Run-on and Run-off Control System Plan

H.W. Pirkey Power Plant Stack-Out Pad
Hallsville, Harrison County, Texas

October 6, 2021
Akron Project Number: 237P-2109

Prepared for:
American Electric Power
1 Riverside Plaza
Columbus, Ohio 43215

Prepared by:
Akron Consulting, LLC
431 N Center St.
Longview, Texas 75601
TBPE Firm # 14014

Table of Contents

1.0 INTRODUCTION

30 TAC 352.811 (Federal Regulation Title 40, Part 257.81) requires the owner or operator of an existing or new CCR landfill or any lateral expansion of an existing CCR landfill to comply with the following:

1. A run-on control system to prevent flow onto the active portion of the CCR unit during the peak discharge from a 24-hour, 25-year storm.
2. A run-off control system from the active portion of the CCR unit to collect and control at least the water volume resulting from a 24-hour, 25-year storm.
3. Run-off from the active portion of the CCR unit must be handled in accordance with the surface water requirements under §257.3-3.
4. Prepare initial and periodic run-on and run-off control system plans for the CCR unit according to the following timeframes:
    a. For existing CCR landfills, the owner or operator of the CCR unit must prepare the initial run-on and run-off control system plan no later than October 17, 2016.
    b. The owner or operator of the CCR unit must prepare periodic run-on and run-off control system plans every five (5) years.
5. Obtain a certification from a qualified professional engineer stating that the initial and periodic run-on and run-off control system plans meet the requirements of this section.
6. Comply with the recordkeeping requirements specified in §257.105(g), the notification requirements specified in §257.106(g), and the internet requirements specified in §257.107(g).

This Plan represents the 5-year revision of the original Run-on and Run-off Control System Plan, dated October 2016, and presents the regulatory-required materials as noted above. It is prepared for the stack-out pad at AEP's H.W. Pirkey Power Plant in Hallsville, Texas.

2.0 RUN-ON CONTROLS

The purpose of run-on controls is to prevent storm water from entering into the stack-out pad from a 24-hour, 25-year storm.

2.1 Run-On Controls Outside the Stack-Out Pad

2.1.1 Diversion Dikes and Berms

An HDPE lined berm is located around the southern, western, and eastern sides of the stack-out pad. This berm provides a barrier that will not allow stormwater from the plant to enter the stack-out pad.

2.1.2 Stormwater Perimeter Ditches

A stormwater ditch to the east of the stack-out pad directs run-on water away from the proposed berm to the Auxiliary Surge Pond. See Appendix A for calculations. Stormwater to the south surface drains away from the berm to the south. Stormwater on the west side of the stack-out pad flows to the north.

3.0 RUN-OFF CONTROLS

The run-off control system prevents flow (contact water) from leaving the stack-out pad during a 24-hour, 25-year storm. Run-off control consists of the following aspects:

- Perimeter HDPE lined berm
- Perimeter Ditches
- Surge Pond

Stormwater from the stack-out pad travels to the surge pond via perimeter ditches. Perimeter HDPE lined berms help to ensure that stormwater is directed to these ditches and does not leave the stack-out pad. The surge pond accepts all stormwater from the stack-out pad, and water from the surge pond is utilized by the power plant in the FGD system.

3.1 Perimeter HDPE Lined Berm

The entire stack-out pad is surrounded on three sides by an HDPE lined berm. The berm is 1.5' tall, with a 3' top width. Not only does the berm prevent run-on from entering the stack-out pad, it directs stormwater inside the stack-out pad to enter perimeter ditches that carry contact water to the surge pond. The design calculations for the Perimeter HDPE lined berms are a function of the perimeter ditches, and calculations for the perimeter ditches are provided in Figure 1.

3.2 Perimeter Ditches

Perimeter ditches inside the stack-out pad transport contact water to the surge pond. One perimeter ditch on the west side of the stack-out pad discharges directly into the surge pond, while another perimeter ditch on the east side discharges into a culvert which discharges into a ditch that enters the auxiliary surge pond. The stack-out pad is graded to divert stormwater to these ditches. Design calculations for the perimeter ditches are provided in Figure 1.

3.3 Surge Pond

All stormwater from the stack-out pad enters the surge pond. Water in the surge pond is utilized by the power plant in the FGD system.

4.0 PLAN REVIEW AND CHANGES IN FACILITY OPERATION

Stack-out Pad Owner and/or Operator will review and evaluate this Plan every five (5) years from initial plan preparation and when there are changes in the facility design, construction, operation, or maintenance that materially affect the facility's potential for run-on and run-off control. Amendments to the Plan made to address changes of this nature are referred to as technical or major amendments, and must be certified by a P.E. Non-technical amendments can be performed by the facility owner and/or operator. This Plan represents the 5-year revision of the original Run-on and Run-off Control System Plan, dated October 2016.

Technical and administrative amendments to the Plan have been and will continue to be documented on the Plan Review Log. Owner/Operator will make the necessary revisions to the Plan as soon as possible, but no later than six months after the change occurs. The Plan must be implemented as soon as possible following a technical amendment, but no later than six months from the date of the amendment. The Designated Person is responsible for initiating and coordinating revisions to the SPCC Plan.

