

**Environmental
Resources
Management**

October 12, 2016

Mr. Ali Abazari
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Project No. 0336706

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Subject: CCR Surface Impoundment Liner Design Criteria
Ash Ponds and Scrubber Sludge Pond
TMPA Gibbons Creek Steam Electric Station,
Grimes County, Texas



Dear Mr. Abazari:

At the request of Jackson Walker L.L.P. (Jackson Walker), and on behalf of Texas Municipal Power Agency (TMPA), Environmental Resources Management (ERM) is pleased to submit this letter report in accordance with the U.S. Environmental Protection Agency (EPA) published rule for the management of Coal Combustion Residuals (CCR) Generated from Electric Utilities (the CCR Rule), published on April 17, 2015 under Title 40, Code of Federal Regulations, Part 257 (40 CFR Part 257). Documents referenced in this letter report, and posted on the facility operating record, are listed in Attachment 1.

Introduction

TMPA owns and operates the Gibbons Creek Steam Electric Station (GCSES) facility in Grimes County, Texas. The GCSES generates CCR that are subject to regulation under Title 40, Code of Federal Regulations, Part 257 (40 CFR Part 257)(the CCR Rule).

TMPA operates two CCR surface impoundments at the GCSES:

- (1) the Ash Ponds (APs); and
- (2) the Scrubber Sludge Pond (SSP).

The CCR Rule requires that owners and operators of existing CCR Surface Impoundments document whether the unit was constructed with a liner that meets the requirements of the CCR Rule.

As described in 40 CFR §257.71, existing CCR Surface Impoundments are considered unlined unless they were constructed with one of either:

- 1) A liner consisting of a minimum of two feet of compacted soil with a permeability less than or equal to 1×10^{-7} centimeters per second (cm/sec);

- 2) A composite liner consisting of a minimum 30-mil thick upper geomembrane component, and a lower component consisting of a minimum of two feet of compacted soil with a permeability less than or equal to 1×10^{-7} cm/sec; or
- 3) An alternative composite liner consisting of a minimum 30-mil thick upper geomembrane component, and a lower component (that is not a geomembrane) with the liquid flow rate consistent with that of a minimum of two feet of compacted soil with a permeability less than or equal to 1×10^{-7} cm/sec.

This letter summarizes the information documenting liner construction of the TMPA GCSES CCR surface impoundments and documents compliance with 40 CFR §257.71, Liner Design Criteria For Existing CCR Surface Impoundments.

Summary of Available Documentation, Ash Ponds

As described in documents in the TMPA operating record, the APs were designed by Tippet & Gee, Inc. and constructed by R. N. Adams Construction Company in 1977. The APs were constructed by excavation and fill to lines and grades in accordance with technical specifications and drawings for the facility.

During construction of the APs, a five-foot deep inspection trench was excavated, exposed soil examined, and then backfilled with compacted clay along the exterior perimeter of the bottom of the APs. The inspection trench was used to identify, and where found replace, pervious soils along the route of the inspection trench. Lignite and sandy soils encountered during construction of the inspection trench and elsewhere on the AP interior excavation surface were excavated to a level three feet below the finished grade surface and replaced with compacted clay (T&G 1977a, T&G 1977b, T&G 1978).

Prior to plant operation, several soil tests were conducted to evaluate the characteristics of the natural soil liner. Results of some of these tests indicated characteristics in portions of liner that did not achieve criteria set out in a guidance document by the Texas Department of Water Resources (TDWR, predecessor to the Texas Commission on Environmental Quality, TCEQ). TDWR guidelines for surface impoundment specified a liner of four feet of natural soil or three feet of compacted clay with the following properties:

- at least 30% soil particles passing the No. 200 sieve;
- a Liquid Limit of at least 30;
- a Plasticity Index of at least 15; and
- a permeability less than or equal to 1×10^{-7} cm/sec.

Subsequently, parts of the liner that did not achieve those criteria were excavated, replaced with three or more feet of clay compacted in eight to nine inch lifts, and retested to confirm conformance with the TDWR guidelines stated above (NSS 1981). Tippet & Gee subsequently provided a certification letter that the APs met the TDWR guidelines (T&G 1981).

However, as only a portion of the APs bottom liner was constructed with compacted clay in accordance with 40 CFR §257.71 (*i.e.* two feet of compacted clay with a permeability less than or equal to 1×10^{-7} cm/sec or a 30-mil geomembrane overlying two feet of compacted clay with a permeability less than or equal to 1×10^{-7} cm/sec), the APs are existing unlined CCR surface impoundments. Consequently, the APs may continue serving as a CCR surface impoundment prior to closure or retrofit of the APs when chosen by TMPA or otherwise required in accordance with 40 CFR §257.101 or 40 CFR §257.102.

Summary of Available Documentation, Scrubber Sludge Pond

As described in documents in the TMPA operating record, the SSP was designed by Tippet & Gee, Inc. and constructed by R. N. Adams Construction Company in 1977. The SSP was constructed by excavation and fill to lines and grades in accordance with technical specifications and drawings for the facility.

During construction of the SSP, a five-foot deep inspection trench was excavated, exposed soil, examined, and then backfilled with compacted clay along the exterior perimeter of the bottom of the SSP. The inspection trench was used to identify and where found to replace, pervious soils along the route of the inspection trench. Lignite and sandy soils encountered during construction of the inspection trench and elsewhere on the SSP interior excavation surface were excavated to three feet below the SSP interior finished grade surface and replaced with compacted clay (T&G 1977a).

