Consumers Energy

A CMS Energy Company

Environmental & Laboratory Services

March 26, 2009

VIA UPS OVERNIGHT (addressee's phone 703-308-8214)

Mr. Richard Kinch
US Environmental Protection Agency (5306P)
Two Potomac Yard
2733 S. Crystal Dr.
5th Floor; N-5783
Arlington, VA 22202-2733

RE: EPA Request for Information Concerning Surface Impoundments, Under Section 104(e) of the Comprehensive Environmental Response, Compensation, and Liability Act, D.E. Karn, J.C. Weadock, and J.R. Whiting Power Plants

Dear Mr. Kinch:

This letter and attached compact disc (CD) responds to letters dated March 9, 2009 from EPA Administrator Lisa P Jackson, and letters dated March 9, 2009 from Acting Assistant Administrator Barry N. Breen, head of the EPA Office of Solid Waste and Emergency Response, addressed to the Plant Managers, of the J.R. Whiting Power Station, and the D.E. Karn and J.C. Weadock Generating Plants.

The letters from Mr. Breen requested detailed information concerning surface impoundments at each of the three facilities. Attached are responses certified by the two plant managers, Steven B. Beachum, P.E. at the J.R. Whiting Plant and Dennis D. Dobbs at the D.E.Karn and J.C. Weadock Plants.

If you have any technical questions concerning this response, please contact me at the address shown below, or the telephone number or e-mail address below. If you have any legal questions concerning this response, please contact John P. Dickey, One Energy Plaza, Jackson, MI 49201, Phone 517-788-1846, jpdickey@cmsenergy.com.

Sincerely,

Gary A. Dawson

Gary A. Dawson, Ph.D.
Director of Environmental Services
Land and Water Management
Phone: (517) 788-2432
e-mail: gadawson@cmsenergy.com

I certify that the information contained in this response to EPA's request for information and the accompanying documents is true, accurate, and complete. As to the identified portions of this response for which I cannot personally verify their accuracy, I certify under penalty of law that this response and all attachments were prepared in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature: Steven B. Beachum, P.E.
Name: Steven B. Beachum
Title: Business Manager, JR Whiting Plant

This request has been reviewed and approved by the Office of Management and Budget pursuant to the Paperwork Reduction Act, 44 U.S.C., 3501-3520.

Please send your reply to:

Mr. Richard Kinch
US Environmental Protection Agency (5306P)
1200 Pennsylvania Avenue, NW
Washington, DC 20460

If you are using overnight or hand delivery mail, please use the following address:

Mr. Richard Kinch
US Environmental Protection Agency
Two Potomac Yard
2733 S. Crystal Dr.
5th Floor; N-5783
Arlington, VA 22202 2733

EPA expects the owners and operators of these units to exercise the utmost care and diligence in examining whether there are any potential concerns at the units and to take appropriate actions to address them. We ask that this effort be a priority at the highest levels of your organization to ensure the protection of public health, safety, and the environment.

CONSUMERS ENERGY COMPANY
JR Whiting Plant Solid Waste Disposal Area
Response to Information Request under Section 104(e) of CERCLA dated 3/9/09

Background and Michigan Regulatory Context

In Michigan, surface impoundments for the storage or disposal of residuals or by-products from the combustion of coal are regulated under Michigan's Natural Resources and Environmental Protection Act, (NREPA) Part 115, Solid Waste Management, (Michigan Compiled Laws 324.11501 et seq). Specifically, they are regulated under Michigan Administrative Code Rule 299.4309, "Industrial waste surface impoundments closed as landfills," promulgated under Part 115. This rule provides for the operation of solid waste surface impoundments with industrial wastes and free liquids, with liquids discharged from the facility subject to a National Pollutant Discharge Elimination System (NPDES) permit issued under NREPA Part 31 (Michigan Compiled Laws 324.3101, et seq.). Part 31 implements the issuance of permits under the Federal Clean Water Act. Importantly, this rule requires the closure of these impoundments as landfills, with the owner or operator required to eliminate free liquids from the facility or solidifying the remaining wastes, stabilizing the remaining wastes to a bearing capacity sufficient for supporting final cover, and then applying a landfill final cover that is in conformance with landfill final cover requirements stipulated in the rule. In considering surface impoundments in Michigan under this Section 104(e) information request, it is important to keep this regulatory construct in mind, for it divides the operation of landfill cells or whole landfills into three phases: Phase I, where coal combustion residues or by-products are disposed with free liquids and subject to freeboard requirements, Phase II, where liquids are being eliminated and landfill solids are consolidated in an engineered structural fill in preparation for the landfill receiving final cover, and Phase III , bringing the landfill to final grade and installation of the final cover. Typically, the last two phases involve the placement of coal combustion products above freeboard elevation and above dike elevation to provide a final cover gradient that allows surface water to flow off the landfill final cover.

The JR Whiting Plant went on line in 1952 and ash impoundments were constructed as necessary to store or dispose of coal ash produced by the Plant. At present, there are six "surface impoundments" licensed to receive coal ash combustion wastes under a Michigan Department of Environmental Quality (MDEQ) Solid Waste Disposal Area Operating License No. 9018. **(See Attachment A, whiting ash ponds outlines.pdf)**. For the past several years, fly ash disposal at the Plant has been minimal, with almost all ash collected dry and sold for cement manufacture.

Bottom ash has historically been stored in Ponds 1 and 2 and then excavated for use as a construction material for the construction of roads and in the closure of the landfill. In June of 2008, half of Pond 2 was modified to receive fly ash in the event there was an outage in the dry ash collection system.

