Royal Caribbean Cruises Ltd.
Source Reduction Evaluation

August 19, 2008

Submitted per Section 1.9 of the
Alaska Cruise Ship General Permit

Source Reduction Evaluation

Royal Caribbean Cruises Ltd.

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Source Reduction Evaluation Overview

Purpose

In submitting the Notices of Intent for the discharge of sewage, graywater or other waste waters (as defined) under the Alaska Department of Environmental Conservation Large Commercial Passenger Vessel Wastewater Discharge Permit No. 2007DB0002 from the vessels identified in the table below, Royal Caribbean Cruises Ltd (Royal Caribbean International and Celebrity Cruises Inc.) has requested to discharge under the interim discharge limits for the identified constituents. We are including copper for Celebrity Infinity as the 2007 data is not yet available on the ADEC website and the previous data provided places the copper discharge at 3.07 micrograms with an upper limit of 3.1 micrograms. As the Rhapsody of the Seas may be operational in time for the 2009 Alaska cruise season, we may include her in a future version of this evaluation.

Vessel	Constituents Seeking Discharge Under Interim Limits	Vessel Class	Potable Water systems	AWP system
Celebrity Infinity	Ammonia, copper, nickel, zinc	Millennium	Flash Evaporators & Reverse Osmosis	Zenon
Serenade of the Seas	Ammonia, copper, zinc, nickel	Radiance	Flash Evaporators & Reverse Osmosis	Scanship
Radiance of the Seas	Ammonia, copper, zinc, nickel	Radiance	Flash Evaporators & Reverse Osmosis	Hydroxyl
Celebrity Millennium	Ammonia, copper, zinc, nickel	Millennium	Flash Evaporators & Reverse Osmosis	Hydroxyl

Advanced Wastewater Purification system descriptions for the ships included can be found at **appendix 1.**

Pursuant to section 1.9.1 in the General Permit No. 2007DB0002, Royal Caribbean Cruises Ltd. is submitting this Source Reduction Evaluation (SRE) to identify methods to reduce the presence of these constituents in the discharges authorized by this permit.

The goals of this Source Reduction Evaluation are to:

1. Identify the potential sources for each parameter (e.g. ammonia, copper, nickel and zinc) for which we have requested approval to discharge under the interim effluent limits.
2. Establish an action plan and timeline **(see appendix 1)** to meet the long term effluent limits.
3. Report on the success or failure of actions that are implemented to reduce pollutant loading. We will provide an annual progress report to ADEC on or about **December 1st 2008 and December 1st 2009.**

It should be recognized that this Source Reduction Evaluation plan has been developed in response to the General Permit issued March 25, 2008. As such, it is anticipated that this plan will be updated and amended as further information is gathered in the process of completing this evaluation.

Fundamental Principles

The four contaminants of interest in this Source Reduction Evaluation are ammonia, and three metals: copper, nickel and zinc.

Contaminant	2010 Limit	Interim Limit
Ammonia	2.9 mg/L	80.49 mg/L
Copper	0.0031 mg/L	0.066 mg/L
Nickel	0.0082 mg/L	0.182 mg/L
Zinc	.081 mg/L	0.230 mg/L

Past studies of water systems onboard and recent sampling, indicates that metals contamination can come from shore (bunkered water) and shipboard potable water sources (evaporators, reverse osmosis and condensate), and the leaching from plumbing systems, such as copper or other types of steel/iron pipe.

Current metals removal technology options will most likely be effective against all three of these metals. While some technologies may perform better on one metal over the others, for the most part, a removal system for one will positively impact concentrations of the others.

It is widely accepted that the overwhelming majority of ammonia found in the wastewater effluent originates in human bodily wastes (both feces and urine). There is little that can be done to positively impact the source, thus leaving AWP process improvements or end of pipe treatment as the only real options.

Efforts under our plan will fall into one of two categories of activities:

1. Source Reduction of inflows to reduce introduction of constituents to the waste water stream.
2. Technology Evaluation / Implementation to identify, modify and install (as necessary) technology to reduce effluent concentrations.

It should be noted that technology solutions have not yet been fully evaluated and may not yet be commercially available for application on a large cruise ship. Therefore at present, there remains much uncertainty in the evaluation and potential implementation of such technologies.

