



HALEY & ALDRICH, INC.
6500 Rockside Road
Suite 200
Cleveland, OH 44131
216.739.0555

MEMORANDUM

16 October 2018

File No. 129788

SUBJECT: Location Restriction Demonstration – Placement Above Uppermost Aquifer
Zimmer Power Station
Gypsum Recycle Pond
Moscow, Ohio


Dynegy Zimmer, LLC operates the coal-fired Zimmer Power Station (Plant) located in Moscow, Ohio. The Gypsum Recycle Pond (Unit) is an existing coal combustion residuals (CCR) surface impoundment. This demonstration addresses the requirements of 40 CFR §257.60 (*Placement above the uppermost aquifer*) of the US Environmental Protection Agency's (EPA) rule entitled *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities*. 80 Fed. Reg. 21,302 (Apr. 17, 2015) (promulgating 40 CFR §257.60); 83 Fed. Reg. 36,435 (July 30, 2018) (amending 40 CFR §257.60).

§257.60(a): *New CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units must be constructed with a base that is located no less than 1.52 meters (five feet) above the upper limit of the uppermost aquifer, or must demonstrate that there will not be an intermittent, recurring, or sustained hydraulic connection between any portion of the base of the CCR unit and the uppermost aquifer due to normal fluctuations in groundwater elevations (including the seasonal high water table). The owner or operator must demonstrate by the dates specified in paragraph (c) of this section that the CCR unit meets the minimum requirements for placement above the uppermost aquifer.*

O'Brien & Gere developed a contour map representing the upper limit of the uppermost aquifer for the Unit that identified elevations ranging from approximate elevation 473+/- feet to 474+/- feet across the base of the unit. Based on historic document review, field/boring investigation and laboratory testing program at the Unit, Haley & Aldrich, Inc. identified base of unit elevations ranging from 491.6+/- to 492.5+/- across the floor of the Unit. As a result, the separation between the base of the unit and the upper limit of the uppermost aquifer was confirmed to be greater than five feet and therefore meets the requirement of §257.60(a) for the Unit.

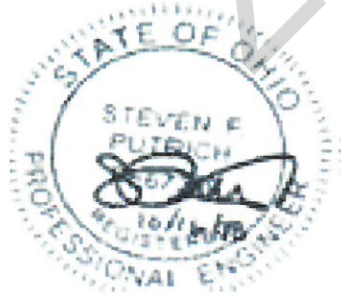
§257.60(b): *The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the demonstration meets the requirements of paragraph (a) of this section.*

I, Steven F. Putrich, being a Registered Professional Engineer in good standing in the State of Ohio, do hereby certify, to the best of my knowledge, information, and belief, that the information contained in this certification has been prepared in accordance with the accepted practice of engineering. I certify, for the above-referenced CCR Unit, that the demonstration regarding the location of the base of the CCR Unit no less than 1.52 meters above the upper limit of the uppermost aquifer as included in the CCR Rule Location Restrictions Evaluation memorandum dated 12 October 2018 meets the requirements of 40 CFR §257.60(a).

Signed: 
Consulting Engineer

Print Name: Steven F. Putrich
Ohio License No.: 67329
Title: Vice President
Company: Haley & Aldrich, Inc.

Professional Engineer's Seal:





HALEY & ALDRICH, INC.
6500 Rockside Road
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Cleveland, OH 44131
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MEMORANDUM

16 October 2018

File No. 129788

SUBJECT: Location Restriction Demonstration - Wetland Areas
Zimmer Power Station
Zimmer Gypsum Recycle Pond
Moscow, Ohio


Dynegy Zimmer, LLC operates the coal-fired Zimmer Power Station (Plant) located in Moscow, Ohio. The Gypsum Recycle Pond (Unit) is an existing coal combustion residuals (CCR) surface impoundment. This demonstration addresses the requirements of 40 CFR §257.61 (*Wetlands*) of the US Environmental Protection Agency's (EPA) rule entitled *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities*. 80 Fed. Reg. 21,302 (Apr. 17, 2015) (promulgating 40 CFR §257.63); Fed. Reg. 36,435 (July 30, 2018) (amending 40 CFR §257.63).

§257.61(a): New CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units must not be located in wetlands, as defined in §232.2 of this chapter, unless the owner or operator demonstrates by the dates specified in paragraph (c) of this section that the CCR unit meets the requirements of paragraphs (a)(1) through (5) of this section.

Based on a review of the U.S. Fish and Wildlife Service's National Wetland Inventory mapping, 0.5-meter resolution aerial imagery (2016) and the results of on-site field assessments, the Unit is not located in wetlands as defined by 40 CFR §232.2.

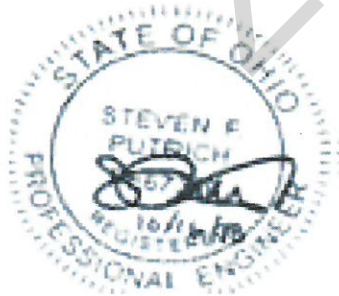
§257.61(b): The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the demonstration meets the requirements of paragraph (a) of this section.