Ponds 3-5 were constructed iteratively, but have been operated as one unit since at least the 1980's. They no longer receive liquid-borne materials or free liquids; all water discharges to these ponds were terminated in June of 2008. They are included in this response only because a small area of water remains in the far southern portion of Pond 5. That area is being pumped down and filled with compacted coal ash. Since the Plant's fly ash is being marketed, fly ash from Pond #6 is being excavated and placed in the Ponds 3-5 structural fill to close these cells in a timely manner. These "ponds" are well into the Phase II consolidation phase and approximately 35 acres are at grade and have received certified final cover.

Pond 6 is a surface impoundment licensed to receive fly ash, but is currently serving primarily as a source of excavated fly ash to bring Ponds 3-5 to design grade for closure.

Responses to the Section 104(e) of CERCLA ICR

I. Q. Relative to the National Inventory of Dams criteria for High, Significant, Low, or Less-than-Low, please provide the potential hazard rating for each management unit and indicate who Established the rating, what the basis of the rating is, and what federal or state agency regulates the unit(s). If the unit(s) does not have a rating, please note that fact.

1 A. Pond #6 has been identified on the National Inventory of Dams as J. R. Whiting Power Plant Dam, Record Number 28365 and NID ID#MI00078. The dam is listed as being regulated by the Michigan Department of Environmental Quality and is listed as having a low (L) downstream hazard potential. No other JR Whiting Plant impoundment dikes are listed on the NID. (See Attachment C, JWhiting_Dam_Inventory_MI0078.pdf)

2Q. What year was each management unit commissioned and expanded?

2A. Ponds 1 & 2

Ash Ponds 1&2 were constructed in 1952 and were subsequently upgraded according to plans developed by Hoad Engineering of Ypsilanti, Michigan and approved by Consumers Power Company staff for construction on 7/6/83 (Attachment B, 400-4022-001.pdf).

Ponds 3-5

Ponds 3 and 4 were constructed in 1959, Pond 4 was expanded in 1966, and Pond 5 was constructed in 1974.

Pond 6

Pond 6 was constructed in 1979 and 1980 under Dam Construction Permit No. 79-4 and Floodplain Permit No. FP-1346 from the Michigan Department of Natural Resources (MDNR).

3Q. What materials are temporarily or permanently contained in the unit? Use the following categories to respond to this question: (l) fly ash; (2) bottom ash: (3) boiler slag; (4) flue gas emission control residuals; (5) other. If the management unit contains more than one type of material, please identify all that apply. Also, if you identify "other," please specify the other types of materials that are temporarily or permanently contained in the unit(s).

3A. Pond 1 receives bottom ash and, as of June 1, 2008, co-disposed liquid wastes regulated by the site's NPDES permit, MI0001864. Please see attached NPDES flow schematic (Attachment C, WQ113_JRW_2008.pdf) for a description of these wastes. In general, the wastes include a number of generally low volume plant wastes, treated boiler cleaning wastes from the Plant's chemical treatment facility, and treated sewage waste from the Plant's sanitary sewage treatment facility.

Pond 2 is separated into two sub-ponds; one for fly ash deposition in the event that the dry fly ash collection system temporarily fails or is down for maintenance; almost all fly ash at JR Whiting and for the past several years was collected dry and used in Portland cement manufacture. As of January of this year, most ash is still collected dry, but is being placed in Ponds 3, 4, and 5 as part of final closure. Pond 2 also receives co-disposed liquid wastes; both ponds discharge to a common internal outfall.

Ponds 3, 4, and 5, prior to June 1, 2008, received both fly ash and NPDES wastes as discussed for ponds 1&2. Since June 1, 2008, these landfill cells receive only fly ash that is excavated and then trucked from Pond 6 or fly ash collected in the dry silo, moistened to an optimal moisture content to allow compaction to a specified density , and then trucked to these cells.

Pond 6 receives fly ash only.

4Q. Was the management unit(s) designed by a Professional Engineer? Is or was the construction of the waste management unit(s) under the supervision of a Professional Engineer? Is inspection and monitoring of the safety of the waste-management unit(s) under the supervision of a Professional Engineer?

4A. Ponds 1&2-We have not found a record of the initial construction design and whether the original design was approved by a professional engineer. However, the design for the upgrade of these facilities was approved by a professional engineer (CA Hunt, No. 06323) on July 6, 1983. (See Attachment B, 400-4022-001.pdf) We were unable to determine if construction was supervised by a registered professional engineer.

Ponds 3-5- We have not found a record of the initial construction design for Ponds 3 and 4 and whether the original design was approved by a professional engineer or construction supervised by a professional engineer. Plans for Pond 5

date to 1972; these plans were approved by a professional engineer, G. Simon Morrell, PE#11129 (See Attachment B, 400-1907-008.pdf)

Pond 6—Pond 6 was designed by MD Challis PE#12630, of Hoad Engineering, Incorporated of Ypsilanti, Michigan. The construction of Ash Area 6 was certified to be in accordance with the certified specifications and drawings submitted to Michigan's Resource Energy Division and Water Management Division by William P. Cooke, PE, Registration No. 13658, on November 12, 1980. (See Attachment D, JRW_Ash Area No 6_Professional Engineer License_19801112.pdf)

5Q. When did the company last assess or evaluate the safety (i.e., structural integrity) of the Management unit(s)? Briefly describe the credentials of those conducting the structural integrity assessments/evaluations. Identify actions taken or planned by facility personnel as a result of these assessments or evaluations. If corrective actions were taken, briefly describe the credentials of those performing the corrective ~ctions, whether they were company employees or contractors. If the company plans an assessment or evaluation in the future, when is it expected? to occur?

