

## Background:

Seven Seas Mariner (SSM) is a large vessel that is managed by V-ships Europe. The SSM is a regular visitor, and visited in 2006, 2007 and 2008 Alaska. It appears that the vessel is planning on visiting Alaska again in 2009. The vessel has excellent compliance record, and is very cooperative, and has environmental "pro active approach".

This review includes the review of the SSM August 13, 2008 SRE application.

The items are set out below.

## Discussion:

Silver Shadow's and SSM vessel management is done by V-ships management. V-ships management visited the CPVEC team in JNU early in 2008, to obtain information regarding the General Permit and associated plans, and to get a feel for ADEC CPVEC expectations. SSM provided on April 4, 2008 the first SRE and updated on August 13, 2008 the SRE application. The August 13, 2008 SRE update is reviewed in this paper. The SSM has a Hamworthy AWTs system, similar as the AWTs / MBR systems on the Princess fleet. The overall discharge quality of the SSM in 2008 season, compared to the other large vessels, is remarkable.

- The SRE is concise, easy readable, to the point, and it appears that SSM approaches the SRE actions seriously, and appears already working on items. Pro-active approach.
- The SRE include two categories: 1) Source reduction evaluation and 2) Treatment Technology evaluation.
- Spa's, pool, etc and technical water use appears not to be addressed in the SRE.
- SSM SRE included list of "reduction" of cleaners and bromine to reduce the NH<sub>3</sub> levels. SSM is also using "Hepburn Bio Chemicals" to improve the effluent performance. Research was on-going in the 2008 season.
- SRE include also changes of MBR operations, the GW BW was already optimized on average ration 5/95 and results look good. Further the MBR are "over designed" they do not operate on full (rated) capacity and retention time is increased.
- SRE include close corrosion controls 2008 check on board revealed that no piping needed to be replaces. This is part of vessel monitoring system.
- Potable water is stabilized / conditioned with Unitor chemicals.
- 2008 sample results showed Cu, Zn, NH<sub>3</sub> well below interim levels.
- SSM has spikes of CU, OR research (ADEC CPVEC direction) revealed that crew had stored "boiler water" in gray water tank.
- Vessel working with suppliers including the MBR's to see if further reduction is possible.
- SRE contains reporting schedules

## Conclusion:

The proposed SRE is acceptable and ADEC staff recommends approving the Seven Seas Mariner 2008 SRE.

### ADEC Seven Seas Mariner Future SRE Reporting Attention Items:

**NOTE:** This Vessel has similar AWTS / MBR system on board as the Princess Fleet, yet it appears that this vessel has better overall discharge quality performance. Therefore reporting regarding AWTS MBR items should be careful compared with Princess Fleet reporting. This to identify why this installation appears to do "better".

@ Reporting to include Dosing / time / date / conditions when bio chemicals are applied, and the method of application.

@SRE reporting to include tankage storage strategy to isolate / track down the potable water flow from different sources.

@ EVAP water system description.

@ Vessel consultation results from Hamworthy MBR consultation to be shared in detail. (This to see if the effluent quality is affect by operating on "full capacity" as some other operators do)

@If SSM does operational changes of MBRs, use of products that could lead to pollutant reductions, the operations / procedures / products should be identified for future reference (compliance verification).

@Technical water, boiler water, equipment wash waters, spa and pool waters are not addressed in SRE. The future reporting should include (if applicable) these waste streams as well.

@Spent Bio products may harm full for the environment and should stored / handles / disposed off according existing laws and regulations. The off load of these products should be included in the "AK Garbage off load plans", and reporting is required.

Juneau, November 26, 2008