Activities under each of these categories is described further below:

Influent Source Reduction Evaluation

A Source Reduction Evaluation will commence immediately and will include:

1. Identification of cleaning or disinfecting (chlorine or chemical disinfectants) products, pesticides, or other industrial products that may be the direct or indirect source of the loading;
2. Identification of other sources such as shore-based drinking water supply or the possible introduction of contaminants through leaching or corrosion of plumbing, storage or waste handling systems;
3. Adoption of operational practices to reduce pollutant sources such as use of alternative cleaning products, selective source water bunkering or distillation;
4. Substitution of non-chemical methods for processes that involve chemicals.

The purpose will be to identify potential sources of copper, zinc, nickel or ammonia as they may enter the waste water stream, and to investigate and implement means to reduce their presence in the influent to the Advanced Wastewater Purification (AWP) systems on board. The major phases of this evaluation will be:

1. **Document influent to waste streams as potential sources**:

   a. **Most significant cleaning or other chemicals in terms of volume and/or concentration of constituents.**
   Our approved chemical list has over 1,000 products listed, however, most should never enter the gray or black water systems directly. The identification of the exact contents of the large number of chemicals that may directly or indirectly enter the waste water stream is the first step. We have conducted an initial survey of our cleaning products and found two small sources of some of the contaminants. Some of our floor cleaners, specifically Vectra and Plaza Plus contain zinc, as zinc is commonly used in floor finishes as a cross linker. It is unlikely that the small amount of product used in relation to the amount of gray water generated could have a detectable impact, but we will evaluate changing our practices to prevent this from being placed into the gray water. As with the floor finishes, we have identified that our Johnson Diversey products Heavy Duty Pre-spray and Extraction Rinse carpet cleaners contain ammonium hydroxide(less than 1%) for neutralization (pH adjustment) in concentrate. These products are further diluted upon use so the percentage decreases even more. Again, the relatively small amount of this diluted product is unlikely to have even a

negligible impact on contaminate levels in the gray water. As we do not control the vast number of personal care products that our guests bring on and potentially add to the gray or black water, this will likely remain an uncontrollable variable. We will work with our business partners, such as our spa provider to identify their products that could enter the waste water stream to determine if any of these products contain any of the contaminants of interest. We use only non-toxic pest management products that are unlikely to enter the waste water stream. They are either mechanical traps or utilize bait gels that are consumed by the pests to prevent infestation of all kinds. **We anticipate completing the chemical evaluation before the end of 2008.**

b. Source water evaluation.

The industry is currently conducting a bunker water sampling program that includes all ports from San Francisco to Seward and every watering point on each dock. The contract is through an Alaska based water quality sampling company and they are testing for copper, zinc and nickel. The goal is to test each water point each week and to capture at least 5 to 9 samples per site. Whenever possible, they will test during the bunkering of water by a cruise ship. The testing began in mid July 2008, and we estimate it will take at least three samples to start to get some patterns. We will provide sample results in the course of our periodic reporting. After we identify any ports with high levels of the contaminants, we will evaluate if another source should be used. If a decision is made to produce more water onboard, this will likely result in higher air emissions being generated regardless of whether Reverse Osmosis or flash evaporators are used as both consumed fuel directly or indirectly. This shoreside source water testing program should be completed by the **end of the 2008 cruise season.** Preliminary results can be found in **Appendix 3.**

c. **Other potential contributors**.

The unknown variables will require significant sampling and operational observation to determine whether or not there are improvements to be made from heretofore unknown products or practices. Our advanced wastewater purification systems treat all domestic waste water on the ship. We collect and treat all gray, including galley, laundry, pulper and salon, as well as all black water. Our source water is a combination of bunkered and produced potable water and condensate from HVAC systems. After the initial potable water and chemical input evaluations are completed and we know their contribution, we will then be better informed as to how much research will be needed regarding other contributors. As most of the ships will be in the Caribbean operating out of Florida during the 2008 and 2009 winter seasons, this will facilitate this evaluation. We anticipate needing approximately 3 months after the first two evaluations are completed and should finish this portion by **March 31st 2009**.