5A. Ash Ponds 1&2— While Company personnel make visual inspections of the dike at least weekly and visual inspections are made by the MDEQ's inspector at least quarterly. We have not found a record of a formal structural inspection of these ash storage ponds.

Ash Ponds 3-5-February 18, 2005—This was the date of Revision A of Black and Veatch Ltd. of Michigan' Final Closure System Report for Ash Ponds 3,4,and 5. This revision supersedes the July 19, 2002 version of the plan that had been approved by MDEQ on September 20, 2002. Revision A, approved by Richard L. Oliver, PE#20056, included a dike stability analysis to allow for additional material placed at an elevation up to 2.08 feet higher than previous design grade. (See Attachment F, B&V_JRW Final Cover System Report for Ash Ponds 3 & 4 & 5_20080508.pdf).

Ash Pond 6—The most recent assessment of Pond 6 structural integrity (dike stability analysis) was conducted by Black and Veatch Ltd. of Michigan in their 17 March 2008 Final Cover System Report for Ash Pond 6 to determine if a revised final cover design would impact dike stability. They concluded that "The factor of safety against slope failure remained adequate for long-term stability."(Attachment F, B&V_JRW Final Cover System Report for Ash Pond 6_Dike Stability_20080609.pdf).

6Q. When did a State or a Federal regulatory official's inspect or evaluate the safety (structural Integrity) of the management unit(s)? If you are aware of a planned state or federal inspection or evaluation in the future, when is it expected to occur? Please identify the Federal or State regulatory agency or department which conducted or is planning the inspection or evaluation. please provide a copy of the most recent official inspection report or evaluation.

CONSUMERS ENERGY COMPANY
JR Whiting Plant Solid Waste Disposal Area
Response to Information Request under Section 104(e) of CERCLA dated 3/9/09

6A. Ponds 1&2—The last quarterly MDEQ Waste and Hazardous Materials Division's inspection of Ponds 1&2 occurred on February 18, 2009. These inspections are general landfill inspections, not specific dike integrity inspections. (See Attachment C, JWhiting_Dam_Inspection_080217.pdf)

Ponds 3,4,5— September 1, 2005—The MDEQ approved Revision A of the Black and Veatch Ltd. of Michigan' Final Closure System Report for Ash Ponds 3,4,and 5, which included a revised stability analysis. These Ponds were also subject to the February 18, 2009 quarterly inspection.

Pond 6- The MDEQ approved Black and Veatch Ltd. of Michigan's 17 March 2008 Final Cover System Report for Pond 6 and its dike stability analyses on March 24, 2009. (See Attachment C, JWhiting Final Cover Inspection 090324.pdf) They also included Pond 6 in their last quarterly inspection on February 18, 2009.

In the wake of the TVA ash dike failure, Consumers Energy sent a request for proposal to four (4) engineering firms to perform an independent assessment of the structural integrity of all of its ash impoundments. Bids were submitted on March 23, 2009 and are currently being evaluated. Results are expected in the third or fourth quarter of 2009.

7Q. Have assessments or evaluations, or inspections conducted by State or Federal regulatory officials conducted within the past year uncovered a safely issue(s) with the management unit(s), and, if so, describe the actions that have been or are being taken to deal with the issue or issues. please provide any documentation that you have for these actions.

7A. No safety issues have been raised during quarterly MDEQ inspections of our ash impoundments.

8Q. What is the surface area (acres) and total storage capacity of each of the management units? what is the volume of materials currently stored in each of the management unites)? Please provide the date that the volume measurement(s) was taken. Please provide the maximum height of the management unites). The basis for determining maximum height is explained later in this enclosure.

8A. Ponds 1&2—The surface area of Pond 1, exclusive of the dikes, is approximately 7.8 acres; maximum dike height is 591-572 =19 feet. (Note: All elevations USGS). The surface area of Pond 2 is approximately 7.1 acres, exclusive of the dikes; maximum height is 591-572=19 feet. While, during wet (Phase I) operation at least two feet of freeboard is maintained, the MDEQ established an ultimate fill elevation, the same as dike height. There are approximately 239,000 cubic yards of storage capacity in Pond 1 and about 218,000 cubic yards of storage capacity in Pond 2. The volume of material in these storage ponds is estimated as 67,386 yds^3 in Pond 1 as of October 2007 and 75,207 yds^3 as of October 2008.

CONSUMERS ENERGY COMPANY
JR Whiting Plant Solid Waste Disposal Area
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Ponds 3, 4, & 5—While these ponds were built iteratively, they have been operated as a unit since at least the late 1970's. Their individual acreages, are 9.9, 37.63, and 34.64 acres, for a total of 82.37 acres. Dike elevation and fill elevations for Pond 3 are 591; ponds 4 & 5 dike and fill elevations are 590. Maximum dike height for Pond 3 is 591-572=19 feet; maximum dike height for ponds 4 & 5 is 590-572=18 feet. Pond capacity for Pond 3 is about 303,000 cubic yards. The pond capacity for Ponds 4 & 5 is about 2,099,000 cubic yards. Total volume for the three-pond unit is 2,402,000 cubic yards. The volume of fly ash stored in these ponds is estimated as 2,125,416 yds^3 as of October 2008.

Pond 6—The surface area of Pond 6, exclusive of dikes, is about 32.1 acres; maximum dike height is 600-573=27 feet. The interior diked bottom is excavated to 565 USGS. Maximum fill elevation is two feet below dike level, or 598; thus capacity depth is 598-565, or 33 feet. There are approximately 1,700,000 cubic yards of storage volume in Pond 6. Ash volume in the pond is estimated as 1,321,850 yds^3 as of October 2008

9 Q. Please provide a brief history of known spills or unpermitted releases from the unit within the last ten years. Whether or not these were reported to State or federal regulatory agencies. For purposes of this question, please include only releases to the surface or to the land (do not include releases to groundwater).

