

# **2017 Annual Groundwater Monitoring and Corrective Action Report**

**Havana East Ash Pond (Cells 1, 2, 3, and 4) – CCR Unit ID 701  
Havana Power Station  
15260 North State Route 78  
Havana, Illinois 62644**

**Dynegy Midwest Generation, LLC**

January 31, 2018

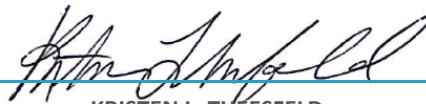


JANUARY 31, 2018 | PROJECT #67719

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701  
Havana Power Station  
Havana, Illinois

Prepared for:  
*Dynegy Midwest Generation, LLC*



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Figure 1	Groundwater Sampling Well Location Map
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## ACRONYMS AND ABBREVIATIONS

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CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
mg/L	milligrams per liter
NRT/OBG	Natural Resource Technology, an OBG Company
OBG	O'Brien & Gere Engineers, Inc.
SSI	statistically significant increase
STD	standard units

## 1 INTRODUCTION

### 1.1 OVERVIEW

This report has been prepared on behalf of Dynegy Midwest Generation, LLC by O'Brien & Gere Engineers, Inc. (OBG), to provide the information required by 40 CFR 257.90(e) for the Havana East Ash Pond (Cells 1, 2, 3, and 4) located at Havana Power Station near Havana, Illinois.

In accordance with 40 CFR 257.90(e), the owner or operator of an existing CCR unit must prepare an annual groundwater monitoring and corrective action report, for the preceding calendar year, that documents the status of the groundwater monitoring and corrective action program for the CCR unit, summarizes key actions completed, describes any problems encountered, discusses actions to resolve the problems, and projects key activities for the upcoming year. At a minimum, the annual report must contain the following information, to the extent available:

1. A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit.
2. Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken.
3. In addition to all the monitoring data obtained under §§ 257.90 through 257.98, a summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs.
4. A narrative discussion of any transition between monitoring programs (*e.g.*, the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels).
5. Other information required to be included in the annual report as specified in §§ 257.90 through 257.98.<sup>1</sup>

This report provides the required information for the Havana East Ash Pond (Cells 1, 2, 3, and 4) for calendar year 2017.

### 1.2 MONITORING AND CORRECTIVE ACTION PROGRAM STATUS

The final three independent samples of the minimum eight required by 40 CFR 257.94(b) were collected and analyzed from each background and downgradient well in 2017 before October 17. The other five independent samples were collected and analyzed in 2015 and 2016.

The first semi-annual monitoring sample for the Detection Monitoring Program was collected in November 2017 from each well.

Using the last of the minimum eight samples required to be collected by October 17, 2017 to determine whether a statistically significant increase (SSI) of Appendix III parameters over background concentrations has occurred, evaluation of analytical data from the downgradient wells was initiated beginning no later than October 17, 2017 for the initial eight samples. SSI determinations will be completed within 90 days (January 15, 2018). In addition, SSI determinations will be completed within 90 days of completion of analysis for the first semi-annual detection monitoring sample collected on November 15, 2017, for which analytical data was received on December 8, 2017.

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<sup>1</sup> For calendar year 2017, corrective action and other information required to be included in the annual report as specified in §§ 257.90 through 257.98 is inapplicable.

## 2 KEY ACTIONS COMPLETED IN 2017

### 2.1 SUMMARY

Three groundwater sampling events were completed in 2017 as part of an effort initiated in 2015 to collect eight independent samples from background and downgradient monitoring wells in accordance with 40 CFR 257.94(b).

Subsequent to collection of the eight independent samples, an additional sampling event was completed in November 2017 for parameters listed in Appendix III, 40 CFR Part 257, to supplement the background data set and as the first semi-annual monitoring sampling event for the Detection Monitoring Program.

A map showing the groundwater monitoring system, including the CCR unit and all background and downgradient monitoring wells with well identification numbers, for the Havana East Ash Pond (Cells 1, 2, 3, and 4) is presented in Figure 1. No monitoring wells were installed or decommissioned from the monitoring system in 2017.

Samples were collected and analyzed in accordance with the Sampling and Analysis Plan (NRT/OBG, 2017a) prepared for the Havana East Ash Pond (Cells 1, 2, 3, and 4).

All monitoring data obtained under 40 CFR §§ 257.90 through 257.98 (as applicable) in 2017, as well as monitoring data for the previously collected five independent samples are presented in Tables 1 and 2. Sample collection dates in 2017 were February 7, May 11, June 29, and November 15. Sample collection dates for previously collected five independent samples are identified in Tables 1 and 2. One ground water sample was collected from each background and downgradient well in each sampling event.

Statistical evaluation of analytical data from the eight independent samples required to be collected by October 17, 2017 and the first semi-annual detection monitoring event on November 15, 2017 was initiated and will be completed within 90 days of October 17, 2017 (January 15, 2018) or 90 days from receipt of the data from the first semi-annual detection monitoring event (March 8, 2018), respectively. Statistical evaluation of analytical data is being performed in accordance with the Statistical Analysis Plan, Havana Power Station, Dynegy Midwest Generation, LLC (NRT/OBG, 2017b).

