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AMERICAN ELECTRIC POWER

BOUNDLESS ENERGY™

ALTERNATIVE SOURCE DEMONSTRATION REPORT

2024 SECOND SEMIANNUAL EVENT

TEXAS STATE CCR RULE

Welsh Power Plant
Bottom Ash Storage Pond
Registration No. CCR 110
Pittsburg, Texas

Prepared for

American Electric Power
1 Riverside Plaza
Columbus, Ohio 43215-2372

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Project CHA8495B

March 2025

Geosyntec consultants

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LIST OF ACRONYMS AND ABBREVIATIONS

AEP	American Electric Power
ASD	alternative source demonstration
BASP	Bottom Ash Storage Pond
CCR	coal combustion residuals
EPRI	Electric Power Research Institute
HDPE	high-density polyethylene
LPL	lower prediction limit
meq/kg	milliequivalents per kilogram
mg/L	milligrams per liter
PBAP	Primary Bottom Ash Pond
SSI	statistically significant increase
SU	standard units
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TDS	total dissolved solids
TRRP	Texas Risk Reduction Program
UPL	upper prediction limit

1. INTRODUCTION AND SUMMARY

This alternative source demonstration (ASD) report has been prepared to address statistically significant increases (SSIs) for boron, chloride, and total dissolved solids (TDS) in the groundwater monitoring network at the Bottom Ash Storage Pond (BASP) located at the Welsh Power Plant (Welsh Plant) in Pittsburg, Texas, following the second semiannual detection monitoring event of 2024. The Welsh Plant has three coal combustion residuals (CCR) storage units regulated by the Texas Commission on Environmental Quality (TCEQ) under Registration No. CCR 110, including the BASP (**Figure 1**). The BASP was undergoing closure by CCR removal at the time of the detection monitoring event, and the other two CCR units were still active.

Background groundwater values for the BASP were originally calculated in January 2018 and have been updated periodically in accordance with the *Statistical Analysis Plan* prepared for the Welsh Plant (Geosyntec 2021). Under this plan, prediction limits were calculated for each well using intrawell comparisons. Applicable background values for the second semiannual event of 2024 are the revised upper prediction limits (UPLs) calculated in January 2024 for each Appendix III parameter (Geosyntec 2024). Revised lower prediction limits (LPLs) were also calculated for pH. Prediction limits were calculated based on a one-of-two retesting procedure to maintain an appropriate site-wide false positive rate. With this procedure, an SSI is concluded only if both samples in a series of two have reported results above the UPL or, in the case of pH, are below the LPL. In practice, if the initial result was not above the UPL or was not below the LPL, a second sample was not collected or analyzed.

The second semiannual detection monitoring event of 2024 was performed in September 2024 (initial sampling event), and the results were compared to the calculated prediction limits. Where initial values were identified above the UPL or below the LPL, verification resampling was completed in November 2024. Following verification resampling, intrawell comparisons identified SSIs for boron and TDS at monitoring well AD-4C and chloride at monitoring well AD-3. A summary of the detection monitoring analytical results for the downgradient compliance wells and the calculated prediction limits to which they were compared is provided in **Table 1**.

1.1 CCR Rule Requirements

TCEQ regulations regarding detection monitoring programs for CCR landfills and surface impoundments provide owners and operators with the option to make an ASD when an SSI is identified (Texas Administrative Code (TAC) Title 30 §352.941(c)(2)[30 TAC §352.941(c)(2)]):

> In making a demonstration under this section, the owner or operator must . . . within 90 days of making a determination of an SSI over the background value for any Appendix III constituent adopted by reference in §352.1421 of this title, submit a report prepared and certified in accordance with §352.4 of this title (relating to Engineering and Geoscientific Information), to the executive director, and any local pollution agency with jurisdiction that has requested to be notified, demonstrating that a source other than a coal combustion residuals unit caused the SSI or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

Pursuant to this regulation, Geosyntec Consultants, Inc. (Geosyntec) has prepared this ASD report to document that the SSIs identified for boron and TDS at well AD-4C and chloride at well AD-3 are from sources other than a release from the BASP.

1.2 Demonstration of Alternative Sources

An evaluation was completed to assess possible alternative sources to which each identified SSI could be attributed. Alternative sources were categorized into the following five types, based on methods provided by the Electric Power Research Institute (EPRI 2017):

- ASD Type I: Sampling Causes
- ASD Type II: Laboratory Causes
- ASD Type III: Statistical Evaluation Causes
- ASD Type IV: Natural Variation
- ASD Type V: Anthropogenic Sources

A demonstration was conducted to show that the identified SSIs at AD-3 and AD-4C were based on Type IV (natural variation) causes and not by a release from the BASP.

2. SUMMARY OF SITE CONDITIONS

The site background summary included in this section was primarily taken from Arcadis (2022), unless otherwise noted.

2.1 BASP Location and Design

The BASP was a 22-acre CCR surface impoundment located in the southern portion of the Welsh Plant, immediately south of the Landfill and Primary Bottom Ash Pond (PBAP) (**Figure 1**). It was designed with approximately 20-foot-high compacted-clay perimeter embankments and a 60-mil-thick high-density polyethylene (HDPE) liner placed over the base of the pond and the interior embankment slopes. The BASP was constructed and placed into operation in 2000 to receive bottom ash and economizer ash dredged and sluiced from the PBAP.

A Closure Plan for the BASP was developed in October 2016 and revised most recently in December 2024 (AEP 2024). This document details the closure activities which are to take place throughout the closure of the BASP. AEP submitted a certified notification that as of April 6, 2021, the BASP ceased receipt of CCR and non-CCR waste streams and closure activities had been initiated in accordance with the certified Closure Plan (AEP 2021). Thus, the BASP no longer received CCR material or transport waters and no longer received non-CCR wastewaters such as stormwater runoff from the landfill and surrounding areas. In November 2021, removal of the CCR material from the BASP began with the CCR material stockpiled in the northern portion of the BASP (AEP 2022a). Dewatering activities began in early 2022 and included installation of dewatering pumps and trenches. As a result of the closure activities, the BASP no longer contained impounded water as of November 3, 2022 (AEP 2022b). The removal of all CCR materials from the BASP as part of closure activities was completed in August 2024. The removal of all CCR materials from the BASP as part of closure activities was completed in August 2024 (AEP, 2024), and the removal of the HDPE liner and 12 inches of soil below the CCR materials was completed in September 2024.

2.2 Regional Geology and Site Hydrogeology

The Welsh Plant is located within the West Gulf Coastal Plain. The BASP is immediately underlain by the Eocene-age Recklaw Formation, which consists of very-fine- to fine-grained sand and clay (Flawn 1966). The Recklaw Formation ranges in thickness from approximately 10 to 110 feet in Titus County, where the Welsh Plant is located. This formation is underlain by the Eocene-age Carrizo Sand, consisting of fine to coarse sand, silt, and clay.

The uppermost aquifer in the vicinity of the BASP consists of an interval of the Recklaw Formation that is approximately 12-feet thick and composed of very-fine- to fine-grained silty sand and sandy silt. This aquifer is first encountered approximately 8 feet below the base of the BASP (Arcadis 2022). It is recharged primarily through infiltration of regional precipitation. Groundwater flow velocities in the uppermost aquifer in the vicinity of the BASP have been reported as approximately 1–20 feet per year (AEP 2022a).

Monitoring well AD-3 is screened from 7-17 feet below ground surface and monitoring well AD-4C is screened from 5-15 feet below ground surface. Both monitoring wells AD-3 and AD-4C are screened within the Recklaw Formation. Subsurface lithology at and near monitoring wells AD-3 and AD-4C are shown on geologic cross sections from Arcadis (2022) (**Attachment A**).

2.3 BASP Monitoring Well Network and Flow Conditions

The BASP monitoring well sampling network consists of background monitoring wells AD-1, AD-5, and AD-17 and downgradient compliance monitoring wells AD-3, AD-4C, and AD-16R (**Figure 1**). Well AD-16R was installed in April 2017 to replace well AD-16, which was frequently unable to yield an adequate volume of water for sampling. The groundwater flow direction near the BASP is generally to the southeast (**Figure 2**). Potentiometric groundwater flow maps from sampling events completed within the past two years are provided as **Attachment B**. Seasonal variability in groundwater flow direction has not been observed in the immediate vicinity of the BASP.

3. ALTERNATIVE SOURCE DEMONSTRATION

The ASD evaluation method and proposed alternative source of boron and TDS at well AD-4C and chloride at well AD-3 are described below.

3.1 Proposed Alternative Sources

An initial review of groundwater sampling field forms did not identify alternative sources due to a Type I (sampling) issue. A review of the laboratory quality assurance and quality control data and the statistical analyses did not identify any Type II (laboratory) or Type III (statistical evaluation) issues. Groundwater sampling, laboratory analysis, and statistical evaluations were generally completed in accordance with 30 TAC §352.941(a) and draft TCEQ guidance for groundwater monitoring (TCEQ 2020).

As described below, the SSIs for boron, TDS, and chloride have been attributed to natural variation, which is a Type IV issue.

3.1.1 Comparison to Background Concentrations - Boron

Recent fluctuations of aqueous boron concentrations at downgradient well AD-4C are attributed to natural variability of boron in the uppermost aquifer. The maximum boron concentration observed at AD-4C of 0.251 milligrams per liter (mg/L) falls within the range of boron concentrations observed in the background wells also screened within the Recklaw Formation and located upgradient or cross-gradient of the BASP (**Figure 3; Attachment A**). Background monitoring well AD-1 has consistently contained reported boron concentrations greater than the AD-4C maximum reported value of 0.251 mg/L. Until 2023, background monitoring well AD-17 also consistently had reported boron concentrations greater than or comparable to those for AD-4C during the same sampling events. It is noted that groundwater boron concentrations at all well locations discussed are lower than the Texas Risk Reduction Program (TRRP) Class I residential ingestion pathway limit ($^{GW}GW_{Ing}$) of 4.9 mg/L (TCEQ 2009; TCEQ 2025), and groundwater boron concentrations at AD-4C are more than 20 times less than the TRRP limit.

Aquifer solids samples were collected from a soil boring advanced adjacent to background monitoring well AD-17 in December 2024. Two samples were collected at depths associated with the screened interval for AD-17 and analyzed for total solid-phase boron.[1] Boron was detected in one sample collected from 29 to 30 feet below ground surface at 5.05 milligrams per kilogram (mg/kg); boron was not detected in the second sample at concentrations above the reporting limit (**Attachment C**). Further, TCEQ established a Texas-specific soil background concentration of 30 mg/kg of boron in 30 TAC §350.51(m). Given the detection of boron in site soils (and its abundance across Texas more broadly), some contribution of boron to groundwater from the aquifer is anticipated.

If the SSI for boron in AD-4C was due to a release from the BASP, we would anticipate similar trends for the concentrations of other CCR constituents, particularly those known to be known to

[1] Additional samples were collected from adjacent to downgradient well AD-16R. All samples were also submitted for analysis of total thorium, uranium, radium-226, and radium-228. These results are excluded from the discussion included herein to emphasize the relevant boron findings. The data is available in **Attachment C**.

be more chemically conservative, such as chloride. However, the observed chloride concentrations at AD-4C have not exhibited increasing trends (**Figure 4**).

3.1.2 Comparison to Background Concentrations – TDS

TDS measurements, which are typically reported in mg/L, represent the total mass of dissolved constituents in a sample rather than a single chemical constituent. TDS concentrations at background wells AD-1, AD-5, and AD-17, which are located upgradient or cross-gradient of the BASP and AD-4C (**Figure 2**), have historically been similar to or greater than those observed at AD-4C (**Figure 5**). TDS values at background well AD-17 continue to be notably greater than those observed at AD-4C, demonstrating the existing variability of TDS concentrations in groundwater throughout the plant. Background monitoring wells AD-1 and AD-5 have historically contained TDS concentrations greater than AD-4C and have both demonstrated significant natural variability in TDS concentrations since monitoring began. TDS concentrations at AD-1 have ranged from 150 mg/L in May 2018 to 612 mg/L in February 2017, and TDS concentrations at AD-5 have ranged from 210 mg/L in April 2024 to 484 mg/L in December 2016. The most recent TDS concentration reported for AD-4C groundwater (390 mg/L) falls within the range of reported values for both background wells. Monitoring well AD-4C is screened within the same hydrostratigraphic unit, the uppermost water-bearing unit, as all three BASP background wells (Arcadis 2022), so the variable TDS ranges within background wells demonstrate the degree of natural variability within the geologic unit monitored by AD-4C. TDS changes at AD-4C are well within the expected natural range of the unit.

Regional scale sampling data from shallow (60 feet or less) wells located in Titus County (**Attachment D**; Texas Water Commission 1965) provide additional examples of TDS variability within groundwater at comparable depths at the regional scale. At the time of publication in 1965, TDS concentrations were reported for 39 samples from 39 wells within Titus County screened at or less than 60 feet in depth (**Figure 6**). This dataset contained an average TDS concentration of 393 mg/L, a median concentration of 178 mg/L, and a maximum concentration of 1,903 mg/L. The average value of this dataset exceeds the TDS UPL of 332 mg/L at AD-4C. These data demonstrate the range of natural variability in TDS concentrations from shallow groundwater in this region and indicate that TDS concentrations at AD-4C groundwater are within expectations.

3.1.3 Comparison to Background Concentrations - Chloride

Chloride concentrations at downgradient well AD-3 have remained generally consistent since monitoring began in 2016, with chloride values less than those recorded for background well AD-17, located upgradient of the BASP, and background well AD-5, located cross-gradient of the BASP (**Figures 2 and 4**). Chloride concentrations at AD-3 are also comparable to and often lower than those observed at the downgradient monitoring well AD-4C. This indicates that the recent chloride concentration exists naturally in the groundwater of the uppermost aquifer at concentrations which exceed the UPL for AD-3 (9.40 mg/L).

Protective concentration levels have not been established for chloride in groundwater through the TRRP program; however, the TRRP protective concentration level tables (TCEQ 2025) list a secondary maximum contaminant level (MCL) for chloride of 250 mg/L. A secondary MCL is a non-enforceable guideline regulating containments that may cause cosmetic effects or aesthetic effects in drinking water. The maximum chloride concentration observed at AD-3 of 10.9 mg/L is approximately 25 times lower than this secondary MCL.

