UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

FEB 24 2012

REPLY TO THE ATTENTION OF:

WN-16J

CERTIFIED MAIL 70091680000076725309
RETURN RECEIPT REQUESTED

Mr. Robert A. Manglitz
President/CEO
Lake Michigan Trans-Lake Shortcut, Inc.
A/K/A Lake Michigan Carferry Service
701 Maritime Drive
Ludington, Michigan 49431

Subject: Additional Information for the Permit Application for the S.S. Badger

Dear Mr. Manglitz:

By this letter, the U.S. Environmental Protection Agency is requesting additional information for the National Pollutant Discharge Elimination System (NPDES) individual permit application for the S.S. Badger in accordance with 40 C.F.R. § 122.21. In addition to the information requested in our letter dated February 6, 2012, which included application forms 1 and 2C, EPA has enclosed two documents that specify the minimum information needed to assess the coal ash discharges. EPA will use this information in development of effluent limitations to meet technology and water quality requirements of the Clean Water Act. All documents supporting your permit application must be submitted no later than June 29, 2012.

In accordance with 40 C.F.R. § 124.3, EPA plans to review the completeness of the application within 60 days of receipt of the requested information in this letter and our letter dated February 6, 2012. EPA will notify you by letter of additional information necessary to complete the application. EPA reserves the right to request additional information to clarify, modify or supplement previously submitted material even after determining the application to be complete.

Form 2C's section entitled "Public Availability of Information" explains the extent to which you may claim information required by or in response to that form as confidential business information. You may claim information not required by form 2C but otherwise requested in this letter as confidential business information, but claims for information which is effluent data will be denied. If you do not assert a claim of confidentiality at the time of submitting the information, EPA may make the information public without further notice to you. Claims of confidentiality will be handled in accordance with EPA's business confidentiality regulations at

40 CFR Part 2. We encourage you to review these regulations before submitting information that may be confidential.

If you have any questions concerning this matter, please contact Sean Ramach of my staff at (312) 886-5284, or your counsel may contact Nicole Cantello, in the Office of Regional Counsel, at (312) 886-2870.

Sincerely,

Tinka G. Hyde
Director, Water Division

Enclosures

cc: William Creal, MDEQ w/enclosure
Kenneth Johnson, WDNR w/enclosure
Barry Hartman, K&L Gates w/enclosure

Enclosure 1: Additional Information to Develop Effluent Limitations

As stated in our February 6, 2012 letter, EPA does not believe that the petition documents submitted on November 2, 2011 contained adequate support for the conclusions about the availability or feasibility of technologies/control techniques to address the coal ash discharges. EPA requests the following information to assess the coal ash discharges as a result.

1. Provide specific details on the age of the vessel and equipment installed on board the vessel associated with the generation and transport or discharge of coal ash. Please specify any equipment that has been installed, replaced or substantially modified since January 1991[1] and the date of installation, replacement or modification.

2. Provide a detailed description of the processes required for daily operations and discuss how coal ash is handled onboard the vessel from the loading of coal to the discharge of the coal ash into waters of the U.S. This should include at minimum, boiler operation, ash handling systems, ash collection/transport systems and the coal ash discharge system.

3. EPA is aware of a number of technologies that have been explored for use on the S.S Badger for controlling the discharge of coal ash. Please describe the engineering aspects[2] of the application of the following technologies/control techniques for the S.S. Badger:

   a) Retention of the ash onboard the vessel.

      EPA is aware that the Badger looked into developing new onboard infrastructure for retaining coal ash. As described in an October 27, 2008 letter to EPA, the S.S. Badger was able to hold all of its ash on board during one 12-hour round trip voyage. The description must specify how ash could be retained on board the vessel and a discussion of the alterations or major components that would need to be added. The description should address the three sources of coal ash separately (bottom ash, economizers and dust collectors).