To be completed by March 31st, 2009

2. **Evaluate plumbing/piping and storage systems as potential sources:**

If the previous influent evaluation and reduction actions due not result in the necessary levels being reached, we anticipate evaluating the plumbing, storage, or conveyance systems as possible sources of contaminants through leaching or corrosion of metals or coatings associated with these systems. Although we will be conducting this analysis concurrently with the above, this evaluation and possible intervention will commence in earnest **around April 2009**. What we know today is that our older vessels' potable water piping is constructed of copper (2 Alaska based ships, but not listed above), while our newer vessels (4 ships listed above) use a combination of metallic and polybuten/plastic. In addition, in the engine spaces (most often), potable water piping is stainless with some plastic pipe sections included. These metallic types of pipes may be a source of some of the metals. We will begin the process of identifying the types and the degree of corrosion found in the piping immediately. We will also evaluate the various types of piping and identify the specific water treatment/preparation options to minimize leaching. There will also be a review of the types of maintenance that is done to eliminate or reduce piping or tank corrosion. There has already been a significant amount of metallic piping replaced with plastic pipe throughout the fleet, but it will take some time to conduct an inventory of the amount already converted. There may also be components found in the advanced wastewater purification systems that may be metal sources. We will begin to evaluate the possible contribution of any of the contaminants either in corrosion or actually in the coating systems of the various tanks used in the storage and treatment of waste water. The manufacturers and types of coatings used varies from ship class to class and is also dependent upon the normal maintenance intervals of a specific tank due to service related wear and tear. However, many of the waste water tanks have been specially coated with products designed to stand up to the rigors of waste water storage, such as Jotun Marathon 2:1 in the gray water tanks and in the treated effluent tanks. The potable water tanks on many ships have been painted with Jotun Naviguard NM. Many of these coatings are very durable epoxy systems designed to resist the aggressive nature of waste or hard water. The approximate mixing ratio of the black water and grey water is approximately from 1 : 12 or as high as 1 : 20. This should not affect the quality of the effluent with the possible exception of the amount of ammonia found in human waste. If it is found that our onboard piping systems are a major source of the pollutants, then we will have to determine the best course of action. The options available will be to try to control the corrosion through water treatment methods, replace the piping with non-metallic types, withhold discharges in Alaskan waters or focus on end of pipe metals removal technologies.

To be completed by July 31st, 2009

3. **Identification of potential product / source water substitution or operational practices to reduce constituent concentrations or environmental loading.**

Condensate water generated through the HVAC system and often used in the laundry and for other technical purposes, such as deck and window washing, is often very hard, and due to copper components, such as the heat exchanging coils, in the AC handling units, the copper content in the condensate may be high. At this time, no treatment is done to condensate water before it enters the gray water stream. This will be investigated in the near future. Potable water produced with evaporators or through reverse osmosis systems may contain one or all of the metal contaminants. Additives used during production are approved food grade acid for pH balancing and chlorine for disinfection. Reverse Osmosis systems will use sodium metabisulfite and cleaning chemicals, that contain no metals. On some vessels, we use a sodium silicate product to reduce corrosion in the potable water. Recently, Royal Caribbean undertook an extensive water testing and evaluation project to determine best practices. Thus, corrosion protection measures (pH balancing and chloride control) that are already in place should help reduce the amount of metals in the water. We will by the end of the 2008 cruise season determine the level of compliance with the project's proposed methods and if variations exist, will direct correction. We will also devise a testing plan to determine the effectiveness of any future modifications to current operational practices. The potable water production and bunkering amounts during a typical cruise in Alaska are below. These amounts are approximate and vary from cruise to cruise.

Vessel	**Evaporator Maker and average production (M3/day)**	**Reverse Osmosis Maker and average production (M3/day)**	**Bunker Ports and average loading (M3/week)**	**Average Condensate water production (M3/day)**
Celebrity Infinity	SERCK COMO GMGH/760m3	Desal GMBH/0m3	N/A	10-15
Serenade of the Seas	Alfa Laval/650m3	Desal/350m3	Skag 75m3 Vanc 250m3	0m3
Radiance of the Seas	Alfa Laval/600m3	Desal/400m3	Jun 133m3 Ket 504m3 Skag 411m3 Van 730m3	0m3
Celebrity Millennium	SERCK COMO GMGH/225m3	Desal GMBH/0m3	3670m3 total, amount per port varies weekly	0m3

To be completed by October 31st, 2009.

