



**FPL Energy.**

**Duane Arnold Energy Center**

FPL Energy Duane Arnold, LLC  
3277 DAEC Road  
Palo, Iowa 52324

July 13, 2007

NG-07-0566  
NPDES Permit #5700104

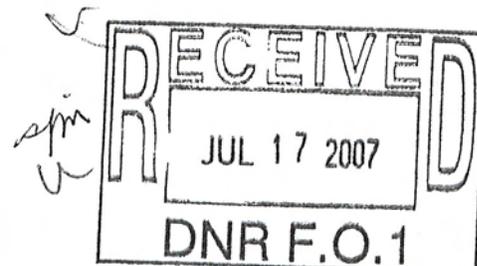
State of Iowa – Department of Natural Resources  
ATTN: Mike Wade  
Field Office #1  
909 W. Main, Suite 4  
Manchester, IA 52057

Duane Arnold Energy Center  
Docket: 50-331  
Op. License No: DPR-49

Response to State of Iowa Inspection of the Duane Arnold Energy Center  
Wastewater Treatment Facility

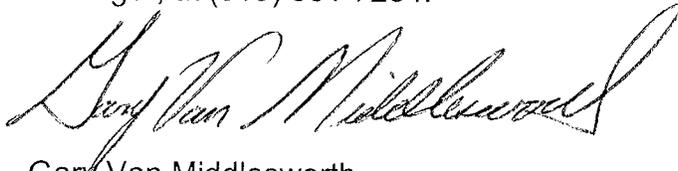
Reference: 1) Letter, Mike Wade (State of Iowa) to Dean Curtland (FPL Energy), Duane Arnold Energy Center Wastewater Treatment Facility Inspection dated June 8, 2007

In Reference 1, FPL Energy Duane Arnold LLC was provided a list of actions to be addressed within 30 days of receipt. Reference 1 was received by FPL Energy Duane Arnold LLC on June 15, 2007. Enclosure A provides a summary of the actions performed or planned to be performed to address each item provided in Reference 1.



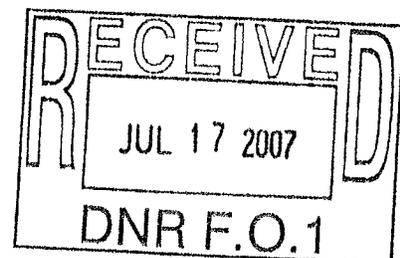
NG-07-0566  
July 13, 2007  
Page 2 of 2

Questions regarding this matter should be directed to Steve Catron, Licensing Manager, at (319) 851-7234.



Gary Van Middlesworth  
Site Vice President, Duane Arnold Energy Center  
FPL Energy Duane Arnold

Enclosures



ENCLOSURE A

**Response to State of Iowa Inspection of the Duane Arnold Energy Center  
Wastewater Treatment Facility**

3 Pages Follow

## ENCLOSURE A

### Response to State of Iowa Inspection of the Duane Arnold Energy Center Wastewater Treatment Facility

#### SUMMARY OF REQUIREMENTS

1. The company must include the discharge from the cooling water filter backwash on its NPDES [National Pollutant Discharge Elimination System] permit.

#### **FPL Energy Duane Arnold Response:**

When the Duane Arnold Energy Center (DAEC) NPDES permit is revised as part of permit renewal in 2009, the discharge from the cooling water filter will be included in this revision.

2. The company must investigate the reason for water bypassing the outfall 001 discharge pipe. If the effluent pipe is found to be plugged, steps must be taken to clear the pipe. If the effluent pipe is not plugged, the pipe diameter is not sufficient to handle the flow. In that case, the effluent pipe must be re-designed to handle all of the flow from the system.

#### **FPL Energy Duane Arnold Response:**

An attempt to unplug the outfall discharge pipe using a hydrolaser was unsuccessful. Divers are planned to be utilized to clean out the pipe by July 31, 2007.

3. The chlorine contact chamber is in disrepair and must be rehabilitated.

#### **FPL Energy Duane Arnold Response:**

The contact chamber has been repaired.