I, Steven F. Putrich, being a Registered Professional Engineer in good standing in the State of Ohio, do hereby certify, to the best of my knowledge, information, and belief, that the information contained in this certification has been prepared in accordance with the accepted practice of engineering. I certify, for the above-referenced CCR Unit, that the CCR Unit is not located in wetlands as included in the CCR Rule Location Restrictions Evaluation memorandum dated 12 October 2018 and, therefore, meets the requirements of 40 CFR §257.61(a).

Signed: 
Consulting Engineer

Print Name: Steven F. Putrich
Ohio License No.: 67329
Title: Vice President
Company: Haley & Aldrich, Inc.

Professional Engineer's Seal:





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MEMORANDUM

16 October 2018

File No. 129788

SUBJECT: Location Restriction Demonstration - Fault Areas
Zimmer Power Station
Gypsum Recycle Pond
Moscow, Ohio


Dynegy Zimmer, LLC operates the coal-fired Zimmer Power Station (Plant) located near Moscow, Ohio. The Gypsum Recycle Pond (Unit) is an existing coal combustion residuals (CCR) surface impoundment. This demonstration addresses the requirements of 40 CFR §257.62 (*Fault Areas*) of the U.S. Environmental Protection Agency's (EPA) rule entitled *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities*. 80 Fed. Reg. 21,302 (Apr. 17, 2015) (promulgating 40 CFR §257.62); 83 Fed. Reg. 36,435 (July 30, 2018) (amending 40 CFR §257.62).

§257.62(a): New CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of CCR units must not be located within 60 meters (200 feet) of the outermost damage zone of a fault that has had displacement in Holocene time unless the owner or operator demonstrates by the dates specified in paragraph (c) of this section that an alternative setback distance of less than 60 meters (200 feet) will prevent damage to the structural integrity of the CCR unit.

A review of available data from the U.S. Geological Survey, the Ohio Department of Natural Resources Division of Geological Survey, the Indiana Geological and Water Survey, the Kentucky Geological Survey, and other available information was completed for this demonstration. The nearest known fault is located approximately 27 miles southeast and is not known to have any activity within the last 11,700 years. Based on the available published geologic data and information reviewed, there are no active faults or fault damage zones that have had displacement in Holocene time reported or indicated within 200 feet of the Unit.

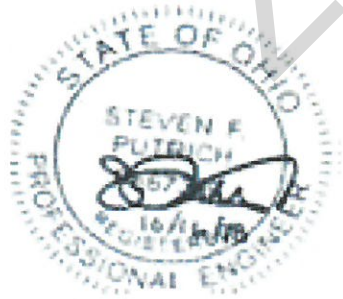
§257.62(b): *The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the demonstration meets the requirements of paragraph (a) of this section.*

I, Steven F. Putrich, being a Registered Professional Engineer in good standing in the State of Ohio, do hereby certify, to the best of my knowledge, information, and belief, that the information contained in this certification has been prepared in accordance with the accepted practice of engineering. I certify, for the above-referenced CCR Unit, that the demonstration that the CCR Unit is not located within 60 meters (200 feet) of the outermost damage zone of a fault that has had a displacement in Holocene time as included in the CCR Rule Location Restrictions Evaluation memorandum dated 12 October 2018 meets the requirements of 40 CFR §257.62(a).

Signed: 
Consulting Engineer

Print Name: Steven F. Putrich
Ohio License No.: 67329
Title: Vice President
Company: Haley & Aldrich, Inc.

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MEMORANDUM

16 October 2018
File No. 129788

SUBJECT: Location Restriction Demonstration – Seismic Impact Zone
Zimmer Power Station
Gypsum Recycle Pond
Moscow, Ohio


Dynegy Zimmer, LLC operates the coal-fired Zimmer Power Station (Plant) located near Moscow, Ohio. The Gypsum Recycle Pond (Unit) is an existing coal combustion residuals (CCR) surface impoundment. This demonstration addresses the requirements of 40 CFR §257.63 (*Seismic Impact Zones*) of the U.S. Environmental Protection Agency's (EPA) rule entitled *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities*. 80 Fed. Reg. 21,302 (Apr. 17, 2015) (promulgating 40 CFR §257.63); Fed. Reg. 36,435 (July 30, 2018) (amending 40 CFR §257.63).

§257.63(a): New CCR landfills, existing and new CCR surface impoundments, and all lateral expansions of a CCR unit must not be located in seismic impact zones unless the owner or operator demonstrates by the dates specified in paragraph (c) of this section that all structural components including liners, leachate collection and removal systems, and surface water control systems, are designed to resist the maximum horizontal acceleration in lithified earth material for the site.

