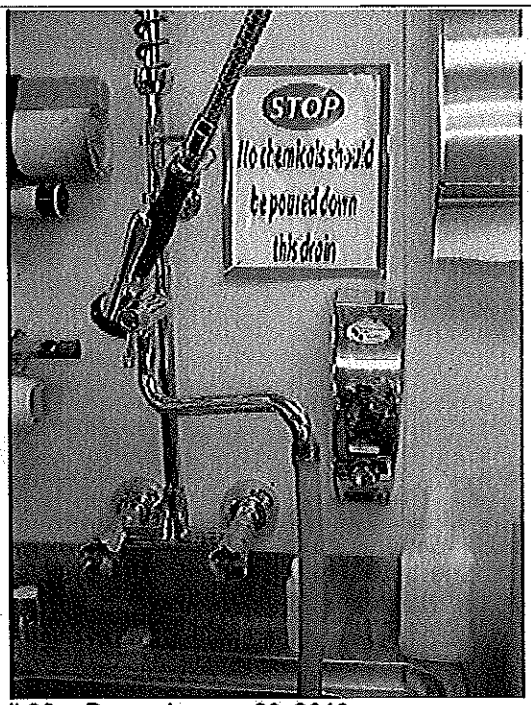

PHOTO #:20 DATE: AUGUST 29, 2010
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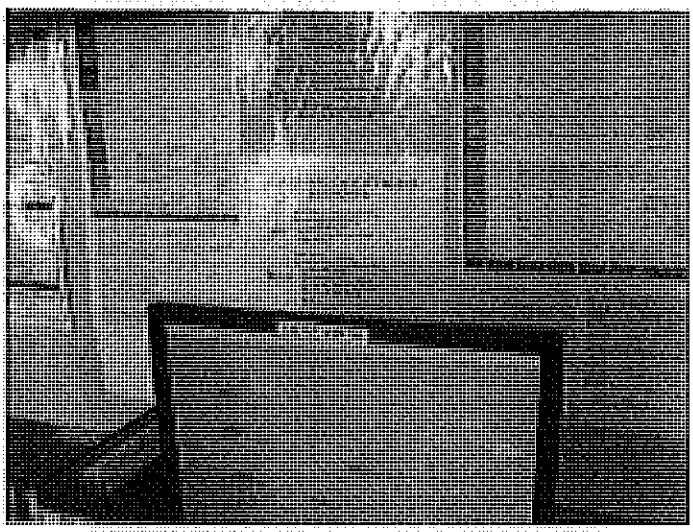

PHOTO #:21 DATE: AUGUST 29, 2010
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DESCRIPTION: NOTIFICATION SIGNAGE ON THE BRIDGE

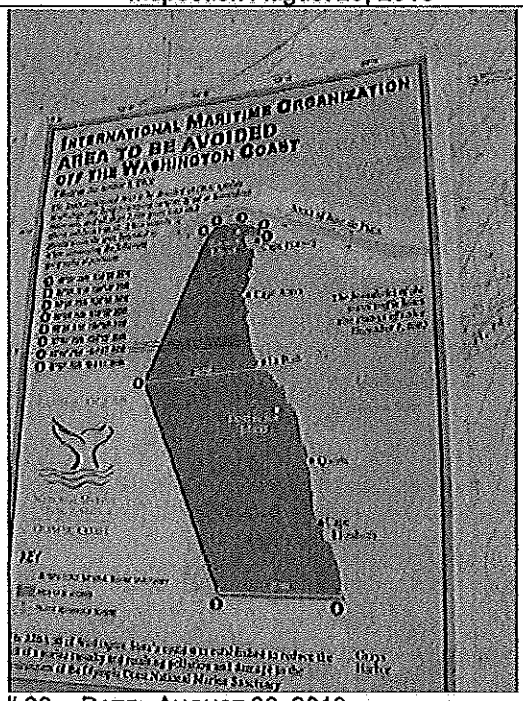

PHOTO #:22 DATE: AUGUST 29, 2010
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DESCRIPTION: OCNMS MAP ON NAVIGATION CHART

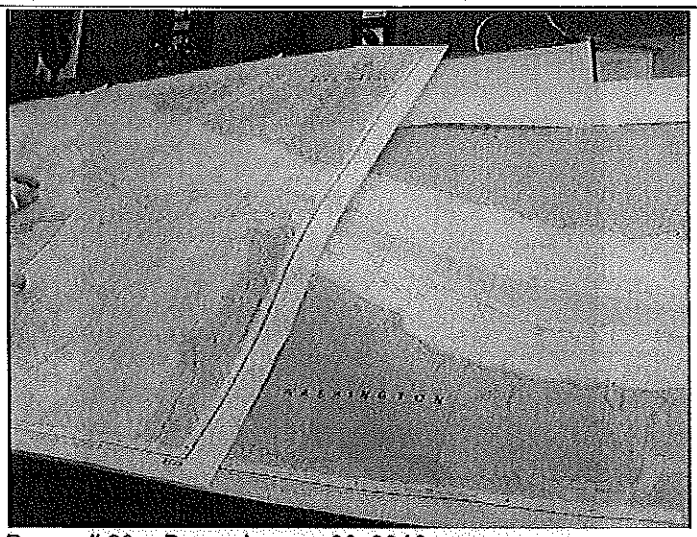

PHOTO #:23 DATE: AUGUST 29, 2010
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DESCRIPTION: NAVIGATION CHARTS

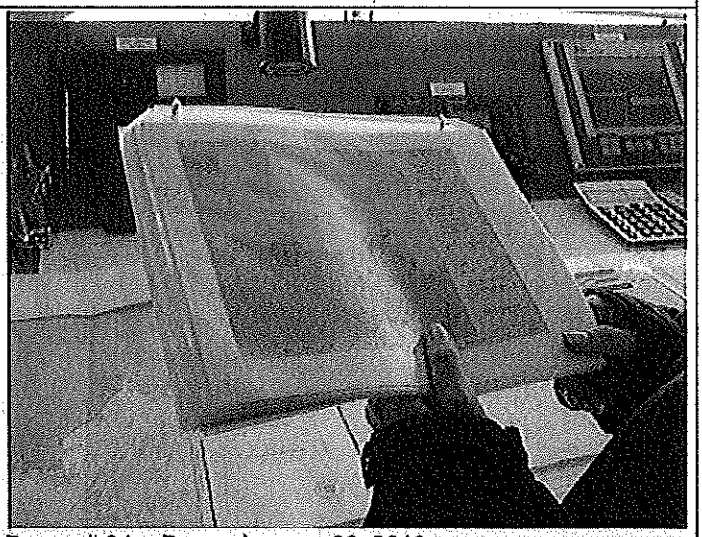

PHOTO #:24 DATE: AUGUST 29, 2010
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DESCRIPTION: NAVIGATION CHARTS – QUICK LOOK BOOK

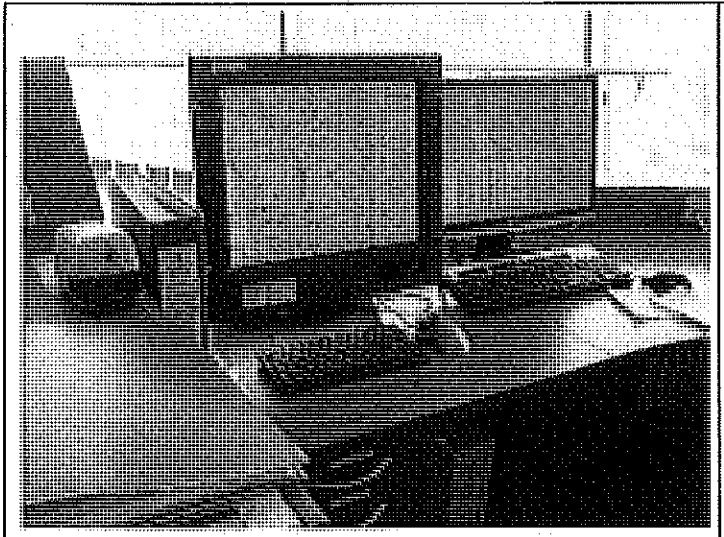

PHOTO #:25 DATE: AUGUST 29, 2010
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DESCRIPTION: ELECTRONIC CHARTING ON THE BRIDGE

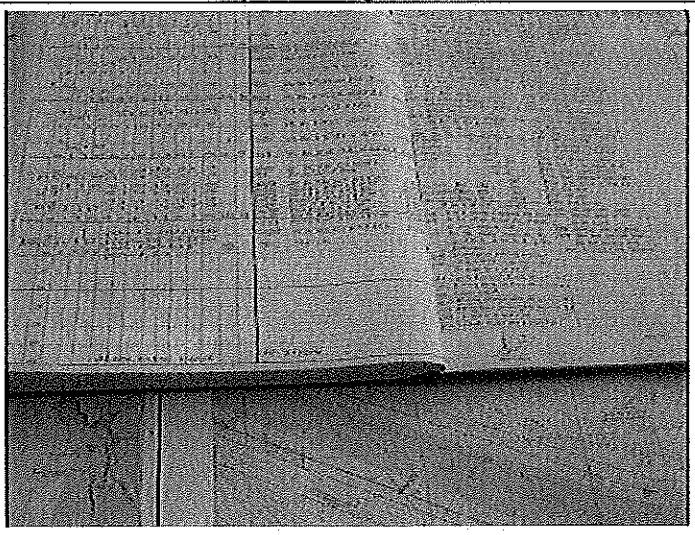

PHOTO #:26 DATE: AUGUST 29, 2010
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DESCRIPTION: LOG BOOK

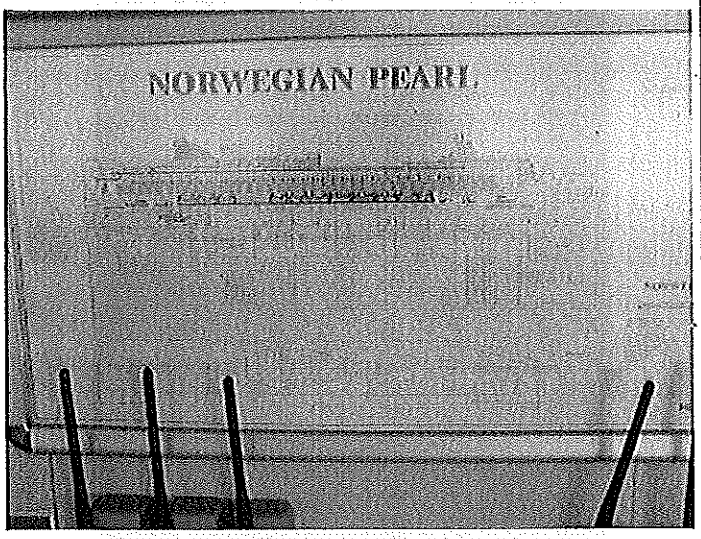

PHOTO #:27 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.: P8290118
DESCRIPTION: SHIP DIAGRAM

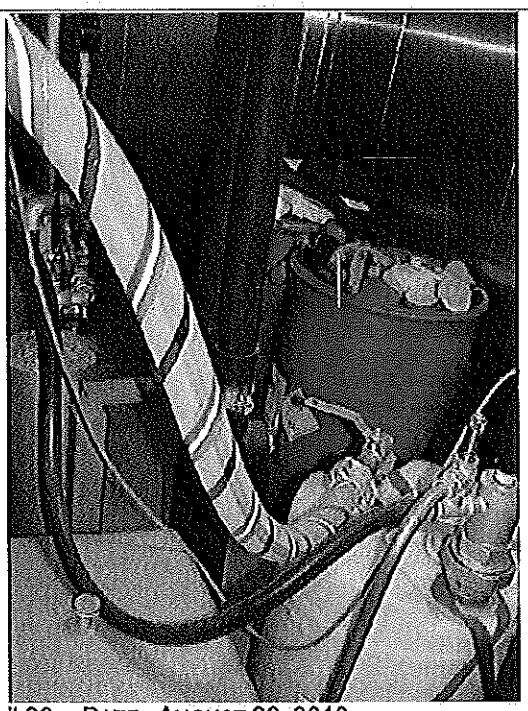

PHOTO #:28 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.: P8290119
DESCRIPTION: DRY CLEANING SYSTEM

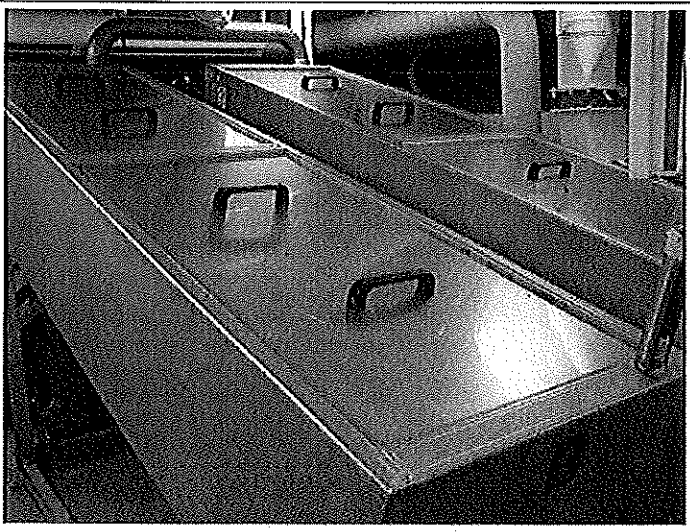

PHOTO #:29 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.:P8290123
DESCRIPTION: SCANSHIP DRUM SCREENS

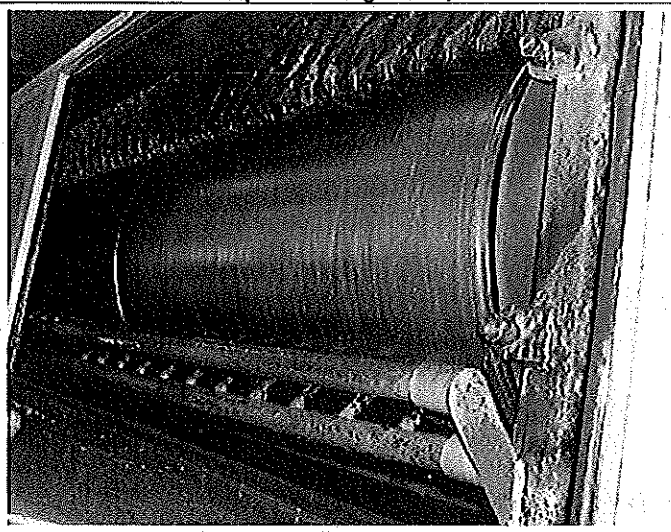

PHOTO #:30 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.: P8290127
DESCRIPTION: INSIDE OF DRUM SCREENS

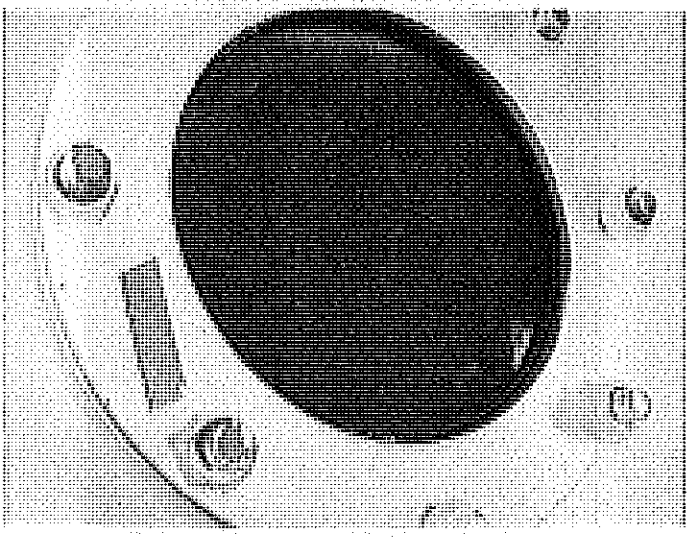

PHOTO #:31 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.: P8290132
DESCRIPTION: SCANSHIP BIOSTEP

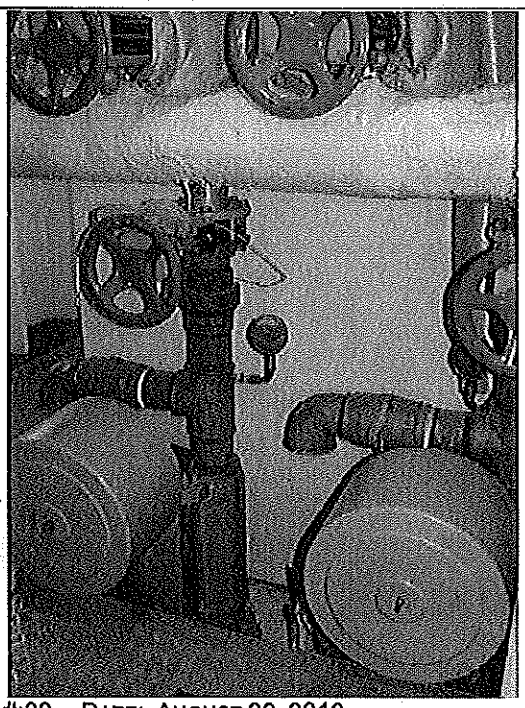

PHOTO #:32 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.: P8290133
DESCRIPTION: SCANSHIP BLOWERS FOR BIOSTEP

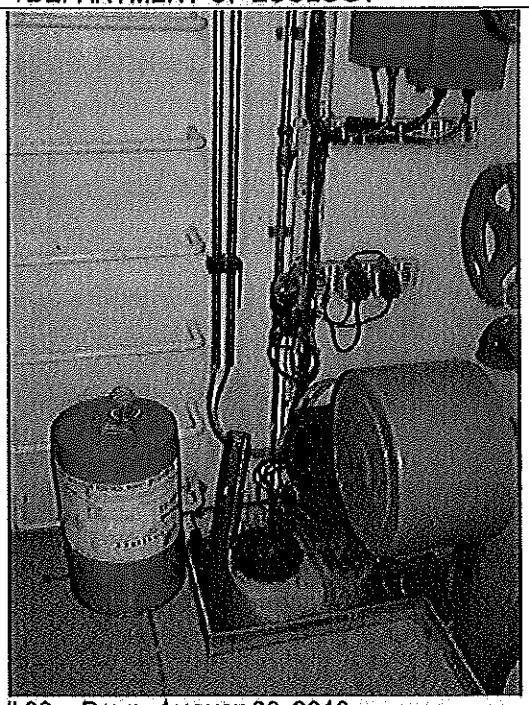

PHOTO #:33 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.:P8290136
DESCRIPTION: DEFOAMER FOR BIOSTEP

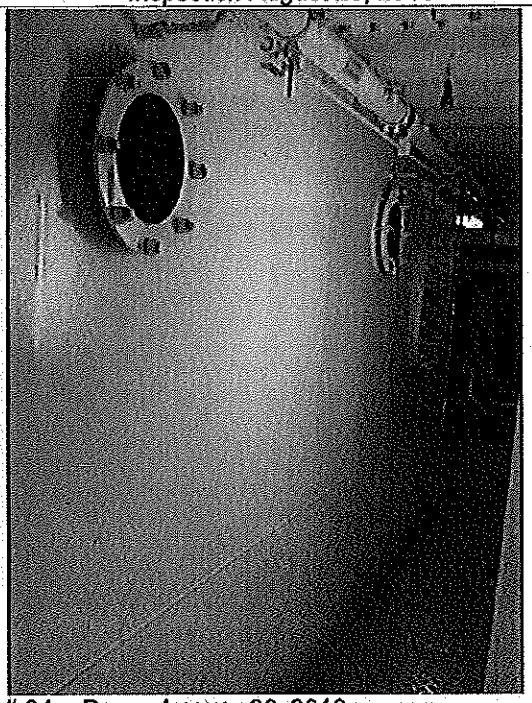

PHOTO #:34 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.: P8290138
DESCRIPTION: BIOSTEP

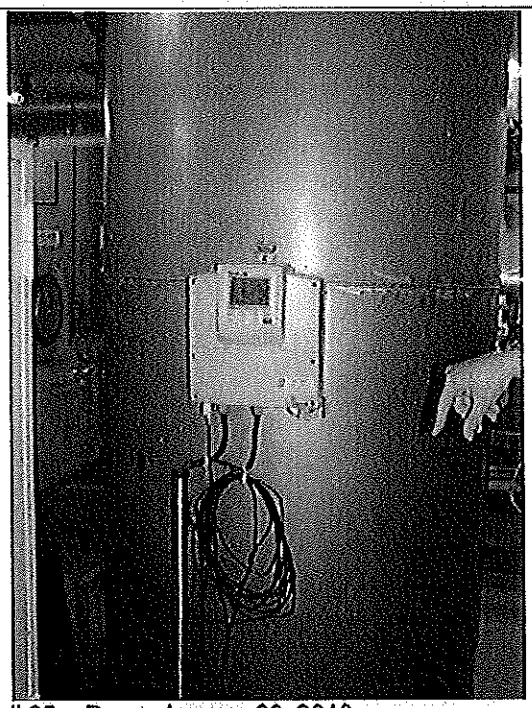

PHOTO #:35 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.: P8290139
DESCRIPTION: FLOC TANK AND PH METER

PHOTO #:36 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.: P8290140
DESCRIPTION: FLOTATION TANK

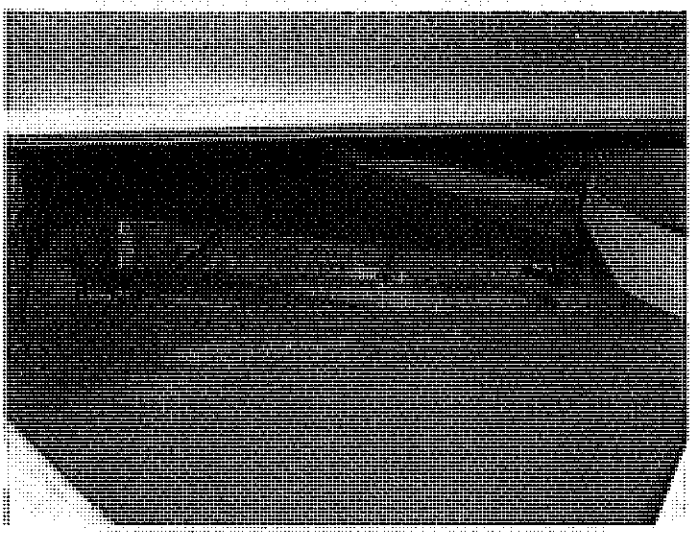

PHOTO #:37 DATE: AUGUST 29, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P8290141
DESCRIPTION: FLOTATION TANK – LID OPEN

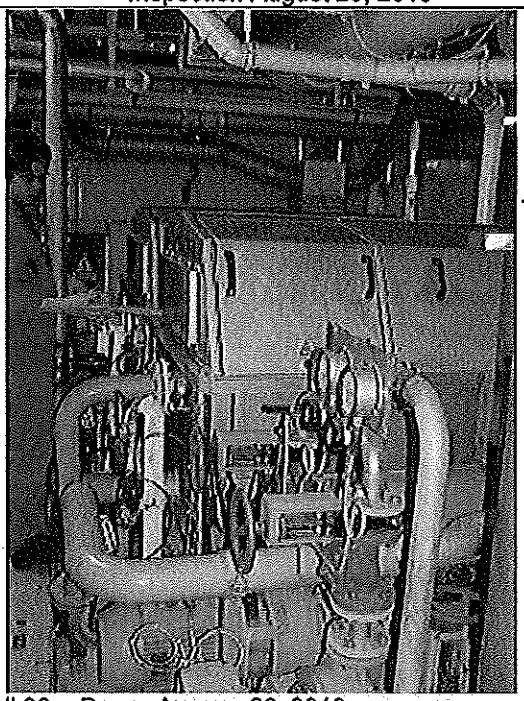

PHOTO #:38 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.: P8290142
DESCRIPTION: ULTRAFILTERS

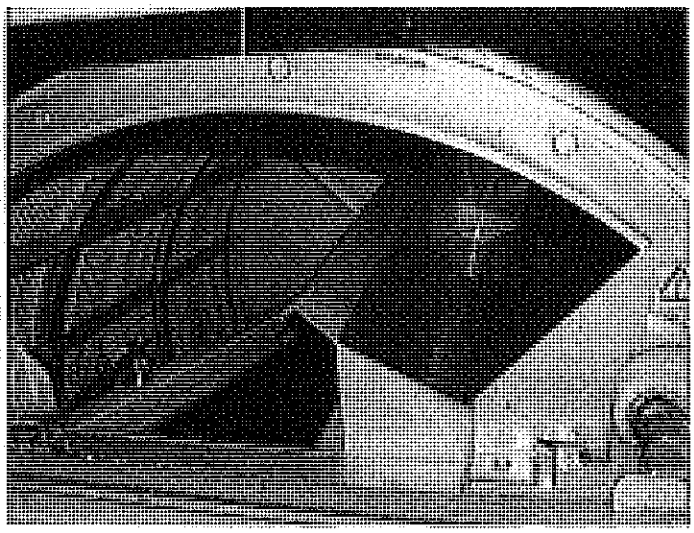

PHOTO #:39 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.: P8290144
DESCRIPTION: INSIDE OF ULTRAFILTER

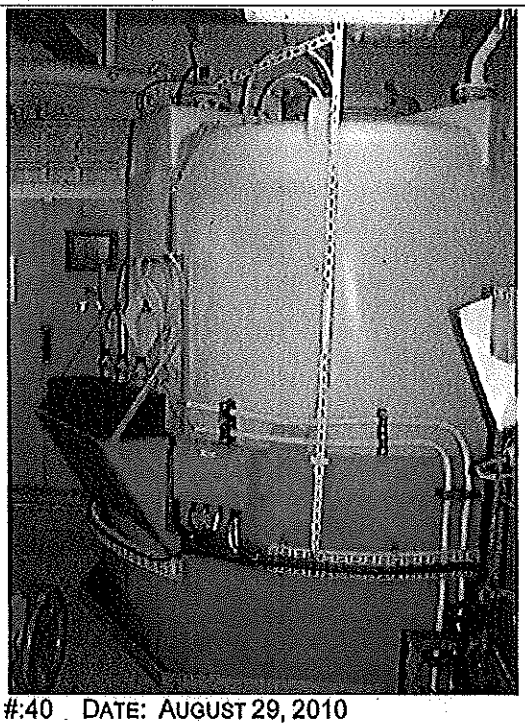

PHOTO #:40 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.: P8290147
DESCRIPTION: POLYMER TANK

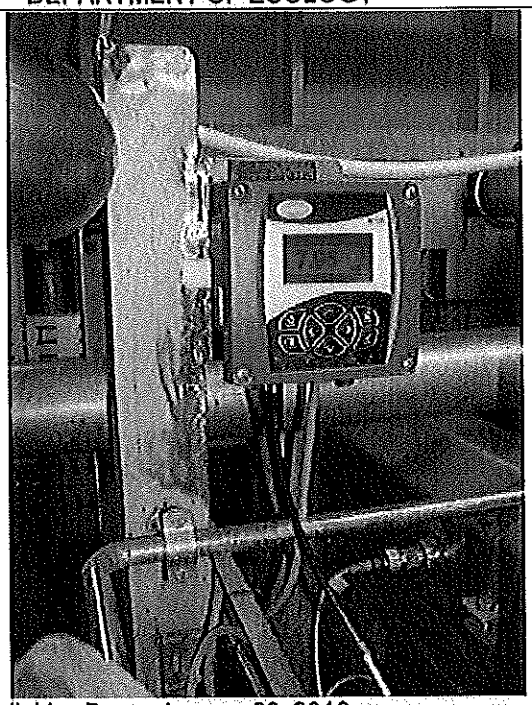

PHOTO #:41 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.:P8290151
DESCRIPTION: TSS METER

