



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
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Inspection Date August 2, 2014	Permit Number NA	County King	Receiving Waters Marine Waters	Ecology Inspector Amy Jankowiak
Entry Time 8:53 am	Photos Taken	Samples Taken	Inspection Announced	Discharges to: <input checked="" type="checkbox"/> Surface Water
Exit Time 10:44 am	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Ground Water <input type="checkbox"/> Dewater <input type="checkbox"/> POTW
Name and Location of Site Inspected: NORWEGIAN JEWEL, Norwegian Cruise Line Pier 66 Seattle, Washington				Additional Participants/Inspectors:
On-Site Representative(s): <i>Name/Title/Phone/e-mail</i> Spiros Zervopoulos, Environmental Officer Env21@NCL.com				
Responsible Official(s): <i>Name/Title/Address/Phone/e-mail</i> 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 July 28, 2014

Section A: Areas Evaluated

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

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

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

NOT APPLICABLE

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

Additional General Questions

<input checked="" type="checkbox"/>	How is deck runoff and hull cleaning handled (scuppers...) (non-toxic/phosphate free cleaners, biodegradable)	Deck runoff and hull cleaning appears to be handled per MOU requirements.
<input checked="" type="checkbox"/>	How is maintenance performed on the outside of the vessel (paint chipping, painting, etc)	Outside vessel maintenance appears to be handled per MOU requirements.
<input checked="" type="checkbox"/>	Sculleries and Galleys – type of detergents and degreasers used (phosphate free and non-toxic)?	Galleys appear to use phosphate free and non-toxic detergents and degreasers.
<input checked="" type="checkbox"/>	How are food waste discharges handled (prevention of erroneous materials)?	Food waste appears to be handled per MOU requirements.
<input checked="" type="checkbox"/>	Medical sinks/floor drains, chem. stor areas wastes go where (plugged, blackwater, bilge)?	Medical sinks/floor drains appear to be handled per MOU requirements.
<input checked="" type="checkbox"/>	Where is pool and spa water discharged? Dechlorinated/debrominated and underway?	Pool and spa water appears to be handled per MOU requirements.
<input checked="" type="checkbox"/>	What type of fuel is used and percent sulfur content?	<1% sulfur content is used throughout the route.

Other:

Section F: Sampling Results

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

Section G: Summary of Findings/Comments

Introduction

Amy Jankowiak, Washington State Department of Ecology (Ecology) Northwest Regional Office, Water Quality Program (NWRO-WQ) conducted the inspection of the Norwegian Cruise Line (NCL) NORWEGIAN JEWEL on August 2, 2014. The main contact on board the NORWEGIAN JEWEL was Spiros Zervopoulos, Environmental Officer for the NORWEGIAN JEWEL. Prior notification of the visit was given on July 28, 2014 for security protocol. The purpose of the inspection was to evaluate compliance with the *Memorandum of Understanding Cruise Operations in Washington State* (MOU), as amended. The NORWEGIAN JEWEL is not approved to discharge wastewater in MOU waters.

The NORWEGIAN JEWEL entered service in 2005, is 965 feet long with 15 decks and about a 27-foot draft. The passenger capacity is about 2376 and the crew capacity is about 1100.

The NORWEGIAN JEWEL is scheduled for 18 port calls in Seattle and conducts one week cruises to Alaska turning around on Saturdays between May 17, 2014 and September 13, 2014.

Inspection

I arrived and boarded the ship (photos #01 and #36) at about 8:53 am and began with introductions and a plan for the day with Spiros Zervopoulos, Environmental Officer (EO). We discussed discharge protocols and various waste streams. We then reviewed the various discharge and environmental records in the Engine Control Room (ECR). We then toured the Scanship blackwater and graywater Advanced Wastewater Treatment System (AWTS) and the oily bilge treatment system. We toured the garbage and recycling rooms, hazardous waste storage, water bunkering (photo #35) and the food waste system. The inspection was then finalized with a debriefing and I disembarked the vessel at about 10:44 am.

