AECOM

FOUR CORNERS POWER PLANT COMBINED WASTE TREATMENT POND

Periodic Inflow Design Flood Control System Plan

October 2021
AECOM Project 60664563

Delivering a better world

Prepared for:

Arizona Public Service
400 North 5th Street
Phoenix, AZ 85004

Prepared by:

AECOM
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Phoenix, AZ 85020
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Table of Contents

Attachment

1. Introduction

This Periodic Inflow Design Flood Control System Plan for the Combined Waste Treatment Pond at Four Corners Power Plant, operated by Arizona Public Service (APS), has been prepared in accordance with the requirements of Title 40 of the Code of Federal Regulations Part 257 (40 CFR 257) ("the Coal Combustion Residuals [CCR] Rule", or "the Rule") and the specific requirement of 40 CFR § 257.82(c)(4) that "(t)he owner or operator of the CCR unit must prepare periodic inflow design flood control system plans required by paragraph (c)(1) of this section every five years."

2. Methodology

The methodology used to prepare this 2021 Periodic Inflow Design Flood Control System Plan for the Combined Waste Treatment Pond (CWTP) at the Four Corners Power Plant is for the certifying Qualified Professional Engineer (QPE) to:

a. Identify and review the hydrologic design basis references used for the 2016 Plan and verify applicability for use in 2021.
b. Perform a documented review of each major component of the contributing technical information from:
    i. AECOM, 2016, Four Corners Power Plant, Combined Waste Treatment Pond, Inflow Design Flood Control System Plan, FC_InflowFlood_012_20161017, August 31, 2016, (hereafter referred to as the "2016 Plan" and incorporated and referenced directly as Attachment A to this document).
c. Consider and document whether the 2016 Plan and its conclusions:
    i. Meet the current reporting requirements of the Rule;
    ii. Reflect the current condition of the structure, as known to the QPE and documented in the annual inspections;
    iii. Are compromised by any identified issues of concern; and
    iv. Are consistent with the standard of care of professionals performing similar evaluations in this region of the country; and
d. Identify any additional analyses, investigations, inspections, and/or repairs that should be completed in order to complete this 2021 Recertification.

This plan documents the results of these considerations, incorporates the 2016 Plan as an Appendix, identifies any additional technical investigation or evaluations (if needed), and presents an updated certification by the QPE.

3. Applicability of 2016 Plan Hydrologic Design Basis

In 2016, the CWTP was an active pond, receiving a gravity inflow of bottom ash sluice water estimated at an average of 5 million gallons per day (MGD). With a pond surface area of approximately 13.4 acres, the daily inflow was equivalent to over 12 inches of direct precipitation on the pond, every day. Therefore, the hydrologic methodology presented in the 2016 Plan followed a flood routing protocol with the following steps:

a. Estimate the 100-Year, 24-Hour precipitation depth as 2.36 inches from NOAA 14;
b. Derive the modified SCS rainfall distribution, per New Mexico Department of Transportation (NMDOT) Hydrology Manual;
c. Estimate the 100-Year, 24-Hour event contribution to the CWTP as 19.6 acre-feet; and
d. Use HEC-HMS 4.1 to route the storm precipitation through the operating pond, to obtain a maximum water surface elevation in the pond, and to show that the two-foot required embankment freeboard was maintained.

In 2021, the Plant has ceased daily discharge to the CWTP, lowered the normal operating level by 2.5 feet, and now requires that the IDF be stored within the allowed freeboard and not discharged through the outlet works. In reviewing the applicability of the 2016 Plan hydrologic design basis to requirements in 2021, AECOM has verified the following:

a. The tributary area to the pond has decreased significantly because:
    i. In 2016, a significant portion of the attributed tributary area were gathered in sumps, pumped to the elevated Pirate Ship tank, and then drained by gravity to the CWTP;
    ii. In 2021, all flows pumped to the Pirate Ship tank now flow by gravity to the Bottom Ash Sluice Water Return (BASWR) tank.
    iii. Therefore, the tributary area used for the 2016 Plan can be considered significantly conservative relative to the actual tributary area in 2021.
b. NOAA Atlas 14 Volume 1 remains the applicable precipitation frequency guide for New Mexico;
c. The NMDOT Hydrology Manual was updated in 2018 but the results for rainfall distribution do not change;
d. Site surfacing, grading, and other conditions have not changed, so the surface runoff coefficients used in the 2016 Plan remain valid; and
e. The normal operating level has been lowered from Elevation 5332.01 feet (NAVD88), as reported in the 2016 Plan, to approximate Elevation 5329.5 feet (NAVD88), just below the inlet apron of the outlet works, in order not to allow discharge from the CWTP to the Plant’s cooling water canal.

In summary, the IDF precipitation estimate of 2.36 inches remains valid, the tributary area is now smaller than in 2016 by an undetermined but significant amount, the runoff coefficients remain valid, and the normal pond level has been lowered to Elevation 5329.5 (NAVD88) . The 2016 Plan estimated the 100-Year, 24-Hour event inflow and direct precipitation on the CWTP as 19.6 acre-feet, which is equivalent to a depth of 1.46 feet over the combined 13.4-acre area of the CWTP decant cells and free water pond. With a normal operating level of 5329.5 feet (NAVD88), the maximum flood pool resulting from the IDF would be, conservatively, 5231.0 feet (NAVD88), which is 5.4 feet lower than the embankment crest elevation of 5336.4 feet (NAVD88) reported in the 2016 Plan.

AECOM concludes that the runoff volume likely to flow to the CWTP during the IDF is significantly lower in 2021 than in 2016, that the hydrologic basis for the derivations used in the 2016 Plan are conservative yet still valid in 2021, and that the estimated 19.6 acre-feet of runoff from the IDF, with no discharge from the stop-logged outlet works, would pool in the CWTP to an elevation 5.4 feet below the crest of the embankment. Therefore, this section of the 2016 Plan, as amended by this analysis, adequately represents current conditions and satisfies the requirements of the Rule.

4. 2016 Plan – Review by Section

Other than as described in the remainder of this section, the details presented in this section of the 2016 Plan adequately represent current conditions and satisfy the requirements of the Rule.

4.1 "§257.82 Hydrologic and Hydraulic capacity requirements for CCR surface impoundments"

The details presented in this section of the 2016 Plan accurately describe the requirements of the Rule.

4.2 "Overview"

The details presented in this section of the 2016 Plan adequately represent current conditions and satisfy the requirements of the Rule, with the following updates to reflect 2021 conditions.

In November 2020, APS ceased discharge of sluiced bottom ash to the CWTP. Flows instead are routed to a new Bottom Ash Sluice Water Return (BASWR) tank. APS intends to close the CWTP by dredge removal of bottom ash sediments within the time frames allowed by the Rule for a surface impoundment of this size.

In 2018, APS made minor improvements to the CWTP embankment that included adding fill to restore crest height in left abutment area. The minimum crest height is now greater than reported in the 2016 Plan.

In 2021, the normal operating level has been lowered from Elevation 5332.01 feet (NAVD88), as reported in the 2016 Plan, to approximate Elevation 5329.5 feet (NAVD88), just below the apron of the outlet works, in order not to allow discharge from the CWTP to the Plant's cooling water canal. The pond is refilled by temporary pump with water from the cooling water canal to maintain hydrostatic balance between the water levels in the Pond and in the adjacent cooling water canal.

4.3 "§257.82 (a)(1)(2)(3) Hydrologic and Hydraulic capacity requirements for CCR surface impoundments"

A separate 2021 Periodic Hazard Potential Study confirms the assignment of the lowest classification, Low Hazard Potential, to the CWTP. Therefore, this aspect of the 2016 Plan adequately represents current conditions and satisfies the requirements of the Rule.

Operational aspects described in the 2016 Plan have changed significantly due to the cessation of discharge of bottom ash sluice water to the CWTP in 2020. The majority of these changes are described in Section "3. Applicability of 2016 Plan Hydrologic Design Basis" of this 2021 Plan. In addition, the following changes relative to information presented in this section of the 2016 Plan are documented:

a. The estimate of 15 MGD discharge reported in the 2016 Plan is now believed to have been affected by a measurement error and the more reasonable estimate would have been 5 MGD. As stated, this discharge is now directed to the BASWR tank, which discharges to the cooling water canal.
b. The CWTP is now blocked from discharging to the cooling water canal and Morgan Lake.

Therefore, this section of the 2016 Plan, as amended by this analysis, adequately represents current conditions and satisfies the requirements of the Rule.

4.4 "§257.82 (b) Hydrologic and Hydraulic capacity requirements for CCR surface impoundments"

The details presented in this section of the 2016 Plan no longer represent current conditions. There is no longer a discharge from the CWTP to Morgan Lake, therefore this requirement of the Rule is satisfied.

4.5 "§257.82 (c) Hydrologic and Hydraulic capacity requirements for CCR surface impoundments"

The owner or operator continues to acknowledge and will comply with these requirements.

Per the requirement of §257.82 (c)(4), this document constitutes the "every five years" Periodic Inflow Design Flood Control System Plan.

A certification of this Periodic Inflow Design Flood Control System Plan by a QPE is included in this document per the requirement of §257.82(c)(5).

4.6 "§257.82 (d) Hydrologic and Hydraulic capacity requirements for CCR surface impoundments"

The owner or operator continues to acknowledge and will comply with these requirements.

5. Recommended Additional Technical Investigations or Evaluations

None identified and none recommended.

6. Conclusion

The 2016 Plan and its conclusions, as amended by the analyses presented in this 5-Year periodic revision, meet the current reporting requirements of the Rule, reflect the current condition of the structure as known to the QPE and documented in the annual inspections, are not compromised by any identified issues of concern, and are consistent with the standard of care of professionals performing similar evaluations in this region of the country.

7. Limitations

This document is for the sole use of APS on this project only and is not to be used for other projects. In the event that conclusions based upon the data presented in this document are made by others, such conclusions are the responsibility of others.

The Periodic Inflow Design Flood Control System Plan presented in this report is based on the 2016 Plan and relies and incorporates any Limitations expressed in that document.