Scheduled reviews and Plan amendments will be recorded in the Plan Review Log provided in Appendix 2. The log will be completed even if no amendment is made to the Plan as a result of the review.

5.0 PROFESSIONAL ENGINEER CERTIFICATION

This revised Plan, and all subsequent reviews and amended plans, must obtain certification from a qualified P.E. stating that the initial and subsequent run-on and run-off control system plans meet the requirements of 40 CFR 257. This certification in no way relieves the owner or operator of the facility of his/her duty to fully implement this Plan. The Professional Engineer Certification page is provided in Appendix C.

APPENDIX A:
Figures and Calculations

DITCH DESCRIPTION	CAPACITY	25 YR, 24 HR FLOW
RUN-OFF PERIMETER DITCH #1	65 CFS	11.63 CFS
RUN-OFF PERIMETER DITCH #2	53 CFS	5.92 CFS
CULVERT FOR DITCH #2	6.6 CFS	5.92 CFS
STORMWATER PERIMETER DITCH	58 CFS	6.85 CFS
CULVERT FOR STORMWATER DITCH	10 CFS	6.85 CFS

AKRON CONSULTING, LLC.
431 N. CENTER ST.
LONGVIEW, TX 75601
TBPE Firm Reg. # 14014
(O) 903-236-9744
(F) 903-236-9745
www.akron-consulting.com

0 100' 200'
1"=100'

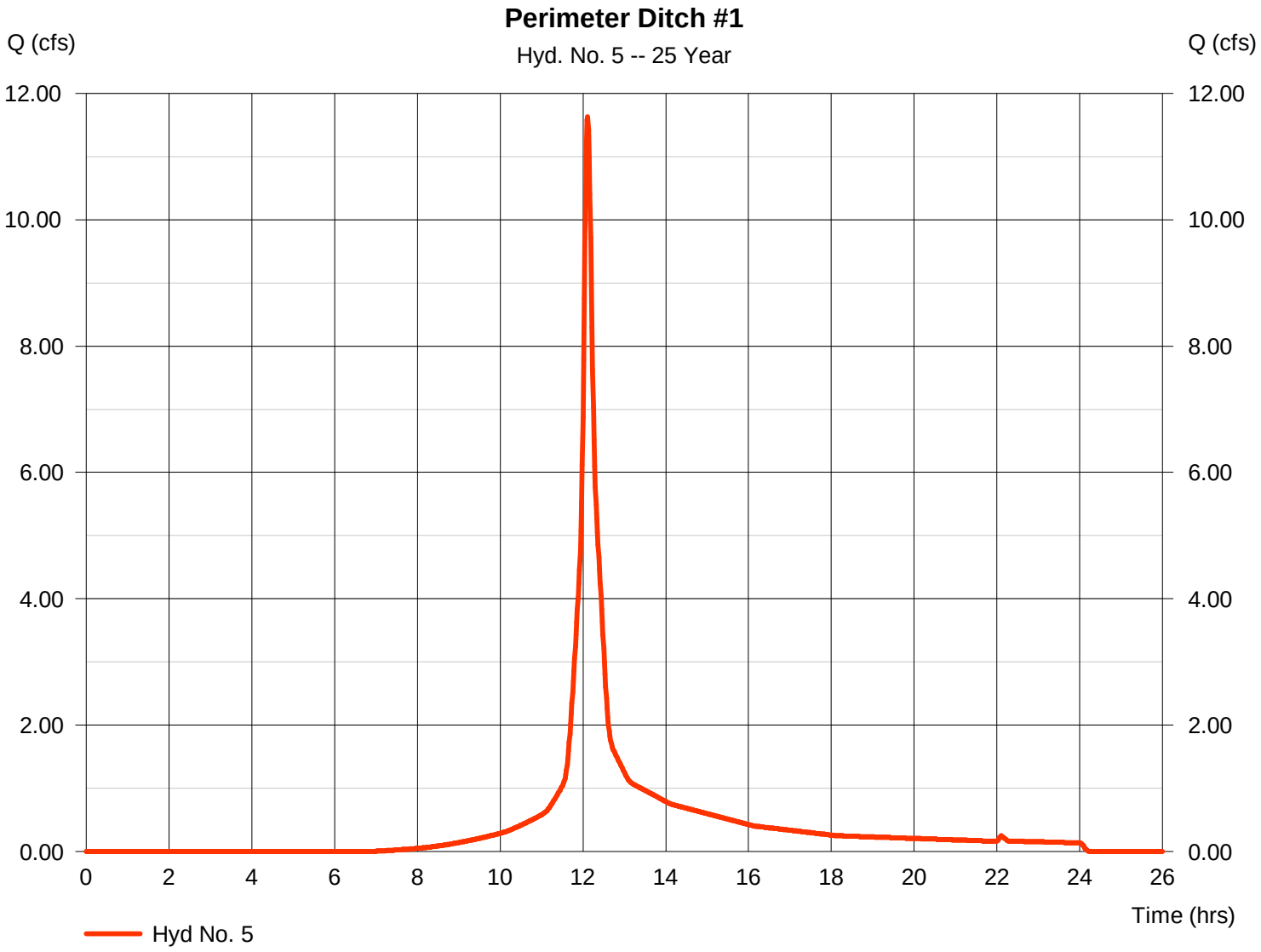
N

FIGURE 1
OVERALL STACKOUT EXHIBIT

Hydrograph Report

Perimeter Ditch #1

Hydrograph type	= SCS Runoff	Peak discharge	= 11.63 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.12 hrs
Time interval	= 1 min	Hyd. volume	= 39,978 cuft
Drainage area	= 2.120 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.30 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Channel Report

