US Army Corps
of Engineers
Philadelphia District

2017 ANNUAL SUMMARY REPORT

Pearce Creek Confined Disposal Facility

February 2018

1.0 INTRODUCTION

This Annual Summary Report was developed at the request of the Maryland Department of the Environment (MDE) in accordance with the MDE's approval of the Groundwater Monitoring Plan (GWMP), as part of renewing placement of dredge material by the U.S. Army Corps of Engineers, Philadelphia District (USACE) at the Pearce Creek Confined Disposal Facility (CDF). The MDE approved the GWMP on February 16, 2017.

The Pearce Creek CDF is located in Earleville, Cecil County, Maryland, immediately south of Pearce Creek and the eastern shore of the Elk River, a major tributary of the Chesapeake Bay. The CDF is bounded by residential properties to the west, by residential, agricultural, and

The purpose of the Annual Summary Report is to present groundwater sampling and water level data to monitor potential changes in groundwater quality resulting from the installation of an impermeable liner designed to mitigate the effects of future and past dredge disposal at the Pearce Creek CDF. The 2016 Annual Summary Report summarized historical groundwater sampling performed at the site from 1996 (when wells were first installed) to 2016. This specific report summarizes the recent installation of monitoring wells agreed to as part of the GWMP, groundwater flow in the 3 primary water-bearing units, and the first 2 rounds of groundwater sampling from the new network of monitoring wells around the CDF.

2.0 FIELD INVESTIGATION

Seventeen groundwater monitoring wells were drilled and installed at eleven locations along the perimeter of the CDF in May and June 2017, in accordance with the GWMP. One planned monitoring well (CSW-30) was not installed due to a lack of saturated sand in the shallow Magothy formation at that location. Figure 1 presents the locations of the newly installed monitoring wells and the existing wells that are part of the GWMP.

The new wells and piezometers were installed by Cascade Environmental (Cascade), a Maryland-licensed driller, in accordance with MDE regulations. Prior to field mobilization, Cascade submitted monitoring well permit applications to the Cecil County Health Department.

2.1 Borehole Drilling

All drilling activities were supervised by a professional geologist from the USACE's contractor Tetra Tech, and Cascade performed all drilling using the rotosonic method. The rotosonic drilling method employs a high frequency vibrational and low speed rotational motion coupled with down pressure to advance the cutting edge of the drill string, which produces a uniform borehole and a continuous, undisturbed core sample of the drilled sediments.

In accordance with the GWMP, a pilot borehole was drilled to the target depth of the deepest monitoring well at a cluster at each of the 11 drilling locations, or to the target depth of the single well to be installed at that location. At several locations the pilot holes were deepened due to a

lack of suitable aquifer material (sand) at the originally planned total depth of the borehole. The depths of the pilot boreholes range in subsurface depths between 51 and 286 feet, and are listed in Table 1.

The pilot boreholes produced continuous, 4-inch diameter cores, and the Tetra Tech geologist recorded the lithology and generated boring logs, which are included in Attachment A.

2.2 Borehole Geophysics - Gamma Logging

After the total depth of the pilot borehole was reached, each borehole was geophysically logged with a natural gamma downhole detector instrument. The logging was performed with the rotosonic drilling casing in place, which kept the borehole open and stable. The formations' naturally occurring gamma radioactivity were not significantly attenuated by the casing, and high-quality gamma logs were produced.

The gamma logs identified the clay-prone intervals from the sandier intervals, and were used in conjunction with the boring log and the visual observations from the soil cores to select the subsurface interval(s) to be screened by the monitoring well(s) to be installed at that location. Gamma logs are included in Attachment B.

2.3. Monitoring Well Boreholes

The initial pilot borehole was modified to accommodate either the single well to be installed at each location, or the deepest well at that location if a well cluster was installed. The pilot borehole was enlarged to either an 8-inch diameter (for 4-inch diameter wells) or a 6-inch diameter (for 2-inch diameter wells/piezometers) by consecutively over-casing the in-place pilot casing with 6-inch diameter and 8-inch diameter drill casing. Once the largest-diameter casing was in place, the smaller diameter casing and soils were removed from the borehole.

For the additional boreholes required at the well cluster locations, the boreholes were drilled without core collection to a depth of 10 feet above the projected screen interval and then continuously cored through a 20 foot interval (or to the bottom of the projected screen interval) in order to confirm that the lithology was similar to that noted in the adjacent pilot hole and was appropriate for well screen placement.

2.4 Monitoring Well Construction

The monitoring wells and piezometers were constructed by Cascade in accordance with MDE and Cecil County regulations. Where the addition of water was required, only potable water obtained from the Cecilton Fire Department was used in the construction of the wells. Well construction details are summarized in Table 1, and well construction diagrams are included in Attachment C, along with the well records filed by the driller with Cecil County and the MDE.

Figures 2, 3, and 4 show well locations in the Magothy, Upper Patapsco-Shallow, and Upper Patapsco-Deep aquifers, respectively.

As per the GWMP, the wells were constructed with either 4-inch or 2-inch diameter, schedule 40 polyvinyl chloride (PVC) with flush-joint, threaded-coupling riser pipe and 0.010-inch, factory slotted, PVC well screen. Well casing centralizers were placed every 25 vertical feet along the casing to center the wells within the borehole. The length of the well screen was either 5 feet or 10 feet, depending on the thickness of the aquifer material encountered. A PVC sump ranging in length from 0.3 foot to 0.5 foot was installed below the bottom of the screen.

A filter pack composed of size #00N filter sand was installed in the borehole around the well screen from the bottom of the borehole to a height of approximately 3 feet above the top of the well screen. A secondary, 3-foot thick, filter pack was installed directly above the primary filter pack, and consisted of size #00 filter sand. All sand was emplaced in the borehole via tremie pipe. A bentonite seal ranging in thickness from 3 to 4 feet was installed above the filter sand and allowed to hydrate and set for a minimum of 1 hour before the emplacement of the overlying cement-bentonite annular grout, which was emplaced by tremie pipe to a depth of approximately 3 feet below ground surface.

Each well was completed with a protective steel outer casing (standpipe) constructed with a lockable cover lid, set in a concrete pad, and a well permit tags was permanently affixed to each well.

2.5 Well Development

All new monitoring wells and piezometers were developed to remove fine-grained materials from the well and the surrounding filter pack. A variety of development techniques were required, and included air surging with air-lift pumping, the use of a surge block, and pumping with a submersible pump. Well development was generally conducted until the groundwater was visibly clear and free of fine-grained suspended sediments, and the turbidity of the water was less than 20 nephelometric turbidity units (NTUs). In general about 4 hours was spent developing each well, although this time was exceeded for several wells that were particularly difficult to develop.

In addition to turbidity, the progress of the well development was evaluated by field-measurement of water quality criteria, including:

- pH stabilization within ±0.1 pH unit
- Specific conductance stabilization within ±10 µmhos/cm
- Temperature stabilization within ±0.5^{o} C

The goal of 20 NTU turbidity was achieved in all five piezometers, and in seven of the twelve monitoring wells. The wells that did not achieve this turbidity despite multiple attempts did significantly clean up from their initial conditions (>1,000 NTU), and reached final turbidities ranging from 21.3 NTU to 57.1 NTU.

The USACE also redeveloped all existing wells prior to the start of the sampling program by pumping varying quantities of groundwater from the wells.

2.6 Surveying of Monitoring Well Locations

The new monitoring wells and all existing wells that are part of the groundwater monitoring program were surveyed to determine their horizontal location and vertical elevation. The surveying was performed by Precision Surveying and Mapping LLC of Baltimore, a Maryland-licensed surveyor, using MD State Plane Coordinate System NAD83 (US Survey feet) and NAVD 88 (US Survey feet). The horizontal locations were surveyed to the nearest 0.1 feet, and the vertical elevations were surveyed to the nearest 0.01 foot. Three elevation points were surveyed for each well: top of inner casing, top of outer casing, and ground surface. Table 1 presents this information.

2.7 Groundwater Elevation Monitoring

To evaluate potential local seasonal variations in groundwater elevation and flow direction and also to evaluate potential changes in hydraulic head due to the installation of the impermeable liner over the CDF, site-wide groundwater elevation data was manually obtained in July, September, and November 2017, as well as January 2018. Water levels for each round were measured over a short time span to make the data as synoptic as possible. The data were generally collected within a period of two hours. Local tidal charts were consulted to temporally place the data within the daily tidal periods. Two rounds of water levels were collected during the July 2017 event, with one round near low tide and one round near high tide. The September 2017 data were collected near high tide, the November 2017 data were collected midway through a rising tide, and the January 2018 data were collected near high tide.

Groundwater elevation data are presented in Attachment D. Groundwater elevation contour maps were individually generated for the Magothy, the Upper Patapsco-Shallow, and the Upper Patapsco-Deep aquifers for each measurement round. These figures show that groundwater flow in each aquifer was relatively consistent from July through November. It is also noteworthy that tidal influence is most pronounced in the Upper Patapsco-Shallow aquifer more so than within the Magothy or Upper Patapsco-Deep aquifers. One other note of interest is that Pearce Creek Lake seems to act as a constant-head boundary creating a groundwater mound extending beneath the CDF, especially for the Magothy aquifer, and to a lesser degree the Upper Patapsco-Shallow aquifer.

In addition, to evaluate potential changes within the Magothy aquifer when dredge material is discharged to the CDF, electronic pressure transducers were placed in four wells screened in the Magothy (one each on the north, east, south, and west side of the CDF) to record any water level changes that occur before, during, and after the placement of the dredge material. The transducers were placed in PZ-1, PZ-3, PZ-5, and CSW-29 in September 2017, and programmed to record water level elevations at 30-minute intervals. The data generated to date for this report (through January 3, 2018) is presented graphically in Figure 5. Note the clear tidal fluctuations

present at well PZ-1 are barely noticeable at other Magothy wells around the CDF. Placement of dredge material was expected to begin in October 2017, however, because of contracting issues, dredging did not begin until December 1, 2017. The hydrographs show that to date, placement of dredge material has had no effect on water levels in the Magothy aquifer. Hydrographs of transducer data in the spring of 2018 will be included in the 2018 Annual Report.