9 A. There have been no spills or unpermitted releases to surface water or land from these impoundments in the last ten years attributable to a loss of dike integrity. NPDES operating records show eight (8) exceedances of the monthly average standard for selenium over the last ten years from former Outfall 002 from ash ponds 3, 4, and 5. Outfall 002 was closed in 2008 as part of the process to close these ash ponds as a landfill.

10 Q. Please identify all current legal owner(s) and operator (s) at the facility.

10 A. The current legal owner and operator of this facility is Consumers Energy Company.

I certify that the information contained in this response to EPA's request for information and the accompanying documents is true, accurate, and complete. As to the identified portions of this response for which I cannot personally verify their accuracy, I certify under penalty of law that this response and all attachments were prepared in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature: _____
Name: Dennis D. Dobbs
Title: Site Business Manager, DE Karn & JC Weadock Plants

This request has been reviewed and approved by the Office of Management and Budget pursuant to the Paperwork Reduction Act, 44 U.S.C., 3501-3520.

Please send your reply to:

Mr. Richard Kinch
US Environmental Protection Agency (5306P)
1200 Pennsylvania Avenue, NW
Washington, DC 20460

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EPA expects the owners and operators of these units to exercise the utmost care and diligence in examining whether there are any potential concerns at the units and to take appropriate actions to address them. We ask that this effort be a priority at the highest levels of your organization to ensure the protection of public health, safety, and the environment.

CONSUMERS ENERGY COMPANY
DE Karn Plant Solid Waste Disposal Area
Response to Information Request under Section 104(e) of CERCLA dated 3/9/09

Background and Michigan Regulatory Context

In Michigan, surface impoundments for the storage or disposal of residuals or by-products from the combustion of coal are regulated under Michigan's Natural Resources and Environmental Protection Act, (NREPA) Part 115, Solid Waste Management, (Michigan Compiled Laws 324.11501 et seq). Specifically, they are regulated under Michigan Administrative Code Rule 299.4309, "Industrial waste surface impoundments closed as landfills," promulgated under Part 115. This rule provides for the operation of solid waste surface impoundments with industrial wastes and free liquids, with liquids discharged from the facility subject to a National Pollutant Discharge Elimination System (NPDES) permit issued under NREPA Part 31 (Michigan Compiled Laws 324.3101, et seq.). Part 31 implements the issuance of permits under the Federal Clean Water Act. Importantly, this rule requires the closure of these impoundments as landfills, with the owner or operator required to eliminate free liquids from the facility or solidifying the remaining wastes, stabilizing the remaining wastes to a bearing capacity sufficient for supporting final cover, and then applying a landfill final cover that is in conformance with landfill final cover requirements stipulated in the rule. In considering surface impoundments in Michigan under this Section 104(e) information request, it is important to keep this regulatory construct in mind, for it divides the operation of landfill cells or whole landfills into three phases: Phase I, where coal combustion residues or by-products are disposed with free liquids and subject to freeboard requirements, Phase II, where liquids are being eliminated and landfill solids are consolidated in an engineered structural fill in preparation for the landfill receiving final cover, and Phase III , bringing the landfill to final grade and installation of the final cover. Typically, the last two phases involve the placement of coal combustion products above freeboard elevation and above dike elevation to provide a final cover gradient that allows surface water to flow off the landfill final cover. At some sites with substantial surface area and favorable geotechnical properties, Phase II may include substantial landfill vertical expansions through the use of coal ash combustion residues or by-products compacted to specified densities in engineered structural fills. Therefore, in later phases, the volume of ash in a landfill that began as a surface impoundment may be substantially greater than the volume calculated by multiplying impoundment surface area by dike height with the required freeboard.

Moreover, detailed accounting of the yards or tons of ash placed in the landfills goes back only to 1990 with the institution of perpetual care funds for these landfills. Actual capacity depends upon the in-place density of the ash that has been placed. In-place density varies from impoundment to impoundment due to drainage characteristics, type of coal burned, boiler characteristics, and the type of compaction equipment and amount of effort used in compaction in phases II and III of the landfill to bring the facility to design grade. For these and other reasons, the best estimate of ash cubic yards disposed of in these facilities is a loose fill (as produced) volume based on ash generated minus estimated historic sales or use.

CONSUMERS ENERGY COMPANY
DE Karn Plant Solid Waste Disposal Area
Response to Information Request under Section 104(e) of CERCLA dated 3/9/09

The DE Karn Plant Units 1 & 2 went on line in 1959 and 1961, respectively. The 174 acre surface impoundment constructed to serve as the means of coal ash disposal for these units is regulated under Solid Waste Disposal Area Operating License No. 9023. (Attachment A, ashponds.pdf)

The entire 174 acre landfill is considered an "active" area under the current operating license and is licensed to receive either liquid-borne or dry (fly ash conditioned with water to an acceptable moisture content for specified compaction in an engineered, structural fill). The designation of individual ponds within the landfill is an artifact of early Phase I operations and is not relevant to current operations. In the fall of 2008, a $41 million dry fly ash handling system was completed for the handling of ash at both the DE Karn Plant and the adjacent JC Weadock Plant. At this time, neither plant is receiving liquid-borne fly ash for disposal, although both plants still receive water-borne bottom ash in separate bottom ash storage cells within each landfill. The transition to a redundant, stand-alone dry ash placement system has taken place over the last several months, with all dry ash currently being placed in the nearby JC Weadock landfill. A low volume of water is being discharged to the former Karn impoundment to keep the pipes from freezing in the event that we should be forced to rely on the wet system as an emergency back-up during the transition.

