

FILE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Water, Region 8  
6274 East Avon-Lima Road, Avon, NY 14414-9516  
P: (585) 226-5450 | F: (585) 226-9485  
www.dec.ny.gov

June 12, 2017

Dale Irwin  
General Manager  
Greenidge Generation LLC  
590 Plant Road  
Dresden, NY 14441

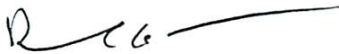
RE: Inspections – June 7, 2017  
Greenidge Station SPDES # NY- 0001325  
Lockwood Ash Disposal Landfill SPDES # NY - 0107069  
Dresden (V), Yates (C)

Dear Mr. Irwin,

Based upon observations made during the inspection conducted at the above-referenced facilities and a review of your Discharge Monitoring Reports (DMRs), the facilities were found to be in satisfactory compliance with the requirements and limitations set forth in the State Pollutant Discharge Elimination System Permits.

I have enclosed a copies of the completed inspection reports showing the results of the inspections. Please review these reports and make note of any requirements or recommendations. If you have any questions regarding these inspections, please feel free to contact me directly at (585) 226-5449.

Sincerely,



David G. Pratt, P.E.  
Professional Engineer 1  
Water Division

Enclosures

Eec: Scott Gibson  
Bethany Acquisto



# INDUSTRIAL WASTEWATER FACILITY INSPECTION REPORT

**Inspection Type: Comprehensive**

SPDES Number: NY0107069  
County: YATES DEC Region:8  
Fac. Insp. Rep.: Scott Gibson/Dale Irwin

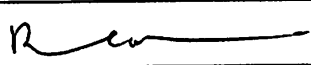
Facility Name: LOCKWOOD ASH DISPOSAL LANDFILL  
Date: 06/07/2017 Time: 01:00 PM

DEC ID: 8 5736 00005

Inspector: PRATT, DAVID  
Industry Desc.: Power Plant  
Facility Contact:  
Summary Rating: SATISFACTORY

Joint w/EPA:  Sample Taken:   
Inspection Purpose: Compliance  
Weather Conditions: Sun 70  
Completed Inspection:  Add. Info. Atchd: ...

Items	Rating	Comments (Note units out of operation / outstanding operation, etc.)
<b>A. GENERAL</b>		
Housekeeping	SATISFACTORY	Small amounts of waste from Greenidge only.
Records/Permits/Reports	SATISFACTORY	
Flow Metering	SATISFACTORY	
BMP/PPP/SPCC	SATISFACTORY	No BMP. Solid Waste permit coverage.
Preventative Maintenance	SATISFACTORY	
<b>B. LABORATORY</b>		
Monitoring Equipment	SATISFACTORY	
Sampling	SATISFACTORY	
Process Control	SATISFACTORY	
QA/QC	SATISFACTORY	
<b>C. TREATMENT SYSTEMS</b>		
1. Holding or Detention Pond	MARGINAL	GW contamination detected. Evaluating under order.
2.		
3.		
4.		
5.		
6.		
7.		
8.		
<b>D. EFFLUENT/RECEIVING</b>		
Visual Observation of Outfalls	SATISFACTORY	
Receiving Water Condition	SATISFACTORY	
3. Outfall Structure Condition	SATISFACTORY	Modified under consent order.
4. Sign Law for Outfalls	NOT INSPECTED	
Part 1 (Continued)		
Items	Rating	Comments (Note units out of operation / outstanding operation, etc.)
<b>E. SLUDGE HANDLING/DISPOSAL</b>		
Sludge Processing	NOT APPLICABLE	
Dewatering	NOT APPLICABLE	
Disposal Location(s)	NOT APPLICABLE	

Signature of Inspector: 

Date: 6/12/17

# INDUSTRIAL WASTEWATER FACILITY INSPECTION REPORT

Inspection Type: Comprehensive

SPDES Number: NY0107069 Facility Name: LOCKWOOD ASH DISPOSAL LANDFILL

Inspection Date: 06/07/2017 DEC ID: 8 5736 00005

## F. Records and Reports

- (1) Records and reports maintained as required by permit?  Yes  No  N/A  
Details:
- (2) Adequate records maintained of:
- (a) Sampling date, time, exact location?  Yes  No  N/A
- (b) Analytical methods/techniques used?  Yes  No  N/A
- (c) Analytical results (e.g. consistent with self-monitoring report data)?  Yes  No  N/A
- (3) Monitoring records (e.g. flow, pH, D.O., etc.) maintained for a minimum of three years, including all original strip chart recordings (e.g. continuous monitoring instrumentation, calibration and maintenance records)?  Yes  No  N/A
- (4) On-site lab equipment calibration and maintenance records kept?  Yes  No  N/A
- (5) Facility operating records kept, including operating logs for each treatment unit?  Yes  No  N/A

## G. Permit Verification

- (1) Inspection observations verify the permit?  Yes  No  N/A  
Details:
- (2) Correct name and mailing address of permittee?  Yes  No  N/A
- (3) Facility is as described in permit?  Yes  No  N/A
- (4) Principal product(s) conform with those set forth in the permit application?  Yes  No  N/A
- (a) Type of waste streams treated, sources of wastewater: **leachate & stormwater**
- (5) Treatment processes are as described in permit application?  Yes  No  N/A
- (6) Accurate records of raw water volume maintained?  Yes  No  N/A
- (a) Amount of raw water used, source:
- (7) Number and location of discharge points are as described in permit?  Yes  No  N/A
- (8) All discharges are permitted?  Yes  No  N/A
- (9) Are stormwater outfalls permitted?  Yes  No  N/A

(10) Does permittee have a compliance schedule?  Yes  No  N/A

Details:

Consent Order for evaluation of leachate system. NYSDEC DMM taking the lead.