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

The discharge protocol for wastewater includes an "environmental voyage plan" that is discussed and planned prior to the cruise season and is marked on the charts. When a discharge is to occur, the bridge notifies the ECR and the EO that they are within 30 minutes of an authorized area and within 30 minutes of exiting an authorized area. The locations are logged on the bridge and in the ECR as well as electronically. The control screens in the ECR also have an Overboard Valve in the locked or unlocked position (photo #02). The EO, Chief Engineer and the Captain are the only ones who have the port keys to unlock the discharge port. The EO is notified to open the discharge port. The environmental voyage plan for the 2014 season requires that all discharges (wastewater, oily bilge, ballast water, food waste, galley water, etc.) not occur in MOU related waters. For black water and gray water, the latitude and longitude coordinates are recorded in the *Sewage and Graywater Discharge Record Book*. 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, Washington State waters or the Olympic Coast National Marine Sanctuary (OCNMS) (MOU related waters).

Screenings and grit from drum screen as well as biomass (sewage sludge) from the Scanship system is held and then discharged (photo #18) outside of MOU related waters.

Medical floor drains go to the blackwater tanks and then to the Scanship system. Biohazardous wastes are collected and offloaded as biohazardous waste. Sharps are off-loaded with hazardous waste.

All hazardous waste that is collected is being sent off-shore in Victoria, Canada. Some logs were reviewed and showed consistency. Hazardous waste materials include items such as aerosols, paints, thinners, batteries, dry cleaning waste, photo waste and sharps.

Waste from the photo processing goes through a silver recovery system to <5ppm prior to offload with hazardous waste materials. X-rays are done digitally.

Dry cleaning uses PERC which is off-loaded with hazardous waste. Laundry water is collected and sent through the Scanship system.

Expired and unused medications are either offloaded back to the vendor or offloaded for disposal. Narcotics are incinerated with witness.

Fluorescent lamps go through a bulb crusher (photo #33) and are then offloaded. Mercury filters are offloaded as hazardous waste. Other types of bulbs are offloaded as hazardous waste (photo #34).

The various solid waste streams are collected, sorted, stored (photo #28), and sent ashore or incinerated as appropriate. The garbage record book was reviewed and showed consistency with requirements. Glass (photo #27), some plastics

(photo #26), pallets, aluminum, tin, scrap metal, batteries (photo #31) some paper, non-contaminated cardboard, used cooking oil (photo #29), and other materials are recycled. Reduction and reuse opportunities are broadly used to prevent the amount of waste. Some materials are stored in cold storage (photo #32).

Incinerator ash is offloaded and tested annually for non-hazardous status. Results have passed. Food-contaminated cardboard, soft plastics and paper are incinerated (photo #30). The amount of materials being incinerated has reduced drastically and the vessel plans to remove one of the two incinerators (photo #24) for space. Fuel at <1% sulfur is used throughout the cruise.

In response to a report received by Ecology concerning the off-loading of what was reported as international garbage, records of offloads for certain dates were reviewed and showed that the only waste offloads included metals, insulation and wood debris from the scrubber which is being removed for a new installation. The materials were sent to Waste Management for recycling per contract.

Oily bilge is treated first with a Marin Floc oily water separator system (photos #19 and #20) and then with an RWO oily water separator system (photo #21) to bring oil content down to <15 ppm. Values are usually less than 5 ppm. Discharges (photo #23) occur at less than 15 ppm and outside of MOU related waters. A white box (photo #22) is used to prevent discharges of more than 15 ppm. At the time of the inspection, a vendor was on board to calibrate the two white boxes. Oily sludge is drummed and offloaded for proper disposal. Oily rags are incinerated.

The last ballast exchange occurred prior to the beginning of the season outside of 200 nautical miles.

Food waste is sorted prior to going into the pulper (photo #25). Bones are crushed and some food is sent to the new compost bins (photo #32) which are offloaded in Victoria. To assure proper sorting, signs, training and checks are done. Solid food waste is discharged outside of MOU related waters after pulping and with pulping water after recirculation. Grease is collected from galley grease traps and offloaded.

Phosphate free, non-toxic cleaners are used in the galleys (Swisher brand).

Upper hull cleaning is done underway. Bottom hull cleaning is only done when in dry dock. Deck runoff goes to the scuppers and overboard. Windows are spray cleaned with fresh water and non-toxic, phosphate free detergents and usage is logged.

Paint chipping and painting is not done in the Port of Seattle.

Pool and spa water is discharged outside of MOU related waters and is de-chlorinated prior to discharge. Spa water can also be sent to the graywater tanks.