Treatment Technology Evaluation

Identification of potential treatment technologies for reducing the target constituents is expected to be more complex than the initial source identification phase. Much of the information needed to select the proper system(s), in both size and type, will come from the influent source evaluation and operational reviews described above. Therefore during the next approximate 1.5 years, Royal Caribbean Cruises Ltd will work with our AWP system and other vendors and evaluate additional treatment technologies as may be appropriate for reducing these pollutants that are practicable for implementation in a cruise ship environment. The EPA Draft Assessment identified two treatment technologies as having the potential to improve effluent quality for ammonia: biological nitrification and ion exchange. Depending upon hydraulic retention time and levels of dissolved oxygen, some of our AWP systems have achieved a very good level of nitrification, however, it has not consistently been observed to meet the 2010 ammonia limits set in the permit. It may be possible to modify our existing systems to maximize this effect and this will be one strategy we will pursue. We have already communicated with our AWP vendors, waste water treatment experts and other treatment companies to gauge feasibility, safety, and costs of the above options. This evaluation will be made more complex due to the severe space limitations on the ships and the unknown impacts that end of pipe metals and or ammonia removal technology will have on the existing conventional pollutant treatment. For instance, if chemical precipitation (lime is a common element) is used to remove the metals then what impact will that have on pH, and Total Suspended Solids. There are frequently other resultant waste streams generated that will have to be managed as well.

At present, Royal Caribbean is completing the plans and specifications for the *Rhapsody of the Seas* and intends to install a system by a manufacturer that is new to cruise ships. We anticipate the system being installed and beginning initial operation **sometime after the end of the 2008 Alaska Cruise season. Sometime in early to mid 2009** we hope to have initial results of the plant's effectiveness against all relevant criteria and will know more if this system is also capable of removing the ammonia. If so, it may be possible to install a partial system on the existing ships to specifically treat the ammonia. In a land-based prototype installation, this process has shown promising results in the removal of ammonia and other nutrients through an advanced oxidation process. The *Rhapsody of the Seas*, although not listed as an applicable ship in this SRE, will receive the first shipboard system built to date. Although a prototype of this technology has been used in a land-based sewage and laundry facility, it is yet unproven in a large marine/cruise ship application.

The need for and level of removal of the dissolved metals is harder to gauge. We will have significantly more data with which to work after the piping and chemical analysis are done. It remains to be seen if the operational and piping program in and of themselves will be enough to reduce the metals in the effluents to below the limits. After our evaluation is done, **around July of 2009,** we will be better prepared to engage vendors in going beyond the current feasibility studies. The EPA Draft Assessment identified two treatment technologies for consideration in the removal of metals: ion exchange and reverse osmosis. In the interim, Royal Caribbean has substantial in-house technical expertise with which to research these and any other promising technologies.

This includes a large and technically diverse Newbuilding and Fleet Design department that routinely evaluates the suitability of various technologies, including potable water and wastewater treatment. Royal Caribbean also works continuously with our AWP vendors in response to a whole host of waste water topics. We will continue the dialogue with them in order to learn and research the issues related to reducing the ammonia and metals in our effluent. Therefore, the lack of an immediate firm contractual relationship with any one company should not be construed as a failure on our part to be pursuing this issue.

We will continue to coordinate our actions with those of other cruise lines operating in Alaska and thus subject to the general permit. It is possible that pilot studies undertaken on various treatment technologies will be coordinated in order to facilitate review of as many different types of technologies as possible. We anticipate possibly beginning a pilot study of promising technologies in **the fall of 2009** and completing the evaluation by the **end of 2009**. Based on the results of the studies, we would look to install on those ships planned to discharge in Alaska in early 2010 in time for the 2010 Alaska season.

We will update this plan and report on our overall progress in the scheduled annual report approximately **December 1st,** but no later than **December 15th, 2008**.

