Proactive by Design

GEOTECHNICAL
ENVIRONMENTAL
ECOLOGICAL
WATER
CONSTRUCTION MANAGEMENT

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October 14, 2016
File: 21.0056797.00

Mr. Kevin Schroeder
Kevin.schroeder@nrgenergy.com
Huntley Power LLC
Tonawanda, NY 14150

Re: Existing CCR Landfill Closure Plan
Huntley Generating Station Ash Landfill
Tonawanda, New York

Dear Mr. Schroeder:

GZA GeoEnvironmental of New York (GZA) presents this landfill closure plan to Huntley Power LLC (Huntley) for the existing coal combustion residuals (CCR) landfill located at the Huntley Power facility in Tonawanda New York (Site). This closure plan is required by the United States Environmental Protection Agencies (USEPAs) 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 §257.102(b)), owners/operators of a CCR unit must prepare a written closure plan that describes the steps necessary to close the CCR unit at any point during the active life of the CCR unit consistent with recognized and generally good engineering practices.

In accordance with §257.102(b)), the closure plan must include, at a minimum, the information specified in paragraphs (b)(1)(i) through (vi) of section 257.102.

Site Background

The active/open CCR landfill cells for the Site are identified as Cells A, C and D. The remaining landfill cells at the Site are considered to be closed and are not included with this closure plan. Portions of the side slopes of Cells A and D have previously been closed with a final cover system and only the upper tier of each cell remain open and active. An area designated as future Cell B, located between Cells A and C, was never constructed. The limits of the active cells included in this closure plan are shown on the attached figure.

The Huntley facilities CCR landfill is currently permitted (ID#9-14648-00089/00002) with the New York State Department of Environmental Conservation (NYSDEC) to accept CCR and associated waste generated from the Huntley Power facility through January 3, 2023.

Information required by §257.102(b)(i) through (vi) for the required closure plan is as follows.

1. Narrative of Closure - §257.102(b)(1)(i)

The active ash landfill cells (identified as the upper portions of Cells A and D and the entire Cell C) will be closed by leaving the CCR in place and the closure will be performed in accordance with §257.102(d) and will include a final cover system that will comply with its NYSDEC permit specific requirements. The CCR landfill cells will be closed as described in the following sections.

2. CCR Removal and Decontamination – §257.102(b)(1)(ii)

CCR from the active portions of ash landfill cells A, C and D will be left in place and covered in accordance with §257.102(d); therefore, CCR removal and decontamination is not applicable for the landfill closure.

3. Final Cover Requirements – §257.102(b)(1)(iii)

As the CCR will remain in place, the active landfill cells will be closed with a final cover system that meets the requirements specified in §257.102(d) and in accordance with the requirements of 6 NYCRR Part 360 and the specific NYSDEC issued permit.

Specifically, the remaining exposed CCR waste will be graded and compacted in conformance with the NYSDEC permit requirements (side slopes no steeper than 33% (3H:1V)) to allow for appropriate drainage conditions and required stability of the final cover system. As required by the NYSDEC permit and taking into account that the landfill is not anticipated to be filled to its original design capacity, the final cover material requirements will consist of, at a minimum, the following components from top to bottom (i.e., top of waste).

- 6-inches of seeded topsoil
- 12-inches of protective soil material
- Drainage geocomposite layer
- Geomembrane layer

The final closure slopes of the CCR/waste materials area are expected to range between 3% and 33%. Flatter slopes will be utilized for upper tiers and intermediate benches or access areas and the steeper slopes will be constructed on the northern, western and southern sides of Cell C. The final slope grades are expected to be completed using typical construction equipment including low ground pressure bulldozers and smooth and/or sheepsfoot roller/compactors. Dump trucks would be used to deliver cover material soils (including barrier protection soil and topsoil) for placement over the geosythetic materials.

An impermeable geomembrane will be installed as part of the final cover systems over the final graded waste ash of Cells A and D. The membrane will be welded to the existing cover system membrane of the adjoining closed portions of the respective cells. The membrane cover for Cell C also will be welded to its membrane that comprises its primary geomembrane cell liner (located along the northern, western and northern sides of the cell). The membrane cover system for these cells will meet the requirements of §257.102(d)(3)(i)(A) through (D) with a system that will essentially encapsulate the ash waste with a low permeability system resulting in minimizing precipitation infiltration, and will aid in reducing the potential for CCR erosion. The geomembrane and overlying

drainage geocomposite layer will be covered by 12-inch thick barrier protection soil and 6-inch thick topsoil to support vegetative growth.