4. The influent v-notch weirs may not be used to calculate the influent flow.

#### **FPL Energy Duane Arnold Response:**

The influent v-notch weirs will no longer be used to calculate the influent flow. An effluent flow transmitter is planned to be installed by October 31, 2007. This transmitter will provide effluent flow data and will prevent the need for use of the influent v-notch weirs to calculate the influent flow.

## ENCLOSURE A

5. The lift station pumps must be recalibrated at least every six months to take into account for impeller wear. These calibrations must be kept with other maintenance records.

### **FPL Energy Duane Arnold Response:**

An effluent flow transmitter is planned to be installed by October 31, 2007. This transmitter will provide effluent flow data and will prevent the need for pump calibration.

6. The company must replace the old comminutor with the new one that was purchased.

### **FPL Energy Duane Arnold Response:**

The existing comminutor has been repaired and is currently working properly. If the existing comminutor fails, the spare unit is available onsite.

7. Because this is an SBR [Sequencing Batch Reactor] plant, effluent samples must be flow-based rather than time based composites.

### **FPL Energy Duane Arnold Response:**

The effluent flow transmitter that is planned to be installed by October 31, 2007 will provide flow-based samples.

8. The composite sample must be preserved during the entire 24-hour sampling event, by refrigeration or ice. A thermometer must be placed in the sampler and a log kept of the temperatures to ensure that the sample was properly preserved.

### **FPL Energy Duane Arnold Response:**

Samples will continue to be properly preserved during the sampling process. Thermometers have been purchased and installed and a log of the temperature data will be generated.

## ENCLOSURE A

9. MSDS [Material Safety Data Sheets] sheets for the copper ion additive and VitaStim must be submitted to this office within 30 days of receipt of this report.

### **FPL Energy Duane Arnold Response:**

The MSDS sheet for Vitastim is attached as Enclosure B. No copper ion additive is currently used. An electrified copper anode that dissolves copper into the water is utilized. The specifications for this copper anode are provided in Enclosure C. No MSDS exists for this piece of equipment.

10. Representative grab samples from Outfall 001 must be collected and analyzed for copper. Copper is toxic to aquatic life. Data from this analysis will determine if copper monitoring and effluent limits will be added for this parameter to the NPDES permit for this facility.

### **FPL Energy Duane Arnold Response:**

Data collected from 2006 is attached as Enclosure D. The copper ion additive function is not currently in use. A new grab sample with data analysis need not be performed unless the copper ion additive system is utilized in the future.

## **SUMMARY OF RECOMMENDATIONS**

1. I recommend that the company stop adding VitaStim. It is not clear that the benefit outweighs the cost of the additive.

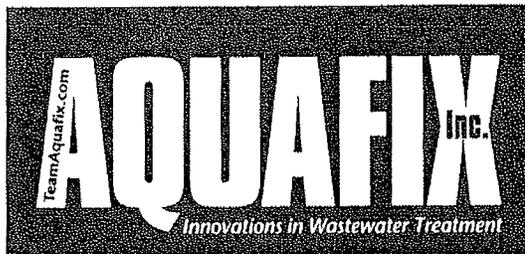
### **FPL Energy Duane Arnold Response:**

FPL Energy Duane Arnold has determined that VitaStim is the appropriate chemical to be used for the DAEC wastewater and plans to continue its use. FPL Energy Duane Arnold believes that VitaStim improves the quality of the wastewater.