Scanship System:

Blackwater, which includes toilet waste and infirmity drains by vacuum to one of the collection tanks and graywater which includes sink and shower water, galley water, spa water and laundry water, combines in tanks before combining and entering the drum screens. There are two drum screens (photo #03) which provide pre-screening. The drum screens are cleaned weekly with water. Solids from the drum screens go to the sludge tank (photo #17). Liquid flow from the drum screens then enters the biostep tanks (photos #04 and #05) for biological treatment (biofilm on rotating plastic pieces – 2 tanks in series, air added). After biostep, coagulants and polymers are added (photo #08). Clarification then occurs via flotation tanks (photos #06, #07 and #09). Solids from the flotation tanks are sent to the sludge tank along with the screenings to be held for later discharge. Liquid flow then moves to the polishing filters (photo #10) for ultrafiltration (2 rotating mesh drums). Flow then moves to ultraviolet light (UV) disinfection (photo #14). There are three UV units, of which two are typically used with 14 bulbs each. The bulbs are alarmed for bulb failure and intensity. The UV sleeves are cleaned by dosing Ameroid RSR cleaner automatically, daily. The UV light sleeves are also hand wiped about once a month. Effluent (photo #13) from the UV units is either discharged directly overboard via the discharge port (photo #15) or is held for discharge later outside of MOU waters. The engineer showed us how the valve system works when the turbidity is raised (photo #12). A total suspended solids (TSS) meter measures solids (equivalent to turbidity) continuously at the UV system. The TSS meter is alarmed at 30 mg/l to shut down the discharge. Effluent pH is also continuously monitored (photo #11). And flow is measured at the discharge port (photo #16). The Scanship operator said that the meter only spikes when cleaning occurs.

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.

Attachments:
Photographs

Copies to:

Spiros Zervopoulos, Environmental Officer, NORWEGIAN JEWEL
Randy Fiebrandt, NCL
Mark Toy, Department of Health
Greg Wirtz, NWCCA
Amy Jankowiak, Ecology
Mark Henley, Ecology
Kevin Fitzpatrick, Ecology

Central Files: Norwegian Cruise Line - NORWEGIAN JEWEL; WQ 6.1

<u>Name and Signature of Inspector:</u> Amy Jankowiak 	<u>Agency/Office/Telephone:</u> Department of Ecology Northwest Regional Office Water Quality Program Municipal Compliance Specialist 425-649-7195	<u>Date</u> 8/7/14
<u>Name and Signature of Reviewer:</u> Mark Henley 	<u>Agency/Office/Telephone:</u> Department of Ecology Northwest Regional Office Municipal Unit Supervisor 425-649-7103	<u>Date</u> 8/7/14

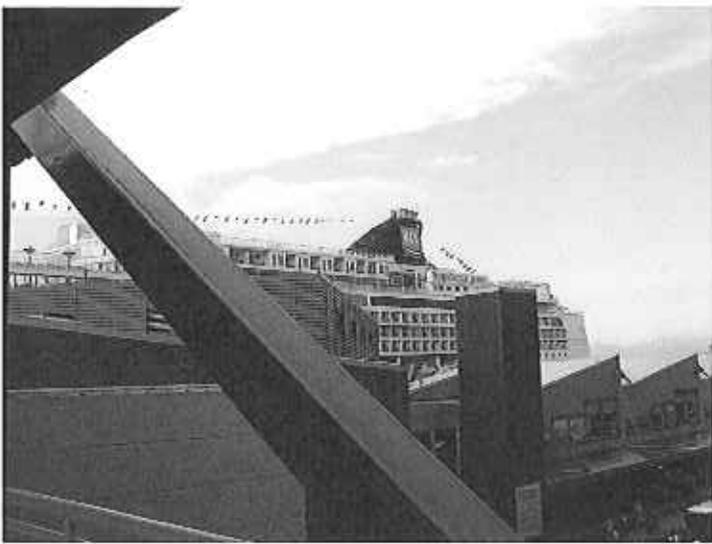


PHOTO #:01 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020122
DESCRIPTION: VESSEL



PHOTO #:02 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020123
DESCRIPTION: ECR SCANSHIP CONTROL SCREEN AND
OVERBOARD VALVE