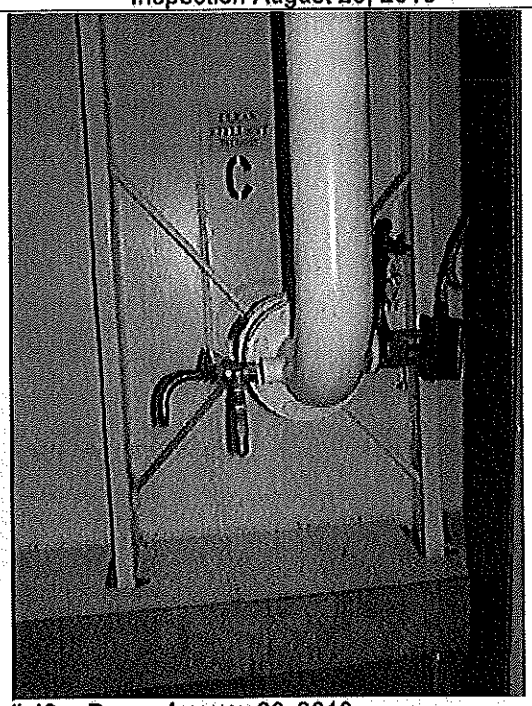

PHOTO #:42 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.: P8290155
DESCRIPTION: DISCHARGE PORT

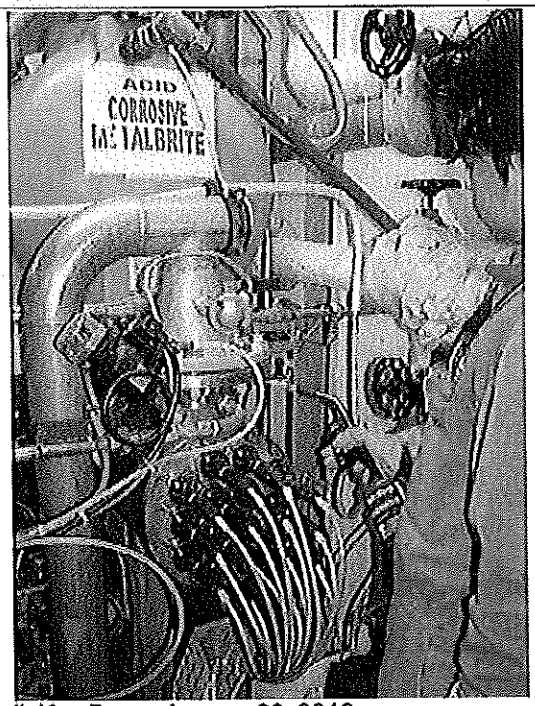

PHOTO #:43 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.: P8290158
DESCRIPTION: DISINFECTING THE SAMPLE PORT

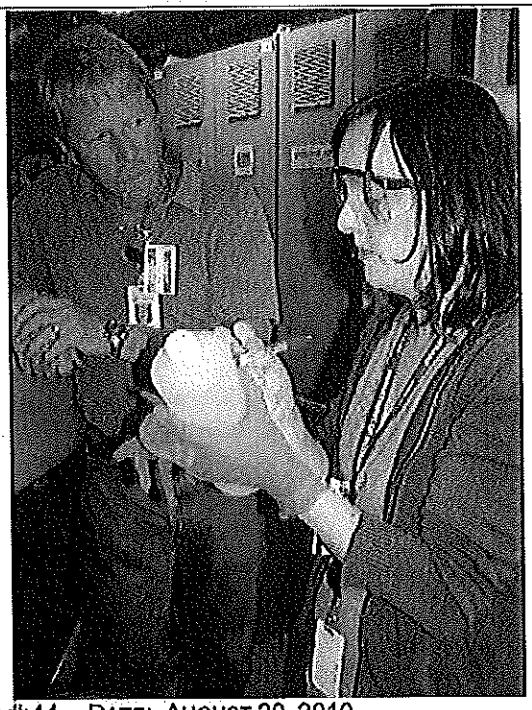

PHOTO #:44 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.: P8290161
DESCRIPTION: SAMPLING

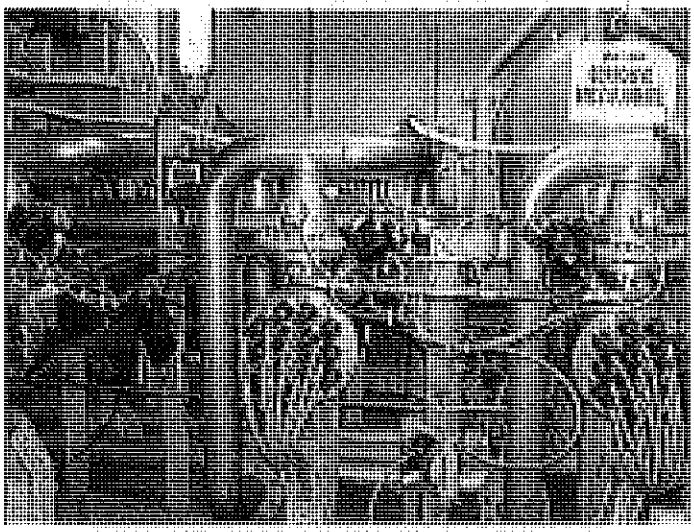

PHOTO #:45 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.:P8290165
DESCRIPTION: ULTRAVIOLET DISINFECTION SYSTEM

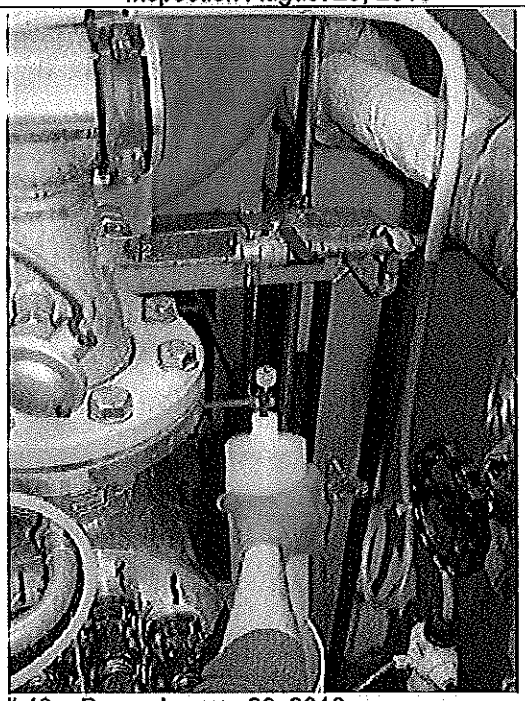

PHOTO #:46 DATE: AUGUST 29, 2010
TAKEN BY: LORI LEVANDER FILE NO.: P8290167
DESCRIPTION: SAMPLING

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

AMTEST LABORATORIES

Professional Analytical Services

ANALYSIS REPORT

DOE
3190 106th Ave SE
Bellevue, WA 98008
Attention: Amy Jankaviak
All results reported on an as received basis.

Date Received: 08/30/10
Date Reported: 9/30/10

AMTEST Identification Number 10-A014546
Client Identification Norweglan Pearl
Sampling Date 08/29/10, 12:09

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Fecal Coliforms	2.	CFU/100 ml		1.	SM 9222D	DC	08/30/10 11:45

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
pH	6.77	unit	*		EPA 150.1	KF	08/29/10
Chlorine Residual	< 0.1	mg/l		0.10	EPA 330.5	KF	08/29/10
Total Suspended Solids	15.	mg/l		1.0	SM 2540D	NLN	08/30/10

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
BOD	2.6	mg/l		2.0	SM 5210B	DC	08/30/10

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Ammonia Nitrogen	29.5	mg/l		0.005	EPA 350.1	KK	09/02/10

* = The method specifies the test is to be performed in the field; therefore the result is an estimate.

Kathy Fuglel
President

Jankowiak, Amy (ECY)

From: Kathy Fugiel [kathyf@amtestlab.com]
Sent: Thursday, September 30, 2010 1:08 PM
To: Jankowiak, Amy (ECY)
Subject: Re: Norwegian Pearl results
Attachments: B10-A014546.pdf; QCB10-A014546.pdf

I was all set to email it to you today.

Kathy

----- Original Message -----
From: Jankowiak, Amy (ECY)
To: Kathy Fugiel
Sent: Thursday, September 30, 2010 8:00 AM
Subject: Norwegian Pearl results

Kathy,

Just checking to see if you have the Norwegian Pearl results from the Aug 29th sampling yet.

Thanks,

Amy Jankowiak
Department of Ecology, Northwest Regional Office
Water Quality Program
3190 160th Avenue SE, Bellevue WA 98008
(425) 649-7195 ajan461@ecy.wa.gov

DEPARTMENT OF ECOLOGY
State of Washington

State of Washington Department of Ecology

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

Northwest Regional Office
3190 160th Ave SE
Bellevue, WA 98008
Phone: (425) 649-7000
Fax: (425) 649-7098

Inspection Date	Permit Number	County	Receiving Waters	Ecology Inspector
09/12/2010	NA	King	Marine Waters	Amy Jankowiak, Compliance Specialist
Entry Time 8:55 am **Exit Time** 10:40 am	**Photos Taken** ☒ Yes ☐ No	**Samples Taken** ☐ Yes ☒ No	**Inspection Announced** ☒ Yes ☐ No	**Discharges to:** ☒ Surface Water ☐ Ground Water ☐ Dewater ☐ POTW

Name and Location of Site Inspected:
SAPPHIRE PRINCESS, Princess Cruises
Pier 91
Seattle, Washington

Additional Participants/Inspectors:

On-Site Representative(s): *Name/Title/Phone/e-mail*
Zeljko Speranda, Environmental Officer

Responsible Official(s): *Name/Title/Address/Phone/e-mail*
Andrew Lorenzana, Environmental Operations Manager
Princess Cruises
24200 Magic Mountain Parkway, Santa Clarita, CA 91355-1283
661-753-2755; alorenzana@princesscruises.com

Other Facility Data:
Notification made to Andrew Lorenzana on September 9, 2010

Section A: Areas Evaluated

☒ Black/Gray Wastewater System	☒ Residual Solids	☒ Records/Reports	☒ Hazardous Waste/ Solid Waste	☒ Sampling/Monitoring
☒ Discharge Locations	☒ Operation & Maintenance	☒ Sludge Handling/ Disposal	☒ Oily Bilge Water	☒ Other

Section B: For Vessels Discharging ≥ 1nm from Berth and ≥ 6 Knots Only [2.1.3(A)]

☐ Schematics Match Black/Gray Wastewater System	
☐ Operations as Described in Submitted Documentation	
☐ Daily 24-hour Continuous Monitoring for Turbidity or Equivalent Monitoring	
☐ Turbidimeter or Equivalent Monitoring Equipment Functioning Properly	
☐ 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: Trigger Level for Shutdown:

Recorded Turbidity/Equivalent Levels Above Triggers:

☐ Daily 24-hour Continuous Monitoring for Disinfection Effectiveness	
☐ Disinfection Effectiveness Monitoring Equipment Functioning Properly	

Disinfection Effectiveness Monitoring:

☐ Auto Shut Down or Operational Controls to Insure System Shut Down if Disinfection System Upset Occurs	
☐ Disinfection System Operated and Maintained Properly	

Disinfection System:

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

☐	Schematics Match Black/Gray Wastewater System	
☐	Operations as Described in Submitted Documentation	
☐	Daily 24-hour Continuous Monitoring for Turbidity or Equivalent Monitoring	
☐	Turbidimeter or Equivalent Monitoring Equipment Functioning Properly	
☐	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: Trigger Level for Shutdown: Recorded Turbidity/Equivalent Levels Above Triggers:	
☐	Daily 24-hour Continuous Monitoring for Disinfection Effectiveness	
☐	Disinfection Effectiveness Monitoring Equipment Functioning Properly	
	Disinfection Effectiveness Monitoring:	
☐	Auto Shut Down or Operational Controls to Insure System Shut Down if Disinfection System Upset Occurs	
☐	Disinfection System Operated and Maintained Properly	
	Disinfection System:	
	Section D: General (Approved to Discharge)	
☐	No Discharges Within ½ Miles From Shellfish Beds/ Protocol (President's Point, Apple Tree Cove, Tyee Shoal)	
☐	Discharges Immediately Stopped When High Turbidity Occurs	
☐	Discharges Immediately Stopped When Disinfection System Upset Occurs	
☐	Immediate Notifications Made to WA Department of Health for Disinfection System Upset	
☐	Sampling Conducted 2/month, 1/month in Seattle (BOD, TSS, Fecal Coliform, pH, Chlorine Residual)	
☐	Whole Effluent Toxicity Testing 1 per 2 Years (homeported) or 1/40 Calls for Continuous	
	Section E: General	
☒	Wastewater Discharge Records Review	Discharge records were reviewed (blackwater/graywater/residual solids) and are maintained properly. No discharges in MOU waters were present from the beginning of the 2010 cruise season to present.
☒	Residual Solids Managed Properly/Disposal Protocol per MOU	Screenings are incinerated and biomass is held to be discharged at greater than 12 nautical miles and outside of MOU waters and the Olympic Coast National Marine Sanctuary.
☒	Hazardous Waste Managed Properly	All hazardous waste that is collected is being sent off-shore in Victoria, Canada. Records were reviewed for hazardous waste discharges.
☒	WA Hazardous Waste Guidelines Followed (Appendix vii)	All hazardous waste that is collected is being sent off-shore in Victoria, Canada. Records were reviewed for hazardous waste discharges.
☒	Solid Waste Managed Properly	Solid waste is being managed properly. The various solid waste streams are collected, sorted, stored, and sent ashore or incinerated as appropriate. Records were reviewed for garbage off-loads.
☒	Oily Bilge Water Managed Properly	Oily bilge water is treated and discharged at less than 15 ppm and outside of MOU waters.
Other:		

Section F: Sampling Results	
Parameter	Results
Biochemical Oxygen Demand 5-Day (BOD_5)	
Total Suspended Solids (TSS)	
Fecal Coliform	
Residual Chlorine	
pH	
Ammonia, Nitrogen	

Section G: Summary of Findings/Comments

Introduction

Amy Jankowiak, Washington State Department of Ecology (Ecology) Northwest Regional Office, Water Quality Program (NWRO-WQ) conducted the inspection of the Princess Cruises SAPPHIRE PRINCESS on September 12, 2010. The main contact on board the SAPPHIRE PRINCESS was Zeljko Speranda, Environmental Officer for the SAPPHIRE PRINCESS. Prior notification of the visit was given on September 9, 2010 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 SAPPHIRE PRINCESS is not approved to discharge in MOU waters. The vessel has not been discharging and is holding effluent until outside MOU waters.

The SAPPHIRE PRINCESS was built in May of 2004 and was the first ship to be christened in Seattle. The vessel is 951 feet long with a passenger capacity of 2670 and a crew capacity of 1100. The ship's wastewater treatment system, Hamworthy, was installed at the time the ship was built in 2004.

The SAPPHIRE PRINCESS is scheduled for 20 port calls in Seattle and conducts one week cruises to Alaska turning around on Sundays between May 13, 2010 through September 19, 2010.

Inspection

I arrived and boarded the ship (photo #01) at about 8:55 am and began with introductions and a plan for the day with Zeljko Sperenda, the Environmental Officer. We discussed various waste streams, and the discharge protocols. We then reviewed the various discharge and environmental records. We toured the dry cleaning system and the Hamworthy advanced wastewater treatment system (AWTS). We also viewed the oily water separator system and its white box. The inspection was then finalized with a debriefing and we disembarked the vessel at about 10:40 am.

Discharge Types and Protocols:

No discharges of any kind occur in Washington state waters. Prior to entering Washington waters and within 12 miles from land, every discharge port is closed. If the vessel is in an area where a discharge is allowed, the Bridge and the staff in the Engine Control Room (ECR) communicate by phone and with written verification by e-mail prior to any discharges. The Watchkeepers have the authority to then discharge and have "key" access for the overboard ports. For blackwater and graywater, the latitude and longitude coordinates are recorded in the *Sewage and Graywater Discharge Record Book* and in the deck log. The date, time and location of both the start and the stop of the discharges are recorded, along with port location, effluent type, and volumes. All wastewater discharge records that were reviewed appeared to be in compliance with the MOU and also did not occur in MOU waters. The AWTS, Hamworthy treats both black water, which includes toilet waste and gray water which includes sink and shower water, and laundry water. The Hamworthy system has 3 units. Two treat gray water, and one treats mostly black water with some gray water. They combine prior to disinfection and are then held and not discharged while in MOU waters.

Screenings from the Hamworthy system are collected and incinerated. The solids separated out by the bioreactors is discharged outside of MOU waters, >12 nautical miles from shore, and outside of the Olympic Coast National Marine Sanctuary.

Pool and spa water is discharged outside of 12 nautical miles. The pools and spas use fresh water and chlorine to disinfect. The pool and spa water is dechlorinated prior to discharge.

Food waste is collected in various locations, is sent through a pulper. The water is recirculated and eventually sent to a holding tank and is discharged outside of MOU waters. The solid food material from the pulpers is discharged outside of 12 nautical miles and outside MOU waters. Records reviewed were consistent with this protocol. Used cooking oil, is collected and recycled for biodiesel.

Oily bilge water is treated with an oily water separator (photos #17 and #18) and discharged at less than 15 ppm after first going through a white box (photos #19 and #20) for monitoring. The vessel typically meets 4-5 ppm. The chief Engineer has the keys for the white box and it was locked during the inspection.

Some potable water is bunkered, while the rest is produced by desalination with two evaporators while out at Sea. The brine is discharged out at Sea.

The vessel has switched from a PERC using dry cleaning system to a non-perc wet-dry cleaning system that does not have any byproduct chemical. This "Aqua Care Process" (photos #02 and #03) uses a SoftenAll fabric softener with isopropanol and Soft'N Brite a non-hazardous gentle detergent, both by Laidlaw. The chemicals do not have any hazardous components. Phosphate-free detergents are used in the laundry.

Silver is captured with a silver recovery system from the photo waste, is treated to less than 5 ppm and is then incinerated. X-rays are now done digitally without any chemical byproduct. Hazardous wastes include chemicals, oily rags, paints and thinners, printer cartridges, paints, batteries, bulbs (no crusher on board), sludge oil, aerosols (punctured), and sharps. All hazardous waste is off-loaded in Victoria.

Expired medications and narcotics are incinerated (narcotics with witness) along with biohazardous waste. Most cardboards, some plastics, paper and some food waste and dry garbage is also incinerated. Incineration occurs once the vessel is going 6 knots and greater than 4 nautical miles. Ash from the incinerators is off-loaded and tested yearly. The drains in the medical area are blocked and do not discharge anywhere.

Plastics, garbage, and other materials are collected and sorted on a sorting table. Most materials are then condensed and recycled on-shore. Glass, aluminum, tin, scrap metals, some cardboard and plastics are all recycled along with other materials.

Above water-line work that occurs at the Port of Seattle is done so with permission and with the use of proper Best Management Practices including tarps. Washing is done with fresh water.

Black water and Gray water System:
Blackwater, which includes toilet waste and graywater which includes sink and shower water and laundry water is treated with a Hamworthy advanced wastewater treatment system and is currently discharged outside of MOU waters. The Hamworthy system, consists of three separate membrane bioreactors (MBRs). Two are used to treat gray water and one treats black water with a small amount of gray water. Black water is collected by vacuum. The wastewater flow moves to the screen press (photos #04 and #05). The solids are screened into bags (photo #06) and are then sent to the incinerator. The liquid moves to the 1st stage of the membrane bioreactor (photo #07) where aeration occurs (photo #08). From the 1st stage, flow moves to the Inter-stage filters (photo #09). The inter-stage filtered solids are returned back to the screen press. The liquid (photo #10) moves onto the 2nd stage of the MBR for further aeration. From the 2nd stage MBR, flow is sent to the membrane modules (photos #11, #13 and #14) for ultrafiltration. Effluent from the membrane modules are sent to a permeate tank (photo #12) where turbidity is monitored. Flow then combines with the other two MBR's for ultraviolet (UV) disinfection (photos #21, #22 and #23). Disinfected effluent goes to a permeate tank (photo #24) and either goes directly overboard (photo #25) or to a holding tank if not in an approved area for discharge. The held effluent will eventually go back through the UV system before discharge. Currently, effluent is held and discharged outside of MOU waters. There is a sample port for treated effluent after UV disinfection.

Turbidity is measured continuously on each of the MBR permeate tanks. The readings at the time of the inspection were 1.1 NTU on the #1 GW MBR, 0.2 NTU on the #2 GW MBR, and 0.7 on the #3 BW MBR. The meters are alarmed at 25 NTU maximum and the discharge is automatically stopped at this level. The UV system consists of 6 bulbs which are alarmed. If the lamps are off or there is low flow, the system alarms. There are typically 6 spare bulbs available on board. The maintenance system provides details of when all maintenance is needed. Representatives from Hamworthy visit the ship periodically. There is a tank used for cleaning the membranes by hand where chemicals are used, including an organic acid cleaner (photo #16). Automatic cleaning of the membranes occurs by backwashing.

The staff have a small laboratory on board where they sample for such parameters as total and free chlorine, total suspended solids (TSS), pH and total coliform weekly. Ammonia is being tested daily on the vessel. The on-board sampling allows for immediate results and a chance for immediate corrections to the system.

A copy of the current MOU was available on the vessel and non-compliance notification procedures were known.

Conclusions and Recommendations

It is recommended that staff continue to work towards high functioning wastewater treatment systems. The staff on board the vessel were very knowledgeable of the systems and protocols.

The laboratory testing on-board is an excellent way to monitor and make needed adjustments to the system. Having a laboratory on-board for the testing is ideal.

Attachments:
Photographs

Copies to:
Andrew Lorenzana, Princess Cruises
Zeljko Speranda, Environmental Officer
Amy Jankowiak, Ecology
Karen Burgess, Ecology
Mark Toy, Health
Kevin Fitzpatrick, Ecology
Central Files: Princess Cruises – SAPPHIRE PRINCESS; WQ 6.1

Section H: Signatures

Name and Signature of Inspector:	Agency/Office/Telephone:	Date
Amy Jankowiak	Department of Ecology Northwest Regional Office Water Quality Program Municipal Compliance Specialist 425-649-7195	9/28/10
Name and Signature of Reviewer:	Agency/Office/Telephone:	Date
Kevin C. Fitzpatrick	Department of Ecology Northwest Regional Office Water Quality Section Manager 425-649-7033	9/28/10

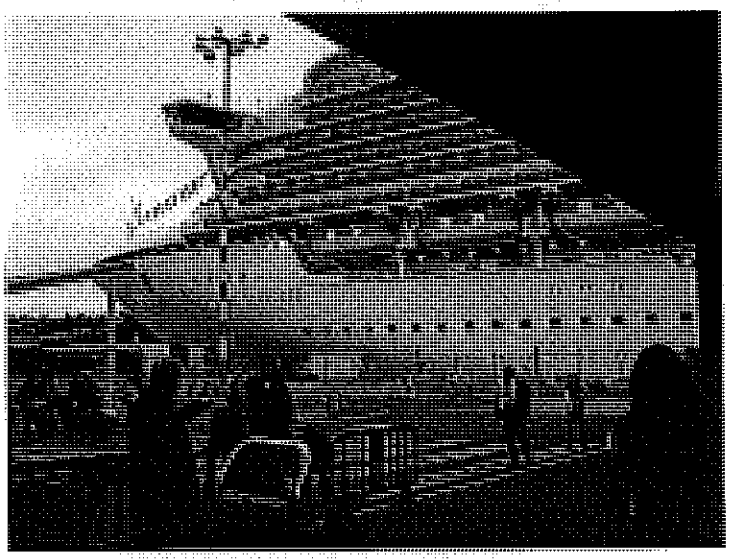

PHOTO #:01 DATE: SEPTEMBER 12, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9120005
DESCRIPTION: SAPPHIRE PRINCESS VESSEL

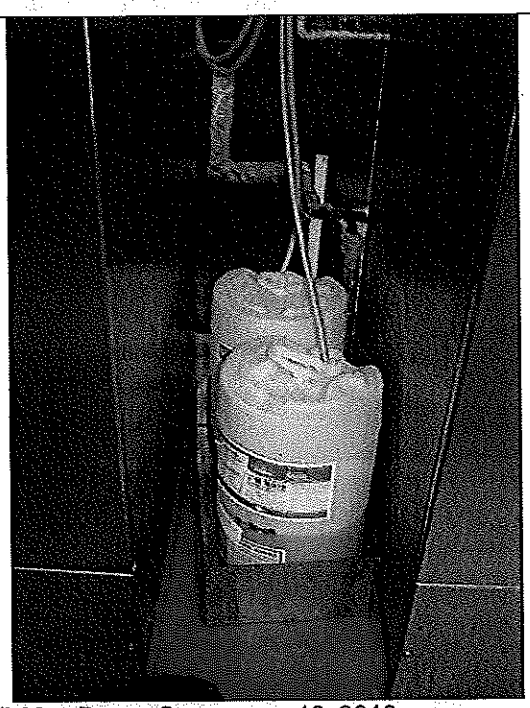

PHOTO #:02 DATE: SEPTEMBER 12, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9120006
DESCRIPTION: DRY CLEANING WET CHEMICALS

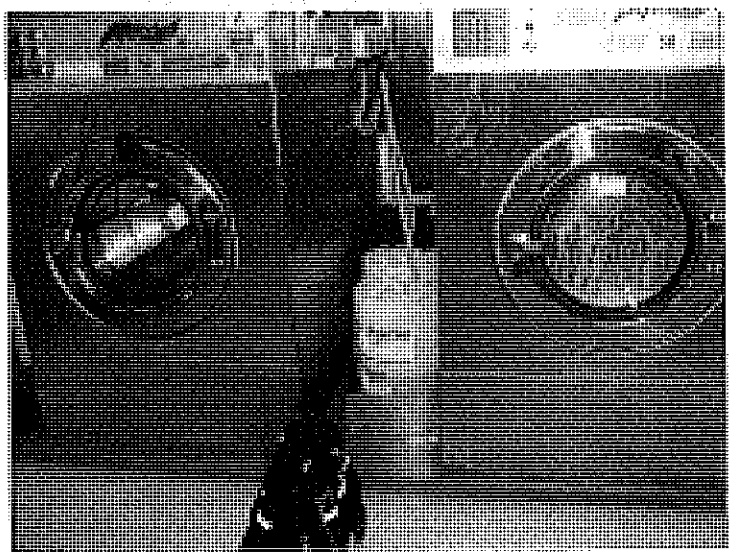

PHOTO #:03 DATE: SEPTEMBER 12, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9120007
DESCRIPTION: DRY – WET CLEANING MACHINES

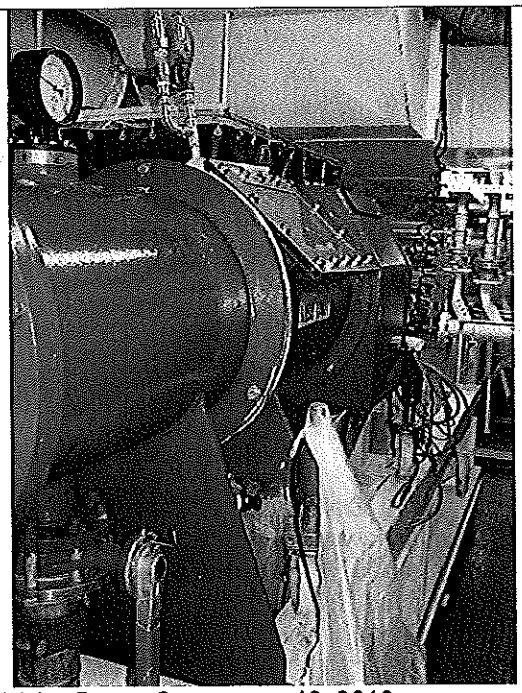

PHOTO #:04 DATE: SEPTEMBER 12, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9120008
DESCRIPTION: SCREEN PRESS

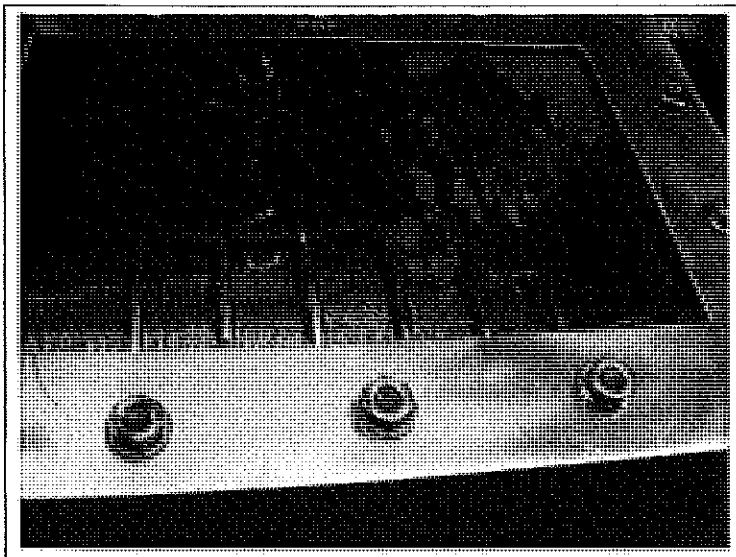

PHOTO #:05 DATE: SEPTEMBER 12, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9120010
DESCRIPTION: VIEW INSIDE SCREEN PRESS