The cover system for the active cells would be constructed with intermediate sloped benches or terraces that would assist in controlling and directing surface run off to the appropriate discharge locations (i.e., rip-rap lined down chutes) and to minimize erosion potential.

Based on the estimated volume of CCR and associated waste designated for disposal at the landfill, in comparison to the cell's design capacity, the final grades are estimated to require side slopes no steeper than 3H:1V, as required by the existing permit. Construction of these flatter slopes will provide more stable slopes and reduce the potential for sloughing or movement of the final cover system during the post closure period.

Based on the size of the active cells and weather conditions, construction of a cover system (including notification, issuance of design and QA/QC Plans and construction) could be completed within a period of about two years from the time of final receipt of CCR and associated wastes.

4. Maximum CCR Inventory - §257.102(b)(1)(iv)

For the purposes of this closure plan, the maximum CCR inventory capable of being stored within the active landfill cells (designated as Cells A, C and D) has been estimated to be greater than the estimated remaining volume of CCR and associated wastes requiring disposal. The table below presents the estimated maximum CCR and associated wastes for the ash landfill and the anticipated remaining volume as determined by the 2015 fill progression survey.

Landfill Cell	Waste Received in 2015 (cy)	Current Ash Volume (cy)	Volume Remaining (cy)
A	0	498,994	206,546
C	14,836	397,729	381,314
D	560	545,397	40,263
Totals for A, C & D	15,396	1,442,120*	628,123

cy = cubic yards
*The Wendel Fill Progression Survey incorrectly listed the total values as 1,442,140.

5. Maximum Area Requiring Final Cover – §257.102(b)(1)(v)

Based on the footprint of the active cells the maximum area requiring a cover system in its current configuration is estimated at approximately 556,850 sf (12.8 acres).

6. Closure Schedule – §257.102(b)(1)(vi)

Closure of the Huntley facility ash landfill is anticipated to begin when the final receipt of CCR or non-CCR waste stream has been made in accordance with §257.102(e). Prior to commencing closure construction, permit-level design drawings, technical specifications and QA/QC plan documents will be prepared to support applications for required local, state, and federal permits. Closure construction design documents will include construction-level design drawings, technical specifications, QA/QC plan, and contract bid documents, and required notifications to

NYSDEC. The permits required for closure or cover system construction will be evaluated at the time of closure, but are anticipated to include permits from the NYSDEC. A preliminary schedule of anticipated closure activities and associated dates is included below.

Permit-Level Design	August-September 2017
NYSDEC Review of Permit Level Design	October – November 2017
Response to NYSDEC Comments on Permit Design	November-December 2017
Final Receipt of CCR and Non-CCR Waste Stream	December 2018
Construction-Level Closure Plans, Permits and Contracting	January 2019 to June 2019
Construction of Cover System	July 2019 to October 2019
Landfill Closure Certification Report and NYSDEC Approval	October 2019 to January 2020

PROFESSIONAL ENGINEER CERTIFICATION

The undersigned registered professional engineer is familiar with the requirements of §257.102 *Criteria for conducting the closure or retrofit of CCR Units*. The undersigned registered professional engineer attests that this CCR Landfill Closure Plan has been prepared in accordance with good engineering practice, including consideration of applicable state regulatory requirements and meets the requirements of §257.102(b), and that this plan is adequate for NRG - Huntley Power. This certification was prepared as required by §257.102(b)(4).

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

Signature: _____
Date: October 14, 2016
PE Registration State: New York
PE Registration Number: 081139-1

Professional Engineer Seal:

We trust this information satisfies your needs for this project.