Hydraflow Express Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc. Wednesday, Sep 28 2016

Run-off Perimeter Ditch #1

Trapezoidal

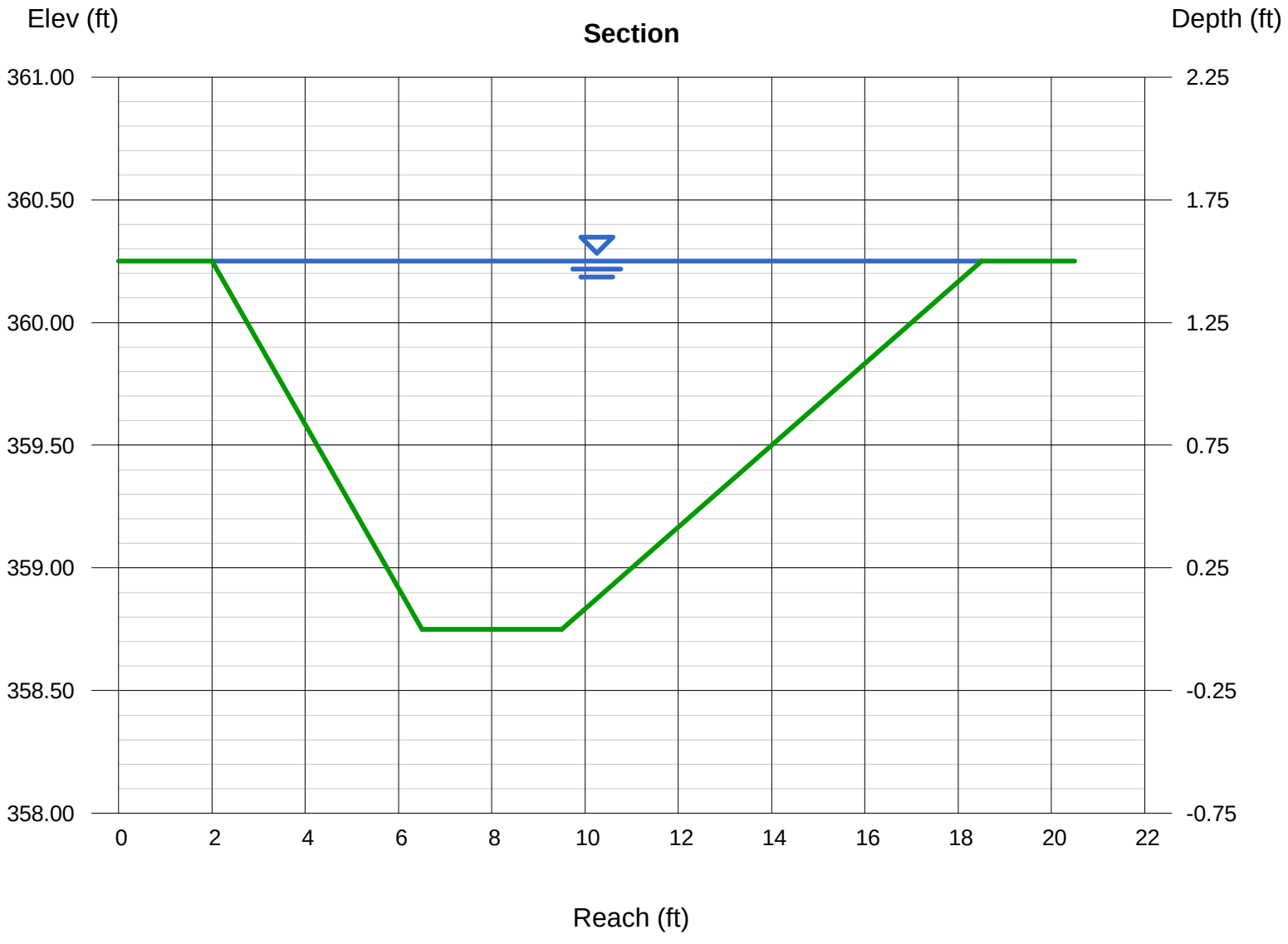
Bottom Width (ft)	= 3.00
Side Slopes (z:1)	= 3.00, 6.00
Total Depth (ft)	= 1.50
Invert Elev (ft)	= 358.75
Slope (%)	= 1.00
N-Value	= 0.030

Calculations

Compute by:	Known Depth
Known Depth (ft)	= 1.50

Highlighted

Depth (ft)	= 1.50
Q (cfs)	= 65.87
Area (sqft)	= 14.63
Velocity (ft/s)	= 4.50
Wetted Perim (ft)	= 16.87
Crit Depth, Yc (ft)	= 1.39
Top Width (ft)	= 16.50
EGL (ft)	= 1.82