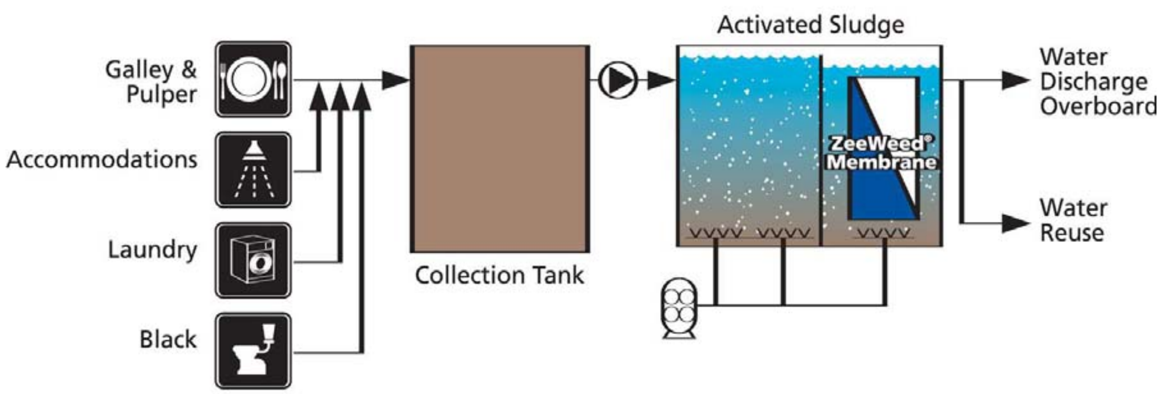
Appendix 1

Celebrity Infinity

Zenon

The Zenon system uses a combination of biological treatment and membrane filtration processes:

- Coarse mechanical screens remove wastewater solids, such as plastics, before they enter the treatment system.
- Submerged within the biological reactor are filtration membrane fibers resembling spaghetti strands. The fibers create a physical barrier between the water and tiny solid materials.
- Using a very slight vacuum, the water is pulled through membranes that are so fine they even filter out most bacteria.
- In additional to the below diagram, the resulting clean water is then pumped to an ultraviolet light reactor for final disinfection. The treated effluent can then be pumped directly overboard or held in a tank for future discharge. After being held in a tank, it is again treated by the UV system to disinfect.
- The solids that remain from this entire process are pumped to a holding tank for subsequent drying and incineration, for disposal at an approved land-based facility, or at sea in accordance with international standards.



<u>Celebrity Millennium and Radiance of the Seas</u>

Hydroxyl

- Coarse mechanical screens remove wastewater solids, such as plastics, before they enter the treatment system.

- The biological reactor uses a fixed-film media, which looks like small plastic gears or wheels, which give beneficial bacteria a surface on which to attach themselves to aid in breaking down any solids.

- From the biological reactor, the water and any tiny solids are pumped to machines that mechanically and chemically remove the remaining solids from the water.

- The resulting very clean water is then pumped through polishing filters.

- Next, an ultraviolet light reactor provides the final disinfection. The treated effluent can then be pumped directly overboard or held in a tank for future discharge. After being held in a tank, it is again treated by the UV system to disinfect.

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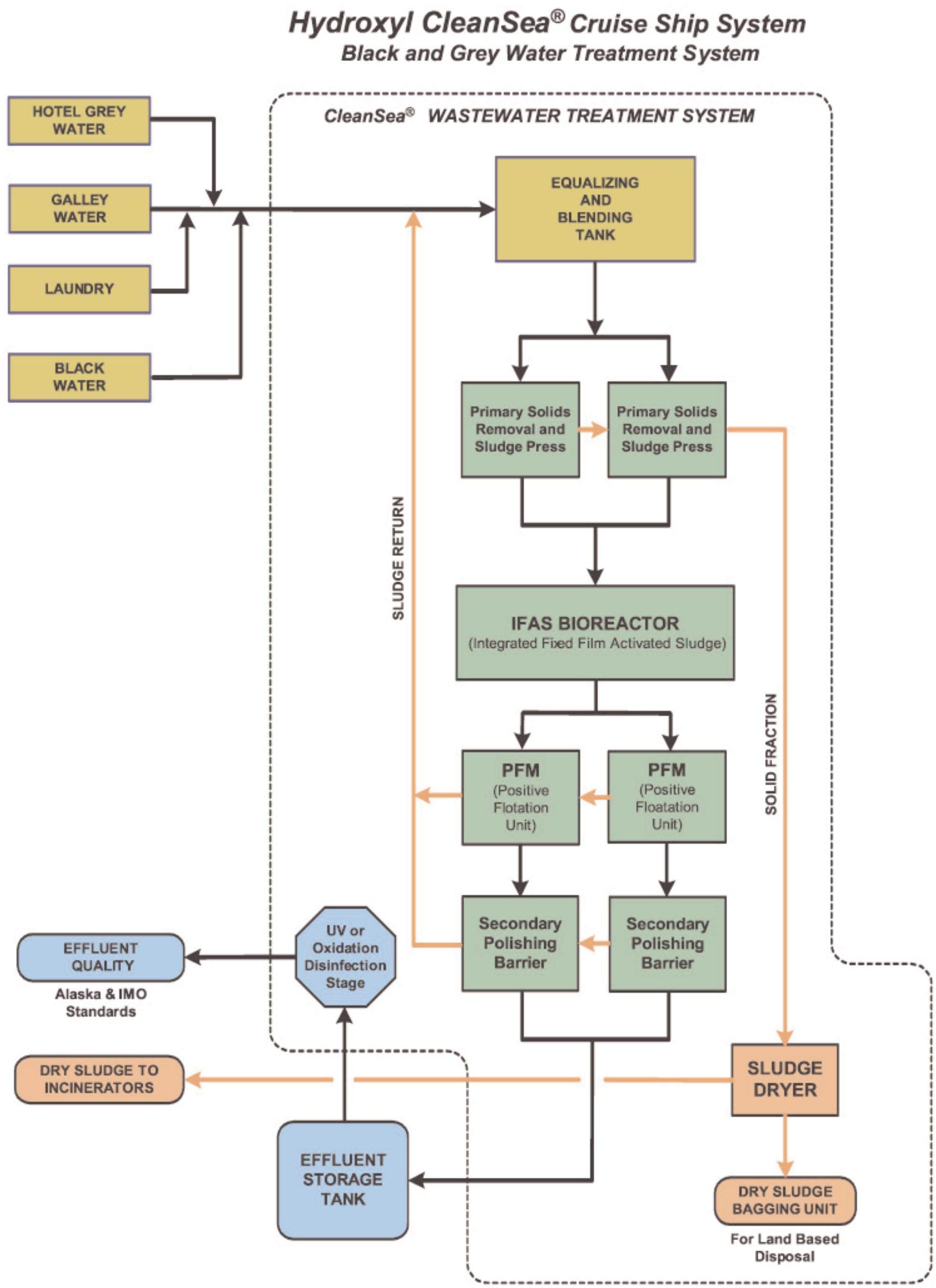
- The solids that remain from this entire process are pumped to a holding tank for subsequent drying and incineration, disposal at an approved land-based facility, or at sea in accordance with international standards.