The Certification of Professional Opinion in this report is limited to the information available to AECOM at the time this Assessment was performed in accordance with current practice and the standard of care. Standard of care is defined as the ordinary diligence exercised by fellow practitioners in this area performing the same services under similar circumstances during the same period. Professional judgments presented herein are primarily based on information from previous reports that have been assumed to be accurate, knowledge of the site, and partly on our general experience with dam safety evaluations performed on other dams.

No warranty or guarantee, either written or implied, is applicable to this work. The use of the word “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.

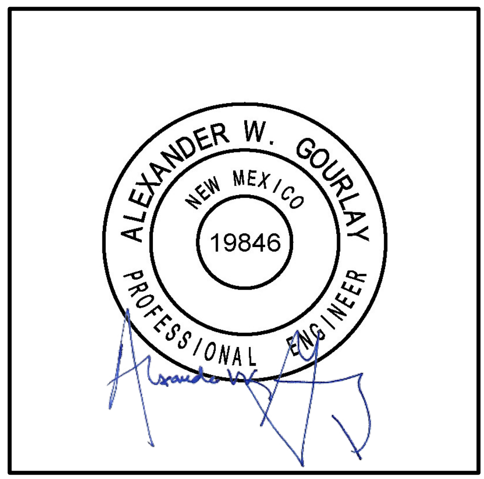
8. Certification Statement

Certification Statement for:

- Certification Statement 40 CFR § 257.82(c)(5) – Periodic Inflow Design Flood Control System Plan for an Existing CCR Surface Impoundment.
- CCR Unit: Arizona Public Service; Four Corners Power Plant; Combined Waste Treatment Pond

I, Alexander W. Gourlay, being a Registered Professional Engineer in good standing in the State of New Mexico, 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 information contained in this Periodic Inflow Design Flood Control System Plan dated October 2021, including the technical content in Attachment A, meets the requirements of 40 CFR § 257.81.

Alexander W. Gourlay, P.E.
Printed Name



October 11, 2021
Date

Attachment A:

AECOM, 2016, *Four Corners Power Plant, Combined Waste Treatment Pond, Inflow Design Flood Control System Plan, FC_InflowFlood_012_20161017,* August 31, 2016.

ATTACHMENT A

AECOM, 2016, *Four Corners Power Plant, Combined Waste Treatment Pond, Inflow Design Flood Control System Plan, FC_InflowFlood_012_20161017,* August 31, 2016.

FOUR CORNERS POWER PLANT
COMBINED WASTE TREATMENT POND
INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN
FC_InflowFlood_012_20161017

This *Inflow Design Flood Control System Plan* (Plan) document has been prepared specifically for the Combined Water Treatment Pond (CWTP) at the Four Corners Power Plant. This Plan has been prepared in accordance with our understanding of the requirements prescribed in §257.82 of the Federal Register, Volume 80, Number 74, dated April 17, 2015 (U. S. Government, 2015) for hydrologic and hydraulic capacity requirements for CCR surface impoundments associated with existing Coal Combustion Residual (CCR) surface impoundments. Section §257.82 is reproduced below for reference purposes. This document serves as the *initial plan* described in §257.82.

The CWTP is an existing CCR surface impoundment facility. Calculations have been prepared in support of the facility operation and have been included herein to address the requirements listed.

<u>§257.82 Hydrologic and Hydraulic capacity requirements for CCR surface impoundments</u>

(a) The owner or operator of an existing or new CCR surface impoundment or any lateral expansion of a CCR surface impoundment must design, construct, operate, and maintain an inflow design flood control system as specified in paragraphs (a)(1) and (2) of this section.

(1) The inflow design flood control system must adequately manage flow into the CCR unit during and following the peak discharge of the inflow design flood specified in paragraph (a)(3) of this section.

(2) The inflow design flood control system must adequately manage flow from the CCR unit to collect and control the peak discharge resulting from the inflow design flood specified in paragraph (a)(3) of this section.

(3) The inflow design flood is:

(i) For a high hazard potential CCR surface impoundment, as determined under §257.73(a)(2) or §257.74(a)(2), the probable maximum flood;

(ii) For a significant hazard potential CCR surface impoundment, as determined under §257.73(a)(2) or §257.74(a)(2) , the 1,000-year flood;

(iii) For a low hazard potential CCR surface impoundment, as determined under §257.73(a)(2) or §257.74(a)(2), the 100-year flood; or

(iv) For an incised CCR surface impoundment, the 25-year flood.

(b) Discharge from the CCR unit must be handled in accordance with the surface water requirements under §257.3-3.

(c) *Inflow design flood control system plan* –

(1) *Content of the Plan*. The owner or operator must prepare initial and periodic inflow design flood control system plans for the CCR unit according to the timeframes specified in paragraphs (c)(3) and (4) of this section. These plans must document how the inflow design flood control system has been designed and constructed to meet the requirements of this section. Each plan must be supported by appropriate engineering calculations. The owner or operator of the CCR unit has completed the inflow design flood control system plan when the plan has been placed in the facility's operating record as required by §257.105(g)(4).

(2) *Amendment of the Plan*. The owner or operator of the CCR unit may amend the written inflow design flood control system plan at any time provided the revised plan is placed in the facility's operating record as required by §257.105(g)(4). The owner or operator must amend the written inflow design flood control system plan whenever there is a change in conditions that would substantially affect the written plan in effect.

(3) *Timeframes for preparing the initial plan* -

(i) *Existing CCR surface impoundments*. The owner or operator must prepare the initial inflow design flood control system plan no later than October 17, 2016.

(ii) New CCR surface impoundments and any lateral expansion of a CCR surface impoundment. The owner of operator must prepare the initial inflow design flood control system plan no later than the date of initial receipt of CCR in the CCR unit.

(4) *Frequency for revising the plan*. The owner or operator must prepare periodic inflow design flood control system plans required by paragraph (c)(1) of this section every five years. The date of completing the initial plan is the basis for establishing the deadline to complete the first periodic plan. The owner or operator may complete any required plan prior to the required deadline provided the owner or operator places the completed plan into the facility's operating record within a reasonable amount of time. In all cases, the deadline for completing a subsequent plan is based on the date of completing the previous plan. For purposes of this paragraph (c)(4), the owner or operator has completed an inflow design flood control system plan when the plan has been placed in the facility's operating record as required by §257.105(g)(4).

(5) The owner or operator must obtain a certification from a qualified engineer stating that the initial and periodic inflow design flood control system plans meet the requirements of this section.

(d) The owner or operator of the CCR unit must comply with the record keeping requirements specified in §257.105(g), the notification requirements specified in §257.106(g), and the internet requirements specified in §257.107(g).

SITE INFORMATION	
Site Name / Address	Four Corners Power Plant / 691 CR-6100, Fruitland, NM 85416
Owner Name / Address	Arizona Public Service / 400 North 5th Street, Phoenix, AZ 85004
CCR Unit	Combined Waste Treatment Pond (CWTP)

OVERVIEW

The CWTP located at the Four Corners Power Plant (FCPP) (Exhibit 1) receives storm water inflow from sumps located in Units 4 and 5, the coal blending area, and from the area of decommissioned Units 1,2, and 3. This is in addition to the direct precipitation associated with the impoundment. The impoundment embankment has an average height of 23 feet and the lowest elevation on the crest of the embankment is 5336.4 feet (NAVD88). The normal operating water level in CWTP is assumed to be 5332.01 feet based on survey data.

This inflow / flood control plan describes the contributing runoff volumes and storage capacities estimated for the CWTP.

Exhibit 1 – Combined Waste Treatment Pond (CWTP) at Four Corners Power Plant Facility

§257.82 (a)(1)(2)(3) Hydrologic and Hydraulic capacity requirements for CCR surface impoundments	
(a) The owner or operator of an existing or new CCR surface impoundment or any lateral expansion of a CCR surface impoundment must design, construct, operate, and maintain an inflow design flood control system as specified in paragraphs (a)(1) and (2) of this section. (1) The inflow design flood control system must adequately manage flow into the CCR unit during and following the peak discharge of the inflow design flood specified in paragraph (a)(3) of this section.	The 100-Year 24-Hour storm water runoff produced from the contributing watershed is 19.58 acre-feet, as shown in the calculations included in Appendix 1. This volume is based on a 2.36 inch precipitation depth, and a runoff curve number of 95 for the facilities and 100 for the pond impoundment. The CWTP receives an average 15 million gallons per day of water from the plant during normal operations. The CWTP receives runoff from direct precipitation and runoff from the units and coal processing area which is collected in drains and trenches and is pumped to the CWTP with the normal operating water. The pumped inflow is conveyed through a 48-inch pipe to the CWTP. The runoff is detained in the CWTP and discharged into Morgan Lake through two 36-inch pipes. The normal operating water surface elevation is 5332.01 feet with a crest elevation of 5336.4 feet based on survey data. The maximum water elevation is 5334.4 feet. There is 2.0 feet of freeboard from the maximum water elevation to the lowest crest elevation.
(a) The owner or operator of an existing or new CCR surface impoundment or any lateral expansion of a CCR surface impoundment must design, construct, operate, and maintain an inflow design flood control system as specified in paragraphs (a)(1) and (2) of this section. (2) The inflow design flood control system must adequately manage flow from the CCR unit to collect and control the peak discharge resulting from the inflow design flood specified in paragraph (a)(3) of this section.	The 100-Year 24-Hour storm water runoff is discharged from the CWTP to Morgan Lake through two 36"RCP pipes. The discharge pipes have sufficient capacity to handle the stormwater discharge and the normal operating flow with a maximum water elevation of 5334.4 feet. Refer to response to (a)(1) for additional details regarding the Inflow Design Flood Control System Plan for the URS.