ENCLOSURE B

**Material Safety Data Sheet for Vitastim**

2 Pages Follow



## **Material Safety Data Sheet AQUAFIX, INC.**

### **Section 1 – Product and Company Identification**

**Product Name: Vita Stim Low F:M**

**Product Description: Bio-Vitamins, Bio-Stimulants and select bacteria Cultures**

**Company: AQUAFIX, INC.**

**P.O.Box 8682**

**Madison, WI 53708**

**Phone: 888-757-9577**

**Fax: 866-636-1864**

### **Section 2 – Composition and Information on Ingredients**

**Bio-Vitamins, Probiotics and select bacterial cultures**

### **Section 3 – Hazards Identification**

**Caution: Eye Irritant, if swallowed, do not induce vomiting, keep out of reach of children**

### **Section 4 – First Aid Measures**

**Eye Contact – Immediately rinse eyes with plenty of water**

**Skin Contact – In keeping with good hygiene practices, wash exposed areas with soap and water.**

**Inhalation – Remove to fresh air**

**Ingestion – Considered non-toxic, but may cause diarrhea or nausea**

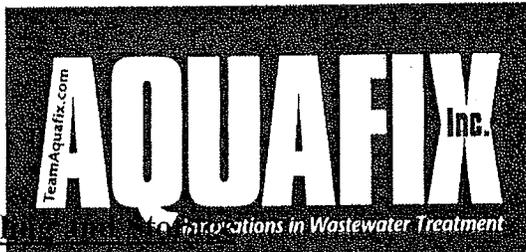
### **Section 5 – Fire and Explosion Data**

**Stability – Non Flammable**

**Incompatibility – Acids or alkalis may break down enzymes and inactive bacterial cultures.**

### **Section 6 – Accidental Release Measures**

**Spillages can be washed away with large amounts of water**



**Section 7 – Handling**

Store in a cool dry space between 41-104 degrees F  
Description: Dry Powder, brown or yellow in color  
Specific Gravity: 1.0 gr/cc  
Odor: Earthy smell

**Section 8 – Stability and Reactivity Data**

Chemical Stability – This product is stable  
Incompatibility – Strong acids or bases

**Section 9 – Toxicological Information**

Exposure contact: Eye irritant  
Skin Contact: None Expected  
Inhalation: None Expected  
Ingestion: May cause diarrhea or nausea  
Carcinogenicity: Not listed as carcinogenic by OSHA or NTP

**Section 10 – Ecological Information**

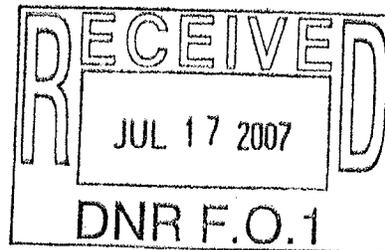
Exotoxicity - Not Available

**Section 11 – Disposal Concerns**

Dispose of in accordance with state, local and federal regulations

**Section 12 – Transportation Information**

Not a DOT regulated substance



ENCLOSURE C

**Copper Anode Specifications**

2 Pages Follow

**Biofouling  
Control Technology**

\* \* \* \* \*

**MacroTech, Inc.**

**INHIBITS VELIGER SETTLEMENT**

- ZEBRA MUSSELS
- BRYOZOA
- ASIATIC CLAMS

**PREVENTS BIOFILM FORMATION**

**USES PROVEN CONTROL TECHNOLOGY**

- IONIC COPPER
- 15 YEARS OF EXPERIENCE

**REDUCES COSTS**

- LOW INSTALLATION COST
- EASY OPERATION
- LOW MAINTENANCE COST

**IS SAFE**

- NO HAZARDOUS CHEMICALS
- ENVIRONMENTALLY FRIENDLY
- DRINKING WATER SAFE

***Stops Fouling  
Before It Starts***

**Installations**

- AES Greenidge Power Plant
- AES Cayuga Power Plant
- Alliant Energy - Edgewater Plant
- Buffalo River Improvement Corp.
- Cargill Salt Company
- Exelon - Byron Nuclear Station
- Exelon - Zion Nuclear Station
- General Motors Corp.
- International Paper - De Pere Mill
- International Paper - Kaukauna Mill
- NMC - Point Beach Nuclear Plant
- NMC - Duane Arnold Energy Center
- NYPA - Sienheim-Gilboa Hydroelectric Plant
- US Salt Corporation
- Unilever Home & Personal Care N.A.
- we energies - Oak Creek Power Plant