Until 1986, the DE Karn landfill was operated strictly as a surface impoundment. On 12/15/86, Construction Permit #0195 issued by the Michigan Department of Natural Resources provided for Phase II consolidation and the vertical expansion of an engineered structural fill in portions of the landfill. This expansion did not increase the height of the dikes or the areal extent of the landfill, but is being accomplished by creating a raised structural fill set back 100' from the toe of the dikes and rising on a maximum slope of 1:4 to a maximum elevation of 641.75 IGLD 85. Maximum dike elevation in "Pond A" is 594.85 IGLD 85; dike elevation in the remainder of the landfill is 590 IGLD 85.

Responses to the Section 104(e) of CERCLA ICR

1 Q. Relative to the National Inventory of Dams criteria for High, Significant, Low, or Less-than Low, please provide the potential hazard rating for each management unit and indicate who Established the rating, what the basis of the rating is, and what federal or state agency regulates The unit(s). If the unit(s) does not have a rating, please note that fact.

1 A. We have not been able to find documentation that any of the subject facilities have been rated under the National Inventory of Dams criteria for hazard potential

2 Q. What year was each management unit commissioned and expanded?

2 A. The 174 acre surface impoundment was constructed to serve as the means of coal ash disposal for Units 1 and 2 of the DE Karn Plant, which went online in 1959 and 1961, respectively. Construction of the ash impoundment dikes in their current conformation was completed by 1965. A vertical expansion of the dikes was

completed in 1973. On 12/15/86, Construction Permit #0195 issued by the Michigan Department of Natural Resources authorized the vertical expansion of this facility in portions of the landfill.

3 Q. What materials are temporarily or permanently contained in the unit? Use the following categories to respond to this question: (l) fly ash; (2) bottom ash: (3) boiler slag; (4) flue gas emission control residuals; (5) other. If the management unit contains more than one type of material, please identify all that apply. Also, if you identify "other," please specify the other types of materials that are temporarily or permanently contained in the unit(s).

3 A. The 174 acre landfill includes a bottom ash pond of approximately 14 acres where bottom ash is sluiced hydraulically for storage. This bottom ash is periodically removed from the pond, allowed to dewater, and then is used or stored for use as a construction material within the landfill. The remainder of the facility, 160 acres, has been used for the disposal of fly ash and co-disposed liquid wastes under NPDES Permit No. MI0001878. (See Attachment C, WQ113_K_W.pdf) This waste stream includes numerous miscellaneous and low-volume plant wastes, included treated metal cleaning wastes from the DE Karn chemical treatment facility

4 Q. Was the management unit(s) designed by a Professional Engineer? Is or was the construction of the waste management unit(s) under the supervision of a Professional Engineer? Is inspection and monitoring of the safety of the waste-management unit(s) under the supervision of a Professional Engineer?

4 A. The original dike drawings could not be found and therefore there is no data to indicate whether or not the original Karn ash dikes were designed by a professional engineer (PE). Construction of the ash impoundment dikes in their current conformation was completed by 1965. A vertical expansion of the dikes was completed in 1973. (See Attachment B, 695-1906-005.pdf, 695-1906-006.pdf, and 695-1906-007.pdf).

The structural fill vertical expansion design permitted by MDNR in 1986 was initially prepared under the direction of CA Hunt, PE# 6323; subsequent revisions to the design were reviewed and approved by DL Sowers, PE #28728. (See Attachment D, DEK_Ash Disposal Areas A-E_Section 4-Registered Engineer Services_19860829.pdf) Woodward-Clyde Consultants conducted the geotechnical studies and worked with Consumers personnel on geotechnical-based design and analyses. These analyses were reviewed by Woodward-Clyde Consultants under the direction of Jeffrey C. Evans, P.E., and Project Geotechnical Engineer. (Attachment E, WCC_DEK Geotechnical Investigations Coal Ash Disposal Studies_19830510.pdf)

While, over the years, ash area construction and operations have been supervised by Consumers engineers, they may or may not have been registered professional engineers.

5Q. When did the company last assess or evaluate the safety (i.e., structural integrity) of the Management unit(s)? Briefly describe the credentials of those conducting the structural integrity assessments/evaluations. Identify actions taken or planned by facility personnel as a result of these assessments or evaluations. If corrective actions were taken, briefly describe the credentials of those performing the corrective ~ctions, whether they were company employees or contractors. If the company plans an assessment or evaluation in the future, when is it expected? to occur?

5 A. No formal structural assessments of the dikes and structural fill have been made since the geotechnical work underpinning the facility's conversion to the conditioned ash structural fill mode in 1986. Company personnel make visual inspections of the dike at least weekly, and visual inspections are made by the MDEQ's personnel at least quarterly.

For the Consumers Power Company structural assessment of the 1986 vertical expansion, see Attachment F, CPCo_DEK Ash Disp Areas_Str. Integrity Assessment-Eval. for Ash Ponds A, B, & C_1981.pdf.

In the wake of the TVA ash dike failure, Consumers Energy sent a request for proposal to four (4) engineering firms to perform an independent assessment of the structural integrity of its ash impoundments. Bids were received on March 23, 2009; results are expected in the third or fourth quarter, 2009.

6 Q. When did a State or a Federal regulatory official's inspect or evaluate the safety (structural Integrity) of the management unit(s)? If you are aware of a planned state or federal inspection or evaluation in the future, when is it expected to occur? Please identify the Federal or State regulatory agency or department which conducted or is planning the inspection or evaluation. please provide a copy of the most recent official inspection report or evaluation.