(a) Is the permittee conforming to the compliance schedule?  Yes  No  N/A

### H. Operation and Maintenance

(1) Treatment facility properly operated and maintained?  Yes  No  
N/A

Details:

All stormwater has been separated from leachate.

(2) Were there any unpermitted bypasses/overflows in the past year?  Yes  No  
N/A

(3) Were appropriate agencies notified promptly, when required, of each overflow?  Yes  No   
N/A

(4) Adequate alarm system for power or equipment failures available?  Yes  No   
N/A

(5) Sludge and solids adequately disposed?  Yes  No  
N/A

(6) All treatment units in service?  Yes  No  
N/A

(7) Files maintained on spare parts inventory, major equipment specifications, and parts and equipment suppliers?  Yes  No   
N/A

(8) Instructions files kept for operation and maintenance of each item of major equipment?  Yes  No   
N/A

(9) BMP/PPP maintained?  Yes  No   
N/A

(10) SPCC plan available?  Yes  No   
N/A

(11) Any hydraulic organic overloads experienced?  Yes  No  
N/A

### I. Self Monitoring Program

(1) Flow Measurement

(a) Permittee flow measurement meets the requirements and intent of the permit?  Yes  No  N/A

Details:

(b) Primary measuring device properly installed?  Yes  No  N/A

Type of device:

- Weir  
 Parshall  
 Flume  
 Magmeter  
 Venturi  
Meter  
Other (Specify  
)

(c) Calibration frequency adequate?  
(Date of last calibration)

- Yes  No  N/A

(d) Primary flow measuring device properly operated and maintained?

- Yes  No  N/A

(e) Secondary instruments (totalizers, recorders, etc.) properly operated and maintained?

- Yes  No  N/A

(2) Sampling

(a) Permittee sampling meets the requirements and intent of the permit?

- Yes  No  N/A

Details:

(b) Does the permittee have a written sampling plan?

- Yes  No  N/A

If yes, are they following their plan?

- Yes  No  N/A

(c) Locations adequate for representative samples?

- Yes  No  N/A

(d) Parameters and sampling frequency agree with permit?

- Yes  No  N/A

(e) Permittee is using method of sample collection required by permit?

- Yes  No  N/A

If no,

- Grab  Manual  
Composite  
 Automatic Composite  
Frequency

(f) Sample collection procedures are adequate?

- Yes  No  N/A

(1) Samples are refrigerated during compositing?

- Yes  No  N/A

(2) Proper preservation techniques used?

- Yes  No  N/A

(3) Flow proportioned samples obtained where required by permit?

- Yes  No  N/A

(4) Sample holding times prior to analysis in conformance with 40 CFR 136.3?

- Yes  No  N/A

(g) Monitoring and analysis being performed more frequently than required by permit?

- Yes  No  N/A

If yes, results are reported in permittee's self-monitoring report?

- Yes  No  N/A

(3) Laboratory

(a) Permittee laboratory ELAP certified?

- Yes  No  N/A

Details:

(b) Commercial laboratory used?

- Yes  No  N/A

Lab Name: Adirondack Env. Services

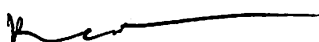
Lab Address: Albany, NY

**Inspector Comments**

Only receive wastes from Greenidge. Facility has a consent order for investigation of the leachate system. Stormwater has been separated from leachate flow. Some stormwater collection pond work remains. Monitoring of leachate flows continuing in order to aid selection/design of appropriate actions. Sampling plan should be generated and available for review.

### Sampling Inspection Procedures and Observations

- Additional information attached?  Yes  No
- Sampling was for:  
Conventional  Toxic  Other
- Grab samples obtained?  Yes  No
- Composite obtained?  Yes  No
- Flow proportioned sample?  Yes  No
- Automatic sampler used?  Yes  No
- Sample split with permittee?  Yes  No
- Chain of custody employed?  Yes  No
- Sample obtained from facility sampling device?  Yes  No
- Compositing Frequency:
- Preservation:
- Sample refrigerated during compositing?  Yes  No
- Sample representative of volume and nature of discharge?  Yes  No

Signature of Inspector: 	Date: 6/12/17
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NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FILE

Division of Water, Region 8  
6274 East Avon-Lima Road, Avon, NY 14414-9516  
P: (585) 226-5450 | F: (585) 226-9485  
www.dec.ny.gov

February 7, 2017

Dale Irwin  
Greenidge Generation, LLC  
590 Plant Road, PO Box 187  
Dresdin, NY 14441

Re: Toxicity Testing Review  
Lockwood Ash Disposal Site #NY0107069

Dear Mr. Irwin,

Attached, please find the Toxicity Testing Unit's review of the Lockwood Ash Disposal Site #NY0107069 Tier 2 Chronic Toxicity Test Data. Contact information for questions regarding this review is also included in the attached.

Sincerely,



David G. Pratt, P.E.  
Professional Engineer 1  
Division of Water

ec: Brian Baker (BWP)  
Alan Cherubin (BWCP)  
Nicole Wright (BWAM)



Department of  
Environmental  
Conservation

The review of Tier 2 Chronic toxicity test data submitted for a period of one year by AES Greenidge-Lockwood Ash Disposal Site SPDES#NY0107069 at Outfall 001 between March and October 2016 was completed (please see summary table below). The toxicity testing was conducted by your facility's contracted laboratory AquaTOX Research Inc., using the vertebrate fathead minnow (*Pimephales promelas*) and invertebrate water flea (*Ceriodaphnia dubia*) freshwater test species.

The majority of the tests indicated that the effluent was chronically toxic with NOEC results  $\geq 25\%$  and corresponding TUC results  $\leq 4.0$  with the Most Sensitive Species (MSS) not definitively determined. However, the effluent is not predicted to be unacceptably acutely or chronically toxic after mixing with the receiving water of the Class C(T) Keuka Lake Outlet at the Instream Waste Concentration (IWC).

