



# **Semiannual Report on the Progress of Remedy Selection – Ash Pond Complex**

Gallatin Fossil Plant  
Gallatin, Tennessee

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Quality information

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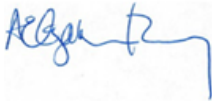


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**Acronyms**

ACM	Assessment of Corrective Measures
APC	Ash Pond Complex
CARA	Corrective Action/Risk Assessment
CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
CRM	Cumberland River Mile
EAR	Environmental Assessment Report
EI	Environmental Investigation
GAF	Gallatin Fossil Plant
GWPS	Groundwater Protection Standards
HHERA	Human Health and Ecological Risk Assessment
MNA	Monitored Natural Attenuation
NPDES	National Pollutant Discharge Elimination System
NRL	North Rail Loop
PRB	Permeable Reactive Barrier
SRL	South Rail Loop
SSL	Statistically Significant Levels
TDEC	Tennessee Department of Environment and Conservation
TVA	Tennessee Valley Authority
ug/L	Microgram per liter
USEPA	United States Environmental Protection Agency

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## **1.0 Introduction**

In accordance with the requirements in 40 CFR § 257.97(a), this report has been prepared to describe the current progress in selecting and designing a remedy for the Ash Pond Complex (APC) (including Ash Pond A, Ash Pond E, Middle Pond A, and Bottom Ash Pond) at the Tennessee Valley Authority (TVA) Gallatin Fossil Plant (GAF) in Gallatin, Sumner County, Tennessee.

### **1.1 Regulatory Background**

On April 17, 2015, the U.S. Environmental Protection Agency (USEPA) published a rule that set forth national criteria for the management of coal combustion residuals (CCR) produced by electric utilities. The requirements can be found in Title 40, Code of Federal Regulations (40 CFR) Part 257, Subpart D. The rule includes requirements for monitoring groundwater, assessing corrective measures, and selecting a remedy if constituents listed in Appendix IV of the rule are detected in groundwater samples collected from downgradient monitoring wells at statistically significant levels (SSL) greater than groundwater protection standards (GWPS).

In January 2019, TVA completed an evaluation of whether there were SSLs over established GWPS as defined in 40 CFR § 257.95(h) for one or more Appendix IV constituents in accordance with 40 CFR § 257.95(g). At the APC, as a result of at least one SSL in a downgradient well, TVA initiated an assessment of corrective measures in accordance with 257.95(g)(3)(i).

There are currently SSLs for arsenic in two downgradient wells (GAF-410U, GAF-450L). No new SSLs were identified in this reporting period. Refer to SSL notices for each sampling event at GAF on TVA's CCR Rule Compliance Data and Information website:

<https://www.tva.com/environment/environmental-stewardship/coal-combustion-residuals/gallatin>

In accordance with 40 CFR § 257.96(a), TVA prepared the 2019 Assessment of Corrective Measures (ACM) Report for the APC, added it to the operating record on July 15, 2019, and uploaded it to the CCR Rule Compliance Data and Information website on August 14, 2019. The ACM Report provided an assessment of the effectiveness of corrective measures in accordance with 40 CFR § 257.96(c). As described in Section 1.2 (below), closure of the APC is integrated into the ACM process.

Following preparation of the ACM Report, TVA began the process to select a remedy. Semiannual reports are required pursuant to 40 CFR § 257.97(a) to document progress toward selection and design of a remedy. Semiannual progress reports have been prepared and placed in the operating record since January 2020 and uploaded to the CCR Rule Compliance Data and Information website:

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<https://www.tva.com/environment/environmental-stewardship/coal-combustion-residuals/gallatin>

To aid/support remedy selection, TVA will continue to review new data as it becomes available and implement changes to the groundwater monitoring and corrective action program as necessary to maintain compliance with 40 CFR § 257.90 through § 257.98.