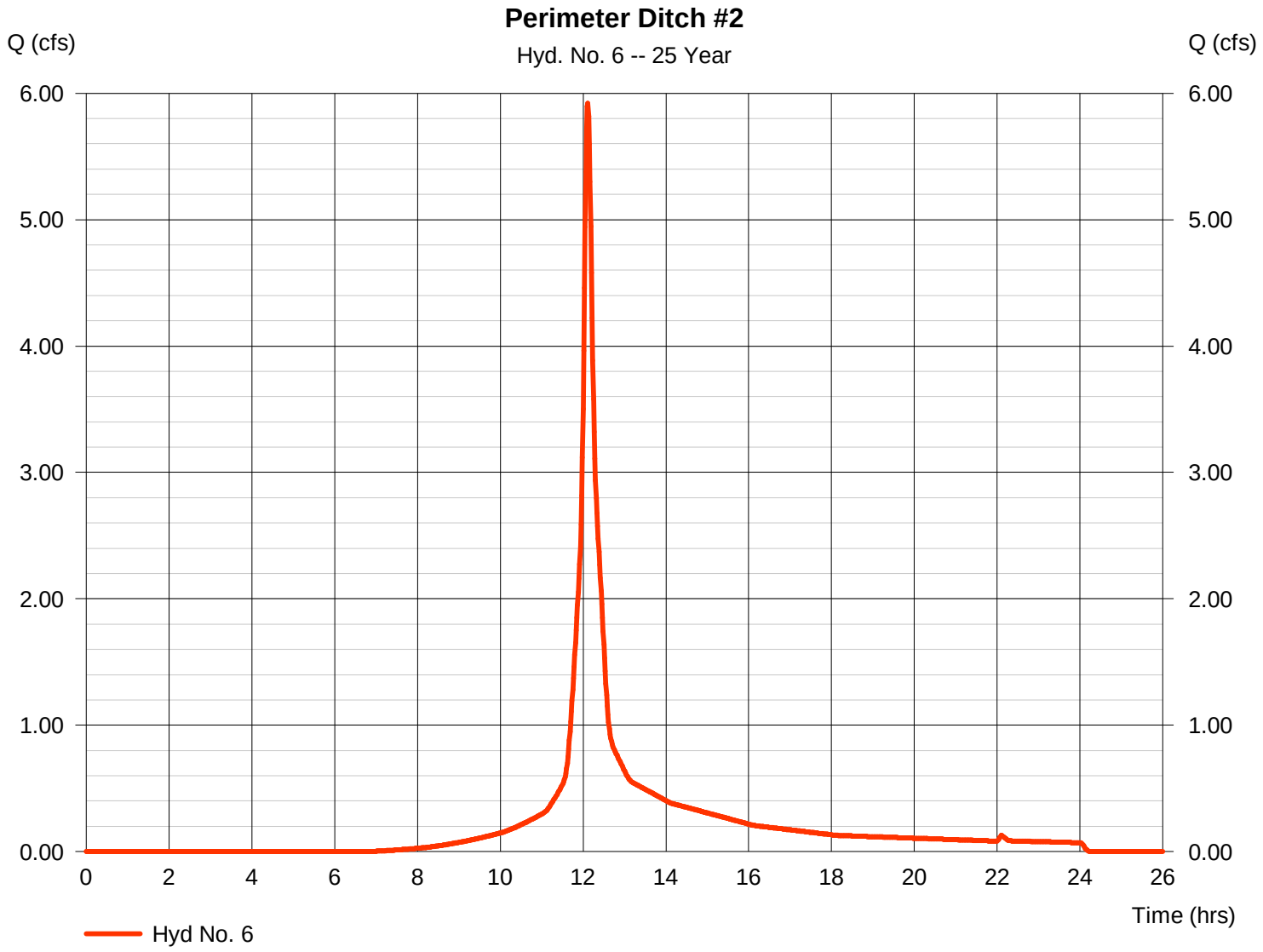


Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc. v9 Wednesday, 00 28, 2016

Perimeter Ditch #2

Hydrograph type	= SCS Runoff	Peak discharge	= 5.923 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.12 hrs
Time interval	= 1 min	Hyd. volume	= 20,366 cuft
Drainage area	= 1.080 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.30 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Channel Report