Regional scale sampling data from shallow wells located in Titus County (**Attachment D**; Texas Water Commission 1965) further support the existence of naturally occurring chloride concentrations exceeding the UPL of 9.40 mg/L. At the time of publication in 1965, chloride concentrations were reported for 44 samples from 27 wells within Titus County screened at shallow (60 feet or less) depths. Of these 44 samples, only 6 contained reported chloride concentrations below the UPL of 9.40 mg/L (**Figure 7**). This dataset contained an average chloride concentration of 130.4 mg/L, a median concentration of 39.5 mg/L, and a maximum of 450 mg/L. Both the average and the median values exceed the chloride UPL of 9.40 mg/L at well AD-3. These data indicate that chloride concentrations vary within groundwater at comparable depths at the regional scale.

3.1.4 AD-3 and AD-4C Aqueous Geochemical Stability

A release from the BASP would be expected to impact the geochemical conditions of downgradient groundwater such that groundwater at compliance monitoring wells would alter to reflect the geochemistry of the CCR source (i.e., BASP water). A Piper diagram was created to visualize the major ion chemistry of AD-3 and AD-4C groundwater (**Figure 8**). Piper diagrams represent the relative proportions of major cations and anions in water samples in the lower left and right triangles respectively and provide a combined view in the middle diamond which is created by projecting each triangle's axes onto a singular plot. Placement of data on the diamond therefore does not incorporate the full extent of the data plotted in individual triangles (i.e., movement along one axis in each triangle is not reflected in the diamond). The BASP sample included on **Figure 8**, which was collected in August 2020, is the most recently collected water sample from the unit and represents the final geochemical composition prior to the initiation of pond dewatering. No additional BASP samples can be collected due to pond closure activities.

The geochemical signature of AD-4C groundwater has displayed some variability (particularly among anion proportions) but has remained generally similar throughout the monitoring period, as illustrated by the clustering of sample results on the Piper diagram (**Figure 7**). In the event of a BASP release, AD-4C groundwater chemistry would be expected to shift to reflect the major ion signature of the BASP sample. The cation signature of AD-4C groundwater has remained consistent, and the anion signature has diverged further from the BASP sample since well installation. The lack of a temporal shift towards the BASP sample suggests a lack of influence from the BASP on the groundwater chemistry of AD-4C. This conclusion reinforces the determination that recently observed chemical concentrations at AD-4C are associated with natural variability in groundwater composition of the uppermost aquifer.

AD-3 groundwater has also displayed some variability (particularly among anion proportions) throughout the monitoring period but has remained generally consistent. In the event of a BASP release, AD-3 groundwater chemistry would be expected to shift to reflect the major ion signature of the BASP sample. The cation signature of AD-3 has remained consistent except for one sample collected in 2019, and the anion signature does not display a clear temporal trend among the minor variability. This observation reinforces the determination that chloride concentrations at AD-3 are not associated with a BASP release, but rather due to natural variability in groundwater composition of the uppermost aquifer.

4. CONCLUSIONS AND RECOMMENDATIONS

The preceding information serves as the ASD prepared in accordance with 30 TAC §352.941(c)(2) and supports the position that the boron and TDS SSIs at AD-4C and the chloride SSI at AD-3 identified during the second semiannual detection monitoring event of 2024 should be attributed to natural variation and not to a release from the Welsh BASP. Therefore, no further action is warranted. Certification of this ASD by a qualified professional engineer is provided in **Attachment E**.

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TABLES

Table 1. Detection Monitoring Data Summary
Alternative Source Demonstration Report - 2024 Second Semiannual Event
Welsh Plant - Bottom Ash Storage Pond

Analyte	Unit	Description	AD-3	AD-3	AD-4C	AD-4C	AD-16R	AD-16R
			9/10/2024	11/4/2024	9/10/2024	11/4/2024	9/10/2024	11/4/2024
Boron	mg/L	Intrawell Background Value (UPL)	0.0407		0.0882		0.0577	
		Analytical Result	0.010	--	**0.251**	**0.205**	0.020	--
Calcium	mg/L	Intrawell Background Value (UPL)	1.38		1.44		2.90	
		Analytical Result	0.78	--	**1.74**	1.30	0.32	--
Chloride	mg/L	Intrawell Background Value (UPL)	9.40		18.6		8.00	
		Analytical Result	**9.89**	**10.9**	15.9	--	7.30	--
Fluoride	mg/L	Intrawell Background Value (UPL)	0.263		0.180		0.296	
		Analytical Result	0.09	--	0.10	--	0.05	--
pH	SU	Intrawell Background Value (UPL)	5.2		5.7		4.6	
		Intrawell Background Value (LPL)	3.8		4.0		2.8	
		Analytical Result	**3.2**	4.5	4.9	4.8	**2.5**	3.7
Sulfate	mg/L	Intrawell Background Value (UPL)	10.6		123		73.4	
		Analytical Result	4.0	--	123	--	44.7	--
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	136		332		242	
		Analytical Result	120	--	**360**	**390**	180	--

Notes:
1. Bold values exceed the background value.
2. Background values are shaded gray.
--: not measured
LPL: Lower prediction limit
mg/L: milligrams per liter
SU: standard units
UPL: Upper prediction limit

FIGURES

Legend

- Downgradient Sampling Location
- Background Sampling Location
- CCR Units

Notes

- Monitoring well coordinates provided by AEP.
- Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation (Arcadis, 2022).
- Aerial imagery provided by Google Earth Pro, dated December 29, 2023.
- AEP: American Electric Power
- CCR: Coal combustion residuals

500 250 0 500 Feet

Site Layout
Bottom Ash Storage Pond

AEP Welsh Power Plant
Cason, Texas

Geosyntec consultants

Columbus, Ohio | 2024/12/19

Figure **1**

A:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Welsh\AEP-Welsh_Updated_BASP_Site_Layout.mxd. Okiemute.Commander. 12/19/2024. CHA8423/14/08.

Legend

- Groundwater Monitoring Well
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Approximate Groundwater Flow Direction
- CCR Units

Notes

1. Monitoring well coordinates and water level data (collected on September 8, 9, and 10, 2024) provided by AEP.
2. Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation (Arcadis 2022).
3. Groundwater elevation units are feet above mean sea level (ft amsl).
4. Aerial imagery provided by Google Earth Pro, dated December 29, 2023.

500 250 0 500 Feet

Beth Ann Gross

1/13/2025
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STATE OF TEXAS
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79864
LICENSED
PROFESSIONAL ENGINEER

Groundwater Potentiometric Map
September 2024

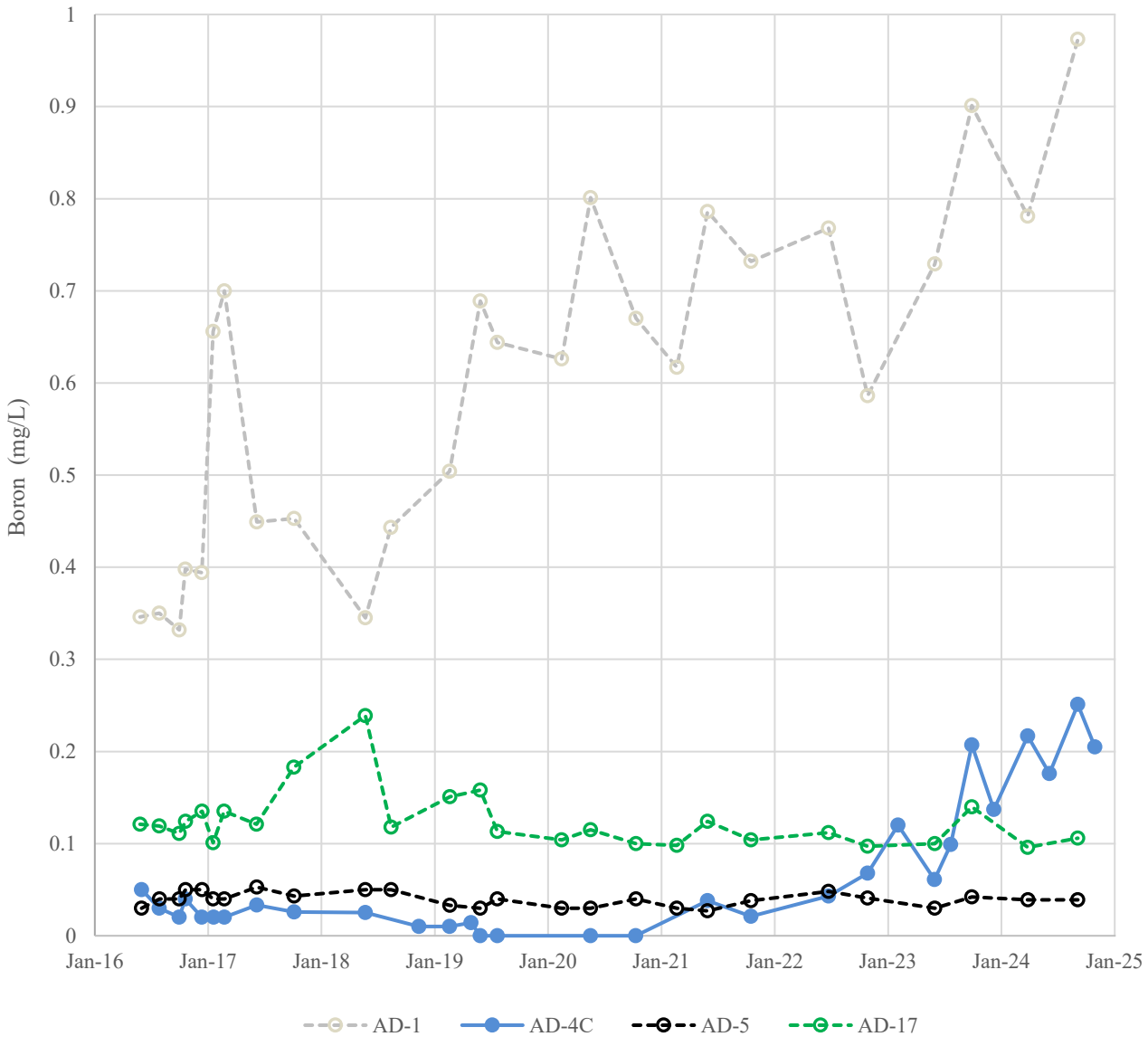
AEP Welsh Power Plant
Cason, Texas

Geosyntec consultants

Columbus, Ohio | 2025/01/13

Figure
2

\\annarbor-01\Data\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Welsh\2024\AEP-Welsh_GW_2024-09Sep.mxd. ASoltero. 1/13/2025. CHA8423/14/08.



Notes: Boron time series diagram for BASP background wells AD-1, AD-5, and AD-17 (dashed lines) and downgradient well AD-4C (solid line). Data collected as part of the federal coal combustion residuals (CCR) program. Results are shown in milligrams per liter (mg/L).

Boron Time Series Graph
Welsh Bottom Ash Storage Pond

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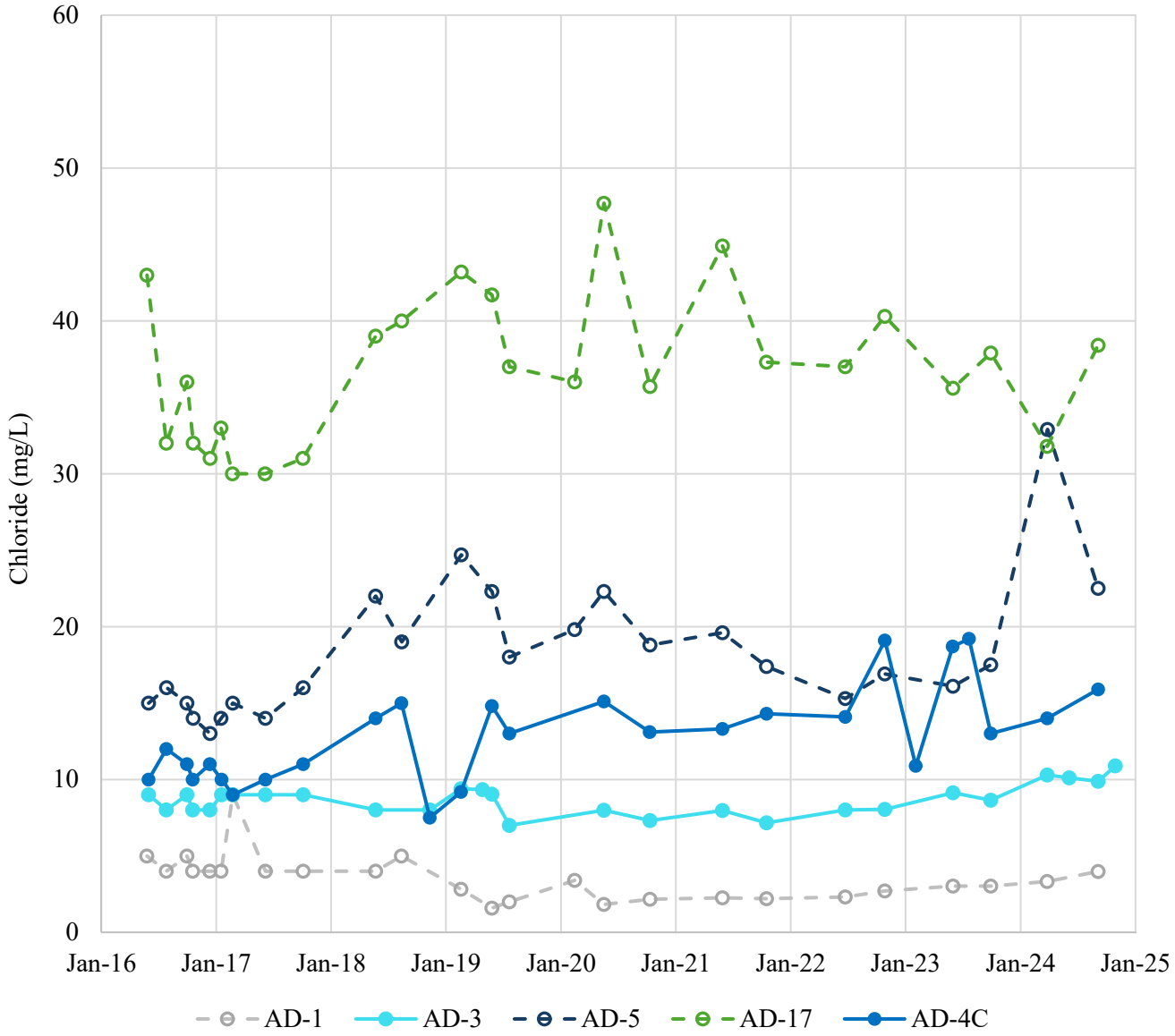
Figure **3**

Columbus, Ohio

January 2025



Notes: Chloride time series diagram for BASP background wells AD-1, AD-5, and AD-17 (dashed lines) and downgradient wells AD-3 and AD-4C (solid lines). Data collected as part of the federal coal combustion residuals (CCR) program. Results are shown in milligrams per liter (mg/L).