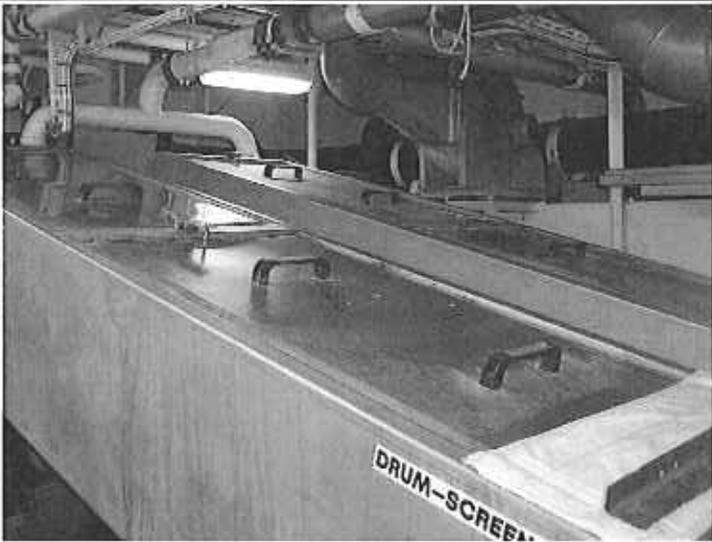


PHOTO #:03 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020124
DESCRIPTION: SCANSHIP SCREENS

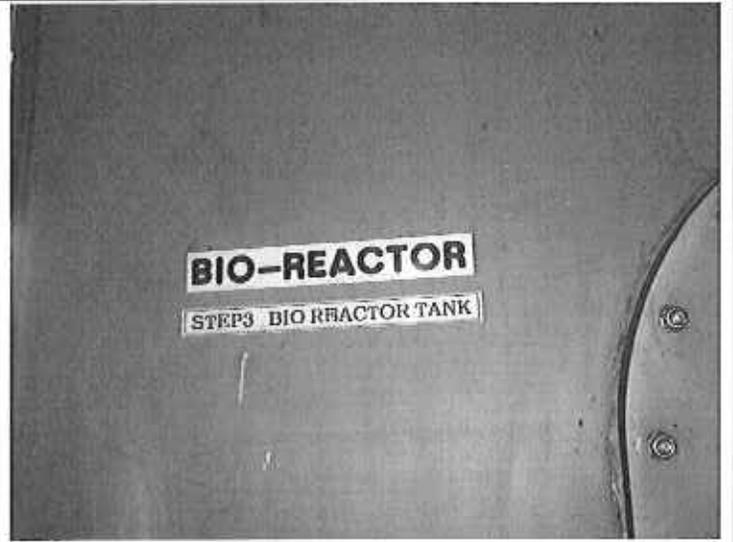


PHOTO #:04 AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020125
DESCRIPTION: SCANSHIP BIO-REACTOR