(a)(3) The inflow design flood is: (i) For a high hazard potential CCR surface impoundment, as determined under §257.73(a)(2) or §257.74(a)(2), the probable maximum flood; (ii) For a significant hazard potential CCR surface impoundment, as determined under §257.73(a)(2) or §257.74(a)(2) , the 1,000-year flood; (iii) For a low hazard potential CCR surface impoundment, as determined under §257.73(a)(2) or §257.74(a)(2), the 100-year flood; or (iv) For an incised CCR surface impoundment, the 25-year flood.	The hazard classification for the CWTP is low, based on the **Final Summary Report Structural Integrity Assessment, Combined Waste Treatment Pond, Four Corners Power Plant**, prepared by AECOM in August 2016 (AECOM 2016).
§257.82 (b) Hydrologic and Hydraulic capacity requirements for CCR surface impoundments	
(b) Discharge from the CCR unit must be handled in accordance with the surface water requirements under §257.3-3.	The CWTP discharges into Morgan Lake as permitted by the current NPDES permit. The discharge is tested weekly to verify that the discharge does not exceed the permitted level for total suspended solids, oil, and grease. No dredged or fill material is being discharged.
§257.82 (c) Hydrologic and Hydraulic capacity requirements for CCR surface impoundments	
(c)(1) *Content of the plan.* The owner or operator must prepare initial and periodic inflow design flood control system plans for the CCR unit according to the timeframes specified in paragraphs (c)(3) and (4) of this section. These plans must document how the inflow design flood control system has been designed and constructed to meet the requirements of this section. Each plan must be supported by appropriate engineering calculations. The owner or operator of the CCR unit has completed the inflow design flood control system plan when the plan has been placed in the facility's operating record as required by §257.105(g)(4).	This *Inflow Design Flood Control Plan* serves as the initial plan prescribed herein.

(c)(2) *Amendment of the Plan*. The owner or operator of the CCR unit may amend the written inflow design flood control system plan at any time provided the revised plan is placed in the facility's operating record as required by §257.105(g)(4). The owner or operator must amend the written inflow design flood control system plan whenever there is a change in conditions that would substantially affect the written plan in effect.	The owner or operator acknowledges and will comply with this requirement.
(c)(3*) Timeframes for preparing the initial plan* – (i) Existing CCR impoundments. The owner or operator must prepare the initial inflow design flood control system plan no later than October 17, 2016. (ii) New CCR surface impoundments and any lateral expansion of a CCR surface impoundment. The owner or operator must prepare the initial inflow design flood control system plan no later than the date of initial receipt of CCR in the CCR Unit	The CWTP is an existing CCR impoundment at Four Corners Power Plant. The inflow design flood control system plan is included herein. The owner or operator acknowledges and will comply with this requirement.

(c)(4) Frequency for revising the plan. The owner or operator must prepare periodic inflow design flood control system plans required by paragraph (c)(1) of this section every five years. The date of completing the initial plan is the basis for establishing the deadline to complete the first periodic plan. The owner or operator may complete any required plan prior to the required deadline provided the owner or operator places the completed plan into the facility's operating record within a reasonable amount of time. In all cases, the deadline for completing a subsequent plan is based on the date of completing the previous plan. For purposes of this paragraph (c)(4), the owner or operator has completed an inflow design flood control system plan when the plan has been placed in the facility's operating record as required by §257.105(g)(4).	The owner or operator acknowledges and will comply with this requirement.
(c)(5) The owner or operator must obtain a certification from a qualified professional engineer stating that the initial and periodic inflow design flood control system plans meet the requirements of this section.	Certification by a professional engineer is included as an attachment to this document.
§257.82 (d) RECORDKEEPING, NOTIFICATION, AND INTERNET REQUIREMENTS	
(d) The owner or operator of the CCR unit must 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).	The owner or operator acknowledges and will comply with this requirement.

References

AECOM, August 2016, **Final Summary Report Structural Integrity Assessment, Combined Waste Treatment Pond, Four Corners Power Plant**.

U.S. Government, April 2015, ***Federal Register, Volume 80, Number 74, Rules and Regulations***.

Certification Statement 40 CFR § 257.82(c)(5) –Initial Inflow Design Flood Control System Plan for an Existing CCR Surface Impoundment

CCR Unit: Arizona Public Service; Four Corners Power Plant; Combined Waste Treatment Pond

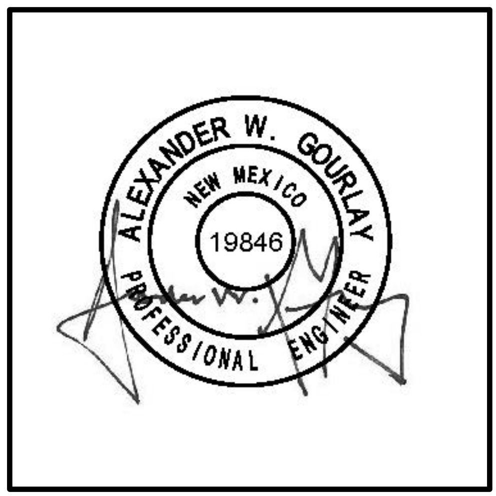
I, Alexander W. Gourlay, being a Registered Professional Engineer in good standing in the State of New Mexico, do hereby certify, to the best of my knowledge, information, and belief, that the information contained in this certification has been prepared in accordance with the accepted practice of engineering. I certify, for the above-referenced CCR Unit, that the information contained in the initial inflow design flood control system plan dated August, 31, 2016 meets the requirements of 40 CFR § 257.82.

Alexander W. Gourlay, P.E.
____

Printed Name

August 31, 2016
____

Date



APPENDIX 1 - CALCULATIONS

PROBLEM STATEMENT:

The purpose of this calculation package is to document the hydrologic analysis prepared by AECOM for the watershed draining toward the CWTP.

REQUIRED DELIVERABLES:

- Maximum stage in the CTWP for a 100-year 24-hour storm.

DATA /ASSUMPTIONS:

- The inflow to the pond for the various watersheds is conveyed through a 48" pipe. A constant discharge of 59.68 cfs (26,787 gpm) was assumed as inflow.
- The stage-volume for the CWTP was entered.
- The precipitation value of 2.36 inches for the 100-yr 24-hr storm was obtained from NOAA 14. The modified SCS rainfall distribution was used as per New Mexico Department of Transportation (NMDOT) Hydrology Manual.
- The normal operating water surface elevation in the CWTP pond is assumed to be 5332.01 feet.
- The discharge from the pond is conveyed by two – 36 " RCP pipe that drains in to the Morgan Lake. The stage discharge rating table for the outlet pipes that was developed using CulvertMaster was entered as outflow input.
- HEC-HMS 4.1 was utilized to obtain a maximum water surface elevation.
- Calculation results are provided based on NAVD88 vertical datum. As-builts are based on NGVD29. A conversion factor of 3.012 feet was used to convert NGVD29 to NAVD88.

RESULTS:

The HEC-HMS model calculated a maximum water surface elevation of 5334.4 feet with the above mentioned inputs. The maximum stage is 2 feet below the crest elevation of 5336.4 feet. Figures 1 and 2 illustrate the model and global summary table of the HEC-HMS simulation run. Figure 3 delineates the drainage areas contributing to the CWTP. The stage storage calculation and volumes are shown in Table 1. The total runoff volume calculation for the CWTP and contributing facility areas are shown in Table 2.