### 2.2 PROBLEMS ENCOUNTERED AND ACTIONS TO RESOLVE THE PROBLEMS

No problems were encountered with the groundwater monitoring program during 2017. Groundwater samples were collected and analyzed in accordance with the Sampling and Analysis Plan, and all data was accepted.

### 3 KEY ACTIVITIES PLANNED FOR 2018

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#### 3.1 SUMMARY

The following key activities are planned for 2018:

- Continuation of the Detection Monitoring Program with semi-annual sampling scheduled for the 2nd and 4th quarters of 2018.
- Complete evaluation of analytical data from the downgradient wells, using both the eight samples required to be collected by October 17, 2017 and the first semi-annual detection monitoring sample taken in November 2017 to determine whether a SSI of Appendix III parameters over background concentrations has occurred.
- If an SSI is identified, potential alternate sources (*i.e.*, a source other than the CCR unit caused the SSI or that that SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality) will be evaluated. If an alternate source is demonstrated to be the cause of the SSI, a written demonstration will be completed within 90 days of SSI detection and included in the annual groundwater monitoring and corrective action report for 2018.
  - » If an alternate source(s) is not identified to be the cause of the SSI, the applicable requirements of 40 CFR §§ 257.94 through 257.98 (*e.g.*, assessment monitoring) as may apply in 2018 will be met, including associated recordkeeping/notifications required by 40 CFR §§ 257.105 through 257.108.

## REFERENCES

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Natural Resource Technology, an OBG Company, 2017a, Sampling and Analysis Plan, Havana East Ash Pond (Cells 1, 2, 3, and 4), Havana Power Station, Havana, Illinois, Project No. 2285, Revision 0, October 17, 2017.

Natural Resource Technology, an OBG Company, 2017b, Statistical Analysis Plan, Baldwin Energy Complex, Havana Power Station, Hennepin Power Station, Wood River Power Station, Dynegy Midwest Generation, LLC, October 17, 2017.





Tables

## Havana

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Table 1. Havana East Ash Pond (Cells 1, 2, 3, and 4): Appendix III Analytical Results

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Location ID	Sample Date	B, tot, mg/L	Ca, tot, mg/L	Cl, tot, mg/L	F, tot, mg/L	pH (field), STD	SO4, tot, mg/L
HAMW-30	11/19/2015	0.03400	46.30	14.00	<0.07000	7.830	18.00
	2/16/2016	0.03960	44.40	12.00	<0.1000	7.450	17.00
	6/6/2016	0.03280	44.80	12.00	<0.1000	7.540	16.00
	8/8/2016	0.04510	47.20	12.00	<0.1000	7.100	15.00
	11/7/2016	0.04160	44.70	12.00	<0.1000	7.990	12.00
	2/7/2017	0.03860	47.60	12.00	<0.1000	7.920	13.00
	5/11/2017	0.04600	49.30	17.00	<0.1000	7.260	15.00
	6/29/2017	0.04230	48.10	17.00	<0.1000	7.780	16.00
	11/15/2017	0.03650	52.70	18.00	<0.1000	7.620	20.00
HAMW-31	11/19/2015	0.06940	69.30	14.00	<0.07000	7.310	18.00
	2/16/2016	0.06680	69.10	10.00	<0.05000	7.030	21.00
	6/6/2016	0.05860	66.30	13.00	<0.05000	7.540	18.00
	8/8/2016	0.05320	66.90	12.00	<0.05000	7.950	24.00
	11/7/2016	0.06220	75.60	14.00	<0.1000	7.560	25.00
	2/7/2017	0.08190	71.50	15.00	<0.05000	7.690	23.00
	5/11/2017	0.08220	66.80	16.00	<0.05000	6.760	22.00
	6/29/2017	0.1000	67.80	15.00	<0.1000	7.240	21.00
	11/15/2017	0.05810	64.80	15.00	<0.1000	7.400	19.00

Table 1. Havana East Ash Pond (Cells 1, 2, 3, and 4): Appendix III Analytical Results

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Location ID	Sample Date	TDS, mg/L
HAMW-30	11/19/2015	190.0
	2/16/2016	214.0
	6/6/2016	214.0
	8/8/2016	218.0
	11/7/2016	234.0
	2/7/2017	182.0
	5/11/2017	248.0
	6/29/2017	204.0
	11/15/2017	292.0
HAMW-31	11/19/2015	212.0
	2/16/2016	294.0
	6/6/2016	274.0
	8/8/2016	272.0
	11/7/2016	300.0
	2/7/2017	280.0
	5/11/2017	296.0
	6/29/2017	276.0
	11/15/2017	320.0

Havana

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Table 1. Havana East Ash Pond (Cells 1, 2, 3, and 4): Appendix III Analytical Results