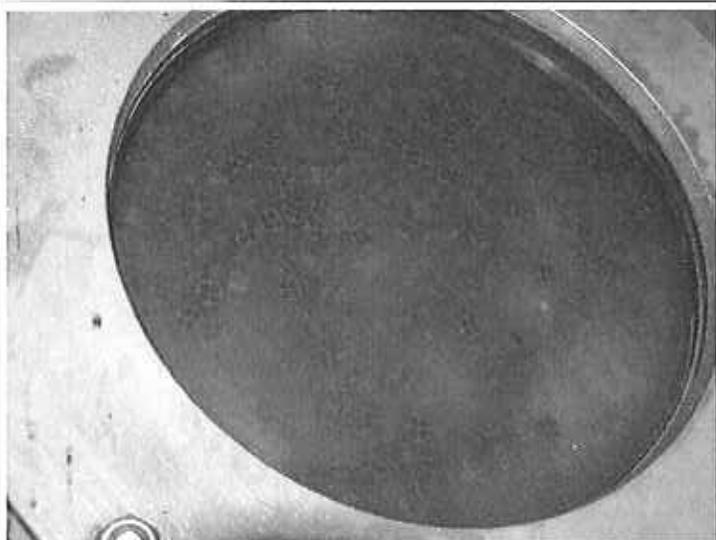


PHOTO #:05 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020126
DESCRIPTION: SCANSHIP BIO-REACTOR INSIDE VIEW



PHOTO #:06 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020127
DESCRIPTION: SCANSHIP FLOTATION TANK



PHOTO #:07 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020128
DESCRIPTION: SCANSHIP FLOTATION TANK INSIDE VIEW

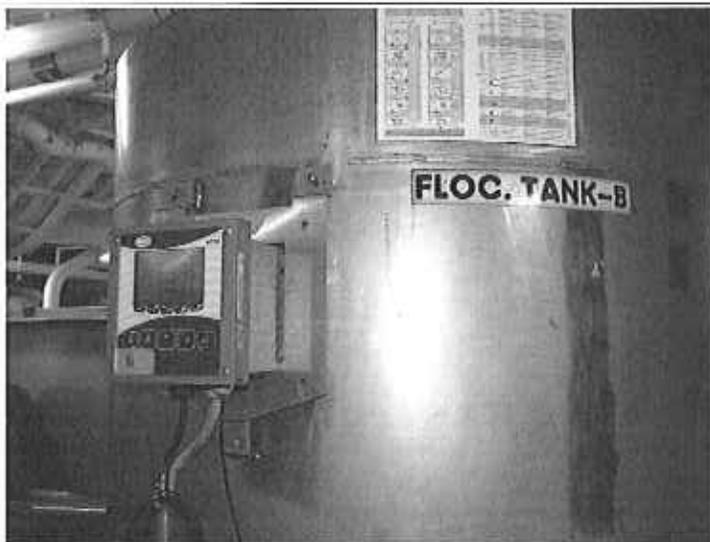


PHOTO #:08 AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020129
DESCRIPTION: SCANSHIP FLOC DOSING TANK



PHOTO #:09 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020130
DESCRIPTION: SCANSHIP FLOTATION TANKS

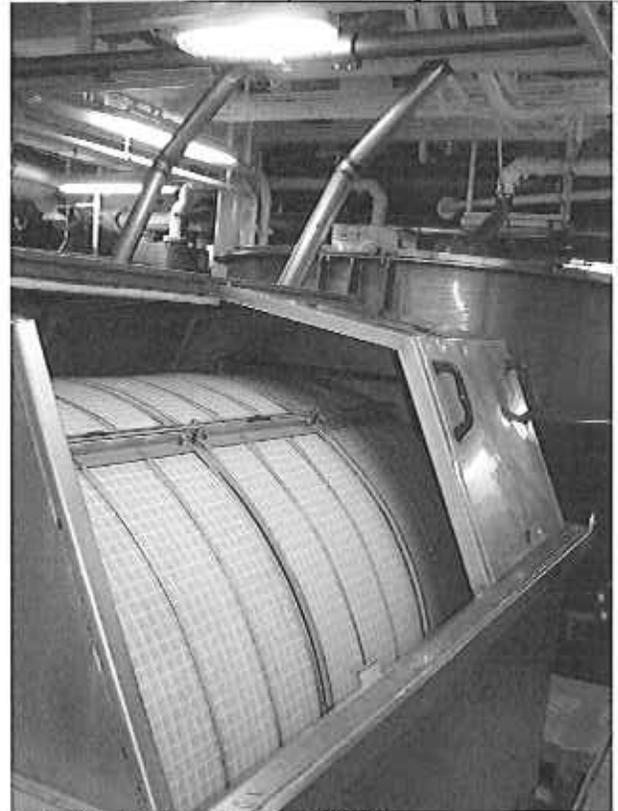


PHOTO #:10 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020131
DESCRIPTION: SCANSHIP POLISHING FILTER INSIDE VIEW

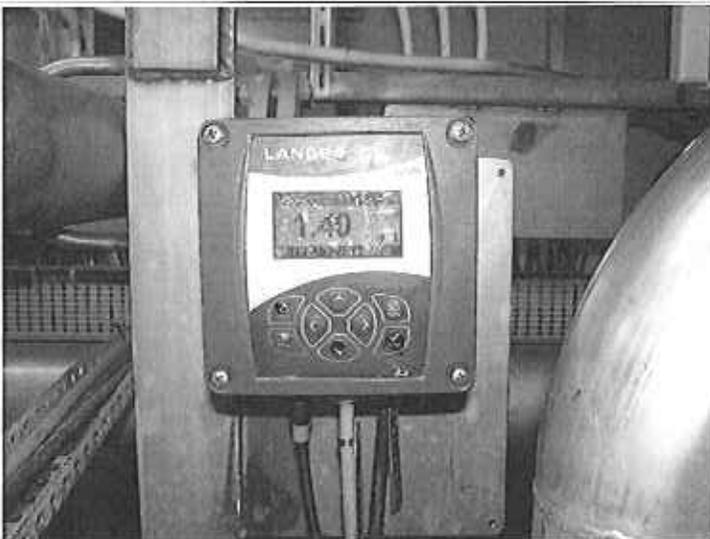


PHOTO #:11 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020132
DESCRIPTION: SCANSHIP EFFLUENT PH