Chloride Time Series Graph
Welsh Bottom Ash Storage Pond

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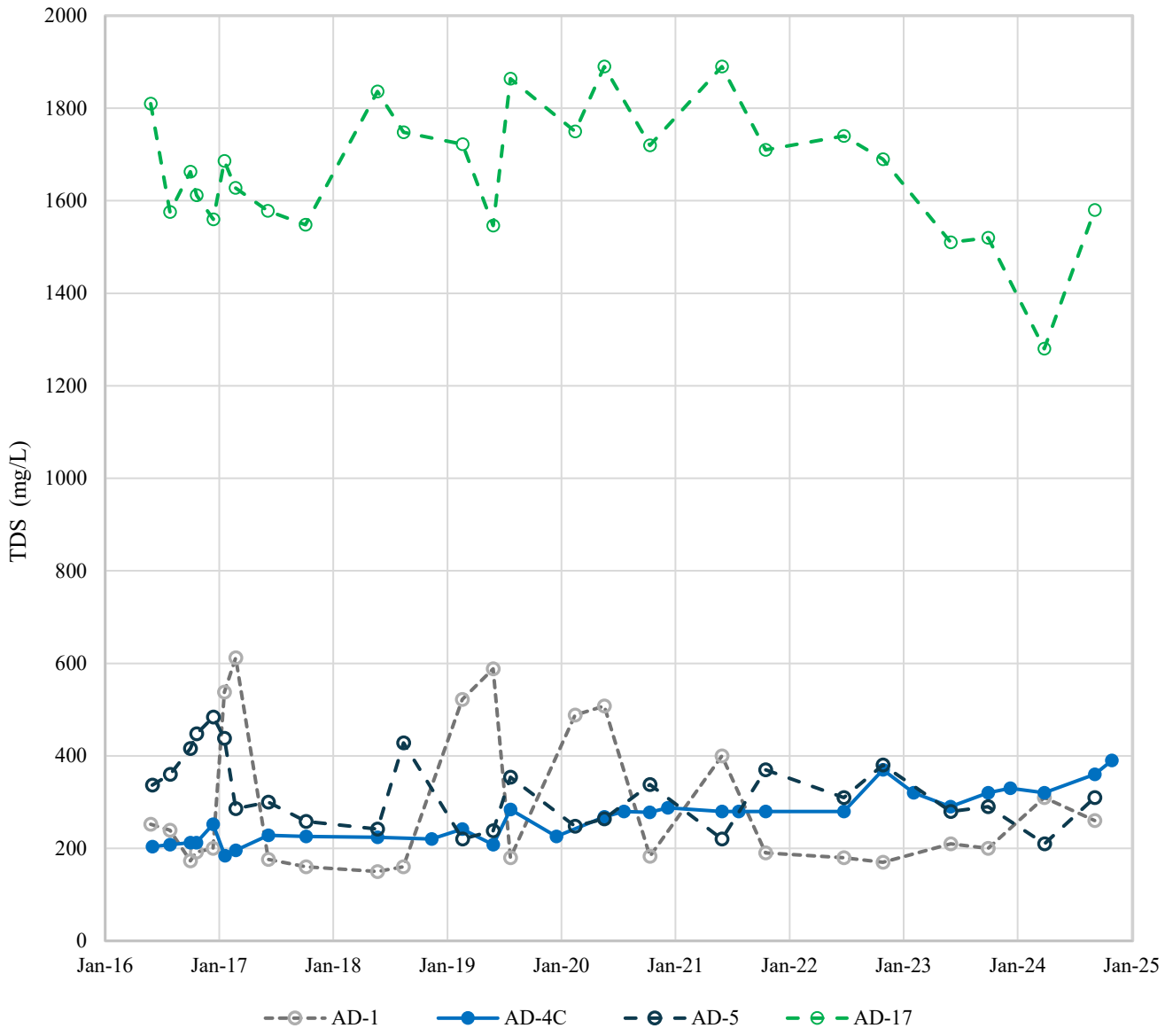
Figure 4

Columbus, Ohio

March 2025



Notes: Total Dissolved Solids (TDS) time series diagram for BASP background wells AD-1, AD-5, and AD-17 (dashed lines) and downgradient well AD-4C (solid line). Data collected as part of the federal coal combustion residuals (CCR) program. Results are shown in milligrams per liter (mg/L).

Total Dissolved Solids
Time Series Graph
Welsh Bottom Ash Storage Pond

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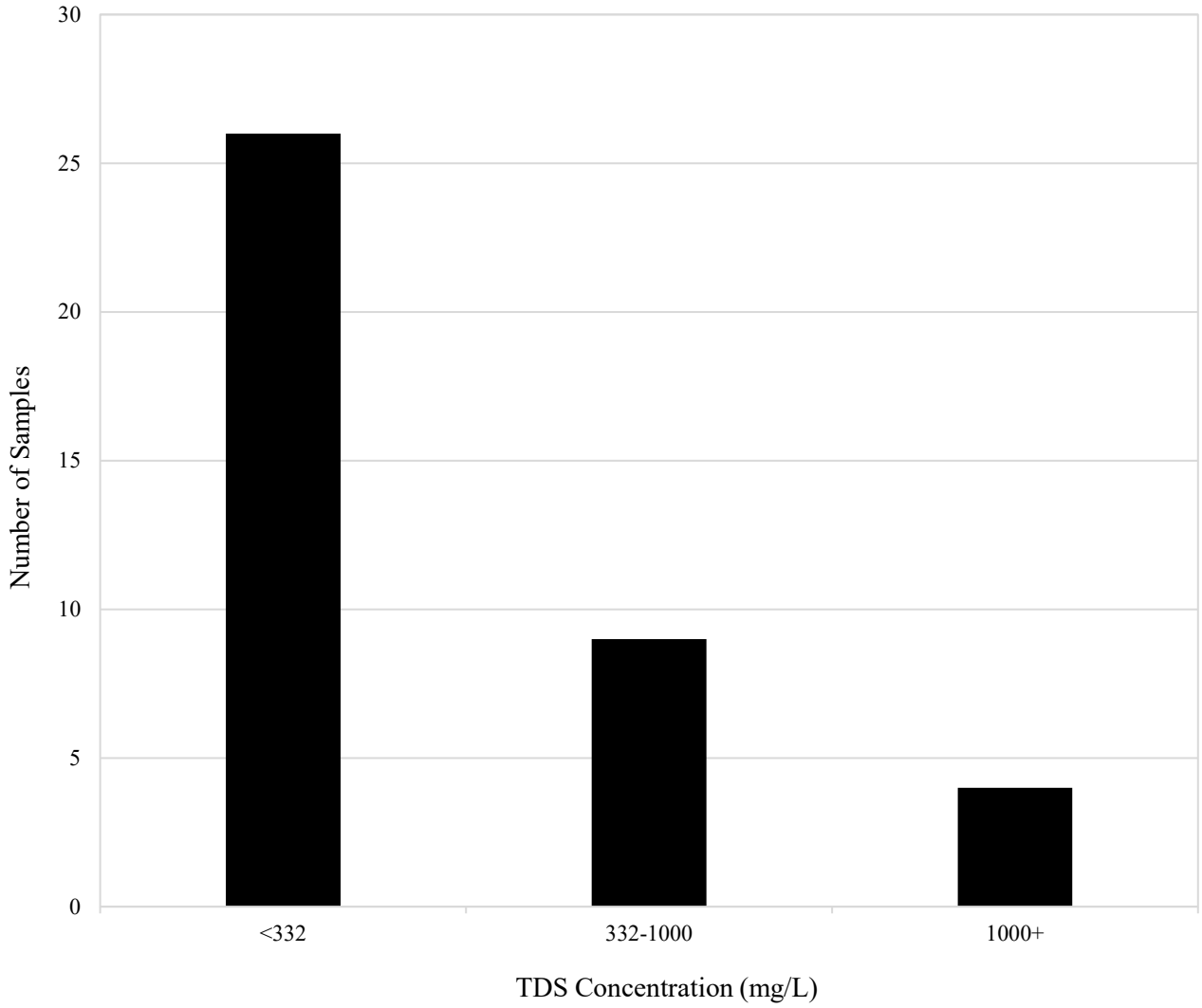
Figure **5**

Columbus, Ohio

March 2025



Notes: Total dissolved solids (TDS) analytical data is shown for 39 groundwater samples collected from 39 groundwater wells screened at a depth of less than 60 feet below ground surface (bgs). Results are grouped in bins in units of milligrams per liter (mg/L). From Texas Water Commission 1965 (provided as **Attachment C**).

Titus County TDS Concentrations in Shallow (<60' Depth) Wells
Welsh Bottom Ash Storage Pond

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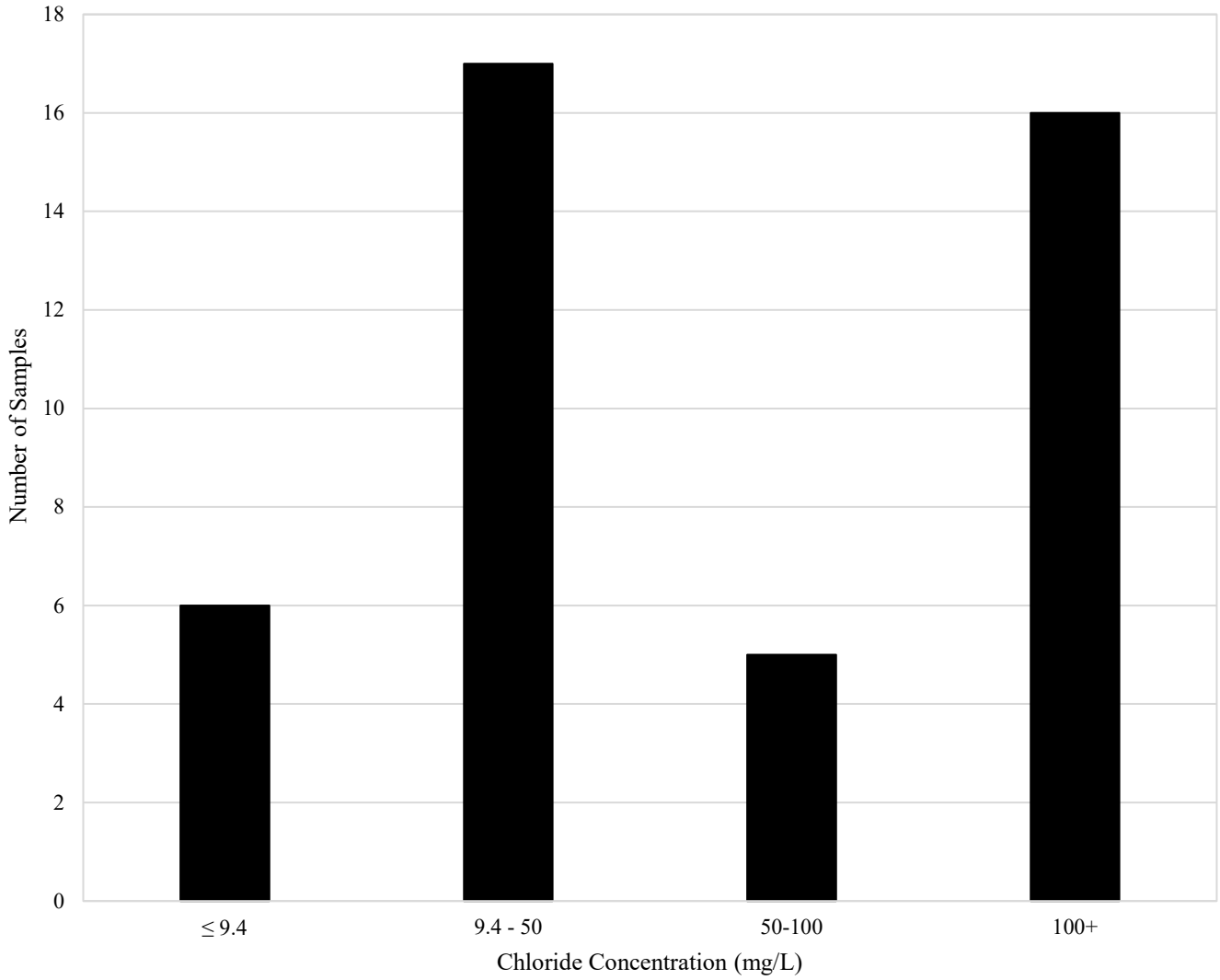
Columbus, Ohio | March 2025



Notes: Chloride analytical data is shown for 44 groundwater samples collected from 27 groundwater wells screened at a depth of less than 60 feet below ground surface (bgs). Results are grouped in bins in units of milligrams per liter (mg/L). From Texas Water Commission 1965 (provided as **Attachment C**).