Therefore, due to no exceedances of the toxicity based action levels, additional toxicity testing is not required at this time unless your permit is modified or 2021, as all current requirements have been satisfactorily met as specified in your SPDES permit. However in 2021, please conduct four quarterly tests in accordance with your permit, thereby enabling seasonal effluent characterization as required. Additionally, application of the Reasonable Potential Determination (RPD) to the acute and chronic results indicates that toxicity based limits are also not required at this time.

If you have any questions, please do not hesitate to contact Nicole Wright (<[nicole.wright@dec.ny.gov](mailto:nicole.wright@dec.ny.gov) or 518-402-8206) of the Toxicity Testing Unit, or you can also reference Technical and Operational Guidance Series (TOGS) 1.3.2 - Acute and Chronic Toxicity Testing in the SPDES Permit Program online at [http://www.dec.ny.gov/docs/water\\_pdf/togs132.pdf](http://www.dec.ny.gov/docs/water_pdf/togs132.pdf).

Test Date	<sup>1</sup> MSS 48H LC50 (%Effluent)	<sup>2</sup> MSS TUa	<sup>3</sup> TUa Action Level	<sup>4</sup> MSS Survival 100% Effluent	<sup>5</sup> Acute Test Result	<sup>6</sup> MSS RPD TUa	<sup>7</sup> Acute WET Limit Required	<sup>8</sup> MSS 7D NOEC/IC25 (%Effluent)	<sup>9</sup> MSS NOEC/IC25 TUC	<sup>10</sup> TUC Action Level	<sup>11</sup> Chronic Test Result NOEC/IC25	<sup>12</sup> MSS RPD IC25 TUC	<sup>13</sup> Chronic WET Limit Required
03/16	>100% (FI)	<0.3 (FI)	10.7	100% (FI)	Pass	<0.9	No	>100% (FI)/>100% (FI)	<1.0 (FI)/<1.0 (FI)	70.0	Pass/Pass	<3.0	No
06/16	>100% (FI)	<0.3 (FI)	10.7	100% (FI)	Pass	<0.9	No	25% (I)/34.3% (I)	4.0 (I)/2.9 (I)	70.0	Pass/Pass	8.7	No
10/16	>100% (FI)	<0.3 (FI)	10.7	100% (FI)	Pass	<0.9	No	50% (F)/>100% (FI)	2.0 (F)/<1.0 (FI)	70.0	Pass/Pass	<3.0	No

<sup>1</sup>Most Sensitive Species 48-hour Lethal Concentration: (F=Fish; I=Invertebrate) is the concentration or percentage of effluent that is lethal to 50% of the exposed organisms over a 48-hour period, and often indicates one species is more sensitive than the other during effluent testing.

<sup>2</sup>Most Sensitive Species Toxic Units Acute: is calculated as  $(100 / \text{MSS 48H LC50})$ . However, because  $\leq 0.3$  TUa is defined as the acceptable amount of acute toxicity at the edge of the acute mixing zone, and mathematically  $100 / 100 = 1.0$  (i.e. a "failing result"), non-toxic acute test results are indicated as  $< 0.3$ .

<sup>3</sup>Toxic Unit Acute Action Level: is calculated as  $[(\text{Acute Dilution Factor}+1) \times 0.3 \text{ TUa}]$  representing the maximum allowable effluent TUa at the edge of the acute mixing zone after mixing with the receiving water and using the seven-day once-in-ten year low flow (7Q10), to assure acute protection of the receiving water.

<sup>4</sup>Most Sensitive Species Survival in 100% Effluent: is the lowest percentage of surviving organisms in 100% effluent, providing additional evidence of unacceptable acute toxicity when the necessary 50% or greater mortality required to generate an LC50 has not been attained. \*Denotes statistically significant mortality in 100% effluent as compared to the control.

<sup>5</sup>Acute Test Result: MSS TUa  $\leq$  TUa Action Level for passing effluent test result and MSS TUa  $>$  TUa Action Level for a failing effluent test result. If unacceptable mortality (i.e. statistically significant as compared to the control) is noted in 100% effluent, this may also be considered a failing test result.

<sup>6</sup>Most Sensitive Species Reasonable Potential Determination Toxic Units Acute: is calculated as  $(\text{MSS TUa} \times 3.0)$ , the Reasonable Potential Multiplier when three tests have been conducted, taking into account the statistical potential for effluent variability to occur causing an exceedance of the toxicity based action level.

<sup>7</sup>Acute Whole Effluent Toxicity Limit Required: MSS RPD TUa  $\leq$  TUa Action Level, then no toxicity based limit is required and the action level remains in place. If MSS RPD TUa  $>$  TUa Action Level, then a toxicity based limit is required and the action level becomes the limit.

<sup>8</sup>Most Sensitive Species 7-day No Observed Effect Concentration or 25% Inhibition Concentration: is the highest concentration or percentage of effluent tested that causes no statistically significant effect to the exposed test organisms as compared to the control over a 7-day period, or the concentration or percentage of effluent that causes a 25% reduction in reproduction or growth for the test population.

<sup>9</sup>Most Sensitive Species Toxic Units Chronic: is calculated as  $(100 / \text{MSS 7D NOEC})$  or  $(100 / \text{MSS 7D IC25})$ .

<sup>10</sup>Toxic Unit Chronic Action Level: is calculated as  $[(\text{Chronic Dilution Factor}+1) \times 1.0 \text{ TUC}]$  representing the maximum allowable effluent TUC at the edge of the chronic mixing zone after mixing with the receiving water and using the seven-day once-in-ten year low flow (7Q10), to assure chronic protection of the receiving water.