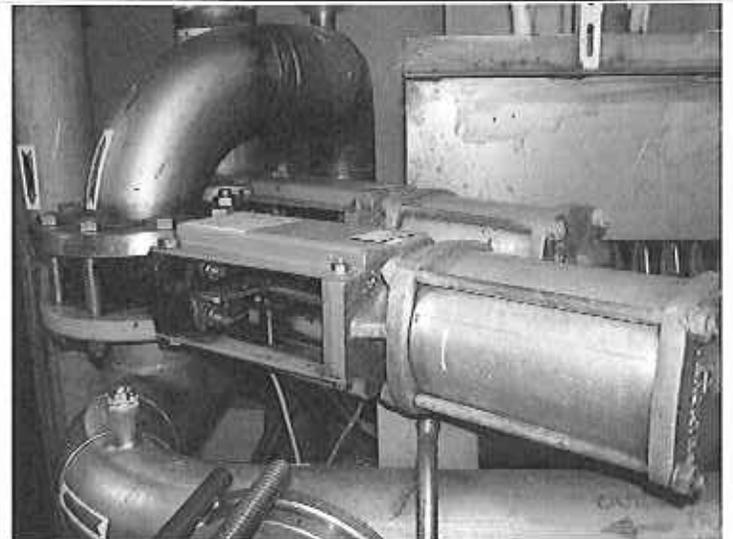


PHOTO #:12 AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020133
DESCRIPTION: SCANSHIP AUTO DISCHARGE SHUT DOWN VALVES



PHOTO #:13 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020134
DESCRIPTION: SCANSHIP EFFLUENT

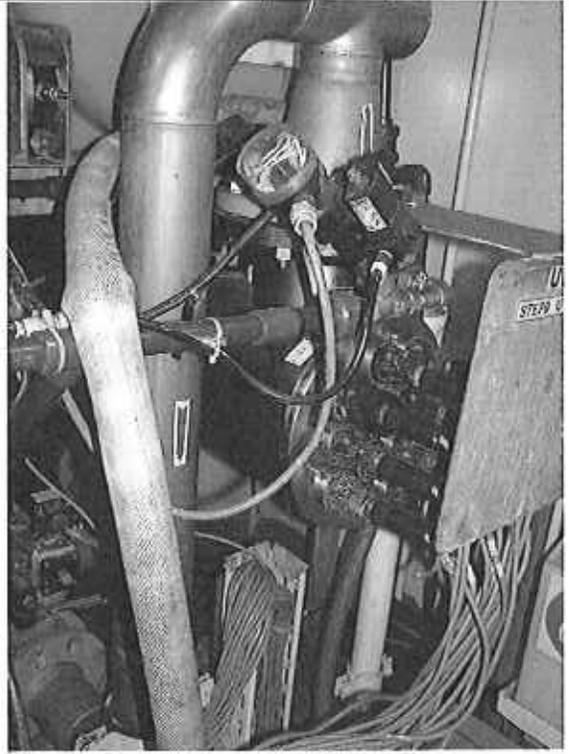


PHOTO #:14 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020135
DESCRIPTION: SCANSHIP UV DISINFECTION SYSTEM



PHOTO #:15 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020144
DESCRIPTION: SCANSHIP DISCHARGE PORT

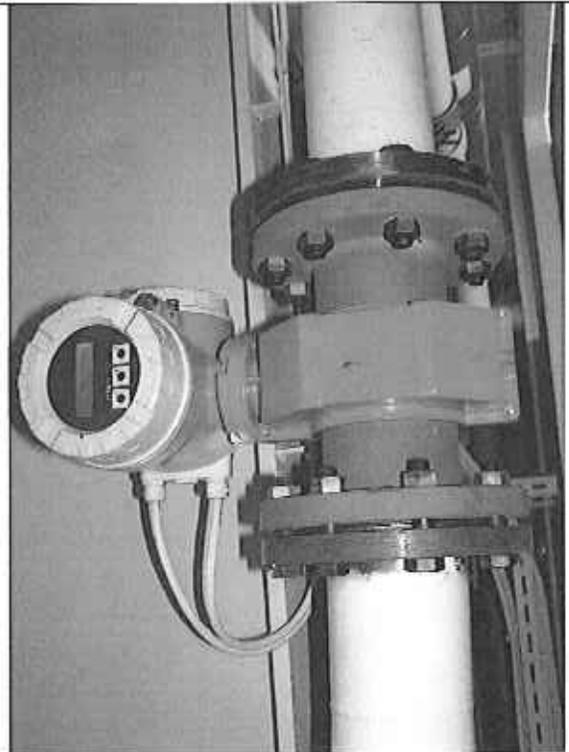


PHOTO #:16 AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020145
DESCRIPTION: SCANSHIP DISCHARGE PORT FLOW METER



PHOTO #:17 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020149
DESCRIPTION: SCANSHIP BIOSLUDGE TANK



PHOTO #:18 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020146
DESCRIPTION: SCANSHIP BIOSLUDGE DISCHARGE PORT



PHOTO #:19 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020137
DESCRIPTION: BILGE – OILY WATER SEPARATOR MARIN FLOC