Titus County Chloride Concentrations in Shallow (<60' Depth) Wells

Welsh Bottom Ash Storage Pond

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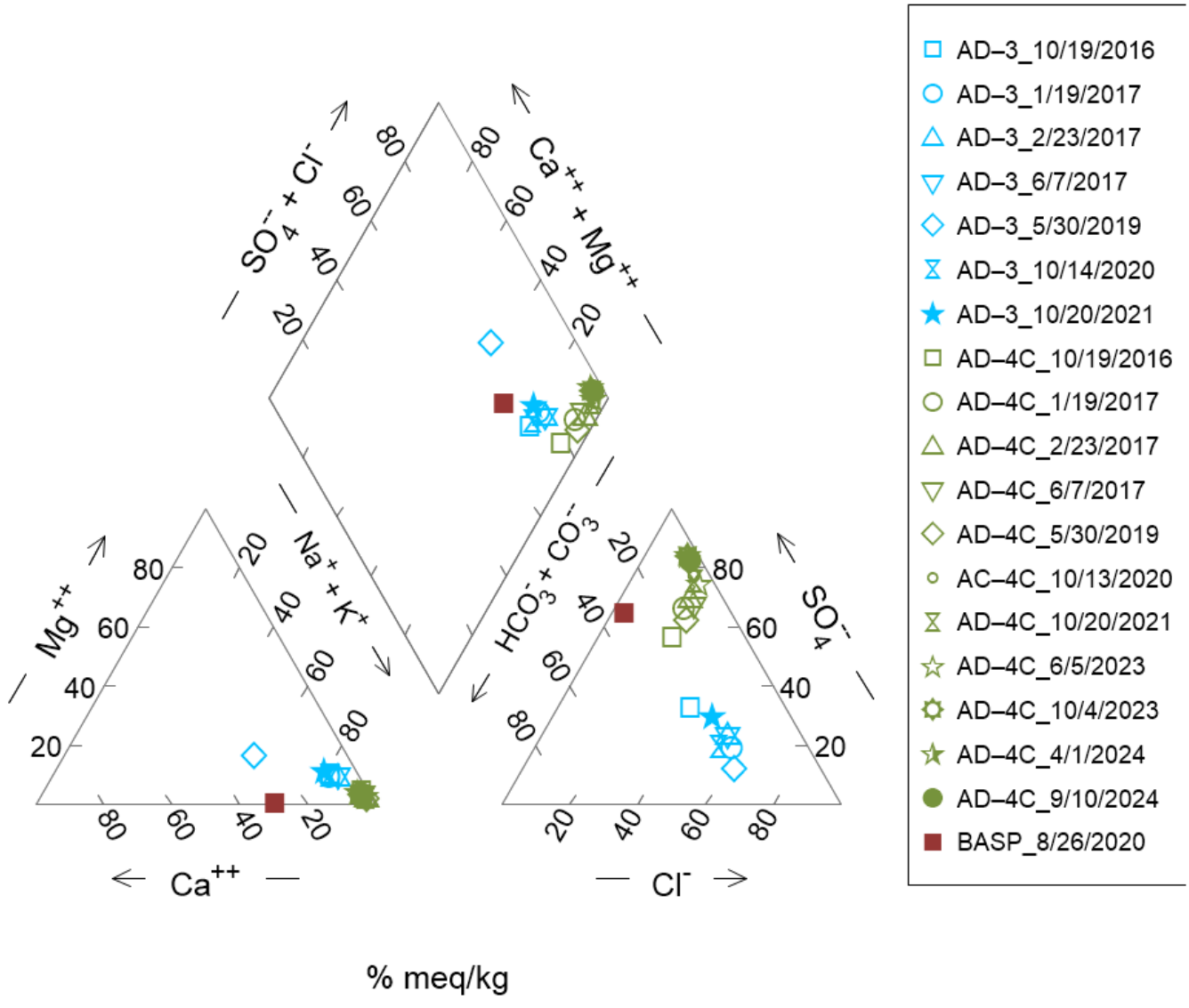
Columbus, Ohio

March 2025

Figure **7**



Notes: Groundwater samples from monitoring wells AD-3 and AD-4C which contain analytical results for all major ions are plotted on the Piper diagram with the most recent BASP water sample collected. Results are shown in milliequivalents per kilogram (meq/kg). In instances where the total alkalinity and potassium analytical results were not detected, the method detection limit was provided for the Piper diagram.

AD-3 and AD-4C Piper Diagram
Welsh Bottom Ash Storage Pond

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Figure **8**

ATTACHMENT A
Geologic Cross Sections

Document Path: Z:\GISProjects_ENV\AEP\Welsh Plant\MXD\Landfill report\September 2019\Fig2-3-Cross Section LocationsREV.mxd

A
AD-23
AD-22
FM 1735
SB-4 (background)
AD5
AD6
Primary Bottom Ash Pond
Ash-2
Ash-1
Weir Box
AD-18
SB-3
Drainage Canal
SB-2
AD-17
AD12
B
Landfill
Temp-1
C
AD1
Bottom Ash Storage Pond
AD4a
AD4b
D4
AD4c
1/4-acre Clear Water Pond
Ash-4
Weir Box
SB-1
AD2
D'
E'
D
AD7
A
Ash-3
E
AD8
SB-5
A'
AD-15
B1
B2
G-1
B4
AD9
B3
SB-6
Clear Water Pond
B5
Welsh Reservoir
AD13
SB-7
AD10
B'
B6
G-2
AD11
TPDES Outfall
AD14
AD-19
AD-16
G-3
AD-16R
AD-21
C'
AD-20
GB2
GB6
GB7
GB5
GB4
MW9
MW10

Legend

- Existing CCR Unit Upgradient Monitoring Well
- Existing CCR Unit Downgradient Monitoring Well
- Monitoring Well Location
- Piezometer/Temporary Monitoring Well Location
- Plugged Monitoring Well/Piezometer
- Soil Boring (May 2018)
- Geotechnical Soil Boring (October 2018)
- Ash Pore Water Sample Location (May 2018)
- Site Features
- A-A' LINE OF GEOLOGIC CROSS SECTION

0 800 1,600
SCALE IN FEET

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

J. ROBERT WELSH POWER PLANT
1187 COUNTY ROAD 4865
PITTSBURG, TITUS COUNTY, TEXAS

SITE LAYOUT AND WELL LOCATIONS (UPDATED SEPTEMBER 2022)

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3

Cross sections excerpted from "Bottom Ash Storage Pond - CCR Groundwater Monitoring Well Network Evaluation", Rev 3: 11-2022. Arcadis.

WEST

C

EAST

C'

BOTTOM ASH STORAGE POND

WELSH RESERVOIR

370'
360'
350'
340'
330'
320'
310'
300'

PERIMETER ROAD (EL. 360')

PERIMETER ROAD (EL. 360')

B-12

B-13

AD-1

AD-4A

AD-4B

AD-4C

AD-20

AD-21

SILTY CLAY AND SANDY CLAY, BROWN TO GRAY.

CLAYEY SAND, DRY

BOTTOM ASH STORAGE 60-ML. HDPE LINER (PROJECTED)

SANDY SILT AND SILTY SAND, VERY FINE TO FINE GRAINED, GRAY TO TAN.

SANDY CLAY

REDDISH BROWN TO GRAY, SILTY CLAY.

DARK GRAY SILTY, SANDY CLAY.
(confining unit)

RECKAW FORMATION
(AVERAGE HYDRAULIC CONDUCTIVITY = 0.95 ft/day)
(EFFECTIVE POROSITY = 0.21)

ELEVATION (FEET MSL)

ELEVATION (FEET MSL)

NOTES:
1. BASE OF BOTTOM ASH STORAGE HAS A 60-MIL. HDPE LINER AT ELEVATION 340.0', TAKEN FROM FREESE AND NICHOLS "HYDRAULIC ANALYSIS OF WELSH POWER PLANT ASH PONDS, AMERICAN ELECTRIC POWER COMPANY", DATED DECEMBER 2010.
2. HYDRAULIC CONDUCTIVITY CALCULATED BASED ON ON-SITE AQUIFER TEST OF MONITORING WELL AD-6 ON 9-17-21; AND SLUG TESTING OF MONITORING WELLS AD-6, AD-9, AD-13, AD-17, AND AD-19 DURING OCTOBER 2018.
3. EFFECTIVE POROSITY ESTIMATED AT 0.21 BASED ON SITE LITHOLOGY. SITE SPECIFIC YIELD FOR FINE SAND, REFERENCE: C. W. FETTER, "APPLIED HYDROGEOLOGY", UNIVERSITY OF WISCONSIN - OSHKOSH, 1980.

STATE OF TEXAS
Kenneth J. Brandner
Geology
1787
LICENSED PROFESSIONAL GEOSCIENTIST

9-29-22

LEGEND

MONITORING WELL SCREENED INTERVAL

WATER LEVEL IN MONITORING WELL (10/29/18)

PROJECTED BASE OF ASH STORAGE (SEE NOTE)

0 200'
HORIZONTAL SCALE

J. ROBERT WELSH POWER PLANT
1187 COUNTY ROAD 4865
PITTSBURG, TITUS COUNTY, TEXAS

CROSS SECTION
C - C'
(UPDATED SEPTEMBER 2022)

ARCADIS

FIGURE 6

Cross sections excerpted from "Bottom Ash Storage Pond - CCR Groundwater Monitoring Well Network Evaluation", Rev 3: 11-2022. Arcadis.

NORTH

D

PRIMARY BOTTOM ASH POND

LANDFILL

BOTTOM ASH STORAGE

SOUTH

D'

ELEVATION (FEET MSL)

380'
370'
360'
350'
340'
330'
320'
310'
300'

AD-7

B-10

B-13

PERIMETER ROAD (EL. 360')

PERIMETER ROAD (EL. 360')

AD-2

FILL WITH (ASH-COAL PIECES)

FILL WITH (ASH-COAL PIECES)

CLAYEY SAND, DRY

60-ML. HDPE LINER (PROJECTED)

CLAY AND SANDY CLAY, GRAY TO TAN.

CLAY AND SANDY CLAY

SAND AND CLAYEY SAND, GRAY TO BROWN.

FILL WITH (ASH-COAL PIECES)

SAND

CLAY

SILTY CLAY

SILTY CLAY, GRAY TO BROWN. (CONFINING UNIT)

RECKLAW FORMATION
(AVERAGE HYDRAULIC CONDUCTIVITY = 0.95 ft/day)
(EFFECTIVE POROSITY = 0.21)

STATE OF TEXAS
Kenneth J. Brandner
Geology
1787
LICENSED PROFESSIONAL GEOSCIENTIST

9-29-22

LEGEND

- MONITORING WELL SCREENED INTERVAL
- WATER LEVEL IN MONITORING WELL (5/12/15)
- BASE OF CCR UNIT

0 300'
HORIZONTAL SCALE

NOTES:
1. BASE OF ASH POND TAKEN FROM "WELSH POWER PLANT-UNIT 1 FLY ASH STORAGE AREA PHASE I " DRAWING ID WEPX-88, DATED 12-3-76; AND U.S. GEOLOGICAL SURVEY 7 1/2 MINUTE SERIES TOPOGRAPHIC MAP, CASON, TX QUADRANGLE, 1964 (PHOTO REVISED 1980).
2. HYDRAULIC CONDUCTIVITY CALCULATED BASED ON ON-SITE AQUIFER TEST OF MONITORING WELL AD-6 ON 9-17-21; AND SLUG TESTING OF MONITORING WELLS AD-6, AD-9, AD-13, AD-17, AND AD-19 DURING OCTOBER 2018.
3. EFFECTIVE POROSITY ESTIMATED AT 0.21 BASED ON SITE LITHOLOGY. SITE SPECIFIC YIELD FOR FINE SAND, REFERENCE: C. W. FETTER, "APPLIED HYDROGEOLOGY", UNIVERSITY OF WISCONSIN - OSHKOSH, 1980.

J. ROBERT WELSH POWER PLANT
1187 COUNTY ROAD 4865
PITTSBURG, TITUS COUNTY, TEXAS

CROSS SECTION D - D' (UPDATED SEPTEMBER 2022)

ARCADIS

FIGURE 7

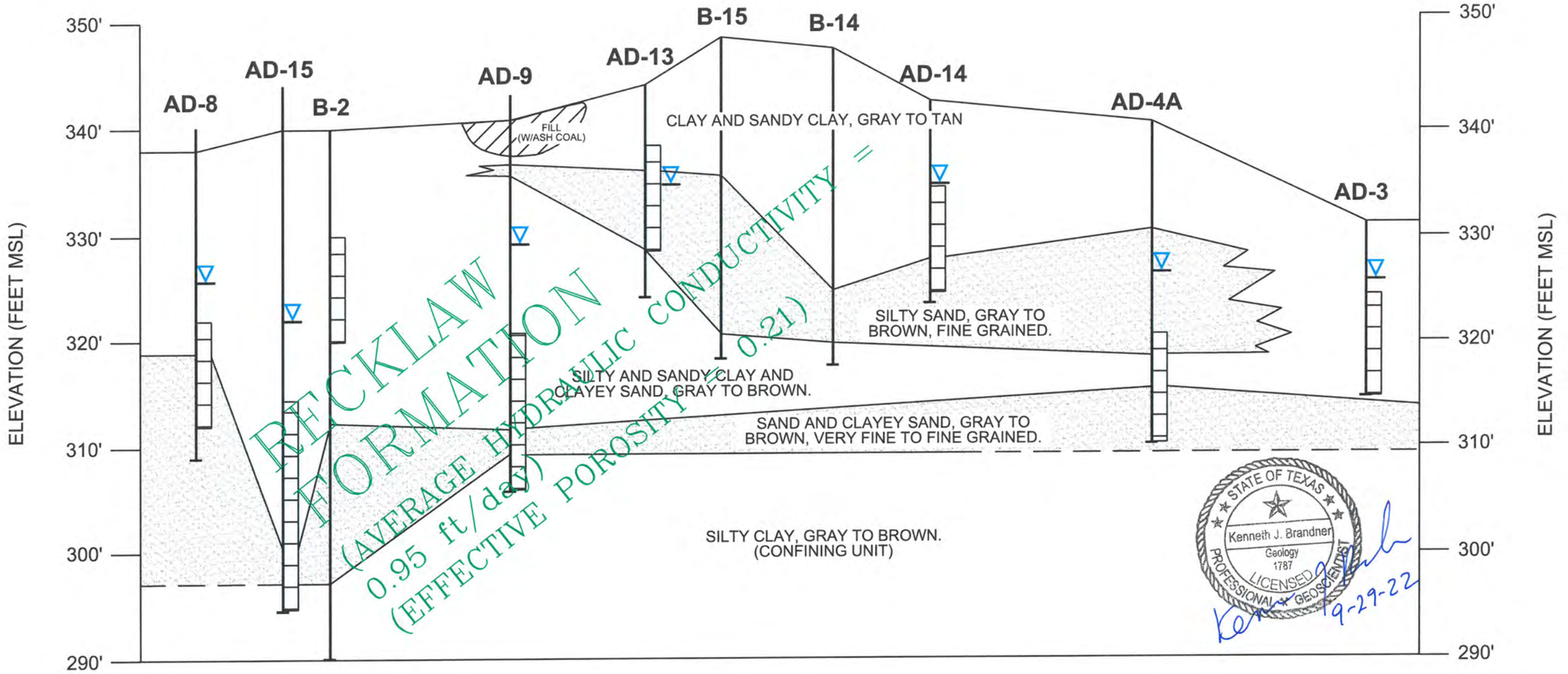
Cross sections excerpted from "Bottom Ash Storage Pond - CCR Groundwater Monitoring Well Network Evaluation", Rev 3: 11-2022. Arcadis.