At least 30 days prior to the selection of the remedy, the owner/operator must discuss the results of the ACM in a public meeting required by 40 CFR § 257.96(e). The selected remedy must, at a minimum, meet the requirements of 40 CFR § 257.97(b) and must consider the evaluation factors set forth in 40 CFR § 257.97(c) in the selection process. Once a final remedy is chosen, a final report describing the remedy and how it meets the standards set forth in 40 CFR § 257.97(b) will be prepared. The owner/operator must also provide a schedule for implementing the selected remedy that takes into account the factors set forth in 40 CFR § 257.97(d).

## 1.2 Overview of July 2019 Closure Plan

A revised Closure Plan was prepared for the APC as the result of a consent decree entered between and agreed upon among TVA and the Tennessee Department of Environment and Conservation (TDEC) to close the APC by removing the CCR from the APC (described as “the agreement” for the remainder of this document). This Closure Plan was added to the operating record on July 19, 2019, and was posted on TVA’s CCR Rule Compliance Data and Information website on August 19, 2019.

Per the agreement with TDEC, TVA is closing the APC by following a closure-by-removal approach pursuant to 40 CFR § 257.102(c). Closure activities are anticipated to include ponded water drawdown, CCR dewatering, and CCR excavation and removal. CCR is expected to be transported and disposed of in an on-site permitted landfill. An APC Removal Plan, approved by TDEC, will guide these efforts.

Potentially impacted underlying soils will be addressed. Post-excavation surfaces will be graded to promote positive drainage, and permanent vegetation or permanent stabilization will be established.

Additional information on TVA’s progress towards closing the APC is provided in Section 4.1 below.

## 1.3 Summary of State Required Investigation and Remedy Selection Process

From 2016 to 2020, TVA conducted an environmental investigation (EI) of CCR disposal sites at its GAF coal-fired site in Tennessee under the oversight of TDEC. TVA submitted an Environmental Assessment Report (EAR) to TDEC on July 9, 2021. TDEC provided review comments on the EAR to TVA on December 21, 2021. A revised EAR was submitted by TVA to TDEC on September 20, 2022. TDEC provided review comments on the EAR Revision 1 to TVA

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on January 26, 2023. EAR Revision 2 (TVA, 2023) was submitted to TDEC on April 26, 2023. This revised EAR was approved by TDEC on June 6, 2023. The EAR provides an evaluation of the extent of impacts associated with CCR constituents based on data from the EI, including groundwater impacts.

As required by the agreement with TDEC, TVA prepared an APC Removal Plan (AECOM, 2023a) to guide the removal process. TDEC approved the APC Removal Plan (AECOM, 2023a) on November 7, 2023. TVA submitted a Corrective Action/Risk Assessment (CARA) Plan (AECOM, 2024) to address groundwater impacts at the APC to TDEC on January 8, 2024 for review and approval. TDEC provided review comments on the CARA Plan to TVA on April 22, 2024. As of the date of this report, TVA is working on responding to TDEC's comments and developing the CARA Plan Revision 1. TVA expects to submit the revised CARA Plan to TDEC by July 22, 2024. The CARA Plan presents the proposed groundwater corrective action for the APC under the agreement with TDEC. The CARA plan specifies the actions that TVA proposes, the basis for those actions, and includes a schedule of activities to be completed by TVA.

The agreement between TVA and TDEC for closure of the APC includes a public comment period on the proposed CARA Plan of at least 30 days. Following the public comment period, TVA will have 30 days to provide TDEC with responses to the public comments. The public comments and TVA responses will be considered in TDEC's review and approval of the CARA Plan. Following TDEC approval of the CARA Plan, TVA will complete remedy selection in accordance with 40 CFR § 257.97.

### **1.4 Report Contents**

Following this introduction, this progress report provides summaries of the GAF site characteristics, the groundwater assessment monitoring program, the findings of the ACM process, and the current progress of groundwater remedy selection.

## **2.0 Site Background and Characteristics**

This section provides a brief overview of the CCR management operations and geologic setting for GAF.