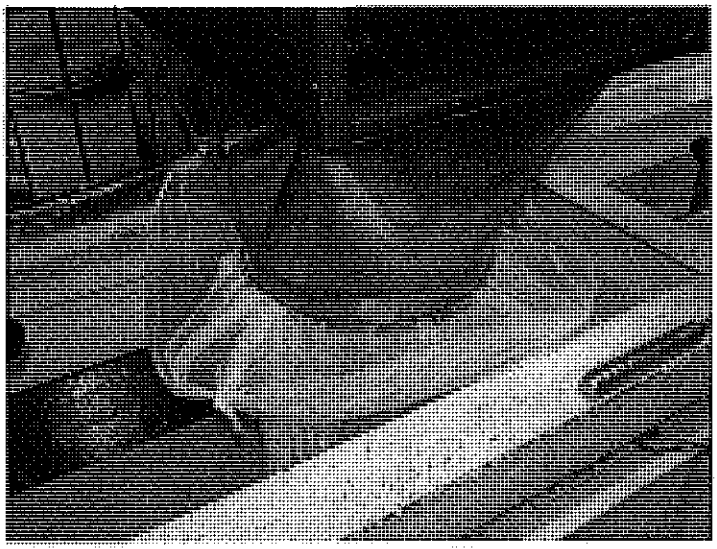

PHOTO #:06 DATE: SEPTEMBER 12, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9120012
DESCRIPTION: SCREEN PRESS SCREENINGS TO BAG

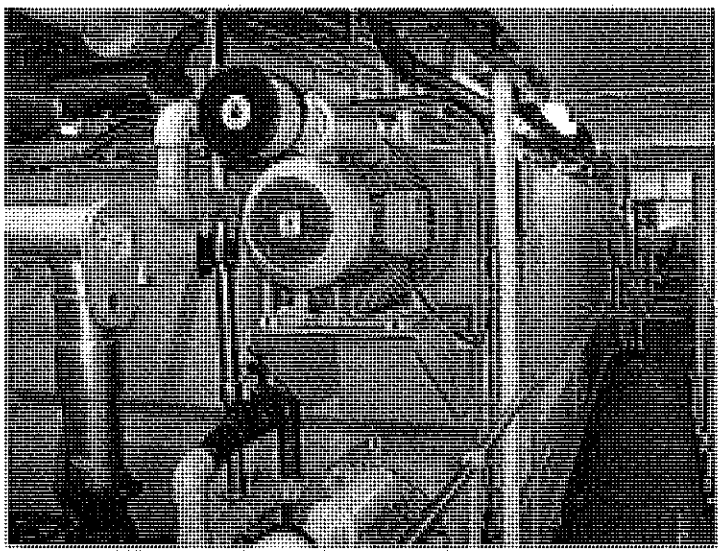

PHOTO #:07 DATE: SEPTEMBER 12, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9120013
DESCRIPTION: 1ST AND 2ND STAGE TANKS OF BIOREACTOR

PHOTO #:08 DATE: SEPTEMBER 12, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9120015
DESCRIPTION: VIEW INSIDE 1ST STAGE OF BIOREACTOR

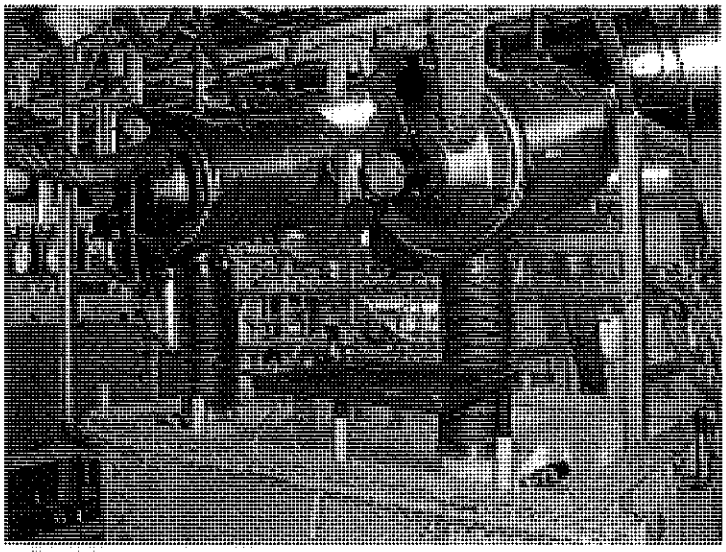

PHOTO #:09 DATE: SEPTEMBER 12, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9120016
DESCRIPTION: INTER-STAGE FILTERS

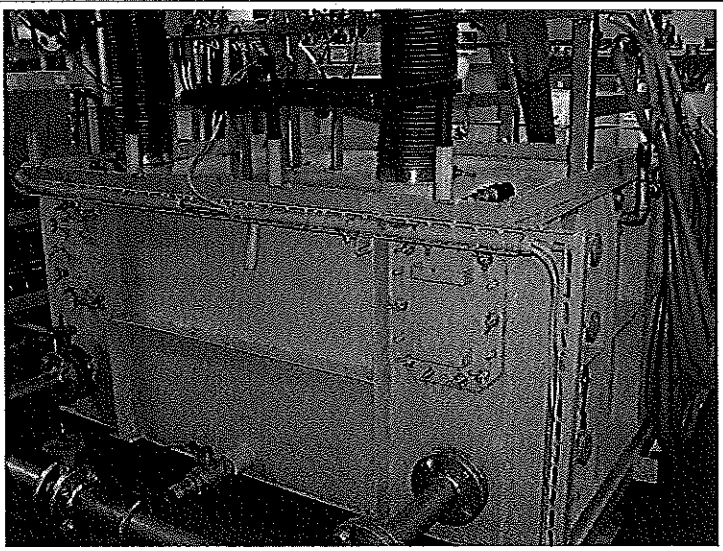

PHOTO #:10 DATE: SEPTEMBER 12, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9120017
DESCRIPTION: INTERSTAGE FILTER PERMEATE TANK

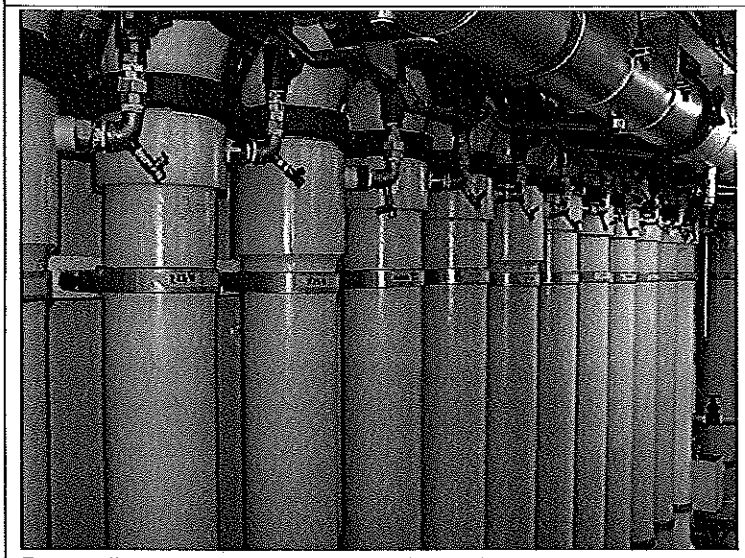

PHOTO #:11 DATE: SEPTEMBER 12, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9120018
DESCRIPTION: MEMBRANE FILTERS

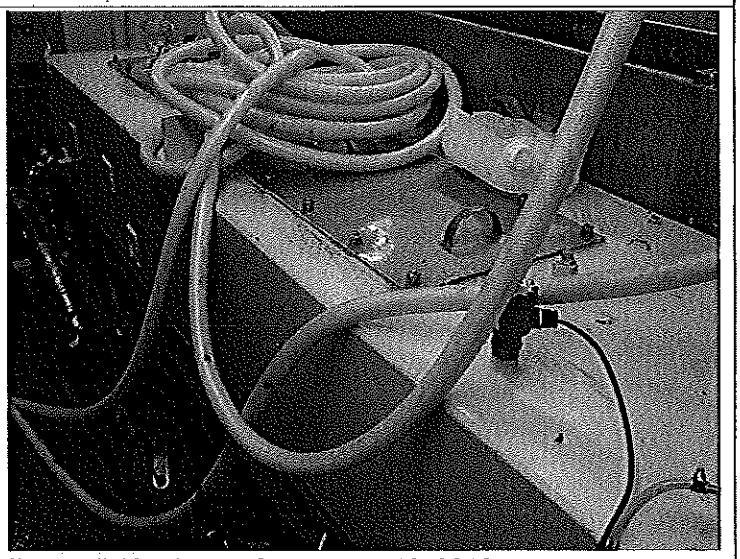

PHOTO #:12 DATE: SEPTEMBER 12, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9120019
DESCRIPTION: MEMBRANE FILTER PERMEATE TANK

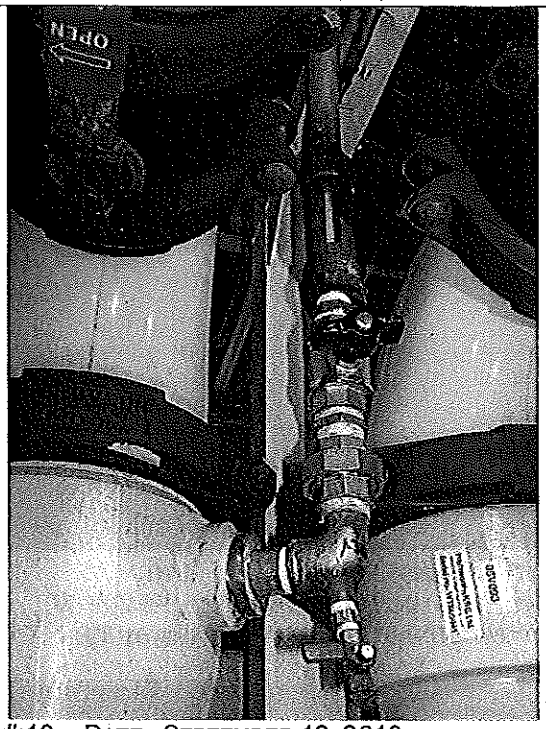

PHOTO #:13 DATE: SEPTEMBER 12, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9120021
DESCRIPTION: MEMBRANE FILTERS VIEWING TUBE

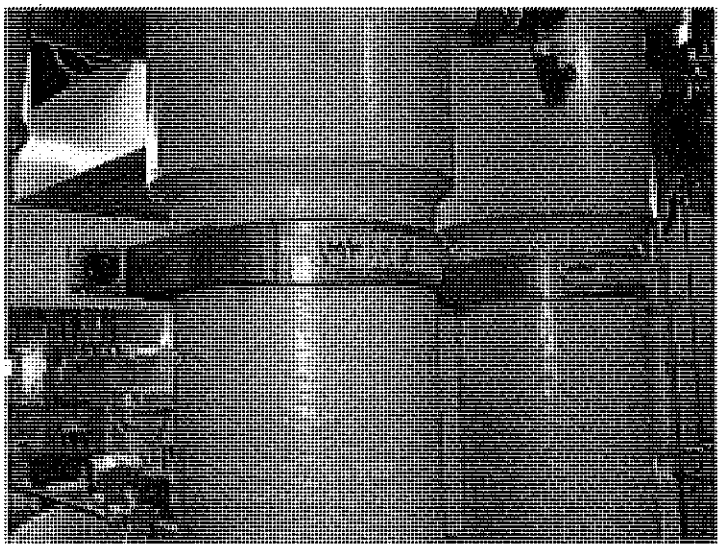

PHOTO #:14 DATE: SEPTEMBER 12, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9120022
DESCRIPTION: MEMBRANE FILTERS CLEANING DATES NOTED

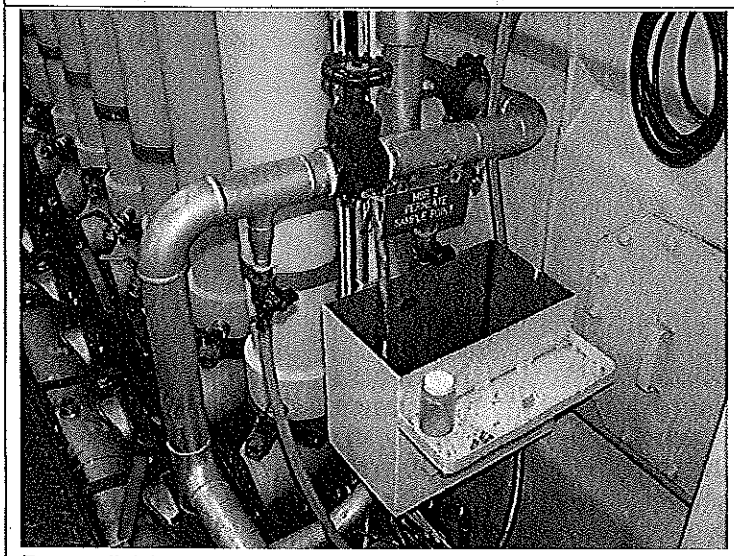

PHOTO #:15 DATE: SEPTEMBER 12, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9120023
DESCRIPTION: MBR SAMPLE POINT

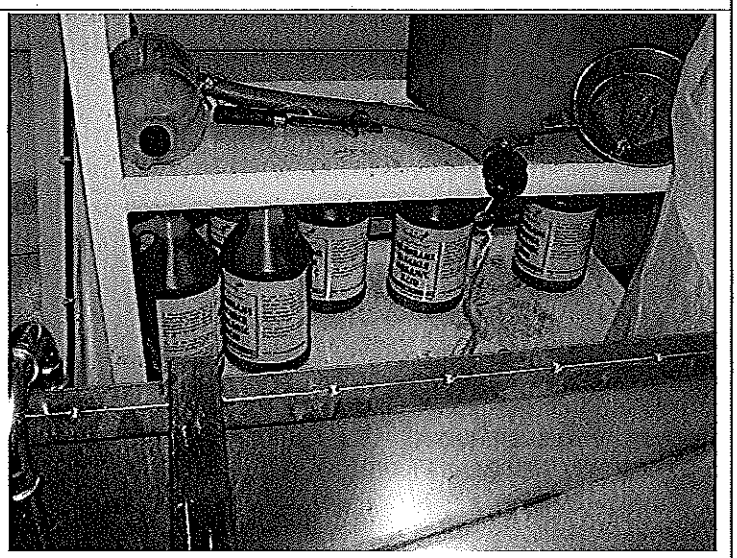

PHOTO #:16 DATE: SEPTEMBER 12, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9120024
DESCRIPTION: MEMBRANE FILTERS CLEANING CHEMICALS (MEMBRANE CLEANER ORGANIC ACID)

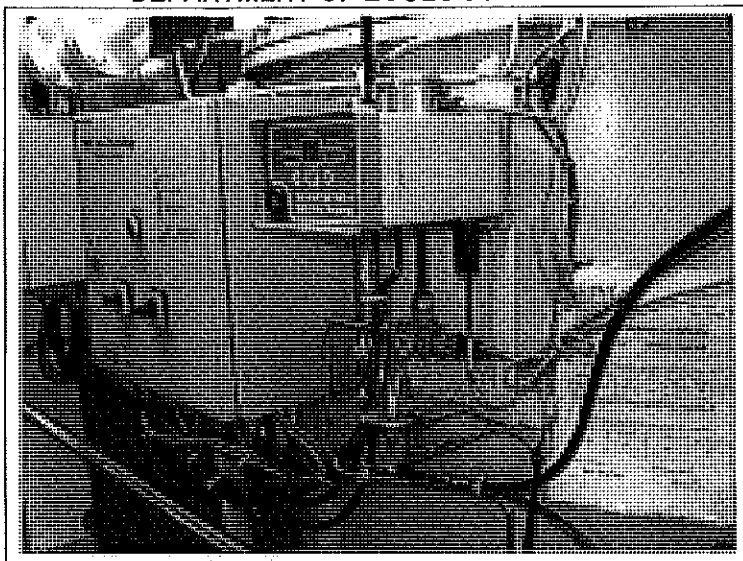

PHOTO #:17 DATE: SEPTEMBER 12, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9120025
DESCRIPTION: OILY WATER SEPARATOR

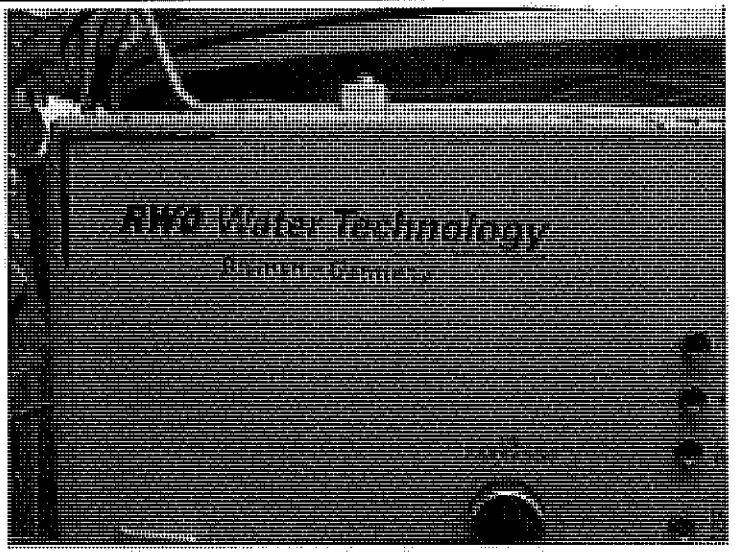

PHOTO #:18 DATE: SEPTEMBER 12, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9120026
DESCRIPTION: OILY WATER SEPARATOR

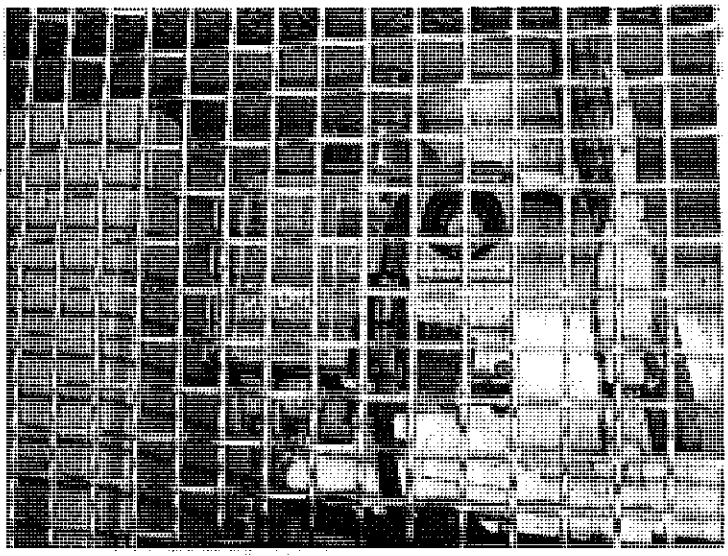

PHOTO #:19 DATE: SEPTEMBER 12, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9120028
DESCRIPTION: OILY WATER SEPARATOR WHITE BOX

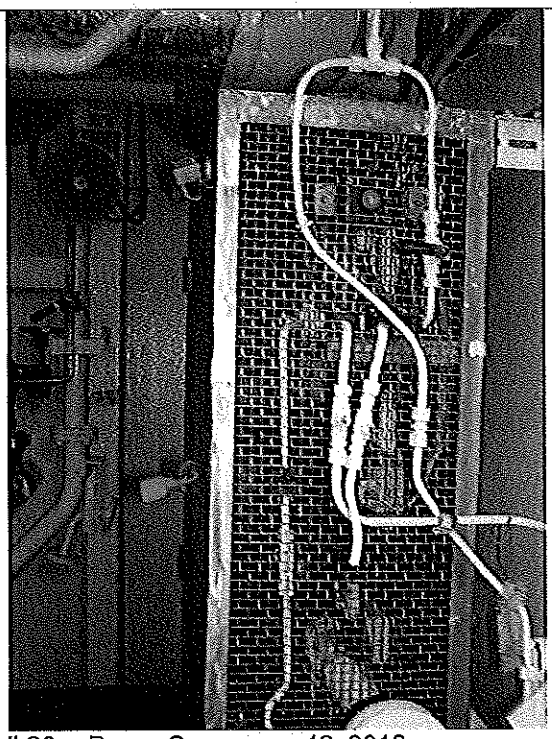

PHOTO #:20 DATE: SEPTEMBER 12, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9120029
DESCRIPTION: OILY WATER SEPARATOR WHITE BOX

PHOTO #:21 DATE: SEPTEMBER 12, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9120030
DESCRIPTION: ULTRAVIOLET LIGHT DISINFECTION UNIT

PHOTO #:22 DATE: SEPTEMBER 12, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9120031
DESCRIPTION: UV SYSTEM ELECTRONICS

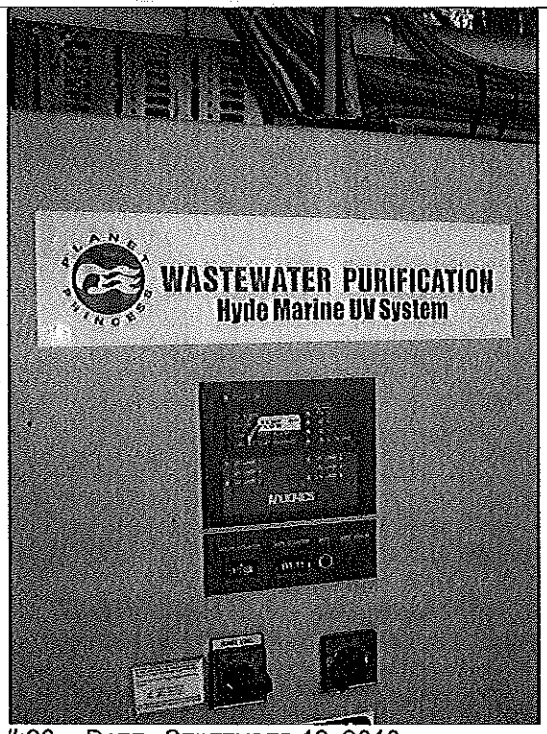

PHOTO #:23 DATE: SEPTEMBER 12, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9120032
DESCRIPTION: UV SYSTEM ELECTRONICS

PHOTO #:24 DATE: SEPTEMBER 12, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9120033
DESCRIPTION: VIEW OF UV PERMEATE IN UV PERMEATE TANK

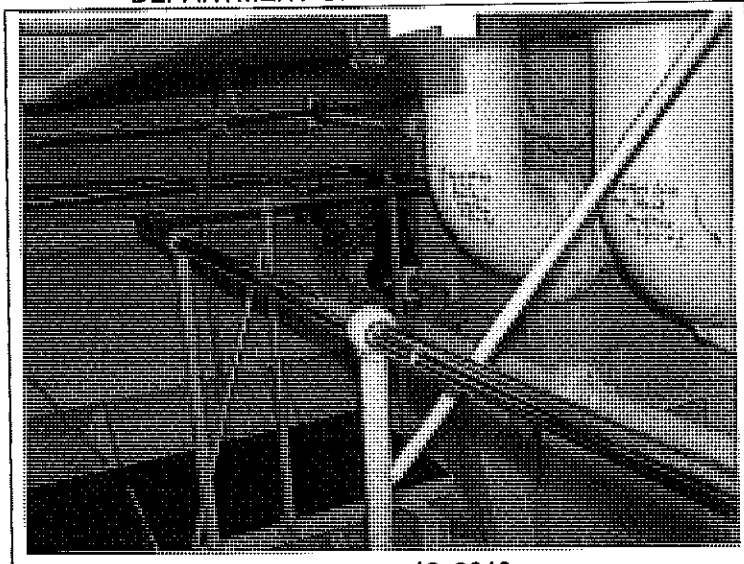

PHOTO #:25 . DATE: SEPTEMBER 12, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9120034
DESCRIPTION: DISCHARGE PORT

DEPARTMENT OF ECOLOGY
State of Washington

State of Washington Department of Ecology

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

Northwest Regional Office
3190 160th Ave SE
Bellevue, WA 98008
Phone: (425) 649-7000
Fax: (425) 649-7098

Inspection Date	Permit Number	County	Receiving Waters	Ecology Inspector
09/20/2010	NA	King	Marine Waters	Amy Jankowiak, Compliance Specialist
Entry Time 8:50 Exit Time 10:48	Photos Taken ☒ Yes ☐ No	Samples Taken ☐ Yes ☒ No	Inspection Announced ☒ Yes ☐ No	Discharges to: ☒ Surface Water ☐ Ground Water ☐ Dewater ☐ POTW

Name and Location of Site Inspected:
MILLENNIUM, Celebrity Cruises
Passenger Vessel
Pier 66, Seattle, Washington

Additional Participants/Inspectors:
Cheryl Thompson, Ecology

Ronald Rausch, the Environmental Officer was out on Compassionate Leave.

On-Site Representative(s): *Name/Title/Phone/e-mail*
Pantelis Ampatzis, Safety Officer
Antonis K. Athanasiou, Staff Captain;
ML_StaffCaptain@Celebritycruises.com

Responsible Official(s): *Name/Title/Address/Phone/e-mail*
Rich Pruitt, Director Environmental Programs
Royal Caribbean International
1080 Caribbean Way, Miami, FL 33132
Office: 305-982-2179; Cell: 305-495-2845; RPruitt@rccl.com

Other Facility Data:

Prior notification was made to Rich Pruitt on September 16, 2010.