Figure 1 – HEC HMS Schematic

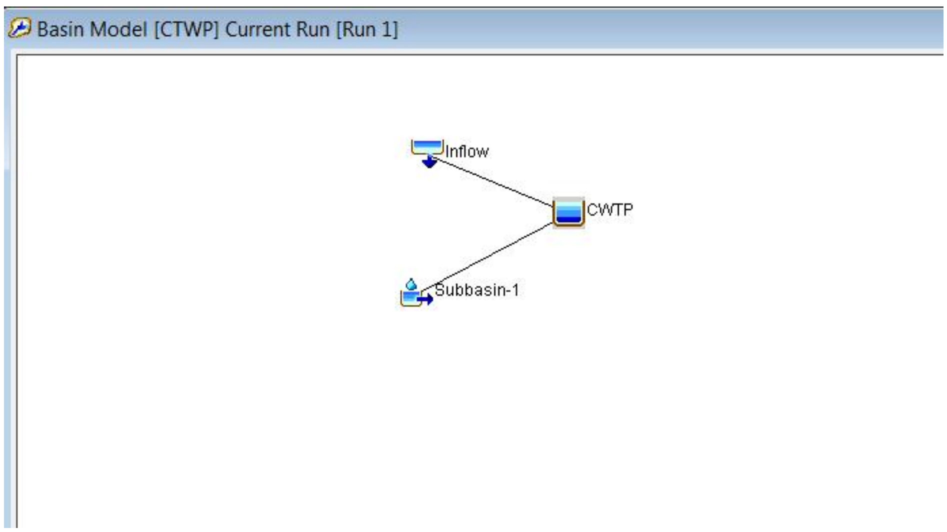


Figure 2 – HEC-HMS Output

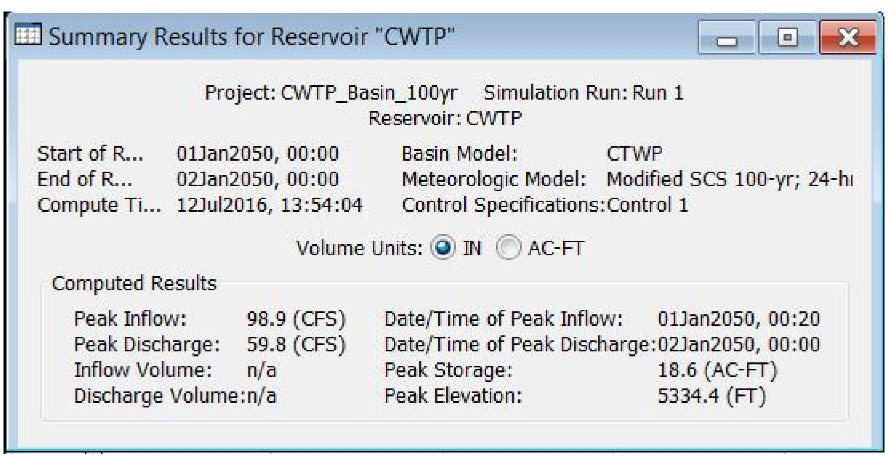


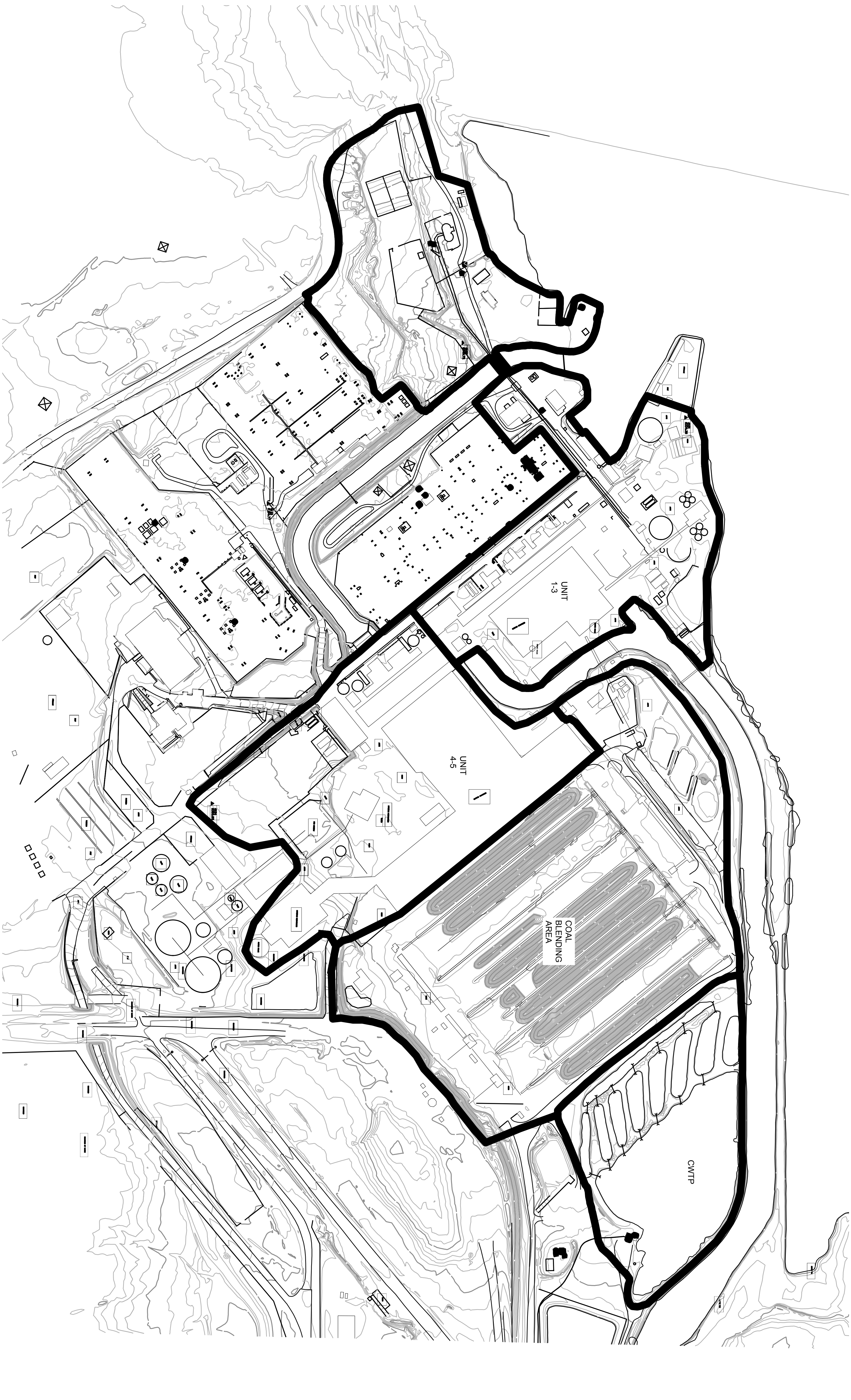
Table 1 – Stage Storage Volume

STAGE	DEPTH [ft]	AREA [ft^2]	VOL_{INC} [ft^3]	VOL_{INC} [ac-ft]	VOL_{CUM} [ft^3]	VOL_{CUM} ac-ft
5,332.01	0.00	315,071.43	0.00	0.00	0.00	0.00
5,333.00	0.99	320,323.51	314,520	7.22	314,520	7.22
5,334.00	1.99	330,034.00	325,179	7.47	639,699	14.69
5,335.00	2.99	557,820.66	443,927	10.19	1,083,627	24.88
5,336.00	3.99	606,436.41	582,129	13.36	1,665,755	38.24

Table 2 – Retention Volume Calculation – 100-YR Storm

Sub-basin	**Area (sq ft)**	**Area (acre)**	**Curve number**	**Precipitation**	**Direct runoff**	**Runoff Volume**
			CN	**P (inch)**	**Qd (inch)**	**Qv (ac-ft)**
Units 1, 2 & 3	1737090	39.88	95	2.36	1.83	6.07
Units 4&5	1211456	27.81	95	2.36	1.83	4.24
Coal Blending Area	1852488	42.53	95	2.36	1.83	6.48
CWTP	685262	15.73	98	2.36	2.13	2.79
				TOTAL (ac-ft)		**19.58**

FIGURE 3



Four Corners Power Plant CCR
Arizona Public Service
Four Corners Power Plant, Farmington, NM
60492608 Date: 2016-07-14

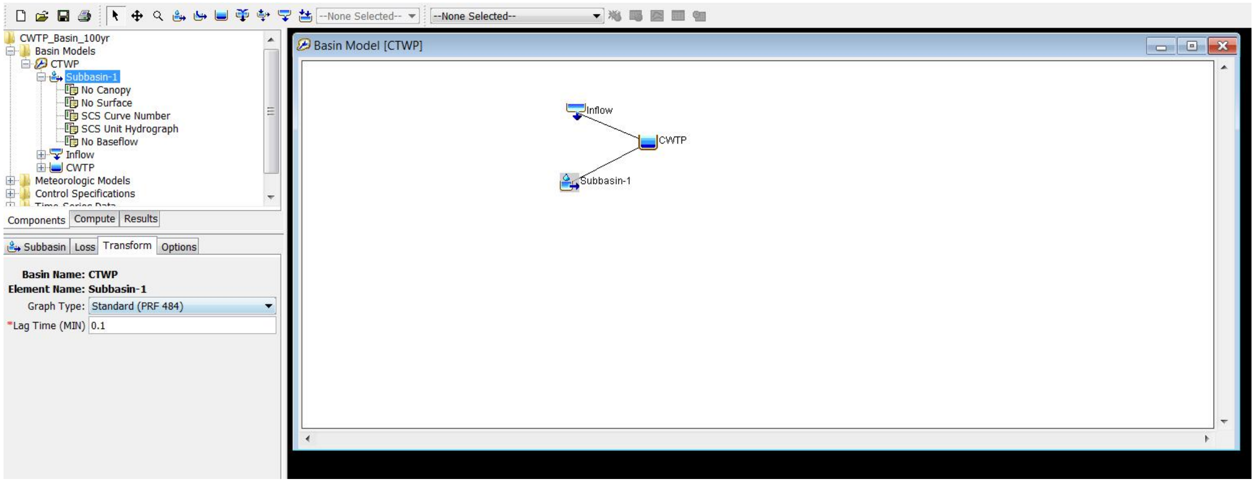
Four Corners CWTP Drainage Areas

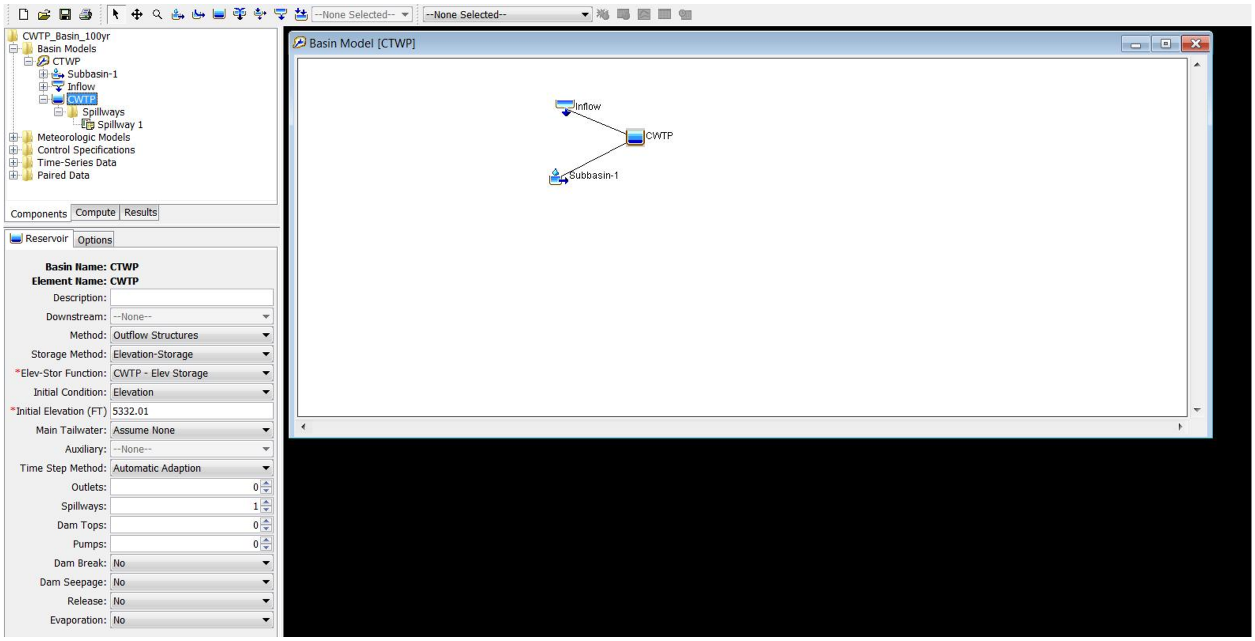
AECOM

Figure: 3

SUPPORTING DOCUMENTS

HEC-HMS DATA


CWTP_Basin_100yr
Basin Models
CTWP
Subbasin-1
No Canopy
No Surface
SCS Curve Number
SCS Unit Hydrograph
No Baseflow
Inflow
CWTP
Meteorologic Models
Control Specifications
Components
Compute
Results
Subbasin
Loss
Transform
Options
Basin Name: CTWP
Element Name: Subbasin-1
Graph Type: Standard (PRF 484)
*Lag Time (MIN) 0.1
Basin Model [CTWP]
Inflow
CWTP
Subbasin-1