6 A. The Michigan Department of Natural Resources, predecessor to the Michigan Department of Environmental Quality, Waste and Hazardous Materials Division (hereafter MDEQ) approved the safety analysis in the 1986 construction permit for vertical expansion. The last quarterly MDEQ Waste and Hazardous Materials Division inspection occurred on November 5, 2008. This is a general landfill inspection and should not be characterized as a safety (structural integrity) inspection

We are not aware of any state or federal plans to inspect or evaluate this facility.

7 Q. Have assessments or evaluations, or inspections conducted by State or Federal regulatory officials conducted within the past year uncovered a safely issue(s) with the management unit(s), and, if so, describe the actions that have been or are being taken to deal with the issue or issues.

please provide any documentation that you have for these actions.

7 A. No safety issues have been raised during quarterly MDEQ inspections of our ash impoundments.

8 Q. What is the surface area (acres) and total storage capacity of each of the management units? what is the volume of materials currently stored in each of the management unites)? Please provide the date that the volume measurement(s) was taken. Please provide the maximum height of the management unites). The basis for determining maximum height is explained later in this enclosure.

8 A. The surface area of the landfill is 174 acres. The maximum dike elevation is 594.85 IGLD in "Pond A" and 590 IGLD for the remainder of the landfill dikes, with original grade about 575 IGLD. Dike height, then is 19.85 feet in 65.6 acre" Pond A" and 15 feet for the remainder of the facility. Total capacity of the diked area at 2 feet of freeboard is approximately 4,175,000 cubic yards.
The capacity of the structural fill authorized by Construction Permit No.0195 is 2,960,000 cubic yards. Together, these capacities total 7, 135,000 cubic yards.

No volume measurements of compacted ash have been taken, rather we manage to the available remaining capacity in conformance with MDEQ regulation.

A conservative estimate of ash currently in the facility can be obtained by multiplying the annual ash production from the construction permit site capacity statement by the years that the Units have been online, viz., 148,000 cubic yards x 48 years = 7,104,000 cubic yards. This is an overestimate, given ash sales of about 5% annually and a decrease in ash production with the new western coal blend over the last 9 years to about 120,000 cubic yards/year. Further, the actual volume in place would be less due to compaction.

The maximum height of the dike is 590 IGLD 85 with the final height of the structural fill at 641.5 IGLD 85.

9 Q. Please provide a brief history of known spills or unpermitted releases from the unit within the last ten years. Whether or not these were reported to State or federal regulatory agencies. For purposes of this question, please include only releases to the surface or to the land (do not include releases to groundwater).

9 A. There have been no spills or unpermitted releases to surface water or land in the last ten years attributable to a loss of dike integrity.

10 Q. Please identify all current legal owner(s) and operator (s) at the facility.

10 A. The current legal owner and operator of this facility is Consumers Energy Company.

CONSUMERS ENERGY COMPANY
JC Weadock Plant Solid Waste Disposal Area
Response to Information Request under Section 104(e) of CERCLA dated 3/9/09

Background and Michigan Regulatory Context

In Michigan, surface impoundments for the storage or disposal of residuals or by-products from the combustion of coal are regulated under Michigan's Natural Resources and Environmental Protection Act, (NREPA) Part 115, Solid Waste Management, (Michigan Compiled Laws 324.11501 et seq). Specifically, they are regulated under Michigan Administrative Code Rule 299.4309, "Industrial waste surface impoundments closed as landfills," promulgated under Part 115. This rule provides for the operation of solid waste surface impoundments with industrial wastes and free liquids, with liquids discharged from the facility subject to a National Pollutant Discharge Elimination System (NPDES) permit issued under NREPA Part 31 (Michigan Compiled Laws 324.3101, et seq.). Part 31 implements the issuance of permits under the Federal Clean Water Act. Importantly, this rule requires the closure of these impoundments as landfills, with the owner or operator required to eliminate free liquids from the facility or solidifying the remaining wastes, stabilizing the remaining wastes to a bearing capacity sufficient for supporting final cover, and then applying a landfill final cover that is in conformance with landfill final cover requirements stipulated in the rule. In considering surface impoundments in Michigan under this Section 104(e) information request, it is important to keep this regulatory construct in mind, for it divides the operation of landfill cells or whole landfills into three phases: Phase I, where coal combustion residues or by-products are disposed with free liquids and subject to freeboard requirements, Phase II, where liquids are being eliminated and landfill solids are consolidated in an engineered structural fill in preparation for the landfill receiving final cover, and Phase III , bringing the landfill to final grade and installation of the final cover. Typically, the last two phases involve the placement of coal combustion products above freeboard elevation and above dike elevation to provide a final cover gradient that allows surface water to flow off the landfill final cover. At some sites with substantial surface area and favorable geotechnical properties, Phase II may include substantial landfill vertical expansions through the use of coal ash combustion residues or by-products compacted to specified densities in engineered structural fills. Therefore, in later phases, the volume of ash in a landfill that began as a surface impoundment may be substantially greater than the volume calculated by multiplying impoundment surface area by dike height with the required freeboard.

Moreover, detailed accounting of the yards or tons of ash placed in the landfills goes back only to 1990 with the institution of perpetual care funds for these landfills. Actual capacity depends upon the in-place density of the ash that has been placed. In-place density varies from impoundment to impoundment due to drainage characteristics, type of coal burned, boiler characteristics, and the type of compaction equipment and amount of effort used in compaction in phases II and III of the landfill to bring the facility to design grade. For these and other reasons, the best estimate of ash cubic yards disposed of in these facilities is a loose fill (as produced) volume based on ash generated minus estimated historic sales or use.