NORTH

E

SOUTH

E'



STATE OF TEXAS
Kenneth J. Brandner
Geology
1787
LICENSED
PROFESSIONAL GEOSCIENTIST
9-29-22

NOTES:
1. BASE OF ASH POND TAKEN FROM "WELSH POWER PLANT-UNIT 1 FLY ASH STORAGE AREA PHASE I " DRAWING ID WEPX-88, DATED 12-3-76; AND U.S. GEOLOGICAL SURVEY 7 1/2 MINUTE SERIES TOPOGRAPHIC MAP, CASON, TX QUADRANGLE, 1964 (PHOTO REVISED 1980).
2. HYDRAULIC CONDUCTIVITY CALCULATED BASED ON ON-SITE AQUIFER TEST OF MONITORING WELL AD-6 ON 9-17-21; AND SLUG TESTING OF MONITORING WELLS AD-6, AD-9, AD-13, AD-17, AND AD-19 DURING OCTOBER 2018.
3. EFFECTIVE POROSITY ESTIMATED AT 0.21 BASED ON SITE LITHOLOGY. SITE SPECIFIC YIELD FOR FINE SAND, REFERENCE: C. W. FETTER, "APPLIED HYDROGEOLOGY", UNIVERSITY OF WISCONSIN - OSHKOSH, 1980.

LEGEND

MONITORING WELL SCREENED INTERVAL

WATER LEVEL IN MONITORING WELL (3/4/16)

0 300'
HORIZONTAL SCALE

J. ROBERT WELSH POWER PLANT
1187 COUNTY ROAD 4865
PITTSBURG, TITUS COUNTY, TEXAS

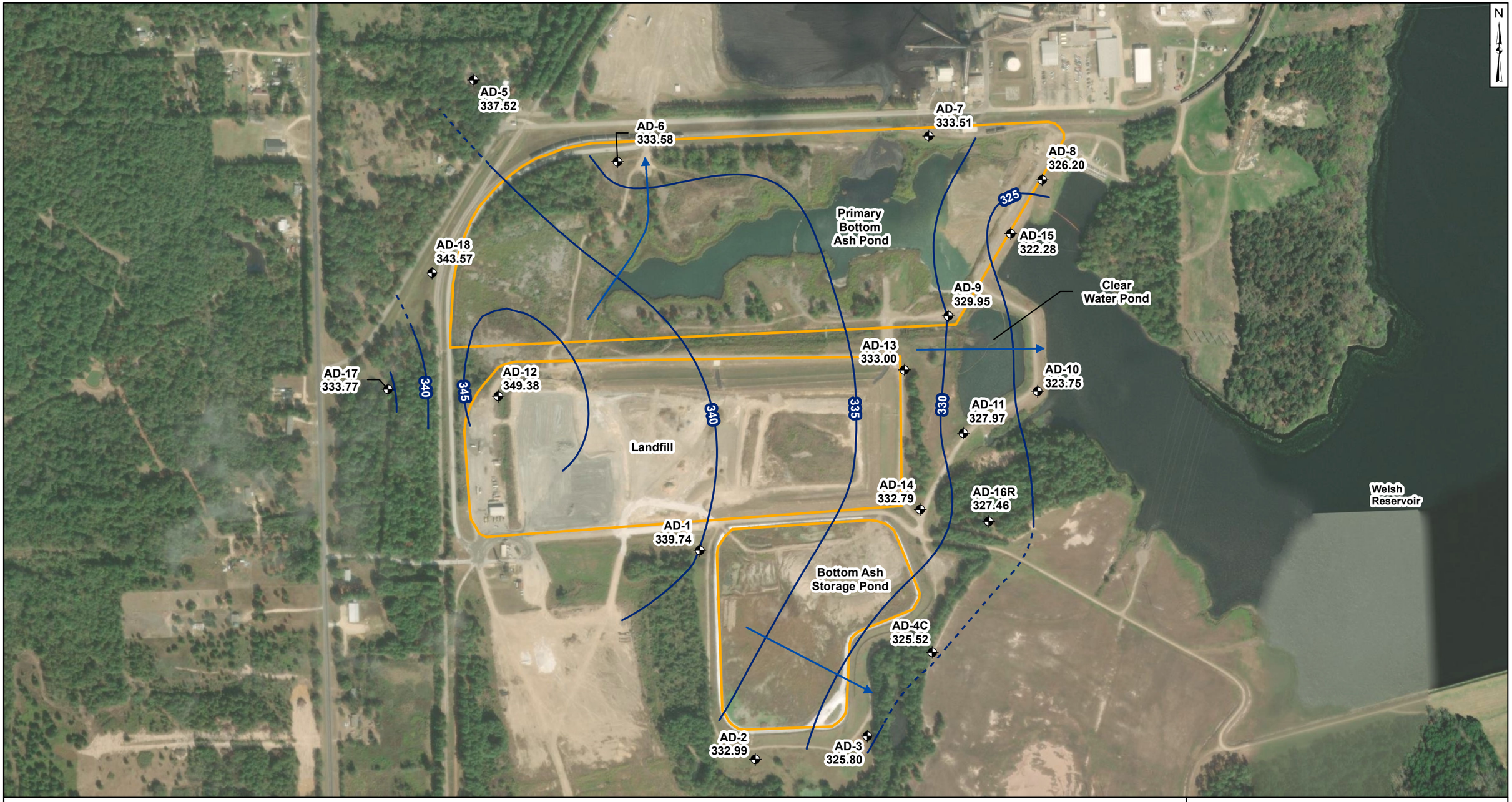
CROSS SECTION
E - E'
(UPDATED SEPTEMBER 2022)

ARCADIS

FIGURE
8

Cross sections excerpted from "Bottom Ash Storage Pond - CCR Groundwater Monitoring Well Network Evaluation", Rev 3: 11-2022. Arcadis.

ATTACHMENT B
Historical Potentiometric Maps



Legend

- Groundwater Monitoring Well
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Approximate Groundwater Flow Direction
- CCR Units

Notes

1. Monitoring well coordinates and water level data (collected on February 6 and 7, 2023) provided by AEP.
2. Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation (Arcadis 2022).
3. Groundwater elevation units are feet above mean sea level.
4. Satellite imagery provided by ESRI.

500 250 0 500 Feet

STATE OF TEXAS
BETH ANN GROSS
79864
LICENSED PROFESSIONAL ENGINEER

Beth Ann Gross

November 30, 2023

Geosyntec Consultants, Inc.
Texas Firm Registration No. 1182

Groundwater Potentiometric Map
February 2023

AEP Welsh Power Plant
Cason, Texas

Geosyntec consultants

Columbus, Ohio | 2023/11/30

Figure
B-1

\\annarbor-01\Data\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Welsh\2023\AEP-Welsh_GW_2023-02Feb.mxd. ASoltero. 11/30/2023. CHA8423/14/08.

Legend

- Groundwater Monitoring Well
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Approximate Groundwater Flow Direction
- CCR Units

Notes

1. Monitoring well coordinates and water level data (collected on June 6, 2023) provided by AEP.
2. AD-12 was not gauged during the June 2023 event.
3. Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation (Arcadis 2022).
4. Groundwater elevation units are feet above mean sea level.
5 Satellite imagery provided by ESRI.

500 250 0 500 Feet

STATE OF TEXAS
BETH ANN GROSS
79864
LICENSED
PROFESSIONAL ENGINEER

Beth Ann Gross

November 30, 2023

Geosyntec Consultants, Inc.
Texas Firm Registration No. 1182

Groundwater Potentiometric Map
June 2023

AEP Welsh Power Plant
Cason, Texas

Geosyntec consultants

Columbus, Ohio | 2023/11/30

Figure **B-2**

\\annarbor-01\Data\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Welsh\2023\AEP-Welsh_GW_2023-06June.mxd. ASoltero. 11/30/2023. CHA8423/14/08.

Legend

- Groundwater Monitoring Well
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Approximate Groundwater Flow Direction
- CCR Units

Notes

1. Monitoring well coordinates and water level data (collected on July 27, 2023) provided by AEP.
2. Only well AD-04C was gauged during the July 2023 verification event.Groundwater contours based on June 2023 sampling event.
3. Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation (Arcadis, 2018).
4. Groundwater elevation units are feet above mean sea level.
5 Satellite imagery provided by ESRI.

500 250 0 500 Feet

STATE OF TEXAS
BETH ANN GROSS
79864
LICENSED
PROFESSIONAL ENGINEER

Beth Ann Gross

November 29, 2023

Geosyntec Consultants, Inc.
Texas Firm Registration No. 1182

Groundwater Potentiometric Map
July 2023

AEP Welsh Power Plant
Cason, Texas

Geosyntec consultants

Columbus, Ohio | 2023/11/29

Figure **B-3**

\\annarbor-01\Data\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Welsh\2023\AEP-Welsh_GW_2023-07July_ver.mxd. ASoltero. 11/29/2023. CHA8423/14/08.

Legend

- Groundwater Monitoring Well
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Approximate Groundwater Flow Direction
- CCR Units

Notes

1. Monitoring well coordinates and water level data (collected on October 3 and 4, 2023) provided by AEP.
2. Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation (Arcadis 2022).
3. Groundwater elevation units are feet above mean sea level.
4. Satellite imagery provided by ESRI.

500 250 0 500 Feet

STATE OF TEXAS
BETH ANN GROSS
79864
LICENSED
PROFESSIONAL ENGINEER

Beth Ann Gross
November 30, 2023

Geosyntec Consultants, Inc.
Texas Firm Registration No. 1182

Groundwater Potentiometric Map
October 2023

AEP Welsh Power Plant
Cason, Texas

Geosyntec consultants

Columbus, Ohio | 2023/11/30

Figure **B-4**

\\annarbor-01\Data\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Welsh\2023\AEP-Welsh_GW_2023-10Oct.mxd. ASoltero. 11/30/2023. CHA8423/14/08.

Legend

- Groundwater Monitoring Well
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Approximate Groundwater Flow Direction
- CCR Units

Notes

1. Monitoring well coordinates and water level data (collected on December 14, 2023) provided by AEP.
2. Only wells AD-3, AD-4C, and AD-16R were gauged during the December 2023 verification event. Groundwater contours based on October 2023 sampling event.
3. Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation (Arcadis, 2018).
4. Groundwater elevation units are feet above mean sea level.
5 Aerial imagery provided by Google Earth Pro, dated December 29, 2023.

500 250 0 500
Feet

STATE OF TEXAS
BETH ANN GROSS
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PROFESSIONAL ENGINEER

Beth Ann Gross
February 19, 2024

Geosyntec Consultants, Inc.
Texas Firm Registration No. 1182

Groundwater Potentiometric Map
December 2023

AEP Welsh Power Plant
Cason, Texas

Geosyntec consultants

Columbus, Ohio | 2024/12/23

Figure
B-5

A:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Welsh\2023\AEP-Welsh_GW_2023-12Dec_ver.mxd. Okiemute.Commander. 12/23/2024. CHA8423/14/08.

Legend

- Groundwater Monitoring Well
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Approximate Groundwater Flow Direction
- CCR Units

Notes

1. Monitoring well coordinates and water level data (collected on February 26, 2024) provided by AEP.
2. Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation (Arcadis 2022).
3. Groundwater elevation units are feet above mean sea level (ft amsl).
4. Satellite imagery provided by ESRI (updated February 19, 2024).

500 250 0 500 Feet

Beth Ann Gross

August 19, 2024
Geosyntec Consultants, Inc.
Texas Firm Registration
No. 1182

STATE OF TEXAS
BETH ANN GROSS
79864
LICENSED
PROFESSIONAL ENGINEER

Groundwater Potentiometric Map
February 2024

AEP Welsh Power Plant
Cason, Texas

Geosyntec consultants

Columbus, Ohio | 2024/07/16

Figure
B-6

A:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Welsh\2024\AEP-Welsh_GW_2024-02Feb.mxd. Okiemute.Commander. 7/16/2024. CHA8423/14/08.

Legend

- Groundwater Monitoring Well
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Approximate Groundwater Flow Direction
- CCR Units

Notes

1. Monitoring well coordinates and water level data (collected on April 1 and 2, 2024) provided by AEP.
2. AD-6 was not gauged during the April 2024 event
3. Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation (Arcadis 2022).
4. Groundwater elevation units are feet above mean sea level (ft amsl).
5. Satellite imagery provided by ESRI (updated February 19, 2024).

500 250 0 500
Feet

Beth Ann Gross

August 19, 2024
Geosyntec Consultants, Inc.
Texas Firm Registration
No. 1182

STATE OF TEXAS
BETH ANN GROSS
79864
LICENSED
PROFESSIONAL ENGINEER

Groundwater Potentiometric Map
April 2024

AEP Welsh Power Plant
Cason, Texas

Geosyntec consultants

Columbus, Ohio | 2024/06/14

Figure
B-7

A:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Welsh\2024\AEP-Welsh_GW_2024-04Apr.mxd. Okiemute.Commander. 6/14/2024. CHA8423/14/08.