CWTP_Basin_100yr
Basin Models
CTWP
Subbasin-1
Inflow
CWTP
Spillways
Spillway 1
Meteorologic Models
Control Specifications
Time-Series Data
Paired Data
Components
Compute
Results
Reservoir
Options
Basin Name: CTWP
Element Name: CWTP
Description:
Downstream: --None--
Method: Outflow Structures
Storage Method: Elevation-Storage
*Elev-Stor Function: CWTP - Elev Storage
Initial Condition: Elevation
*Initial Elevation (FT) 5332.01
Main Tailwater: Assume None
Auxiliary: --None--
Time Step Method: Automatic Adaption
Outlets: 0
Spillways: 1
Dam Tops: 0
Pumps: 0
Dam Break: No
Dam Seepage: No
Release: No
Evaporation: No
Basin Model [CTWP]
Inflow
CWTP
Subbasin-1

100-YEAR, 24 HOUR RAINFALL DISTRIBUTION

ARIZONA PUBLIC SERVICES, FARMINGTON, NM
FOUR CORNERS POWER PLANT CCR - CWTP
MODIFIED NOAA-SCS RAINFALL DISTRIBUTION

NOAA 14 Depth Duration Frequency Data [100-YEAR] (1) *:*

DURATION	[hours]	[inches](1)
0	0	0
5-min	0.0833	0.523
10-min	0.1667	0.796
15-min	0.2500	0.986
30-min	0.5000	1.330
	0.7500	1.485
1-hr	1.0000	1.640
	1.2500	1.690
	1.5000	1.740
	1.7500	1.790
2-hr	2.0000	1.840
	2.5000	1.850
3-hr	3.0000	1.860
	3.5000	1.890
	4.0000	1.920
	5.0000	1.980
6-hr	6.0000	2.040
	7.0000	2.067
	8.0000	2.093
	9.0000	2.120
	10.0000	2.147
	11.0000	2.173
12-hr	12.0000	2.200
	14.0000	2.227
	16.0000	2.253
	18.0000	2.280
	20.0000	2.307
	22.0000	2.333
24-hr	24.0000	2.360

Modified NOAA-SCS Rainfall Distribution (2) *:*

n	TIME [hours]	CUMULATIVE DEPTH [inches]	INCREMENTAL DEPTH [inches]	HYETOGRAPH TIME PERIOD (hrs)			n [REARRANGED]	INCREMENTAL DEPTH [inches]	CUMULATIVE DEPTH [inches]	CUMULATIVE DEPTH [%]
0	0	0.000		0.00	TO	1.00	19	0.027	0.027	0.011
1	0.25	0.986	0.986	1.00	TO	2.00	17	0.027	0.053	0.023
2	0.5	1.330	0.344	2.00	TO	3.00	15	0.027	0.080	0.034
3	0.75	1.485	0.155	3.00	TO	4.00	13	0.060	0.140	0.059
4	1	1.640	0.155	4.00	TO	4.50	11	0.030	0.170	0.072
5	1.25	1.690	0.050	4.50	TO	5.00	9	0.010	0.180	0.076
6	1.5	1.740	0.050	5.00	TO	5.25	7	0.050	0.230	0.097
7	1.75	1.790	0.050	5.25	TO	5.50	5	0.050	0.280	0.119
8	2	1.840	0.050	5.50	TO	5.75	3	0.155	0.435	0.184
9	2.5	1.850	0.010	5.75	TO	6.00	1	0.986	1.421	0.602
10	3	1.860	0.010	6.00	TO	6.25	2	0.344	1.765	0.748
11	3.5	1.890	0.030	6.25	TO	6.50	4	0.155	1.920	0.814
12	4	1.920	0.030	6.50	TO	6.75	6	0.050	1.970	0.835
13	5	1.980	0.060	6.75	TO	7.00	8	0.050	2.020	0.856
14	6	2.040	0.060	7.00	TO	7.50	10	0.010	2.030	0.860
15	7	2.067	0.027	7.50	TO	8.00	12	0.030	2.060	0.873
16	8	2.093	0.027	8.00	TO	9.00	14	0.060	2.120	0.898
17	9	2.120	0.027	9.00	TO	10.00	16	0.027	2.147	0.910
18	10	2.147	0.027	10.00	TO	11.00	18	0.027	2.173	0.921
19	11	2.173	0.027	11.00	TO	12.00	20	0.027	2.200	0.932
20	12	2.200	0.027	12.00	TO	14.00	21	0.027	2.227	0.944
21	14	2.227	0.027	14.00	TO	16.00	22	0.027	2.253	0.955
22	16	2.253	0.027	16.00	TO	18.00	23	0.027	2.280	0.966
23	18	2.280	0.027	18.00	TO	20.00	24	0.027	2.307	0.977
24	20	2.307	0.027	20.00	TO	22.00	25	0.027	2.333	0.989
25	22	2.333	0.027	22.00	TO	24.00	26	0.027	2.360	1.000
26	24	2.360	0.027							

Notes:
1. Precipitation depth, duration, frequency data based on NOAA Atlas 14 Online Precipitaiton Data Frequency Server.
2. Modified NOAA-SCS rainfall distribution developed based on procedures prescribed by New Mexico State Highway and Transportation Department's *Drainage Manual, Volume I,* 1995.
3. Rainfall data based on Blanco Arroyo watershed centroid located at Latitude 36.8170 ° N Longitude 107.9810° W

100-YEAR HMS

time [hrs]	[inches]
0	0
0.25	0.986
0.5	1.33
0.75	1.485
1	1.64
1.25	1.69
1.5	1.74
1.75	1.79
2	1.84
2.5	1.85
3	1.86
3.5	1.89
4	1.92
5	1.98
6	2.04
7	2.066667
8	2.093333
9	2.12
10	2.146667
11	2.173333
12	2.2
14	2.226667
16	2.253333
18	2.28
20	2.306667
22	2.333333
24	2.36

time [hrs]	[inches]
0.00	0.000
0.25	0.986
0.50	1.330
0.75	1.485
1.00	1.640
1.25	1.690
1.50	1.740
1.75	1.790
2.00	1.840
2.25	1.845
2.50	1.850
2.75	1.855
3.00	1.860
3.25	1.875
3.50	1.890
3.75	1.905
4.00	1.920
4.25	1.935
4.50	1.950
4.75	1.965
5.00	1.980
5.25	1.995
5.50	2.010
5.75	2.025
6.00	2.040
6.25	2.047
6.50	2.053
6.75	2.060
7.00	2.067
7.25	2.073
7.50	2.080
7.75	2.087
8.00	2.093
8.25	2.100
8.50	2.107
8.75	2.113
9.00	2.120
9.25	2.127
9.50	2.133
9.75	2.140
10.00	2.147
10.25	2.153
10.50	2.160
10.75	2.167
11.00	2.173
11.25	2.180
11.50	2.187
11.75	2.193
12.00	2.200
12.25	2.203
12.50	2.207
12.75	2.210
13.00	2.213
13.25	2.217
13.50	2.220
13.75	2.223
14.00	2.227
14.25	2.230
14.50	2.233
14.75	2.237
15.00	2.240
15.25	2.243
15.50	2.247
15.75	2.250
16.00	2.253
16.25	2.257
16.50	2.260
16.75	2.263
17.00	2.267
17.25	2.270
17.50	2.273
17.75	2.277
18.00	2.280
18.25	2.283
18.50	2.287
18.75	2.290
19.00	2.293
19.25	2.297
19.50	2.300
19.75	2.303
20.00	2.307
20.25	2.310
20.50	2.313
20.75	2.317
21.00	2.320
21.25	2.323
21.50	2.327
21.75	2.330
22.00	2.333
22.25	2.337
22.50	2.340
22.75	2.343
23.00	2.347
23.25	2.350
23.50	2.353
23.75	2.357
24.00	2.360

NOAA 14 PRECIPITATION INFORMATION

NOAA Atlas 14, Volume 1, Version 5
Location name: Waterflow, New Mexico, US*
Latitude: 36.6899°, Longitude: -108.4778°
Elevation: 5334 ft*
* source: Google Maps