Section A: Areas Evaluated

☒ Black/Gray Wastewater System	☒ Residual Solids	☒ Records/Reports	☒ Hazardous Waste/ Solid Waste	☒ Sampling/Monitoring
☒ Discharge Locations	☒ Operation & Maintenance	☒ Sludge Handling/ Disposal	☒ Oily Bilge Water	☒ Other

Section B: For Vessels Discharging ≥ 1nm from Berth and ≥ 6 Knots Only [2.1.3(A)]

☐ Schematics Match Black/Gray Wastewater System	
☐ Operations as Described in Submitted Documentation	
☐ Daily 24-hour Continuous Monitoring for Turbidity or Equivalent Monitoring	
☐ Turbidimeter or Equivalent Monitoring Equipment Functioning Properly	
☐ 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: Trigger Level for Shutdown:
Recorded Turbidity/Equivalent Levels Above Triggers:

☐ Daily 24-hour Continuous Monitoring for Disinfection Effectiveness	
☐ Disinfection Effectiveness Monitoring Equipment Functioning Properly	

Disinfection Effectiveness Monitoring:

☐ Auto Shut Down or Operational Controls to Insure System Shut Down if Disinfection System Upset Occurs	
☐ Disinfection System Operated and Maintained Properly	

Disinfection System:

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

☐	Schematics Match Black/Gray Wastewater System	
☐	Operations as Described in Submitted Documentation	
☐	Daily 24-hour Continuous Monitoring for Turbidity or Equivalent Monitoring	
☐	Turbidimeter or Equivalent Monitoring Equipment Functioning Properly	
☐	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: Trigger Level for Shutdown: Recorded Turbidity/Equivalent Levels Above Triggers:	
☐	Daily 24-hour Continuous Monitoring for Disinfection Effectiveness	
☐	Disinfection Effectiveness Monitoring Equipment Functioning Properly	
	Disinfection Effectiveness Monitoring:	
☐	Auto Shut Down or Operational Controls to Insure System Shut Down if Disinfection System Upset Occurs	
☐	Disinfection System Operated and Maintained Properly	
	Disinfection System:	
	Section D: General (Approved to Discharge)	
☐	No Discharges Within ½ Miles From Shellfish Beds/ Protocol (President's Point, Apple Tree Cove, Tyee Shoal)	
☐	Discharges Immediately Stopped When High Turbidity Occurs	
☐	Discharges Immediately Stopped When Disinfection System Upset Occurs	
☐	Immediate Notifications Made to WA Department of Health for Disinfection System Upset	
☐	Sampling Conducted 2/month, 1/month in Seattle (BOD, TSS, Fecal Coliform, pH, Chlorine Residual)	
☐	Whole Effluent Toxicity Testing 1 per 2 Years (homeported) or 1/40 Calls for Continuous	
	Section E: General	
☒	Wastewater Discharge Records Review	Discharge records were reviewed (blackwater/graywater/residual solids) and are maintained properly. No discharges in MOU waters were present from the beginning of the 2010 cruise season to present.
☒	Residual Solids Managed Properly/Disposal Protocol per MOU	Residual solids are discharged outside of MOU waters, outside of 12 nautical miles (at >6knots), and outside the Olympic Coast National Marine Sanctuary.
☒	Hazardous Waste Managed Properly	Hazardous waste that is collected is being landed ashore in locations outside of Washington State.
☒	WA Hazardous Waste Guidelines Followed (Appendix vii)	Hazardous waste that is collected is being landed ashore in locations outside of Washington State.
☒	Solid Waste Managed Properly	Solid waste appeared to be managed properly. The various solid waste streams are collected, sorted, stored, and sent ashore or incinerated as appropriate.
☒	Oily Bilge Water Managed Properly	Oily bilge water is treated and discharged at less than 5 ppm (and at greater than 12 nautical miles.
Other:		

Section F: Sampling Results	
Parameter	Results
Biochemical Oxygen Demand 5-Day (BOD_5)	
Total Suspended Solids (TSS)	
Fecal Coliform	
Residual Chlorine	
pH	
Ammonia, Nitrogen	

Section G: Summary of Findings/Comments

Introduction

Amy Jankowiak, Washington State Department of Ecology (Ecology) Northwest Regional Office, Water Quality Program, conducted the inspection of the Celebrity Cruises MILLENNIUM on September 20, 2010 along with Cheryl Thompson, Water Quality Program. The main contacts on board the MILLENNIUM Pantelis Ampatzis, Safety Officer and Antonis K. Athanasiou, Staff Captain. Ronald Raasch, the Environmental Officer was out on Compassionate Leave. Prior notification of the visit was given on September 16, 2010 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 MILLENNIUM has not requested and is not approved for discharge in Washington State.

The MILLENNIUM was placed into service in 2000, and is 964.6 feet long with a width of 105.6 feet. Passenger capacity on the day of the inspection was 1991 with a crew of 899.

The MILLENNIUM runs most of the cruise season out of Vancouver, British Columbia up to Alaska. The vessel conducted two calls to Seattle, once at the beginning of the season on May 3, 2010 and once on September 20, 2010. The vessel will be repositioning to the Caribbean for the winter as it leaves Seattle.

Inspection

We arrived and boarded the ship (photos #01 and #02) at 8:50 am and began with introductions and a plan for the day. We then discussed and viewed the advanced wastewater treatment system with staff that operate the system. We then discussed discharge protocols for various waste streams. Discharge records were reviewed for black water and gray water discharges and showed no discharges in Washington waters from the beginning of the cruise season to date. Next, we headed to the Bridge to review additional discharge records for hazardous waste and garbage. We then headed to the galley and the garbage and recycling areas. We toured the medical facilities and then concluded with a de-briefing and disembarked the vessel at about 10:48 am.

Discharge Protocols:

The MILLENNIUM has not requested, and is not approved to discharge in waters subject to the MOU. All black water and gray water is treated with an advanced wastewater treatment system (AWTS), Hydroxyl, and is discharged outside of MOU waters. All discharges are logged in the *Sewage and Graywater Discharge Record Book* based on the coordinates from the bridge. When a discharge is to occur, the bridge contacts the Engine Control Room and authorized staff allow the discharge and record the information. All wastewater discharge records that were reviewed appeared to be in compliance with the MOU and also did not occur in MOU waters. The discharge ports are padlocked.

Sewage residuals (sludge or biomass) are collected in the bio-residue tank and are then sent to the Hamann type II MSD system for treatment and held until discharged at greater than 12 nautical miles from shore, at greater than six knots, and outside of MOU waters and the Olympic Coast National Marine Sanctuary.

There is one large main galley (photos #20 and #21), one smaller galley and a crew galley. The food waste is separated in the galleys and sent to the pulpers (photo #22). The food waste is pulped and discharged outside of MOU waters and outside 12 nautical miles. The water from the pulper is recycled and occasionally held and discharged outside of MOU waters and outside of 12 nm and other protected waters at a minimum speed of six knots. The food waste disposal areas are monitored regularly by the Environmental Officer. The galley water goes to the gray water holding tanks. Cooking oil is collected to tanks and is off-loaded shore-side for recycling. Garbage records verified that food waste is the only waste

discharged to sea and is done so outside of MOU waters.

Pool and spa water is de-chlorinated and discharged outside of 12 nautical miles. The pools use seawater and both pools and spas use chlorine for disinfection. The spas are emptied daily to tanks and held for discharge outside 12 nautical miles.

Oily bilge water is treated with the Turbulo system first and then a Marinfloc system second (oily water separators) to less than 5 ppm. There is a white box for the systems.

The vessel bunkers for potable water frequently in Alaska and produces the rest by desalinization with evaporators when underway.

Laundry water is sent to the gray water holding tanks and is phased into the AWP. Dry cleaning is done with a system using Perchloroethylene (PERC) which is collected and off-loaded as hazardous waste.

Fluorescent light bulbs are off-loaded as hazardous waste (no bulb crusher). Materials such as paint and thinners, batteries, chemicals, aerosols and oily sludge are landed ashore outside of Washington State as hazardous waste. All hazardous waste records showed that all off-loads occurred outside of Washington State. Photo waste goes through a silver recovery system to less than five (5) ppm and is then off-loaded as non-hazardous waste. X-rays are now done digitally (photo #30) and do not produce any chemical byproduct.

Materials such as aluminum (photo #25), tin (photo #26), cardboard (photos #24 and #29), paper, glass (photo #28), some plastics, and scrap metal are recycled (photo #24). Some papers, some plastics, some biohazardous materials, sharps, expired medications and narcotics and oily rags are incinerated. Incinerators are used when the vessel is greater than four nautical miles from port. Ash (photo #27) is offloaded as hazardous waste.

Black water and Gray water Systems:
Black water, which includes toilet waste and infirmary drains is collected in collection tanks. Gray water, which includes sink and shower water, along with laundry water and galley water, is sent to collection tanks. The black water and gray water collection then combines at the Advanced Wastewater Purification (AWP), Hydroxyl, system mixing tank (photo #03). PH is adjusted in the mixing tank. From the mixing tank, the wastewater is screened with one of two separate primary screens (photos #11 and #12). The screens are cylinders of mesh filters. The solids are sent to the bio-residue tank (photo #08), while the liquid moves (photo #04) onto the bioreactors. There are three bioreactor stages (photos #05, #06 and #07). Air is blown (photo #09) into the bioreactors and both air and levels are monitored with sensors. The wastewater is then conveyed to the Dissolved Air Flotation (DAF) units (photos #13 and #14). On the way to the DAFs, polymer is mixed in the line (photo #15). There are two DAFs. From the DAFs, liquid moves to the polishing filters (photos #16 and #17). The two polishing filters have two layers at 10 microns. Any solids collected from the filters or DAF are sent to the bio-residue tank. From the polishing filters, the liquid moves to ultraviolet (UV) light disinfection. There are four UV units of six bulbs each (photo #19). Total suspended solids (TSS) are monitored (photo #18) both prior to UV and immediately after UV. Effluent from the UV is also monitored for pH. The UV units are self-cleaning with an automatic wiper. The vessel can either discharge the disinfected effluent, or send the treated wastewater to holding tanks. The AWP is in constant operation.

The vessel has a small laboratory on board and samples and analyzes for Total Suspended Solids (TSS), total and free chlorine, Chemical Oxygen Demand (COD) and pH daily and samples Biochemical Oxygen Demand (BOD) twice weekly and fecal coliform once weekly. At the time of the inspection, the TSS sensors were reading at 31 FTU and 7 FTU. The TSS often spikes when in port when cleaning on the vessel is occurring. At 20 FTU, the system automatically recirculates for re-treatment. The recirculation was occurring during the inspection. The vessel was not discharging.

If any painting or paint chipping is done on the vessel while in port, the vessel first requests permission from the local authorities and uses proper best management practices. The vessel uses tarps that have been fashioned with magnets to hold them close to the vessel while conducting such work and to prevent any discharges.

Conclusions and Recommendations
Staff was very knowledgeable of the environmental systems and protocols.

It is recommended that staff continue to work towards high functioning wastewater treatment systems.

The laboratory testing on-board is an excellent way to monitor and make needed adjustments to the system. Having a laboratory on-board for testing is ideal.

Attachments:

Photographs

Copies to:
Rich Pruitt, RCCL
Pantelis Ampatzis, Safety Officer MILLENNIUM
Antonis K. Athanasiou, Staff Captain MILLENNIUM
Ronald Raasch, MILLENNIUM EO
Amy Jankowiak, Ecology
Kevin Fitzpatrick, Ecology
Mark Toy, Dept. of Health
Central Files: Celebrity Cruises – MILLENNIUM; WQ 6.1

Section H: Signatures

Name and Signature of Inspector:	Agency/Office/Telephone:	Date
Amy Jankowiak	Department of Ecology Northwest Regional Office Water Quality Program Municipal Compliance Specialist 425-649-7195	9/28/10
Name and Signature of Reviewer:	**Agency/Office/Telephone:**	**Date**
Kevin C. Fitzpatrick	Department of Ecology Northwest Regional Office Water Quality Section Manager 425-649-7033	9/28/10

PHOTO #:01 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200034
DESCRIPTION: MILLENNIUM VESSEL (CHERYL THOMPSON)

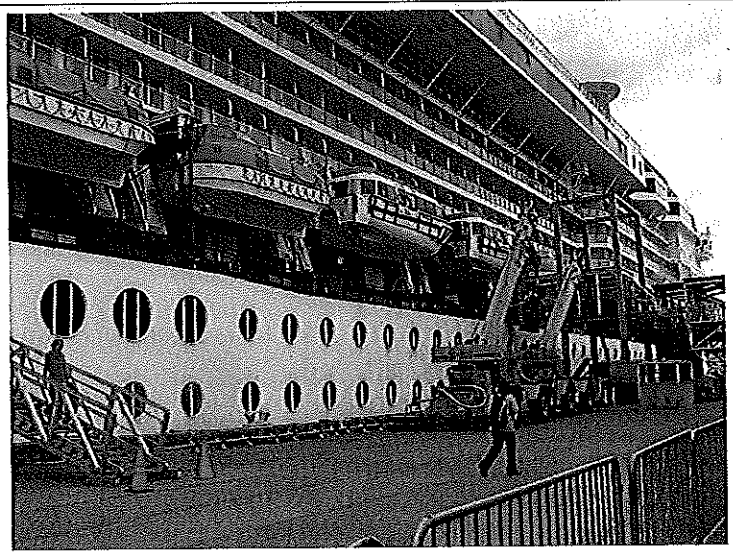

PHOTO #:02 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200035
DESCRIPTION: MILLENNIUM VESSEL

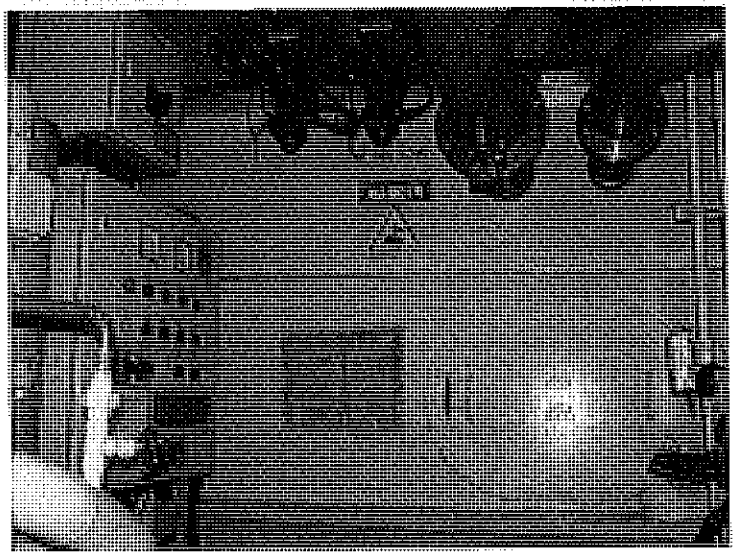

PHOTO #:03 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200002
DESCRIPTION: MIXING TANK

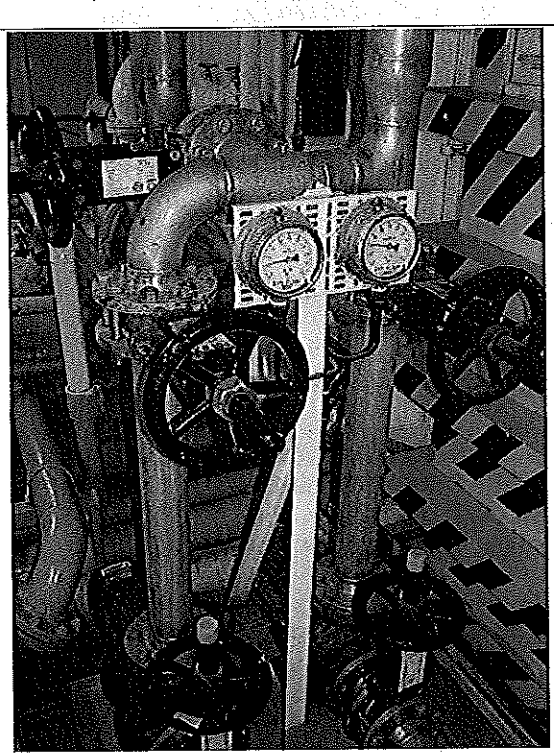

PHOTO #:04 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200003
DESCRIPTION: PUMPS FOR BIOREACTOR

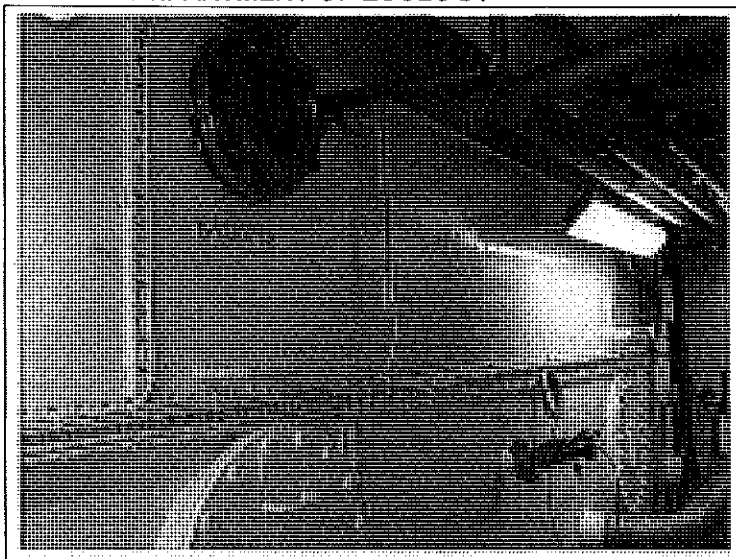

PHOTO #:05 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200004
DESCRIPTION: BIO-REACTORS (#2 AND #3)

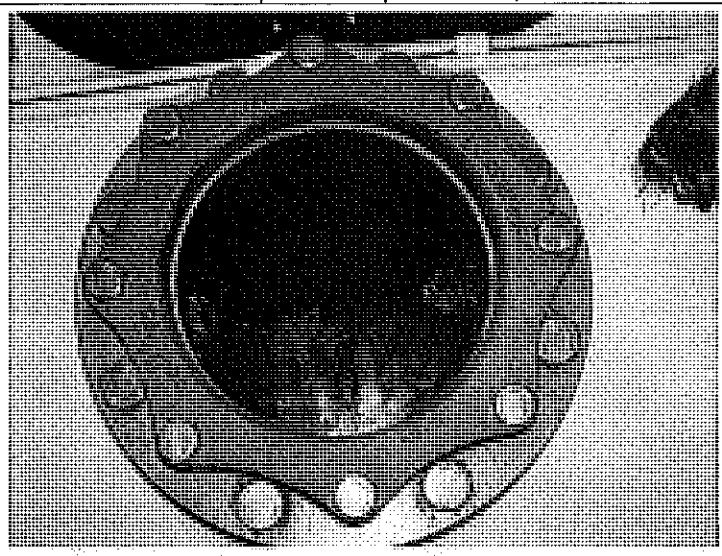

PHOTO #:06 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200005
DESCRIPTION: VIEW INSIDE OF BIO-REACT 1

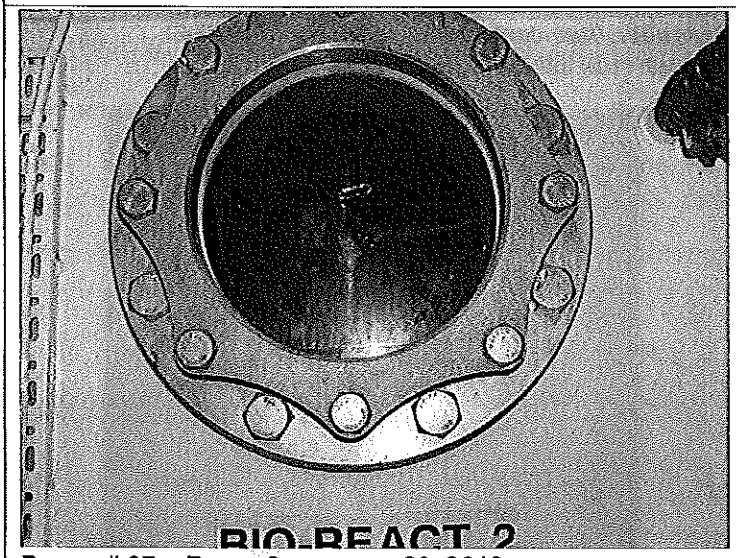

PHOTO #:07 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200006
DESCRIPTION: VIEW INSIDE OF BIO-REACT 2

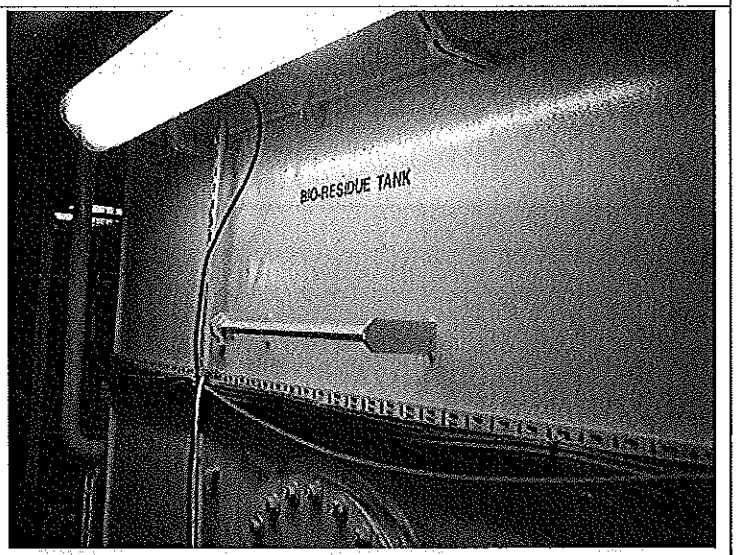

PHOTO #:08 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200007
DESCRIPTION: BIO-RESIDUE TANK

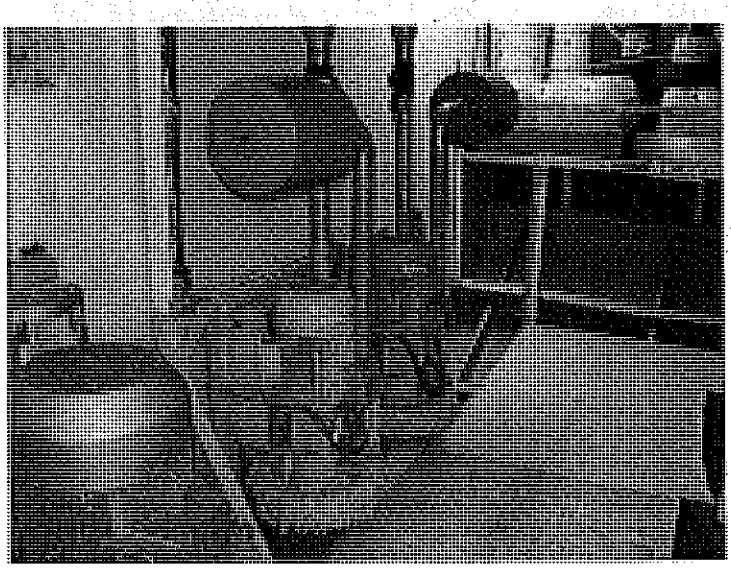

PHOTO #:09 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200009
DESCRIPTION: BLOWERS FOR BIOREACTORS

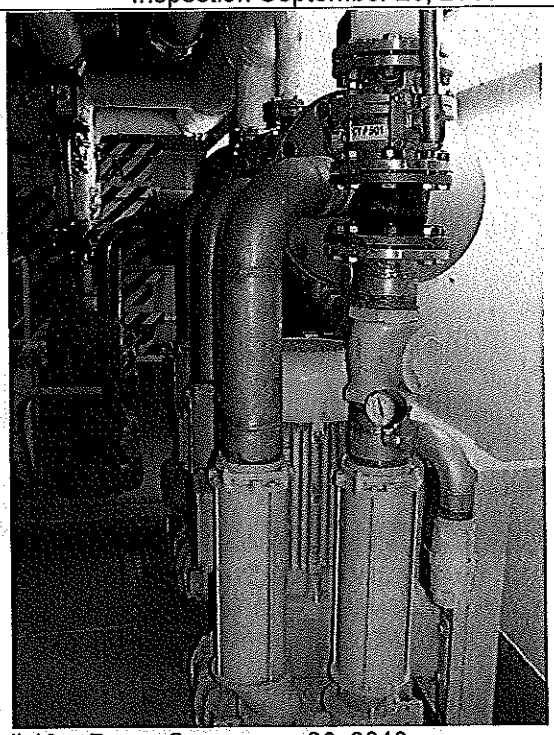

PHOTO #:10 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200010
DESCRIPTION: PUMPS

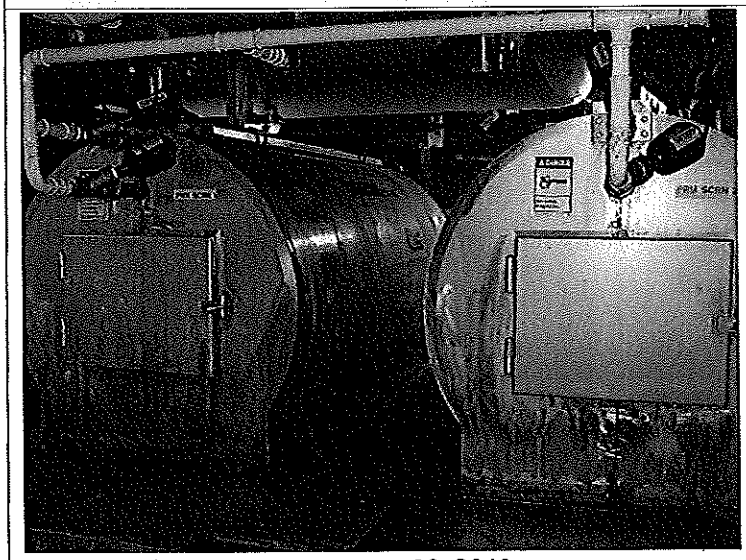

PHOTO #:11 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200011
DESCRIPTION: PRIMARY SCREENS

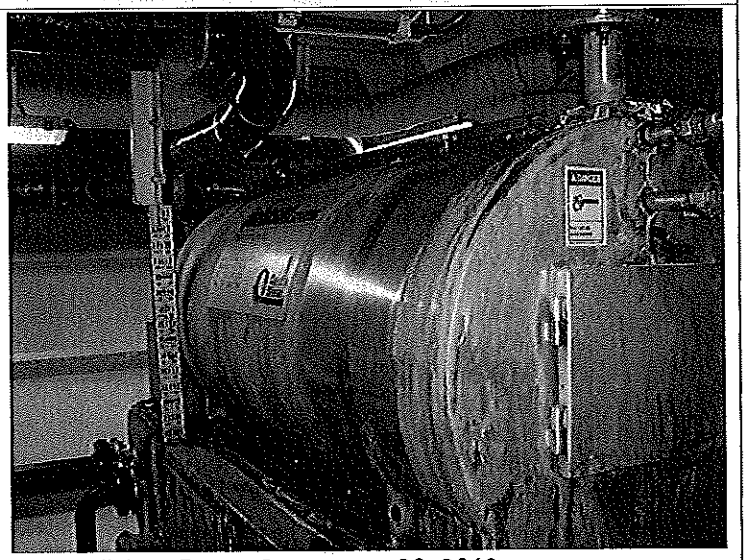

PHOTO #:12 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200012
DESCRIPTION: PRIMARY SCREENS

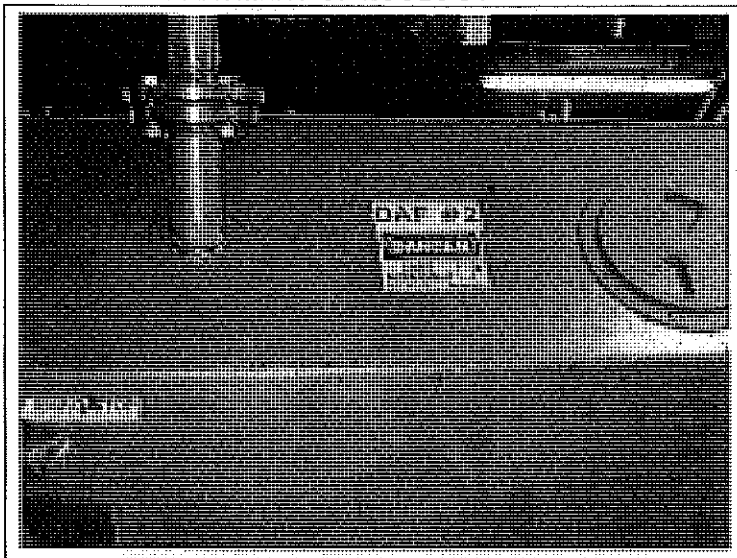

PHOTO #:13 DATE: SEPTEMBER 20, 2010 13
TAKEN BY: AMY JANKOWIAK FILE NO.:P92000
DESCRIPTION: DISSOLVED AIR FLOTATION (DAF)

PHOTO #:14 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200014
DESCRIPTION: INSIDE VIEW OF DAF