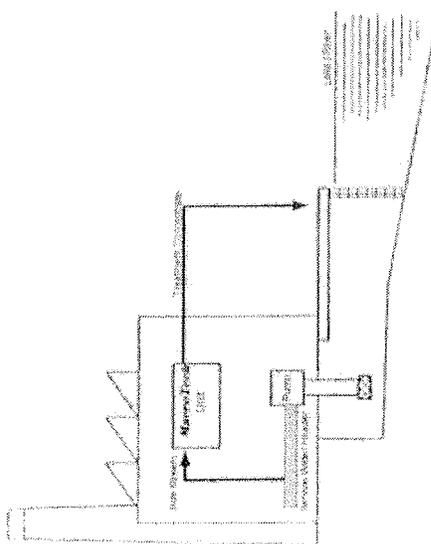
**MacroTech, Inc.**

246 Mamaroneck Road  
Scarsdale, NY 10583-7242

Phone (914) 723-6165

Fax (914) 723-6085

wjblume@verizon.net



Installation is according to the diagram above. A side stream of water is passed through the MacroTech treatment unit, wherein a copper concentrate is formed. The treated water is then reinjected to the intake for final dilution and treatment of the entire system to be protected.

## INTRODUCTION

*MacroTech, Inc.* was established in 1991 to develop and manufacture fresh water biofouling control technology based on electrolytically produced copper ions. The result of this effort is the *ZM-Series Biofouling Control Technology*.

### *ZM-Series*

Applying technology developed 50 years ago for sea water macrofouling control, the *ZM-Series* employs the controlled electrolytic dissolution of copper anodes to inhibit macrofouling settlement and micro-fouling (biofilm) formation. Due to the very low conductivity of fresh water a special treatment unit has been developed by *MacroTech, Inc.* to produce the required copper ions.

The *ZM-Series* are modular units which can be expanded to economically treat any flow rate required. The treatment cell is extremely efficient. For example, the *ZM-5* requires less than 100 watts to treat 5,000 GPM.



The *ZM-Series* works in two ways.

First, by the electrolytic dissolution of toxic ionic copper into the water to inhibit veliger settlement. The level of copper added is 5-10 PPB above ambient, which is an environmentally acceptable level.

Second, the ionic copper inhibits biofilm formation, thereby reducing the potential for microbiologically induced corrosion (MIC).

## RESULTS

Development began in the Winter of 1990. The first prototype unit was installed at AES's Somerset Generating Station in July 1991 and operated successfully.

In 1992 a larger unit was operated in conjunction with Ontario Hydro's test rig at their Nanticoke TGS, again with encouraging results.

In 1993 a full scale unit was successfully operated at the City of Toledo's water intake crib. The results provided the final design basis for the *ZM-Series*.

Since 1994, when the first commercial unit was installed, *ZM-Series* units have been successfully treating the service water and cooling water systems at many electric utility and industrial facilities. It is now proven, accepted control technology, with 22 installations in Illinois, Indiana, Iowa, New York and Wisconsin.

In addition, *MacroTech's* first Canadian installation, for control of blue mussel infestation at a Newfoundland power plant, will be installed in 2005.

ENCLOSURE D

**DAEC Wastewater Analysis for Copper**

4 Pages Follow

FPL ENERGY-DUANE ARNOLD ENERGY CENTER Work Order: CPE0314  
 3277 DAEC Road  
 Palo, IA 52324  
 Jerry Hogan