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Location ID	Sample Date	B, tot, mg/L	Ca, tot, mg/L	Cl, tot, mg/L	F, tot, mg/L	pH (field), STD	SO4, tot, mg/L
HAMW-32	11/19/2015	0.06580	73.00	12.00	<0.07000	7.580	25.00
	2/16/2016	0.06440	70.10	14.00	<0.1000	7.250	27.00
	6/6/2016	0.05780	65.20	12.00	<0.1000	7.520	25.00
	8/8/2016	0.05100	63.80	13.00	<0.1000	7.360	22.00
	11/7/2016	0.06800	67.10	14.00	<0.1000	7.480	20.00
	2/7/2017	0.06540	68.90	13.00	<0.1000	7.850	22.00
	5/11/2017	0.07100	72.20	13.00	<0.1000	6.710	18.00
	6/29/2017	0.07420	72.50	13.00	<0.1000	7.450	20.00
	11/15/2017	0.05410	70.80	14.00	<0.1000	7.380	22.00
HAMW-39	11/19/2015	0.06090	56.70	15.00	<0.06000	7.850	22.00
	2/16/2016	0.06250	58.50	16.00	<0.1000	7.590	26.00
	6/6/2016	0.05420	54.70	15.00	<0.1000	7.840	28.00
	8/8/2016	0.06340	64.70	16.00	<0.1000	8.030	34.00
	11/7/2016	0.05390	62.90	18.00	<0.1000	7.800	26.00
	2/7/2017	0.1110	72.10	16.00	<0.1000	7.690	39.00
	5/11/2017	0.07870	60.30	15.00	<0.1000	6.800	23.00
	6/29/2017	0.07930	54.70	15.00	<0.1000	7.700	23.00
	11/15/2017	0.04820	54.70	13.00	<0.1000	7.360	19.00

Table 1. Havana East Ash Pond (Cells 1, 2, 3, and 4): Appendix III Analytical Results

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Location ID	Sample Date	TDS, mg/L
HAMW-32	11/19/2015	246.0
	2/16/2016	306.0
	6/6/2016	254.0
	8/8/2016	232.0
	11/7/2016	320.0
	2/7/2017	290.0
	5/11/2017	320.0
	6/29/2017	300.0
	11/15/2017	192.0
HAMW-39	11/19/2015	230.0
	2/16/2016	234.0
	6/6/2016	176.0
	8/8/2016	294.0
	11/7/2016	254.0
	2/7/2017	292.0
	5/11/2017	304.0
	6/29/2017	236.0
	11/15/2017	274.0

Table 1. Havana East Ash Pond (Cells 1, 2, 3, and 4): Appendix III Analytical Results

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Location ID	Sample Date	B, tot, mg/L	Ca, tot, mg/L	Cl, tot, mg/L	F, tot, mg/L	pH (field), STD	SO4, tot, mg/L
HAMW-40	11/19/2015	0.1160	85.40	17.00	<0.06000	7.420	49.00
	2/16/2016	0.07710	63.00	14.00	<0.05000	7.340	30.00
	6/6/2016	0.05920	57.00	14.00	<0.06000	7.680	34.00
	8/8/2016	0.1190	59.30	13.00	<0.1000	7.950	24.00
	11/7/2016	0.07420	64.20	16.00	<0.1000	7.580	21.00
	2/7/2017	0.1520	74.00	15.00	<0.1000	7.430	27.00
	5/11/2017	0.08130	60.20	13.00	<0.1000	6.700	18.00
	6/29/2017	0.2040	81.50	22.00	<0.1000	7.390	37.00
	11/15/2017	0.2020	88.60	19.00	<0.1000	7.250	42.00
HAMW-41	11/19/2015	0.04790	56.20	12.00	<0.06000	7.760	28.00
	2/16/2016	0.04690	55.50	13.00	<0.1000	7.440	28.00
	6/6/2016	0.06280	58.20	12.00	<0.1000	7.850	29.00
	8/8/2016	0.05340	62.80	13.00	<0.1000	7.890	33.00
	11/7/2016	0.04290	64.10	15.00	<0.1000	7.620	35.00
	2/7/2017	0.04620	60.80	15.00	<0.1000	8.070	32.00
	5/11/2017	0.05070	56.70	13.00	<0.1000	6.890	28.00
	6/29/2017	0.04750	59.30	13.00	<0.1000	7.650	39.00
	11/15/2017	0.04380	63.40	13.00	<0.1000	7.610	31.00

Table 1. Havana East Ash Pond (Cells 1, 2, 3, and 4): Appendix III Analytical Results

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Location ID	Sample Date	TDS, mg/L
HAMW-40	11/19/2015	342.0
	2/16/2016	242.0
	6/6/2016	214.0
	8/8/2016	274.0
	11/7/2016	266.0
	2/7/2017	300.0
	5/11/2017	262.0
	6/29/2017	346.0
	11/15/2017	402.0
HAMW-41	11/19/2015	254.0
	2/16/2016	264.0
	6/6/2016	236.0
	8/8/2016	274.0
	11/7/2016	300.0
	2/7/2017	244.0
	5/11/2017	298.0
	6/29/2017	270.0
	11/15/2017	294.0

Table 1. Havana East Ash Pond (Cells 1, 2, 3, and 4): Appendix III Analytical Results