<sup>11</sup>Chronic Test Result: MSS NOEC/IC25 TUC  $\leq$  TUC Action Level for passing effluent test result and MSS NOEC/IC25 TUC  $>$  TUC Action Level for a failing effluent test result.

<sup>12</sup>Most Sensitive Species Reasonable Potential Determination Toxic Units Chronic: is calculated as  $(\text{MSS IC25 TUC} \times 3.0)$ , the Reasonable Potential Multiplier when three tests have been conducted, taking into account the statistical potential for effluent variability to occur causing an exceedance of the toxicity based action level.

<sup>13</sup>Chronic Whole Effluent Toxicity Limit Required: MSS RPD IC25 TUC  $\leq$  TUC Action Level, then no toxicity based limit is required and the action level remains in place. If MSS RPD IC25 TUC  $>$  TUC Action Level, then a toxicity based limit is required and the action level becomes the limit.



DP



2620 Grand Island Blvd. Grand Island, New York 14072 ph (716) 773-6872 /fax (716) 773-6873 www.daiglerengineering.com

March 31, 2017

Scott Rodabaugh  
Regional Water Engineer  
**New York State Department of Environmental Conservation-Region 8**  
6274 East Avon-Lima Road  
Avon, New York 14414

**Re: Lockwood Ash Disposal Site SPDES Permit No. NY0107069  
Mercury Minimization Program 2016 Annual Report**

Dear Mr. Rodabaugh:

On behalf of Lockwood Hills LLC, please find enclosed the Mercury Minimization Program (MMP) Annual Report for the Lockwood Ash Disposal Site located in Torrey, New York. The enclosed report summarizes the monitoring results for the 2016 monitoring period including the required MMP elements listed in the site's SPDES permit.

We trust this report satisfies the SPDES permit requirements for the Mercury Minimization Program. Should you have any questions or comments, please do not hesitate to contact us.

Sincerely,

**DAIGLER ENGINEERING, PC**

**Allyson M. Zurawski, EIT**  
Digitally signed by Allyson M. Zurawski, EIT  
Date: 2017.03.31 14:13:43 -04'00'

Allyson M. Zurawski, E.I.T.  
Environmental Engineer

cc: Bureau of Water Permits, NYSDEC-Central Office  
Dale Irwin, Lockwood Hills LLC

Attachment: (1) Mercury Minimization Program 2016 Annual Report  
(Lockwood Ash Disposal Site)

# MERCURY MINIMIZATION PROGRAM 2016 ANNUAL REPORT

Lockwood Hills LLC  
Lockwood Ash Disposal Site

## *INTRODUCTION*

Lockwood Hills LLC (Lockwood Hills) manages the Lockwood Ash Disposal Site (Lockwood or the Landfill), a coal ash monofill associated with the Greenidge Power Generating Station. Lockwood is located on Swarthout Road, across NYS Route 14 from the Station in the Town of Torrey, Yates County, New York. With the exception of a minor volume of soil contaminated with unburned coal or ash in 2015 and 2016 associated with cleanup activity at the Station and construction activity at the Landfill, Lockwood has been inactive and largely under intermediate cover. Lockwood Hills maintains a State Pollutant Discharge Elimination System (SPDES) permit (No. NY0107069) to discharge a mixture of stormwater and leachate from the sedimentation/neutralization basin (Outfall 001) to the Keuka Lake Outlet.

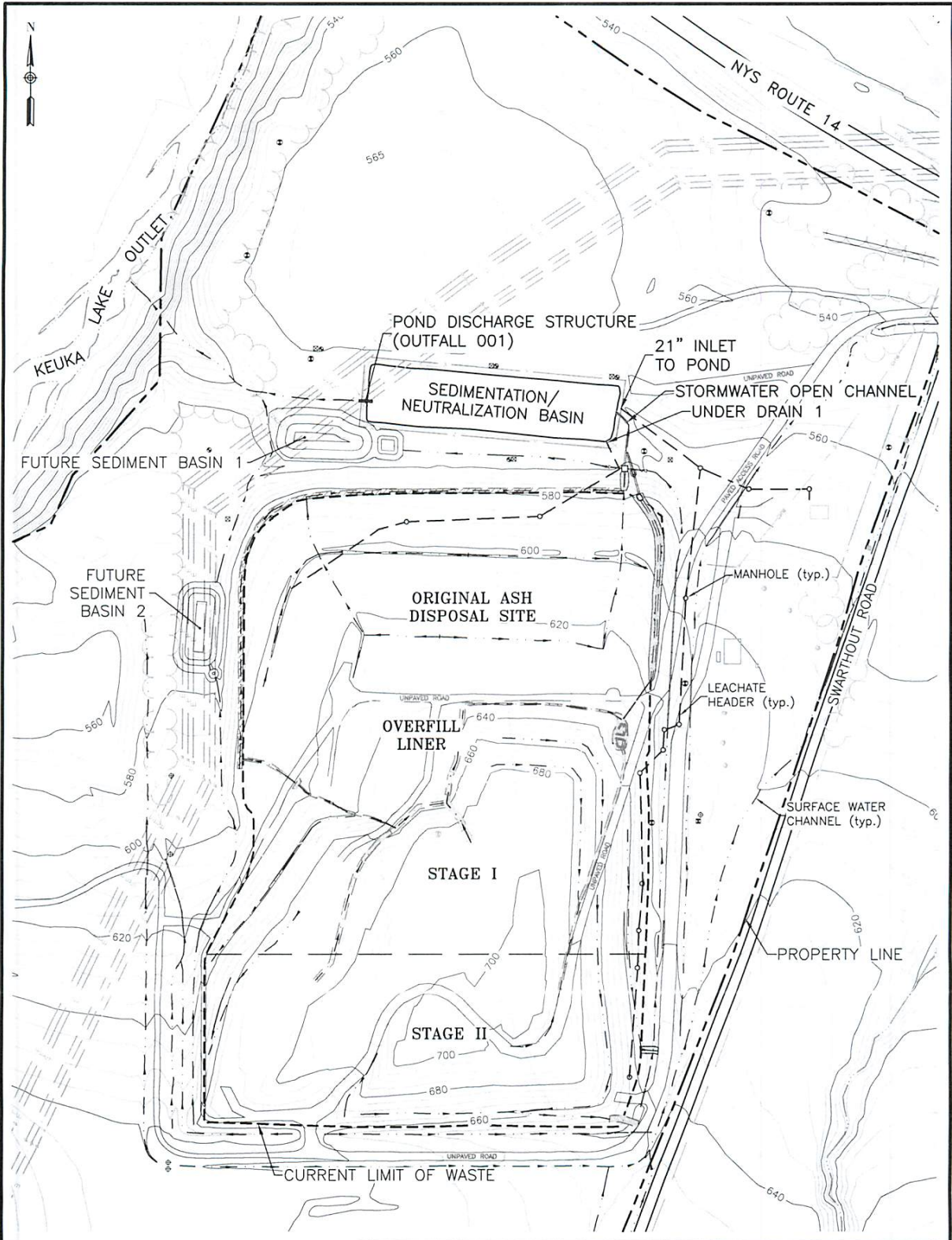
Since the 50 ng/L permit limit exceeds the state-wide calculated WQBEL of 0.70 ng/L, a Mercury Minimization Program (MMP) was developed and maintained as part of the SPDES permit requirements. This report is intended to satisfy the MMP's annual report requirements for monitoring conducted during calendar year 2016 for industrial facilities described in Lockwood's SPDES permit. Specifically, the following six required elements are included:

1. Summary of the monitoring results from the applicable monitoring period;
2. List of known and potential sources of mercury;
3. Mass balance of mercury on the sediment basin;
4. Summary of all actions taken to support the mercury control strategy laid out in the March 2011 MMP Plan prepared by AES Greenidge, LLC;
5. Actions planned for the upcoming year; and,
6. Summary of MMP's progress toward the goal stated in the SPDES permit "to reduce mercury effluent levels in pursuit of the calculated [Water Quality Based Effluent Level] WQBEL" of 0.7 ng/L.

### *MONITORING RESULTS*

The monitoring of mercury is designed to quantify and, over time, track trending associated with the parameter. Sampling for low-level mercury is performed by Adirondack Environmental Services, Inc (ADK) of Albany, New York at the effluent from the sedimentation/neutralization basin (i.e., Outfall 001) during batch discharges in accordance with the site's SPDES permit, and quarterly at the leachate influents to the basin in coordination with the site's Part 360 environmental monitoring plan. Laboratory analysis, also conducted by ADK, is performed using EPA Method 1631, as required.

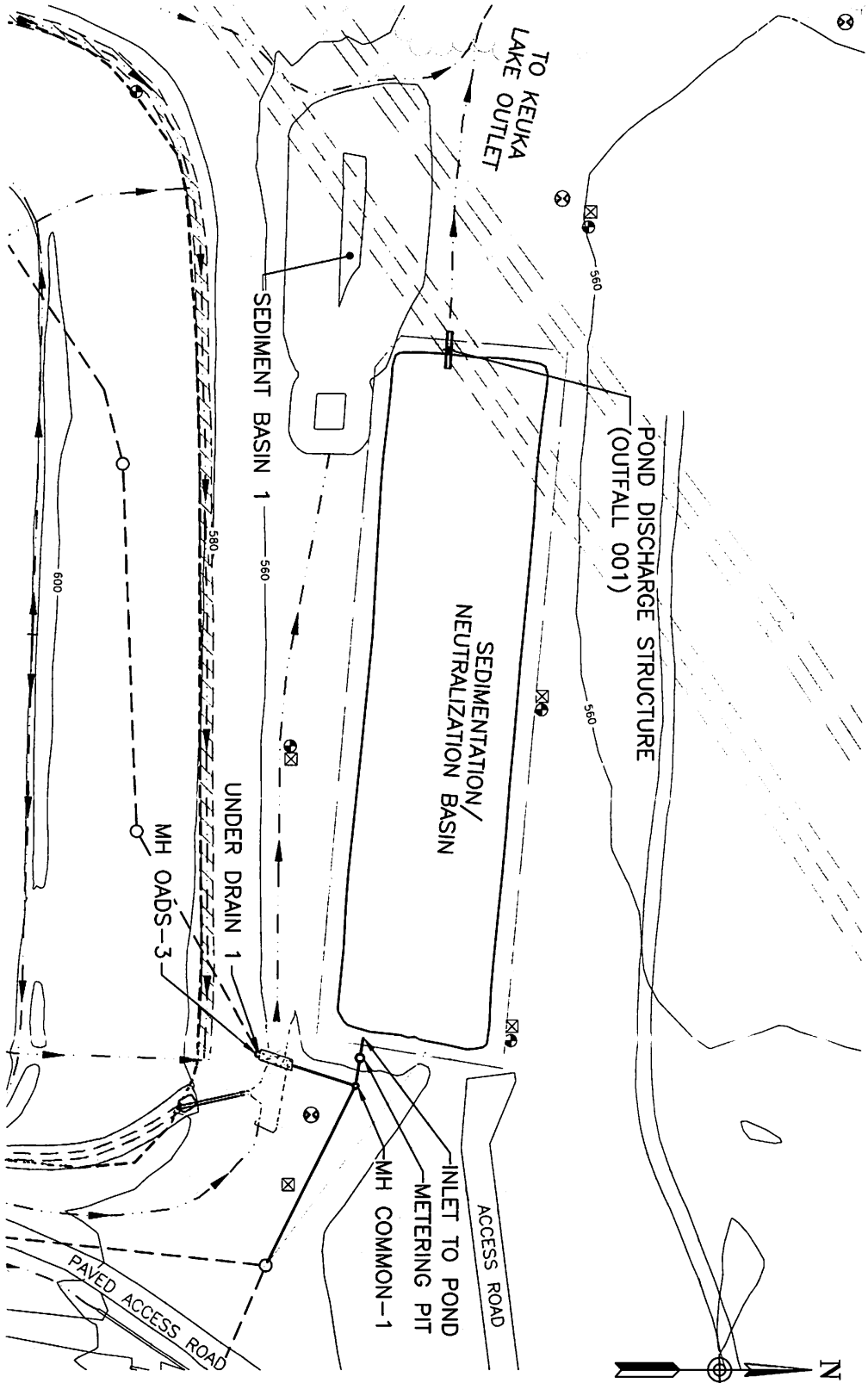
Lockwood Hills entered into a Consent Order (Case No. R8-20140710-47) with the New York State Department of Environmental Conservation (NYSDEC) to segregate stormwater from leachate and to treat and dispose of the leachate onsite or at an appropriate offsite facility. Construction efforts under this Consent Order began in 2016. During the second quarter of 2016, the influents to the sedimentation/neutralization basin were modified. Prior to the end of June, 2016, leachate influents to the basin included the 21" Inlet to Pond and Under Drain 1 and portion of the site's stormwater was conveyed to the basin via an open channel on the east bank of the basin, as shown on Figure 1. All leachate and stormwater was combined in the basin before discharging via Outfall 001. Modifications to the system began in June 2016 when the two PVC pipes discharging to the basin, the 21" Inlet to Pond and Under Drain 1, were abandoned in place or removed, respectively. The two leachate flows now are combined in a new common manhole, routed through a Meter Pit, where the flowrate is measured using a trapezoidal flume and an open channel flow level sensor, before discharging to the sedimentation/neutralization basin along its east bank through a single, eight-inch, PVC pipe. This new combined discharge is now referred to as Inlet to Pond and was the location for sampling during the third and fourth quarters of 2016. A new manhole (MH OADS-3) was installed upgradient of the original Under Drain 1 sampling location where it discharged into the basin. This manhole contains only leachate from the Original Ash Disposal Site and has become the new sampling location for Under Drain 1. Later in September and November of 2016, the open channel discharging stormwater to the basin was filled in and the stormwater was rerouted to an improved Sediment Basin 1; thereby satisfying one of the primary Consent Order objectives. The new layout is depicted in Figure 2.