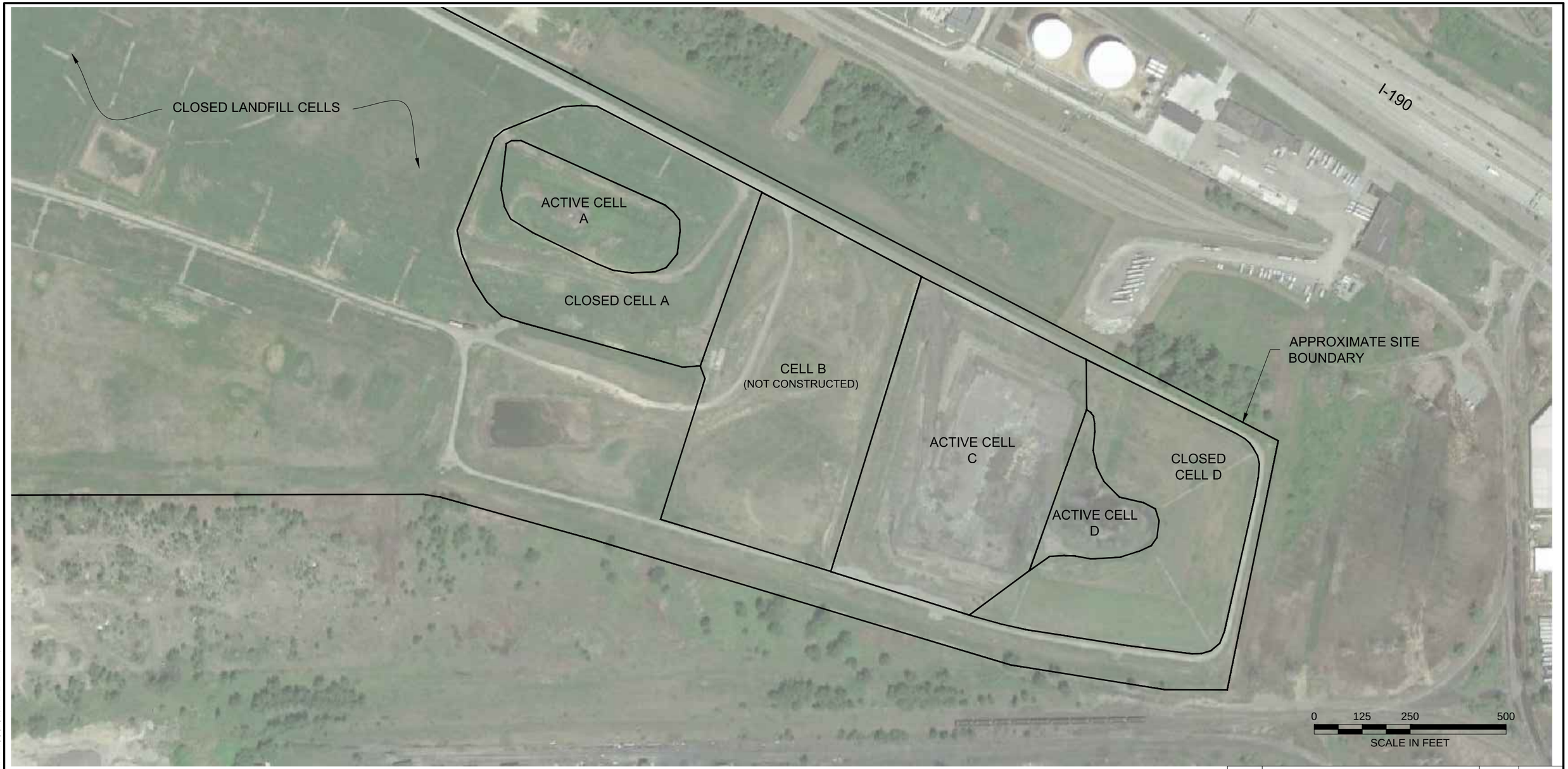
Sincerely,

GZA GEOENVIRONMENTAL OF NEW YORK

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

Bart A. Klettke, P.E.
Principal

Attachments: Figure 1 - Site Plan



NOTES:

1. AERIAL PHOTOGRAPHY ADAPTED FROM AN IMAGE DOWNLOADED FROM GOOGLE EARTH PRO.

2. THE SIZE AND LOCATION OF SITE FEATURES SHOULD BE CONSIDERED APPROXIMATE.

NO.	ISSUE/DESCRIPTION	BY	DATE

HUNTLEY LANDFILL
TONAWANDA, NEW YORK

LANDFILL CLOSURE PLAN

SITE PLAN

PREPARED BY:
GZA GeoEnvironmental of N.Y.
Engineers and Scientists
535 WASHINGTON STREET 11th FLOOR
BUFFALO, NEW YORK 14203
(716) 685-2300

PREPARED FOR:
NRG HUNTLEY POWER, LLC

PROJ MGR: DJT	REVIEWED BY:	CHECKED BY:	FIGURE 1
DESIGNED BY:	DRAWN BY: TAK	SCALE: AS SHOWN	
DATE SEPT. 2016	PROJECT NO. 21.0056797.00	REVISION NO.	