Hydroxyl CleanSea® Cruise Ship System
Black and Grey Water Treatment System
HOTEL GREY WATER
GALLEY WATER
LAUNDRY
BLACK WATER
CleanSea® WASTEWATER TREATMENT SYSTEM
EQUALIZING AND BLENDING TANK
Primary Solids Removal and Sludge Press
Primary Solids Removal and Sludge Press
SLUDGE RETURN
SOLID FRACTION
IFAS BIOREACTOR
(Integrated Fixed Film Activated Sludge)
PFM (Positive Flotation Unit)
PFM (Positive Floatation Unit)
Secondary Polishing Barrier
Secondary Polishing Barrier
UV or Oxidation Disinfection Stage
EFFLUENT QUALITY
Alaska & IMO Standards
DRY SLUDGE TO INCINERATORS
SLUDGE DRYER
EFFLUENT STORAGE TANK
DRY SLUDGE BAGGING UNIT
For Land Based Disposal

<u>Serenade of the Seas</u>

SCANSHIP

- Coarse mechanical screens remove wastewater solids, such as plastics, before they enter the treatment system.

- The biological reactor uses a fixed-film media, which looks like small plastic gears or wheels, which give beneficial bacteria a surface on which to attach themselves to aid in breaking down any solids.

- From the biological reactor, the water and any tiny solids are pumped to machines that mechanically and chemically remove the remaining solids from the water.

- The resulting very clean water is then pumped through polishing filters.

- Next, an ultraviolet light reactor provides the final disinfection. The treated effluent can then be pumped directly overboard or held in a tank for future discharge. After being held in a tank, it is again treated by the UV system to disinfect.

- The solids that remain from this entire process are pumped to a holding tank for either subsequent drying and incineration, disposal at an approved land-based facility or at sea discharge in accordance with international standards.

AWP SYSTEM DIAGRAMS

Appendix 2 Timeline:

Event	**Approximate Date**
Begin Influent Source Reduction Evaluation	July 2008
Begin initial Treatment Technology Evaluation	July 2008
Complete documenting chemicals in influent to waste streams as potential sources	October 2008
Complete sampling of Source Potable Water (bunkered)	October 2008
Begin initial operational testing of new AWP system with potential to reduce ammonia	October 2008
Annual progress report to ADEC	December 2008
Complete evaluation of other potential contributors including technical water	31 March 2009
Obtain initial sample results from new AWP system that has potential to reduce ammonia	Early to Mid 2009
Begin evaluating the impact of plumbing/piping systems on pollutant levels (if necessary)	April 2009
Focus on most promising Treatment Technologies	July 2009
Complete the evaluation of the impact of plumbing/piping systems on pollutant levels (if necessary)	31 July 2009
Identify potential product, source water or operational practices substitutes (if necessary)	August 2009
Begin pilot study of promising technology(ies)	Fall 2009
Complete the identification of potential product, source water or operational practices substitutes (if necessary)	31 October 2009
Complete treatment technology evaluation	End of 2009
Annual progress report to ADEC	December 2009
Install treatment technology on those ships planned to discharge in Alaska.	April 2010