O:\Lockwood Hills LLC\31-1217 2016 MMP Annual Report\ACAD\SITE PLAN FIG 1.dwg 3/13/2017 10:21 AM

**DAIGLER ENGINEERING, P.C.**  
 CIVIL & GEO-ENVIRONMENTAL ENGINEERING  
 2620 GRAND ISLAND BLVD. GRAND ISLAND, NEW YORK 14072  
 (716) 773-6872 (716) 773-6873 FAX

HISTORIC SITE PLAN			FIGURE 1
LOCKWOOD ASH DISPOSAL SITE MERCURY MINIMIZATION PROGRAM			
LOCKWOOD HILLS LLC			
TOWN OF TORREY	YATES COUNTY	NEW YORK	
March 2017	SCALE: 1" = 300'	REVISION # 0	



**DAIGLER ENGINEERING, P.C.**  
 CIVIL & GEO-ENVIRONMENTAL ENGINEERING  
 2620 GRAND ISLAND BLVD., GRAND ISLAND, NEW YORK 14072  
 (716) 773-6872

LOCKWOOD HILLS LLC		<b>CURRENT CONDITIONS</b>		<b>FIGURE 2</b>
SCALE: 1" = 120'	REVISION # 0			
MARCH 2017		LOCKWOOD ASH DISPOSAL SITE MERCURY MINIMIZATION PROGRAM		
TOWN OF TORREY		YATES COUNTY		NEW YORK

Liquid in the sedimentation/neutralization basin is held until the water surface reaches approximately two feet below the spillway. A pre-discharge sample is analyzed to confirm the SPDES discharge limit will be met before discharge from the basin is directed to the Keuka Lake Outlet via a natural channel and further conveyed to Seneca Lake. Grab samples for low-level mercury are taken directly from the discharge (Outfall 001). The following table shows the results of mercury monitoring for 2016 at Outfall 001, as well as, at the 21" Inlet to Pond and Under Drain 1 for the first two quarters, and at the Inlet to Pond for the latter two quarters of 2016.