      The description must also address the methods by which coal ash could be removed from the vessel. At a minimum, this assessment should address using existing infrastructure/slightly modifying the infrastructure to pump out ash (e.g., using the current discharge point to pump concentrated slurry to a shoreside facility or barge). Please provide information on the maximum concentration at which a slurry could be pumped, and the total volume of effluent which would be produced.

   b) Conversion of the existing boilers to an alternate fuel.

      The description must include the use of alternative fuels including at a minimum, fuel oil, diesel and natural gas and include a discussion of the alterations or major components

[1] EPA selected this date based upon its understanding that the Lake Michigan Carferry, Inc. began operating the S.S. Badger that year.

[2] This analysis should provide as detailed engineering assessments as possible including design drawings, discussion of materials considered, and the anticipated engineering issues with any technology or control technique.

that would need to be added to utilize these fuel sources with the existing boilers. The description should also address the modifications necessary to store these alternative fuels onboard the vessel. Finally, the information must include what concrete steps LMC has taken to date toward implementation of such modifications.

c) Repowering with alternative engines.

The description must address the types of alternative engines available to repower the vessel (e.g. diesel, gas turbine). Include a discussion of the alterations or major components that would be needed to repower the vessel with alternative engines.

For each of the technologies/control techniques evaluated under Item 3, provide a detailed explanation of the process changes required to install, operate and maintain that technology.

4. Provide estimates of the costs associated with implementation of the technologies/control techniques discussed in Item 3 including supporting information showing the basis for the cost estimates. This analysis must address capital costs and operation and maintenance costs over an appropriate amortization period and consider a range of reasonable interest rates. EPA recently issued a direct final rule that provides financial incentives for steamships operating in the Great Lakes that should be considered when calculating this information. Please provide cost information on any other coal ash-related pollution control technologies installed onboard the vessel as documented in Item 1.

5. Describe in detail the non-water quality environmental impacts, if any, that you have determined will occur from the use of each technology and the current approach used.

Enclosure 2: Sampling Requirements for the SS Badger Discharges

The following sampling requirements are requested pursuant to 40 CFR 122.21(g)(13) and the applicable requirements of Form 1 and 2c (40 CFR 122.1(a), (f), and (g)). These additional requirements are designed to help the Agency better characterize the SS Badger coal ash and related discharges. Lake Michigan Carferry (LMC) is responsible for collecting all information consistent with methods in 40 CFR Part 136 (where applicable) and with the requirements of this enclosure. If LMC plans to deviate from these requirements, they must explain their alternatives to EPA in writing, and must receive written concurrence from the Agency for that deviation.

I. Coal Ash Slurry Sample Collection

EPA has not conducted a ship visit of the Badger, so EPA cannot make a fully independent assessment of the best approaches for collecting effluent from the SS Badger. This document is based on our best knowledge of the workings of the vessel. The effluent should be collected at the point of discharge; however, EPA appreciates that LMC believes there may be logistical and safety issues which could complicate collection of coal ash slurry at the discharge point. Hence, EPA has developed two sampling options which may be followed by LMC as they collect the discharge. LMC must document how and where they collect the samples in all information they submit to EPA.

Conventional or modified conventional sampling techniques (as opposed to "clean hands/dirty hands" sampling techniques per EPA Method 1669) should be adequate for collecting coal ash samples; however, EPA Method 1669 must be used to collect ambient lake water samples. Please see the discussion in Part IV of this attachment for the sampling schedule and number of samples to be taken and Part V of this attachment for discussion about which analytes must be analyzed and what methods must be used.

- Option 1 - Collect Coal Ash Slurry Samples at the Point of Discharge

  Samples of the coal ash slurry discharge would be collected when ash is actively being discharged at a point after the effluent strikes the metal barrier and before it enters the receiving water.