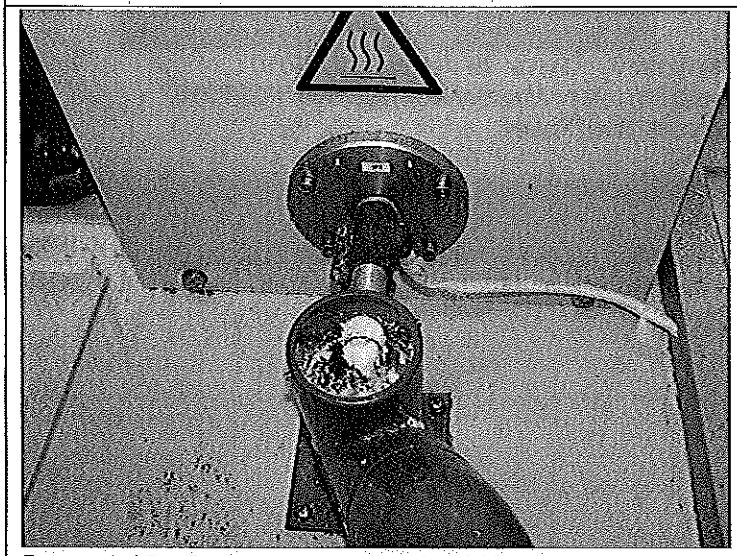

PHOTO #:15 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200015
DESCRIPTION: POLYMER INJECTION

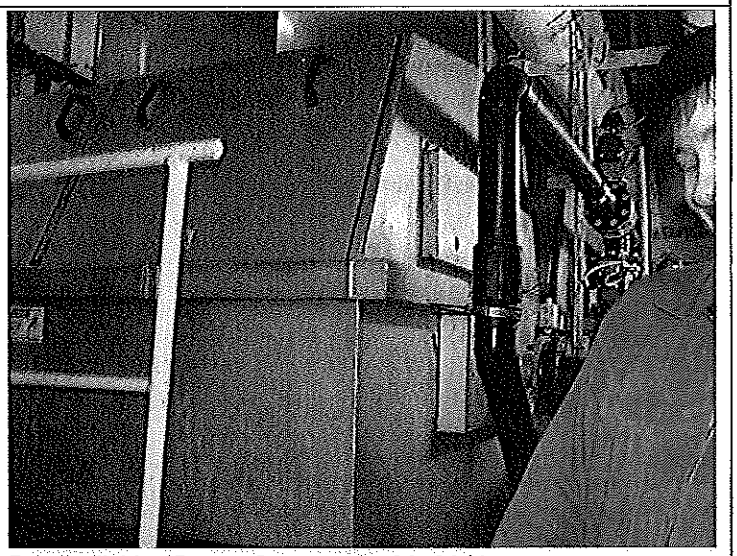

PHOTO #:16 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200016
DESCRIPTION: POLISHING FILTERS

PHOTO #:17 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200017
DESCRIPTION: VIEW INSIDE OF POLISHING FILTER

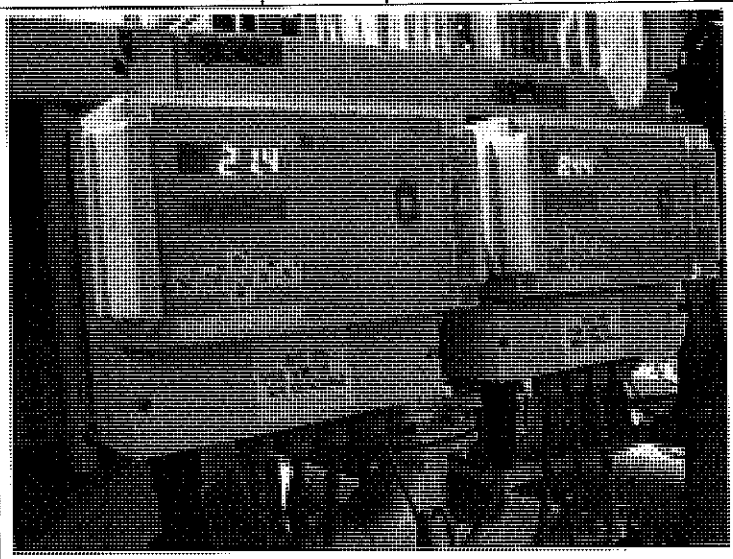

PHOTO #:18 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200018
DESCRIPTION: TSS/TURBIDITY METERS

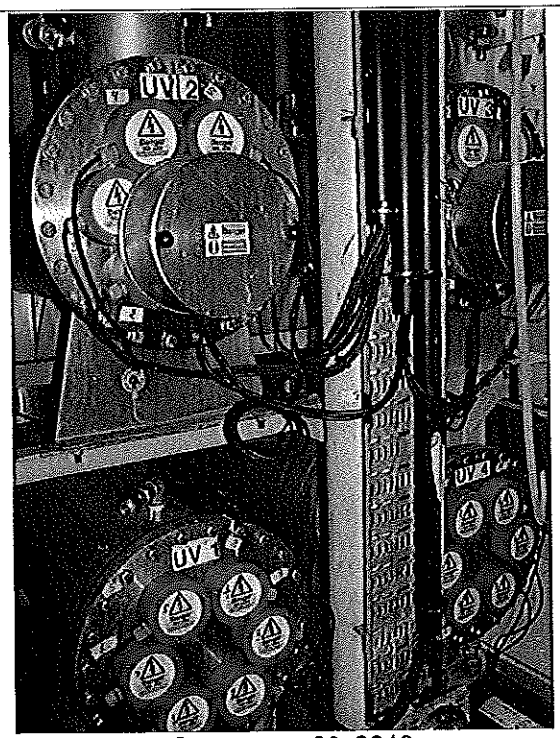

PHOTO #:19 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200020
DESCRIPTION: ULTRAVIOLET DISINFECTION UNITS

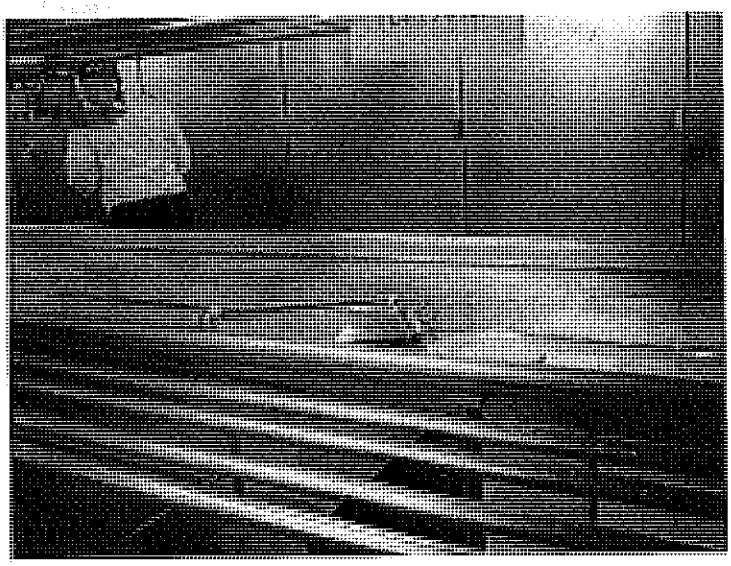

PHOTO #:20 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200022
DESCRIPTION: MAIN GALLEY

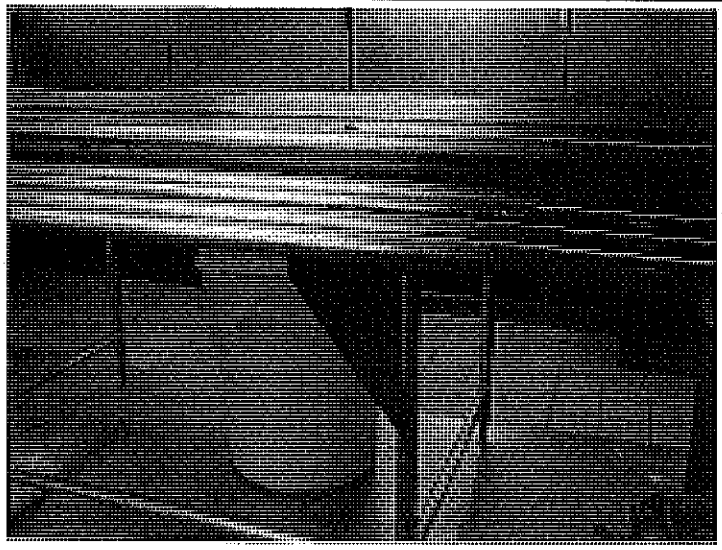

PHOTO #:21 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200023
DESCRIPTION: GALLEY FOOD WASTE SORTING

PHOTO #:22 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200024
DESCRIPTION: GALLEY PULPER

PHOTO #:23 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200025
DESCRIPTION: COMPACTED CARDBOARD FOR OFF-LOADING

PHOTO #:24 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200026
DESCRIPTION: GARBAGE AND RECYCLING SORTING AREA

PHOTO #:25 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200028
DESCRIPTION: COMPACTED ALUMINUM

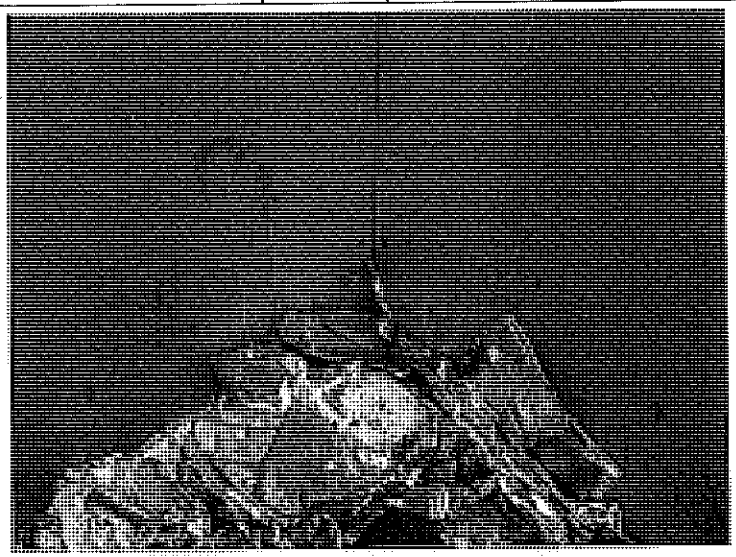

PHOTO #:26 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200029
DESCRIPTION: CLEANED AND COMPACTED TIN

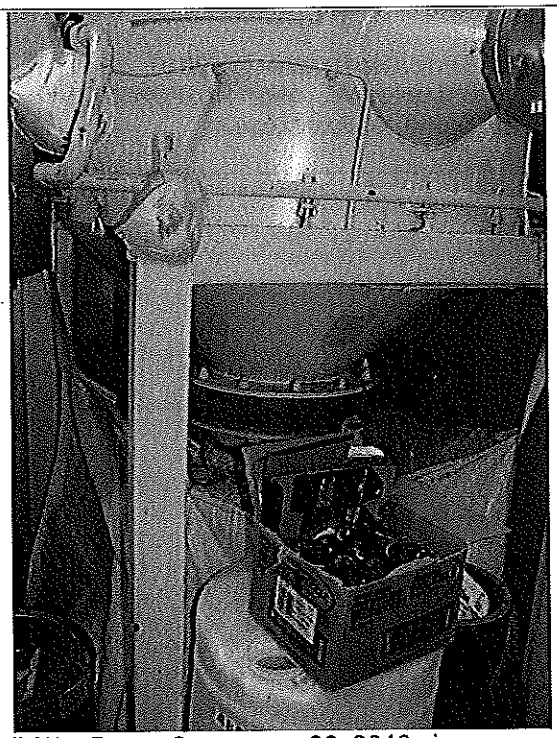

PHOTO #:27 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200030
DESCRIPTION: BATTERY COLLECTION (FRONT); INCINERATOR ASH BAGGING

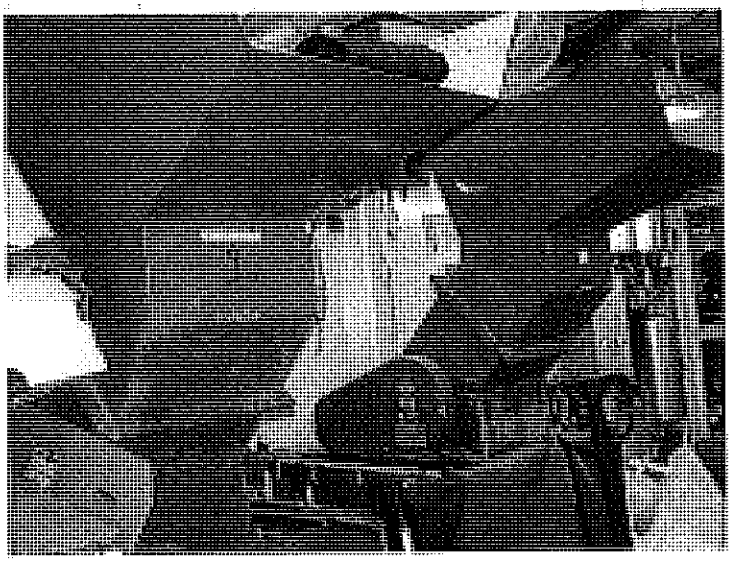

PHOTO #:28 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200031
DESCRIPTION: GLASS CRUSHERS

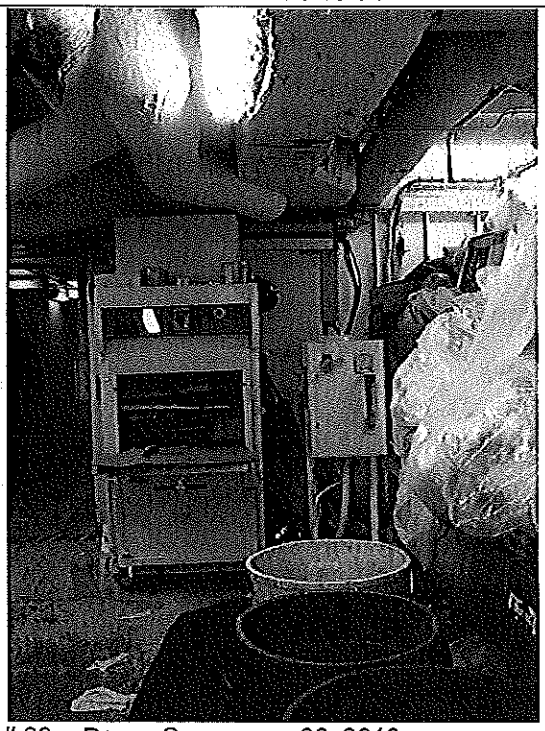

PHOTO #:29 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200032
DESCRIPTION: CARDBOARD COMPACTOR

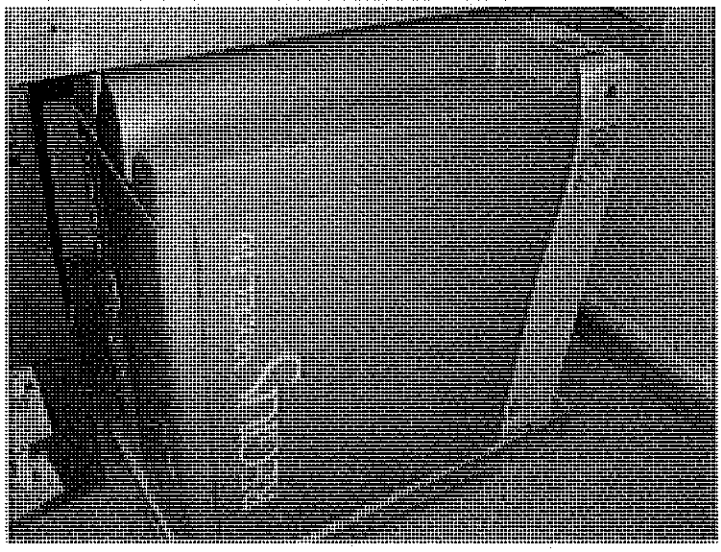

PHOTO #:30 DATE: SEPTEMBER 20, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9200033
DESCRIPTION: DIGITAL X-RAY MACHINE

DEPARTMENT OF ECOLOGY
State of Washington

State of Washington Department of Ecology

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

Northwest Regional Office
3190 160th Ave SE
Bellevue, WA 98008
Phone: (425) 649-7000
Fax: (425) 649-7098

Inspection Date	Permit Number	County	Receiving Waters	Ecology Inspector
September 24, 2010	NA	King	Marine Waters	Amy Jankowiak, Compliance Specialist
Entry Time 9:12 am Exit Time 12:28 pm	Photos Taken ☒ Yes ☐ No	Samples Taken ☐ Yes ☒ No	Inspection Announced ☒ Yes ☐ No	Discharges to: ☒ Surface Water ☐ Ground Water ☐ Dewater ☐ POTW

Name and Location of Site Inspected:
AMSTERDAM, Holland America Line
Passenger Vessel
Pier 91, Seattle

Additional Participants/Inspectors:
Cheryl Thompson, Water Quality Program Ecology

Jeanne Tran, Water Quality Program Ecology

On-Site Representative(s): *Name/Title/Phone/e-mail*
Jonathan Bailey, Safety, Environment and Health Officer
Jon Turvey, Senior Manager, Auditing, Training and ISO 14001 Coordination
206-298-3849

Responsible Official(s): *Name/Title/Address/Phone/e-mail*
William J. Morani Jr., Vice President – Environmental Management Systems
Holland America Line
300 Elliott Ave. West, Seattle WA 98119
206-281-3535

Other Facility Data:
Notification made to Jon Turvey on September 21, 2010

Section A: Areas Evaluated

☒ Black/Gray Wastewater System	☒ Residual Solids	☒ Records/Reports	☒ Hazardous Waste/ Solid Waste	☒ Sampling/Monitoring
☒ Discharge Locations	☒ Operation & Maintenance	☒ Sludge Handling/ Disposal	☒ Oily Bilge Water	☒ Other

Section B: For Vessels Discharging ≥ 1nm from Berth and ≥ 6 Knots Only [2.1.3(A)]

☐ Schematics Match Black/Gray Wastewater System	
☐ Operations as Described in Submitted Documentation	
☐ Daily 24-hour Continuous Monitoring for Turbidity or Equivalent Monitoring	
☐ Turbidimeter or Equivalent Monitoring Equipment Functioning Properly	
☐ 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: Trigger Level for Shutdown:

Recorded Turbidity/Equivalent Levels Above Triggers:

☐ Daily 24-hour Continuous Monitoring for Disinfection Effectiveness	
☐ Disinfection Effectiveness Monitoring Equipment Functioning Properly	

Disinfection Effectiveness Monitoring:

☐ Auto Shut Down or Operational Controls to Insure System Shut Down if Disinfection System Upset Occurs	
☐ Disinfection System Operated and Maintained Properly	

Disinfection System:

Section C: For Vessels Discharging Continuously [2.1.3(B)]	
☐ Schematics Match Black/Gray Wastewater System	
☐ Operations as Described in Submitted Documentation	
☐ Daily 24-hour Continuous Monitoring for Turbidity or Equivalent Monitoring	
☐ Turbidimeter or Equivalent Monitoring Equipment Functioning Properly	
☐ 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: Trigger Level for Shutdown: Recorded Turbidity/Equivalent Levels Above Triggers:	
☐ Daily 24-hour Continuous Monitoring for Disinfection Effectiveness	
☐ Disinfection Effectiveness Monitoring Equipment Functioning Properly	
Disinfection Effectiveness Monitoring:	
☐ Auto Shut Down or Operational Controls to Insure System Shut Down if Disinfection System Upset Occurs	
☐ Disinfection System Operated and Maintained Properly	
Disinfection System:	
Section D: General (Approved to Discharge)	
☐ No Discharges Within ½ Miles From Shellfish Beds/ Protocol (President's Point, Apple Tree Cove, Tyee Shoal)	
☐ Discharges Immediately Stopped When High Turbidity Occurs	
☐ Discharges Immediately Stopped When Disinfection System Upset Occurs	
☐ Immediate Notifications Made to WA Department of Health for Disinfection System Upset	
☐ Sampling Conducted 2/month, 1/month in Seattle (BOD, TSS, Fecal Coliform, pH, Chlorine Residual)	
☐ Whole Effluent Toxicity Testing 1 per 2 Years (homeported) or 1/40 Calls for Continuous	
Section E: General	
☒ Wastewater Discharge Records Review	Discharge records were reviewed (black water/gray water/residual solids) and are maintained properly. All discharges occurred outside of MOU waters (reviewed from beginning of cruise season, to date). Policy is to only discharge black and gray water at greater than 12nm and outside of MOU waters, and outside the Olympic Coast National Marine Sanctuary.
☒ Residual Solids Managed Properly/Disposal Protocol per MOU	Sewage sludge and screenings are currently collected from the black water treatment system, drummed and landed ashore.
☒ Hazardous Waste Managed Properly	Hazardous waste is off-loaded in Victoria, Canada, and not in Washington State. Hazardous waste records were reviewed and appear to be consistent with MOU requirements.
☒ WA Hazardous Waste Guidelines Followed (Appendix vii)	Hazardous waste is off-loaded in Victoria, Canada, and not in Washington State. Hazardous waste records were reviewed and appear to be consistent with MOU requirements.
☒ Solid Waste Managed Properly	Solid waste appears to be managed properly. The various solids waste streams are collected, sorted, stored, and sent ashore for

	proper disposal. Records reviewed showed only food waste and crushed glass as being discharged and only outside of MOU waters.
☒ Oily Bilge Water Managed Properly	Oily bilge water is treated and discharged at less than 15ppm and outside of MOU waters.

Other:

Section F: Sampling Results

Parameter	Results
Biochemical Oxygen Demand 5-Day (BOD_5)	
Total Suspended Solids (TSS)	
Fecal Coliform	
Residual Chlorine	
pH	
Ammonia, Nitrogen	

Section G: Summary of Findings/Comments

Introduction

Amy Jankowiak, Washington State Department of Ecology (Ecology) Northwest Regional Office, Water Quality Program (NWRO-WQ), conducted the inspection of the Holland America Line AMSTERDAM on September 24, 2010 along with Cheryl Thompson, Ecology NWRO-WQ and Jeanne Tran, Ecology NWRO-WQ. The main contacts on board the AMSTERDAM included Jonathan Bailey, the Safety, Environment and Health (SHE) Officer. Jon Turvey, Senior Manager, Auditing, Training and ISO 14001 Coordination for Holland America Line also joined us for the inspection. Prior notification of the visit was given on September 21, 2010 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 AMSTERDAM arrived on April 26, 201 at the Port of Seattle to begin the 2010 cruise season which consists of 14 calls on Mondays to Seattle (one call on Friday at the end of the season). The vessel has a traditional marine sanitation device for black water that includes screening, aeration and chlorination. Gray water is held and discharged without treatment. No discharges of black water or gray water are occurring in MOU waters. Approval for discharge from Ecology has not been requested nor issued. The vessel has been holding effluent and not discharging in MOU waters since the beginning of the season.

The AMSTERDAM was delivered in 2000, is 780 feet long, with about a 26-foot draft. Passenger capacity is about 1400 with about 650 crew.

Inspection

We arrived and boarded the ship at 9:12 am and began with introductions and a plan for the day. We then discussed discharge protocols for various waste streams, and reviewed discharge records for hazardous waste, oily bilge water, garbage and black water and gray water. We then went to the Bridge to view discharge valve monitoring. We then toured the main galley and the garbage and recycling area and food waste system. We then went to the Engine Control Room (ECR) to view operations and finalize record reviewing. Then we toured the marine sanitation devices and the oily water separators for bilge water. We viewed the evaporator filters and the displays for Environmental Objectives and finished with a tour of the main operations of the cruise ship, including the spa areas, the hair salon and some of the deck areas. The inspection was then finalized and we disembarked the vessel at about 12:28 pm.

Discharge Types and Protocols:

Only upon verification of location between the Bridge (photo #01) and the Engine Control Room (ECR) (photo #18), will a discharge occur at greater than 12 nautical miles and outside of MOU waters and outside of the Olympic Coast National Marine Sanctuary. The Bridge authorizes the discharge. The latitude and longitude coordinates are recorded in the *Sewage and Graywater Discharge Record Book* and in the deck log. There is an overboard valve monitoring system (photo #02) on the bridge and the ECR has lights monitoring discharges. The date, time and location of both the start and the stop of the discharges are recorded, along with port location, effluent type, volumes, and speed. Discharges are tentatively scheduled ahead of time by matrix (photo #03), but are locations are always verified prior to discharges. All

discharge records that were reviewed appeared to be in compliance with the MOU. The information related to the opening and closing of discharge ports is also electronically recorded in the PriLog. An "event" is recorded such as an opening and closing of a valve, as well as alarms such as high tank levels in the PriLog.

Blackwater, which includes toilet waste, is treated by a traditional marine sanitation device (photos #20 and #21), and graywater, which includes sink and shower water, laundry water, galley and pulper water, is always discharged at greater than 12 nautical miles and outside of MOU waters. There are three MSDs on board the vessel. Blackwater is collected (photo #29) by vacuum to a tank, then goes through prefiltration. Liquid moves to the next part of the tank for aeration. The liquid is then chlorinated and held until discharge. The chlorine is dosed with a pump and a timer at a rate of 2.3 LTR (photos #22 and #23), twice a day. The solids from the MSD are collected and off-loaded in drums Victoria. This occurs about every couple of months. There are three of the blackwater treatment systems on board the vessel. Graywater is collected and strained. The strained material is also collected and off-loaded in Victoria. The graywater does not receive any further treatment and is held until discharge outside of MOU waters.

The vessel was connected to shore power at the time of the inspection and typically uses 1.5 percent sulfur content fuel or MGO.

Ballast water exchanges do not occur in MOU waters. Exchanges occur at least 200 miles out and 200 meters deep. Ballast tanks are sometimes used as gray water tanks and are cleaned out (decontaminated with chlorine) prior to a change in use out at Sea. The more stringent requirements of ballast or gray water are used when the tanks are changing use. The ballast and the bilge tanks are not mixed.

Outside maintenance work on the vessel, including paint chipping and painting is done using a cherry picker (photos #4, #37 and #38) that folds out and if applicable, a float in the water with a paint mat. There have been some concerns about the best management practices (BMPs) used for outside vessel work throughout the season from various vessels. BMPs will be discusses with the MOU parties during the off-season.

There are three galleys on board the vessel including the main galley, the Lido galley and the crew galley. There are also a few other food preparation areas. Food waste is collected in the various locations and sent (photo #06) to the pulping system (photo #15). The food is separated in the main kitchens into three bins, garbage (gray), recycle (blue) and food (yellow) (photo #07). The Environmental Officer oversees the source separation and training. Some food wastes such as pineapple rinds, banana peels, and coffee, which clogs up the pulpers, is offloaded as food waste in Victoria. The pulped food waste (photo #12) is discharged out at Sea (outside MOU waters, >12 nm and outside the OCNMS). The galley water (photo #08), along with pulper water is sent to the gray water holding tanks to be discharged along with the gray water. Used cooking oil is reused (photo #11) as biofuel by being burned with heavy fuel.

Oily bilge water is treated with a FACET and SERAP two-part oily water separator system. The FACET (photo #25 and #26) system brings the oil content down to less than 50ppm and the SERAP (photo #27 and #28) filter brings the content down to less than 15 ppm. Discharges occur at less than 15 ppm and outside of MOU waters. A white box (photo #24) is used for additional monitoring assurance. Oily sludge is drummed and offloaded for proper disposal.

Some pools use salt water and some fresh. Spas use fresh water. Both are disinfected with bromine. Pool water is discharged outside of 12 nautical miles and outside of MOU waters. Spa water is sent to the gray water holding tanks and is discharged outside of 12 nautical miles and outside of MOU waters.

Potable water is either bunkered or produced by exhaust heat from the boilers and a steam evaporator. The brine is then discharged. The water is only made once underway.

Oily sludge, some paper, food-contaminated cardboard, some oily rages, narcotics, with witness, and some plastics are all incinerated (photo #14). The incinerators are only used when outside of Admiralty Inlet. Opacity is monitored with a new electronic system (photo #19) and is alarmed via the PriLog.