3.0 GROUNDWATER SAMPLING

Two rounds of groundwater samples were collected from all wells that are part of the groundwater monitoring program. The first sampling event was in June and July 2017, and the second round of sampling was conducted in October 2017. New dedicated tubing was placed in all wells at the start of the sampling program. All groundwater sampling was performed by Tetra Tech personnel who are MDE-certified water samplers. Monitoring well locations are shown on Figures 1 through 4, and construction details (depths, screened intervals, and aquifer) of these wells are specified in Table 1.

Groundwater sampling was conducted using standard U.S. Environmental Protection Agency (EPA) low stress (low flow) guidelines. Samples were collected following stabilization of groundwater quality parameters, and in accordance with the GWMP, analyzed using standard EPA and/or MDE methods for the following parameters:

- Total Metals: Aluminum, Arsenic, Beryllium, Cadmium, Calcium, Iron, Lead, Magnesium, Manganese, Nickel, Potassium, Sodium, and Zinc
- General Chemistry Parameters: Alkalinity, Total Dissolved Solids, Total Suspended Solids, Fluoride, Chloride, Bromide, Sulfate, Nitrogen (nitrite and nitrate), Nitrogen (nitrate), and Nitrogen (nitrite)
- Radiologic Parameters: Radium 226, Radium 228, Gross Alpha, and Gross Beta

All samples were analyzed by TestAmerica, operating as a subcontractor to Earth Toxics, Inc. TestAmerica Savannah maintains MDE certification for potable water and is accredited under Department of Defense (DOD) Environmental Laboratory Accreditation Program (ELAP). TestAmerica St. Louis performed the radiochemistry analyses. This laboratory maintains NRC licenses for these analyses, has MDE certification, and is also accredited under DOD ELAP. The samples were shipped on a daily basis via FedEx overnight delivery service.

4.0 LABORATORY ANALYSIS AND GROUNDWATER SAMPLING RESULTS

Tables 2 and 3 summarize the sampling results. The sampling results are compared with the Federal USEPA Maximum Contaminant Levels (MCLs) for drinking water quality and Secondary Drinking Water Regulations (non-mandatory standards based on aesthetics – taste, color, odor), as well as Groundwater Quality Standards established by the MDE.

5.0 HYDROGEOLOGIC SUMMARY

There is now a network of 36 monitoring wells as part of the GWMP. This includes 16 wells in the Magothy aquifer, 13 wells in the Upper Patapsco Shallow aquifer, and 7 wells in the Upper Patapsco Deep aquifer. To further evaluate hydrogeologic conditions and visualize subsurface stratigraphy at the site, a series of geologic cross sections were generated using both boring and gamma log information. For simplification, the geology was divided into 3 primary units (sand, silt/clay, and an interbedded mixture). The cross sections also include the screen intervals of each well. Attachment E includes a cross section location map and several cross sections through the area. Review of the cross sections shows the vast amount of clay and silt in the subsurface separating generally thinner water-bearing sand units. In addition to the cross sections, a fence diagram was prepared showing the complexity of the geology in the area, and the interwoven network of sands separated by thick units of silt/clay.

6.0 FUTURE ACTIVITIES

- The new network of wells will continue to be sampled as part of the GWMP (a total of 36 monitor wells and piezometers). Two groundwater sampling events (spring and fall) spaced approximately 6 months apart will be conducted in 2018.

- Water levels and groundwater flow direction will continue to be monitored on a regular basis at the CDF.

- Placement of dredge material into the CDF is expected to continue in the winter 2018, then resume sometime in the fall 2018, after the second groundwater sampling event.

- The USACE will develop a database for the project which will allow better evaluation of groundwater chemistry changes over time.

- The third annual report will be submitted in February 2019. This report will include sampling results from the network of 36 wells around the CDF. Groundwater quality trend plots (if applicable), groundwater elevation contour maps, and other pertinent information also will be included in subsequent annual reports.

FIGURES

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LEGEND

EXISTING MONITORING WELL

NEW MONITORING WELL

ELK RIVER

PEARCE CREEK

N

11A 11R 11C

PZ-1 CSW-37

CSW-31

CSW-39

18B

CSW-38 PZ-2

CSW-7

7B 7A

CSW-9

13A CSW-13

CSW-32 CSW-33

8A 8B

PZ-3

16A CSW-35

CSW-29 CSW-10

21S 21D

PZ-5

CSW-36 PZ-4

CSW-34 CSW-27 CSW-28

14R 12R

CSW-5

BASIN ROAD

SHORT STREET

CIRCLE DRIVE

LOW STREET

MIDWAY DRIVE

SOUTH DRIVE

OLD BARN LANE

MARYLAND DRIVE

WICKWIRE DRIVE

POND CREEK LANE

POND NECK ROAD

0 500 1,000

SCALE IN FEET

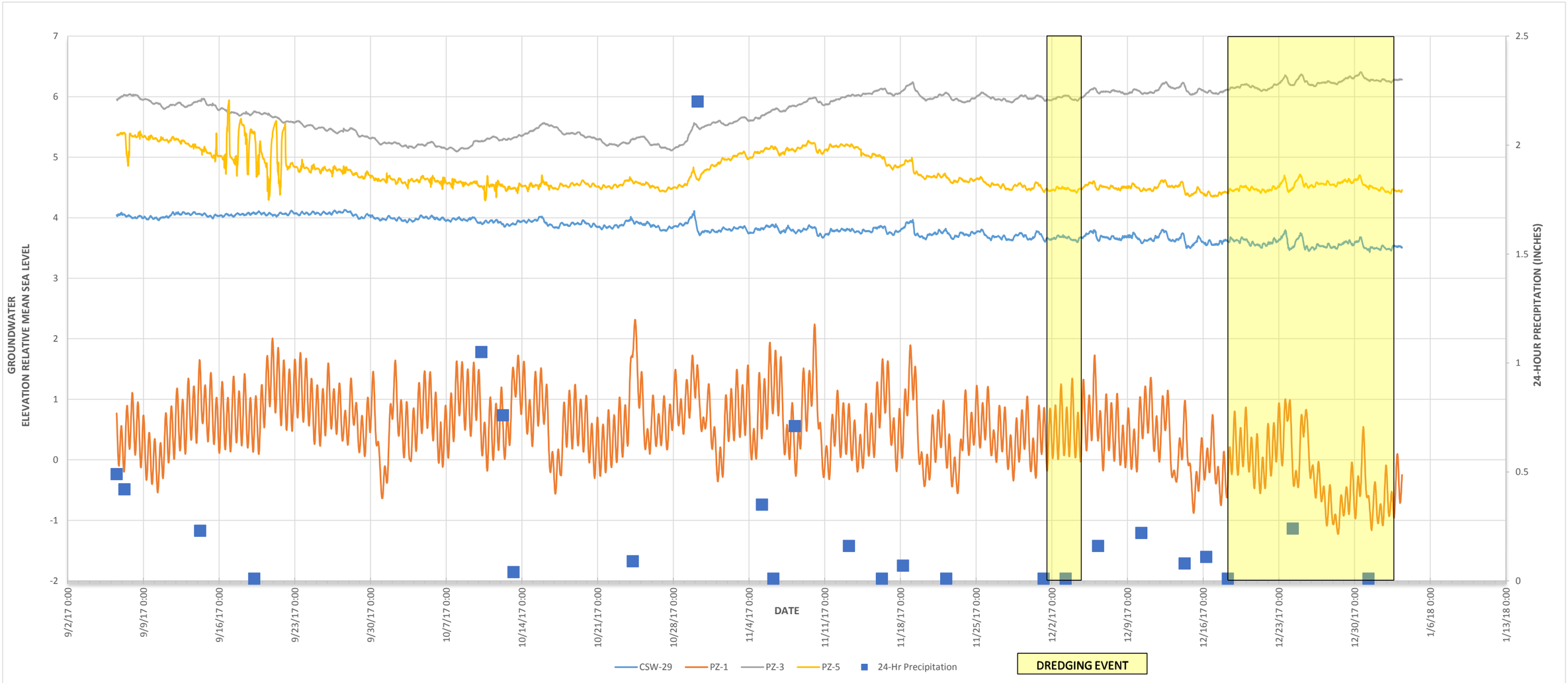
Figure 1. MONITORING WELL LOCATIONS
PEARCE CREEK
CONFINED DISPOSAL FACILITY
CECIL COUNTY, MARYLAND