### **2.1 CCR Management Operations**

GAF is located at 1499 Steam Plant Road in Gallatin, Sumner County, Tennessee. The facility is located on the north bank of the Cumberland River and between Cumberland River Mile (CRM) 246 and 241.5. The Cumberland River is impounded by the Old Hickory Dam located approximately 25 miles downstream (CRM 216.2). GAF construction began in 1953. GAF began operations in 1956 with full operation in 1959, following completion of the fourth generating unit.

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The coal combustion process at GAF historically generated by-products that included fly ash and bottom ash. **Figure 1** depicts the areas at GAF where CCR is stored and managed. The fly ash and bottom ash were managed at the former Non-Registered Site (NRS) from 1956 until approximately 1970. From approximately 1970 until 2019, CCR was managed in the APC in accordance with National Pollutant Discharge Elimination System (NPDES) Permit No. TN0005428 issued by TDEC. Approximately 11.9 million cubic yards of CCR material is currently present in the APC, with the majority present in Ash Pond A. The APC covers approximately 383 acres.

TVA's scrubber system (constructed 2013-2016) and bottom ash dewatering facility (completed 2019) currently produce dry CCR material. The dry CCR material is managed in the 52-acre Class II Landfill (Tennessee Solid Waste Permit IDL83-0219) called the North Rail Loop (NRL) Landfill. The landfill is constructed with both a soil and geosynthetic liner system and groundwater monitoring well network. Cell 1 began receiving CCR in June 2016 and currently has interim cover on it; Cell 2 began receiving CCR in September 2021.

With the completion of the Flow Management System in 2019, the APC has been removed from service. In accordance with 40 CFR § 257.102(g), the Notice of Intent to Close the APC was placed in the Operating Record on July 19, 2019, and posted to the CCR Rule Compliance Data and Information website on August 19, 2019. Process flows and NRL Landfill leachate have been rerouted to the Flow Management System. The Flow Management System effluent is discharged to the Cumberland River at NPDES Outfall 010.

### **2.2 Hydrogeologic Setting**

A hydrogeologic conceptual site model (CSM) is needed to support decision making during remedy selection. This section of the report provides a summary of the hydrogeologic conceptual site model (TVA, 2023).

GAF is located within the Central Basin Aquifer system of Middle Tennessee (Brahana and Bradley, 1986). Primary porosity is largely absent from the limestone formations in the Central Basin Aquifer system. Therefore, groundwater within these formations flows through secondary porosity consisting of a network of water-bearing fracture zones that have been developed and enhanced by dissolution of the limestone.

Groundwater in the vicinity of the APC is encountered in water-bearing zones within the alluvium/unconsolidated materials (limited to isolated areas west of the APC), Carters Limestone and Lebanon Limestone formations. In the limestone formations, these water-bearing zones have been developed primarily along the nearly flat-lying horizontal bedding planes. The primary water-bearing fracture zone in the Lebanon Limestone occurs at a recognizable stratigraphic horizon, which has been designated as the L1 fracture zone. Water-bearing zones in the Carters Limestone have developed largely where the T-3 bentonite layer has been eroded and the Lower Carters (i.e., bedrock below the T-3) is exposed to weathering and karst activity.



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As a result, the Lower Carters Limestone does not transmit water (does not form an aquifer) on the southeast side of the APC (see **Figure 3**).

North of the APC is a large area where many surficial karst features are present. Hydraulic heads in both aquifers in this area are low (similar to the Cumberland River) with little to no gradient. This area has been termed a hydraulic trough, as there is a gradient towards this area from the north, south, and east. Dye trace studies have verified the trough feature and groundwater flow westward to the Cumberland River.

The highest hydraulic heads in both bedrock formations are present in the vicinity of the Bottom Ash Pond and along the southern portion of the APC. In the Lebanon Limestone, the hydraulic gradient is radial from this area to the east, south, and west towards the Cumberland River as well as northward towards the area of low hydraulic head north of the APC, as shown in **Figures 3 and 4**. In the Lower Carters Limestone, the gradient is primarily westward towards the River and northward towards the trough.

### **3.0 Groundwater Assessment Monitoring Program**

Groundwater assessment monitoring for the APC is conducted at GAF in accordance with 40 CFR § 257.95. This section of the report summarizes the results of the groundwater assessment monitoring program to date for the APC.