Garbage and recycling materials are sorted in the garbage/recycling area (photo #09). Sorting cans are cleaned (water to graywater tanks) out (photo #13). Plastics, some paper, some cardboard, aluminum, tin, and scrap metals, and some batteries (photo #16) are all recycled. Chemical containers are rinsed out (to gray water) and re-used. Oil drums are cleaned out with cloths and recycled with metals. Glass bottle necks are removed (photo #10) and glass is crushed and discharged out at sea. Fluorescent lamps are crushed on board with a mercury vapor removal system. Some materials are also donated when feasible. The recycling percentages are tracked along with various other environmental goals and are posted for crew to view (photos #30 and #31). Garbage records looked to be in good order. Food waste and crushed glass are the only solid materials being discharged out at sea. Holland America Line has been working on finding other uses for materials such as using crushed glass for road construction in Alaska and looking at options for reusing wood pallets. Materials off-loaded for recycling are off-loaded in Victoria, Canada. General garbage is also landed ashore in

Victoria. Some medications are returned to the vendor for credit.

Dry cleaning no longer uses PERC, instead, a wet cleaning, dry cleaning system is used. Photo waste goes through a silver recovery system and is then off-loaded at less than 5ppm. X-ray's are done digitally, and do not have a waste product. Other hazardous waste materials including paints and thinners, some oily rags, medical sharps, and some batteries, and aerosol condensate (photo #17), are off-loaded in Victoria, Canada. Hazardous waste records were reviewed and appear to be consistent with MOU requirements.

A copy of the current MOU and notification procedures were on board and available.

Conclusions and Recommendations

The protocols and procedures for discharge are clear and inclusive of verification.

The staff was very knowledgeable of the systems and procedures related to compliance with the MOU.

It is recommended that best management practices for outside vessel maintenance be discussed with the MOU parties for all MOU covered vessels.

Attachments:
Photographs

Copies to:
William Morani, Jr., HAL
Robert Diaz, HAL
John Turvey, HAL
Jonathan Bailey, HAL
John Hansen, NorthWest CruiseShip Association
Mark Toy, Dept. of Health
Karen Burgess, Ecology
Kevin Fitzpatrick, Ecology
Amy Jankowiak, Ecology
Central Files: Holland America Line - AMSTERDAM; WQ 6.1.

Section H: Signatures

Name and Signature of Inspector:	Agency/Office/Telephone:	Date
Amy Jankowiak Amy Jankowiak	Department of Ecology Northwest Regional Office Water Quality Program Municipal Compliance Specialist 425-649-7195	10/26/10
Name and Signature of Reviewer:	**Agency/Office/Telephone:**	**Date**
Kevin C Fitzpatrick Kevin C. Fitzpatrick	Department of Ecology Northwest Regional Office Water Quality Section Manager 425-649-7033	10/26/10

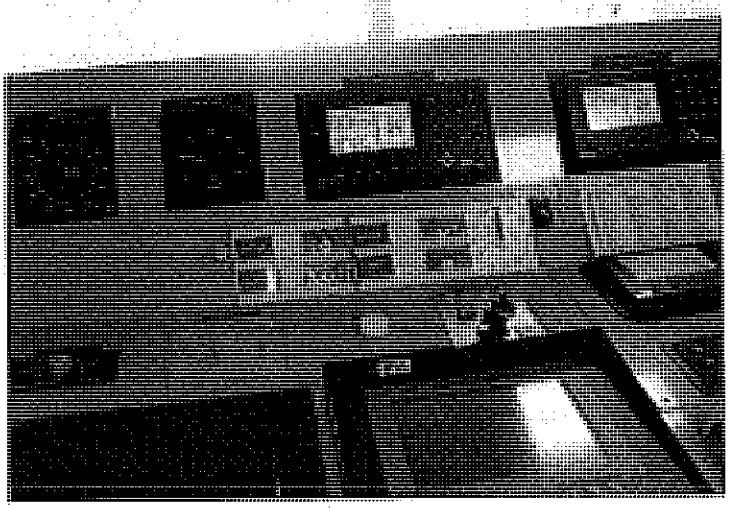

PHOTO #:01 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240001
DESCRIPTION: BRIDGE – DISCHARGE VALVE DISPLAY

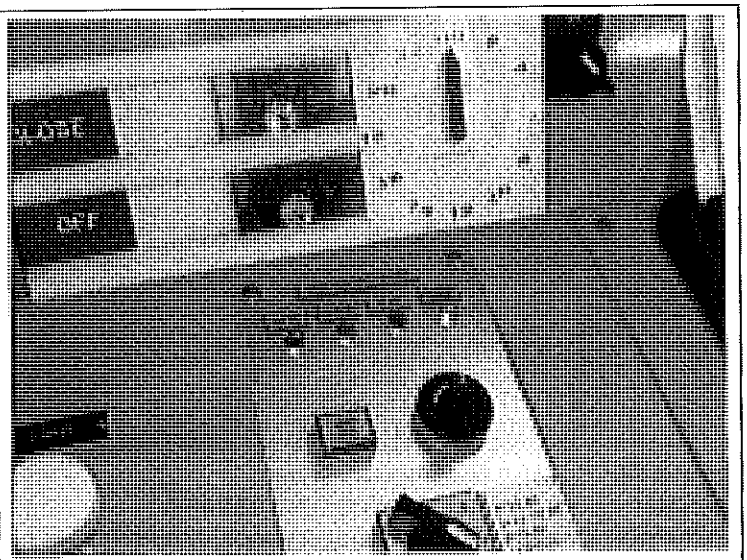

PHOTO #:02 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240002
DESCRIPTION: BRIDGE – VALVE MONITORING SYSTEM

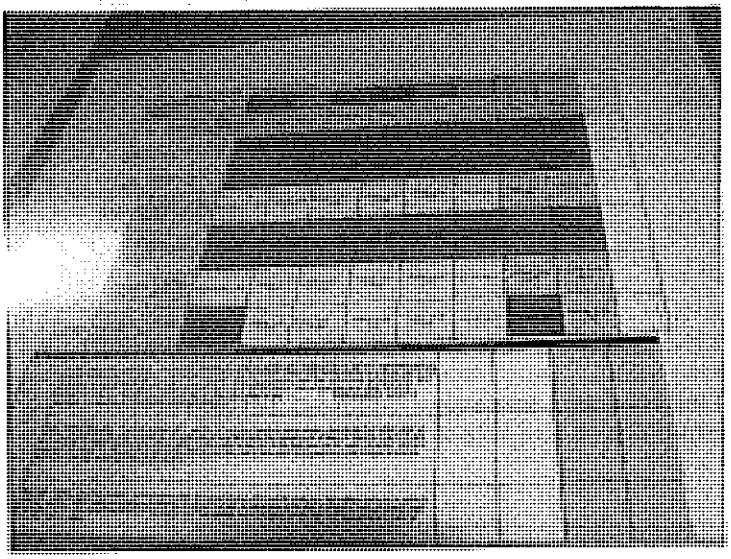

PHOTO #:03 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240003
DESCRIPTION: BRIDGE – DISCHARGE SCHEDULE

PHOTO #:04 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240004
DESCRIPTION: BRIDGE – VIEW BELOW

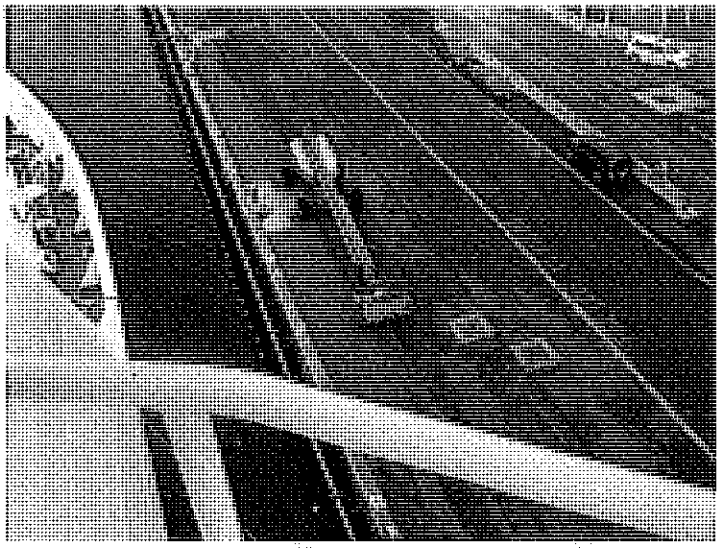

PHOTO #:05 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240005
DESCRIPTION: CHERRY PICKER USED FOR VESSEL MAINTENANCE

PHOTO #:06 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240009
DESCRIPTION: GALLEY – FOOD GOING TO PULPER

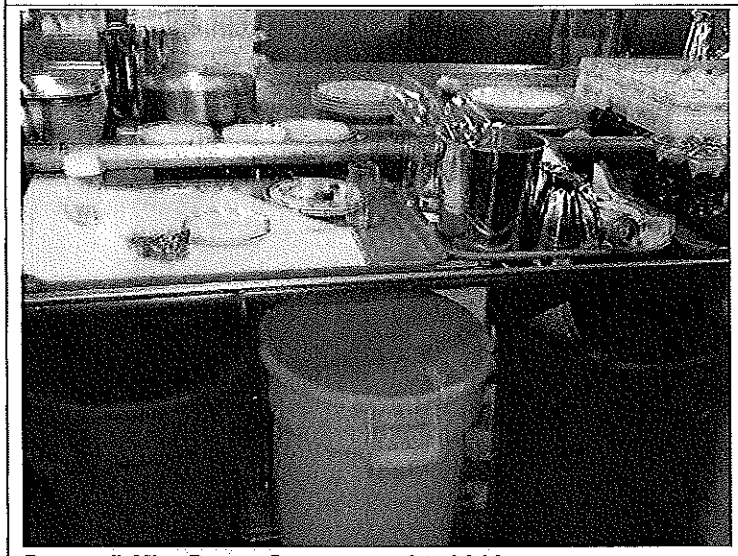

PHOTO #:07 DATE: SEPTEMBER 24, 2010
Taken By: AMY JANKOWIAK FILE NO.:P9240010
DESCRIPTION: GALLEY - FOOD WASTE SORTING

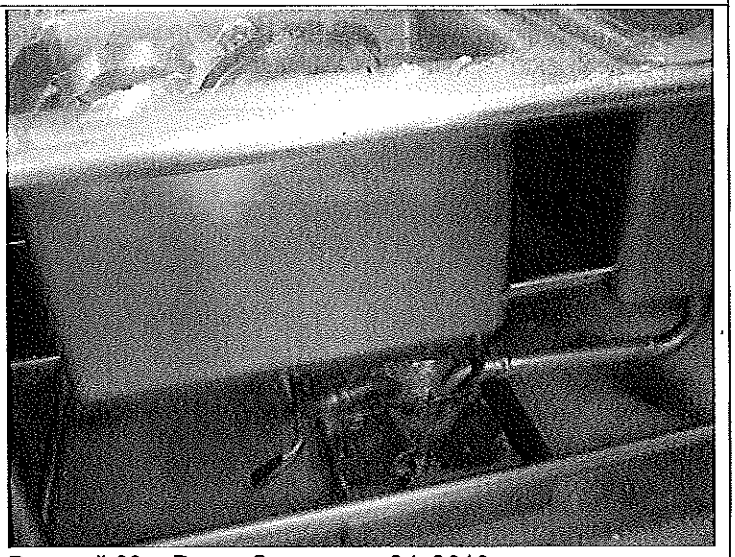

PHOTO #:08 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240011
DESCRIPTION: GALLEY SINKS TO GRAY WATER

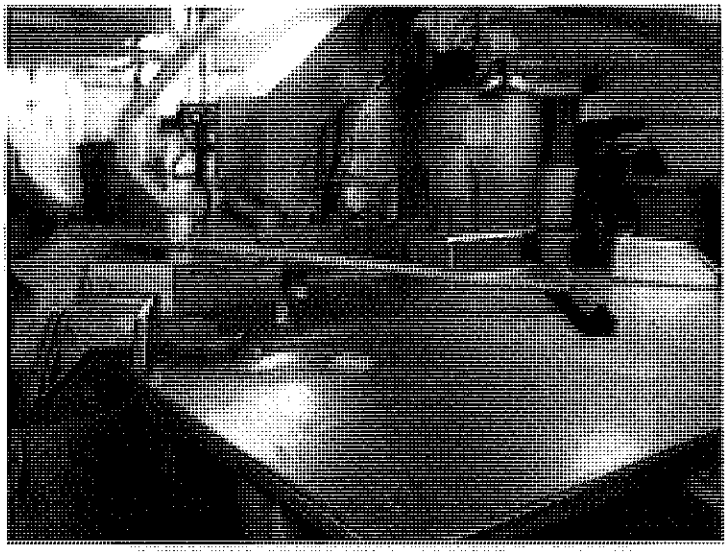

PHOTO #:09 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240012
DESCRIPTION: GARBAGE/RECYCLING SORTING AREA

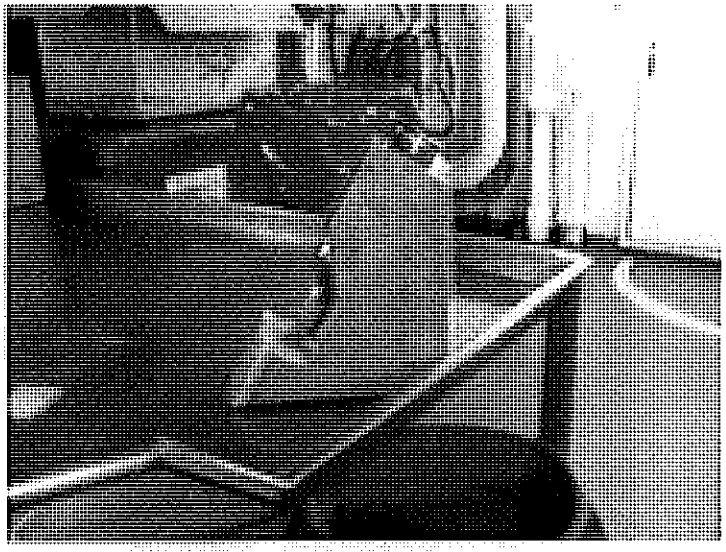

PHOTO #:10 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240013
DESCRIPTION: GLASS BOTTLE NECK REMOVAL DEVICE (MADE ON VESSEL)

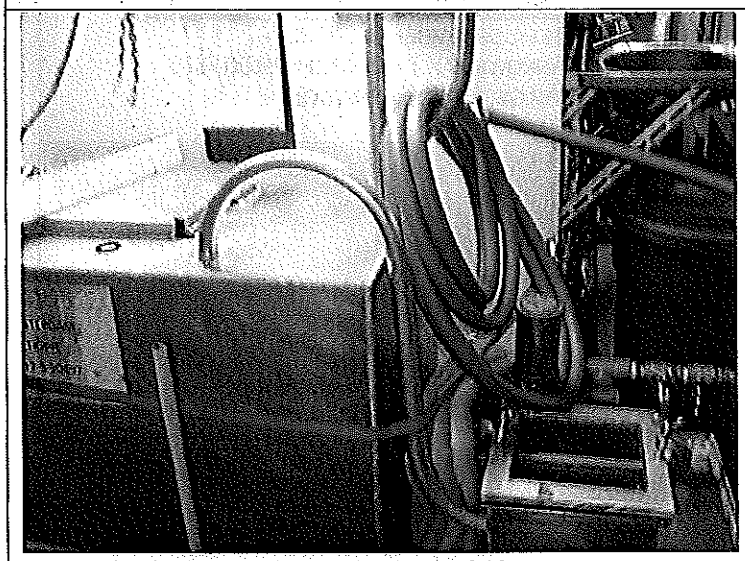

PHOTO #:11 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240015
DESCRIPTION: USED COOKING OIL FILTRATION SYSTEM

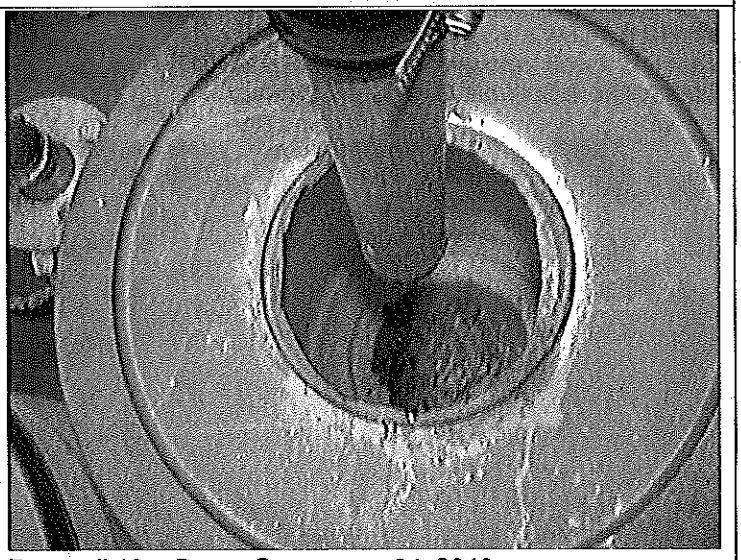

PHOTO #:12 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240016
DESCRIPTION: FOOD WASTE FROM PULPERS

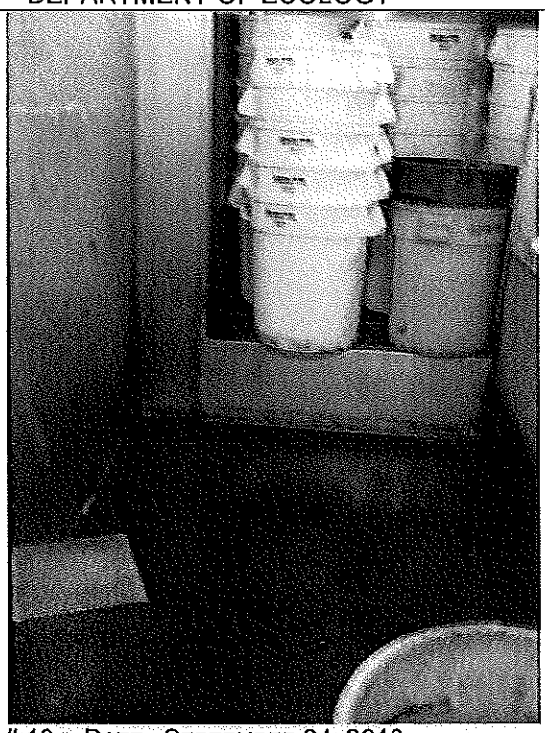

PHOTO #:13 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240017
DESCRIPTION: SORTING CAN CLEANING AREA

PHOTO #:14 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240018
DESCRIPTION: GARBAGE FOR INCINERATION

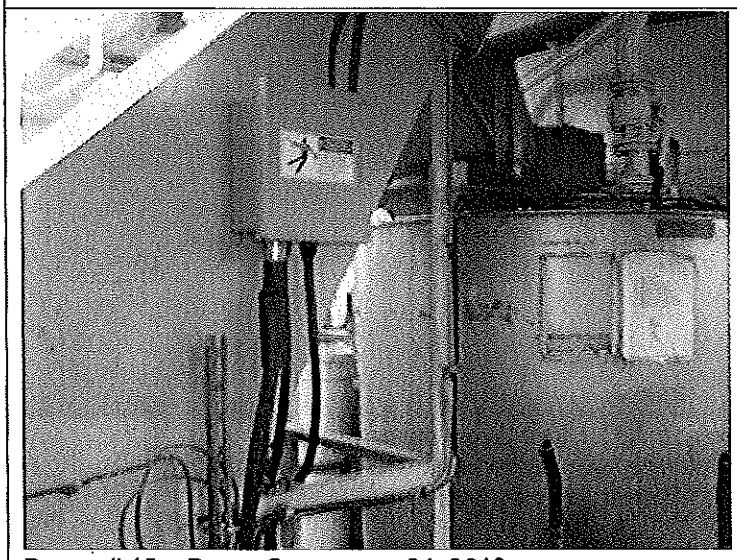

PHOTO #:15 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240019
DESCRIPTION: SOMAT PRESS FOR FOOD WASTE

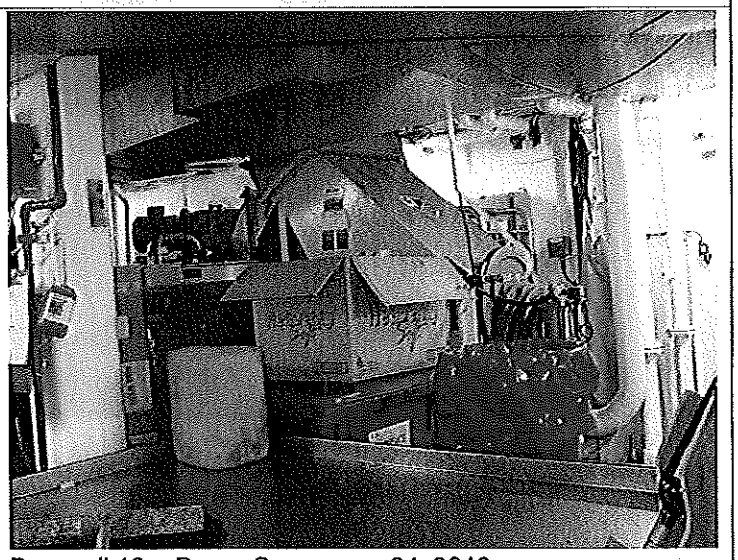

PHOTO #:16 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240020
DESCRIPTION: SECOND SOMAT PRESS (BACK), BATTERIES FOR RECYCLING(GREEN CAN)

PHOTO #:17 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240021
DESCRIPTION: AERSOL CAN PUNCTURING DEVICE

PHOTO #:18 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240023
DESCRIPTION: ENGINE CONTROL ROOM

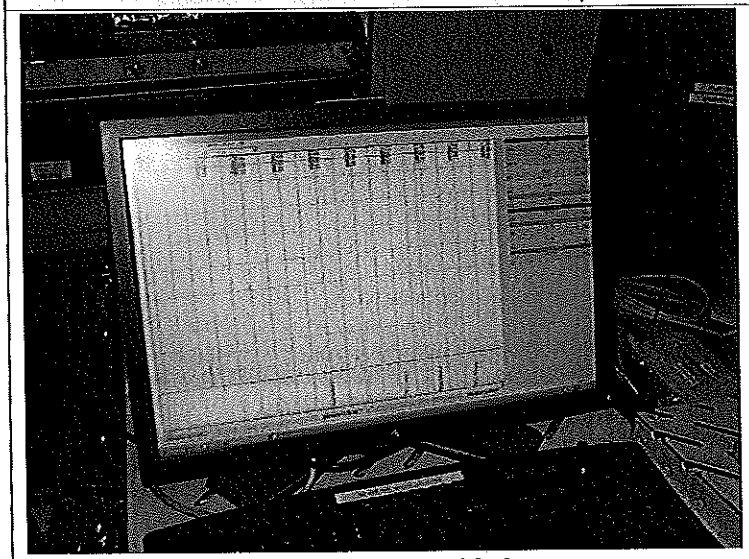

PHOTO #:19 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240024
DESCRIPTION: STACK OPACITY MONITORING

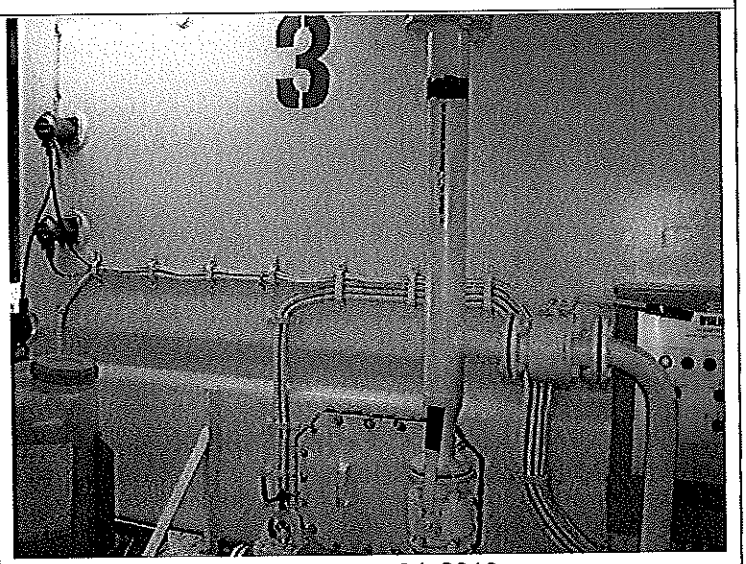

PHOTO #:20 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240025
DESCRIPTION: NUMBER 3 (OF 3) MARINE SANITATION DEVICE (MSD)

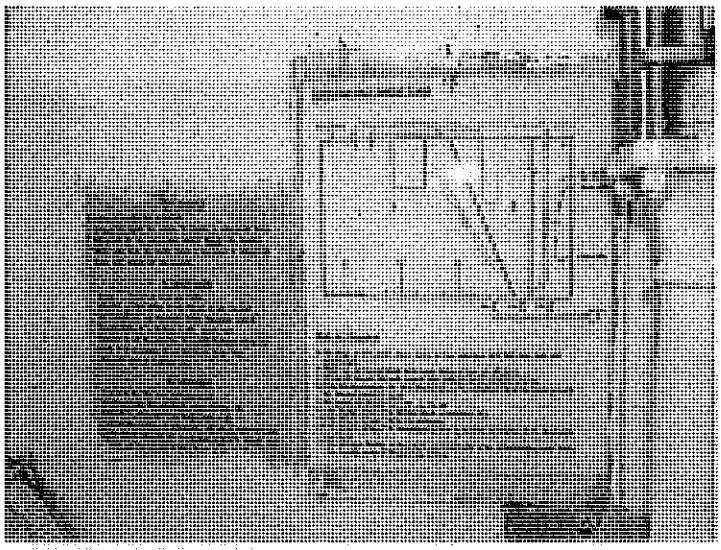

PHOTO #:21 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240026
DESCRIPTION: MSD DRAWING

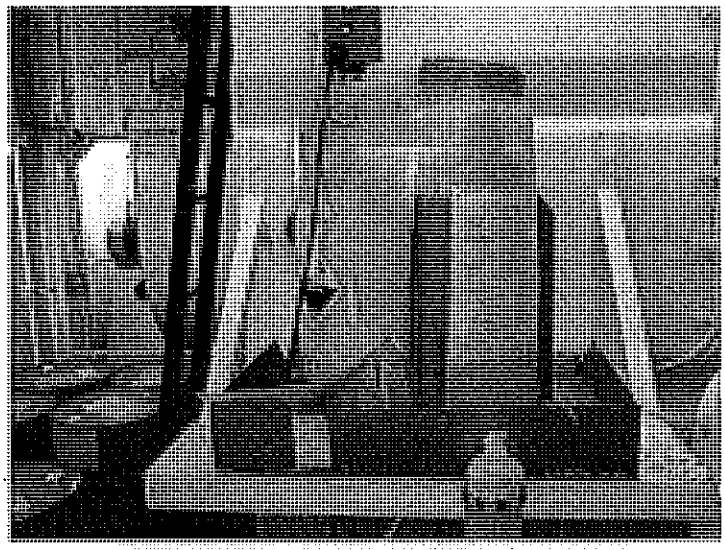

PHOTO #:22 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240027
DESCRIPTION: MSD CHLORINE ADDITION

PHOTO #:23 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240029
DESCRIPTION: MSD CHLORINE DOSING