Location ID	Sample Date	B, tot, mg/L	Ca, tot, mg/L	Cl, tot, mg/L	F, tot, mg/L	pH (field), STD	SO4, tot, mg/L
HAMW-42	11/19/2015	0.04490	61.10	9.000	<0.07000	7.480	31.00
	2/16/2016	0.05430	79.60	14.00	<0.1000	7.110	36.00
	6/6/2016	0.06670	71.60	8.000	<0.1000	7.590	23.00
	8/8/2016	0.07730	73.20	10.00	<0.1000	7.460	26.00
	11/7/2016	0.05320	69.50	9.000	<0.1000	7.500	24.00
	2/7/2017	0.05110	67.20	10.00	<0.06000	7.910	29.00
	5/11/2017	0.06230	62.80	11.00	<0.05000	6.730	28.00
	6/29/2017	0.06090	67.80	10.00	<0.1000	7.380	24.00
	11/15/2017	0.05330	69.50	11.00	<0.1000	7.670	31.00



Table 1. Havana East Ash Pond (Cells 1, 2, 3, and 4): Appendix III Analytical Results

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Location ID	Sample Date	TDS, mg/L
HAMW-42	11/19/2015	276.0
	2/16/2016	334.0
	6/6/2016	274.0
	8/8/2016	278.0
	11/7/2016	318.0
	2/7/2017	298.0
	5/11/2017	312.0
	6/29/2017	260.0
	11/15/2017	298.0

Table 2. Havana East Ash Pond (Cells 1, 2, 3, and 4): Appendix IV Analytical Results

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Location ID	Sample Date	As, tot, mg/L	Ba, tot, mg/L	Bc, tot, mg/L	Cd,tot, mg/L	Co, tot, mg/L	Cr, tot, mg/L
HAMW-30	11/19/2015	0.001200	0.01560	<0.001000	<0.001000	<0.001000	0.001100
	2/16/2016	0.001200	0.01580	<0.001000	<0.001000	<0.0006000	0.001300
	6/6/2016	0.001100	0.01460	<0.001000	<0.001000	<0.001000	<0.001000
	8/8/2016	0.001100	0.01610	<0.001000	<0.001000	<0.001000	0.001300
	11/7/2016	0.001300	0.01590	<0.001000	<0.001000	<0.001000	<0.0009000
	2/7/2017	0.001200	0.01620	<0.001000	<0.001000	<0.001000	<0.001000
	5/11/2017	0.001000	0.01770	<0.001000	<0.001000	<0.001000	<0.0008000
	6/29/2017	0.001200	0.01670	<0.001000	<0.001000	<0.001000	0.001300
HAMW-31	11/19/2015	<0.0006000	0.02510	<0.001000	<0.001000	<0.001000	0.001000
	2/16/2016	<0.0006000	0.02120	<0.001000	<0.001000	<0.001000	<0.0008000
	6/6/2016	<0.0005000	0.01990	<0.001000	<0.001000	<0.001000	<0.0006000
	8/8/2016	<0.0006000	0.02140	<0.001000	<0.001000	<0.001000	<0.0008000
	11/7/2016	<0.0005000	0.02460	<0.001000	<0.001000	<0.001000	<0.0006000
	2/7/2017	<0.0006000	0.02400	<0.001000	<0.001000	<0.001000	<0.0006000
	5/11/2017	<0.0006000	0.02240	<0.001000	<0.001000	<0.001000	<0.0006000
	6/29/2017	<0.001000	0.02360	<0.001000	<0.001000	<0.001000	<0.001000
HAMW-32	11/19/2015	<0.0006000	0.02170	<0.001000	<0.001000	<0.001000	0.001700
	2/16/2016	<0.0004000	0.01990	<0.001000	<0.001000	<0.001000	0.001100

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Table 2. Havana East Ash Pond (Cells 1, 2, 3, and 4): Appendix IV Analytical Results

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Location ID	Sample Date	F, tot, mg/L	Hg, tot, mg/L	Li, tot, mg/L	Mo, tot, mg/L	Pb, tot, mg/L	Ra-226,228, tot, pCi/L
HAMW-30	11/19/2015	<0.07000	<0.0002000	<0.0006000	<0.001000	<0.001000	0.5100
	2/16/2016	<0.1000	<0.0002000	<0.0007000	<0.001000	<0.0004000	0.5200
	6/6/2016	<0.1000	<0.0002000	<0.0007000	<0.001000	<0.001000	1.360
	8/8/2016	<0.1000	<0.0002000	<0.001000	<0.001000	<0.001000	0.9100
	11/7/2016	<0.1000	<0.0002000	0.001300	<0.001000	<0.001000	0.4400
	2/7/2017	<0.1000	<0.0002000	<0.0007000	<0.001000	<0.001000	0.8400
	5/11/2017	<0.1000	<0.0002000	<0.0009000	<0.001000	<0.001000	0.6800
	6/29/2017	<0.1000	<0.0002000	0.001200	0.001500	<0.001000	0.02000
HAMW-31	11/19/2015	<0.07000	<0.0002000	0.001000	<0.001000	<0.001000	0.0
	2/16/2016	<0.05000	<0.0002000	<0.001000	<0.001000	<0.001000	0.2200
	6/6/2016	<0.05000	<0.0002000	0.001000	<0.001000	<0.001000	0.1800
	8/8/2016	<0.05000	<0.0002000	0.001400	<0.001000	<0.001000	0.3000
	11/7/2016	<0.1000	<0.0002000	0.001600	<0.001000	<0.001000	0.6500
	2/7/2017	<0.05000	<0.0002000	<0.0009000	<0.001000	<0.001000	0.6000
	5/11/2017	<0.05000	<0.0002000	0.001300	<0.001000	<0.001000	0.1800
	6/29/2017	<0.1000	<0.0002000	0.001300	<0.001000	<0.001000	2.650
HAMW-32	11/19/2015	<0.07000	<0.0002000	0.001100	<0.001000	<0.0003000	0.1600
	2/16/2016	<0.1000	<0.0002000	<0.0009000	<0.001000	<0.001000	0.6800