#### **3.1 Groundwater Monitoring Network**

In compliance with 40 CFR § 257.91, the recently updated APC certified groundwater monitoring well system contains 27 monitoring wells: 7 background monitoring wells and 20 downgradient monitoring wells. The monitoring well locations are shown on **Figure 5**.

The primary target of monitoring is the Carters Limestone, with 10 wells located along the downgradient waste boundary of the unit. At least one well in the Lebanon Limestone on each downgradient side of the unit was also included in the network, typically paired with Carters wells, or where the first water-bearing zones were encountered in the Lebanon.

The background monitoring wells (GAF-412C, GAF-412L, GAF-414L, GAF-426C, GAF-426L, GAF-427C, and GAF-427L) represent conditions unaffected by CCR (40 CFR § 257.91(a)(1) and (c)(1)). The background wells are hydraulically separated from the APC by an area of low hydraulic head, so they represent conditions unaffected by CCR.

The downgradient monitoring wells (24, GAF-402C, GAF-402M, GAF-402L, GAF-405C, GAF-406L, GAF-410U, GAF-416C, GAF-422C, GAF-433L, GAF-437L, GAF-446C, GAF-449L, GAF-450C, GAF-450L, GAF-451CR, GAF-452C, GAF-452L, GAF-453C and NRL221) monitor groundwater downgradient near the waste boundary (40 CFR § 257.91(a)(2) and (c)(1)). There are 10 downgradient monitoring wells completed in the Carters Limestone, one downgradient

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monitoring well at the Carters/Lebanon Contact, eight monitoring wells in the Lebanon Limestone, and one monitoring well screened in alluvium/unconsolidated materials.

The certification of the groundwater monitoring system is included in the facility operating record and on the TVA's CCR Rule Compliance and Information website:

<https://www.tva.com/environment/environmental-stewardship/coal-combustion-residuals/gallatin>

### 3.2 Groundwater Characterization

There are currently SSLs for arsenic in two downgradient wells (GAF-410U, GAF-450L) as documented in SSL notices for each sampling event on TVA's CCR Rule Compliance Data and Information website.

The nature and extent of the GWPS exceedances for arsenic in groundwater was evaluated as part of the EI activities (2016 – 2020) and on-going CCR Rule assessment monitoring. Supplemental investigations may be conducted during the selection of remedy process to aid in selection and design of a remedy. Groundwater monitoring results are summarized below:

- Arsenic continues to exceed the GWPS at GAF-410U. This well is screened in alluvium/unconsolidated materials. The published GWPS for arsenic is 10 ug/L. **Figure 6** presents a concentration trend plot for arsenic in this well through March 2024.
- GAF-410U is screened in alluvium, which has a very limited extent in this area (**Figure 2**). Alluvium is not present and/or water-bearing zones are not found in overburden in the areas surrounding this well. Thus, its horizontal extent in alluvium at and beyond the waste boundary is defined by the limited extent of water in that geologic unit.
- In the vertical direction, a nearby well is screened in the underlying Carters Limestone (GAF-446C, **Figure 5**). This well is already part of the CCR Rule monitoring network, and arsenic is not above the GWPS in this well. Thus, the vertical extent at and beyond the waste boundary is defined by the existing well network.

Since 2021, arsenic has also been (statistically) greater than its GWPS at GAF-450L.

- Arsenic continues to exceed the GWPS at GAF-450L. The well is screened in the Lebanon Limestone unit. **Figure 6** presents a concentration trend plot for arsenic in this well through March 2024.
- GAF-450L is screened in the Lebanon Limestone bedrock (**Figure 5**) which is the deeper water-bearing zone beneath the APC. Horizontal extent at and beyond the waste boundary is bound by the lack of arsenic GWPS exceedances in other CCR Rule monitoring wells along the Cumberland River.
- In the vertical direction, a shallower paired well screened in the Carters limestone (GAF-450C, **Figure 5**) does not exhibit arsenic above the GWPS.