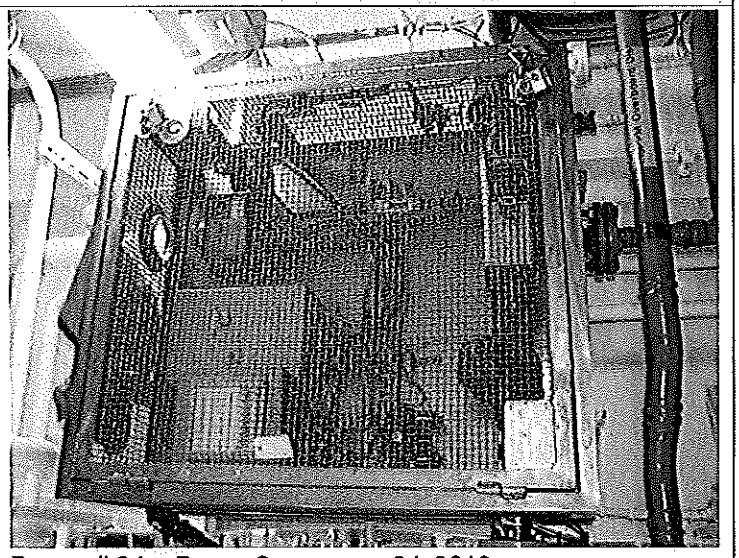

PHOTO #:24 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240030
DESCRIPTION: OILY WATER SEPARATOR (OWS) WHITE BOX

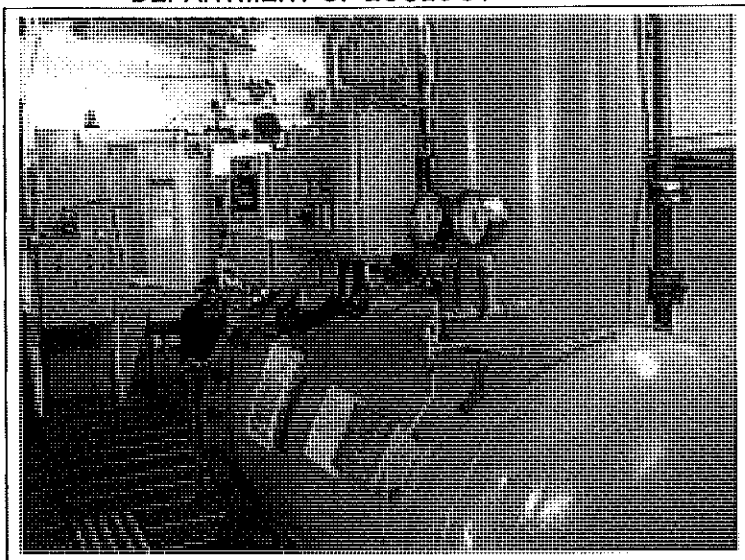

PHOTO #:25 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240031
DESCRIPTION: OWS FACET 50 PPM SYSTEM

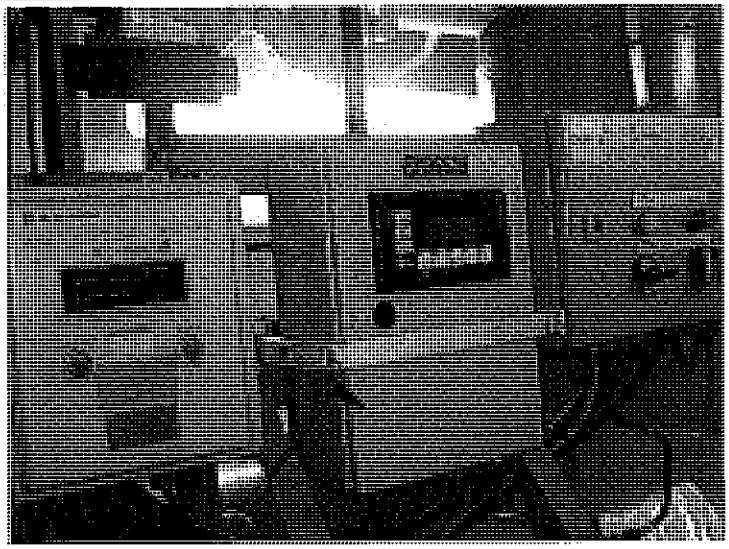

PHOTO #:26 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240032
DESCRIPTION: OWS FACET CONTROLS

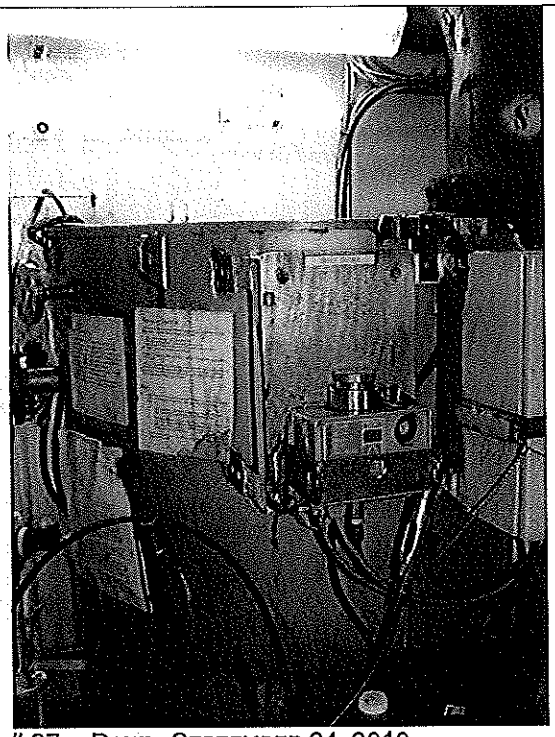

PHOTO #:27 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240034
DESCRIPTION: OWS SERAP 15 PPM SYSTEM

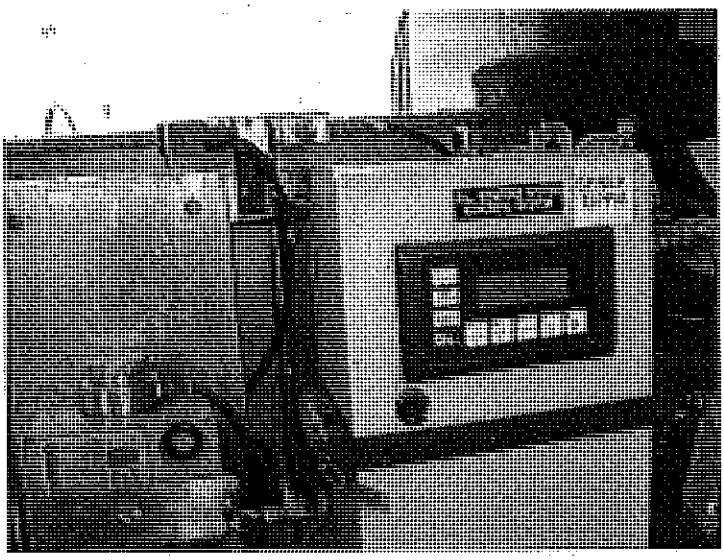

PHOTO #:28 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240035
DESCRIPTION: OWS SERAP CONTROLS

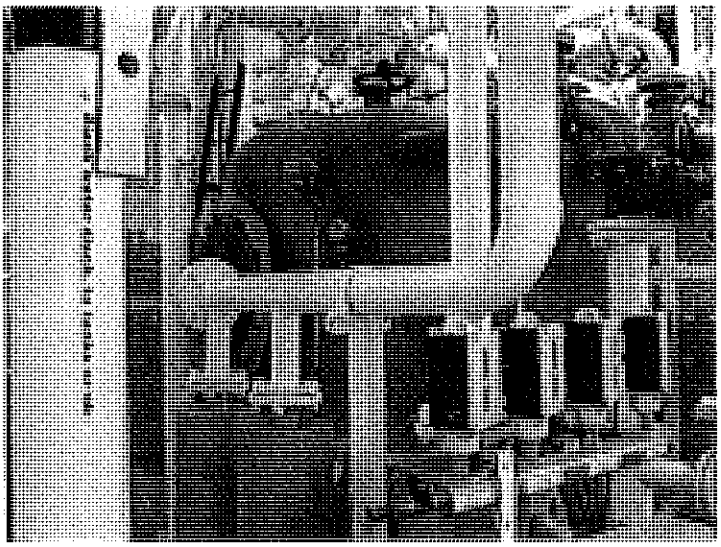

PHOTO #:29 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240038
DESCRIPTION: BLACK WATER COLLECTION TANK

PHOTO #:30 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240040
DESCRIPTION: ENVIRONMENTAL OBJECTIVES AND TARGETS DISPLAY

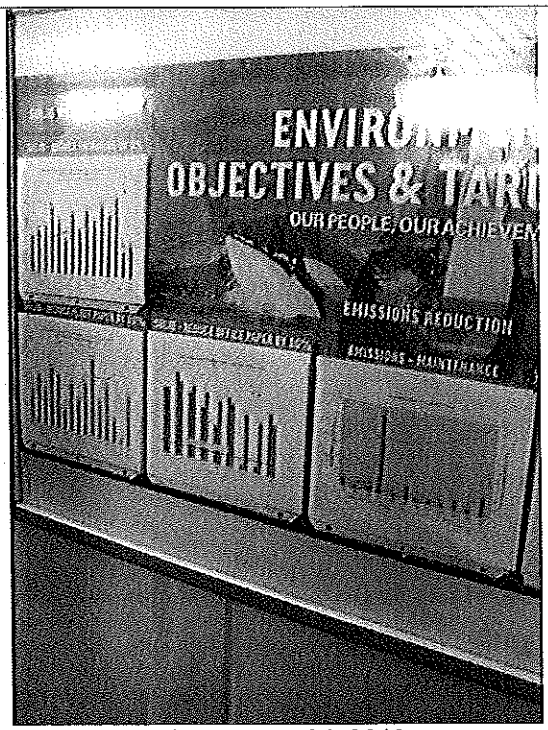

PHOTO #:31 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240041
DESCRIPTION: ENVIRONMENTAL OBJECTIVES AND TARGETS DISPLAY

PHOTO #:32 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240042
DESCRIPTION: SPA AREA

PHOTO #:33 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240043
DESCRIPTION: HAIR SALON CHEMICALS

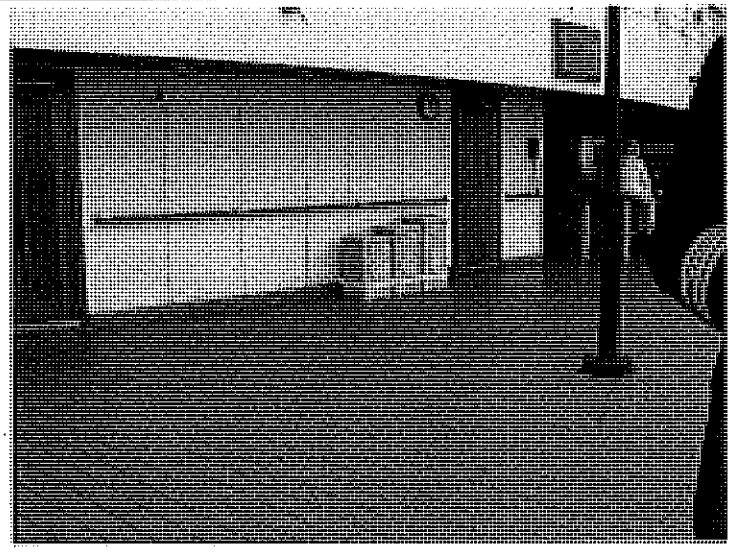

PHOTO #:34 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240044
DESCRIPTION: RECYCLE BINS FOR PASSENGERS

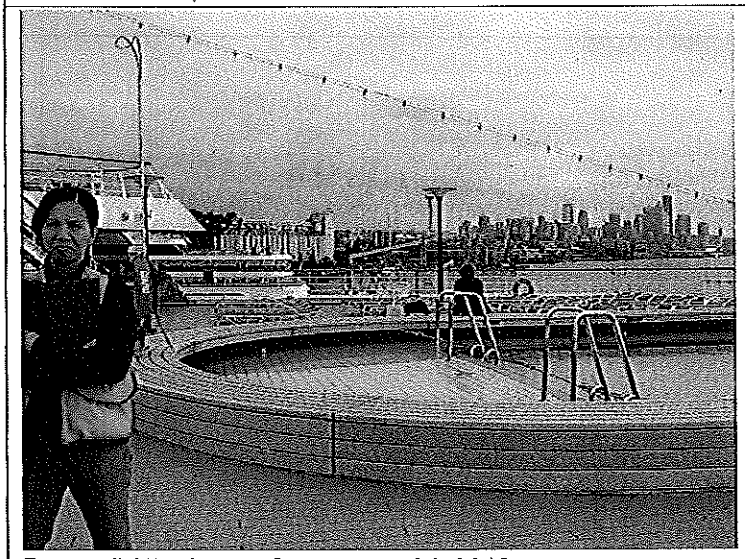

PHOTO #:35 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240045
DESCRIPTION: VIEW FROM LIDO DECK

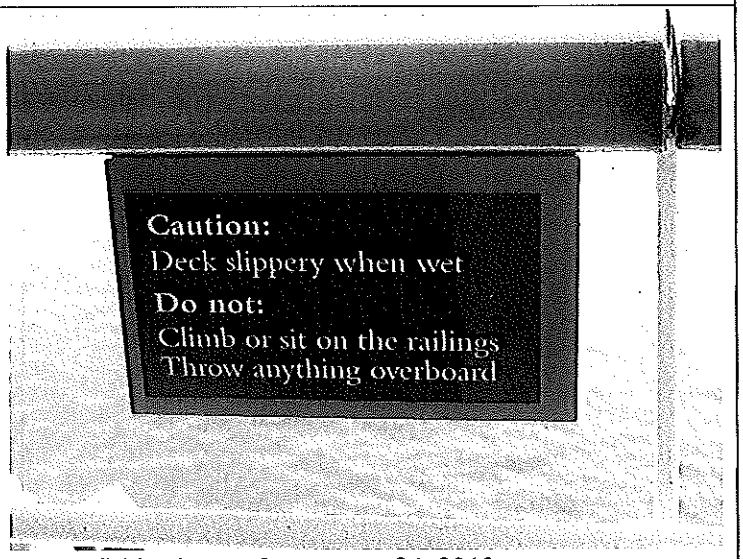

PHOTO #:36 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240047
DESCRIPTION: DO NOT THROW ANYTHING OVERBOARD SIGNAGE

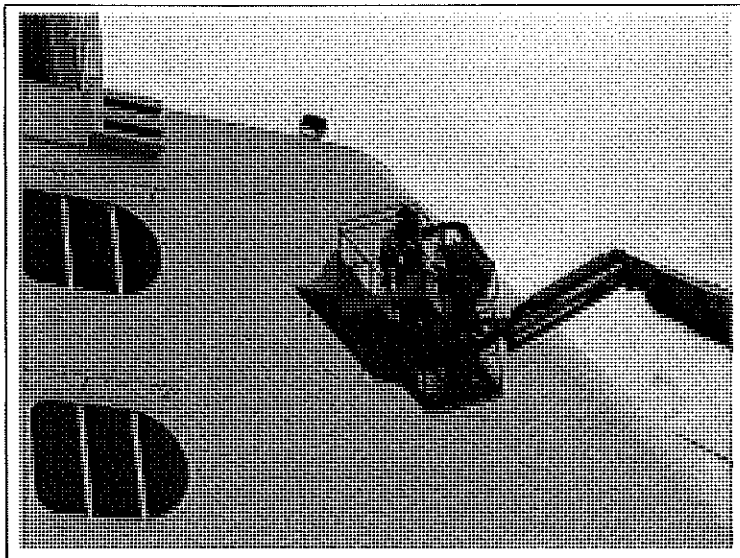

PHOTO #:37 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240049
DESCRIPTION: CHERRY PICKER PREP FOR PAINT TOUCH UP ON OUTSIDE OF VESSEL

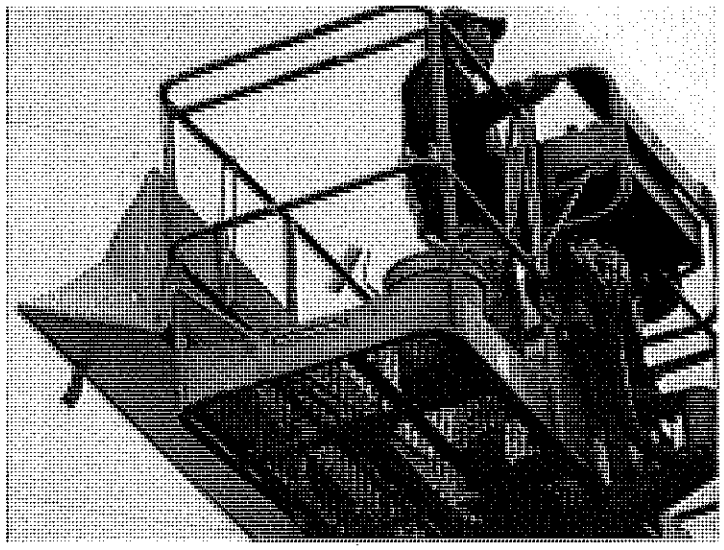

PHOTO #:38 DATE: SEPTEMBER 24, 2010
TAKEN BY: AMY JANKOWIAK FILE NO.:P9240050
DESCRIPTION: CHERRY PICKER PREP FOR PAINT TOUCH UP ON OUTSIDE OF VESSEL

Appendix D. Letters of Compliance from Member Lines

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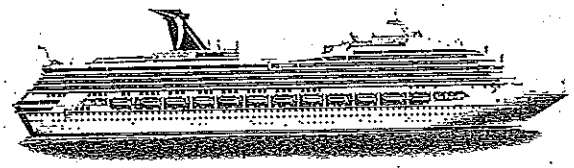
TB Amy



Carnival

November 11, 2010

Regional Director
Washington State Department of Ecology
Northwest Regional Office
3190 160th Ave. SE
Bellevue, WA 98008-5452

RE: Washington Cruise MOU Compliance Report 2010 Cruise Season

Dear Director:

Section 9 of the Memorandum of Understanding for Cruise Operations in Washington State signed April 20, 2004 and amended May 19, 2008, requires an annual submittal detailing the compliance with the MOU for each vessel within the NWCA that calls to a port in Washington for the previous cruise season. Please accept this letter on behalf on Carnival Cruise Lines (CCL) for the 2010 cruise season.

The following ships operated in Washington waters during 2010: Carnival Spirit, Seattle, May 11 through September 7 every 7 days for a total of 19 calls.

Carnival Spirit's operations in Washington State addressed the following key provision of the MOU as follows:

- In compliance with section 2.1.1 and 2.1.2, Carnival Spirit held all treated and untreated gray water, treated black water, and treated oily bilge water while in Washington waters and did not discharge solid waste at sea. The Carnival Spirit has 4 Triton type II MSDs for treating black water, a Rochem UF system for treating gray and black water, and 2 Norddeutsche oil water separators for treating bilge water. Based on a thorough review of the ship's logs and records we certify that our ship complied with these provisions of the MOU. CCL will make these records available to Ecology upon request.
- In compliance with section 2.1.4, Carnival Spirit held all residual solids from the MSDs for disposal ashore in Seattle. Residuals from the Rochem UF system were managed in compliance with 2.1.4. CCL will make these records available to Ecology upon request.
- In compliance with section 2.2.1 through 2.2.4, Carnival Spirit managed hazardous wastes in accordance with these sections of the MOU. CCL will make these records available to Ecology upon request. Hazardous wastes were disposed

of ashore in Seattle in accordance with the Department of Ecology and RCRA regulations. The Carnival Spirit landed 3,290 pounds of RCRA hazardous waste in Seattle in 2010.

- CCL certifies that Carnival Spirit was in compliance with section 6. Additionally, no ballast water was discharged in Washington waters. CCL will make these records available to Ecology upon request.
- Carnival Spirit had one incidence of non-compliance to report. The vessel had an accidental release of hydraulic oil from the Forward Starboard shell door on August 17 at 6:08 a.m. The rubber hose containing the hydraulic oil for the shell door ruptured when the door was opened and released approximately 1 gallon of oil into the water while docked at Pier 91 in Seattle. The hose was replaced within 30 minutes of identification. The U.S. Coast Guard, National Response Center, Washington State Maritime Cooperative, and Washington State Department of Ecology were all notified of the spill. Additionally, CCL's oil spill contractor was notified and requested to clean up the spill. The contractor arrived on scene but was unable to recover the oil in the water due to the wave action dissipating the spill and making it too sparse to recover.

I herby certify that the above information is true and can be verified through documentation. If you have any questions or concerns, please call me at 305-406-5806.

Sincerely,

Michelle Matejka

Michelle Matejka
Environmental Supervisor
Carnival Cruise Lines
3655 NW 87th Ave.
Miami, FL 33178
mmatejka@carnival.com

cc: Carnival Spirit Captain
Carnival Spirit Chief Engineer
Carnival Spirit Environmental and Occupational Safety Officer
Brendan Corrigan
Martin Kennerley
Gerald Zyderveld
Domenico Rognoni
Elaine Heldewier
Pablo Vaquer

Celebrity Cruises

January 7, 2011

Regional Director
Washington State Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5452

Dear Director:

Re: Washington Cruise MOU Compliance Report: 2010 Cruise Season

Section 9 of the Memorandum of Understanding for Cruise Operations in Washington State (April 20, 2004 as amended May 19, 2008), requires an annual submittal detailing the compliance with the MOU for the each vessel within the NWCA that calls to a port in Washington for the previous cruise season. Please accept this letter on behalf of Celebrity Cruises Inc. for the 2010 cruise season.

The following ships operated in Washington waters during 2010:

- *Celebrity Mercury;* Seattle: May 20
- *Celebrity Infinity*; Seattle: May 21,28; June 4,11,18,25; July 2,9,16,23,30; August 6,13,20,27; September 3,10,17,24.
- *Celebrity Millennium;* Seattle: May 3; September 20.

Celebrity Cruises Inc.'s operations in Washington State addressed the following key provisions of the MOU as follows:

Section 2.1 Wastewater Management. Celebrity Cruises Inc. managed its wastewater in compliance with this section as follows:

In compliance with Section 2.1.1 and 2.1.2, *Celebrity Mercury, Celebrity Infinity*, and *Celebrity Millennium* held all treated and untreated gray and black water while in Washington waters. The ships all have Type II Certified Marine Sanitation Devices and/or Type II Certified Advanced Wastewater Purification Systems (respectively Rochem, Zenon, and Hydroxyl), but due to sufficient holding capacities chose to hold as noted above. These ships also did not discharge solid waste or oily bilge water while in Washington waters. The ships all have Marinfloc Oily Water Separation Systems. Based on a thorough review of ships' logs and records we certify that our ship(s) complied with these provisions of the MOU. Celebrity Cruises Inc. will make these records available to Ecology upon request.

Section 2.1.4 Discharge of Residual Solids. Based on a review of ships' logs and records, Celebrity Cruises Inc. certifies that we complied with the prohibition on discharging residual solids coming from any type of treatment system within 12 nautical miles from shore and within the Olympic Coast National Marine Sanctuary. Celebrity Cruises Inc. will make these records available to Ecology upon request.

Section 2.2.1 through 2.2.4 Hazardous Waste Management. Based on a review of ships' logs and records, Celebrity Cruises Inc. certifies that Hazardous Wastes were managed in accordance with these sections of the MOU. All hazardous waste is landed shoreside to an approved hazardous waste vendor for processing and disposal in accordance with RCRA. Celebrity Cruises Inc. will make these records available to Ecology upon request.

Section 6. Marine Mammal Protection Act, Invasive Species Act, and the Washington Ballast Water Management Act. Based on a review of ships' logs and records, Celebrity Cruises Inc. certifies that the provisions of the above laws were implemented as required by these laws. Celebrity Cruises Inc. will make these records available to Ecology upon request. Further to Marine Mammal protection, the ships are provided with training materials and are under Washington State or U.S. Federal pilotage during their entire stay in MOU waters. Compliance with the Ballast Water laws is achieved through the administration of Celebrity Cruises Inc. Ballast Water Management Policy, which is in compliance with the IMO Ballast Water Convention and 33CFR 151.2000 et al.

Section 9. Immediate self-reporting to Ecology of any incidences of non-compliance with any provisions of the MOU. Celebrity Cruises Inc. experienced no violations of the provisions of the MOU during the 2010 season.

I hereby certify that the above information is true and can be verified through documentation. If you have any questions or concerns, please call me at 305-982-4874.

Sincerely,

Gregory M. Purdy
Vice President, Marine Operations
Celebrity Cruises Inc.

Holland America Line

Amy Jankowiak

PHONE: 206 281 3535
FAX: 206 281 7110

300 Elliott Avenue West
Seattle, Washington 98119

December 1, 2010

Regional Director
Washington State Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5452

Re: Washington Cruise MOU Compliance Report: 2010 Cruise Season

Section 9 of the Memorandum of Understanding for Cruise Operations in Washington State (signed May 19, 2008), requires an annual submittal detailing the compliance with the MOU for the each vessel within the Northwest Cruise Ship Association that calls to a port in Washington for the previous cruise season. Please accept this letter on behalf of Holland America Line (HAL) for the 2010 cruise season.

The following ships operated in Washington waters subject to the MOU during 2010:

- Amsterdam: Seattle, one call April 26, 2010; one call May 3, 2010; one call May 10, 2010; bi-weekly calls May 17 to September 20, 2010; one call September 24, 2010.
- Oosterdam: Seattle, weekly calls May 9 to September 26, 2010
- Rotterdam: Seattle, weekly calls May 15 to September 18, 2010
- Statendam: Seattle, one call May 15, 2010; Port Angeles, one call May 15, 2010
- Volendam: Seattle, one call September 23, 2010
- Zaandam: Seattle, weekly calls May 14 to October 1, 2010
- Zuiderdam: Port Angeles, one call May 7, 2010

HAL's operations in Washington State addressed the following key provisions of the MOU as follows:

Section 2.1 Wastewater Management. The HAL vessels listed above managed their wastewater in compliance with this section as follows: In compliance with Section 2.1.1 and 2.1.2, HAL held all treated and untreated gray and black water while in Washington waters and did not discharge solid waste or oily bilge water while in Washington waters. Amsterdam and Rotterdam have Hamworthy Type II MSDs. Statendam, Volendam, and Zaandam have Zenon Advanced Wastewater Treatment Systems (AWTS). Oosterdam and Zuiderdam have Rochem AWTSs. Based on a thorough review of ships' logs and records we certify that our ship(s) complied with these provisions of the MOU. HAL will make these records available to Ecology upon request.

Section 2.1.3 (C)(1-3) Shellfish and "upset" conditions. As noted above, and based on a review of HAL's ship's logs and records, HAL certifies that we complied with the prohibition on discharging within 0.5 nautical miles of bivalve shellfish beds that are recreationally harvested or commercially approved to harvest as identified annually by the Department of Ecology. For the above listed ships, there were no upset conditions that resulted in a discharge in MOU waters.

Section 2.1.3 (C)(4-10) Other discharge approval requirements. HAL did not submit documentation as described in sections 2.1.3 A. or B. of the MOU.

Section 2.1.4 Discharge of Residual Solids. Based on a review of HAL ships' logs and records, HAL certifies that we complied with the prohibition on discharging residual solids coming from any type of treatment system within 12 nautical miles from shore and within the Olympic Coast National Marine Sanctuary. HAL will make these records available to Ecology upon request.

Section 2.2.1 through 2.2.4 Hazardous Waste Management. Based on a review of HAL ship's logs and records in preparation for this report, HAL has determined that a shipment of seven fifteen gallon containers of treated photo processing waste (containing less that than 5 ppm silver), was offloaded in Washington State. HAL will make these records available to Ecology upon request.

Section 6. Marine Mammal Protection Act, Invasive Species Act, and the Washington Ballast Water Management Act. Based on a review of HAL ship's logs and records, HAL certifies that the provisions of the above laws were implemented as required by these laws. HAL will make these records available to Ecology upon request. HAL has developed an internal procedure designed to ensure compliance with all ballast waster regulations, this procedure is MR-704, the Ballast Water Management Manual.

Section 9. Immediate self-reporting to Ecology of any incidences of non-compliance with any provisions of the MOU. HAL operations in Washington State resulted in no known incidences of non-compliance with the MOU.

I hereby certify that the above information is true and can be verified through documentation. If you have any questions or concerns, please call me at (206) 301-5343.