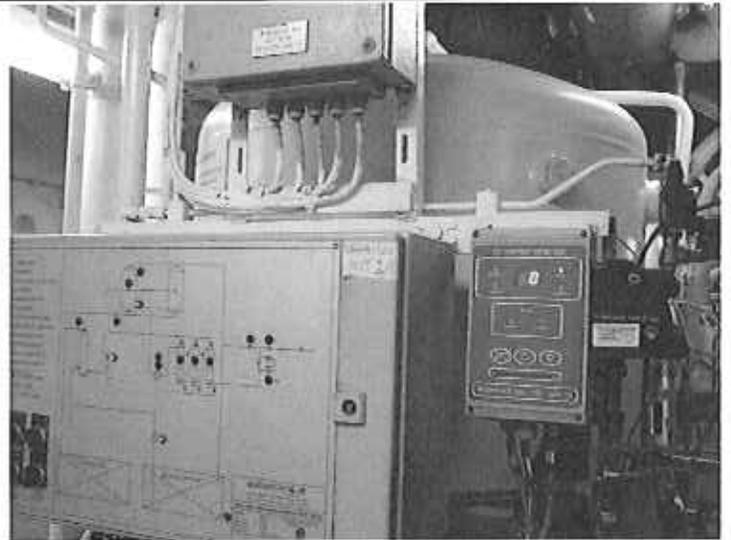


PHOTO #:20 AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020138
DESCRIPTION: BILGE – OWS MARIN FLOC

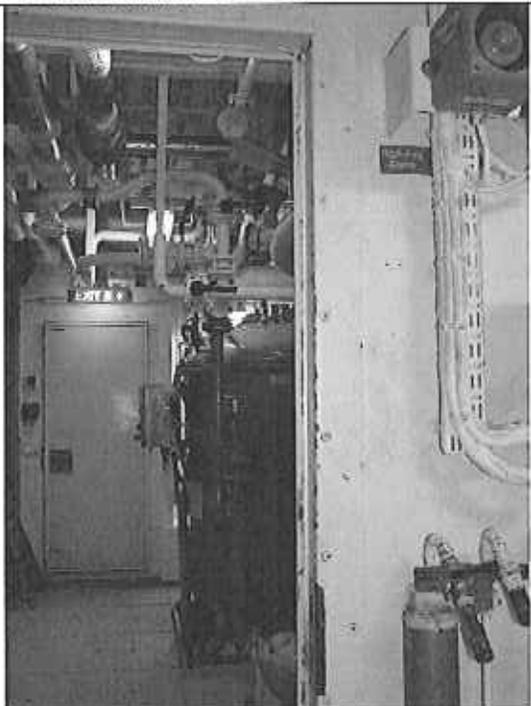


PHOTO #:21 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020140
DESCRIPTION: BILGE OWS RWO

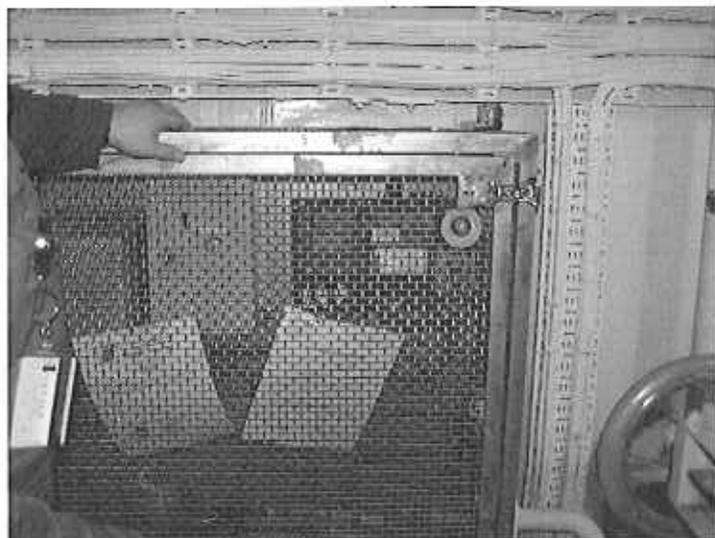


PHOTO #:22 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020141
DESCRIPTION: OWS WHITE BOX