Seepage was observed at locations on the exterior of the SSP dikes in 1983 on initial receipt of wastewater in the SSP. In response, TMPA conducted a study of the SSP dikes to evaluate the location of the seep and to develop options to correct the seep (NSS 1983).

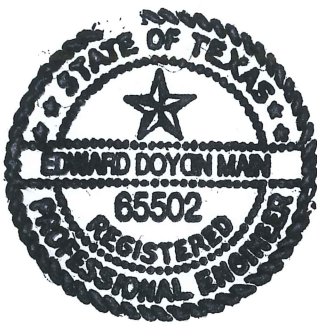
In accordance with NSS recommendations, a 36-mil thick, fabric reinforced "Hypalon" geomembrane liner supplied by J. P. Stevens & Co., Inc. was installed by Staff Industries, Inc. (SII) in 1985. SII subsequently provided a certification letter that the "Hypalon" liner was installed in accordance with the liner plans and specifications (TMPA 1983 and --- unknown). TMPA obtained a 20-year material warranty for the liner provided by J. P. Stevens (SII 1985). . The geomembrane liner achieves the geomembrane component requirements of a composite liner defined in 40 CFR §257.70(b), *i.e.* a minimum 30-mil geomembrane.

However, only a portion of the SSP liner supporting the geomembrane was constructed with compacted clay achieving requirements in 40 CFR §257.71(a)(1)(i). Therefore, the SSP is an existing unlined CCR surface impoundment. Consequently, the SSP may continue serving as a CCR surface impoundment prior to closure or retrofit when chosen by TMPA or otherwise required in accordance with 40 CFR §257.101 or 40 CFR §257.102.

Professional Engineer's Certification

40 CFR §257.71(b) requires that the owner or operator of the CCR unit obtain certification from a professional engineer that the documentation presented in this letter demonstrating whether the CCR units meet the requirements of 40 CFR §257.71(a) is accurate. That certification is provided below.

I hereby certify that I have reviewed the available documentation for the Ash Ponds and the Scrubber Sludge Pond CCR surface impoundments at the Gibbons Creek Steam Electric owned and operated by the Texas Municipal Power Agency in Grimes County, Texas, and being familiar with the provisions of 40 CFR Part 257.71, attest that this documentation is accurate to the best of my knowledge.



E. Doyon Main, P.E.
Printed Name of Licensed Professional Engineer


Signature of Licensed Professional Engineer

Date: 10/12/16

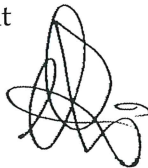
Please contact us if you have questions about this report.

Sincerely,

Environmental Resources Management



Jim Davidson, P.G.
Partner



E. Doyon Main, P.E.
Project Engineer

Referenced Document List
Attachment 1

October 2016
Project No. 0336706
Jackson Walker

Environmental Resources Management
CityCentre Four
840 West Sam Houston Parkway North, Suite 600
Houston, Texas 77024-3920
(281) 600-1000

ATTACHMENT 1

Referenced Document List

Data from the following documents were used for the CCR Surface Impoundment Liner Construction Documentation, Ash Ponds and Scrubber Sludge Pond, TMPA Gibbons Creek Steam Electric Station, Grimes County, Texas. Those documents are posted on the facility operating record.

- NSS 1981 *Summary of Testing of Ash Ponds, Gibbons Creek Steam Electric Station, Grimes County, Texas, Report No. D-76602-4, NFS/National Soil Services, Inc. March 2, 1981.*
- NSS 1983 *Sludge Pond Study, Gibbons Creek Steam Electric Station, Grimes County, Texas, Job No. D-76602-52, NFS/National Soil Services, Inc. October 21, 1983.*
- SII, 1985 *Sludge Pond Liner Certification and Warranty, Staff Industries, Inc., Edward C. Staff, March 27, 1985*
- T&G 1977a *Specifications and Contract Documents for Site Preparation, Gibbons Creek Steam Electric Station, Unit No. 1, Texas Municipal Power Agency, Specification No. GC-1022, Tippet & Gee, Inc. March, 1977.*
- T&G 1977b *Sections, Site-Grading, Gibbons Creek S.E.S. Unit No. 1, Texas Municipal Power Agency, Drawing No. C-230-003, Tippet & Gee, Inc. April 21, 1977, revised October 28, 1977.*
- T&G 1978 *Plant Site Layout, Gibbons Creek S.E.S. Unit No. 1, Texas Municipal Power Agency, Drawing No. C-230-001, Tippet & Gee, Inc. April 21, 1977, revised May 14, 1978.*
- T&G 1981 *Ash Pond Lining Certification, Gibbons Creek S.E.S. Unit No. 1, Texas Municipal Power Agency, Tippet & Gee, Inc., March 13, 1981*
- TMPA 1983 *Specifications For Material and Installation of a Flexible Membrane Liner for a Sludge Disposal Pond, Gibbons Creek Steam Electric Station, Unit No. 1, Texas Municipal Power Agency, Specification No. SPPE-84001, J. Schults, TMPA, December, 1983.*
- (unknown) *Specifications, Site Preparation of Sludge Pond Prior to Installation of Liner, unknown author, unknown date.*