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Table 2. Havana East Ash Pond (Cells 1, 2, 3, and 4): Appendix IV Analytical Results

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Location ID	Sample Date	Sb, tot, mg/L	Se, tot, mg/L	Tl, tot, mg/L
HAMW-30	11/19/2015	<0.001000	<0.001000	<0.001000
	2/16/2016	<0.0005000	<0.001000	<0.001000
	6/6/2016	<0.0006000	<0.001000	<0.001000
	8/8/2016	0.001200	<0.001000	<0.001000
	11/7/2016	<0.001000	<0.001000	<0.0003000
	2/7/2017	<0.001000	<0.001000	<0.0003000
	5/11/2017	<0.001000	<0.001000	<0.001000
	6/29/2017	<0.001000	<0.001000	<0.001000
HAMW-31	11/19/2015	<0.001000	<0.001000	<0.0004000
	2/16/2016	<0.0003000	<0.001000	<0.0003000
	6/6/2016	<0.0009000	<0.001000	<0.001000
	8/8/2016	<0.001000	<0.001000	<0.001000
	11/7/2016	<0.001000	<0.001000	<0.0004000
	2/7/2017	<0.001000	<0.001000	<0.0004000
	5/11/2017	<0.001000	<0.001000	<0.001000
	6/29/2017	<0.001000	<0.001000	<0.001000
HAMW-32	11/19/2015	<0.0006000	<0.001000	<0.001000
	2/16/2016	<0.0004000	<0.001000	<0.001000

Havana

January 16, 2018

Table 2. Havana East Ash Pond (Cells 1, 2, 3, and 4): Appendix IV Analytical Results

5:16:32 PM

Location ID	Sample Date	As, tot, mg/L	Ba, tot, mg/L	Be, tot, mg/L	Cd,tot, mg/L	Co, tot, mg/L	Cr, tot, mg/L
HAMW-32	6/6/2016	<0.0004000	0.01890	<0.001000	<0.001000	<0.001000	<0.001000
	8/8/2016	<0.0004000	0.01990	<0.001000	<0.001000	<0.001000	<0.0009000
	11/7/2016	<0.0005000	0.02130	<0.001000	<0.001000	<0.001000	<0.0009000
	2/7/2017	<0.0005000	0.02220	<0.001000	<0.001000	<0.001000	<0.0008000
	5/11/2017	<0.0004000	0.02450	<0.001000	<0.001000	<0.001000	<0.0008000
	6/29/2017	<0.001000	0.02450	<0.001000	<0.001000	<0.001000	0.001300
HAMW-39	11/19/2015	<0.0006000	0.01240	<0.001000	<0.001000	<0.0005000	0.001300
	2/16/2016	<0.0005000	0.01200	<0.001000	<0.001000	<0.001000	<0.001000
	6/6/2016	<0.0004000	0.01120	<0.001000	<0.001000	<0.001000	<0.0009000
	8/8/2016	<0.0006000	0.01380	<0.001000	<0.001000	<0.0005000	0.001000
	11/7/2016	<0.0006000	0.01330	<0.001000	<0.001000	<0.001000	0.001000
	2/7/2017	<0.0008000	0.01750	<0.001000	<0.001000	<0.0005000	0.001200
	5/11/2017	<0.0005000	0.01340	<0.001000	<0.001000	<0.0004000	<0.0009000
	6/29/2017	<0.001000	0.01160	<0.001000	<0.001000	<0.001000	0.001300
HAMW-40	11/19/2015	0.004300	0.04690	<0.001000	<0.001000	0.01120	0.005600
	2/16/2016	<0.0006000	0.01740	<0.001000	<0.001000	<0.0006000	0.001200
	6/6/2016	<0.0005000	0.01450	<0.001000	<0.001000	<0.001000	<0.0009000
	8/8/2016	<0.0005000	0.01530	<0.001000	<0.001000	<0.0005000	0.001000

Havana

January 16, 2018

Table 2. Havana East Ash Pond (Cells 1, 2, 3, and 4): Appendix IV Analytical Results