Figure 2. MONITORING WELLS IN THE MAGOTHY AQUIFER

Figure 3. MONITORING WELLS IN THE UPPER PATAPSCO SHALLOW AQUIFER

Figure 4. MONITORING WELLS IN THE UPPER PATAPSCO DEEP AQUIFER

Figure 5. HYDROGRAPH - LONG TERM GROUNDWATER MONITORING - MAGOTHY AQUIFER



TABLES

TABLE 1
MONITORING WELL CONSTRUCTION DETAILS
PEARCE CREEK GROUNDWATER MONITORING PROGRAM
CECIL COUNTY, MARYLAND

WELLS INSTALLED 2017 FOR THE GROUNDWATER MONITORING PROGRAM

Well Identifier	Well Total Depth	Borehole Total Depth	PVC Diameter	Screen Interval	Screen Elevation	Sand Pack Interval	Sand Pack Elevation	Northing	Easting	Elevation NAVD88			Aquifer
										Top of Casing	Top of PVC	Ground	
	feet bgs		inches	feet bgs	feet BMSL	feet bgs	feet BMSL	NAD83		feet AMSL			
CSW-27	50.5	56	4	40.5 - 50.5	8.58 - 18.58	34 - 56	2.08 - 24.08	641445.523	1598175.768	35.57	35.26	31.92	Magothy
CSW-28	140	146	4	130 - 140	97.89 - 107.89	124 - 146	91.89 - 113.89	641442.561	1598166.430	35.56	35.23	32.11	Patapsco - Shallow
CSW-29	47	51	4	37 - 47	8.84 - 18.84	31 - 51	2.84 - 22.84	642684.596	1597722.308	31.32	31.20	28.16	Magothy
CSW-30	-----		Well Not Installed - Magothy Aquifer Consisted Entirely of Clay										Magothy
CSW-31	145	156	4	135 - 145	113.88 - 123.88	129 - 156	107.88 - 134.88	644664.678	1600500.662	24.02	23.90	21.12	Patapsco - Shallow
CSW-32	53	56	4	48 - 53	25.22 - 30.22	42 - 56	19.22 - 33.22	643133.172	1601445.241	25.60	25.49	22.78	Magothy
CSW-33	166	167	4	161 - 166	138.23 - 143.23	155 - 167	132.23 - 144.23	643140.598	1601442.797	25.57	25.45	22.77	Patapsco - Shallow
CSW-34	196	216	4	191 - 196	158.44 - 163.44	185 - 203	152.44 - 170.44	641438.833	1598156.188	35.70	35.47	32.56	Patapsco - Deep
CSW-35	265	266	4	255 - 265	230.31 - 240.31	248 - 266	223.31 - 241.31	642576.531	1597167.435	28.02	27.82	24.69	Patapsco - Deep
CSW-36	210	276	4	200 - 210	178.93 - 188.93	191 - 215	169.93 - 193.93	641660.783	1601250.337	24.30	24.13	21.07	Patapsco - Deep
CSW-37	135	206	4	130 - 135	110.84 - 115.84	124 - 143	104.84 - 123.84	644963.200	1599108.262	22.04	21.84	19.16	Patapsco - Shallow
CSW-38	233.5	236	4	228.5 - 233.5	205.86 - 210.86	222.5 - 235	199.86 - 212.36	643929.086	1600999.147	26.64	26.16	22.64	Patapsco - Deep
CSW-39	285	286	4	275 - 285	247.35 - 257.35	264 - 286	236.35 - 258.35	644425.568	1598434.781	31.19	30.89	27.65	Patapsco - Deep
PZ-1	32	36	2	27 - 32	7.65 - 12.65	21 - 36	1.65 - 16.65	644964.826	1599115.090	22.63	22.51	19.35	Magothy
PZ-2	65	66	2	60 - 65	37.44 - 42.44	54 - 66	31.44 - 43.44	643933.022	1601006.901	25.66	25.45	22.56	Magothy
PZ-3	54	76	2	49 - 54	27.89 - 32.89	43 - 76	21.89 - 54.89	642586.996	1602043.597	24.03	23.87	21.11	Magothy
PZ-4	86	86.5	2	76 - 86	54.75 - 64.75	70 - 86.5	48.75 - 65.25	641654.704	1601244.735	24.38	24.20	21.25	Magothy
PZ-5	48.5	90	2	38.5 - 48.5	1.02 - 11.02	32 - 90	7.52 - 50.48	641686.897	1600070.702	42.75	42.62	39.52	Magothy
WELLS INSTALLED PRIOR TO 2017													
CSW-5	90		4	80 - 90	33.18 - 43.18			640418.877	1600881.043	47.03	46.82	46.82	Magothy
CSW-7	91		4	81 - 91	73.26 - 83.26			643973.655	1596467.431	8.05	7.74	7.74	Patapsco - Shallow
CSW-9	125		4	115 - 125	87.47 - 97.47			643685.642	1598170.755	31.22	30.85	27.53	Patapsco - Shallow
CSW-10	115		2	100 - 115	71.05 - 86.05			642664.840	1597714.757	32.21	31.91	28.95	Patapsco - Shallow
CSW-13	53		4	48 - 53	32.75 - 37.75			643662.830	1602744.431	17.81	17.26	15.25	Magothy
7A	16		4	11 - 16	+0.07 - 4.93			643813.575	1596529.126	11.52	11.07	11.07	Magothy
7B	222		4	217 - 222	206.22 - 211.22			643821.173	1596527.150	11.32	10.78	10.78	Patapsco - Deep
8A	89		4	79 - 89	55.48 - 65.48			643003.316	1595973.516	25.61	25.43	23.52	Patapsco - Shallow
8B	44		4	39 - 44	15.45 - 20.45			642997.164	1595969.647	25.79	25.49	23.55	Magothy
11A	198		4	188 - 198	167.22 - 177.22			645346.666	1599775.912	23.75	23.51	20.78	Patapsco - Deep
11C	30		4	20 - 30	+0.74 - 9.26			645349.364	1599787.526	23.88	23.51	20.74	Magothy
11R	128.5		4	118.5 - 128.5	97.80 - 107.80			645348.041	1599781.345	23.76	23.43	20.70	Patapsco - Shallow
12R	40		4	35 - 40	+1.69 - 3.31			640990.466	1599205.972	39.79	39.48	36.69	Magothy
13A	145		4	135 - 145	119.05 - 129.05			643691.094	1602757.833	19.72	19.35	15.95	Patapsco - Shallow
14R	118		4	108 - 118	71.36 - 81.36			640991.624	1599197.731	39.58	39.36	36.64	Patapsco - Shallow
16A	40		4	30 - 40	8.52 - 18.52			642637.393	1597186.522	24.41	24.18	21.48	Magothy
18B	87		4	77 - 87	50.26 - 60.26			644215.947	1598234.884	30.38	30.10	26.74	Patapsco - Shallow
21S	67		4	57 - 67	35.61 - 45.61			642126.368	1602756.547	24.13	23.93	21.39	Magothy
21D	150		4	145 - 150	123.86 - 128.86			642120.688	1602755.418	23.89	23.53	21.14	Patapsco - Shallow

bgs = below ground surface AMSL = above mean sea level BMSL = below mean sea level

Table 2
June/July 2017 Groundwater Sampling Results
Pearce Creek Confined Disposal Facility
Cecil County, Maryland

Field Sample ID Collection Date Matrix: Parameter	USEPA MCL	USEPA Secondary Standards	MDE GWQS	7A 7/11/2017 Groundwater Sample Results	Q	7B 7/11/2017 Groundwater Sample Results	Q	8A 7/13/2017 Groundwater Sample Results	Q	8B 7/13/2017 Groundwater Sample Results	Q	11A 7/6/2017 Groundwater Sample Results	Q	11A Duplicate 7/6/2017 Groundwater Sample Results	Q	11C 7/6/2017 Groundwater Sample Results	Q	11R 7/6/2017 Groundwater Sample Results	Q	12R 7/11/2017 Groundwater Sample Results	Q
Unfiltered Metals Analysis (mg/l)																					
Aluminum	NS	0.05	0.05	***0.82***		***0.28***		***2.7***		***1.6***		***0.26***		***0.26***		***5.7***		0.044	J	***0.17***	
Arsenic	0.01	NS	0.01	0.003	U	0.003	U	0.005		0.002	J	0.003	U	0.003	U	0.003	U	0.003	U	0.002	J
Beryllium	0.004	NS	0.004	0.0004	U	0.0004	U	0.0026		0.0029		0.0004	U	0.0004	U	0.0027		0.00027	J	0.0004	U
Cadmium	0.005	NS	0.005	0.0004	U	0.0004	U	0.0023		0.0015		0.0004	U	0.0004	U	0.0002	J	0.0004	U	0.0004	U
Calcium	NS	NS	NS	5.2		25		74	J	56	J	15		16		31		9		1000	
Iron	NS	0.3	0.3	***15***		***22***		***16***		0.076	U	***8.9***		***8.8***		***32***		***19***		***0.96***	
Lead	0.015	NS	0.015	0.0025	U	0.0025	U	0.0025	U	0.0025	U	0.0025	U	0.0025	U	0.0025	U	0.0025	U	0.0025	U
Magnesium	NS	NS	NS	2.2		3.7		38		36		2.5		2.6		22		1.7		0.58	
Manganese	NS	0.05	0.05	***0.2***		***0.2***		***19***	J	***8.8***	J	***0.15***		***0.16***		***12***		***0.14***		***0.14***	
Nickel	NS	NS	0.073	0.0024	J	0.005	U	0.058		0.043		0.005	U	0.005	U	0.062		0.005	U	0.045	
Potassium	NS	NS	NS	1.2		8.7		5.7		4.4		28		29	J	4.4		1.9		13	
Sodium	NS	NS	NS	10		21		90	J	170	J	34		34	J	27		9.6		410	
Zinc	NS	5	5	0.02	U	0.02		0.4		0.21		0.045		0.041		0.16		0.01	J	0.022	
General Chemistry (mg/l)																					
Bromide	NS	NS	NS	0.5	U	0.24	J	0.42	J	0.32	J	0.5	U	0.5	U	0.26	J	0.5	U	12	
Chloride	NS	250	NS	13		37		120	J	*300*		17		17		20		4.1		*2600*	
Fluoride	4	2	NS	0.085	J	0.07	J	0.94		0.39		0.086	J	0.083	J	0.29		0.079	J	1	U
Sulfate	NS	250	NS	2.3		22		*560*	J	290	J	12		12		120		12		190	
Nitrate	10*	NS	NS	1.8		0.05	U	0.05	U	8		0.05	U	0.05	U	0.036	J	0.05	U	0.045	J
Nitrite	1*	NS	NS	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.024	J	0.05	U	0.05	U
Nitrogen, Nitrate-Nitrite	NS	NS	NS	1.5		0.025	U	0.025	U	6.3		0.14	J	0.025	U	0.051	UJ	0.014	UJ	0.095	
Alkalinity, Total	NS	NS	NS	51	U	710		5	U	5	U	100		120		69		29		5	U
Total Dissolved Solids	NS	500	NS	140		180		*920*		*890*		130		130		360		59		*11000*	
Total Suspended Solids	NS	NS	NS	34		40		8.2		1	U	26		24		71		26		32	
Radiological (pCi/l) (No Secondary Standards)																					
Gross alpha radioisotopes	15	NS	NS	0.856	U	2.54	J	10.9		2.91	U	0.47	U	1.55	U	5.47		1.14	U	**15.5**	U
Gross beta radioisotopes	4mR/year	NS	NS	0.915	U	7.62		21.1		11.1		19.7		21.1		5.75	U	2.66	U	2.01	U
Radium 226	5 (Radium 226 +	NS	NS	0.188	U	0.894	U	**1.94**		0.801	U	0.653	J	0.699	J	0.115	U	0.775	J	2.25	
Radium 228	Radium 228)	NS	NS	0.28	U	0.95	J	**9.59**		3.42		0.488	J	0.288	U	0.936	J	0.489	J	1.53	
Field Parameters																					
pH (S.U.)	6.5-8.5	NS	NS	**6.29**		**2.17**		**4**		**4.09**		7.08		NA		**5.87**		**6.16**		**13.18**	
Specific Conductivity (mS/cm)	NS	NS	NS	0.166		0.129		0.561		1.57		0.31		NA		0.225		0.151		7.17	
Temperature (°c)	NS	NS	NS	20.84		17.73		18.14		19.84		15.51		NA		17.56		18.38		24.84	
Turbidity (NTU)	NS	NS	NS	19.1		9.18		3.43		1.4		30		NA		24.8		10.8		6.51	
Dissolved Oxygen (mg/L)	NS	NS	NS	0		0.06		1.35		0.15		0		NA		0		0		0	
Oxidation-Reduction Potential (mV)	NS	NS	NS	-42		107		217		396		-69		NA		-53		1		-80	