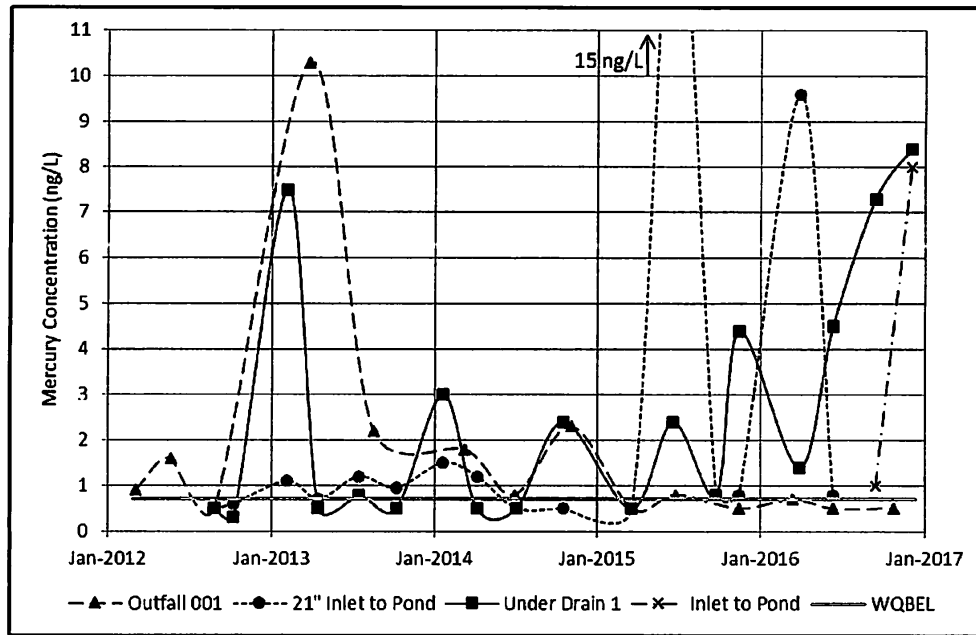
<b>Collection Date (2016)</b>	<b>Mercury Concentration</b>			
	<i>Outfall 001</i>	<i>21" Inlet to Pond</i>	<i>Under Drain 1</i>	<i>Inlet to Pond</i>
1 <sup>st</sup> Quarter	0.7 ng/L	9.6 ng/L	1.4 ng/L	-
2 <sup>nd</sup> Quarter	< 0.5 ng/L	0.8 ng/L	4.5 ng/L	-
3 <sup>rd</sup> Quarter	< 0.5 ng/L	-	-	1.0 ng/L
4 <sup>th</sup> Quarter	No Discharge	-	-	8.0 ng/L

All results are less than the 50 ng/L permit limit; however, all sample results for 2016 at the leachate influents to the basin were greater than the 0.7 ng/L state-wide WQBEL.

The graph below includes all available data for the sampling locations from the beginning of 2012 to the end of 2016. All results for Under Drain 1 are included for comparison; however, it should be noted that the Inlet to Pond sample is a combination of leachate from Under Drain 1 and leachate formerly discharged through the 21" Inlet to Pond. Thus, in the third and fourth quarters the Under Drain 1 sample does not discharge directly to the basin, but is assimilated into the Inlet to Pond sample.

The concentration of mercury at Outfall 001 has continued to decrease with all samples less than or equal to the WQBEL this year. The two most recent samples from the second and third quarters were below the detection limit (there was no discharge during the fourth quarter). The elevated concentration in the fourth quarter at Inlet to Pond (8.0 ng/L) is likely the result of the intra-location maximum observed at Under Drain 1 (8.4 ng/L) of leachate from the original ash disposal site.

Comparison of the annual geometric mean<sup>1</sup> concentrations between 2012 and 2016 for each of the discharge locations reveals a generally, and slightly increasing trend at the 21" Inlet to Pond and at Under Drain 1, while the annual geometric means at Outfall 001 have decreased over time, with the 2015 and 2016 geometric means (0.5 ng/L and 0.4 ng/L, respectively) less than the WQBEL.



#### SOURCES OF MERCURY

The potential sources of mercury at the Landfill include fly ash and other byproducts of the coal combustion process disposed of in the Landfill. Coal has not been burned at the Station since 2011 when the Station and the landfill were placed under protective layup status. The majority of the landfill is under intermediate cover. As such, there are no raw materials to be sampled. In 2005 and again in 2007 when the Station was operational, the fly ash was sampled using EPA Method 245.1 which has a significantly higher method detection limit (200 ng/L) than EPA Method 1631 (0.5 ng/L). Both sampling results from 2005 and 2007 resulted in mercury being less than the detection limit, or less than 200 ng/L. The 2011 MMP Plan indicated that typical mercury

<sup>1</sup> Results reported as less than detection were included in all data operations discussed herein as one half of the detection limit ( $0.5 \div 2 = 0.25$  ng/L)

concentrations in coal range from 100 ng/L to 600 ng/L. This suggests that the concentration of mercury that remains in the ash is less than that of the parent material prior to combustion.

*MASS BALANCE*

The movement of mercury through the landfill from the source (i.e., coal combustion byproducts) to Outfall 001 is conveyed via the leachate to the sedimentation/neutralization basin. Within the basin, sedimentation occurs, depositing adsorbed mercury. The remaining mass of mercury is discharged through Outfall 001. The following is a general mass balance taking into account the mercury concentration for each sampling location (expressed within brackets) multiplied by the volume. Instantaneous flowrates were measured during the sampling events for the 21” Inlet to Pond and Under Drain 1 during the first and second quarters. Assuming the flowrate is constant over the entire quarter, these instantaneous flowrates were converted to a total volume per quarter. As discussed earlier, the flowrate at Inlet to Pond is now measured and recorded. A totalized flow volume over each quarter was used. Finally, the total volume of each discharge event is estimated based on beginning and ending basin levels.

$$\begin{aligned} & \sum [21'' \text{ Inlet to Pond}] \times (\text{Volume from } 21'' \text{ Inlet to Pond}) + \\ & \sum [\text{Under Drain 1}] \times (\text{Volume from Under Drain 1}) + \\ & \sum [\text{Inlet to Pond}] \times (\text{Volume from Inlet to Pond}) + \\ & \sum [\text{Stormwater}] \times (\text{Volume of Stormwater}) - \text{Mass Deposited in Basin} = \\ & \sum [\text{Outfall 001}] \times (\text{Volume Discharge from Outfall 001}) \end{aligned}$$

A table of the calculated mass of mercury at each discharge location for each quarter of 2016 follows. The concentration of mercury in stormwater was assumed to be zero. The annual mass of mercury entering and existing the basin is substituted into the mass balance equation and the “Mass Deposited in Basin” term was solved for.