Received: 05/05/06  
 Reported: 05/12/06 11:18

Project: Monthly Wastewater  
 Project Number: Monthly WW

## ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	Quan. Limit	Dilution Factor	Date Analyzed	Seq/Analyst Batch	Method
<b>Sample ID: CPE0314-01 (Circ Water (06-2220) - Waste Water)</b>						<b>Sampled: 05/04/06 08:05</b>	<b>Recvd: 05/05/06 09:30</b>	
Total Metals by EPA 200 Series Methods								
Zinc	0.0911		mg/L	0.0200	1	05/11/06 16:02	llw 6050422	EPA 200.7
<b>Sample ID: CPE0314-02 (06-1837 RWS - Misc. Liquid)</b>						<b>Sampled: 04/13/06 08:05</b>	<b>Recvd: 05/05/06 09:30</b>	
Total Metals by EPA 200 Series Methods								
Copper	<0.0200		mg/L	0.0200	1	05/11/06 16:07	llw 6050422	EPA 200.7
<b>Sample ID: CPE0314-03 (06-1842 Cirw Water - Waste Water)</b>						<b>Sampled: 04/13/06 08:47</b>	<b>Recvd: 05/05/06 09:30</b>	
Total Metals by EPA 200 Series Methods								
Copper	<0.0200		mg/L	0.0200	1	05/11/06 16:12	llw 6050422	EPA 200.7
<b>Sample ID: CPE0314-04 (06-1961 River 3 D-51 - Misc. Liquid)</b>						<b>Sampled: 04/19/06 10:10</b>	<b>Recvd: 05/05/06 09:30</b>	
Total Metals by EPA 200 Series Methods								
Copper	<0.0200		mg/L	0.0200	1	05/11/06 16:17	llw 6050422	EPA 200.7
<b>Sample ID: CPE0314-05 (06-1960 River 2 D-50 - Misc. Liquid)</b>						<b>Sampled: 04/19/06 10:05</b>	<b>Recvd: 05/05/06 09:30</b>	
Total Metals by EPA 200 Series Methods								
Copper	<0.0200		mg/L	0.0200	1	05/11/06 16:22	llw 6050422	EPA 200.7
<b>Sample ID: CPE0314-06 (06-1962 River 5 Dis Canal - Misc. Liquid)</b>						<b>Sampled: 04/19/06 10:15</b>	<b>Recvd: 05/05/06 09:30</b>	
Total Metals by EPA 200 Series Methods								
Copper	<0.0200		mg/L	0.0200	1	05/11/06 16:27	llw 6050422	EPA 200.7

FPL ENERGY-DUANE ARNOLD ENERGY CENTER Work Order: CPF1743  
 3277 DABC Road  
 Palo, IA 52324  
 Jerry Hogan

Project: Monthly Wastewater  
 Project Number: Monthly WW

Received: 06/29/06  
 Reported: 07/11/06 12:19

## ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	Quan. Limit	Dilution Factor	Date Analyzed	Seq/ Analyst Batch	Method
<b>Sample ID: CPF1743-01 (Circ Water 06-3115 - Waste Water)</b>						<b>Sampled: 06/22/06 07:44</b>	<b>Recvd: 06/29/06 09:35</b>	
Total Metals by EPA 200 Series Methods								
Copper	0.0241		mg/L	0.0200	1	07/06/06 20:12	llw 6070029	EPA 200.7
Zinc	0.0805		mg/L	0.0200	1	07/10/06 19:47	llw 6070276	EPA 200.7
<b>Sample ID: CPF1743-02 (B River Water Supply - Misc. Liquid)</b>						<b>Sampled: 06/15/06 09:40</b>	<b>Recvd: 06/29/06 09:35</b>	
Total Metals by EPA 200 Series Methods								
Copper	<0.0200		mg/L	0.0200	1	07/06/06 20:17	llw 6070029	EPA 200.7
<b>Sample ID: CPF1743-03 (Circ Bottle #29-14 - Waste Water)</b>						<b>Sampled: 06/15/06 07:58</b>	<b>Recvd: 06/29/06 09:35</b>	
Total Metals by EPA 200 Series Methods								
Copper	0.0236		mg/L	0.0200	1	07/06/06 20:36	llw 6070029	EPA 200.7

FPL ENERGY-DUANE ARNOLD ENERGY CENTER  
 3277 DAEC Road  
 Palo, IA 52324  
 Jerry Hogan