5:16:32 PM

Location ID	Sample Date	F, tot, mg/L	Hg, tot, mg/L	Li, tot, mg/L	Mo, tot, mg/L	Pb, tot, mg/L	Ra-226,228, tot, pCi/L
HAMW-32	6/6/2016	<0.1000	<0.0002000	0.001000	<0.001000	<0.001000	0.9700
	8/8/2016	<0.1000	<0.0002000	0.001400	<0.001000	<0.001000	0.09000
	11/7/2016	<0.1000	<0.0002000	0.001500	<0.001000	<0.001000	1.040
	2/7/2017	<0.1000	<0.0002000	0.001500	<0.001000	<0.001000	0.1000
	5/11/2017	<0.1000	<0.0002000	0.001300	<0.001000	<0.001000	0.3100
	6/29/2017	<0.1000	<0.0002000	0.001400	<0.001000	<0.001000	0.1000
HAMW-39	11/19/2015	<0.06000	<0.0002000	<0.0007000	<0.001000	<0.0003000	0.6300
	2/16/2016	<0.1000	<0.0002000	<0.0008000	<0.001000	<0.001000	0.1700
	6/6/2016	<0.1000	<0.0002000	<0.0007000	<0.001000	<0.001000	0.4100
	8/8/2016	<0.1000	<0.0002000	<0.0009000	<0.001000	<0.0004000	0.7600
	11/7/2016	<0.1000	<0.0002000	0.001300	<0.001000	<0.001000	1.590
	2/7/2017	<0.1000	<0.0002000	0.001600	<0.0004000	<0.0005000	2.040
	5/11/2017	<0.1000	<0.0002000	0.001100	<0.001000	<0.0003000	0.6600
	6/29/2017	<0.1000	<0.0002000	<0.001000	<0.001000	<0.001000	0.6900
HAMW-40	11/19/2015	<0.06000	<0.0002000	0.004400	<0.0007000	0.01120	2.010
	2/16/2016	<0.05000	<0.0002000	<0.001000	<0.001000	<0.0006000	0.6100
	6/6/2016	<0.06000	<0.0002000	<0.0008000	<0.001000	<0.0004000	0.7900
	8/8/2016	<0.1000	<0.0002000	0.001600	<0.001000	<0.0004000	0.2900

Havana

January 16, 2018

Table 2. Havana East Ash Pond (Cells 1, 2, 3, and 4): Appendix IV Analytical Results

5:16:32 PM

Location ID	Sample Date	Sb, tot, mg/L	Se, tot, mg/L	Tl, tot, mg/L
HAMW-32	6/6/2016	<0.0006000	<0.001000	<0.001000
	8/8/2016	<0.001000	<0.001000	<0.001000
	11/7/2016	<0.001000	<0.001000	<0.0003000
	2/7/2017	<0.001000	<0.001000	<0.001000
	5/11/2017	<0.001000	<0.001000	<0.001000
	6/29/2017	<0.001000	<0.001000	<0.001000
HAMW-39	11/19/2015	<0.001000	0.001000	<0.001000
	2/16/2016	<0.0004000	0.001400	<0.001000
	6/6/2016	<0.0004000	0.001600	<0.001000
	8/8/2016	<0.001000	0.001100	<0.001000
	11/7/2016	<0.001000	0.001200	<0.001000
	2/7/2017	<0.0004000	0.001400	<0.001000
	5/11/2017	<0.001000	0.001200	<0.001000
	6/29/2017	<0.001000	0.001200	<0.001000
HAMW-40	11/19/2015	<0.0004000	<0.0009000	<0.001000
	2/16/2016	<0.0004000	0.001300	<0.001000
	6/6/2016	<0.0003000	<0.001000	<0.001000
	8/8/2016	<0.001000	<0.001000	<0.001000

Havana

January 16, 2018

Table 2. Havana East Ash Pond (Cells 1, 2, 3, and 4): Appendix IV Analytical Results

5:16:32 PM

Location ID	Sample Date	As, tot, mg/L	Ba, tot, mg/L	Be, tot, mg/L	Cd,tot, mg/L	Co, tot, mg/L	Cr, tot, mg/L
HAMW-40	11/7/2016	<0.0005000	0.01640	<0.001000	<0.001000	<0.001000	<0.0008000
	2/7/2017	0.001200	0.02560	<0.001000	<0.001000	0.002300	0.001600
	5/11/2017	<0.0006000	0.01790	<0.001000	<0.001000	<0.0007000	0.001100
	6/29/2017	<0.001000	0.02420	<0.001000	<0.001000	<0.001000	0.001700
HAMW-41	11/19/2015	<0.0005000	0.01500	<0.001000	<0.001000	<0.001000	0.001100
	2/16/2016	<0.0005000	0.01590	<0.001000	<0.001000	<0.0003000	<0.0008000
	6/6/2016	<0.0005000	0.01490	<0.001000	<0.001000	<0.001000	<0.0008000
	8/8/2016	<0.0006000	0.01680	<0.001000	<0.001000	<0.0003000	<0.0007000
	11/7/2016	<0.0006000	0.01790	<0.001000	<0.001000	<0.001000	<0.0006000
	2/7/2017	<0.0006000	0.01670	<0.001000	<0.001000	<0.001000	<0.0007000
	5/11/2017	<0.0005000	0.01560	<0.001000	<0.001000	<0.0004000	<0.0006000
	6/29/2017	<0.001000	0.01440	<0.001000	<0.001000	<0.001000	<0.001000
HAMW-42	11/19/2015	<0.0009000	0.02130	<0.001000	<0.001000	<0.0007000	0.001000
	2/16/2016	<0.0008000	0.02430	<0.001000	<0.001000	<0.0003000	<0.0007000
	6/6/2016	<0.0007000	0.02020	<0.001000	<0.001000	<0.001000	<0.0007000
	8/8/2016	<0.0007000	0.02310	<0.001000	<0.001000	<0.0003000	<0.0007000
	11/7/2016	<0.0007000	0.02180	<0.001000	<0.001000	<0.001000	<0.0006000
	2/7/2017	<0.0007000	0.01880	<0.001000	<0.001000	<0.001000	<0.0005000