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.147 (0.126–0.172)	0.190 (0.162–0.221)	0.255 (0.219–0.296)	0.309 (0.265–0.360)	0.387 (0.328–0.451)	0.452 (0.380–0.525)	0.521 (0.433–0.605)	0.596 (0.489–0.694)	0.703 (0.565–0.821)	0.792 (0.627–0.929)
10-min	0.224 (0.192–0.261)	0.288 (0.247–0.336)	0.388 (0.333–0.451)	0.471 (0.403–0.548)	0.590 (0.500–0.686)	0.688 (0.578–0.799)	0.792 (0.659–0.922)	0.907 (0.745–1.06)	1.07 (0.860–1.25)	1.21 (0.954–1.41)
15-min	0.277 (0.238–0.324)	0.358 (0.307–0.416)	0.481 (0.413–0.559)	0.584 (0.500–0.680)	0.731 (0.620–0.851)	0.853 (0.717–0.990)	0.982 (0.817–1.14)	1.12 (0.923–1.31)	1.33 (1.07–1.55)	1.49 (1.18–1.75)
30-min	0.373 (0.321–0.436)	0.482 (0.413–0.561)	0.647 (0.557–0.753)	0.786 (0.673–0.915)	0.984 (0.835–1.15)	1.15 (0.966–1.33)	1.32 (1.10–1.54)	1.51 (1.24–1.76)	1.79 (1.44–2.09)	2.01 (1.59–2.36)
60-min	0.462 (0.397–0.540)	0.596 (0.511–0.694)	0.801 (0.689–0.932)	0.973 (0.833–1.13)	1.22 (1.03–1.42)	1.42 (1.20–1.65)	1.64 (1.36–1.90)	1.87 (1.54–2.18)	2.21 (1.78–2.58)	2.49 (1.97–2.92)
2-hr	0.503 (0.439–0.583)	0.638 (0.559–0.741)	0.851 (0.746–0.983)	1.03 (0.898–1.19)	1.29 (1.11–1.49)	1.51 (1.29–1.74)	1.75 (1.47–2.02)	2.01 (1.67–2.32)	2.40 (1.94–2.78)	2.72 (2.16–3.17)
3-hr	0.555 (0.493–0.632)	0.699 (0.618–0.800)	0.910 (0.807–1.04)	1.09 (0.957–1.23)	1.35 (1.18–1.52)	1.56 (1.35–1.77)	1.80 (1.53–2.04)	2.05 (1.73–2.34)	2.44 (2.01–2.79)	2.75 (2.23–3.18)
6-hr	0.651 (0.588–0.730)	0.808 (0.728–0.905)	1.02 (0.918–1.15)	1.20 (1.08–1.34)	1.47 (1.30–1.64)	1.69 (1.48–1.88)	1.92 (1.66–2.15)	2.17 (1.86–2.44)	2.55 (2.13–2.88)	2.86 (2.34–3.24)
12-hr	0.759 (0.688–0.842)	0.944 (0.855–1.05)	1.17 (1.06–1.30)	1.35 (1.22–1.50)	1.61 (1.44–1.77)	1.81 (1.61–1.99)	2.01 (1.78–2.22)	2.22 (1.95–2.47)	2.57 (2.17–2.91)	2.89 (2.37–3.27)
24-hr	0.834 (0.762–0.913)	1.05 (0.953–1.14)	1.32 (1.20–1.44)	1.54 (1.40–1.69)	1.86 (1.68–2.02)	2.10 (1.90–2.29)	2.36 (2.12–2.58)	2.63 (2.34–2.87)	3.00 (2.65–3.29)	3.29 (2.88–3.62)
2-day	0.943 (0.859–1.03)	1.18 (1.08–1.29)	1.47 (1.34–1.60)	1.70 (1.55–1.85)	2.03 (1.84–2.21)	2.27 (2.06–2.47)	2.53 (2.28–2.75)	2.79 (2.50–3.04)	3.15 (2.80–3.43)	3.42 (3.02–3.73)
3-day	1.01 (0.926–1.11)	1.26 (1.16–1.38)	1.57 (1.44–1.71)	1.81 (1.66–1.97)	2.14 (1.95–2.33)	2.40 (2.18–2.60)	2.66 (2.40–2.89)	2.92 (2.63–3.18)	3.28 (2.93–3.57)	3.55 (3.15–3.88)
4-day	1.08 (0.994–1.18)	1.35 (1.24–1.47)	1.67 (1.53–1.82)	1.92 (1.77–2.09)	2.26 (2.07–2.46)	2.52 (2.30–2.74)	2.79 (2.53–3.03)	3.05 (2.76–3.32)	3.41 (3.06–3.72)	3.67 (3.28–4.02)
7-day	1.20 (1.11–1.31)	1.50 (1.37–1.63)	1.84 (1.70–2.00)	2.11 (1.94–2.29)	2.46 (2.27–2.67)	2.73 (2.50–2.95)	2.99 (2.74–3.24)	3.26 (2.96–3.53)	3.60 (3.25–3.90)	3.85 (3.47–4.18)
10-day	1.33 (1.22–1.45)	1.66 (1.53–1.80)	2.04 (1.88–2.21)	2.33 (2.15–2.53)	2.72 (2.50–2.94)	3.00 (2.75–3.24)	3.28 (3.00–3.55)	3.55 (3.24–3.85)	3.90 (3.54–4.23)	4.15 (3.76–4.53)
20-day	1.65 (1.52–1.79)	2.06 (1.89–2.24)	2.54 (2.33–2.75)	2.90 (2.67–3.14)	3.39 (3.11–3.67)	3.75 (3.43–4.06)	4.11 (3.75–4.45)	4.46 (4.05–4.84)	4.92 (4.44–5.35)	5.26 (4.73–5.73)
30-day	1.95 (1.80–2.13)	2.44 (2.24–2.65)	2.99 (2.75–3.25)	3.40 (3.13–3.69)	3.93 (3.61–4.26)	4.31 (3.96–4.68)	4.69 (4.29–5.09)	5.06 (4.61–5.49)	5.51 (5.00–6.00)	5.85 (5.29–6.37)
45-day	2.33 (2.15–2.53)	2.90 (2.68–3.15)	3.56 (3.29–3.85)	4.04 (3.73–4.36)	4.64 (4.28–5.01)	5.07 (4.67–5.47)	5.48 (5.04–5.91)	5.87 (5.38–6.33)	6.33 (5.79–6.84)	6.65 (6.07–7.18)
60-day	2.63 (2.43–2.85)	3.27 (3.02–3.54)	3.98 (3.68–4.30)	4.50 (4.16–4.86)	5.16 (4.76–5.56)	5.62 (5.18–6.05)	6.06 (5.58–6.52)	6.47 (5.94–6.96)	6.96 (6.38–7.50)	7.29 (6.67–7.85)

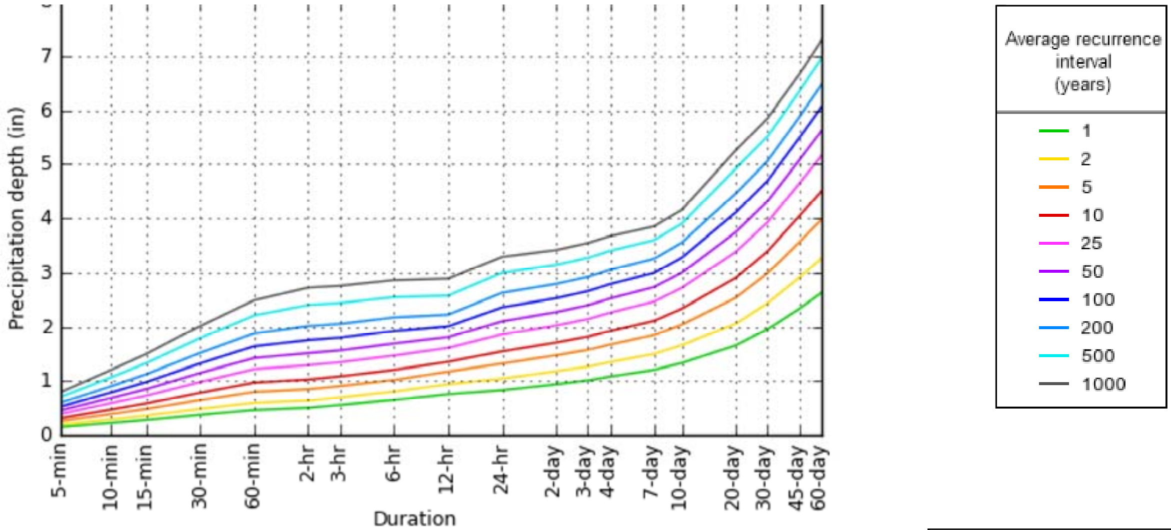
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

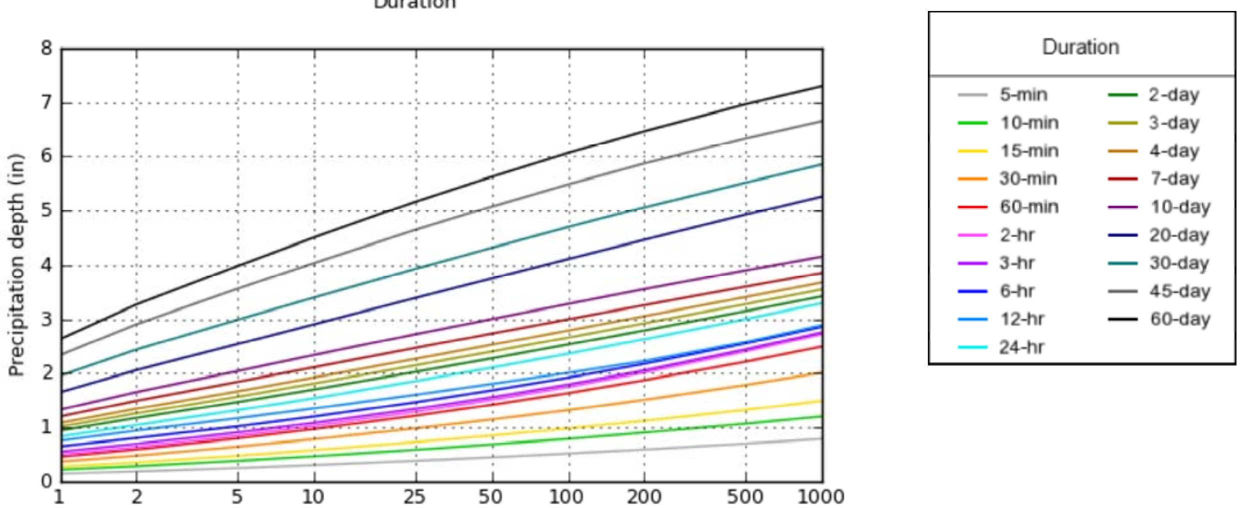
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical





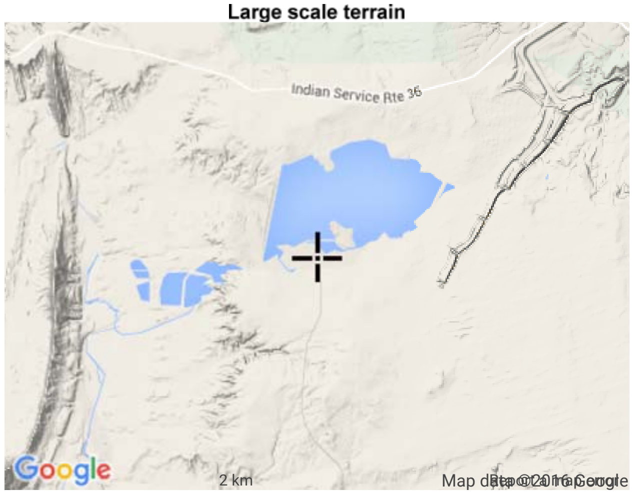
Back to Top

NOAA Atlas 14, Volume 1, Version 5 Created (GMT): Mon Jun 6 19:12:24 2016

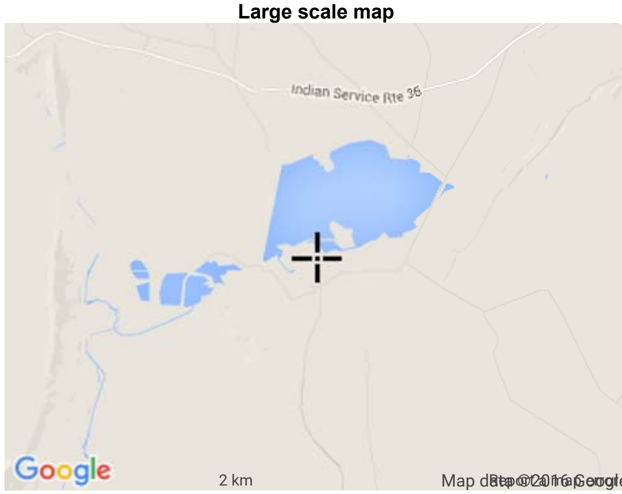
Maps & aerials

Small scale terrain

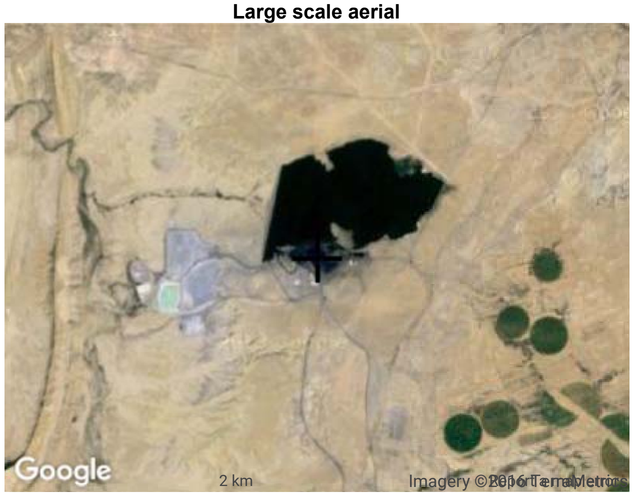
Large scale terrain



Large scale map



Large scale aerial



Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910

Questions?: HDSC.Questions@noaa.gov

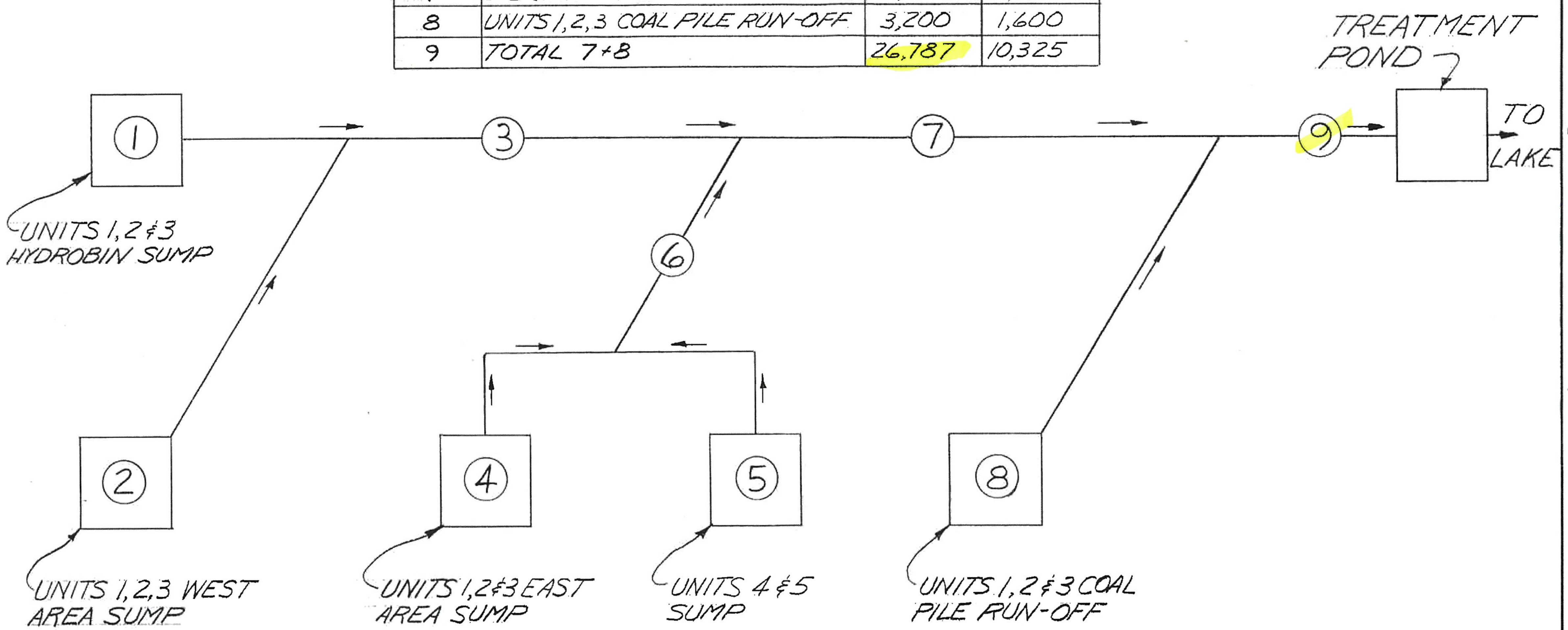
Disclaimer

PIPE INFLOW INFORMATION

FLOW DIAGRAM LOW VOLUME WASTE - UNITS 1 THRU 5

FOUR CORNERS POWER PLANT — NPDES PROJECTS

FLOW NO.	DESCRIPTION	MAX G.P.M.	AVE. G.P.M.
1	UNITS 1,2,3 HYDROBIN SUMP	8,000	1,300
2	UNITS 1,2,3 WEST AREA SUMP	682	248
3	SUB-TOTAL 1+2	8,682	1,548
4	UNITS 1,2,3 EAST AREA SUMP	3,000	2,571
5	UNITS 4 & 5 SUMP	11,905	4,616
6	COM. EAST AREA SUMP & 4 & 5 SUMP	14,905	7,187
7	SUB-TOTAL 3+6	23,587	8,725
8	UNITS 1,2,3 COAL PILE RUN-OFF	3,200	1,600
9	TOTAL 7+8	26,787	10,325



NO.	DATE	REVISION	DWN	CHD	EXD	APPD	APPD	W.A.
1	7/1/90	REV. APS DWG #	JS				RM	7/1/01

ONE-LINE DIAGRAM
LOW VOLUME WASTES

ARIZONA **PUBLIC SERVICE** COMPANY
PHOENIX

SCALE N.T.S. DATE 8/28/78

DWN R.K. APPD ENGINEERING MANAGER
CHD APPD W.A.
EXD CJJ

DRAWING NO. D-110711
SHEET 1 OF 1

CULVERTMASTER REPORT

Rating Table Report
2-36" Pipe Calc

Range Data:				
	Minimum	Maximum	Increment	
Allowable HW E	5,331.50	5,336.00	0.50	ft

HW Elev. (ft)	Discharge (cfs)
5,331.50	0.00
5,332.00	2.20
5,332.50	8.61
5,333.00	18.64
5,333.50	31.65
5,334.00	46.93
5,334.50	63.74
5,335.00	81.30
5,335.50	98.87
5,336.00	111.84

VERTICAL DATUM CONVERSION SHEET

APS

Four Corners

28 February 2011

INPUT	OUTPUT
State Plane, NAD83	State Plane, NAD27
3003 - New Mexico West, U.S. Feet	3003 - New Mexico West, U.S. Feet
Vertical - NAVD88, U.S. Feet	Vertical - NGVD29 (Vertcon94), U.S. Feet

Accuracies of conversions from NAD 83 to NAD 27 are typically 12 to 18 cm.

3119 — 1/3

	Input		Output
Northing/Y:	2070171.29	**Northing/Y:**	2070108.945
Easting/X:	2526557.36	**Easting/X:**	303648.046
Elevation/Z:	5256.59	**Elevation/Z:**	5253.581
Convergence:	-0 24 01.74021	**Convergence:**	-0 24 00.36715
Scale Factor:	0.999960861	**Scale Factor:**	0.999960779
Combined Factor:	0.999712839	**Combined Factor:**	0.999709557

Grid Shift (U.S. ft.): X/Easting = -2222909.3, Y/Northing = -62.3

Datum Shift (m.): Delta Lat. = -0.173, Delta Lon = -57.032

^Z = 3.009 feet

3124 — 2/3

	Input		Output
Northing/Y:	2068657.97	**Northing/Y:**	2068595.641
Easting/X:	2528437.23	**Easting/X:**	305527.916
Elevation/Z:	5325.39	**Elevation/Z:**	5322.375
Convergence:	-0 23 47.73518	**Convergence:**	-0 23 46.36266
Scale Factor:	0.999960020	**Scale Factor:**	0.999959938
Combined Factor:	0.999708710	**Combined Factor:**	0.999705427

Grid Shift (U.S. ft.): X/Easting = -2222909.3, Y/Northing = -62.3

Datum Shift (m.): Delta Lat. = -0.183, Delta Lon = -57.018

^Z = 3.015 feet

3117 — 3/3

	Input		Output
Northing/Y:	2067386.15	**Northing/Y:**	2067323.844
Easting/X:	2524575.80	**Easting/X:**	301666.494
Elevation/Z:	5158.64	**Elevation/Z:**	5155.628
Convergence:	-0 24 15.87006	**Convergence:**	-0 24 14.49696
Scale Factor:	0.999961757	**Scale Factor:**	0.999961674
Combined Factor:	0.999718419	**Combined Factor:**	0.999715134