Legend

- Groundwater Monitoring Well
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Approximate Groundwater Flow Direction
- CCR Units

Notes

1. Monitoring well coordinates and water level data (collected on September 8, 9, and 10, 2024) provided by AEP.
2. Site features based on information available in CCR Groundwater Monitoring Well Network Evaluation (Arcadis 2022).
3. Groundwater elevation units are feet above mean sea level (ft amsl).
4. Aerial imagery provided by Google Earth Pro, dated December 29, 2023.

500 250 0 500 Feet

Beth Ann Gross

1/13/2025
Geosyntec Consultants, Inc. Texas
Firm Registration No. 1182

STATE OF TEXAS
BETH ANN GROSS
79864
LICENSED
PROFESSIONAL ENGINEER

Groundwater Potentiometric Map
September 2024

AEP Welsh Power Plant
Cason, Texas

Geosyntec consultants

Columbus, Ohio | 2025/01/13

Figure
B-8

\\annarbor-01\Data\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Welsh\2024\AEP-Welsh_GW_2024-09Sep.mxd. ASoltero. 1/13/2025. CHA8423/14/08.

ATTACHMENT C
Laboratory Analytical Report - Aquifer Solids

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Allison Kreinberg
Geosyntec Consultants Inc
500 West Wilson Bridge Road
Suite 250
Worthington, Ohio 43085

Generated 1/9/2025 10:43:38 PM

JOB DESCRIPTION

AEP Welsh

JOB NUMBER

820-16585-1

Eurofins Lubbock
6701 Aberdeen Ave.
Suite 8
Lubbock TX 79424

See page two for job notes and contact information.

myEOL

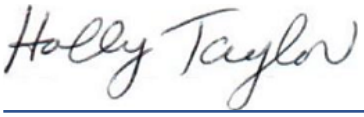
Eurofins Lubbock

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing South Central, LLC Project Manager.

Authorization



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1/9/2025 10:43:38 PM

Authorized for release by
Holly Taylor, Project Manager
Holly.Taylor@et.eurofinsus.com
(806)794-1296

Table of Contents

Definitions/Glossary

Client: Geosyntec Consultants Inc
Job ID: 820-16585-1
Project/Site: AEP Welsh

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job Narrative
820-16585-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 12/12/2024 9:00 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 3.1°C.

Metals
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Gamma Spectroscopy
Method GA_01_R_Ra: Gamma Prep Batch 160-694203:

The sample results for AD-16R-RELOG-14'-15' (820-16585-1), AD-16R-RELOG-19'-20' (820-16585-2), AD-17-RELOG-29'-30' (820-16585-3) and AD-17-RELOG-33'-34' (820-16585-4) are based upon sample as received (i.e. wet weight).

Method GA_01_R_Ra: Gamma Prep Batch 160-694203
Many isotopes requested by gamma spectrometry analysis do not have any gamma emissions, the gamma emissions they do have are very poor, and/or are reported by assuming secular equilibrium with a longer-lived parent (or vice-versa). For example, Th-232 (which does not have a good gamma-ray) is often reported assuming the shorter-lived Ra-228 daughter is in equilibrium with the Th-232 parent. Or, Pb-214 and/or Bi-214, daughters of potentially volatile Rn-222 in the Ra-226 decay chain, may not be in equilibrium with the parent unless sufficient time has been allowed since the break in equilibrium (e.g. 21 days in the case of Ra-226-supported ingrowth). The client should ensure that such inference is acceptable for their sample based upon process knowledge. The following assumptions were made for this report:

Inferred from	Reported to Analyte
Th-234	Pa-234
Th-234	U-238
Pb-210	Po-210
Pb-210	Bi-210
Cs-137	Ba-137m
Pb-212	Po-216
Xe-131m	Xe-131
Sb-125	Te-125m
Ag-108m	Ag-108
Rh-106	Ru-106
Pb-212	Th-228
Pb-212	Ra-224
U-235	Th-231
Ac-228	Th-232
Ac-228	Ra-228
Th-227	Ra-223
Th-227	Ac-227
Th-227	Bi-211
Th-227	Pb-211
Bi-214	Ra-226

AD-16R-RELOG-14'-15' (820-16585-1), AD-16R-RELOG-19'-20' (820-16585-2), AD-17-RELOG-29'-30' (820-16585-3), AD-17-RELOG-33'-34' (820-16585-4), (570-210742-A-1-A) and (570-210742-A-1-B DU)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client Sample ID: AD-16R-RELOG-14'-15'
Lab Sample ID: 820-16585-1

Date Collected: 12/11/24 08:10
Matrix: Solid
Date Received: 12/12/24 09:00

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	<1.84	U	4.24	1.84	mg/Kg		12/18/24 11:11	12/18/24 14:56	5
Thorium	3.93		0.424	0.424	mg/Kg		01/08/25 17:45	01/09/25 12:04	5
Uranium	0.436		0.424	0.119	mg/Kg		12/18/24 11:11	12/18/24 14:56	5

Method: DOE GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.04		0.207	0.231	1.00	0.166	pCi/g	12/17/24 15:34	01/07/25 14:34	1
Radium-228	1.37		0.286	0.316		0.116	pCi/g	12/17/24 15:34	01/07/25 14:34	1

Client Sample ID: AD-16R-RELOG-19'-20'
Lab Sample ID: 820-16585-2

Date Collected: 12/11/24 08:20
Matrix: Solid
Date Received: 12/12/24 09:00

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.93	J	4.24	1.84	mg/Kg		12/18/24 11:11	12/19/24 12:37	5
Thorium	6.89		0.424	0.424	mg/Kg		01/08/25 17:45	01/09/25 12:10	5
Uranium	1.13		0.424	0.119	mg/Kg		12/18/24 11:11	12/18/24 15:12	5

Method: DOE GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.32		0.228	0.263	1.00	0.200	pCi/g	12/17/24 15:34	01/07/25 15:50	1
Radium-228	1.52		0.362	0.390		0.243	pCi/g	12/17/24 15:34	01/07/25 15:50	1

Client Sample ID: AD-17-RELOG-29'-30'
Lab Sample ID: 820-16585-3

Date Collected: 12/11/24 09:50
Matrix: Solid
Date Received: 12/12/24 09:00

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	5.05		4.39	1.91	mg/Kg		12/18/24 11:11	12/19/24 12:39	5
Thorium	5.84		0.439	0.439	mg/Kg		01/08/25 17:45	01/09/25 12:11	5
Uranium	1.75		0.439	0.123	mg/Kg		12/18/24 11:11	12/18/24 15:14	5

Method: DOE GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.20		0.204	0.236	1.00	0.182	pCi/g	12/17/24 15:34	01/07/25 16:27	1
Radium-228	1.21		0.276	0.300		0.148	pCi/g	12/17/24 15:34	01/07/25 16:27	1

Client Sample ID: AD-17-RELOG-33'-34'
Lab Sample ID: 820-16585-4

Date Collected: 12/11/24 10:10
Matrix: Solid
Date Received: 12/12/24 09:00

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	<1.81	U	4.17	1.81	mg/Kg		12/18/24 11:11	12/19/24 12:41	5

Client: Geosyntec Consultants Inc
Job ID: 820-16585-1
Project/Site: AEP Welsh

Client Sample ID: AD-17-RELOG-33'-34'
Lab Sample ID: 820-16585-4
Date Collected: 12/11/24 10:10
Matrix: Solid
Date Received: 12/12/24 09:00

Method: SW846 6020B - Metals (ICP/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thorium	1.52		0.417	0.417	mg/Kg		01/08/25 17:45	01/09/25 12:12	5
Uranium	0.325	J	0.417	0.117	mg/Kg		12/18/24 11:11	12/18/24 15:16	5

Method: DOE GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.526		0.131	0.141	1.00	0.112	pCi/g	12/17/24 15:34	01/07/25 18:10	1
Radium-228	0.372		0.233	0.236		0.242	pCi/g	12/17/24 15:34	01/07/25 18:10	1

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 860-206256/1-A
Matrix: Solid
Analysis Batch: 206368

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 206256

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	<0.435	U	1.00	0.435	mg/Kg		12/18/24 11:11	12/18/24 14:50	1
Uranium	<0.0281	U	0.100	0.0281	mg/Kg		12/18/24 11:11	12/18/24 14:50	1

Lab Sample ID: LCS 860-206256/2-A
Matrix: Solid
Analysis Batch: 206368

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 206256

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	10.0	9.943		mg/Kg		99	80 - 120
Uranium	2.49	2.387		mg/Kg		96	80 - 120

Lab Sample ID: LCSD 860-206256/3-A
Matrix: Solid
Analysis Batch: 206368

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 206256

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Boron	10.0	10.20		mg/Kg		102	80 - 120	3	20
Uranium	2.49	2.372		mg/Kg		95	80 - 120	1	20

Lab Sample ID: 820-16585-1 MS
Matrix: Solid
Analysis Batch: 206368

Client Sample ID: AD-16R-RELOG-14'-15'
Prep Type: Total/NA
Prep Batch: 206256

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	<1.84	U	8.33	6.304		mg/Kg		76	75 - 125
Uranium	0.436		2.07	2.209		mg/Kg		86	75 - 125

Lab Sample ID: 820-16585-1 MSD
Matrix: Solid
Analysis Batch: 206368

Client Sample ID: AD-16R-RELOG-14'-15'
Prep Type: Total/NA
Prep Batch: 206256

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Boron	<1.84	U	8.77	7.187		mg/Kg		82	75 - 125	13	20
Uranium	0.436		2.18	2.328		mg/Kg		87	75 - 125	5	20

Lab Sample ID: MB 860-209800/1-A
Matrix: Solid
Analysis Batch: 209977

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 209800

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thorium	<0.100	U	0.100	0.100	mg/Kg		01/08/25 17:45	01/09/25 12:00	1

Lab Sample ID: LCS 860-209800/2-A
Matrix: Solid
Analysis Batch: 209977

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 209800

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Thorium	5.00	4.580		mg/Kg		92	80 - 120

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCSD 860-209800/3-A
Matrix: Solid
Analysis Batch: 209977

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 209800

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Thorium			5.00	4.531		mg/Kg		91	80 - 120	1	20

Lab Sample ID: 820-16585-1 MS
Matrix: Solid
Analysis Batch: 209977

Client Sample ID: AD-16R-RELOG-14'-15'
Prep Type: Total/NA
Prep Batch: 209800

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Thorium	3.93		4.17	8.774		mg/Kg		116	75 - 125		

Lab Sample ID: 820-16585-1 MSD
Matrix: Solid
Analysis Batch: 209977

Client Sample ID: AD-16R-RELOG-14'-15'
Prep Type: Total/NA
Prep Batch: 209800

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Thorium	3.93		4.39	8.997		mg/Kg		116	75 - 125	3	20

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Lab Sample ID: MB 160-694203/1-A
Matrix: Solid
Analysis Batch: 697154

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 694203

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.08231	U	0.264	0.264	1.00	0.456	pCi/g	12/17/24 15:34	01/07/25 13:13	1
Radium-228	-0.1363	U	0.298	0.298		0.456	pCi/g	12/17/24 15:34	01/07/25 13:13	1

Lab Sample ID: LCS 160-694203/2-A
Matrix: Solid
Analysis Batch: 697157

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 694203

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Americium-241			351	360.5		37.1		1.26	pCi/g	103	75 - 125		
Cesium-137			105	111.6		11.0		0.367	pCi/g	107	75 - 125		
Cobalt-60			38.0	40.11		3.96		0.184	pCi/g	105	75 - 125		

Metals

Prep Batch: 206256

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
820-16585-1	AD-16R-RELOG-14'-15'	Total/NA	Solid	3051A	
820-16585-2	AD-16R-RELOG-19'-20'	Total/NA	Solid	3051A	
820-16585-3	AD-17-RELOG-29'-30'	Total/NA	Solid	3051A	
820-16585-4	AD-17-RELOG-33'-34'	Total/NA	Solid	3051A	
MB 860-206256/1-A	Method Blank	Total/NA	Solid	3051A	
LCS 860-206256/2-A	Lab Control Sample	Total/NA	Solid	3051A	
LCSD 860-206256/3-A	Lab Control Sample Dup	Total/NA	Solid	3051A	
820-16585-1 MS	AD-16R-RELOG-14'-15'	Total/NA	Solid	3051A	
820-16585-1 MSD	AD-16R-RELOG-14'-15'	Total/NA	Solid	3051A	

Analysis Batch: 206368

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
820-16585-1	AD-16R-RELOG-14'-15'	Total/NA	Solid	6020B	206256
820-16585-2	AD-16R-RELOG-19'-20'	Total/NA	Solid	6020B	206256
820-16585-3	AD-17-RELOG-29'-30'	Total/NA	Solid	6020B	206256
820-16585-4	AD-17-RELOG-33'-34'	Total/NA	Solid	6020B	206256
MB 860-206256/1-A	Method Blank	Total/NA	Solid	6020B	206256
LCS 860-206256/2-A	Lab Control Sample	Total/NA	Solid	6020B	206256
LCSD 860-206256/3-A	Lab Control Sample Dup	Total/NA	Solid	6020B	206256
820-16585-1 MS	AD-16R-RELOG-14'-15'	Total/NA	Solid	6020B	206256
820-16585-1 MSD	AD-16R-RELOG-14'-15'	Total/NA	Solid	6020B	206256

Analysis Batch: 206622

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
820-16585-2	AD-16R-RELOG-19'-20'	Total/NA	Solid	6020B	206256
820-16585-3	AD-17-RELOG-29'-30'	Total/NA	Solid	6020B	206256
820-16585-4	AD-17-RELOG-33'-34'	Total/NA	Solid	6020B	206256