Sincerely,

William J. Morani, Jr.
Vice President
Safety and Environmental Management Systems

WJM/jg

NORWEGIAN CRUISE LINE®

January 4, 2011

Regional Director
Washington State Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5452

Dear Director:

Re: Washington Cruise MOU Compliance Report: 2010 Cruise Season

Section 9 of the Memorandum of Understanding for Cruise Operations in Washington State (signed May 25, 2007), requires an annual submittal detailing the compliance with the MOU for each vessel within the NWCA that calls to a port in Washington for the previous cruise season. Please accept this letter on behalf of NCL (Bahamas) Ltd for the 2010 cruise season.

The following ships operated in Washington waters during 2010:

- NORWEGIAN STAR – Sailed from Seattle on 5/15, 5/22, 5/29, 6/05, 6/12, 6/19, 6/26, 7/03, 7/10, 7/17, 7/24, 7/31, 8/07, 8/14, 8/21, 8/28, 9/04, 9/11, 9/18 and 9/25. The vessel likely transited a small portion of Washington waters upon departure from Victoria, on 10/03, while enroute to Astoria, Oregon.

- NORWEGIAN PEARL – Sailed from Seattle on 5/09, 5/16, 5/23, 5/30, 6/06, 6/13, 6/20, 6/27, 7/04, 7/11, 7/18, 7/25, 8/01, 8/08, 8/15, 8/22, 8/29, 9/05, and 9/12. The vessel likely transited a portion of Washington waters on 4/29 while enroute to Victoria, BC and on 9/19 upon departure Vancouver, BC.

NCL's operations in Washington State addressed the following key provisions of the MOU as follows:

Section 2.1 Wastewater Management. NCL managed its wastewater in compliance with this section as follows:

- In compliance with Section 2.1.3, NCL submitted information supporting its request to discharge treated wastewater while underway more than one nautical mile from the berth to Ecology for the following ships - NORWEGIAN STAR and NORWEGIAN PEARL. Both of these ships are equipped with the Scanship Advanced Wastewater Treatment Systems (AWTS) and were sampled three times a month for the entire season (twice in Alaska, once in Washington). All sample results were submitted to

Department of Ecology and, with the exception of one, were within the standards detailed in the MOU. The May samples included one slightly high on fecal coliforms; as two samples were done, the Geomean met the standards, but the one result of 49 exceeded the 10% limit over 40. Effective steps were taken and all other samples throughout the season were acceptable. Approval to discharge while > 1nm from berth and speed greater than 6 knots was received from Ecology on May 4th, 2010 for both ships.

- In compliance with Section 2.1.3.A, NCL complied with each of the requirements to discharge including sampling requirements and, except as noted above, meeting effluent limitations.

Section 2.1.3 (C)(1-3) Shellfish and "upset" conditions. Based on a review of NCL ship's logs and records, NCL certifies that we complied with the prohibition on discharging within 0.5 nautical miles of bivalve shellfish beds that are recreationally harvested or commercially approved to harvest as identified annually by the Department of Ecology and that any "upset" conditions were stopped and immediately reported to the Washington State Department of Health.

Section 2.1.3 (C)(4-10) Other discharge approval requirements. Based on a review of NCL ship's logs and records and other knowledge, NCL certifies that the requirements in this section were met.

Section 2.1.4 Discharge of Residual Solids. Based on a review of NCL ships' logs and records, NCL certifies that we complied with the prohibition on discharging residual solids coming from any type of treatment system within waters subject to this MOU, within 12 nautical miles from shore and within the entire boundaries of the Olympic Coast National Marine Sanctuary. NCL will make these records available to Ecology upon request.

Section 2.2.1 through 2.2.4 Hazardous Waste Management. Based on a review of NCL ship's logs and records, NCL certifies that Hazardous Wastes were managed in accordance with these sections of the MOU. NCL will make these records available to Ecology upon request. All hazardous waste was collected and held aboard and landed ashore in Canada (Victoria or Prince Rupert) in accordance with Canadian and Company policies.

Section 6. Marine Mammal Protection Act, Invasive Species Act, and the Washington Ballast Water Management Act. Based on a review of NCL ship's logs and records, NCL certifies that the provisions of the above laws were implemented as required by these laws. NCL will make these records available to Ecology upon request. Prior to initial entry to Washington the NORWEGIAN STAR and NORWEGIAN PEARL each conducted an open ocean exchange of ballast and held all ballast water aboard during the

season. Appropriate Ballast Water Reports were filed with the U.S. Coast Guard and the Marine Exchange throughout the season.

Section 9. Immediate self-reporting to Ecology of any incidences of non-compliance with any provisions of the MOU. To my knowledge, there were no incidents of non-compliance.

I hereby certify that the above information is true and can be verified through documentation. If you have any questions or concerns, please call me at 305-436-4956.

Sincerely,

Randall R. Fiebrandt
Director, Environmental Operations
(T) 305-436-4956 (F) 305-436-4159

PRINCESS CRUISES

January 7, 2011

Amy Jankowiak
Water Quality Program
Washington State Department of Ecology, Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5452

Re: Washington Cruise MOU Compliance Report: 2010 Cruise Season

Dear Amy,

Please accept this letter on behalf of Princess Cruises for the 2010 cruise season.

The following ships operated in Washington waters during 2010:

- Royal Princess
- Golden Princess
- Sapphire Princess

Please see enclosure (1) for the listing of each date and port of call.

Princess Cruises' operations in Washington State addressed the following key provisions of the MOU as follows:

Based on a review of Princess Cruises' ship's logs and records, Princess Cruises certifies that we did not discharge while operating in Washington State Waters.

Based on a review of Princess Cruises' ship's logs and records, we certify that Hazardous Wastes were managed in accordance with the appropriate sections of the MOU. Princess Cruises' will make these records available to Ecology upon request. Hazardous waste offloaded in Seattle was managed by Waste Management. Most of our waste during the season was off-loaded in Victoria, Canada.

Princess Cruises
24305 Town Center Drive
Santa Clarita, California 91355-4999
Corporate 661 753 0000
Fax 661 259 3108
princess.com

Princess Cruises' ship management system provides instructions to its ships on marine mammal avoidance and its instructions on ballast operations are included in the ships ballast water management plan.

No incidences of non-compliance occurred during the 2010 season.

I hereby certify that the above information is true and can be verified through documentation. If you have any questions or concerns, please call me at 661-753-2745.

Sincerely,

George Wright
Senior Vice President
Marine Operations

Enclosures (1) – Listing of 2010 Princess Cruises: Washington State Port of Call Dates

Vessel Name	Arrival Date/ Time		Departure Date/ Time		Voyage #	Itinerary
Seattle - SEA, Usa						
2010						
Sapphire Princess	Thu 13-May-2010	09:00	Thu 13-May-2010	22:00	SA1020	10110.002
Golden Princess	Sat 15-May-2010	07:00	Sat 15-May-2010	16:00	NP1013	10012.003
Sapphire Princess	Sun 16-May-2010	07:00	Sun 16-May-2010	16:00	SA1022	10701.001
Royal Princess	Thu 20-May-2010	07:00	Thu 20-May-2010	16:00	RP1012	10739.001
Golden Princess	Sat 22-May-2010	07:00	Sat 22-May-2010	16:00	NP1014	10012.001
Sapphire Princess	Sun 23-May-2010	07:00	Sun 23-May-2010	16:00	SA1023	10701.001
Royal Princess	Mon 24-May-2010	07:00	Mon 24-May-2010	16:00	RP1013	10702.001
Golden Princess	Sat 29-May-2010	07:00	Sat 29-May-2010	16:00	NP1015	10012.003
Sapphire Princess	Sun 30-May-2010	07:00	Sun 30-May-2010	16:00	SA1024	10701.001
Golden Princess	Sat 05-Jun-2010	07:00	Sat 05-Jun-2010	16:00	NP1016	10012.001
Sapphire Princess	Sun 06-Jun-2010	07:00	Sun 06-Jun-2010	16:00	SA1025	10701.001
Royal Princess	Mon 07-Jun-2010	07:30	Mon 07-Jun-2010	16:00	RP1014	10702.002
Golden Princess	Sat 12-Jun-2010	07:00	Sat 12-Jun-2010	16:00	NP1017	10012.003
Sapphire Princess	Sun 13-Jun-2010	07:00	Sun 13-Jun-2010	16:00	SA1026	10701.001
Golden Princess	Sat 19-Jun-2010	07:00	Sat 19-Jun-2010	16:00	NP1018	10012.001
Sapphire Princess	Sun 20-Jun-2010	07:00	Sun 20-Jun-2010	16:00	SA1027	10701.001
Royal Princess	Mon 21-Jun-2010	07:30	Mon 21-Jun-2010	16:00	RP1015	10702.002
Golden Princess	Sat 26-Jun-2010	07:00	Sat 26-Jun-2010	16:00	NP1019	10012.003
Sapphire Princess	Sun 27-Jun-2010	07:00	Sun 27-Jun-2010	16:00	SA1028	10701.001
Golden Princess	Sat 03-Jul-2010	07:00	Sat 03-Jul-2010	16:00	NP1020	10012.001
Sapphire Princess	Sun 04-Jul-2010	07:00	Sun 04-Jul-2010	16:00	SA1029	10701.001
Royal Princess	Mon 05-Jul-2010	07:30	Mon 05-Jul-2010	16:00	RP1016	10702.003
Golden Princess	Sat 10-Jul-2010	07:00	Sat 10-Jul-2010	16:00	NP1021	10012.003
Sapphire Princess	Sun 11-Jul-2010	07:00	Sun 11-Jul-2010	16:00	SA1030	10701.001
Golden Princess	Sat 17-Jul-2010	07:00	Sat 17-Jul-2010	16:00	NP1022	10012.001
Sapphire Princess	Sun 18-Jul-2010	07:00	Sun 18-Jul-2010	16:00	SA1031	10701.001
Royal Princess	Mon 19-Jul-2010	07:30	Mon 19-Jul-2010	16:00	RP1017	10702.003
Golden Princess	Sat 24-Jul-2010	07:00	Sat 24-Jul-2010	16:00	NP1023	10012.003
Sapphire Princess	Sun 25-Jul-2010	07:00	Sun 25-Jul-2010	16:00	SA1032	10701.001
Golden Princess	Sat 31-Jul-2010	07:00	Sat 31-Jul-2010	16:00	NP1024	10012.001
Sapphire Princess	Sun 01-Aug-2010	07:00	Sun 01-Aug-2010	16:00	SA1033	10701.001
Royal Princess	Mon 02-Aug-2010	07:30	Mon 02-Aug-2010	16:00	RP1018	10702.003
Golden Princess	Sat 07-Aug-2010	07:00	Sat 07-Aug-2010	16:00	NP1025	10012.003
Sapphire Princess	Sun 08-Aug-2010	07:00	Sun 08-Aug-2010	16:00	SA1034	10701.001
Golden Princess	Sat 14-Aug-2010	07:00	Sat 14-Aug-2010	16:00	NP1026	10012.001
Sapphire Princess	Sun 15-Aug-2010	07:00	Sun 15-Aug-2010	16:00	SA1035	10701.001
Royal Princess	Mon 16-Aug-2010	07:30	Mon 16-Aug-2010	16:00	RP1019	10702.003
Golden Princess	Sat 21-Aug-2010	07:00	Sat 21-Aug-2010	16:00	NP1027	10012.003
Sapphire Princess	Sun 22-Aug-2010	07:00	Sun 22-Aug-2010	16:00	SA1036	10701.001
Golden Princess	Sat 28-Aug-2010	07:00	Sat 28-Aug-2010	16:00	NP1028	10012.001
Sapphire Princess	Sun 29-Aug-2010	07:00	Sun 29-Aug-2010	16:00	SA1037	10701.001
Royal Princess	Mon 30-Aug-2010	07:30	Mon 30-Aug-2010	16:00	RP1020	10702.003
Golden Princess	Sat 04-Sep-2010	07:00	Sat 04-Sep-2010	16:00	NP1029	10012.003
Sapphire Princess	Sun 05-Sep-2010	07:00	Sun 05-Sep-2010	16:00	SA1038	10701.001
Golden Princess	Sat 11-Sep-2010	07:00	Sat 11-Sep-2010	16:00	NP1030	10012.001
Sapphire Princess	Sun 12-Sep-2010	07:00	Sun 12-Sep-2010	16:00	SA1039	10701.001
Royal Princess	Mon 13-Sep-2010	07:30	Mon 13-Sep-2010	16:00	RP1021	10609.001
Golden Princess	Sat 18-Sep-2010	07:00	Sat 18-Sep-2010	16:00	NP1031	10012.003
Sapphire Princess	Sun 19-Sep-2010	07:00	Sun 19-Sep-2010	16:00	SA1040	10756.001
Golden Princess	Sat 25-Sep-2010	07:00	Sat 25-Sep-2010	16:00	NP1032	10211.003

Royal Caribbean International
1050 Caribbean Way
Miami, Florida 33132

tel 305.539.6000
www.royalcaribbean.com

January 7, 2011

Regional Director
Washington State Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5452

Dear Director:

Re: Washington Cruise MOU Compliance Report: 2010 Cruise Season

Section 9 of the Memorandum of Understanding for Cruise Operations in Washington State (April 20, 2004 as amended May 19, 2008), requires an annual submittal detailing the compliance with the MOU for the each vessel within the NWCA that calls to a port in Washington for the previous cruise season. Please accept this letter on behalf of Royal Caribbean International for the 2010 cruise season.

The following ship operated in Washington waters during 2010:

- *Rhapsody of the Seas;* Seattle: May: 14, 21, 28; June: 4, 11, 18, 25; July: 2, 9, 16, 23, 30; August: 6, 13, 20, 27; September: 3, 10.

Royal Caribbean International's operations in Washington State addressed the following key provisions of the MOU as follows:

Section 2.1 Wastewater Management. Royal Caribbean International managed its wastewater in compliance with this section as follows:

In compliance with Section 2.1.1 and 2.1.2, *Rhapsody of the Seas* held all treated and untreated gray and black water while in Washington waters. The ship has a Type II Certified Marine Sanitation Devices and/or Type II Certified Advanced Wastewater Purification System (respectively Navalis & Hamman), but due to sufficient holding capacity chose to hold as noted above. The ship also did not discharge solid waste or oily bilge water while in Washington waters. The ship has a Marinfloc Oily Water Separation System. Based on a thorough review of ships' logs and records we certify that our ship complied with these provisions of the MOU. Royal Caribbean International will make these records available to Ecology upon request.

Section 2.1.4 Discharge of Residual Solids. Based on a review of ships' logs and records, Royal Caribbean International certifies that we complied with the prohibition on discharging residual solids coming from any type of treatment system within 12 nautical miles from shore and within the Olympic Coast National Marine Sanctuary. Royal Caribbean International will make these records available to Ecology upon request.

Section 2.2.1 through 2.2.4 Hazardous Waste Management. Based on a review of ships' logs and records Royal Caribbean International certifies that Hazardous Wastes were managed in accordance with these sections of the MOU. All hazardous waste is landed shoreside to an approved hazardous waste vendor for processing and disposal in accordance with RCRA. Royal Caribbean International will make these records available to Ecology upon request.

Section 6. Marine Mammal Protection Act, Invasive Species Act, and the Washington Ballast Water Management Act. Based on a review of ships' logs and records, Royal Caribbean International certifies that the provisions of the above laws were implemented as required by these laws. Royal Caribbean International will make these records available to Ecology upon request. Further to Marine Mammal protection, the ships are provided with training materials and are under Washington State or U.S. Federal pilotage during their entire stay in MOU waters. Compliance with the Ballast Water laws is achieved through the administration of Royal Caribbean International's Ballast Water Management Policy, which is in compliance with the IMO Ballast Water Convention and 33CFR 151.2000 et al.

Section 9. Immediate self-reporting to Ecology of any incidences of non-compliance with any provisions of the MOU. Royal Caribbean International experienced no violations of the provisions of the MOU during the 2010 season.

I hereby certify that the above information is true and can be verified through documentation. If you have any questions or concerns, please call me at 305-982-2469.

Yours truly,

William S. Wright
Senior Vice President, Marine Operations

Appendix E. Annual Cruise Meeting Notes

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WASHINGTON ANNUAL CRUISE MEMORANDUM OF UNDERSTANDING & CRUISE SHIP UPDATE MEETING

Date/Time: January 13, 2011; 1:00 pm to 3:00 pm

Groups: Port of Seattle, WA Department of Ecology, Cruise Line Representatives, interested parties

Location: Port of Seattle, Pier 69

Attendees:

Bruce Carter, self
Shayne Cothern, Department of Natural Resources
Rosie Courtney, Port of Seattle
Jean Cox, Cruise Terminals of America (CTA)
Puth Eang, CTA
Rob Edwardson, Alaska Department of Environmental Conservation (ADEC)
Fred Felleman, Friends of the Earth
Randall Fiebrandt, Norwegian Cruise Line
Marie Fritz, Port of Seattle
John Hansen, North West & Canada Cruise Association (NWCCA)
Amy Jankowiak, Department of Ecology
Stephanie Jones Stebbins, Port of Seattle
Lincoln Loehr, Stoel Rives/NWCCA
Andrew Lorenzana, Princess Cruises (C/C)
Mike McLaughlin, Port of Seattle
Andy Nelson, Royal Caribbean International / Celebrity Cruises
Shannon Serrano, Surfriders (C/C)
Donna Spalding, NWCCA
Mark Toy, Department of Health
Heather Trim, People for Puget Sound
Jonathon Turvey, Holland America Line
Ellen Watson, Port of Seattle
Ed White, ADEC (C/C)

C/C = via conference call

Agenda

1:00 PM – 1:10 PM	**Welcome, Introductions** MOU Introduction presentation	(Amy Jankowiak, All)
1:10 PM – 1:30 PM	**Compliance with the 2010 season** Findings from 2010 season inspections/records review	(Amy Jankowiak, cruise line reps)
1:30 PM – 1:50 PM	**Updates** EPA Vessel Discharge Permit MOU Funding	(Amy Jankowiak)

	WET Tesing No Discharge Zones	
1:50 PM – 2:00 PM	**MOU Amendment on Amendment Process**	(Amy Jankowiak)
2:00 PM – 2:10 PM	**BREAK**	
2:10 PM – 2:20 PM	**Looking Ahead** What lines/vessels will be coming in 2011?	(Parties of the MOU)
2:20 PM – 3:00 PM	**Comments/Discussion from interested parties**	(Amy Jankowiak, All)

Welcome, Introductions

Welcome and introductions

Compliance with the 2010 Season, Amy Jankowiak, Department of Ecology

Began by going through PowerPoint slides on Compliance for the 2010 season. (Link to PowerPoint included on Ecology website)

2010 Approvals

- 100% *port calls from large cruise ships under the MOU, 2 vessels approved; 223 port calls*
- >1 nm and > 6 knots
  - NORWEGIAN PEARL
  - NORWEGIAN STAR
- Continuously
  - NONE

Compliance Evaluation consists of:

- Discharge Approval Process
- Inspections
- Sampling Data
- Annual Reports/Records Review

Typical Inspection includes

- Introductions/overview of plan for the day (prior notification given)
- Control room
  - Run-through of how system works
  - Variety of questions on staffing, training, protocols…
  - Review of records
- Tour of treatment system(s)
- Observations of other waste streams on the ship
- Sampling
- Conclude
- Approximately 2-3 hours in length
- Similar to inspections for on-land plants

2010 Inspections

- Inspections Conducted
  - 8 inspections conducted (mix of homeported vessels and less frequent callers)
- Inspection findings

- Discharge protocols thorough with verification
- Recommendations made –
  - Continue to work towards high functioning wastewater treatment systems
- 4 of 8 inspected operating traditional MSDs (2AWTS's not functioning properly, not discharging)
- Waste Minimization efforts impressive
- Take care with implementing BMPs for ship painting and maintenance while at Port

- Copies of discharge documents requested
  - Requested, some submitted, in process of reviewing

DATE OF INSPECTION	VESSEL
June 18, 2010	RCCL RHAPSODY OF THE SEAS
July 6, 2010	CARNIVAL SPIRIT
July 31, 2010	HAL ROTTERDAM
August 16, 2010	ROYAL PRINCESS
August 29, 2010	NORWEGIAN PEARL
September 12, 2010	SAPPHIRE PRINCESS
September 20, 2010	CELEBRITY MILLENNIUM
September 24, 2010	HAL AMSTERDAM

Ecology noted that of the vessels inspected, four of the vessels use traditional marine sanitation equipment, two use AWTS and the other two are equipped with AWTS, but are using traditional MSD equipment because the AWTS were not operating consistently. Ecology recommends continuing work toward the use of functioning AWTS systems.

Ecology noted that the cruise lines had met earlier and had a detailed discussion of requirements related to outside vessel maintenance such as paint chipping, painting, and related maintenance while at port to prevent discharges to water.

Friends of the Earth expressed concern that not all vessels were inspected. Ecology noted that the number of vessels inspected is a representative sample of the fleet, a standard similar to that used for inspections of land based treatment plants. It was also noted that the inspections completed in 2010 represent both ships with frequent and infrequent calls to Washington.

2010 Sampling

- Sampling data received and evaluated. Summary of data and data will be included in the 2010 annual report
  - pH all within 6.0-9.0, but some lower than WA WQ standard of 7.0
  - BOD max of 17 mg/l, TSS max of 12 mg/l
  - Chlorine all ND
  - Fecal mostly ND, although two higher fecals: 96 and 50 #/100 ml (sampling events were in Alaska waters) – not in violation of MOU
  - Ammonia ranged from 0.52 mg/l to 35 mg/l (avg = 18); lower than previous seasons

- Dissolved Copper range = Non Detect to 22 ug/l (lower than previous seasons)
- Dissolved Nickel range = Non Detect to 16 ug/l (lower than previous seasons)
- Dissolved Zinc range = 23 ug/l to 220 ug/l

It was pointed out that the requirements for ammonia, copper, nickel and zinc monitoring come from the Alaska requirements. Sampling results above are for vessels approved to discharge (results from both Alaska testing and Seattle testing).

- WET testing
  - Purpose is to evaluate whether there are potential toxicity issues from vessel discharges.
  - Required for vessels approved for discharge continuously – once every two years for homeported vessels (20 calls) or 1/40 port calls or turnarounds.
  - Previous Results – toxicity from ammonia and possibly from surfactants and detergents.
  - No vessels required to conduct WET testing in 2010

2010 Compliance Notifications

- Compliance notifications
  - No reported incidents for 2010 season to date
  - Compliance letters
    - Receiving

2009 Assessment of Cruise Ship Environmental Effects in Washington

- Recommendations
  - Ecology recommends MOU continue to be used as a complement to environmental regulations until state specific regulations for cruise ship waste management in Washington are put in place
  - Ecology continue to inspect ships that discharge, including closely looking at wastewater management and other waste streams [Continuing inspections]
    Ecology continues to inspect the vessels
  - Parties of MOU continue to work together on evaluating discharges from cruise ships into MOU waters. The parties to the MOU will also meet to discuss and make recommendations on how best to proceed in regard to evaluating future proposed amendments to the MOU and how to best take public input on proposed amendments. The parties to the MOU will continue to meet in regard to future MOU funding mechanisms to support Ecology staff on maintaining and implementing the MOU. [Amendment to the MOU agreed upon by MOU parties to incorporate a new process]
  - Cruise lines to conduct a thorough review of records on an on-going basis and at end of season to evaluate compliance and inspection recommendations to be implemented.

Upon a question about coverage of air quality issues under the MOU, Ecology confirmed that air emissions are not an element of the MOU, that this falls under the jurisdiction of the Clean Air Agencies and further that Ecology does not inspect the incineration logs as a regular protocol. The member lines confirmed that if DOE wished to, they could review the incineration logs when on board the ships. Friends of the Earth questioned the cruise lines about where they are located when they are incinerating and some member lines stated that they do not incinerate while in MOU waters.

There was some discussion comparing the standards in neighboring jurisdictions (Canada, Oregon, Alaska, and California). NWCCA and Norwegian Cruise Line representatives commented on the Marpol Annex VI standards and regulations adopted by Canada, noting that blackwater regulations are similar to Alaska and Canada is currently developing standards for graywater. Also that the NWCCA member lines follow practices as outlined in the CLIA standards.

Updates

EPA Vessel General permit, Amy Jankowiak, Department of Ecology, cruise line reps

Ecology provided an update on the VGP including that EPA is in the beginning process of drafting the next version of the VGP. Ecology will be monitoring the current process carefully and offering comments that will provide for the 401 certification to include requirements to meet State water quality standards. EPA has communicated that they plan to give the State's appropriate time to provide for a 401 Certification evaluation.

MOU Funding, Amy Jankowiak, Department of Ecology, and Marie Fritz, Port of Seattle

It was discussed that funding for the MOU is covered for the 2011 year through reserve funds from previous seasons, however, the Port of Seattle requests to change how the funding from the cruise lines is sent to Ecology. The parties have had some discussions on the scenarios for funding in the future and are to evaluate how to collect actual costs in the future.

Whole Effluent Toxicity Testing, Amy Jankowiak, Department of Ecology, cruise line reps
As there was already a discussion on WET testing during the Compliance timeslot, no further discussion on WET testing was necessary.

No Discharge Zones, Amy Jankowiak, Department of Ecology and Mark Toy, Department of Health

Ecology provided information that Ecology and Department of Health will be working on a study as a first step to consider all or part of Puget Sound for a no-discharge zone designation. EPA is providing a grant to Ecology through Department of Health sometime in February. Department of Health noted that there are several departments involved in this and will be working on an agreement to complete the work. Ecology noted that this is being done as part of the Puget Sound Partnership's Action Agenda to prevent pathogen and nutrient loading into the waters. There was some discussion of the timeline (about two years to complete the initial study of what is available to support the designation – ship numbers, existing pump out facilities, whether or not they work, identification of high priority areas, etc.). The grant period is six years.

It was noted by cruise line members that this effort may not be practical for ocean going vessels and might be restricted to high priority areas frequented by recreational and smaller vessels only.

Ecology noted that they will work to keep all stakeholders informed and involved throughout the process.

MOU Amendment on Amendment Process

Ecology provided an update on the process that the parties of the MOU have been going through to revamp the amendment process for the MOU. The parties had met several times in person or by phone, drafted language and that the parties have agreed on language to amend the MOU. The amendment was presented. The amendment includes language that the MOU will be reviewed with public comment once every three years; starting with a request for proposed amendments on Ecology's and the Port's websites, followed by a review period. Amendments that meet criteria laid out in the MOU will be posted for a 30-day public comment period, followed by a review by signatories and decision by the MOU parties on adoption by unanimous approval. The only exception of the process is an amendment proposed by one of the signatories and supported unanimously by the other two signatories.

The amendment process agreed to was also supported by the Port of Seattle Commissioners. In response to questions, it was noted that members of the public may offer comment even though the process has been agreed to by the signatories. There were comments from People for Puget Sound and Friends of the Earth on the timing of the annual report and data review as it relates to the timing of the amendment process. Access to various sources of testing were discussed. In addition to the results collected by Ecology which will be provided with the annual report, results are also available from the Alaska DEC website. It was noted that moving the timeline for the amendment process back to allow for more review time of data, would inhibit completing amendments prior to the next cruise season.

The criteria for amendments were discussed, and the Port of Seattle noted that the position of the Port of Seattle going forward is that the Commissioners will vote on any proposed amendments.

Friends of the Earth reiterated concerns that the collection and publication of data by Ecology under the current process does not allow public review prior to the time specified for submission of proposed amendments. Further, they indicated concern that an amendment requires support of one of the signatories. Ecology offered that Ecology would not turn away any amendment demonstrating environmental gain for those areas under the jurisdiction of the MOU.

[This amendment has since been signed and the MOU, 5th Amendment is available on Ecology's website.]

Looking Ahead

John Hansen with NWCCA commented on his impending retirement from NWCCA and thanked Ecology and the Port of Seattle for their partnership, effort and work in the development of the MOU and the important role it has played since its inception in 2004.

Discussed schedule for 2011 season. Mostly the same vessels as last season. The schedule will be available shortly on the Port of Seattle's website.

Comment/Open Discussion, All

There being no further comments or questions, the meeting was adjourned at 3:00 pm.