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Refer to SSL notices for each sampling event at GAF on TVA's CCR Rule Compliance Data and Information website:

<https://www.tva.com/environment/environmental-stewardship/coal-combustion-residuals/gallatin>

### **4.0 Assessment of Corrective Measures**

TVA prepared the 2019 ACM Report for the APC, added it to the operating record on July 15, 2019, and posted it on TVA's CCR Rule Compliance Data and Information website on August 14, 2019. The ACM Report provided an assessment of the effectiveness of corrective measures in accordance with 40 CFR § 257.96(c). The potential corrective action technologies presented in the ACM Report also apply to the SSL for arsenic at monitoring well GAF-450L identified in 2021.

As described in Section 1.2, closure of the APC will be by removal of the CCR, and closure represents the key source control measure for the purposes of remedy selection under 40 CFR § 257.97 as required by the agreement with TDEC.

#### **4.1 Source Control Measures**

The objectives of corrective measures under 40 CFR § 257.96(a) are to “prevent further releases [from the CCR Unit], to remediate any releases, and to restore affected areas to original conditions.” Ultimately, in accordance with 40 CFR § 257.97(b)(3), the selected corrective measure must at a minimum “[c]ontrol the source(s) of releases so as to reduce or eliminate, to the maximum extent feasible, further releases of constituents in appendix IV to this part into the environment.”

The Preamble (80 Fed. Reg. 21302, 21406) to the 2015 CCR Rule discusses that source control measures may include modifying operational procedures. TVA has already implemented operational changes such as reducing free water in Ash Pond E, constructing a new flow management system, and rerouting flows previously sent to the APC.

As noted in Section 1.2, the APC will be closed by removal in accordance with the current Closure Plan (July 2019). Closure-by-removal of the APC can serve as source control measures as required under 40 CFR § 257.97(b)(3). These measures will eliminate the potential for migration of CCR constituents to groundwater after completion of the removal efforts.

On September 17, 2020, the Record of Decision for the Environmental Impact Statement completed pursuant to the National Environmental Policy Act that analyzed several alternatives and selected closure by removal as TVA's preferred alternative was published. TVA has been working closely with TDEC on various plans and documents related to APC removal. In particular, the activities to complete the closure-by-removal approach will be governed by the

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APC Removal Plan, a submittal to TDEC that requires their review and approval prior to starting CCR removal activities. TDEC approved the APC Removal Plan (AECOM, 2023a) on November 7, 2023. Implementation of the Removal Plan will be overseen by TDEC. TVA has developed a plan for monitoring during the removal process. TDEC approved the APC Removal Monitoring Plan (AECOM, 2023b) on August 21, 2023. Monitoring under this plan has begun as required by TDEC.

In 2020, TVA submitted a Solid Waste Permit Application to TDEC for a new on-site landfill, the South Rail Loop (SRL) Landfill, for receipt of CCR to be removed from the APC. TDEC's review of the SRL Landfill permit documents has been completed, and a permit (IDL830000224) was issued to TVA on August 5, 2022. Construction for the initial cells (4 and 5) started in November 2022. CCR cannot be removed from the APC until the new landfill is ready to receive it. The contractor estimates that Cell 4 construction will be complete in late 2024 barring unusual weather or other unanticipated construction delays.

Continued semi-annual groundwater assessment monitoring will be conducted in accordance with 40 CFR § 257.95 throughout the closure process to track changes in groundwater conditions as a result of these closure and operation changes. The monitoring data will be considered in the selection and design of a remedy in accordance with 40 CFR § 257.97. Long-term groundwater monitoring will be a component of the corrective measures implementation in accordance with 40 CFR § 257.98(a)(1).

### **4.2 Potential Corrective Measures Technologies**

The APC will be closed by removal in accordance with 40 CFR § 257.102 and applicable state law.

In addition to this source control measure, three primary strategies have been identified and continue to be considered for addressing groundwater exhibiting concentrations above GWPSs including the following:

- In-Situ Physical/Chemical Treatment;
- Permeable Reactive Barrier (PRB); and
- Hydraulic Containment and Treatment.