Work Order: CPG1506  
 Project: Monthly Wastewater  
 Project Number: Monthly WW

Received: 07/28/06  
 Reported: 08/02/06 12:49

## ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	Quan. Limit	Dilution Factor	Date Analyzed	Seq/ Analyst	Batch	Method
<b>Sample ID: CPG1506-01 (Circ Water 06-3513 - Waste Water)</b>						<b>Sampled: 07/12/06 14:35</b>	<b>Recvd: 07/28/06 09:45</b>		
Total Metals by EPA 200 Series Methods									
Chromium	<0.0200		mg/L	0.0200	1	08/01/06 21:43	llw	6080003	EPA 200.7
Zinc	0.0384		mg/L	0.0200	1	08/01/06 21:43	llw	6080003	EPA 200.7
<b>Sample ID: CPG1506-02 (River 5 - Misc. Liquid)</b>						<b>Sampled: 07/19/06 08:30</b>	<b>Recvd: 07/28/06 09:45</b>		
Total Metals by EPA 200 Series Methods									
Copper	0.0302		mg/L	0.0200	1	08/01/06 21:49	llw	6080003	EPA 200.7
<b>Sample ID: CPG1506-03 (River 2 - Misc. Liquid)</b>						<b>Sampled: 07/19/06 08:30</b>	<b>Recvd: 07/28/06 09:45</b>		
Total Metals by EPA 200 Series Methods									
Copper	<0.0200		mg/L	0.0200	1	08/01/06 21:54	llw	6080003	EPA 200.7
<b>Sample ID: CPG1506-04 (RWS 1 - Misc. Liquid)</b>						<b>Sampled: 07/12/06 09:40</b>	<b>Recvd: 07/28/06 09:45</b>		
Total Metals by EPA 200 Series Methods									
Copper	<0.0200		mg/L	0.0200	1	08/01/06 22:14	llw	6080003	EPA 200.7
<b>Sample ID: CPG1506-05 (RWS 2 - Misc. Liquid)</b>						<b>Sampled: 07/20/06 00:48</b>	<b>Recvd: 07/28/06 09:45</b>		
Total Metals by EPA 200 Series Methods									
Copper	<0.0200		mg/L	0.0200	1	08/01/06 22:19	llw	6080003	EPA 200.7

FPL ENERGY-DUANE ARNOLD ENERGY CENTER  
 3277 DAEC Road  
 Palo, IA 52324  
 Jerry Hogan

Work Order: CPJ0364  
 Project: Monthly Wastewater  
 Project Number: Circ. Water Blowdown/River Samples

Received: 10/06/06  
 Reported: 10/12/06 11:32

## ANALYTICAL REPORT

Analyte	Sample Result	Data Qualifiers	Units	MDL	Quan Limit	Dilution Factor	Date Analyzed	Seq/Analyst	Batch	Method
<b>Sample ID: CPJ0364-01 (Circ Water 06-4858 - Waste Water)</b>							<b>Sampled: 09/21/06 08:50</b>	<b>Recvd: 10/06/06 09:40</b>		
Total Metals by EPA 200 Series Methods										
Chromium	<0.00430		mg/L	0.00430	0.0200	1	10/11/06 17:39	llw	6100439	EPA 200.7
Zinc	0.0890		mg/L	0.00480	0.0200	1	10/11/06 17:39	llw	6100439	EPA 200.7
<b>Sample ID: CPJ0364-02 (River Water Supply - Misc. Liquid)</b>							<b>Sampled: 09/20/06 11:20</b>	<b>Recvd: 10/06/06 09:40</b>		
Total Metals by EPA 200 Series Methods										
Copper	<0.0130		mg/L	0.0130	0.0200	1	10/11/06 17:44	llw	6100439	EPA 200.7
<b>Sample ID: CPJ0364-03 (River 2 - Misc. Liquid)</b>							<b>Sampled: 09/29/06 09:00</b>	<b>Recvd: 10/06/06 09:40</b>		
Total Metals by EPA 200 Series Methods										
Copper	<0.0130		mg/L	0.0130	0.0200	1	10/11/06 17:49	llw	6100439	EPA 200.7
<b>Sample ID: CPJ0364-04 (River 5 - Misc. Liquid)</b>							<b>Sampled: 09/29/06 09:15</b>	<b>Recvd: 10/06/06 09:40</b>		
Total Metals by EPA 200 Series Methods										
Copper	0.0267		mg/L	0.0130	0.0200	1	10/11/06 17:54	llw	6100439	EPA 200.7