A Seismic Impact Zone is defined in 40 CFR §257.63 as "an area having a 2% or greater probability that the maximum expected horizontal acceleration, expressed as a percentage of the earth's gravitational pull (g), will exceed 0.10 g in 50 years." The 2014 U.S. Geological Survey Hazard Map raw data for the Zimmer Gypsum Recycle Pond indicates that the maximum expected horizontal acceleration for 2 percent probability of exceedance in 50 years is 0.08g. Accordingly, the Unit is not located in a seismic impact zone and a demonstration that the structural components have been designed to resist the maximum horizontal acceleration in lithified earth material for the site is not required.

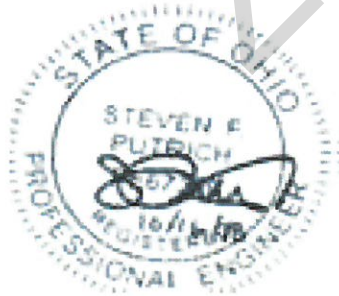
§257.63(b): *The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the demonstration meets the requirements of paragraph (a) of this section.*

I, Steven F. Putrich, being a Registered Professional Engineer in good standing in the State of Ohio, do hereby certify, to the best of my knowledge, information, and belief, that the information contained in this certification has been prepared in accordance with the accepted practice of engineering. I certify, for the above-referenced CCR Unit, that the demonstration that the CCR Unit is not located in a seismic impact zone as included in the CCR Rule Location Restrictions Evaluation memorandum dated 12 October 2018 and, therefore, meets the requirements of 40 CFR §257.63(a).

Signed: 
Consulting Engineer

Print Name: Steven F. Putrich
Ohio License No.: 67329
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MEMORANDUM

16 October 2018

File No. 129788

SUBJECT: Location Restriction Demonstration – Unstable Areas
Zimmer Power Station
Gypsum Recycle Pond
Moscow, Ohio

Dynegy Zimmer, LLC operates the coal-fired Zimmer Power Station (Plant) located near Moscow, Ohio. The Gypsum Recycle Pond (Unit) is an existing coal combustion residuals (CCR) surface impoundment. This demonstration addresses the requirements of 40 CFR §257.64 (*Unstable Areas*) of the US Environmental Protection Agency's (EPA) rule entitled *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities*. 80 Fed. Reg. 21,302 (Apr. 17, 2015) (promulgating 40 CFR §257.63); Fed. Reg. 36,435 (July 30, 2018) (amending 40 CFR §257.63).

§257.64(a): An existing or new CCR landfill, existing or new CCR surface impoundment, or any lateral expansion of a CCR unit must not be located in an unstable area unless the owner or operator demonstrates by the dates specified in paragraph (d) of this section that recognized and generally accepted good engineering practices have been incorporated into the design of the CCR unit to ensure that the integrity of the structural components of the CCR unit will not be disrupted.

§257.64(b): The owner or operator must consider all of the following factors, at a minimum, when determining whether an area is unstable:

- (1) On-site or local soil conditions that may result in significant differential settling;*
- (2) On-site or local geologic or geomorphologic features; and*
- (3) On-site or local human-made features or events (both surface and subsurface).*


Conditions associated with the potential for significant differential settlement due to liquefaction were not identified. A liquefaction analysis performed at the Gypsum Recycle Pond concluded that the alluvial and glacial outwash soils that underlie the site are not susceptible to liquefaction.

In addition, based on available U.S. Geological Survey (USGS), Ohio Department of Natural Resources, and other publicly available information, karst topography or physiographic features such as sinkholes, vertical shafts, sinking streams, caves, large springs, or blind valleys do not exist at the Plant. To evaluate the susceptibility of landslides, we reviewed readily available USGS data, Ohio Department of Transportation data, and information included in the Clermont County All-Hazards Mitigation Plan, and inquired with site personnel. The USGS data indicates that the Plant is in an area of high landslide incidence; however, local information included in the Clermont County All-Hazards Mitigation Plan and Ohio Department of Transportation data, and site-specific inquiries with site personnel indicate that there are no historic landslides within a mile of the Plant and the site is not a high-risk area for landslide

susceptibility. Accordingly, it is our opinion that the Unit is not located in an area that has high susceptibility to landslides. Finally, there are no documented surface or subsurface anthropogenic activities that would be indicative of creating unstable foundation conditions.

§257.64(c): The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the demonstration meets the requirements of paragraph (a) of this section.

I, Steven F. Putrich, being a Registered Professional Engineer in good standing in the State of Ohio, do hereby certify, to the best of my knowledge, information, and belief, that the information contained in this certification has been prepared in accordance with the accepted practice of engineering. I certify, for the above-referenced CCR Unit, that the demonstration indicating the CCR Unit is not located in an unstable area as included in the CCR Rule Location Restrictions Evaluation memorandum dated 12 October 2018 and, therefore, meets the requirements of 40 CFR §257.64(a).

Signed: 
Consulting Engineer

Print Name: Steven F. Putrich
Ohio License No.: 67329
Title: Vice President
Company: Haley & Aldrich, Inc.

Professional Engineer's Seal:

