

Stormwater Run-on and Run-off Control System Plan

for

**Site F CCR Landfill
Gibbons Creek Steam Electric Station
Carlos, Texas**

October 2016

Owner/Developer:

Texas Municipal Power Agency

Carlos, Texas

Prepared By:



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Site F CCR Landfill
Gibbons Creek Steam Electric Station
Carlos, Texas**

ENGINEER

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OWNER

Texas Municipal Power Agency
P.O. 7000
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GENERAL DESCRIPTION, LOCATION AND DESIGN PARAMETERS

This plan describes the run-on and runoff controls for the Site F CCR Landfill at the Gibbons Creek Steam Electric Station in Carlos, Texas. The Site F Landfill receives Coal Combustion Waste products such as fly ash, bottom ash and gypsum. The landfill has been in operation for approximately 25 years. The overall area of the landfill is about 100 acres. A majority of the landfill has its final soil cap in place and is covered with grass. The rainfall run-off from these areas is not captured by the active landfill area as it discharges onto the surrounding area.

Exhibit A shows is a drainage area map of the landfill. The run-off from Drainage Area 1 flows east and goes through an existing pond before discharge onto the surrounding area.

Drainage Area 2 flows south toward the active area, however, the run-off is not allowed to run-on the active area as the run-off is diverted around the active area by a swale and an earthen diversion berm. The following section provides an analysis of the swale and berm. This analysis shows the run-off for the 24-hour, 25-year storm does not run-on the active area.

Drainage Area 3 is the active area which consists of the exposed waste materials and the run-on storage pond. The rainfall that falls into Drainage Area 3 is completely captured and not allowed to run-off this active area. A perimeter containment dike is in place to provide storage and contain the waste materials and the rainfall. The analysis in the following section shows the run-on storage pond is adequate for containing the rainfall from a 24-hour, 25-year storm. The rainfall that accumulates in the run-on storage pond is kept at or near the normal pool level by evaporation, transferring the water to the power plant, using the water for dust control within the active area or using the water to make a fly ash slurry.

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DRAINAGE ANALYSIS

Drainage Area 2 – diversion swale and berm

<i>Methodology:</i>	The runoff peak flowrate and volume were computed using SCS methods and the HEC computer program.
<i>Time of Concentration, T_c:</i>	40 minutes, Lag = 24 minutes, 0.4 hour
<i>Design Storm Event:</i>	25-year, 24-hour storm, Type III, 9.0 inches of precipitation
<i>Runoff Curve Number:</i>	78
<i>Drainage Area:</i>	33.02 acres, 0.051594 square miles, the drainage area is shown on Exhibit A
<i>Design Constraints:</i>	No rainfall run-off overtopping the diversion berm for the 24 hour, 25 year storm
<i>Design Results:</i>	The peak run-off for the 24 hour, 25 year, storm event is 125 cfs. The flow depth in the swale is evaluated near its discharge point where this flow is achieved. The flow depth in the swale adjacent to the diversion berm is 1.8'. The diversion berm at this location has a minimum height of 3', therefore the freeboard is greater than 1'
<i>Applicable Exhibits:</i>	Exhibit A – Drainage Area Map

Drainage Area 3 – Active area storage determination

<i>Methodology:</i>	The runoff peak flowrate and volume were computed using SCS methods and the HEC computer program.
<i>Time of Concentration, T_c:</i>	20 minutes, Lag = 12 minutes, 0.2 hour
<i>Design Storm Event:</i>	25-year, 24-hour storm, Type III, 9.0 inches of precipitation
<i>Runoff Curve Number:</i>	80
<i>Drainage Area:</i>	30.37 acres, 0.047453 square miles, the drainage area is shown on Exhibit A
<i>Design Constraints:</i>	No rainfall run-on discharged from the Run-on Storage Pond
<i>Design Results:</i>	The peak run-off for the 24 hour, 25 year, storm event is 160 cfs and the volume of run-off is 16.6 acre-feet. The typical water

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surface elevation for the pond is elevation is 265. The amount of storage in the pond at elevation 285, one foot below the containment dike berm is approximately 50 acre-feet which is more than 3 times the storage required. Additional storage is also available in the active waste material storage area.

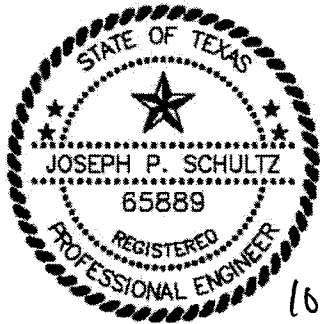
Applicable Exhibits: Exhibit A – Drainage Area Map

CONCLUSION

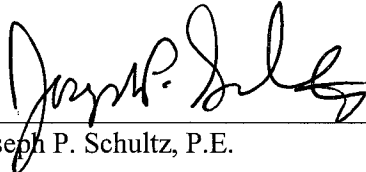
The Site F CCR Landfill Run-on and Run-off Controls are in compliance with the requirements of Federal Register, Vol. 80, No. 74, April 17, 2015, Rules and regulations, Section 257.81.

CERTIFICATION

I, Joseph P. Schultz, Licensed Professional Engineer No. 65889 State of Texas, certify that this Stormwater Run-on and Run-off Control System Plan for the Site F Landfill was prepared by me in accordance with good engineering standards and procedures.