Havana

January 16, 2018

Table 2. Havana East Ash Pond (Cells 1, 2, 3, and 4): Appendix IV Analytical Results

5:16:32 PM

Location ID	Sample Date	F, tot, mg/L	Hg, tot, mg/L	Li, tot, mg/L	Mo, tot, mg/L	Pb, tot, mg/L	Ra-226,228, tot, pCi/L
HAMW-40	11/7/2016	<0.1000	<0.0002000	<0.001000	<0.0003000	<0.001000	0.1300
	2/7/2017	<0.1000	<0.0002000	0.001800	<0.001000	0.001900	0.04000
	5/11/2017	<0.1000	<0.0002000	0.001200	<0.001000	<0.0006000	0.4100
	6/29/2017	<0.1000	<0.0002000	0.001100	<0.001000	<0.001000	0.5800
HAMW-41	11/19/2015	<0.06000	<0.0002000	<0.0006000	<0.001000	<0.001000	0.1300
	2/16/2016	<0.1000	<0.0002000	<0.0005000	<0.001000	<0.001000	0.0
	6/6/2016	<0.1000	<0.0002000	<0.0007000	<0.001000	<0.001000	0.8500
	8/8/2016	<0.1000	<0.0002000	0.001100	<0.001000	<0.001000	0.2100
	11/7/2016	<0.1000	<0.0002000	<0.0009000	<0.0004000	<0.001000	0.5000
	2/7/2017	<0.1000	<0.0002000	0.001100	<0.001000	<0.001000	0.09000
	5/11/2017	<0.1000	<0.0002000	0.001100	<0.001000	<0.0003000	0.7900
	6/29/2017	<0.1000	<0.0002000	<0.001000	<0.001000	<0.001000	1.760
HAMW-42	11/19/2015	<0.07000	<0.0002000	<0.0008000	<0.001000	<0.0006000	0.2300
	2/16/2016	<0.1000	<0.0002000	<0.0008000	<0.001000	<0.0003000	0.4700
	6/6/2016	<0.1000	<0.0002000	<0.0007000	<0.001000	<0.001000	1.500
	8/8/2016	<0.1000	<0.0002000	0.001300	<0.001000	<0.001000	0.5000
	11/7/2016	<0.1000	<0.0002000	<0.0009000	<0.001000	<0.001000	0.4800
	2/7/2017	<0.06000	<0.0002000	0.001600	<0.001000	<0.001000	0.0

Table 2. Havana East Ash Pond (Cells 1, 2, 3, and 4): Appendix IV Analytical Results

Location ID	Sample Date	Sb, tot, mg/L	Se, tot, mg/L	Tl, tot, mg/L
HAMW-40	11/7/2016	<0.001000	<0.001000	<0.001000
	2/7/2017	<0.001000	<0.001000	<0.001000
	5/11/2017	<0.001000	<0.001000	<0.001000
	6/29/2017	<0.001000	<0.001000	<0.001000
HAMW-41	11/19/2015	<0.001000	0.001100	<0.001000
	2/16/2016	<0.0003000	0.001200	<0.001000
	6/6/2016	<0.0004000	0.001100	<0.001000
	8/8/2016	<0.001000	0.001100	<0.001000
	11/7/2016	<0.001000	0.001300	<0.001000
	2/7/2017	<0.001000	0.001600	<0.001000
	5/11/2017	<0.001000	0.001600	<0.001000
	6/29/2017	<0.001000	0.001100	<0.001000
HAMW-42	11/19/2015	<0.001000	<0.001000	<0.001000
	2/16/2016	<0.0003000	<0.001000	<0.001000
	6/6/2016	<0.0003000	<0.001000	<0.001000
	8/8/2016	<0.001000	<0.001000	<0.001000
	11/7/2016	<0.001000	<0.001000	<0.001000
	2/7/2017	<0.001000	<0.001000	<0.001000

**Table 2. Havana East Ash Pond (Cells 1, 2, 3, and 4): Appendix IV Analytical Results**

Location ID	Sample Date	As, tot, mg/L	Ba, tot, mg/L	Be, tot, mg/L	Cd,tot, mg/L	Co, tot, mg/L	Cr, tot, mg/L
HAMW-42	5/11/2017	<0.0007000	0.01840	<0.001000	<0.001000	<0.001000	<0.0006000
	6/29/2017	<0.001000	0.02250	<0.001000	<0.001000	<0.001000	0.001000

Table 2. Havana East Ash Pond (Cells 1, 2, 3, and 4): Appendix IV Analytical Results

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Location ID	Sample Date	F, tot, mg/L	Hg, tot, mg/L	Li, tot, mg/L	Mo, tot, mg/L	Pb, tot, mg/L	Ra-226,228, tot, pCi/L
HAMW-42	5/11/2017	<0.05000	<0.0002000	0.001100	<0.001000	<0.001000	0.1600
	6/29/2017	<0.1000	<0.0002000	<0.001000	<0.001000	<0.001000	1.010

