Proactive by Design

GEOTECHNICAL
ENVIRONMENTAL
ECOLOGICAL
WATER
CONSTRUCTION MANAGEMENT

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October 12, 2018
File: 21.0056812.00

Mr. George Streit
George.streit@nrgenergy.com
Dunkirk Power LLC
106 Point Drive North
Dunkirk, NY 14048

Re: CCR Landfill 2018 Annual Inspection
Dunkirk Generating Station
Van Buren Road
Pomfret, New York

Dear Mr. Streit:

GZA GeoEnvironmental of New York (GZA) presents this 2018 Annual Landfill Inspection report to Dunkirk Power LLC (Dunkirk) for the existing coal combustion residuals (CCR) landfill units at the Dunkirk Generating Station landfill located in Pomfret, New York (Site). This annual inspection is required by the United States Environmental Protection Agencies (USEPA) Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule, as presented in the Federal Register Volume 80 No 74 dated April 17, 2015. In accordance with the CCR Rule (40 CFR 257.84), owners/operators of CCR landfill units are required to be inspected on a periodic basis by a qualified professional engineer to ensure the design, construction, operation and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards.

Document Review

The required periodic inspections presented in the CCR Rule are for open and active landfills and not required for closed or inactive landfills. As such, the active ash waste cells for the Site area identified as Phase 2, Cells A and B-1. The Site landfill cells identified as Phase 1, Cells A and B (excluding a small portion of the northern Phase I Cells A and B) and the eastern portion of Phase 2, Cell A are considered inactive (i.e., closed) and are not included with the annual inspection report. The limits of the active cells requiring this annual inspection report are shown on the attached figure prepared by Wendel for the 2017 fill progression survey. A constructed cell designated as Phase 2, Cell B-2 (adjacent to Phase 2, Cell B-1 on the west) has never received waste ash and there are currently no plans for this cell to receive waste in the future. Therefore, Phase 2, Cell B-2 is not included in this annual inspection plan.

The Dunkirk Power landfill is currently permitted (ID#9-0658-00021/00008) with the New York State Department of Environmental Conservation (NYSDEC) to accept residual coal ash waste generated from the Dunkirk Power facility through May 22, 2021. We note that the power plant has been mothballed and associated equipment has been prepared for long term storage and is currently not in operation. A review of the 2017 (most recent) fill progression assessment for the Phase 2 Cells A and B-1 indicates the following information.

Phase 2 Landfill Cell	Waste Received 2017 (cy)	Current Ash Volume (cy)	Volume Remaining (cy)
Cell A (western extent)	783	721,027	26995
Cell B-1*	16,860	227,173	252,312
Totals for A & B-1	17,643	948,200	279,307

cy = cubic yards
*also includes 1,092 cy of ash received during 2017 in Phase I Cell B.

The 2017 weekly landfill inspection forms prepared by Dunkirk Power personnel did not identify any concerns or complaints related to the operation and/or maintenance of the active ash landfill cells.

Site Observations

GZA visited the Site on September 21, 2018 to make observations of the active landfill cell areas. During our visit, the majority of the landfill Cell A (area west of the upper intermediate berm) and Cell B-1 were observed covered with a densely vegetated temporary cover soil having that had been placed over the graded ash waste. The former haul road leading to the work face on the western side of Phase 2, Cell B-1 was no longer observed and the area was reworked to match the side slope grades. Access to the top of the active landfill was made via an access road from the south, between Phase 1 and Phase 2 cells. The access road was observed in good condition with little to no evidence of erosion or instability. Observations of the vegetated side slopes and top areas of the active cells identified no areas of actual or potential structural weaknesses.

Overall, the temporarily covered areas of the active cells appeared to be graded in general accordance with the proposed design configurations, and the side slopes and other areas were observed in good condition with no evidence of actual, or potential for, structural instability or erosion. Similar to the most recent inspection made in 2017, this inspection identified no areas of concern or areas evidencing structural instability. Except for the additional coverage of the vegetated temporary cover soil and removal of the Cell B-1 access road, no significant changes pertaining to the design, operation and maintenance have been made to the active landfill cells. In general, the ongoing maintenance and grading of the ash waste and temporary cover soil appear to be in compliance with the cell design and permit requirements.

PROFESSIONAL ENGINEER CERTIFICATION

The undersigned registered professional engineer is familiar with the requirements of §257.84 and has visited and examined the Dunkirk Station Landfill or has supervised examination of the facilities by appropriately qualified personnel. The undersigned registered professional engineer attests that this Annual Inspection Report has been prepared in accordance with good engineering practice, including consideration of applicable industry standards and meets the requirements of §257.84, and that this Report is adequate for the Dunkirk Station. This certification was prepared as required by §257.84(b)(2).