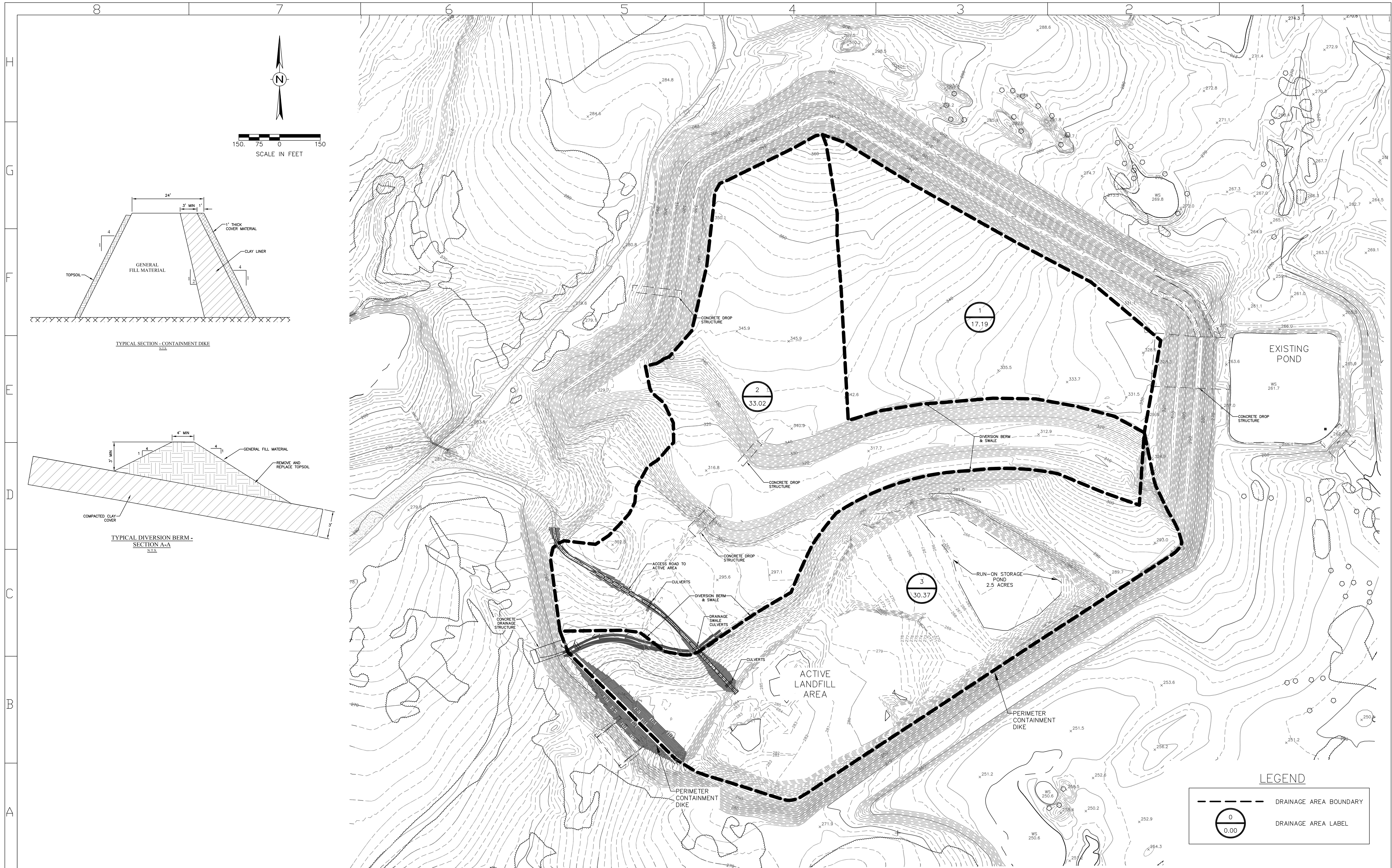
16-14-16



Joseph P. Schultz, P.E.

F-12327
SCHULTZ ENGINEERING, LLC.

EXHIBIT A
Drainage Area Map



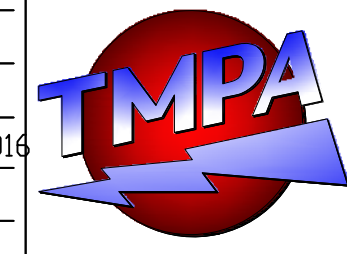
LEGEND

	DRAINAGE AREA BOUNDARY
	DRAINAGE AREA LABEL

REV	DATE	DESCRIPTION	BY	CHK	APP	REV	DATE	DESCRIPTION	BY	CHK	APP

Schultz Engineering, LLC
 911 Southwest Pkwy E
 College Station, Texas 77840
 979.764.3900 TBPE FIRM NO. 12327

SCALE : 1"=150'
 DRAWN BY : JSA
 DEPT. : SE
 DATE : OCTOBER 2016
 CHECKED : JPS
 APPROVED : JPS



TEXAS MUNICIPAL POWER AGENCY
 PROUDLY SERVING THE TEXAS CITIES OF
 BRYAN-DENTON-GARLAND-GREENVILLE
**SITE F CCR LANDFILL
 DRAINAGE AREA MAP**

ABN NO.	REV.
EXHIBIT	
A	

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