Run-off Perimeter Ditch #2

Trapezoidal

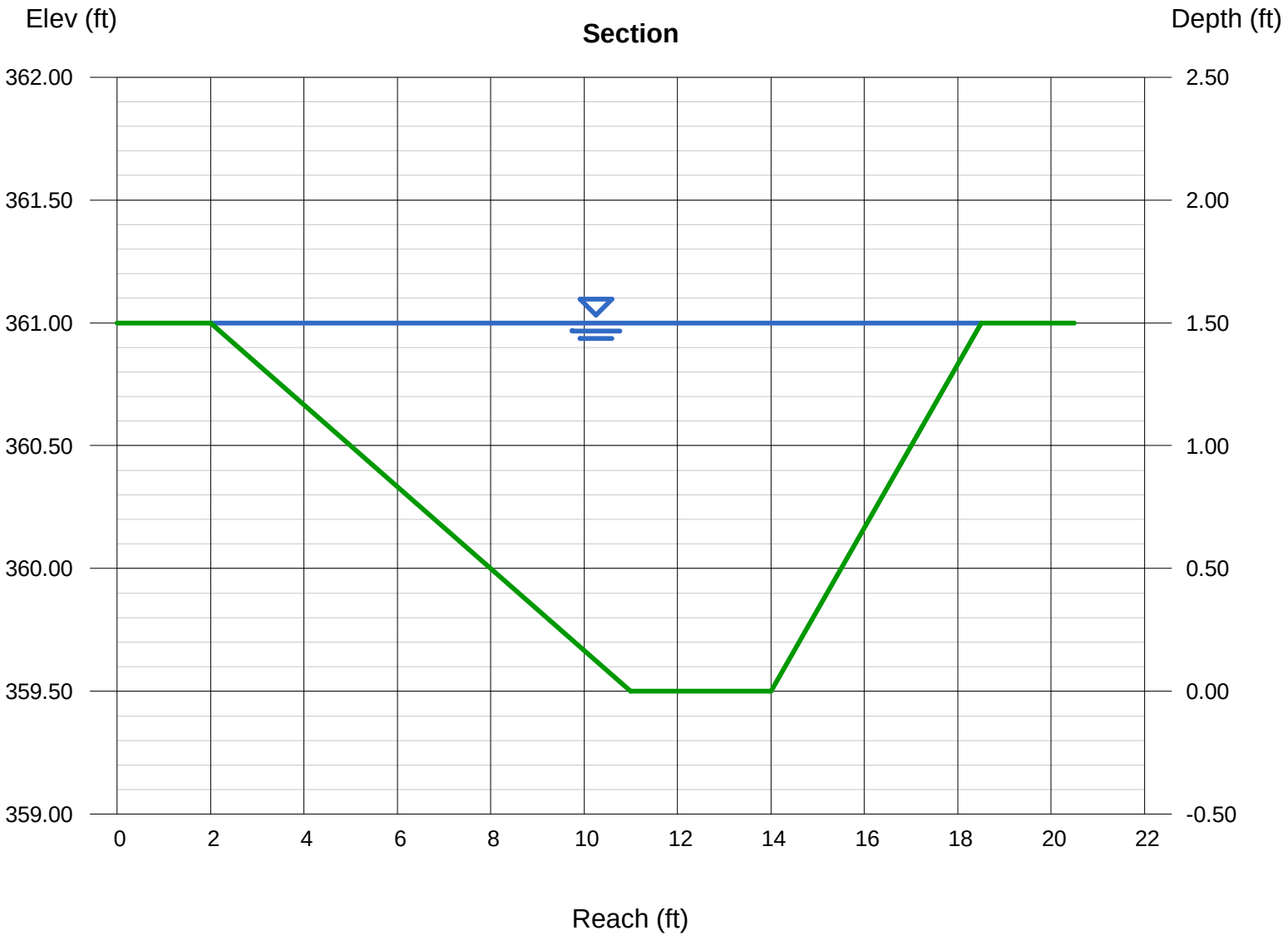
Bottom Width (ft)	= 3.00
Side Slopes (z:1)	= 6.00, 3.00
Total Depth (ft)	= 1.50
Invert Elev (ft)	= 359.50
Slope (%)	= 0.65
N-Value	= 0.030

Calculations

Compute by:	Known Depth
Known Depth (ft)	= 1.50

Highlighted

Depth (ft)	= 1.50
Q (cfs)	= 53.10
Area (sqft)	= 14.63
Velocity (ft/s)	= 3.63
Wetted Perim (ft)	= 16.87
Crit Depth, Yc (ft)	= 1.25
Top Width (ft)	= 16.50
EGL (ft)	= 1.70



Culvert Report

Hydraflow Express Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc. Wednesday, Sep 28 2016

Perimeter Ditch #2 Culvert

Invert Elev Dn (ft)	= 359.00
Pipe Length (ft)	= 65.00
Slope (%)	= 0.65
Invert Elev Up (ft)	= 359.42
Rise (in)	= 14.7
Shape	= Cir
Span (in)	= 14.7
No. Barrels	= 1
n-Value	= 0.012
Inlet Edge	= Projecting
Coeff. K,M,c,Y,k	= 0.0045, 2, 0.0317, 0.69, 0.5

Embankment

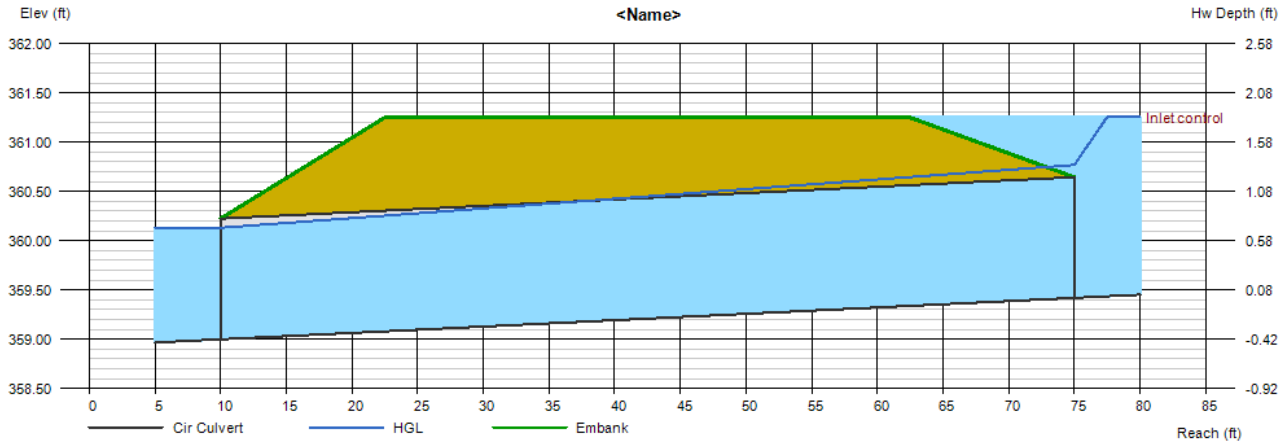
Top Elevation (ft)	= 361.25
Top Width (ft)	= 40.00
Crest Width (ft)	= 20.00