Table 2
June/July 2017 Groundwater Sampling Results
Pearce Creek Confined Disposal Facility
Cecil County, Maryland

Field Sample ID Collection Date Matrix: Parameter	USEPA MCL	USEPA Secondary Standards	MDE GWQS	13A 6/30/2017 Groundwater Sample Results	Q	14R 6/30/2017 Groundwater Sample Results	Q	16A 7/13/2017 Groundwater Sample Results	Q	18B 7/12/2017 Groundwater Sample Results	Q	21D 7/10/2017 Groundwater Sample Results	Q	21S 7/10/2017 Groundwater Sample Results	Q	CSW-5 7/12/2017 Groundwater Sample Results	Q	CSW-5 Duplicate 7/12/2017 Groundwater Sample Results	Q	CSW-7 7/11/2017 Groundwater Sample Results	Q
Unfiltered Metals Analysis (mg/l)																					
Aluminum	NS	0.05	0.05	***7.3***		***18***		0.031	J	0.036	J	***18***		***55***		***0.19***		***0.23***		***0.24***	
Arsenic	0.01	NS	0.01	0.002	J	***0.013***		0.003	U	0.003	U	0.002	J	0.006		0.003		0.004		0.004	
Beryllium	0.004	NS	0.004	0.00066		***0.0078***		0.0004	U	0.0004	U	***0.0094***		***0.0068***		0.0004	U	0.0004	U	***0.0041***	
Cadmium	0.005	NS	0.005	0.0004	U	0.02	U	0.0004	U	0.0004	U	0.0004	U	***0.0079***		0.0005		0.00049	J	0.00049	J
Calcium	NS	NS	NS	23		270		86	J	51		26		210		260		260		300	
Iron	NS	0.3	0.3	***3.8***		***420***		***31***		***24***		***12***		***290***		***630***		***590***		***320***	
Lead	0.015	NS	0.015	0.0083		0.0025	U	0.0025	U	0.0025	U	***0.016***		0.0025	U	0.0025	U	0.0025	U	0.0025	U
Magnesium	NS	NS	NS	2.1		230		54		2.7		1.3		190		260		270		250	
Manganese	NS	0.05	0.05	0.039		***230***		***29***	J	***0.17***		***0.12***		***170***		***170***		***160***		***230***	
Nickel	NS	NS	0.073	0.022		***0.9***		0.0065		0.004	J	0.02		***0.37***		***0.24***		***0.25***		***1.4***	
Potassium	NS	NS	NS	33		24		11		4.9		37		11		19		20		13	
Sodium	NS	NS	NS	32		440		52	J	14		60		360		440		450		410	
Zinc	NS	5	5	0.035		2.2		0.011	J	0.02	U	0.024		1.1		0.22		0.23		4	
General Chemistry (mg/l)																					
Bromide	NS	NS	NS	0.5	U	4.6	J	0.44	J	0.22	J	0.5	U	2.6		2.9	J	2.9	J	25	U
Chloride	NS	250	NS	3		*680*		31		15		11		*610*		*480*		*490*		*730*	
Fluoride	4	2	NS	0.16		1.3	J	0.1	U	0.089	J	0.22		2.5	U	1	U	1	U	5	U
Sulfate	NS	250	NS	13		3600		*510*	J	0.53	J	15		1	U	*3200*		*3200*		*3000*	
Nitrate	10*	NS	NS	0.05	U	0.05	U	0.05	U	0.05	U	0.1	U	0.05	U	0.05	U	0.05	U	0.05	U
Nitrite	1*	NS	NS	0.05	U	0.05	U	0.05	U	0.05	U	0.1	U	0.05	U	0.05	U	0.05	U	0.05	U
Nitrogen, Nitrate-Nitrite	NS	NS	NS	0.025	U	0.067	U	0.057		0.025	U	0.025	UJ	0.025	UJ	0.25	U	0.025	U	0.25	U
Alkalinity, Total	NS	NS	NS	110		5	U	110		150		180		5	U	78		82		21	U
Total Dissolved Solids	NS	500	NS	260		*5500*		*890*		190	U	*1100*	J	*4700*	J	*4600*		*6400*		*4700*	
Total Suspended Solids	NS	NS	NS	86		9.1		49		55		200		5.6		130		140		30	
Radiological (pCi/l) (No Secondary Standards)																					
Gross alpha radioisotopes	15	NS	NS	4.6		**44.4**		-1.35	U	0.363	U	**61.1**		1.46	U	1.23	U	12.2	U	4.6	U
Gross beta radioisotopes	4mR/year	NS	NS	27.1		34.6		9.31		8.61		**93.1**		1.42	U	17.5	J	9.7	U	14	
Radium 226	5 (Radium 226 +	NS	NS	0.578	J	**1.3**		0.227	U	0.62	J	1.44	U	0.208	U	0.497	J	0.763	J	**2.14**	
Radium 228	Radium 228)	NS	NS	0.663	J	**10.4**		1.14	U	1.19		1.4		-0.486	U	1.92		1.56		**4.81**	
Field Parameters																					
pH (S.U.)	6.5-8.5	NS	NS	**10.41**		**4.42**		**6**		7.24		**10.68**		**3.34**		**5.55**		NA		**5.43**	
Specific Conductivity (mS/cm)	NS	NS	NS	0.103		5.57		1.14		0.335		0.17		4.6		3.83		NA		4.9	
Temperature (°c)	NS	NS	NS	21.26		18.87		21.74		24.21		18.99		19.87		27.88		NA		22.72	
Turbidity (NTU)	NS	NS	NS	135		1.58		7.83		29.9		>1000		2.98		9.28		NA		11.4	
Dissolved Oxygen (mg/L)	NS	NS	NS	0		0		0		0		0		0		0		NA		0	
Oxidation-Reduction Potential (mV)	NS	NS	NS	-109		150		37		-111		-53		299		62		NA		78	

Table 2
June/July 2017 Groundwater Sampling Results
Pearce Creek Confined Disposal Facility
Cecil County, Maryland

Field Sample ID Collection Date Matrix: Parameter	USEPA MCL	USEPA Secondary Standards	MDE GWQS	CSW-9 7/12/2017 Groundwater Sample Results	Q	CSW-10 6/28/2017 Groundwater Sample Results	Q	CSW-13 6/30/2017 Groundwater Sample Results	Q	CSW-27 7/14/2017 Groundwater Sample Results	Q	CSW-27 Duplicate 7/14/2017 Groundwater Sample Results	Q	CSW-28 7/14/2017 Groundwater Sample Results	Q	CSW-29 6/27/2017 Groundwater Sample Results	Q	CSW-31 7/7/2017 Groundwater Sample Results	Q	CSW-32 6/29/2017 Groundwater Sample Results	Q
Unfiltered Metals Analysis (mg/l)																					
Aluminum	NS	0.05	0.05	***0.18***		***37***		***1.3***		***0.21***		***0.23***		***3.5***		0.05	U	***1.6***		0.05	U
Arsenic	0.01	NS	0.01	0.003	U	0.006		0.003		0.002	J	0.003	U	0.008		0.004		0.003	U	0.002	J
Beryllium	0.004	NS	0.004	***0.0088***		***0.023***		0.003		0.0004	U	0.0004	U	0.0031		0.0004	U	0.0005		0.0004	U
Cadmium	0.005	NS	0.005	0.00057		***0.007***		0.0004	U	0.0004	U	0.0004	U	0.0023		0.0004	U	0.0004	U	0.0004	U
Calcium	NS	NS	NS	320		300		25		150	J	150	J	230	J	53	J	21		150	J
Iron	NS	0.3	0.3	***620***		***460***		***57***		***330***	J	***360***	J	***470***	J	***47***	J	***27***		***470***	J
Lead	0.015	NS	0.015	0.0025	U	0.0054		0.0025	U	0.0025	U	0.0025	U	0.0025	U	0.0025	U	0.0025	U	0.0025	U
Magnesium	NS	NS	NS	260		270		14		140	J	150	J	220	J	34	J	3.2		77	J
Manganese	NS	0.05	0.05	***180***		***210***		***2.6***		***88***	J	***91***	J	***150***	J	***31***	J	0.36	U	***15***	J
Nickel	NS	NS	0.073	***0.59***		***0.63***		0.053		0.055	J	0.06	J	***0.55***	J	0.018		0.005	U	0.045	
Potassium	NS	NS	NS	16		20		3.2		19		21		27		11		19		8.6	J
Sodium	NS	NS	NS	350		440		39		260	J	290	J	360	J	25	J	15		130	J
Zinc	NS	5	5	0.02		1.6		0.16		0.033	J	0.037	J	0.96	J	0.02	U	0.29		0.023	
General Chemistry (mg/l)																					
Bromide	NS	NS	NS	3.1	J	5.9	J	0.26	J	10	U	10	U	5	U	0.41	J	0.5	U	0.96	
Chloride	NS	250	NS	*650*		*770*		81		*490*		*500*		*720*		13		5.4		230	
Fluoride	4	2	NS	1	U	1.6	J	0.14		2	U	2	U	0.88	J	0.049	J	0.14		2.6	J
Sulfate	NS	250	NS	*3400*		*3300*		45		*1700*		*1700*		*2900*		220		2.2		*1800*	
Nitrate	10*	NS	NS	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U
Nitrite	1*	NS	NS	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U
Nitrogen, Nitrate-Nitrite	NS	NS	NS	0.025	U	0.25	U	0.025	U	0.25	U	0.25	U	0.25	U	0.025	U	0.011	J	0.13	U
Alkalinity, Total	NS	NS	NS	43		5	U	33		91		93		28		160		99		5	U
Total Dissolved Solids	NS	500	NS	*5300*		*6000*		470		*3500*		*3600*		*5000*		*530*		110		*2500*	
Total Suspended Solids	NS	NS	NS	86		23		38		82		140		130		26		66		180	
Radiological (pCi/l) (No Secondary Standards)																					
Gross alpha radioisotopes	15	NS	NS	13	U	**50.7**		1.29	U	**17.8**	U	11.7	U	14.4	U	-0.0549	U	1.6	J	5.75	U
Gross beta radioisotopes	4mR/year	NS	NS	4.02	U	28		4.5	U	22.5	J	14.9	J	24.1		8.65		16.1		5.85	U
Radium 226	5 (Radium 226 +	NS	NS	0.854	J	1.23		0.564	J	0.359	J	0.352	J	0.798	J	0.309	J	0.97	J	0.22	J
Radium 228	Radium 228)	NS	NS	1.32		10.8		0.204	U	1.16		1.34		1.53		0.405	J	0.893	J	0.645	J
Field Parameters																					
pH (S.U.)	6.5-8.5	NS	NS	**5.62**		**3.92**		**5.8**		**6.05**		NA		**6.08**		**6.45**		**8.74**		**6.16**	
Specific Conductivity (mS/cm)	NS	NS	NS	4.04		6.13		0.577		3.67		NA		4.8		0.751		0.255		2.67	
Temperature (°c)	NS	NS	NS	27.22		14.83		17.85		23.62		NA		23.99		16.24		19.13		17.2	
Turbidity (NTU)	NS	NS	NS	3.92		5.3		3.61		18		NA		59.6		5.26		105		19	
Dissolved Oxygen (mg/L)	NS	NS	NS	0		0		0		0		NA		0		0		0		0	
Oxidation-Reduction Potential (mV)	NS	NS	NS	54		219		46		10		NA		-62		-32		-242		-51	