A fourth technology, Monitored Natural Attenuation (MNA) was also identified in the ACM. At this time, based on the current groundwater conditions at the APC, TVA is removing MNA as one of the primary approaches being considered under current conditions. The applicability of MNA will be re-evaluated in the future as CCR removal progresses. During CCR removal, TVA will continue to evaluate natural in-situ processes and groundwater geochemistry to understand the geochemical processes impacting the APC and to potentially support a demonstration of MNA feasibility in the future.

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The ACM Report provides a more detailed description of each of these corrective measures. The effectiveness of each potential corrective measure was assessed in accordance with 40 CFR § 257.96(c).

### **5.0 Selection of Remedy: Current Progress**

The remedy to address SSLs in groundwater will be selected in accordance with 40 CFR § 257.97 and subject to TDEC's approval of the APC CARA Plan in accordance with the agreement between TDEC and TVA. Following agreement on the corrective action with TDEC (via TDEC's review and approval of the APC CARA Plan), TVA will prepare a Remedy Selection Report describing the selected remedy and how it meets the criteria specified below pursuant to 40 CFR § 257.97(b)(1)-(5). Remedies must: (1) Be protective of human health and the environment; (2) Attain the groundwater protection standard as specified pursuant to §257.95(h); (3) Control the source(s) of releases so as to reduce or eliminate, to the maximum extent feasible, further releases of constituents in appendix IV to this part into the environment; (4) Remove from the environment as much of the contaminated material that was released from the CCR unit as is feasible, taking into account factors such as avoiding inappropriate disturbance of sensitive ecosystems; (5) Comply with standards for management of wastes as specified in §257.98(d).

#### **5.1 Remedy Selection Progress**

Since completion of the ACM in 2019, the following activities have taken place or are on-going towards selection of the groundwater remedy:

- In 2019, TVA and TDEC signed a Consent Order specifying that the APC will be closed by removal of the CCR material. This agreement was a principal component of the remedy selection process.
- Between 2019 and 2020, TVA completed a hydrogeologic characterization of the on-site location of a proposed landfill for disposal of the CCR to be removed from the APC.
- TVA submitted to TDEC a permit application for the proposed new landfill in 2020. TVA has also applied for other permits related to development of the landfill at this location.
- In 2020, TVA submitted to TDEC for review and approval a Removal Plan for removal of CCR from the APC impoundments, which TDEC reviewed and provided comments on. In 2021, TVA submitted the updated Removal Plan Revision 1 to TDEC for review and approval. In 2023, TVA submitted an updated Removal Plan Revision 2 (AECOM, 2023a) to TDEC for review and approval. TDEC approved the APC Removal Plan Revision 2 (AECOM, 2023a) on November 7, 2023.
- In 2020, TVA completed a site-wide EI which included the area of the APC impoundments. The findings of the investigation were submitted to TDEC in 2021 in an

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EAR. In 2022, TVA submitted a revised EAR to TDEC addressing TDEC's comments. In 2023, TVA submitted EAR Revision 2 (TVA, 2023) to TDEC addressing TDEC's comments on EAR Rev 1. With TDEC approval of the EAR on June 6, 2023, the findings of the EI serve as the basis for the CARA Plan.