Calculations

Qmin (cfs)	= 6.60
Qmax (cfs)	= 6.60
Tailwater Elev (ft)	= (dc+D)/2

Highlighted

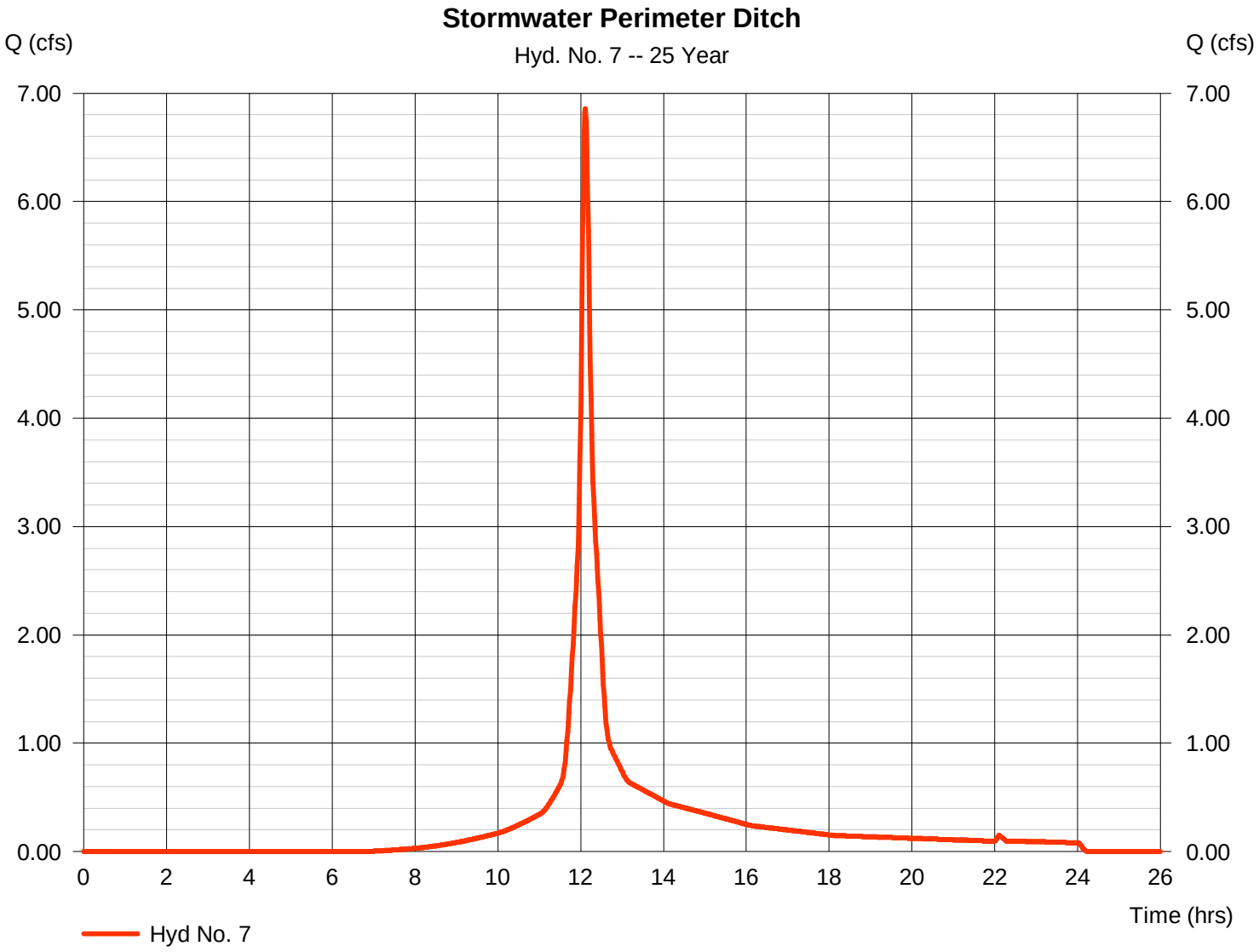
Qtotal (cfs)	= 6.60
Qpipe (cfs)	= 6.60
Qovertop (cfs)	= 0.00
Veloc Dn (ft/s)	= 5.80
Veloc Up (ft/s)	= 5.60
HGL Dn (ft)	= 360.13
HGL Up (ft)	= 360.77
Hw Elev (ft)	= 361.26
Hw/D (ft)	= 1.50
Flow Regime	= Inlet Control