<u>**Appendix 3**</u>

ID #	Port	Location	Day	Date	Dissolved Copper ug/L	Dissolved Nickel ug/L
AE 2161	Seattle	Seattle Pier 30 North Princess	Wed	16-Jul	**14**	1.5
AE 2161	Seattle	Seattle Pier 30 1850R Holland	Wed	16-Jul	**3.9**	2
AE 2161	Seattle	Seattle Pier 66 Pit American	Wed	16-Jul	**52**	1.7
AE 2162	San Francisco	San Francisco Pier 36	Wed	16-Jul	0.83	ND
AE 2163	Skagway	Skagway Broadway Dock	Thu	17-Jul	**6.75**	5.57
AE 2163	Skagway	Skagway Ore Station Dock	Thu	17-Jul	**3.88**	2.23
AE 2163	Skagway	Skagway Railway Dock	Thu	17-Jul	**5.68**	**12.7**
AE 2164	Ketchikan	Ketchikan Dock Berth #2	Wed	18-Jul	2.46	ND
AE 2164	Ketchikan	Ketchikan Dock Berth #3	Wed	18-Jul	1.42	ND
AE 2164	Ketchikan	Ketchikan Dock Berth #4	Wed	18-Jul	**5.87**	0.307
AE 2165	Juneau	Juneau S. Franklin Dock	Mon	21-Jul	1.51	0.753
AE 2165	Juneau	Juneau AJ Dock	Mon	21-Jul	**58.4**	0.771
AE 2165	Juneau	Juneau AK Steamship Dock	Mon	21-Jul	**8.8**	1.88
AE 2167	Skagway	Skagway Ore Station Dock	Thu	24-Jul	0.618	0.732
AE 2167	Skagway	Skagway Broadway Dock	Thu	24-Jul	0.531	0.65
AE 2169	Vancouver	Vancouver South Dock	Thu	24-Jul	**7.8**	<0.2
AE 2169	Vancouver	Vancouver North Dock	Thu	24-Jul	1.5	<0.2
AE 2195	Whittier	Whittier Dock	Thu	24-Jul	1.3	0.345
AE 2167	Skagway	Skagway Railway Dock	Thu	24-Jul	**5.2**	8.11
AE 2169	Vancouver	Vancouver Central Dock	Thu	24-Jul	**15**	<0.2
AE 2166	Ketchikan	Ketchikan Dock Berth #1	Fri	25-Jul	0.953	0.152
AE 2171	Seward	Seward Dock	Fri	25-Jul	2.54	1.15
AE 2166	Ketchikan	Ketchikan Dock Berth #3	Fri	25-Jul	2.97	0.151
AE 2166	Ketchikan	Ketchikan Dock Berth #4	Fri	25-Jul	2.48	0.535
AE	Juneau	Juneau S. Franklin Dock	Mon	28-	**58.1**	1.61