Table 2
June/July 2017 Groundwater Sampling Results
Pearce Creek Confined Disposal Facility
Cecil County, Maryland

Field Sample ID Collection Date Matrix: Parameter	USEPA MCL	USEPA Secondary Standards	MDE GWQS	CSW-33 6/29/2017 Groundwater Sample Results	Q	CSW-33 Duplicate 6/29/2017 Groundwater Sample Results	Q	CSW-34 7/14/2017 Groundwater Sample Results	Q	CSW-35 7/13/2017 Groundwater Sample Results	Q	CSW-36 7/17/2017 Groundwater Sample Results	Q	CSW-37 6/29/2017 Groundwater Sample Results	Q	CSW-38 7/5/2017 Groundwater Sample Results	Q	CSW-39 6/28/2017 Groundwater Sample Results	Q	PZ-1 6/29/2017 Groundwater Sample Results	Q
Unfiltered Metals Analysis (mg/l)																					
Aluminum	NS	0.05	0.05	***1***	J	0.05	U	***0.63***		***0.22***		***5.3***		***0.065***	J	***0.31***		***1***		0.033	J
Arsenic	0.01	NS	0.01	0.002	J	0.002	J	0.002	J	0.003	U	0.008		0.003	U	0.003	U	0.003	U	0.003	J
Beryllium	0.004	NS	0.004	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.00066		0.0004	U	0.0004	U	0.0004	U	0.0004	U
Cadmium	0.005	NS	0.005	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U
Calcium	NS	NS	NS	270	J	150	J	200	J	150	J	93		28	J	130		19		270	
Iron	NS	0.3	0.3	***0.52***	J	***480***	J	***1.6***	J	***2***		***5.4***		***22***	J	***10***		***5.3***		***160***	
Lead	0.015	NS	0.015	0.0025	U	0.0025	U	0.0025	U	0.0025	U	0.0049		0.0025	U	0.0025	U	0.0025	U	0.0025	U
Magnesium	NS	NS	NS	0.34	J	83	J	0.77	J	0.6		2.4		3	J	10		3.4		280	
Manganese	NS	0.05	0.05	0.011	J	***16***	J	0.038	J	***0.061***	J	***0.076***		***0.34***	J	***0.18***		***0.11***		***210***	
Nickel	NS	NS	0.073	0.013	J	0.05	J	0.012	J	0.0052		0.0094		0.005	U	0.0075		0.0033	U	0.0032	J
Potassium	NS	NS	NS	42	J	9.2	J	200		450		84		2.8	J	21		17		33	
Sodium	NS	NS	NS	44	J	140	J	100	J	200	J	82		18	J	73		38		2700	
Zinc	NS	5	5	0.058	J	0.025	J	0.02	UJ	0.02	U	0.012	J	0.02	U	0.02	U	0.02	U	0.02	U
General Chemistry (mg/l)																					
Bromide	NS	NS	NS	0.34	J	1.4	J	0.5	U	0.31	J	0.41	J	0.26	J	0.84		0.25	J	7.2	J
Chloride	NS	250	NS	29	J	230	J	9.6		11		12		23		160		40		*810*	
Fluoride	4	2	NS	0.17	J	5	U	0.1		0.1	U	0.42		0.12		0.1	U	0.12		2.5	U
Sulfate	NS	250	NS	5.7	J	*1900*	J	16		39	J	12		2.4		160		16		*1400*	
Nitrate	10*	NS	NS	0.05	U	0.05	U	0.05	U	0.038	J	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U
Nitrite	1*	NS	NS	0.05	U	0.05	U	0.05	U	0.028	J	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U
Nitrogen, Nitrate-Nitrite	NS	NS	NS	0.025	U	0.13	U	0.039	J	0.03	J	0.032	U	0.025	U	0.034	J	0.025	U	0.025	U
Alkalinity, Total	NS	NS	NS	710	J	5	U	950		1300		360		87		49		84		510	
Total Dissolved Solids	NS	500	NS	*830*	J	*2600*	J	*1200*		*2100*		*500*		150		*740*		200		*4100*	
Total Suspended Solids	NS	NS	NS	8.9		200		60		16		250		28		51		28		220	
Radiological (pCi/l) (No Secondary Standards)																					
Gross alpha radioisotopes	15	NS	NS	4.32	U	9.73	U	3.3	U	**15.3**		9.74		1.9	J	2.26	U	2.58	U	0	U
Gross beta radioisotopes	4mR/year	NS	NS	28.5	J	8.68	U	**163**		**354**		**70.3**		3.07	J	14.9		16.3		37.7	
Radium 226	5 (Radium 226 +	NS	NS	0.518	J	0.278	J	0.923	J	1.87		0.779	J	0.916	J	0.28	U	0.546	J	0.361	J
Radium 228	Radium 228)	NS	NS	0.279	U	0.662	J	0.942	J	1.56	U	1.07	U	0.95	J	0.206	U	0.369	J	0.935	J
Field Parameters																					
pH (S.U.)	6.5-8.5	NS	NS	**13.89**		NA		**12.31**		**12.45**		**11.98**		7.04		**9.29**		7.78		6.55	
Specific Conductivity (mS/cm)	NS	NS	NS	3.41		NA		4.2		6.52		1.65		0.122		0.386		0.343		5.39	
Temperature (°C)	NS	NS	NS	16.33		NA		20.71		21.17		22.16		16.66		20.56		17.59		18.4	
Turbidity (NTU)	NS	NS	NS	5.8		NA		19.4		7.38		183		8.34		35.2		26		3.04	
Dissolved Oxygen (mg/L)	NS	NS	NS	0		NA		0.18		0.48		0		0		0		0		0	
Oxidation-Reduction Potential (mV)	NS	NS	NS	-194		NA		-209		-231		-359		-91		-378		-338		-65	

Table 2
June/July 2017 Groundwater Sampling Results
Pearce Creek Confined Disposal Facility
Cecil County, Maryland

Field Sample ID Collection Date Matrix: Parameter	USEPA MCL	USEPA Secondary Standards	MDE GWQS	PZ-2 7/5/2017 Groundwater Sample Results	Q	PZ-3 7/7/2017 Groundwater Sample Results	Q	PZ-4 7/17/2017 Groundwater Sample Results	Q	PZ-5 7/26/2017 Groundwater Sample Results	Q
Unfiltered Metals Analysis (mg/l)											
Aluminum	NS	0.05	0.05	***0.098***	J	***19***		***0.16***		0.05	U
Arsenic	0.01	NS	0.01	0.005		0.004		0.002	J	0.003	U
Beryllium	0.004	NS	0.004	0.0004	U	***0.0089***		0.00031	J	0.0004	U
Cadmium	0.005	NS	0.005	0.0004	U	0.0004	U	0.00016	J	0.0004	U
Calcium	NS	NS	NS	14		170		370		21	
Iron	NS	0.3	0.3	***99***		***280***		***130***		***24***	
Lead	0.015	NS	0.015	0.0025	U	0.0025	U	0.0025	U	0.0013	J
Magnesium	NS	NS	NS	12		140		100		15	
Manganese	NS	0.05	0.05	***1.1***		***590***		***54***		***11***	
Nickel	NS	NS	0.073	0.0047	J	***0.38***		0.022		0.042	
Potassium	NS	NS	NS	2		14		15		5.9	
Sodium	NS	NS	NS	86		270		210		22	J
Zinc	NS	5	5	0.02	U	0.72		0.02	U	0.048	
General Chemistry (mg/l)											
Bromide	NS	NS	NS	0.32	J	5	U	1.2		0.32	J
Chloride	NS	250	NS	30		*340*		*300*		24	
Fluoride	4	2	NS	0.097	J	0.82	J	0.28		0.1	U
Sulfate	NS	250	NS	170		*2300*		*1200*		130	
Nitrate	10*	NS	NS	0.05	U	0.05	U	0.03	J	0.05	U
Nitrite	1*	NS	NS	0.05	U	0.05	U	0.05	U	0.05	U
Nitrogen, Nitrate-Nitrite	NS	NS	NS	0.025	U	0.25	U	0.025	U	0.025	U
Alkalinity, Total	NS	NS	NS	63		5	U	43		46	
Total Dissolved Solids	NS	500	NS	340		*3000*		*2400*		140	
Total Suspended Solids	NS	NS	NS	110		34		84		7.9	U
Radiological (pCi/l) (No Secondary Standards)											
Gross alpha radioisotopes	15	NS	NS	3.36		-1.48	U	3.39	U	0.908	U
Gross beta radioisotopes	4mR/year	NS	NS	3.58	U	21.9		13.5		5.09	
Radium 226	5 (Radium 226 +	NS	NS	1.25		0.61	J	0.553	J	0.113	J
Radium 228	Radium 228)	NS	NS	1.04		2		0.747	U	0.868	U
Field Parameters											
pH (S.U.)	6.5-8.5	NS	NS	6.75		**4.26**		7.27		**4.2**	
Specific Conductivity (mS/cm)	NS	NS	NS	0.716		3.2		2.92		0.474	
Temperature (°c)	NS	NS	NS	17.79		18.88		22.57		17.13	
Turbidity (NTU)	NS	NS	NS	8.3		5.93		9.24		6.17	
Dissolved Oxygen (mg/L)	NS	NS	NS	0		0		0		3.2	
Oxidation-Reduction Potential (mV)	NS	NS	NS	-134		156		-114		334	