Hydrograph Report

Stormwater Perimeter Ditch

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.855 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.12 hrs
Time interval	=	1 min	Hyd. volume	=	23,572 cuft
Drainage area	=	1.250 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	8.30 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Channel Report

Hydraflow Express Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc. Wednesday, Sep 28 2016

Run-on Perimeter Ditch

Trapezoidal

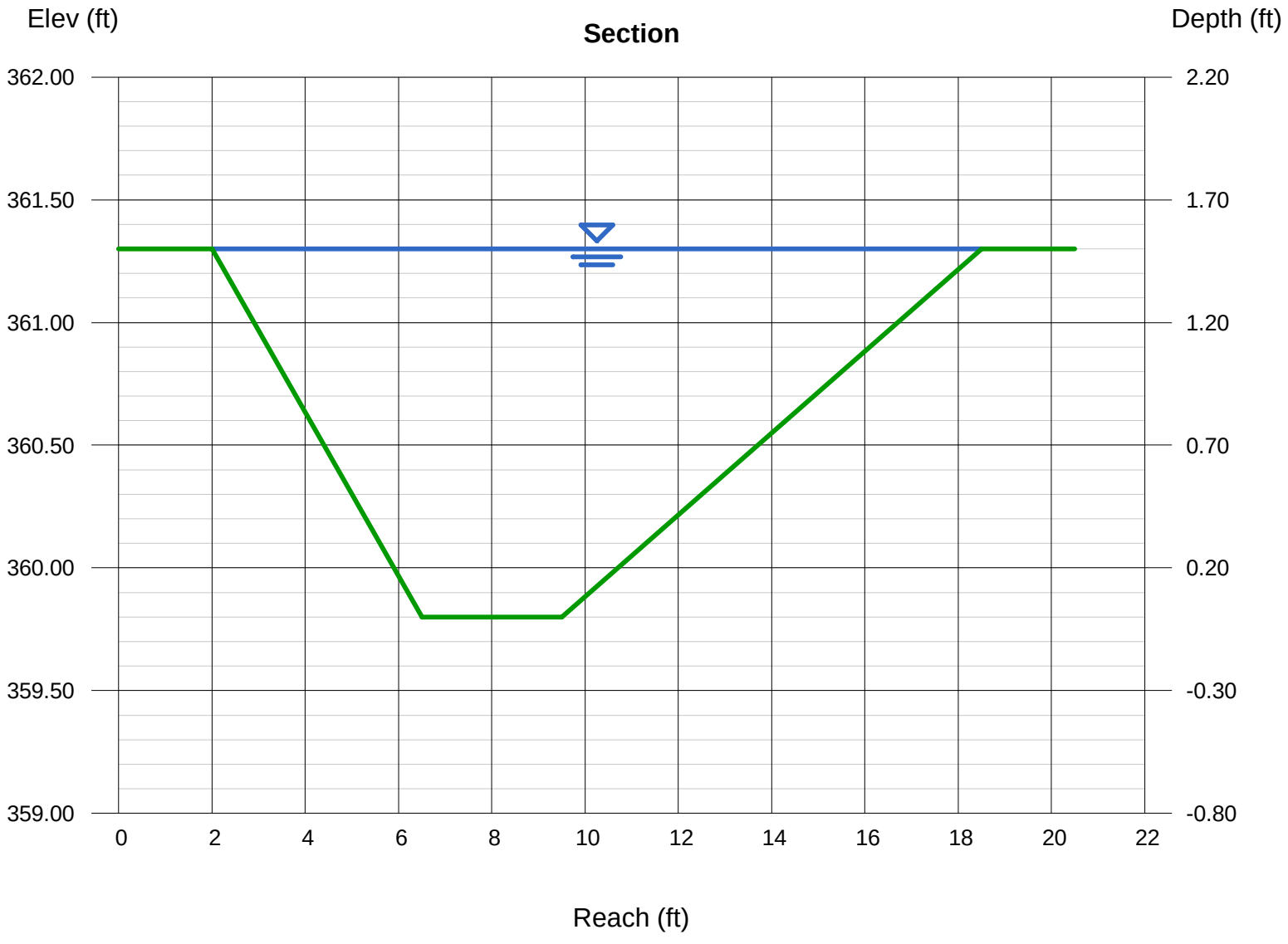
Bottom Width (ft)	= 3.00
Side Slopes (z:1)	= 3.00, 6.00
Total Depth (ft)	= 1.50
Invert Elev (ft)	= 359.80
Slope (%)	= 0.80
N-Value	= 0.030

Calculations

Compute by:	Known Depth
Known Depth (ft)	= 1.50

Highlighted

Depth (ft)	= 1.50
Q (cfs)	= 58.91
Area (sqft)	= 14.63
Velocity (ft/s)	= 4.03
Wetted Perim (ft)	= 16.87
Crit Depth, Yc (ft)	= 1.32
Top Width (ft)	= 16.50
EGL (ft)	= 1.75



Culvert Report

Hydraflow Express Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc. Wednesday, Sep 28 2016

Stormwater Perimeter Ditch Culvert

Invert Elev Dn (ft)	= 359.00
Pipe Length (ft)	= 45.00
Slope (%)	= 0.67
Invert Elev Up (ft)	= 359.30
Rise (in)	= 14.7
Shape	= Cir
Span (in)	= 14.7
No. Barrels	= 1
n-Value	= 0.012
Inlet Edge	= Projecting
Coeff. K,M,c,Y,k	= 0.0045, 2, 0.0317, 0.69, 0.5