  To reduce analytical costs, the sample could be collected as a single composite sample, collected over the 105 minute ash discharge period (see footnote 7 for discussion about the ash discharge period). LMC must assure that any samples collected for analysis are being collected when ash is actively being added to the vacuum system and being discharged into Lake Michigan. For example, individual grab samples would be collected at 2- or 3-minute intervals during the ash discharge period and composited into one sample to represent the entire discharge period[1]. One possible sample collection method

[1] EPA believes collecting sample aliquots as frequently as possible is appropriate because the discharge characteristics may vary significantly during the discharge period. Because the ash is manually placed into the

would be to collect individual grab samples using a wide-mouth container attached to a pole, and then combine these samples into a large composite container. (The composite container should be stored in ice to maintain sample preservation requirements.) Sample aliquots for analysis would then be withdrawn from the composite container. Maintaining a homogenous sample during preparation of the sample aliquots from the composite container is expected to be difficult because the ash is expected to settle easily. One possible method to maintain a homogenous sample is to remove the sample aliquot from the composite container using a peristaltic pump with tubing while simultaneously stirring the container contents.

Sample aliquots for analysis of dissolved metals should be filtered after collection to best represent actual discharge conditions[2]. If a single composite sample is prepared to represent the entire discharge period, then the total contact time between the coal ash and slurry water prior to filtering would be approximately three hours. To reduce contact time to less than one hour, composite samples, consisting of individual grab samples collected at 2- or 3-minute intervals, could instead be prepared for each 15-minute discharge period for each of the three boilers, resulting in the collection of three composite samples. Each of these three composite samples would then be filtered following collection.

- Option 2 - Collect Coal Ash Samples and Simulate Sluicing.

  If coal ash slurry samples cannot be collected at the point of discharge, this option includes collecting coal ash from the boilers, economizers, and dust collectors and then simulating sluicing at a laboratory (EPRI, 1997). EPA believes that this is an inferior sampling method to option 1 and should only be used in the event that sampling using option 1 is found to be impossible.

  The coal ash sample should be collected as three different composite samples: one for the bottom ash, one for the economizer ash, and one for the dust collector ash. The composites would be collected over the specific time frames required to remove the ash from the collection devices/boiler (e.g., the bottom ash composite would be collected over the 60 minutes required to remove the ash from all six boiler zones). For example, individual grab samples of the bottom ash would be collected at the beginning, middle, and end of the ash removal process for each of the boiler zones and composited into one sample to represent the entire ash removal cycle. One possible sample collection method would be to collect individual grab samples from the operator's ash shovel (or other ash

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vacuum system intermittently (i.e., the fireman dumps some ash into the receiver, then there is a break while he gets more ash from the boiler, then he dumps that ash into the receiver) and because there is no mixing of the ash wastewater prior to discharge, the characteristics of the discharge water vary depending on whether or not ash is contained in the discharge at any given instant of sample collection. Additionally, even in those instants when ash is contained in the discharge, the ash content in the wastewater is variable because the amount of ash contained in each scoop of ash that is added to the vacuum system varies.

[2] EPA notes that metals will continue to leach into the ambient water from the coal ash after discharge, and EPA will consider the total loading when calculating permit limits.

removal device) using a scoop or trowel, and then combining these samples into a large composite container. The ash would then be thoroughly mixed using a spoon, trowel, or rod for at least two minutes and shipped to the laboratory. A quantity of ambient lake water must also be collected and shipped to the laboratory for use in simulating sluicing.

Sluice simulation would be conducted by the laboratory to ensure it is performed in a controlled environment. The simulation would consist of thoroughly mixing and agitating the collected coal ash composite samples with the ambient lake water sample in the proper proportions as determined based on representative vessel discharge conditions (e.g., XX grams of ash per liter of water). The laboratory would prepare a sluice simulation for each of the three different types of ash generated by the Badger. Prior to combining the ash with the lake water, the laboratory should grind the ash into sand-like particles to simulate how the ash is broken into smaller pieces when it impacts the hardened alloy plate prior to discharge. After grinding, the ash would be mixed with the lake water at the appropriate proportion (representing expected concentration at discharge[3]) and should then be mixed using a recirculating pump to simulate the turbulence of ash sluicing. Filtration of sample aliquots for analysis of dissolved metals should be then be performed. Sample aliquots would then be withdrawn from the simulation container using the same procedure as described for Option 1. Use of lake water should accurately simulate pH during sluicing.