PHOTO #:23 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020143
DESCRIPTION: OWS DISCHARGE PORT

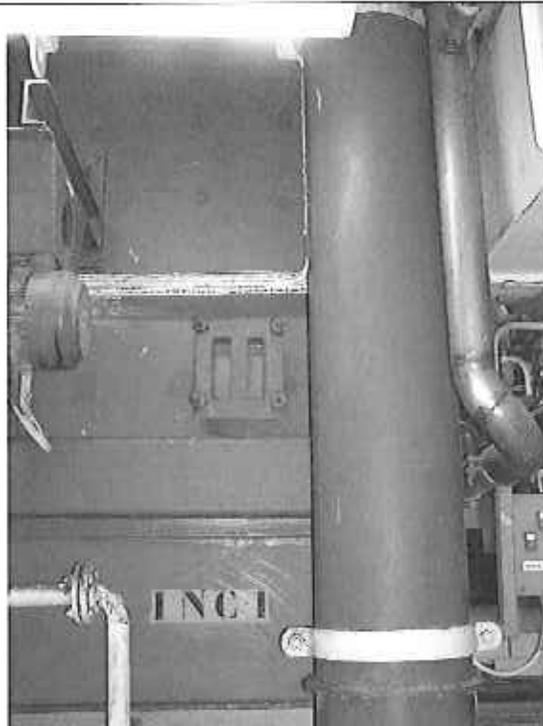


PHOTO #:24 AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020147
DESCRIPTION: INCINERATOR (FROM BELOW)

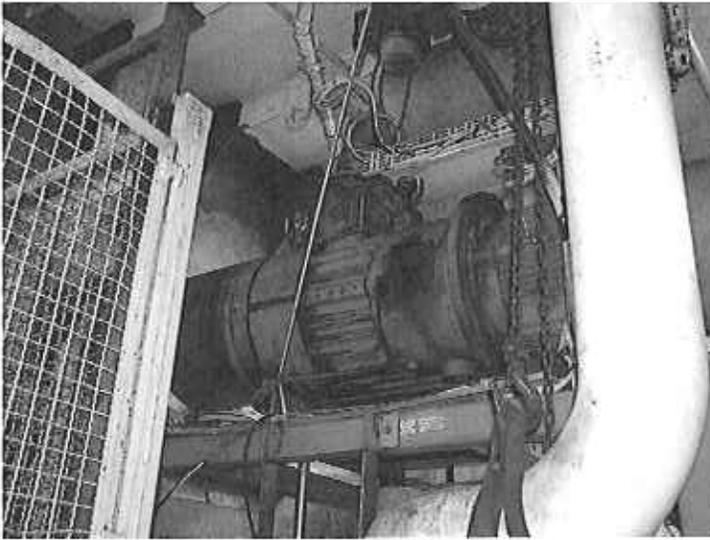


PHOTO #25 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020148
DESCRIPTION: FOOD WASTE PULPER



PHOTO #26 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020151
DESCRIPTION: PLASTICS COMPACTOR



PHOTO #27 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020152
DESCRIPTION: GLASS CRUSHER



PHOTO #28 AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020153
DESCRIPTION: GARBAGE/RECYCLING SORTING



PHOTO #:29 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020154
DESCRIPTION: USED COOKING OIL CONTAINER



PHOTO #:30 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020155
DESCRIPTION: INCINERATOR LOADING



PHOTO #:31 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020156
DESCRIPTION: BATTERY COLLECTION



PHOTO #:32 AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020157
DESCRIPTION: COLD STORAGE ROOM AND COMPOST BINS (BLUE)



PHOTO #:33 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020159
DESCRIPTION: FLUORESCENT BULB EATER



PHOTO #:34 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020160
DESCRIPTION: HAZARDOUS WASTE STORAGE



PHOTO #:35 DATE: AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020161
DESCRIPTION: WATER BUNKERING



PHOTO #:36 AUGUST 2, 2014
TAKEN BY: AMY JANKOWIAK FILE No.: P8020162
DESCRIPTION: VESSEL