Name of Professional Engineer: Daniel J. Troy, P.E.
Company: GZA GEOENVIRONMENTAL OF NEW YORK

Signature: _____
Date: October 12, 2018
PE Registration State: New York
PE Registration Number: 081139-1

Professional Engineer Seal:

We trust this information satisfies your needs for this project.

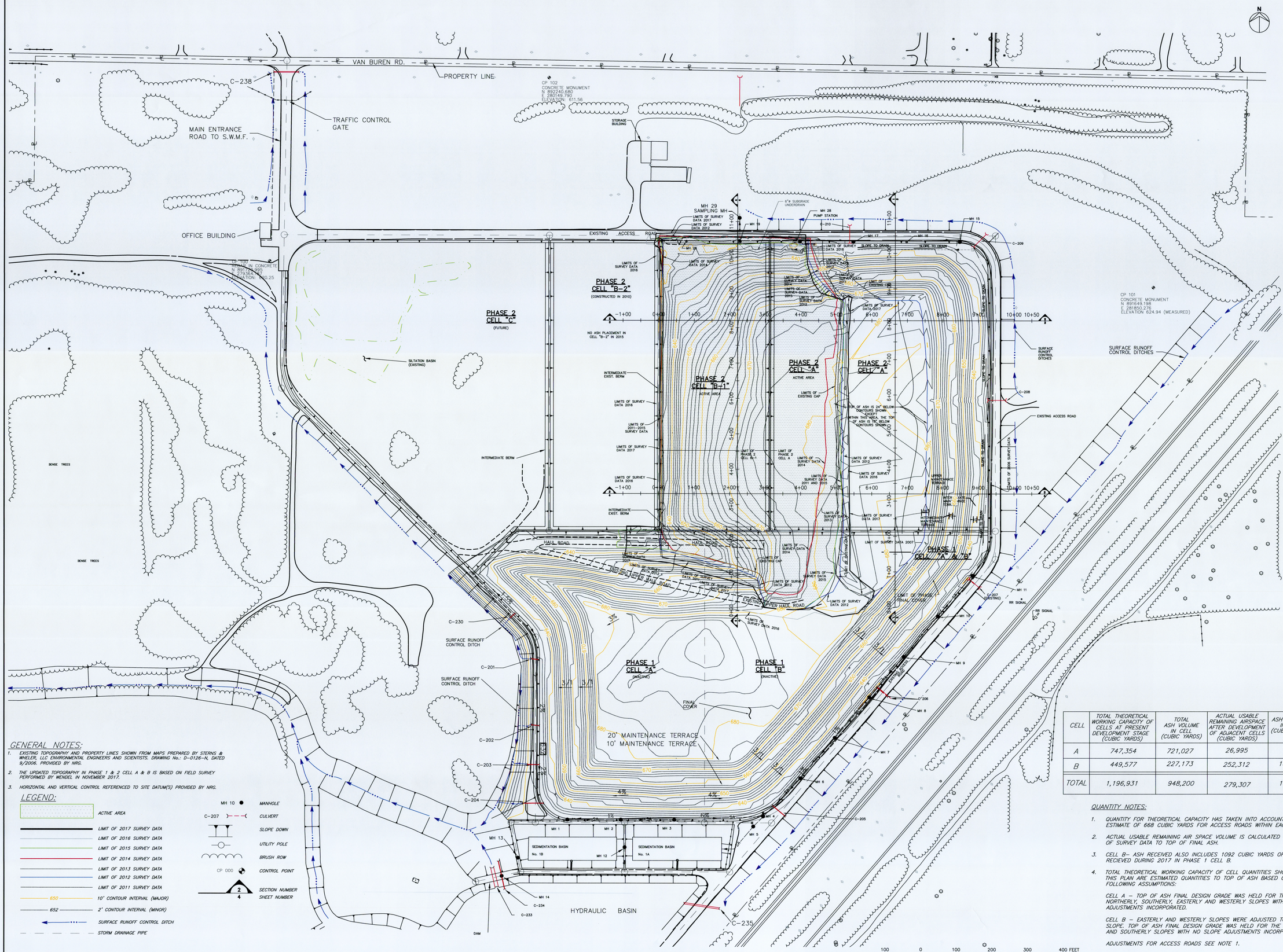
Sincerely,

GZA GEOENVIRONMENTAL OF NEW YORK

Daniel J. Troy, P.E.
Senior Project Manager

Bart A. Klettke, P.E.
Principal

Attachments: Figure 1 - 2017 Dunkirk Fill Progression Survey – Site Plan



GENERAL NOTES:

1. EXISTING TOPOGRAPHY AND PROPERTY LINES SHOWN FROM MAPS PREPARED BY STERNS & WHELER, LLC ENVIRONMENTAL ENGINEERS AND SCIENTISTS. DRAWING No.: D-0126-N, DATED 9/2006. PROVIDED BY NRG.
2. THE UPDATED TOPOGRAPHY IN PHASE 1 & 2 CELL A & B IS BASED ON FIELD SURVEY PERFORMED BY WENDEL IN NOVEMBER 2017.
3. HORIZONTAL AND VERTICAL CONTROL REFERENCED TO SITE DATUM(S) PROVIDED BY NRG.

LEGEND:

- ACTIVE AREA
- LIMIT OF 2017 SURVEY DATA
- LIMIT OF 2016 SURVEY DATA
- LIMIT OF 2015 SURVEY DATA
- LIMIT OF 2014 SURVEY DATA
- LIMIT OF 2013 SURVEY DATA
- LIMIT OF 2012 SURVEY DATA
- LIMIT OF 2011 SURVEY DATA
- 650 — 10' CONTOUR INTERVAL (MAJOR)
- 652 — 2' CONTOUR INTERVAL (MINOR)
- SURFACE RUNOFF CONTROL DITCH
- STORM DRAINAGE PIPE
- MH 10 — MANHOLE
- C-207 — CULVERT
- SLOPE DOWN
- UTILITY POLE
- BRUSH ROW
- CP 000 — CONTROL POINT
- 2/4 — SECTION NUMBER / SHEET NUMBER

CELL	TOTAL THEORETICAL WORKING CAPACITY OF CELLS AT PRESENT DEVELOPMENT STAGE (CUBIC YARDS)	TOTAL ASH VOLUME IN CELL (CUBIC YARDS)	ACTUAL USABLE REMAINING AIRSPACE AFTER DEVELOPMENT OF ADJACENT CELLS (CUBIC YARDS)	ASH RECEIVED IN 2017 (CUBIC YARDS)
A	747,354	721,027	26,995	783
B	449,577	227,173	252,312	16,860
TOTAL	1,196,931	948,200	279,307	17,643

QUANTITY NOTES:

1. QUANTITY FOR THEORETICAL CAPACITY HAS TAKEN INTO ACCOUNT AN ESTIMATE OF 668 CUBIC YARDS FOR ACCESS ROADS WITHIN EACH CELL.
2. ACTUAL USABLE REMAINING AIR SPACE VOLUME IS CALCULATED FROM LIMIT OF SURVEY DATA TO TOP OF FINAL ASH.
3. CELL B– ASH RECEIVED ALSO INCLUDES 1092 CUBIC YARDS OF MATERIAL RECIEVED DURING 2017 IN PHASE 1 CELL B.
4. TOTAL THEORETICAL WORKING CAPACITY OF CELL QUANTITIES SHOWN ON THIS PLAN ARE ESTIMATED QUANTITIES TO TOP OF ASH BASED ON THE FOLLOWING ASSUMPTIONS:

   CELL A – TOP OF ASH FINAL DESIGN GRADE WAS HELD FOR THE NORTHERLY, SOUTHERLY, EASTERLY AND WESTERLY SLOPES WITH NO SLOPE ADJUSTMENTS INCORPORATED.

   CELL B – EASTERLY AND WESTERLY SLOPES WERE ADJUSTED TO A 2/1 SLOPE. TOP OF ASH FINAL DESIGN GRADE WAS HELD FOR THE NORTHERLY AND SOUTHERLY SLOPES WITH NO SLOPE ADJUSTMENTS INCORPORATED.

   ADJUSTMENTS FOR ACCESS ROADS SEE NOTE 1.

nrg
NRG ENERGY
106 POINT DRIVE, NORTH
DUNKIRK, NY 14051

DUNKIRK POWER, LLC

ENGINEERING SERVICES

ANNUAL FILL PROGRESSION SURVEY FOR THE DUNKIRK LANDFILL

RECORD DRAWING

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STATE OF NEW YORK
MARSHALL D. WILSON
No. 050192
LICENSED LAND SURVEYOR

NO.	BY	REVISIONS	DATE

DWG. TITLE

DUNKIRK

2017 FILL PROGRESSION SURVEY

SITE PLAN

DATE	11/13/2017
SCALE	1"=100'
DWN.	JCR
CHK.	RNJ
PROJ. No.	419416
SHEET No.	1 of 4