Prep Batch: 209800

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
820-16585-1	AD-16R-RELOG-14'-15'	Total/NA	Solid	3051A	
820-16585-2	AD-16R-RELOG-19'-20'	Total/NA	Solid	3051A	
820-16585-3	AD-17-RELOG-29'-30'	Total/NA	Solid	3051A	
820-16585-4	AD-17-RELOG-33'-34'	Total/NA	Solid	3051A	
MB 860-209800/1-A	Method Blank	Total/NA	Solid	3051A	
LCS 860-209800/2-A	Lab Control Sample	Total/NA	Solid	3051A	
LCSD 860-209800/3-A	Lab Control Sample Dup	Total/NA	Solid	3051A	
820-16585-1 MS	AD-16R-RELOG-14'-15'	Total/NA	Solid	3051A	
820-16585-1 MSD	AD-16R-RELOG-14'-15'	Total/NA	Solid	3051A	

Analysis Batch: 209977

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
820-16585-1	AD-16R-RELOG-14'-15'	Total/NA	Solid	6020B	209800
820-16585-2	AD-16R-RELOG-19'-20'	Total/NA	Solid	6020B	209800
820-16585-3	AD-17-RELOG-29'-30'	Total/NA	Solid	6020B	209800
820-16585-4	AD-17-RELOG-33'-34'	Total/NA	Solid	6020B	209800
MB 860-209800/1-A	Method Blank	Total/NA	Solid	6020B	209800
LCS 860-209800/2-A	Lab Control Sample	Total/NA	Solid	6020B	209800
LCSD 860-209800/3-A	Lab Control Sample Dup	Total/NA	Solid	6020B	209800
820-16585-1 MS	AD-16R-RELOG-14'-15'	Total/NA	Solid	6020B	209800
820-16585-1 MSD	AD-16R-RELOG-14'-15'	Total/NA	Solid	6020B	209800

QC Association Summary

Client: Geosyntec Consultants Inc
Project/Site: AEP Welsh

Job ID: 820-16585-1

Rad

Leach Batch: 693515

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
820-16585-1	AD-16R-RELOG-14'-15'	Total/NA	Solid	Dry and Grind	
820-16585-2	AD-16R-RELOG-19'-20'	Total/NA	Solid	Dry and Grind	
820-16585-3	AD-17-RELOG-29'-30'	Total/NA	Solid	Dry and Grind	
820-16585-4	AD-17-RELOG-33'-34'	Total/NA	Solid	Dry and Grind	

Prep Batch: 694203

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
820-16585-1	AD-16R-RELOG-14'-15'	Total/NA	Solid	Fill_Geo-21	693515
820-16585-2	AD-16R-RELOG-19'-20'	Total/NA	Solid	Fill_Geo-21	693515
820-16585-3	AD-17-RELOG-29'-30'	Total/NA	Solid	Fill_Geo-21	693515
820-16585-4	AD-17-RELOG-33'-34'	Total/NA	Solid	Fill_Geo-21	693515
MB 160-694203/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	
LCS 160-694203/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	

Lab Chronicle

Client: Geosyntec Consultants Inc
Project/Site: AEP Welsh

Job ID: 820-16585-1

Client Sample ID: AD-16R-RELOG-14'-15'

Lab Sample ID: 820-16585-1

Date Collected: 12/11/24 08:10

Matrix: Solid

Date Received: 12/12/24 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3051A			.59 g	50 mL	206256	12/18/24 11:11	PB	EET HOU
Total/NA	Analysis	6020B		5			206368	12/18/24 14:56	DP	EET HOU
Total/NA	Prep	3051A			.59 g	50 mL	209800	01/08/25 17:45	PB	EET HOU
Total/NA	Analysis	6020B		5			209977	01/09/25 12:04	DP	EET HOU
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	693515	12/13/24 14:02	SAC	EET SL
Total/NA	Prep	Fill_Geo-21			296.5000 g	1.0 g	694203	12/17/24 15:34	HGB	EET SL
Total/NA	Analysis	GA-01-R		1			697155	01/07/25 14:34	CAH	EET SL

Client Sample ID: AD-16R-RELOG-19'-20'

Lab Sample ID: 820-16585-2

Date Collected: 12/11/24 08:20

Matrix: Solid

Date Received: 12/12/24 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3051A			.59 g	50 mL	206256	12/18/24 11:11	PB	EET HOU
Total/NA	Analysis	6020B		5			206368	12/18/24 15:12	DP	EET HOU
Total/NA	Prep	3051A			.59 g	50 mL	206256	12/18/24 11:11	PB	EET HOU
Total/NA	Analysis	6020B		5			206622	12/19/24 12:37	DP	EET HOU
Total/NA	Prep	3051A			.59 g	50 mL	209800	01/08/25 17:45	PB	EET HOU
Total/NA	Analysis	6020B		5			209977	01/09/25 12:10	DP	EET HOU
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	693515	12/13/24 14:02	SAC	EET SL
Total/NA	Prep	Fill_Geo-21			290.1000 g	1.0 g	694203	12/17/24 15:34	HGB	EET SL
Total/NA	Analysis	GA-01-R		1			697155	01/07/25 15:50	CAH	EET SL

Client Sample ID: AD-17-RELOG-29'-30'

Lab Sample ID: 820-16585-3

Date Collected: 12/11/24 09:50

Matrix: Solid

Date Received: 12/12/24 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3051A			.57 g	50 mL	206256	12/18/24 11:11	PB	EET HOU
Total/NA	Analysis	6020B		5			206368	12/18/24 15:14	DP	EET HOU
Total/NA	Prep	3051A			.57 g	50 mL	206256	12/18/24 11:11	PB	EET HOU
Total/NA	Analysis	6020B		5			206622	12/19/24 12:39	DP	EET HOU
Total/NA	Prep	3051A			.57 g	50 mL	209800	01/08/25 17:45	PB	EET HOU
Total/NA	Analysis	6020B		5			209977	01/09/25 12:11	DP	EET HOU
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	693515	12/13/24 14:02	SAC	EET SL
Total/NA	Prep	Fill_Geo-21			333.9000 g	1.0 g	694203	12/17/24 15:34	HGB	EET SL
Total/NA	Analysis	GA-01-R		1			697155	01/07/25 16:27	CAH	EET SL

Client Sample ID: AD-17-RELOG-33'-34'

Lab Sample ID: 820-16585-4

Date Collected: 12/11/24 10:10

Matrix: Solid

Date Received: 12/12/24 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3051A			.6 g	50 mL	206256	12/18/24 11:11	PB	EET HOU
Total/NA	Analysis	6020B		5			206368	12/18/24 15:16	DP	EET HOU

Lab Chronicle

Client: Geosyntec Consultants Inc
Job ID: 820-16585-1
Project/Site: AEP Welsh

Client Sample ID: AD-17-RELOG-33'-34'
Lab Sample ID: 820-16585-4
Date Collected: 12/11/24 10:10
Matrix: Solid
Date Received: 12/12/24 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3051A			.6 g	50 mL	206256	12/18/24 11:11	PB	EET HOU
Total/NA	Analysis	6020B		5			206622	12/19/24 12:41	DP	EET HOU
Total/NA	Prep	3051A			.6 g	50 mL	209800	01/08/25 17:45	PB	EET HOU
Total/NA	Analysis	6020B		5			209977	01/09/25 12:12	DP	EET HOU
Total/NA	Leach	Dry and Grind			1.0 g	1.0 g	693515	12/13/24 14:02	SAC	EET SL
Total/NA	Prep	Fill_Geo-21			390.1000 g	1.0 g	694203	12/17/24 15:34	HGB	EET SL
Total/NA	Analysis	GA-01-R		1			697155	01/07/25 18:10	CAH	EET SL

Laboratory References:

EET HOU = Eurofins Houston, 4145 Greenbriar Dr, Stafford, TX 77477, TEL (281)240-4200

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: Geosyntec Consultants Inc
Job ID: 820-16585-1
Project/Site: AEP Welsh

Laboratory: Eurofins Houston

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Texas	NELAP	T104704215	06-30-25

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
6020B	3051A	Solid	Thorium
6020B	3051A	Solid	Uranium

Laboratory: Eurofins St. Louis

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Texas	NELAP	T104704193	07-31-25

Method Summary

Client: Geosyntec Consultants Inc
Project/Site: AEP Welsh

Job ID: 820-16585-1

Method	Method Description	Protocol	Laboratory
6020B	Metals (ICP/MS)	SW846	EET HOU
GA-01-R	Radium-226 & Other Gamma Emitters (GS)	DOE	EET SL
3051A	Preparation, Metals, Microwave Assisted	SW846	EET HOU
Dry and Grind	Preparation, Dry and Grind	None	EET SL
Fill_Geo-21	Fill Geometry, 21-Day In-Growth	None	EET SL

Protocol References:

DOE = U.S. Department of Energy

None = None

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET HOU = Eurofins Houston, 4145 Greenbriar Dr, Stafford, TX 77477, TEL (281)240-4200

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: Geosyntec Consultants Inc
Project/Site: AEP Welsh

Job ID: 820-16585-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
820-16585-1	AD-16R-RELOG-14'-15'	Solid	12/11/24 08:10	12/12/24 09:00
820-16585-2	AD-16R-RELOG-19'-20'	Solid	12/11/24 08:20	12/12/24 09:00
820-16585-3	AD-17-RELOG-29'-30'	Solid	12/11/24 09:50	12/12/24 09:00
820-16585-4	AD-17-RELOG-33'-34'	Solid	12/11/24 10:10	12/12/24 09:00

Loc: 820
16585

Houston
riar Dr
77477
40-4200

Chain of Custody Record

eurofins | Environment Testing

rmation	Sampler: Abndrea Sellers	Lab PM: Taylor, Holly	Carrier Tracking No(s):	COC No: 860-34474-11813.1
Allison Kreinberg	Phone: (915)253-7813	E-Mail: Holly.Taylor@et.eurofinsus.com	State of Origin: TX	Page: Page 1 of 1
Company: Geosyntec Consultants Inc	PWSID:	Analysis Requested		Job #: CHA8495

Address: 500 West Wilson Bridge Road Suite 250	Due Date Requested:	Preservation Codes: N - None
City: Worthington	TAT Requested (days): 2 weeks	
State, Zip: OH, 43085	Compliance Project: Δ Yes ✕ No	
Phone: 614-468-0421(Tel)	PO #: Purchase Order Requested	
Email: akreinberg@geosyntec.com	WO #:	
Project Name: Radiological Testing	Project #: 86007851	
Site: AEP Welsh	SSOW#:	Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020B - Th, U	GA_01_R_Ra - Radium-226/228	Boron	Total Number of containers	Special Instructions/Note:
Preservation Code:					X	X	N	N		X	
AD-16R-RELOG-14'-15'	12/11/24	0810	G	Solid	N	N	X	X	X	3	
AD-16R-RELOG-19'-20'	12/11/24	0820	G	Solid	N	N	X	X	X	3	
AD-17-RELOG-29'-30'	12/11/24	0950	G	Solid	N	N	X	X	X	3	
AD-17-RELOG-33'-34'	12/11/24	1010	G	Solid	N	N	X	X	X	3	

820-16585 Chain of Custody

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment: Fed Ex

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Abndrea Sellers	12/11/24 1430	Geosyntec	YP	12/12/24 9:00	

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 2.9/3.1 IR-1/+0.2

YP 12/12/24

Ver: 10/10/2024

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1/9/2025

Eurofins Lubbock
6701 Aberdeen Ave. Suite 8
Lubbock, TX 79424
Phone: 806-794-1296

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler: N/A	Lab PM: Taylor, Holly	Carrier Tracking No(s): N/A	COC No: 820-10176.1
Client Contact: Shipping/Receiving	Phone: N/A	E-Mail: Holly.Taylor@et.eurofinsus.com	State of Origin: Texas	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Texas		Job #: 820-16585-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 1/8/2025			
City: Earth City	TAT Requested (days): N/A			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #: N/A			
Email: N/A	WO #: N/A			
Project Name: Radiological Testing	Project #: 86007851			
Site: N/A	SSOW#: N/A			

Analysis Requested

Preservation Codes:
-

Other: N/A

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	GA_01_R_Ra/Dry_Grind Radium-226/228	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
AD-16R-RELOG-14'-15' (820-16585-1)	12/11/24	08:10 Central	G	Solid			X	2	
AD-16R-RELOG-19'-20' (820-16585-2)	12/11/24	08:20 Central	G	Solid			X	2	
AD-17-RELOG-29'-30' (820-16585-3)	12/11/24	09:50 Central	G	Solid			X	2	
AD-17-RELOG-33'-34' (820-16585-4)	12/11/24	10:10 Central	G	Solid			X	2	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing South Central, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing South Central, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing South Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing South Central, LLC.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	YP	12/12/24 1700			0820 DEC 13 2024	ETA-STL
2				Cheyenne Forrest		
3						

Custody Seals Intact:	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Eurofins Lubbock
6701 Aberdeen Ave. Suite 8
Lubbock, TX 79424
Phone: 806-794-1296

Chain of Custody Record

eurofins Environment Testing

1/9/2025

Client Information (Sub Contract Lab)	Sampler: N/A	Lab PM: Taylor Holly	Carrier Tracking No(s): N/A	COC No: 820-10177 1
Client Contact: Shipping/Receiving	Phone: N/A	E-Mail: Holly Taylor@et.eurofinsus.com	State of Origin: Texas	Page: Page 1 of 1
Company: Eurofins Environment Testing South Centr		Accreditations Required (See note): NELAP Texas		Job #: 820-16585-1
Address: 4145 Greenbriar Dr	Due Date Requested: 1/10/2025			
City: Stafford	TAT Requested (days): N/A			
State, Zip: TX, 77477				
Phone: 281-240-4200(Tel)	PO #: N/A			
Email: N/A	WO #: N/A			
Project Name: Radiological Testing	Project #: 86007851			
Site: N/A	SSOW#: N/A			

Analysis Requested

Preservation Codes:

Other: N/A

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020B/3051A (MOD) Th, U	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
AD-16R-RELOG-14 15' (820-16585-1)	12/11/24	08:10 Central	G	Solid			X	1	
AD-16R-RELOG-19'-20' (820-16585-2)	12/11/24	08:20 Central	G	Solid			X	1	
AD-17-RELOG-29'-30' (820-16585-3)	12/11/24	09:50 Central	G	Solid			X	1	
AD-17-RELOG-33'-34 (820-16585-4)	12/11/24	10:10 Central	G	Solid			X	1	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing South Central, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing South Central, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing South Central LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing South Central, LLC.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I II III, IV Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
YF	12/12/24 YF				
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 12-13-24 1017	Company

Custody Seals Intact: Custody Seal No.