CONSUMERS ENERGY COMPANY
JC Weadock Plant Solid Waste Disposal Area
Response to Information Request under Section 104(e) of CERCLA dated 3/9/09

The JC Weadock Plant Units 7 & 8 went on line in 1955 and 1958, respectively. The 292 acre surface impoundment constructed to serve as the means of coal ash disposal for these units is regulated under Solid Waste Disposal Area Operating License No. 9022. (Attachment A, ashponds.pdf)

The entire 292 acre landfill is considered an "active" area under the current operating license and is licensed to receive either liquid-borne or dry (fly ash conditioned with water to an acceptable moisture content for specified compaction in an engineered, structural fill). The designation of individual ponds within the landfill is an artifact of early Phase I operations and is not relevant to current operations. In the fall of 2008, a $41 million dry fly ash handling system was completed for the handling of ash at both the JC Weadock Plant and the adjacent DE Karn Plant. At this time, neither plant is receiving liquid-borne fly ash for disposal, although separate bottom ash storage cells within each landfill still receive water-borne bottom ash. The transition to a redundant, stand-alone dry ash placement system has taken place over the last several months, with all dry ash currently being placed in the JC Weadock landfill. A low volume of water is being discharged to the former Weadock impoundment during cold weather to keep the pipes from freezing in the event that we should be forced to rely on the wet system as an emergency back-up during the transition.

Until 1992, the JC Weadock landfill was operated strictly as a surface impoundment. On 04/21/92, Construction Permit #0260 issued by the Michigan Department of Natural Resources provided for Phase II consolidation and the vertical expansion of an engineered structural fill in portions of the landfill. This expansion did not increase the height of the dikes or the areal extent of the landfill, but is being accomplished by creating a raised structural fill set back 100' from the toe of the dikes and rising on a maximum slope of 1:4 to a maximum elevation of 650 IGLD 85. Dike elevation in at the Weadock landfill is 590 IGLD 85.

Responses to the Section 104(e) of CERCLA ICR

1 Q. Relative to the National Inventory of Dams criteria for High, Significant, Low, or Less-than-Low, please provide the potential hazard rating for each management unit and indicate who established the rating, what the basis of the rating is, and what federal or state agency regulates the unit(s). If the unit(s) does not have a rating, please note that fact.

1 A. We have not been able to find documentation that any of the Weadock dikes have been rated under the National Inventory of Dams criteria for hazard potential

2 Q. What year was each management unit commissioned and expanded?

2 A. We do not know precise dates of construction for the older portion of this landfill. The 292 acre surface impoundment was constructed to serve as the means of coal ash disposal for Units 7 and 8 of the JC Weadock Plant, which went online in 1955 and 1958 respectively. The JC Weadock west disposal area consisting of 156 acres, formerly Ponds A-E, were the first ponds constructed. Construction of Ponds A-E

coincided with and followed as necessary the construction of JC Weadock units 7 and 8. The 136 acre eastern unit dikes were completed in the early 1970's. On 04/21/92, Construction Permit #0260 issued by the Michigan Department of Natural Resources authorized the vertical expansion of this facility in portions of the landfill.

3 Q. What materials are temporarily or permanently contained in the unit? Use the following categories to respond to this question: (l) fly ash; (2) bottom ash: (3) boiler slag; (4) flue gas emission control residuals; (5) other. If the management unit contains more than one type of material, please identify all that apply. Also, if you identify "other," please specify the other types of materials that are temporarily or permanently contained in the unit(s).

3 A. The 292 acre landfill includes a bottom ash pond of approximately 15 acres where bottom ash is sluiced hydraulically for storage. This bottom ash is periodically removed from the pond, allowed to dewater, and then is used or stored for use as a construction material within the landfill. The remaining 277 acres of the facility has been used for the disposal of fly ash and co-disposed liquid wastes under NPDES Permit No. MI0001878. (See Exhibit B, Attachment C, WQ113_K_W.pdf) This waste stream includes numerous miscellaneous and low-volume plant wastes, included treated metal cleaning wastes from the JC Weadock chemical treatment facility.

4 Q. Was the management unit(s) designed by a Professional Engineer? Is or was the construction of the waste management unit(s) under the supervision of a Professional Engineer? Is inspection and monitoring of the safety of the waste-management unit(s) under the supervision of a Professional Engineer?

4 A. The JC Weadock west disposal areas of 156 acres, formerly Ponds A-E, were the first ponds constructed. We could not find the original drawings to determine if the original ash dikes were designed by a registered professional engineer (PE). Construction of Ponds A-E coincided with and followed as necessary the construction of JC Weadock units 7 and 8 in the early 1950's; the 136 acre eastern unit dikes were completed in 1972. The design of "Pond F", the pond nearest to Saginaw Bay, was approved by a professional engineer(E.H. Logan, PE# 12272) on 5/29/71. (See Attachment B, 195-6909-002.pdf) The design of the structural fill vertical expansion permitted by MDNR in 1992 was under the supervision of Richard L. Oliver, PE# 20056. (See Attachment D, JCW_Ash Disposal Areas_Section 4-Registered Engineer Services_19911223.pdf). Materials Testing Consultants, Inc. conducted the geotechnical studies for use in soil slope stability analyses and facility design. (See Attachment E, MTC_JCW Geotech. Field Investigation & Lab Testing_Ash Pond Vert. Exapan. Proj_19911121.pdf and Attachment F, MTC_JCW Slope Stability Evaluation_Ash Pond Vert. Exapan. Proj_19911122.pdf)

While, over the years, ash area construction and operations have been supervised by engineers, they may or may not have been professional engineers.