2173				Jul		
AE 2173	Juneau	Juneau AJ Dock	Mon	28-Jul	**75.4**	0.8
AE 2173	Juneau	Juneau AK Steamship Dock	Mon	28-Jul	1.23	0.683
AE 2174	Ketchikan	KETCHIKAN DOCK	Mon	28-Jul		
AE 2174	Ketchikan					
AE 2174	Ketchikan					
AE 2175	Skagway	SKAGWAY DOCK	Mon	28-Jul		
AE 2175	Skagway					
AE 2175	Skagway					
AE 2179	Seward	Seward Dock	Wed	30-Jul	0.904	1.46
AE 2196	Whittier	WHITTIER DOCK	Mon	28-Jul		
AE 2177	Vancouver	Vancouver South Dock	Tue	29-Jul	**13**	0.2
AE 2177	Vancouver	Vancouver Central Dock	Tue	29-Jul	**6.4**	<0.2
AE 2177	Vancouver	Vancouver North Dock	Tue	29-Jul	**3.1**	0.2
AE 2182	Vancouver	VANCOUVER DOCK	Mon	4-Aug		
AE 2199	Juneau	JUNEAU DOCK	Mon	4-Aug		
AE 2200	Ketchikan	KETCHIKAN DOCK	Mon	4-Aug		
AE 2201	Skagway	SKAGWAY DOCK	Mon	4-Aug		
AE 2202	Seattle	SEATTLE DOCK	Mon	4-Aug		
AE 2203	Seward	SEWARD DOCK	Mon	4-Aug		
AE 2204	Whittier	WHITTIER DOCK	Mon	4-Aug		
AE 2211	San Francisco	SAN FRANCISCO DOCK	Wed	6-Aug		
AE 2183	Vancouver	VANCOUVER DOCK	Mon	11-Aug		
AE 2189	Victoria	VICTORIA DOCK	Mon	11-Aug		
AE 2219	Juneau	JUNEAU DOCK	Mon	11-Aug		
AE 2220	Ketchikan	KETCHIKAN DOCK	Mon	11-Aug		
AE 2221	Skagway	SKAGWAY DOCK	Mon	11-Aug		
AE	Seattle	SEATTLE DOCK	Mon	11-		

2222				Aug		
AE 2223	Seward	SEWARD DOCK	Mon	11-Aug		
AE 2224	Whittier	WHITTIER DOCK	Mon	11-Aug		
AE 2231	San Francisco	SAN FRANCISCO DOCK	Wed	13-Aug		
AE 2184	Vancouver	VANCOUVER DOCK	Mon	18-Aug		
AE 2190	Victoria	VICTORIA DOCK	Mon	18-Aug		
	Juneau	JUNEAU DOCK	Mon	18-Aug		
	Ketchikan	KETCHIKAN DOCK	Mon	18-Aug		
	Skagway	SKAGWAY DOCK	Mon	18-Aug		
	Seattle	SEATTLE DOCK	Mon	18-Aug		
	Seward	SEWARD DOCK	Mon	18-Aug		
	Whittier	WHITTIER DOCK	Mon	18-Aug		
	San Francisco	SAN FRANCISCO DOCK	Wed	20-Aug		
AE 2185	Vancouver	VANCOUVER DOCK	Mon	25-Aug		
AE 2191	Victoria	VICTORIA DOCK	Mon	25-Aug		
	Juneau	JUNEAU DOCK	Mon	25-Aug		
	Ketchikan	KETCHIKAN DOCK	Mon	25-Aug		
	Skagway	SKAGWAY DOCK	Mon	25-Aug		
	Seattle	SEATTLE DOCK	Mon	25-Aug		
	Seward	SEWARD DOCK	Mon	25-Aug		
	Whittier	WHITTIER DOCK	Mon	25-Aug		
	San Francisco	SAN FRANCISCO DOCK	Wed	27-Aug		
AE 2186	Vancouver	VANCOUVER DOCK	Mon	1-Sep		
AE 2192	Victoria	VICTORIA DOCK	Mon	1-Sep		
	Juneau	JUNEAU DOCK	Mon	1-Sep		
	Ketchikan	KETCHIKAN DOCK	Mon	1-Sep		
	Skagway	SKAGWAY DOCK	Mon	1-Sep		
	Seattle	SEATTLE DOCK	Mon	1-Sep		
	Seward	SEWARD DOCK	Mon	1-Sep		
	Whittier	WHITTIER DOCK	Mon	1-Sep		
	San	SAN FRANCISCO DOCK	Wed	3-Sep		

	Francisco					
AE 2187	Vancouver	VANCOUVER DOCK	Mon	8-Sep		
AE 2193	Victoria	VICTORIA DOCK	Mon	8-Sep		
	Juneau	JUNEAU DOCK	Mon	8-Sep		
	Ketchikan	KETCHIKAN DOCK	Mon	8-Sep		
	Skagway	SKAGWAY DOCK	Mon	8-Sep		
	Seattle	SEATTLE DOCK	Mon	8-Sep		
	Seward	SEWARD DOCK	Mon	8-Sep		
	Whittier	WHITTIER DOCK	Mon	8-Sep		
	San Francisco	SAN FRANCISCO DOCK	Wed	11-Sep		
AE 2174	Ketchikan					
AE 2174	Ketchikan					
AE 2175	Skagway					
AE 2175	Skagway					
AE 2176	Seattle					
AE 2176	Seattle					