Cooler Temperature(s) °C and Other Remarks: IR-7B 3.7°

Login Sample Receipt Checklist

Client: Geosyntec Consultants Inc

Job Number: 820-16585-1

Login Number: 16585

List Source: Eurofins Lubbock

List Number: 1

Creator: Pena, Yazmeane

Question	Answer	Comment
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	

Login Sample Receipt Checklist

Client: Geosyntec Consultants Inc

Job Number: 820-16585-1

Login Number: 16585
List Number: 3
Creator: Baker, Jeremiah

List Source: Eurofins Houston
List Creation: 12/13/24 12:45 PM

Question	Answer	Comment
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	

Login Sample Receipt Checklist

Client: Geosyntec Consultants Inc

Job Number: 820-16585-1

Login Number: 16585
List Number: 2
Creator: Forrest, Cheyenne L

List Source: Eurofins St. Louis
List Creation: 12/13/24 11:49 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

ATTACHMENT D
Chemical Analysis of Wells in Titus County

Table 11.--Chemical analyses of water from wells and springs in Camp, Franklin, Morris, Titus, and adjoining counties--Continued

Titus County

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe) (total)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Percent sodium	Sodium adsorption ratio (SAR)	Residual sodium carbonate (RSC)	Specific conductance (micromhos at 25°C)	pH
YA-16-41-101	22	Aug. 20, 1963	--	--	--	--	--	*17		7	0.0	18	--	40	--	--	--	27	57	1.4	0.00	149	5.1
102	34	do	--	--	--	--	--	--		34	--	358	--	--	--	--	--	324	--	--	--	1,250	5.8
201	30	May 26, 1942	--	--	--	12	1.2	*32		55	15	24	--	15	--	--	127	36	--	--	--	--	--
301	60	do	--	--	--	179	126	*126		12	1,025	115	0	3.0	--	--	1,580	968	--	--	--	--	--
302	60	do	--	--	--	134	39	*152		116	211	361	--	1.0	--	--	955	494	--	--	--	--	--
801	200	Feb. 25, 1963	13	0.13	--	6.8	2.0	*147		308	.0	65	.4	.0	--	--	385	25	93	13	4.55	703	7.3
802	31	do	--	--	--	--	--	--		22	4.0	238	--	44	--	--	--	181	--	--	.00	955	5.2
902	470	July 30, 1963	11	.13	--	3.2	.7	*326		406	.0	272	.9	1.5	--	--	815	11	98	43	6.43	1,410	7.5
903	27	May 26, 1942	--	--	--	82	63	*155		268	296	191	0	3.0	--	--	922	464	--	--	--	--	--
42-401	48	June 3, 1942	--	--	--	226	63	*421		549	33	890	--	0	--	--	1,903	824	--	--	--	--	--
702	22	do	--	--	--	12	5.8	*58		55	18	77	--	10	--	--	208	54	--	--	--	--	--
49-103	20	May 22, 1942	--	--	--	.8	1.0	*12		18	11	3.0	--	1.5	--	--	38	6	--	--	--	--	--
202	315	Feb. 20, 1963	51	22	--	9.8	3.2	*24		91	.0	11	.1	.0	--	--	144	38	58	1.7	.74	215	5.8
203	30	do	--	--	--	--	--	*275		64	1,420	700	--	--	--	--	--	1,920	24	2.7	.00	4,090	5.5
206	485	Feb. 25, 1963	14	.68	--	20	.7	*58		122	13	13	.2	1.0	--	--	162	8	94	8.9	1.84	284	7.3
301	24	May 26, 1942	--	--	--	2.4	1.2	*28		31	7	22	--	10	--	--	86	11	--	--	--	--	--
401	24	May 22, 1942	--	--	--	21	3.6	*13		43	26	20	--	7.0	--	--	112	67	--	--	--	--	--
402	395	Mar. 12, 1963	50	11	--	9.0	3.9	16	2.6	64	3.4	14	.2	0	--	0.00	130	38	45	1.1	.28	156	5.9
503	360	Feb. 20, 1963	54	12	--	9	3.2	*26		78	4.6	16	.1	.0	--	--	151	36	61	1.9	.57	218	5.8
601	22	May 25, 1942	--	--	--	49	19	*109		171	74	138	.2	33	--	--	506	202	--	--	--	--	--
603	350	July 30, 1963	11	.12	--	1.5	.1	*86		204	.0	16	.2	1.8	--	--	217	4	98	19	3.26	353	7.4
701	437	May 27, 1942	20	.07	--	3.7	1.2	*231		370	2	149	.2	2.0	--	--	594	14	--	--	--	--	8.2
701	437	June 22, 1949	15	.14	--	1.6	.7	196	1.6	a337	1.6	109	.1	2.2	--	.79	509	--	--	--	--	869	8.5
701	437	Feb. 19, 1963	12	2.8	--	1.5	.5	170	1.1	322	3.2	74	.2	.0	--	.20	421	6	98	30	5.17	758	7.4
702	597	May 27, 1942	20	.05	--	3.8	1.0	224	--	380	2	132	0	.0	--	--	567	14	--	--	--	--	8.4
702	597	Feb. 19, 1963	12	1.4	--	2.5	.7	218	1.2	368	.0	126	.3	.0	--	.27	542	9	98	32	5.85	991	7.7
706	430	May 14, 1942	39	5.6	--	14	6.6	30	--	126	2	15	.1	.5	--	--	176	62	--	--	--	--	--

See footnotes at end of table.

Table 11.--Chemical analyses of water from wells and springs in Camp, Franklin, Morris, Titus, and adjoining counties--Continued

Titus County

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe) (total)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Percent sodium	Sodium adsorption ratio (SAR)	Residual sodium carbonate (RSC)	Specific conductance (micromhos at 25°C)	pH
YA-16-49-708	460	Mar. 14, 1963	13	0.13	--	1.5	0.2	152	.8	298	3.2	62	0.2	0.0	--	0.10	380	5	98	30	4.78	651	8.0
804	18	May 14, 1942	--	--	--	10	1.2		*7.4	24	18	6.0	--	0	--	--	55	31	--	--	--	--	--
924	300	Apr. 25, 1963	33	2.7	--	20	4.0		*55	156	13	31	.5	.0	--	--	234	66	64	2.9	1.23	352	7.1
50-101	35	June 3, 1942	--	--	--	13	2.4		*46	49	12	14	--	86	--	--	197	42	--	--	--	--	--
102	31	do	--	--	--	79	35		*44	110	11	141	--	169	--	--	533	342	--	--	--	--	--
202	48	do	--	--	--	47	12		*38	49	2	125	--	39	--	--	287	168	--	--	--	--	--
403	310	July 30, 1963	18	.09	--	27	6.9		*107	284	57	26	.2	.0	--	--	382	96	71	4.8	2.73	601	7.2
404	10	May 25, 1942	--	--	--	31	28		*6.4	18	74	78	--	5.0	--	--	231	192	--	--	--	--	--
409	300	July 30, 1963	12	.05	--	4.2	.9		*116	270	23	13	.2	2.0	--	--	304	14	95	13	4.15	485	7.3
501	37	May 25, 1942	--	--	--	308	97		*76	488	274	460	0	2.0	--	--	1,457	1,170	--	--	--	--	--
703	18	June 3, 1942	--	--	--	1.6	3.2		*2.3	12	4	4.0	.3	2.0	--	--	23	17	--	--	--	--	--
57-102	246	Aug. 22, 1963	34	2.9	--	45	9.7		*34	130	75	29	.2	.2	--	--	291	152	33	1.2	.00	452	6.6
110	700	June 3, 1963	12	.09	--	4.5	1.2		*420	396	0	425	.5	.7	--	--	1,060	16	98	46	6.17	1,890	7.6
114	475	Aug. 22, 1963	13	.06	--	6.0	.7		*56	155	.0	8.5	.2	.5	--	--	161	18	87	5.7	2.18	272	7.2
301	20	May 13, 1942	--	--	--	4.8	3.6		*10	12	26	7.0	.2	2.0	--	--	60	27	--	--	--	--	--
302	420	July 31, 1963	13	.22	--	3.5	.5		*104	266	.2	15	.2	2.2	--	.06	271	11	95	14	4.14	440	7.3
401	300	Aug. 22, 1963	13	--	--	4.8	1.0		*157	286	.0	86	.6	.0	--	--	403	16	96	17	4.37	688	7.7
402	300	May 1, 1963	13	1.1	0.00	5.0	1.1	157	1.6	296	.2	88	.5	.0	0.94	.28	414	17	95	17	4.51	708	7.5
601	18	May 13, 1942	--	--	--	8.8	2.4		*11	18	5	18	.2	12	--	--	67	32	--	--	--	--	--
58-101	9	May 14, 1942	--	--	--	12	6.1		*31	12	63	29	.2	6.0	--	--	153	54	--	--	--	--	--
103	24	do	--	--	--	8.8	3.6		*13	6	12	20	--	25	--	--	85	37	--	--	--	--	--
203	21	do	--	--	--	13	2.4		*29	61	5	28	--	12	--	--	119	42	--	--	--	--	--
401	13	May 13, 1942	--	--	--	4.8	2.4		*8.1	18	2	10	.1	10	--	--	47	22	--	--	--	--	--
701	25	May 14, 1942	--	--	--	13	12		*38	12	2	35	--	130	--	--	236	83	--	--	--	--	--
17-48-102	26	Aug. 21, 1963	--	--	--	--	--		--	53	--	38	--	--	--	--	--	53	--	--	.00	299	5.6
202	18	Mar. 22, 1942	--	--	--	11	1.0		*104	12	30	84	--	120	--	--	356	31	--	--	--	--	--
202	18	Aug. 21, 1963	--	--	--	--	--		--	22	--	89	--	--	--	--	--	86	--	--	.00	696	5.6

See footnotes at end of table.

Table 11.--Chemical analyses of water from wells and springs in Camp, Franklin, Morris, Titus, and adjoining counties--Continued

Titus County

Well	Depth of well (ft)	Date of collection	Silica (SiO_2)	Iron (Fe) (total)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	Boron (B)	Dissolved solids	Hardness as $CaCO_3$	Percent sodium	Sodium adsorption ratio (SAR)	Residual sodium carbonate (RSC)	Specific conductance (micromhos at 25°C)	pH
YA-17-48-801	13	May 22, 1942	--	--	--	11	4.9	*37		43	12	40	--	29	--	--	155	48	--	--	--	--	--
802	18	May 20, 1942	--	--	--	5.6	6.1	*17		31	7	12	--	33	--	--	96	39	--	--	--	--	--
901	25	May 22, 1942	--	--	--	13	4.9	*37		12	22	39	--	55	--	--	177	53	--	--	--	--	--
56-201	40	May 27, 1942	--	--	--	22	15	*17		12	2	18	--	141	--	--	221	114	--	--	--	--	--
303	20	May 20, 1942	--	--	--	26	4.6	*34		55	11	65	--	10	--	--	178	83	--	--	--	--	--
304	310	Aug. 13, 1963	18	1.8	--	7.5	2.6	*117		190	74	35	0.2	.0	--	--	347	29	90	9.4	2.53	560	7.2
401	11	May 27, 1942	--	--	--	16	7.3	*134		31	122	102	--	82	--	--	478	70	--	--	--	--	--
402	30	do	--	--	--	4.4	1.2	*19		18	30	4.0	.2	6.0	--	--	74	16	--	--	--	--	--
415	225	Jan. 17, 1963	12	.37	--	3.5	1.2	*132		248	71	15	.1	2.8	--	--	360	14	96	15	3.79	526	7.5
601	28	May 20, 1942	--	--	--	98	55	*67		171	185	199	.1	1.5	--	--	690	469	--	--	--	--	--
701	38	May 15, 1942	--	--	--	6.0	0	*5.1		18	4	5.0	0	0	--	--	29	15	--	--	--	--	--
† 707	260	Oct. 15, 1962	22	.1	--	6.7	2.5	*191.1		201.3	198	50.0	--	--	--	--	--	27	--	--	--	892	8.02
707	260	July 27, 1963	7.8	1.7	0.00	8.2	2.3	182	2.4	184	202	50	.1	2.8	0.24	0.09	548	30	92	14	2.42	866	7.0
801	Spring	May 15, 1942	--	--	--	8.8	2.4	*1.2		37	2	1.0	--	1.5	--	--	35	32	--	--	--	--	--
901	502	May 29, 1942	--	--	--	5.2	4.9	*297		323	2	288	.2	7.0	--	--	764	33	--	--	--	--	--
64-101	380	July 31, 1963	14	.09	--	3.8	.9	*82		187	1.8	24	.2	1.2	--	--	220	13	93	9.9	2.80	356	7.5
102	17	May 15, 1942	--	--	--	4.8	2.4	*22		49	3	15	.1	6.0	--	--	77	22	--	--	--	--	--
201	48	do	--	--	--	48	22	*124		43	30	254	--	66	--	--	565	208	--	--	--	--	--
301	40	do	--	--	--	205	126	*239		580	418	450	0	9.0	--	--	1,732	1,033	--	--	--	--	--
401	32	do	--	--	--	24	18	*127		98	30	195	--	32	--	--	474	136	--	--	--	--	--

* Sodium and potassium calculated as sodium (Na).
† Analyses by Curtis Laboratories.
a/ Includes the equivalent of 5 ppm as carbonate (CO_3).

ATTACHMENT E
Certification by a Qualified Professional Engineer

CERTIFICATION BY A QUALIFIED PROFESSIONAL ENGINEER

I certify that the selected and above described alternative source demonstration is appropriate for evaluating the groundwater monitoring data for the Welsh Bottom Ash Storage Pond CCR management area and that the requirements of 30 TAC §352.941(c) have been met.

Beth Ann Gross
Printed Name of Licensed Professional Engineer

Beth Ann Gross

Signature

Geosyntec Consultants
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Texas Registered Engineering Firm
No. F-1182

79864	Texas	March 27, 2025
License Number	Licensing State	Date