CONSUMERS ENERGY COMPANY
JC Weadock Plant Solid Waste Disposal Area
Response to Information Request under Section 104(e) of CERCLA dated 3/9/09

In 2008, in conjunction with the completion of the dry fly ash handling system and the transition of the Karn ash disposal operation to the Weadock landfill, the Company installed a bentonite slurry wall in the Weadock dike to bring the facility to Michigan Department of Environmental Quality (MDEQ) standards for permeability (a maximum of $1x10^{-7}$ cm/sec). This project was designed and constructed under the supervision of a registered professional engineer with STS/AECOM Consultants. The project included extensive geotechnical investigation and analyses of dike and landfill stability. (See Attachment E, AECOM_Soil-Bentonite Cutoff Wall Design Report DEK & JCW Generating Facilities_20071214.pdf and Attachment F, AECOM_JCW Coal Ash Dike Stability Analysis_rev1_20090213.pdf).

5Q. When did the company last assess or evaluate the safety (i.e., structural integrity) of the Management unit(s)? Briefly describe the credentials of those conducting the structural integrity assessments/evaluations. Identify actions taken or planned by facility personnel as a result of these assessments or evaluations. If corrective actions were taken, briefly describe the credentials of those performing the corrective ~ctions, whether they were company employees or contractors. If the company plans an assessment or evaluation in the future, when is it expected? to occur?

5A. As noted above, the Company, in consultation with its consultant, AECOM, conducted extensive geotechnical studies and dike and landfill stability analyses in 2008. The latest assessment was completed on February 13, 2009 and submitted to the MDEQ on March 19, 2009. Company personnel make visual inspections of the dike at least weekly, and visual inspections are made by the MDEQ's personnel at least quarterly. (See Attachment F, AECOM_JCW Coal Ash Dike Stability Analysis_rev1_20090213.pdf)

In the wake of the TVA ash dike failure, Consumers Energy sent a request for proposal to four (4) engineering firms to perform an independent assessment of the structural integrity of all of its ash impoundments. Bids were received on March 23, 2009; results are expected in the third or fourth quarter, 2009.

6 Q. When did a State or a Federal regulatory official's inspect or evaluate the safety (structural Integrity) of the management unit(s)? If you are aware of a planned state or federal inspection or evaluation in the future, when is it expected to occur? Please identify the Federal or State regulatory agency or department which conducted or is planning the inspection or evaluation. please provide a copy of the most recent official inspection report or evaluation.

6 A. The last evaluations of dike and landfill integrity by MDEQ Waste and Hazardous Materials Division occurred in 2008 in conjunction with the slurry wall project that was completed in December of 2008. MDEQ is currently evaluating an enhanced assessment that includes an evaluation of the impact of an interior water elevation to the top of the slurry wall. Safety factors for both dikes and landfill

structural fill are above 2.0. (See Attachment F, AECOM_JCW Coal Ash Dike Stability Analysis_rev1_20090213.pdf). The last quarterly visual MDEQ inspection of the JC Weadock dikes and landfill occurred on November 5, 2008. (Attachment C, DEK & JCW Dam Inspection 081105.pdf)

This is a general landfill inspection and should not be characterized as a safety (structural integrity) inspection.

We are not aware of any state or federal plans to inspect or evaluate this facility.

7 Q. Have assessments or evaluations, or inspections conducted by State or Federal regulatory officials conducted within the past year uncovered a safely issue(s) with the management unit(s), and, if so, describe the actions that have been or are being taken to deal with the issue or issues. please provide any documentation that you have for these actions.

7 A. No safety issues have been raised during quarterly MDEQ inspections of our ash impoundments.

8 Q. What is the surface area (acres) and total storage capacity of each of the management units? what is the volume of materials currently stored in each of the management unites)? Please provide the date that the volume measurement(s) was taken. Please provide the maximum height of the management units). The basis for determining maximum height is explained later in this enclosure.

8 A. The surface area of the landfill is 292 acres. Dike elevation is 590 IGLD 85, with original grade about 575 IGLD. Maximum dike height is 15 feet. Capacity of the impoundment portion of the landfill, given a two-foot freeboard requirement, would be about 6,124,000 cubic yards. The capacity of the structural fill is estimated at 11,200,000 cubic yards. Together, they total of 17,324,000 cubic yards.

No volume measurements of compacted ash have been taken, rather we manage to the available remaining capacity in conformance with MDEQ regulation. A conservative estimate of ash currently in the facility can be obtained by multiplying the annual fly ash production by the years that the plant has been online. During the first 19 years, a multi-cyclone collector would have yielded about 40,000 cubic yards of fly ash/year, or about 760,000 cubic yards. Over the next 33 years with electrostatic precipitators, ash yield would have been about 80,000 cubic yards/year, or 2,640,000 yards, for a total of 3,400,000 cubic yards. The Karn Plant has only deposited ash in the Weadock landfill since late in the fourth quarter of 2008 and has not a substantial impact on ash content.

The maximum height of the dike is 590 IGLD 85 with the final height of the structural fill at 650 IGLD 85.

CONSUMERS ENERGY COMPANY
JC Weadock Plant Solid Waste Disposal Area
Response to Information Request under Section 104(e) of CERCLA dated 3/9/09

9 Q. Please provide a brief history of known spills or unpermitted releases from the unit within the last ten years. Whether or not these were reported to State or federal regulatory agencies. For purposes of this question, please include only releases to the surface water or to the land (do not include releases to groundwater).

9 A. There have been no spills or unpermitted releases to surface water or land in the last ten years attributable to a loss of dike integrity

10 Q. Please identify all current legal owner(s) and operator (s) at the facility.
10 A. The current legal owner and operator of this facility is Consumers Energy Company.