Embankment

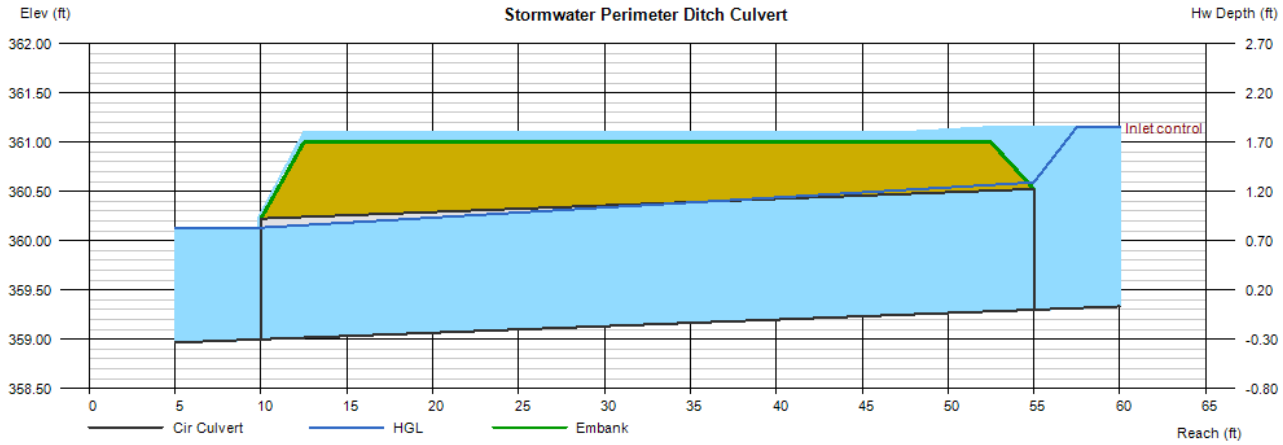
Top Elevation (ft)	= 361.00
Top Width (ft)	= 40.00
Crest Width (ft)	= 20.00

Calculations

Qmin (cfs)	= 10.00
Qmax (cfs)	= 10.00
Tailwater Elev (ft)	= (dc+D)/2

Highlighted

Qtotal (cfs)	= 10.00
Qpipe (cfs)	= 6.66
Qovertop (cfs)	= 3.34
Veloc Dn (ft/s)	= 5.85
Veloc Up (ft/s)	= 5.65
HGL Dn (ft)	= 360.13
HGL Up (ft)	= 360.59
Hw Elev (ft)	= 361.15
Hw/D (ft)	= 1.51
Flow Regime	= Inlet Control



APPENDIX B:
Run-On and Run-Off Plan Review Log

Plan Review and Changes in Facility Configuration

Scheduled reviews and Plan amendments shall be recorded in the Plan Review Log below. This log must be completed even if no amendment is made to the Plan as a result of the review.

By	Date	Amendment Description	P.E. Certification Required?	P.E. Name	Licensing State: Registration No.
Akron Consulting, LLC	10/14/2016	Initial Plan	Yes	Landon C. Allen	TX 119170
Akron Consulting, LLC	10/06/2021	5-Year Plan Revision	Yes	Lane D. Roberts	TX 105135

APPENDIX C:
Professional Engineer Certification

Professional Engineer Certification

The Run-on and Run-off System Control Plan for the H.W. Pirkey Power Plant Stack-Out Pad was prepared by Akron Consulting, LLC (Akron). This Certification/Statement of Professional Opinion is limited to the information available to Akron at the time the Plan was written. On the basis of and subject to the foregoing, it is my professional opinion as a Professional Engineer licensed in the State of Texas, that the Plan has been prepared in accordance with good and accepted engineering practices as exercised by other engineers practicing in the same discipline(s), under similar circumstances at the time, and in the same locale. It is my professional opinion that the Plan was prepared, reviewed, and revised in accordance with the current requirements of 30 TAC 352.811 (Federal Regulation Title 40, Part 257.81).

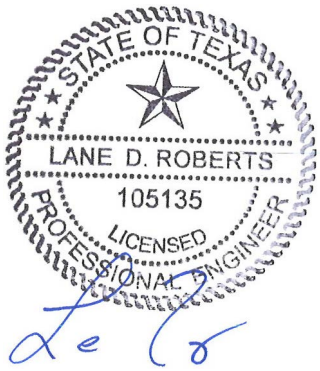
The use of the words “certification” and/or “certify” in this document shall be interpreted and construed as a Statement of Professional Opinion, and is not and shall not be interpreted or construed as a guarantee, warranty or legal opinion. This certification in no way relieves the Owner or Operator of the facility of his/her duty to fully implement this Plan.

Engineer: Lane D. Roberts

Registration Number: 105135

State: Texas

Date: 10/06/2021



P.E. certification is required for the original Plan and Plan reviews and amendments.

AKRON CONSULTING, LLC
431 N. CENTER ST.
LONGVIEW, TX 75601
TBPE Firm Reg. # 14014
(O) 903-236-9744
(F) 903-236-9745
www.akron-consulting.com