Table 2
Notes for Groundwater Sampling Results
Pearce Creek Confined Disposal Facility
Cecil County, Maryland

Table Notes

mg/l: milligrams per liter
pCi/l: picoCuries per liter
mR/year: milliREM per year (The standard laboratory reporting units for gross beta radiation (pCi/l) cannot be directly correlated to the National Drinking Water Standard, which is presented as an annual dose equivalent. The results for gross beta radiation were compared with the 50 pCi/l screening level provided in the National Drinking Water Regulations, Code of Federal Regulations.)
Q: Qualifers
U: The analyte was analyzed for but was not detected above the reported concentration.
J: The reported value is an estimated concentration.
R: Non-detected result value is considered unusable due to exceedance of technical quality control criteria.
NS: Not Specified
N/A: Not Analyzed
MCL: USEPA Maximum Contaminant Level
MDE GWQS: Maryland Department of the Environment Groundwater Quality Standard
Bold result: Sample concentration exceeds the USEPA MCL
Italicized result: Sample concentration exceeds the USEPA Secondary Standard established for aesthetics (taste, color, odor)
Bold italicized result: Sample concentration exceeds the MDE GWQS
*Results for nitrate and nitirite are reported as the anion concentrations. Since the MCLs for these analytes are provided as nitrogen content of the anionic form, the laboratory results were compared to the anion equivalent concentrations of 44 mg/l and 3.3 mg/l for nitrate and nitrite, respectively, for screening purposes.

Table 3
October 2017 Groundwater Sampling Results
Pearce Creek Confined Disposal Facility
Cecil County, Maryland

Field Sample ID Collection Date Matrix: Parameter	USEPA MCL	USEPA Secondary Standards	MDE GWQS	7A 10/12/2017 Groundwater Sample Results	Q	7B 10/12/2017 Groundwater Sample Results	Q	8A 10/12/2017 Groundwater Sample Results	Q	8B 10/12/2017 Groundwater Sample Results	Q	11A 10/10/2017 Groundwater Sample Results	Q	11A Duplicate 10/10/2017 Groundwater Sample Results	Q	11C 10/9/2017 Groundwater Sample Results	Q	11R 10/9/2017 Groundwater Sample Results	Q	12R 10/16/2017 Groundwater Sample Results	Q
Unfiltered Metals Analysis (mg/l)																					
Aluminum	NS	0.05	0.05	0.046	J	0.019	J	***2.5***		***1.6***		0.036	UJ	0.024	UJ	***4***		0.044	J	***0.12***	
Arsenic	0.01	NS	0.01	0.003	U	0.003	U	***0.01***		0.0033		0.003	U	0.003	U	0.0024	J	0.003	U	0.0021	J
Beryllium	0.004	NS	0.004	0.0004	U	0.0004	U	0.0029		0.003		0.0004	U	0.0004	U	0.0014		0.00035	J	0.0004	U
Cadmium	0.005	NS	0.005	0.00047	J	0.0004	U	0.0009		0.001		0.0004	U	0.0004	U	0.00017	J	0.0004	U	0.0004	U
Calcium	NS	NS	NS	5		21		75		53		17	J	16	J	37		8.5		1500	
Iron	NS	0.3	0.3	***12***		***21***		***15***		0.23		***5.9***	J	***5.8***	J	***39***		***19***		***0.66***	
Lead	0.015	NS	0.015	0.0025	U	0.0025	U	0.0025	U	0.0025	U	0.0025	U	0.0025	U	0.0025	U	0.0025	U	0.0025	U
Magnesium	NS	NS	NS	1.9		3.3		37		35		2.6	J	2.5	J	27		1.6		0.36	
Manganese	NS	0.05	0.05	***0.2***		***0.17***		***21***		***8.8***		***0.19***	J	***0.17***	J	***16***		***0.13***		***0.11***	
Nickel	NS	NS	0.073	0.0031	J	0.005	U	0.057		0.044		0.005	UJ	0.005	UJ	0.044		0.005	U	0.057	
Potassium	NS	NS	NS	1.1		8.4		6.1		4.7		30		30		4.8		2		12	
Sodium	NS	NS	NS	6.3		20		86		190		33	J	33	J	34		9		290	
Zinc	NS	5	5	0.02	U	0.02	U	0.36		0.19		0.02	UJ	0.02	UJ	0.11		0.02	U	0.011	J
General Chemistry (mg/l)																					
Bromide	NS	NS	NS	0.1	U	0.14	J	0.41		0.26		0.066	J	0.064	J	0.24	J	0.1	U	12	
Chloride	NS	250	NS	7.9		37		110		*310*		17		17		31		5		*2300*	
Fluoride	4	2	NS	0.058	J	0.04	J	0.96		0.33		0.063	J	0.058	J	0.44		0.052	J	0.06	UJ
Sulfate	NS	250	NS	0.59		22		*430*		*250*		14		14		110		13		*250*	
Nitrate	10*	NS	NS	0.24		0.12		0.013	J	8.9		0.0075	UJ	0.022	UJ	0.027		0.01	U	0.0093	J
Nitrite	1*	NS	NS	0.01	U	0.01	U	0.2	U	0.2	U	0.01	UJ	0.01	UJ	0.01	U	0.01	U	2	UJ
Nitrogen, Nitrate-Nitrite	NS	NS	NS	0.31		0.025	U	0.025	U	10		0.025	U	0.025	U	0.044	J	0.025	U	0.013	J
Alkalinity, Total	NS	NS	NS	45		45		5	U	5	U	110		110		200		36		580	
Total Dissolved Solids	NS	500	NS	93		180		*880*		*990*		200		240		450		83		*11000*	
Total Suspended Solids	NS	NS	NS	27		22		1.8		1	U	12		13		62		33		19	
Radiological (pCi/l) (No Secondary Standards)																					
Gross alpha radioisotopes	15	NS	NS	1.45	U	1.28	U	10		5.1		2.22	J	2.7	J	0.427	U	1.43	J	12.4	U
Gross beta radioisotopes	4mR/year	NS	NS	1.5	U	7.5		15.6		7.72		26.1		25.9		2.51	J	2.14	J	7.7	U
Radium 226	5 (Radium 226 +	NS	NS	0.0293	U	0.826	J	**1.76**		1.28		0.96	J	0.862	J	0.123	J	0.812	J	0.913	J
Radium 228	Radium 228)	NS	NS	0.549	J	0.924	J	**9.57**		4.06		0.576	J	0.807	J	0.961	J	1.08		1.58	U
Field Parameters																					
pH (S.U.)	6.5-8.5	NS	NS	**5.49**		**6.02**		**3.9**		**3.97**		7.1		NA		**6.22**		**5.85**		**12.87**	
Specific Conductivity (mS/cm)	NS	NS	NS	0.131		0.348		1.26		1.69		0.392		NA		0.782		0.152		10.7	
Temperature (°c)	NS	NS	NS	20.01		15.12		15.44		17.55		16.65		NA		23.37		16.42		17.26	
Turbidity (NTU)	NS	NS	NS	13.9		2.58		0.87		3.54		5.99		NA		19.8		26		6.93	
Dissolved Oxygen (mg/L)	NS	NS	NS	0		0.7		0.96		0.54		0		NA		0		0.88		1.94	
Oxidation-Reduction Potential (mV)	NS	NS	NS	-15		-75		288		220		-175		NA		-91		-19		23	

Table 3
October 2017 Groundwater Sampling Results
Pearce Creek Confined Disposal Facility
Cecil County, Maryland