II. Coal and Lake Water Sample Collection

- Coal ash characteristics are dependent upon the characteristics of the coal feed stock. If these characteristics are not available from the coal supplier, a representative sample of each type of coal used on the Badger should be collected for analysis of characteristics such as ash, sulfur, moisture content, and heating value. Conventional sampling techniques are adequate for collecting coal samples.

- Ambient lake water samples must be collected from a location on the lake near the route taken by the vessel during coal ash discharge and where the Badger typically discharges (e.g., at least 5 nm from shore). Lakes samples must be analyzed for the same analytes as the coal ash slurry to assess background concentrations (sample analytes described later in this appendix). Lake water samples may also be required for use in simulating coal ash sluicing as described under coal ash slurry Option 2 above. Lake water samples must be collected using EPA Method 1669 ("clean hands/dirty hands"). Lake samples must be taken on the first voyage of the day and may not be taken within 30 minutes or 1 nm of when and where the coal ash slurry has been discharged to minimize any influence by discharges of coal ash.

[3] LMC must report the dilution concentrations so that EPA can calculate total pollutant loadings.

III. Operating/Process Data Collection[4]

- Sluice Water Flow Rates. According to LMC, 2008b, the pumping system used for coal slurry discharge operates at 180 psi and 650 gpm; however, this should be verified by Badger personnel. High quality flow rate data are required to perform an environmental assessment, as well as to determine the appropriate proportion of coal ash to lake water if coal ash slurry sampling Option 2 is selected. Flow measurements can be made using a recently calibrated in-line flow meter (if available), a strap-on ultrasonic flow meter (e.g., rental), or documented sluice pump rating/capacity. LMC must report the flow rates used by the vessel and total volume of effluent discharged on each voyage. Please provide the minimum and maximum design flow rates of the ash vacuum system per the manufacturer.

- Discharge Duration. The environmental assessment should be based on actual discharge duration for each coal ash discharge source (e.g., bottom ash, economizer, and dust collector ash) and not the total period of time required for ash removal from the boilers (i.e. the timing mechanism should only run when ash is actively entering the system). As this is a manual operation, a stop watch or equivalent can be used to determine the ash discharge duration from each boiler, economizer, and dust collector.

- Amount of Coal Combusted and Combustion Characteristics. Available documentation does not indicate the method and accuracy of coal combustion measurements. High quality coal combustion data are required to calculate ash generation rates necessary to perform an environmental assessment. LMC must verify whether their method for determining coal combustion rates is adequate for this intended use.

[4] According to LMC, 2008b, Coal ash slurry is discharged from the Badger during about 1 ¾ hours of the four-hour voyage across Lake Michigan, between the ports of Ludington, MI and Manitowoc, WI.[4] During 2008, on its last trip of the season (October 12) the amount of coal ash generated on one round-trip voyage was measured. To do so, the S.S. Badger retained all of the coal ash generated during a 12-hour period, which included one round trip from Ludington to Manitowoc. Upon returning to Ludington, the accumulated coal ash was removed from the carferry and weighed. Based on the quantity of ash generated (5,000 lbs) as well as the amount of coal combusted (55,900 lbs) during this trial, an ash generation rate of 8.94 percent was determined. EPA notes that this calculated % ash generation rate is approximately half of the % ash generation rate from coal-fired power plants. Assuming that this ash generation rate applies for the entire 154 day season, the LMC estimated that the S.S. Badger generated (and discharged) 769.7 tons of coal ash in 2008. For the 215 round-trip lake crossings over 137 days scheduled for 2011, the estimated coal ash discharge would be somewhat less, 537.5 tons (GLEC, 2011). The information required under this section is to help better characterize the discharge based upon measurements on board the vessel.
EPA further notes that there is an inconsistency regarding the reported duration of coal ash slurry discharge onboard the Badger during each four-hour voyage. LMC, 2008b indicates that coal ash slurry is discharged 105 minutes during a single trip across Lake Michigan, while LMC, 2008a indicates that coal ash slurry is discharged 60 minutes during a single trip across Lake Michigan, and GLEC, 2011 indicates that coal ash slurry is discharged 150 minutes during a single trip across Lake Michigan. It appears that the actual ash discharge period is 105 minutes: 10 minutes per boiler zone times three boilers (only three of the four boilers operate at a given time) times two zones per boiler, plus 10 minutes per economizer times three economizers, plus 15 minutes for the two dust collectors. In contrast, the 60-minute period is based on 15 minutes per boiler times four boilers, while the 150-minute period regards the duration of time the Badger is able to discharge ash (4 hours total trip minus 45 minutes to get out of port to deep lake waters and 45 minutes prior to entering port).