Table 2. Havana East Ash Pond (Cells 1, 2, 3, and 4): Appendix IV Analytical Results

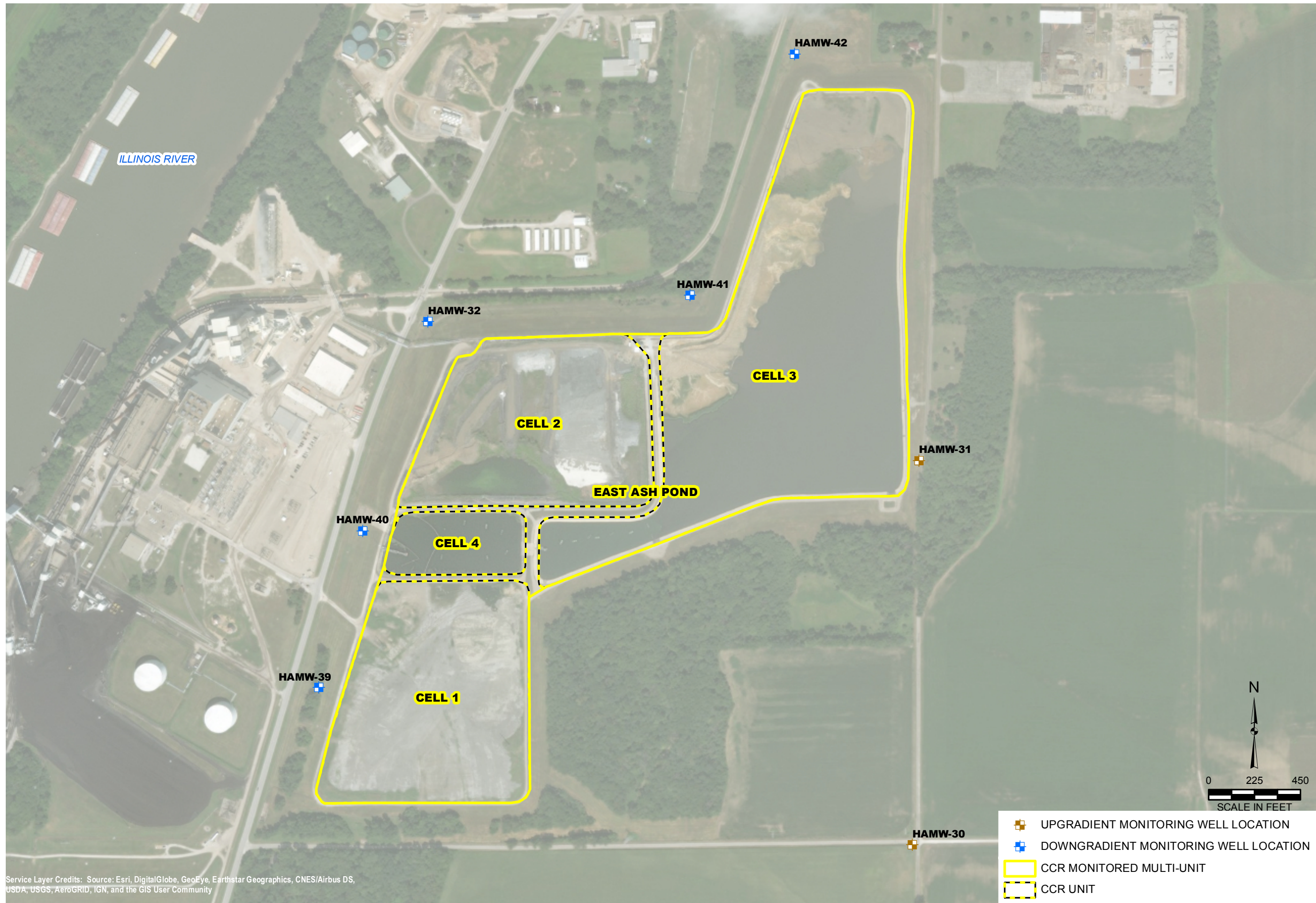
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Location ID	Sample Date	Sb, tot, mg/L	Se, tot, mg/L	Tl, tot, mg/L
HAMW-42	5/11/2017	<0.001000	<0.001000	<0.001000
	6/29/2017	<0.001000	<0.001000	<0.001000



**Figures**

Y:\Mapping\Projects\222285\MXD\2017\_AnnualGMM\_CAR\Figure 1\_GWS\_WellLoc\_Havana.mxd Author: stlzdsc Date/Time: 1/29/2018, 3:41:06 PM



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

DRAWN BY/DATE:  
SDS 1/3/18  
REVIEWED BY/DATE:  
KLT 1/3/18  
APPROVED BY/DATE:  
SJC 1/25/18

GROUNDWATER SAMPLING WELL LOCATION MAP  
HAVANA EAST ASH POND (CELLS 1, 2, 3, AND 4)  
MULTI-UNIT ID: 701

2017 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT  
DYNEGY CCR RULE GROUNDWATER MONITORING  
HAVANA POWER STATION  
HAVANA, ILLINOIS

PROJECT NO: 67719

FIGURE NO: 1



**OBG**

THERE'S A WAY