Field Sample ID Collection Date Matrix: Parameter	USEPA MCL	USEPA Secondary Standards	MDE GWQS	13A 10/3/2017 Groundwater Sample Results	Q	14R 10/10/2017 Groundwater Sample Results	Q	16A 10/13/2017 Groundwater Sample Results	Q	18B 10/17/2017 Groundwater Sample Results	Q	21D 10/4/2017 Groundwater Sample Results	Q	21S 10/4/2017 Groundwater Sample Results	Q	CSW-5 10/17/2017 Groundwater Sample Results	Q	CSW-7 10/17/2017 Groundwater Sample Results	Q	CSW-7 Duplicate 10/17/2017 Groundwater Sample Results	Q
Unfiltered Metals Analysis (mg/l)																					
Aluminum	NS	0.05	0.05	***0.37***		***15***		0.05	U	0.05	U	***0.29***	J	***40***	J	0.028	J	***0.14***		***0.14***	
Arsenic	0.01	NS	0.01	0.003	U	***0.012***		0.0019	J	0.002	J	0.003	U	0.0065		0.0033		0.0053		0.0041	
Beryllium	0.004	NS	0.004	0.0004	U	***0.0069***		0.0004	U	0.0004	U	0.0012		***0.0073***		0.0004	U	***0.004***		***0.0042***	
Cadmium	0.005	NS	0.005	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0038		0.00036	J	0.0004	U	0.0004	U
Calcium	NS	NS	NS	23		220	J	82	J	46		19	J	170	J	230		310		290	
Iron	NS	0.3	0.3	***1.5***		***360***	J	***27***	J	***19***		***3.7***	J	***290***	J	***620***		***320***		***300***	
Lead	0.015	NS	0.015	0.0022	J	0.0025	U	0.0025	U	0.0025	U	0.0025	U	0.0025	U	0.0025	U	0.0025	U	0.0025	U
Magnesium	NS	NS	NS	1.2		210	J	49	J	2.2		0.51	J	160	J	200		250		230	
Manganese	NS	0.05	0.05	0.026		***190***	J	***32***	J	***0.16***		***0.093***	J	***170***	J	***180***		***260***		***260***	
Nickel	NS	NS	0.073	0.0027	J	***0.7***	J	0.0061		0.005	U	0.0027	J	***0.39***	J	***0.2***		***1.6***		***1.5***	
Potassium	NS	NS	NS	29		22		12		5.1		26		9.3		17		13		13	
Sodium	NS	NS	NS	29		390	J	49	J	13		47	J	290	J	350		420		390	
Zinc	NS	5	5	0.02	U	1.8	J	0.02	U	0.02	U	0.02	U	1	J	0.18		4.3		4	
General Chemistry (mg/l)																					
Bromide	NS	NS	NS	0.1	U	2.6		0.48		0.11	J	0.1	U	2.6		2.4		2.7		2.7	
Chloride	NS	250	NS	3.6		*620*		31		15		8		*610*		*500*		*720*		*790*	
Fluoride	4	2	NS	0.15		0.17		0.066	J	0.04	J	0.18	J	0.084	J	0.06	U	0.06	U	0.06	U
Sulfate	NS	250	NS	13		*2600*		*460*		0.88	U	14		*2500*		*2800*		*2500*		*2500*	
Nitrate	10*	NS	NS	0.0071	J	0.057	U	0.078		0.012	J	0.0095	J	0.01	U	0.01	U	0.01	U	0.01	U
Nitrite	1*	NS	NS	0.01	U	0.2	UJ	0.01	UJ	0.01	UJ	0.01	UJ	0.2	UJ	0.2	UJ	0.2	UJ	0.2	UJ
Nitrogen, Nitrate-Nitrite	NS	NS	NS	0.025	U	0.025	U	0.025	U	0.025	UJ	0.025	U	0.025	U	0.025	UJ	0.025	UJ	0.025	UJ
Alkalinity, Total	NS	NS	NS	90		5	U	120		140		150		5	U	120		58		57	
Total Dissolved Solids	NS	500	NS	230		*5300*		*830*		200	J	450		*5700*		*5300*	J	*5400*	J	*5400*	J
Total Suspended Solids	NS	NS	NS	69		10		5.2		41		230		2.5		10	U	4.6	U	1	U
Radiological (pCi/l) (No Secondary Standards)																					
Gross alpha radioisotopes	15	NS	NS	3.93		**23.4**	U	0.878	U	0.106	U	4.08		10	U	5.73	U	11.5	U	-6.61	U
Gross beta radioisotopes	4mR/year	NS	NS	27.3		30.5		10.8		2.76	J	28.4		41.4		1.02	U	10.6	U	1.54	U
Radium 226	5 (Radium 226 +	NS	NS	0.427	J	**1.69**		0.343	J	0.316	J	0.591	J	**1.44**		0.399	J	**1.78**		1.59	
Radium 228	Radium 228)	NS	NS	1.15		**9.61**		1.33		0.472	U	0.225	U	**10.2**		1.28	U	**4.13**		3.37	
Field Parameters																					
pH (S.U.)	6.5-8.5	NS	NS	**10.26**		**4.37**		**5.82**		6.98		**10.68**		**3.49**		**5.31**		**5.39**		NA	
Specific Conductivity (mS/cm)	NS	NS	NS	0.325		5.19		1.24		0.415		0.415		4.93		5.34		5.32		NA	
Temperature (°c)	NS	NS	NS	14.51		16.54		18.2		13.6		13.93		17.98		14.47		17.57		NA	
Turbidity (NTU)	NS	NS	NS	63.7		1.4		5.43		14.3		535		2.85		1.67		2.22		NA	
Dissolved Oxygen (mg/L)	NS	NS	NS	0.67		0.73		0		0		0.44		0		0.93		0		NA	
Oxidation-Reduction Potential (mV)	NS	NS	NS	-84		202		-6		-162		-159		236		36		24		NA	

Table 3
October 2017 Groundwater Sampling Results
Pearce Creek Confined Disposal Facility
Cecil County, Maryland

Field Sample ID Collection Date Matrix: Parameter	USEPA MCL	USEPA Secondary Standards	MDE GWQS	CSW-9 10/6/2017 Groundwater Sample Results	Q	CSW-10 10/3/2017 Groundwater Sample Results	Q	CSW-13 10/3/2017 Groundwater Sample Results	Q	CSW-27 10/11/2017 Groundwater Sample Results	Q	CSW-28 10/11/2017 Groundwater Sample Results	Q	CSW-29 10/3/2017 Groundwater Sample Results	Q	CSW-29 Duplicate 10/3/2017 Groundwater Sample Results	Q	CSW-31 10/10/2017 Groundwater Sample Results	Q	CSW-32 10/5/2017 Groundwater Sample Results	Q
Unfiltered Metals Analysis (mg/l)																					
Aluminum	NS	0.05	0.05	0.036	J	***31***		***0.17***		***0.16***		***13***		0.043	J	0.042	J	***0.7***		0.024	J
Arsenic	0.01	NS	0.01	0.0023	J	0.0093		0.0022	J	0.004		***0.016***		0.0034		0.0035	0	0.003	U	0.0019	J
Beryllium	0.004	NS	0.004	***0.0088***	J	***0.02***		0.0004	U	0.0004	U	***0.0094***		0.0004	U	0.0004	U	0.00056		0.0004	U
Cadmium	0.005	NS	0.005	0.0004	U	0.0032		0.0004	U	0.0004	U	0.04	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U
Calcium	NS	NS	NS	270	J	270		19		160	J	260	J	54		54		26		130	
Iron	NS	0.3	0.3	***620***	J	***510***		***39***		***380***		***540***		***51***		***54***		***22***		***560***	
Lead	0.015	NS	0.015	0.0025	U	0.0051		0.0025	U	0.0025	U	0.0025	U	0.0025	U	0.0025	U	0.0011	J	0.0025	U
Magnesium	NS	NS	NS	200	J	220		8.8		150		270		35		33		2.6		71	
Manganese	NS	0.05	0.05	***190***	J	***240***		***1.7***		***92***	J	***200***	J	***33***		***33***		***0.24***		***10***	
Nickel	NS	NS	0.073	***0.53***	J	***0.53***		0.019		0.059		***0.84***		0.016		0.016		0.0026	J	0.022	
Potassium	NS	NS	NS	13	J	17		2.6		21		26		10		9.8		23		6	
Sodium	NS	NS	NS	350	J	420		27		300		420		28		28		15		130	
Zinc	NS	5	5	0.01	J	1.4		0.034		0.036		1.5		0.02	U	0.02	U	0.57		0.02	U
General Chemistry (mg/l)																					
Bromide	NS	NS	NS	2.6		2.9		0.16	J	2.7		2.5		0.4		0.39		0.1	U	1	
Chloride	NS	250	NS	*680*		*790*		53		*450*		*680*		15		15		6.5		*270*	
Fluoride	4	2	NS	0.06	U	0.25		0.083	J	0.06	UJ	0.51	J	0.059	J	0.058	J	0.067	J	0.06	U
Sulfate	NS	250	NS	*2900*		*3200*		81		*1400*		*2600*		*250*		*250*		2.3		*1600*	
Nitrate	10*	NS	NS	0.01	U	0.01	U	0.0077	J	0.014	J	0.011	J	0.0071	J	0.0083	J	0.011	U	0.01	U
Nitrite	1*	NS	NS	0.1	UJ	0.2	U	0.01	U	0.2	U	0.2	U	0.01	U	0.01	U	0.01	UJ	0.2	UJ
Nitrogen, Nitrate-Nitrite	NS	NS	NS	0.025	U	0.025	U	0.025	U	0.025	U	0.025	U	0.025	U	0.025	U	0.025	U	0.025	U
Alkalinity, Total	NS	NS	NS	22		5	U	5	U	67		9.1		130		150		110		5	U
Total Dissolved Solids	NS	500	NS	*5600*		*6600*		320		*3300*		*5500*		*610*		*600*		140		*3100*	
Total Suspended Solids	NS	NS	NS	54		15		29		100		200		59		58		80		130	
Radiological (pCi/l) (No Secondary Standards)																					
Gross alpha radioisotopes	15	NS	NS	-1.42	U	6.49	U	0.87	U	10.4	U	7.93	U	-1.3	U	1.4	U	6.98		0.96	U
Gross beta radioisotopes	4mR/year	NS	NS	13.6	U	**57.4**		2.38	J	17.2		18.6		8.99		6.9		20.7		4.47	U
Radium 226	5 (Radium 226 +	NS	NS	0.728	J	1.21		0.33	J	0.27	U	0.814	J	0.259	J	0.173	J	1.67		0.235	J
Radium 228	Radium 228)	NS	NS	2.11	U	0.676	J	0.38	U	2.15		2.36		0.249	U	0.617	J	0.9	J	0.286	U
Field Parameters																					
pH (S.U.)	6.5-8.5	NS	NS	**5.09**		**3.72**		**5.67**		**5.64**		**5.59**		**6.32**		NA		8.02		**5.89**	
Specific Conductivity (mS/cm)	NS	NS	NS	5.21		6.3		0.55		4		5.6		0.948		NA		0.264		3.48	
Temperature (°c)	NS	NS	NS	19.55		15.99		16.3		18.24		18.59		17.87		NA		17.95		16.81	
Turbidity (NTU)	NS	NS	NS	1.44		9.92		1.53		10.2		75.6		4.13		NA		165		12.2	
Dissolved Oxygen (mg/L)	NS	NS	NS	0.6		0		0		0		0		0.62		NA		0.36		0.4	
Oxidation-Reduction Potential (mV)	NS	NS	NS	40		175		-54		-30		-30		-63		NA		-373		-76	

Table 3
October 2017 Groundwater Sampling Results
Pearce Creek Confined Disposal Facility
Cecil County, Maryland