- Ash Generation Rate. This parameter is difficult to measure directly, but can be calculated indirectly using measurements of the amount of coal combusted and coal ash content. LMC should develop and/or verify the correlation between coal amounts combusted, coal ash content, and ash generation rates by collecting coal samples, tracking coal combustion, and measuring ash generation rates as performed in October 2008. LMC must report the volume of bottom ash, economizer ash, fly ash, and dust collector ash generated (expressed per voyage and per season).

- Coal Type. In addition to sampling and analyzing the coal feedstock described above, LMC should record coal type, fuel province, and source (e.g., Bituminous, various Appalachian, XX Mining Company, YY and ZZ mines).

- Discharge Conditions. LMC should report the vessel route during discharge for each sampling event (e.g., GPS location at start and end of each discharge period for each boiler, economizer, and dust collector), distance from shore, water depth, air temperature, water temperature, weather conditions, percent relative humidity, average barometric pressure, and vessel speed at time of discharge. Additionally, LMC should report the full range of these values for typical voyages.

- Vessel Characteristics. LMC must report ship width, ship draft, and range of ship speed during discharge events.

- Discharge Port Characteristics. LMC must report the following characteristics regarding the discharge port:
    - Port diameter;
    - Port elevation (vertical distance between the port and the bottom of the water body);
    - Vertical angle (discharge angle relative to the horizontal with zero being horizontal, 90 being vertically upward, and -90 being vertically downward);
    - Horizontal angle (horizontal port discharge angle relative to the x-coordinate);
    - Number of ports (if a diffuser is used, the total number of ports);
    - Port spacing (space between ports);
    - Port depth (distance from surface to the port centerline);
    - Effluent flow (total volumetric flow from all ports) (discussed above);
    - Estimated Effluent temperature;
    - Effluent concentration (discussed above).

IV. Sampling Schedule and Number of Samples

LMC must collect one sample of the coal ash discharges from five different voyages to produce a total of five independent samples. Samples must be composited over the duration of the discharge. However, LMC may analyze the coal ash as a grab sample in the laboratory as an alternative if LMC implements Option 2. EPA defines a voyage as being one complete crossing of Lake Michigan. LMC may use data collected within the previous 12 months to fulfill one or more sample requirements, provided all of the information required by this letter is included, the

sampling collection methods are fundamentally similar, the analytical methods are the same as prescribed in this letter and the detection limits are at least as sensitive as all analytical methods outlined below. LMC must collect at least two samples of ambient lake water for analysis. However, LMC must collect fresh lake water for sluicing with the coal ash discharge on every sample event if they select sampling option 2.

LMC must report analytical results for all samples taken within the last 12 months, whether or not those results are used to fulfill one of the five samples required.