Date (2016)	Mass of Mercury (Hg) ([Concentration] × Flow Rate)			
	Outfall 001	21" Inlet to Pond	Under Drain 1	Inlet to Pond
1 <sup>st</sup> Quarter	4.92 mg	15.10 mg	3.85 mg	-
2 <sup>nd</sup> Quarter	0.62 mg	1.42 mg	5.43 mg	-
3 <sup>rd</sup> Quarter	1.23 mg	-	-	2.07 mg
4 <sup>th</sup> Quarter	-	-	-	24.22 mg
<b>Annual Total</b>	<b>6.8 mg</b>	<b>16.5 mg</b>	<b>9.3 mg</b>	<b>26.3 mg</b>



$$\begin{aligned}
&16.5 \text{ mg Hg} + \\
&\quad 9.3 \text{ mg Hg} + \\
&\quad\quad 26.3 \text{ mg Hg} + \\
&\quad\quad\quad 0 \text{ mg Hg} - \text{Mass Deposited in Basin} = \\
&\quad\quad\quad\quad 6.8 \text{ mg Hg} \\
&\text{Mass Deposited in Basin} = 45.3 \text{ mg Hg}
\end{aligned}$$

The positive value of the Mass Deposited in Basin term suggests that the mass discharged through Outfall 001 is less than the combined mass inputs from the leachate influent pipes in 2016. As the name of the term suggests, it is assumed that excess mass of Hg is deposited or settles with the sediments of the basin. However, once mercury is in water, a number complex factors such as atmospheric volatilization and chemical transformation, in addition to sedimentation of mercury can occur. A combination of these or other factors likely contributed to the total difference in the calculated mass of mercury going into the pond as compared to that coming out.

*CONTROL STRATEGY*

The control strategy outlined in the 2011 MMP Plan remains largely effective at the Lockwood Ash Disposal Site. As noted in Section 3, effective management of raw material and waste streams has been conducted over the past several years to minimize contact of mercury containing materials (i.e., coal combustion byproducts) with stormwater.

The Landfill operates under Part 360 regulations and consists of a geocomposite liner, a leachate collection system, and a groundwater monitoring system. The leachate monitoring points and groundwater wells located upgradient and downgradient of the Landfill are both monitored on a quarterly basis. The results of the sampling and analysis are reported to the NYSDEC. Monthly inspection reports intended to identify upsets in operational controls are completed by Lockwood staff and reported to the NYSDEC in the Part 360 annual report.

As described above, under Consent Order efforts are underway to segregate stormwater from leachate and treat and dispose of the leachate onsite or at an appropriate offsite facility. Construction activities in 2016 included the expansion of Sediment Basin 1 to handle stormwater previously conveyed to the sedimentation/neutralization basin and the installation of a leachate flow metering system to quantify leachate flows into the basin. Once one year of leachate flow

monitoring is complete on June 30, 2017, the data will be analyzed and an adequate storage, treatment, and disposal plan for leachate generated onsite will be designed, with an engineering report submitted to the NYSDEC. Construction of the entire leachate segregation, treatment and disposal system is to be completed by November 1, 2018 per the amended Consent Order schedule. The addition of leachate treatment, whether onsite or off, will significantly reduce the potential for mercury discharges from the facility.

#### *SUMMARY*

All results for the 2016 calendar year remained less than the SPDES effluent limit of 50 ng/L allowable by the facility's permit. Mercury concentrations measured at Outfall 001 were less than or equal to the WQBEL of 0.7 ng/L; however, all results from samples taken at the influents to the basin were greater than the WQBEL. Analysis of the mercury concentrations over time at the influent sampling locations shows slight increasing trends in the annual geometric means. Conversely, the annual geometric mean for Outfall 001 has been decreasing over the past several years, even dropping to below the WQBEL for 2015 and 2016.

It is expected that the implementation of the Consent Order will help decrease the concentration of mercury discharged offsite. This will contribute directly to the goal of the MMP to reduce mercury effluent levels in pursuit of the WQBEL of 0.7 ng/L. In the meantime, monthly visual inspections will continue to aid in identifying deficiencies at the site.

**Pratt, David (DEC)**

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**From:** Bethany Acquisto <Bethany@jadenvgr.com>  
**Sent:** Thursday, June 15, 2017 10:33 AM  
**To:** Pratt, David (DEC)  
**Cc:** Dale Irwin (dirwin@greenidgellc.com); Scott Gibson (sgibson@greenidgellc.com); Harold Sexton  
**Subject:** Lockwood SPDES sampling SOP  
**Attachments:** LOPD Discharge SOP.docx

*ATTENTION: This email came from an external source. Do not open attachments or click on links from unknown senders or unexpected emails.*

David,

As discussed on the phone this morning, please find attached the SPDES sampling SOP from the laboratory who performs the field services at Lockwood.

My Best,



*Bethany Acquisto, Ph.D.*

Senior Environmental Scientist

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## **Lockwood Ash Pond (SPDES Outfall 001) Discharge**

**Adirondack Environmental Services, Inc.**

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- 1. Lockwood Ash Pond is located in Lockwood Ash Landfill across from Greenidge Power Plant in Dresden, NY**
  
- 2. Pond Access and Autosampler setup**
  - a. The Discharge point is at the north end of the pond.
  - b. Set up Autosampler at this discharge chute.
  - c. Run tubing and strainer through fence down into chute.
  - d. Position strainer so that it is downstream of the valve and will pull water no matter where it gets pushed within the chute.
  - e. Set Autosampler to take a 24 hour composite.
  - f. Depart and return the next day.
  
- 3. Sample Collection**
  - a. Take appropriate bottles as per the chain of custody to autosampler and fill composite bottles from composite jar.
  - b. Fill appropriate bottles as per the chain of custody as grab samples directly from flow or with a scoop as is practical/safe.
  - c. Collect sample for pH and temperature. **pH permit limit is 6.0 – 9.0, Typical range is 7.2 – 8.5.**
  - d. Measure and record pH and temperature
  - e. Package samples
  - f. Record pH and temperature
  - g. Complete COC.