Field Sample ID Collection Date Matrix: Parameter	USEPA MCL	USEPA Secondary Standards	MDE GWQS	CSW-33 10/5/2017 Groundwater Sample Results	Q	CSW-34 10/11/2017 Groundwater Sample Results	Q	CSW-35 10/13/2017 Groundwater Sample Results	Q	CSW-36 10/4/2017 Groundwater Sample Results	Q	CSW-37 10/6/2017 Groundwater Sample Results	Q	CSW-38 10/5/2017 Groundwater Sample Results	Q	CSW-39 10/2/2017 Groundwater Sample Results	Q	PZ-1 10/6/2017 Groundwater Sample Results	Q
Unfiltered Metals Analysis (mg/l)																			
Aluminum	NS	0.05	0.05	***1.6***		***0.56***		***0.93***		***0.21***	J	0.036	J	***0.58***		***2.1***		0.05	U
Arsenic	0.01	NS	0.01	0.003	U	0.0024	J	0.0024	J	0.0017	J	0.003	U	0.003	U	0.003	U	0.003	U
Beryllium	0.004	NS	0.004	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.00022	J	0.0004	U
Cadmium	0.005	NS	0.005	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U
Calcium	NS	NS	NS	250		320	J	190	J	370	J	17	J	170		27		230	J
Iron	NS	0.3	0.3	0.2		0.29		***0.41***	J	0.12	J	***25***	J	***11***		***1.9***		***140***	J
Lead	0.015	NS	0.015	0.0025	U	0.0025	U	0.0025	U	0.0025	U	0.0025	U	0.0025	U	0.0025	U	0.0025	U
Magnesium	NS	NS	NS	0.23	J	0.097	J	0.046	J	0.12	J	2.6	J	3.1		1.4		240	J
Manganese	NS	0.05	0.05	0.0041	J	0.0052	J	0.0046	J	0.0095	UJ	***0.23***	J	***0.13***		***0.058***		***36***	J
Nickel	NS	NS	0.073	0.012		0.019		0.011		0.013	J	0.005	U	0.0071		0.002	J	0.0022	J
Potassium	NS	NS	NS	22		130		340		130		2.5	J	18		50		29	J
Sodium	NS	NS	NS	36		100		160	J	100	J	18	J	48		54		430	J
Zinc	NS	5	5	0.017	J	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
General Chemistry (mg/l)																			
Bromide	NS	NS	NS	0.54		0.53		0.25		0.19	J	0.18	J	0.69		0.16	J	4.2	
Chloride	NS	250	NS	44		21		9.9		12		30		92		38		*750*	
Fluoride	4	2	NS	0.14		0.11	J	0.18		0.18	J	0.063	J	0.23		0.091	J	0.061	J
Sulfate	NS	250	NS	5.3		19		31		11		0.22	J	97		11		*1300*	
Nitrate	10*	NS	NS	0.0088	J	0.031		0.031		0.013	J	0.01	U	0.01	U	0.01	U	0.01	U
Nitrite	1*	NS	NS	0.01	UJ	0.01	U	0.011	J	0.01	UJ	0.01	UJ	0.01	UJ	0.01	UJ	0.1	UJ
Nitrogen, Nitrate-Nitrite	NS	NS	NS	0.029	J	0.038	J	0.036	J	0.013	U	0.025	U	0.025	U	0.025	U	0.025	U
Alkalinity, Total	NS	NS	NS	620		880		1100		1200		61		270		130		550	
Total Dissolved Solids	NS	500	NS	*820*		1500		*1800*		*1600*		160		*710*		270		*4200*	
Total Suspended Solids	NS	NS	NS	7.1		13		24		3.2		27		83		110		160	
Radiological (pCi/l) (No Secondary Standards)																			
Gross alpha radioisotopes	15	NS	NS	1.17	U	5.58	U	3.91	U	-2.94	U	0.882	U	0.141	U	0.601	U	16	U
Gross beta radioisotopes	4mR/year	NS	NS	18.2		**83.1**		**260**		**111**		2.74	J	11.4		39.6		13.5	
Radium 226	5 (Radium 226 +	NS	NS	0.411	J	1.04		1.57		1.7		0.714	J	0.268	J	0.516	J	0.318	J
Radium 228	Radium 228)	NS	NS	0.107	U	1.37		2.21		1.12		1.72	U	0.264	U	0.783	J	1.6	U
Field Parameters																			
pH (S.U.)	6.5-8.5	NS	NS	**12.85**		**12.37**		**12.5**		**12.29**		**6.1**		**11.61**		**12.26**		**6.15**	
Specific Conductivity (mS/cm)	NS	NS	NS	3.1		5.56		5.83		5.07		0.264		1.77		0.695		5.24	
Temperature (°c)	NS	NS	NS	17.47		15.59		15.19		18.67		15.47		17.16		17.52		18.37	
Turbidity (NTU)	NS	NS	NS	6.85		11		13.3		3.24		10		34.9		70.3		1.09	
Dissolved Oxygen (mg/L)	NS	NS	NS	0		1.29		1.05		1.23		0.74		1.89		0		0	
Oxidation-Reduction Potential (mV)	NS	NS	NS	-352		-433		-582		-580		-61		-498		-359		-128	

Table 3
October 2017 Groundwater Sampling Results
Pearce Creek Confined Disposal Facility
Cecil County, Maryland

Field Sample ID Collection Date Matrix: Parameter	USEPA MCL	USEPA Secondary Standards	MDE GWQS	PZ-2 10/5/2017 Groundwater Sample Results	Q	PZ-2 Duplicate 10/5/2017 Groundwater Sample Results	Q	PZ-3 10/16/2017 Groundwater Sample Results	Q	PZ-4 10/4/2017 Groundwater Sample Results	Q	PZ-5 10/16/2017 Groundwater Sample Results	Q
Unfiltered Metals Analysis (mg/l)													
Aluminum	NS	0.05	0.05	0.024	J	0.018	J	***16***		***1.2***	J	0.05	U
Arsenic	0.01	NS	0.01	0.0044		0.0043		0.0057		0.0042		0.0019	J
Beryllium	0.004	NS	0.004	0.0004	U	0.0004	U	***0.0063***		0.0033		0.00022	J
Cadmium	0.005	NS	0.005	0.0004	U	0.00022	J	0.001		0.0004	U	0.00024	J
Calcium	NS	NS	NS	9.8		9.5		140		260	J	27	
Iron	NS	0.3	0.3	***76***		***74***		***240***		***180***	J	***20***	
Lead	0.015	NS	0.015	0.0025	U	0.0025	U	0.0025	U	0.0025	U	0.0025	U
Magnesium	NS	NS	NS	9		8.5		120		94	J	19	
Manganese	NS	0.05	0.05	***0.89***		***0.86***		***120***		***79***	J	***15***	
Nickel	NS	NS	0.073	0.0029	J	0.0034	J	***0.34***		***0.076***	J	***0.11***	
Potassium	NS	NS	NS	1.3		1.3		12		9.7		5.5	
Sodium	NS	NS	NS	67		65		240		170	J	24	
Zinc	NS	5	5	0.02	U	0.02	U	0.64		0.03	J	0.18	
General Chemistry (mg/l)													
Bromide	NS	NS	NS	0.28		0.28		1.9		1.4		0.3	
Chloride	NS	250	NS	29		29		*330*		*270*		34	
Fluoride	4	2	NS	0.1		0.098	J	0.35	J	0.89	J	0.06	UJ
Sulfate	NS	250	NS	110		110		*1800*		*1400*		180	
Nitrate	10*	NS	NS	0.01	U	0.01	U	0.01	U	0.011	J	0.0094	J
Nitrite	1*	NS	NS	0.01	UJ	0.01	UJ	0.2	UJ	0.2	UJ	0.01	UJ
Nitrogen, Nitrate-Nitrite	NS	NS	NS	0.025	U	0.025	U	0.025	U	0.025	U	0.029	J
Alkalinity, Total	NS	NS	NS	110		92		5	U	81		39	
Total Dissolved Solids	NS	500	NS	380		390		*3400*		*2700*		440	
Total Suspended Solids	NS	NS	NS	80		98		5.6		110		3.2	
Radiological (pCi/l) (No Secondary Standards)													
Gross alpha radioisotopes	15	NS	NS	1.91	U	1.61	U	4.74	U	-1.19	U	0.0767	U
Gross beta radioisotopes	4mR/year	NS	NS	2.38	J	0.538	U	15.3		3.43	U	4.31	
Radium 226	5 (Radium 226 +	NS	NS	0.86	J	1.02		0.677	J	0.385	J	0.122	J
Radium 228	Radium 228)	NS	NS	0.486	U	0.602	U	2.88	U	0.582	J	0.836	U
Field Parameters													
pH (S.U.)	6.5-8.5	NS	NS	6.71		NA		**4.18**		**6.36**		**5.24**	
Specific Conductivity (mS/cm)	NS	NS	NS	0.72		NA		3.74		3.3		0.615	
Temperature (°c)	NS	NS	NS	18.42		NA		16.87		18.5		14.38	
Turbidity (NTU)	NS	NS	NS	2.46		NA		4.96		15.8		1.81	
Dissolved Oxygen (mg/L)	NS	NS	NS	0		NA		0		0		1.73	
Oxidation-Reduction Potential (mV)	NS	NS	NS	-171		NA		123		-99		167	

Table 3
Notes for Groundwater Sampling Results
Pearce Creek Confined Disposal Facility
Cecil County, Maryland

Table Notes

mg/l: milligrams per liter
pCi/l: picoCuries per liter
mR/year: milliREM per year (The standard laboratory reporting units for gross beta radiation (pCi/l) cannot be directly correlated to the National Drinking Water Standard, which is presented as an annual dose equivalent. The results for gross beta radiation were compared with the 50 pCi/l screening level provided in the National Drinking Water Regulations, Code of Federal Regulations.)
Q: Qualifers
U: The analyte was analyzed for but was not detected above the reported concentration.
J: The reported value is an estimated concentration.
R: Non-detected result value is considered unusable due to exceedance of technical quality control criteria.
NS: Not Specified
N/A: Not Analyzed
MCL: USEPA Maximum Contaminant Level
MDE GWQS: Maryland Department of the Environment Groundwater Quality Standard
Bold result: Sample concentration exceeds the USEPA MCL
Italicized result: Sample concentration exceeds the USEPA Secondary Standard established for aesthetics (taste, color, odor)
Bold italicized result: Sample concentration exceeds the MDE GWQS
*Results for nitrate and nitirite are reported as the anion concentrations. Since the MCLs for these analytes are provided as nitrogen content of the anionic form, the laboratory results were compared to the anion equivalent concentrations of 44 mg/l and 3.3 mg/l for nitrate and nitrite, respectively, for screening purposes.