V. Sample Analyses, Analytes, and Analytical Methods

Coal ash slurry. Because certain water quality standards are expressed in the total form while others are expressed in the dissolved form, coal ash slurry samples must be analyzed for the following pollutants and quantify both total and dissolved metals[5]. Samples should also be analyzed for Polycyclic Aromatic Hydrocarbonss, (LMC detected 2-methylnaphthalene in their 2008 coal ash analysis). Finally, samples should be analyzed for various water quality parameters, including conductivity, hardness, pH, salinity, temperature, turbidity, and Total Suspended Solids (TSS). Note that because coal ash slurry samples contain high quantities of suspended or particulate matter that may be difficult to digest, the solids and liquid phases may need to separated via centrifugation or filtration and analyzed separately to obtain an accurate result for total recoverable metals[6]. The results would then be mathematically combined to determine the sample concentration. The total sample results for the sample can be calculated using the following formula:

$$\text{Total Sample Concentration} = [(\text{Conc.}_{\text{Supernate}}\,(\text{mg/L}) \times \text{Vol.}_{\text{Supernate}}\,(\text{L})) + (\text{Conc.}_{\text{Solid}}\,(\text{mg/kg}) \times \text{Wt.}_{\text{Solid}}\,(\text{kg}))]/\,\text{Vol.}_{\text{Original Sample}}\,(\text{L})$$

Sufficiently sensitive methods[7] must be used to collect data for pollutants expected to be found in trace quantities. This is especially applicable to the toxic metal analytes identified below.

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[5] Samples for dissolved metals analysis should be filtered after mixing the ash with the lake water to more accurately represent the short contact time between the ash and the lake water prior to discharge. The total metals sample will be used to evaluate the total amount of metals present in the sample, regardless of contact time.

[6] EPA Method 200.7 and 200.8 both include the following language: "Aqueous samples containing suspended or particulate material ≥1% (w/v) should be extracted as a solid type sample." Therefore, EPA expects the proposed biphasic approach for high solids samples to be used to ensure complete digestion of the solids.

[7] For purposes of this applications, a method is "sufficiently sensitive" when (1) its method quantitation level is at or below the level of the applicable water quality criterion for the tested analyte or (2) its method quantitation level is above the applicable water quality criterion, but the concentration of an analyte in a facility's discharge is high enough that the method detects and quantifies the level of that analyte in the discharge. For further discussion of sufficiently sensitive methods (in the context of mercury discharges), please see the August 23, 2007 memo titled "Analytical Methods for Mercury in National Pollutant Discharge Elimination System (NPDES) Permits" available at http://water.epa.gov/scitech/methods/cwa/metals/mercury/upload/2007_10_02_pubs_mercurymemo_analyticalmethods.pdf

- EPA recommends use of EPA Method 200.8[8] or EPA method 1638 for the following analytes:

    - Antimony;
    - Arsenic;
    - Cadmium;
    - Chromium;
    - Copper;
    - Lead;
    - Manganese;
    - Nickel;
    - Selenium;
    - Silver;
    - Thallium; and
    - Vanadium.

- EPA Method 200.8 can be used for metals expected to be found at higher concentrations relative to trace metals, but 200.7 could also be used for the analysis:

    - Aluminum;
    - Barium;
    - Beryllium;
    - Boron;
    - Calcium;
    - Cobalt;
    - Iron;
    - Magnesium;
    - Molybdenum;
    - Potassium;
    - Sodium;
    - Tin;
    - Titanium; and
    - Zinc.

- EPA Method 1631E:

    - Mercury

- EPA Method 610 or 625:

    - 2-Methylnaphthalene;

[8]There may be matrix interference concerns with Method 200.8 for certain wastewaters. See relevant discussion in EPA's Determination of Technology-Based Effluent Limits for the Flue Gas Desulfurization Wastewater at Merrimack Station in Bow, New Hampshire (available at: http://www.epa.gov/region1/npdes/merrimackstation/pdfs/MerrimackStationAttachE.pdf).

- Acenaphthene;
- Acenaphthylene;
- Anthracene;
- Benzo(a)anthracene;
- Benzo(a)pyrene;
- Benzo(b)fluoranthene;
- Benzo(ghi)perylene;
- Benzo(k)fluoranthene;
- Chrysene;
- Dibenzo(a,h)anthracene;
- Fluoranthene;
- Fluorene;
- Indeno(1,2,3-cd)pryene;
- Naphthalene;
- Phenanthrene; and
- Pyrene.