Grid Shift (U.S. ft.): X/Easting = -2222909.3, Y/Northing = -62.3

Datum Shift (m.): Delta Lat. = -0.178, Delta Lon = -57.049

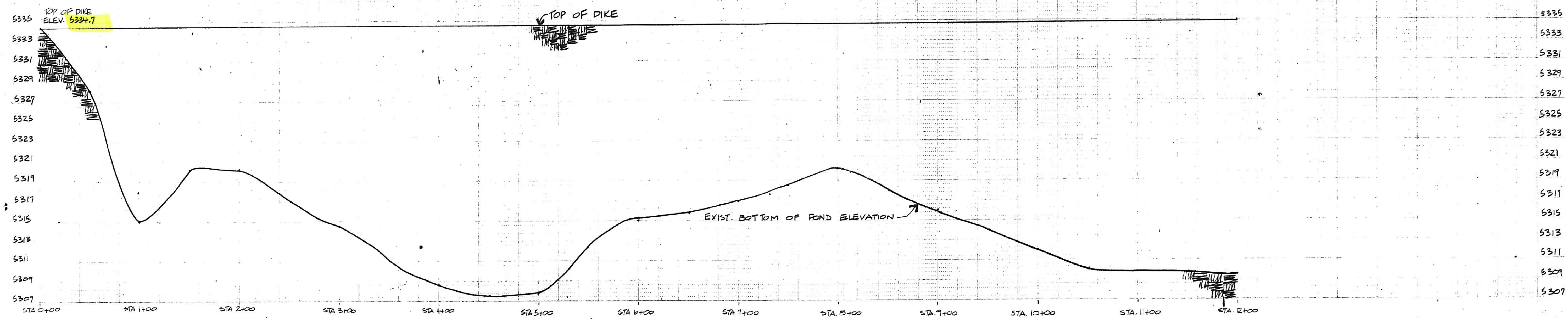
^Z = 3.012 feet

USE AVERAGE ^Z = 3.012 feet

Remark: NGVD29 to NAVD88 Vertical Datum Shift

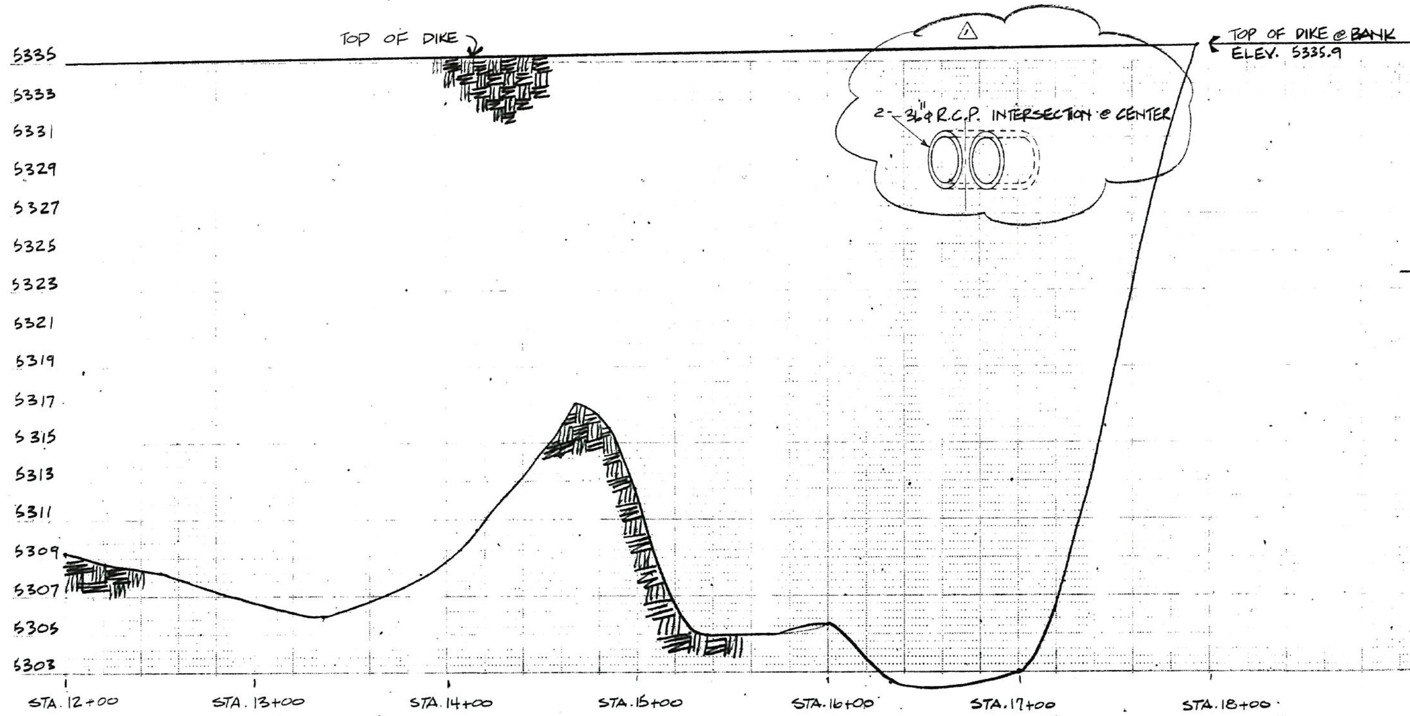
Corpscon v6.0.1, U.S. Army Corps of Engineers

WATER TREATMENT PLANT AS-BUILT SHEET



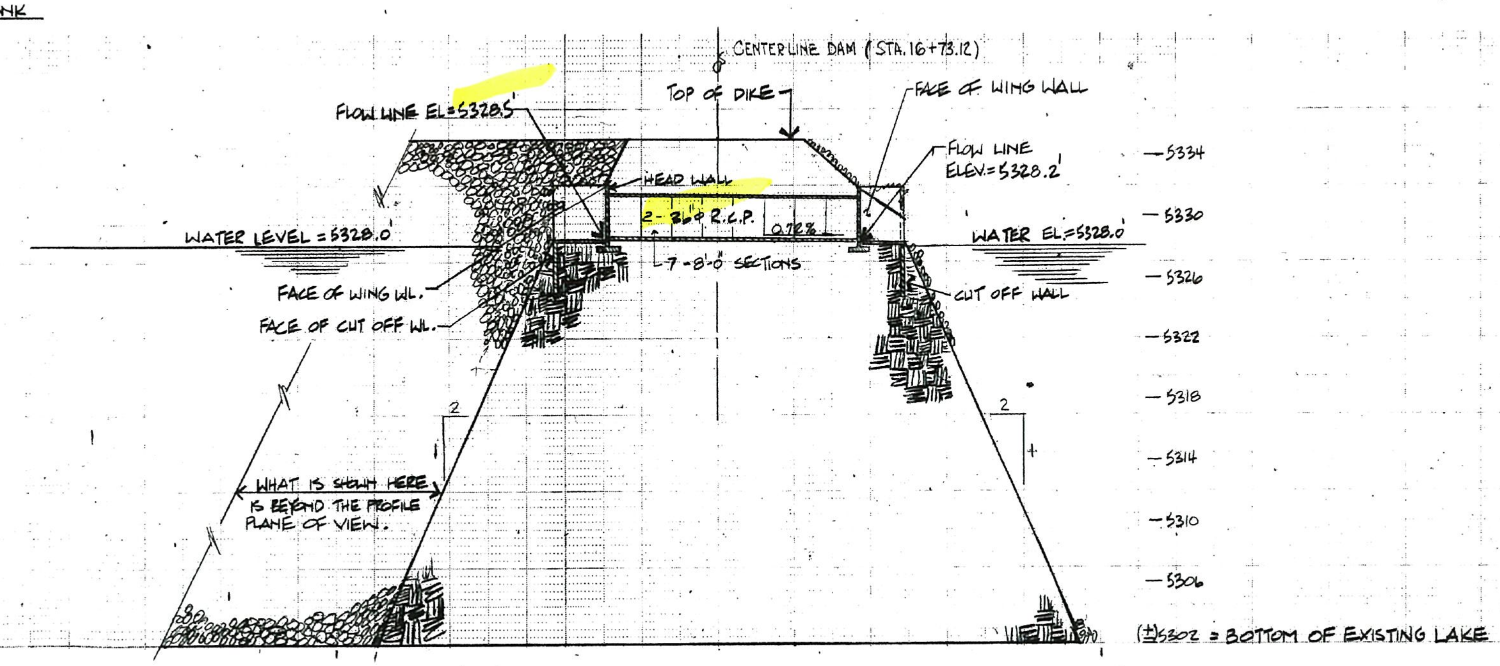
PROFILE @ CENTER OF WATER TREATMENT POND DIKE

SCALE: VERT: 1" = 4'-0
HORIZ: 1" = 40'-0



PROFILE @ CENTER OF WATER TREATMENT POND DIKE

SCALE: (SAME AS ABOVE)



PROFILE @ CENTER OF SPILLWAY

SCALE: VERT: 1" = 5'-0
HORIZ: 1" = 20'-0

NOTE: ADD 20% SURCHARGE TO BORROW

NO.	DATE	REVISION	DWN	CHD	EXD	APPD	APPD	W.A.
1	1/12/79	36"φ R.C.P. ADDED TO SPILLWAY	R.J.P.					

4 CORNERS POWER PLANT - NPDES
WATER TREATMENT POND DAM -
PROFILE @ CENTERLINE OF DAM

ARIZONA **PUBLIC SERVICE** COMPANY
PHOENIX

SCALE: AS NOTED
DATE: JULY 3, 1978

DRAWN: W.K. HOSTERT
CHECKED: [illegible]
APPROVED: J. Weiss 7/14/78 ENGINEERING MANAGER
DRAWING NO. G-67227

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