- Total Suspended Solids and Total Dissolved Solids by Standard Methods 2540 D and 2540 C

- Standard Water Quality Parameters by methods listed below, or other 40 CFR Part 136 methods as applicable:

  - pH by EPA Method 150.2;
  - Temperature by thermometer;
  - Hardness by EPA Method 130.1;
  - Turbidity by EPA Method 180.1;
  - Conductivity by EPA Method 120.1; and
  - Salinity by Standard Method 2520 B.

Consistent with Form 2C, if you believe PCBs or asbestos might be present, you must monitor for these parameters at least once using sufficiently sensitive Part 136 methods (where available).

Lake Water. Samples must be analyzed for the same analytes as for coal ash slurry using sufficiently sensitive methods. However, EPA Method 1669 (clean hands/dirty hands) must be used for sample collection. EPA Method 1638 (rather than EPA Methods 200.7 and 200.8) should be used for metals analysis[9]. Finally, the following additional standard water quality parameters are required:

- Dissolved organic carbon by Standard Method 5310 C;
- Sulfate by EPA Method 300.0;

[9] EPA Method 1638 uses the same instrumentation as EPA Method 200.8 (i.e., ICP-MS); however, EPA Method 1638 has more stringent QA/QC requirements and has lower detection limits than EPA Method 200.8. Therefore, the use of EPA Method 1638 must be used to accurately measure the pollutant levels present in the lake water with minimal contamination.

- Chloride by EPA Method 300.0; and
- Alkalinity by EPA Method 2320 B.

Coal. Coal characteristics can be determined using methods ASTM D3172-07a and ASTM D3176-89. These methods include the analysis of the following parameters:

- Ash content;
- Fixed carbon;
- Moisture;
- Volatile matter; and
- Basic chemical element concentrations (e.g., carbon, sulfur).

Quality Control Samples. Field and laboratory QC must be conducted per method requirements. When not specified by the method, field duplicates must be collected and analyzed at a frequency of five percent, field blanks must be collected and analyzed at each sampling point (e.g., ash type, lake water), and bottle blanks and equipment blanks must be collected and analyzed once per bottle and equipment type.

VI. References

ADEC. 2002. Alaska Department of Environmental Conservation, The Impact of Cruise Ship Wastewater Discharge on Alaska Waters. Juneau, AK. http://www.dec.state.ak.us/water/cruise_ships/pdfs/impactofcruiseship.pdf

EPRI. 1997. Electric Power Research Institute, PISCES Water Characterization Field Study. November 1997.

GLEC. 2011. Great Lakes Environmental Center, Evaluation of the Potential Ecological Impacts of Coal Ash Slurry Discharges from the S.S. Badger to the Open Waters of Lake Michigan. Prepared for Lake Michigan Carferry Service. June 3, 2011.

James A. Hanlon. 2007. Analytical Methods for Mercury in National Pollutant Discharge Elimination System (NPDES) Permits. EPA Memorandum to Water Division Directors, Regions 1-10. August 23, 2007

LMC. 2011a. Lake Michigan Carferry, Inc., Lake Michigan Car Ferry, inc. SS Badger Petition for Individual NPDES Permit. Letter from Robert A. Manglitz, President and CEO to Ms. Susan Hedman, Regional Administrator, EPA Region 5. November 2, 2011.

LMC. 2011b. Lake Michigan Carferry Service: S.S. Badger: VGP and 2012. Letter from Barry M. Hartman to Ryan Albert. June 9, 2011.

LMC. 2008a. Lake Michigan Carferry, Inc., Comments on EPA's 2008 Proposed Issuance of a NPDES Vessel General Permit for Discharges Incidental to the Normal Operation of Commercial and Large Recreational Vessels. EPA-HQ-OW-2008-0055-0432.1.

LMC. 2008b. Lake Michigan Carferry, Inc., Response to Request for Information Pursuant to Section 308 of the Clean Water Act (33 U.S.C. §1318). October 27, 2008.