- As part of the revised EAR in 2022, TVA provided additional characterization of conditions associated with the APC including delineation of the extent of arsenic in the Carters Limestone and Lebanon Limestone groundwater in the vicinity of the APC.
- In August 2022, TDEC issued the final solid waste permit (IDL830000224) for the new landfill.
- TVA selected a construction contractor for the initial cells (4 and 5) of the new landfill. Construction started in November 2022. The contractor has estimated that Cell 4 construction will be complete in late 2024 barring unusual weather or other unanticipated construction delays.
- As part of the revised EAR in 2022, TVA proposed to TDEC a groundwater monitoring network to be used for groundwater monitoring at the APC during CCR removal activities. This monitoring network was approved by TDEC in January 2023.
- In May 2023, TVA submitted to TDEC a plan for groundwater monitoring to be conducted during the APC removal and closure process. In August 2023 TVA submitted a revised monitoring plan (AECOM, 2023b) to TDEC addressing TDEC's comments. TDEC approved this plan on August 21, 2023. TVA has initiated monitoring under this plan as required by TDEC.
- A Human Health and Ecological Risk Assessment (HHERA) (HAI, 2023) has been performed to evaluate potential risks to receptors that could be posed by the current groundwater conditions at the APC. The HHERA informed the scope of the potential groundwater corrective actions evaluated in the CARA Plan.
- In January 2024, TVA submitted the APC CARA Plan (AECOM, 2024), including the HHERA as an attachment, to TDEC for review and approval. TDEC provided comments on April 22, 2024. TVA is working to respond to TDEC's comments and update the CARA Plan, including the HHERA. TVA anticipates submitting Revision 1 of the APC CARA Plan to TDEC by July 22, 2024.
- TVA selected an APC Removal Contractor in early 2024 for the APC removal. The Removal Contractor is preparing various plans for submittal to TDEC for review. TDEC's approval of these plans is required prior to starting the removal of CCR from the APC.
- Starting in June 2024, TVA's APC Removal Contractor is implementing additional investigative activities at the APC (cone penetrating testing, temporary wells and vibrating wire transducer installations) to gather geotechnical data on existing saturated CCR material conditions to evaluate best practices for excavation safety, collect additional CCR material pore water data for a pore water treatability study. The

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Removal Contractor is also planning to perform testing to evaluate porewater withdrawal rates for design of a wastewater treatment system to be used during CCR removal activities.

### **5.2 Requirements for Design of Groundwater Corrective Action**

Characterization of arsenic impacts is complete beyond the limit of waste at the APC, in accordance with 40 CFR § 257.95(g). As noted in Section 1.3, the EI is complete, and TDEC has approved a revised EAR (TVA, 2023) as of June 6, 2023. The EAR informed the development of the CARA Plan. Pursuant to the agreement between TDEC and TVA (Consent Order No. 15-23-IV dated July 24, 2019), the groundwater corrective action for the APC must be approved by TDEC. TVA is proceeding with implementing the APC closure-by-removal since TDEC's approval of the APC Removal Plan in November 2023. TVA expects the source removal to improve the conditions in groundwater over time.

### **5.3 Semiannual Reporting, Public Meeting, Remedy Selection, and Final Report**

Progress toward the selection of the remedy will be documented in semiannual reports in accordance with 40 CFR § 257.97(a). At least 30 days prior to selecting a remedy, a public meeting to discuss the results of the corrective measures assessment will be conducted as required by 40 CFR § 257.96(e). A final report will be produced after the remedy is selected. This final report will describe the remedy and how it meets 40 CFR § 257.97. Recordkeeping requirements specified in 40 CFR § 257.105(h), notification requirements specified in 40 CFR § 257.106(h), and internet requirements specified in 40 CFR § 257.107(h) will be complied with as required by 40 CFR § 257.97(e).

## **6.0 References**

- AECOM, 2023a. Removal Plan Ash Pond Complex, Tennessee Valley Authority, Gallatin Fossil Plant, Revision 2. July 28, 2023.
- AECOM, 2023b. Monitoring Plan Ash Pond Complex Removal, Tennessee Valley Authority, Gallatin Fossil Plant, Revision 1. August 2023.
- AECOM, 2024. Corrective Action/Risk Assessment Plan, Ash Pond Complex, Tennessee Valley Authority, Gallatin Fossil Plant. January 2023.
- Brahana and Bradley, 1986. *Preliminary Delineation and Description of the Regional Aquifers of Tennessee – The Central Basin Aquifer System*. Prepared by the United States Geological Survey in cooperation with the U.S. Environmental Protection Agency. USGS Water- Resources Investigations Report 82-4002.

**Semiannual Report on the Progress of Remedy  
Selection – Ash Pond Complex  
Gallatin Fossil Plant**

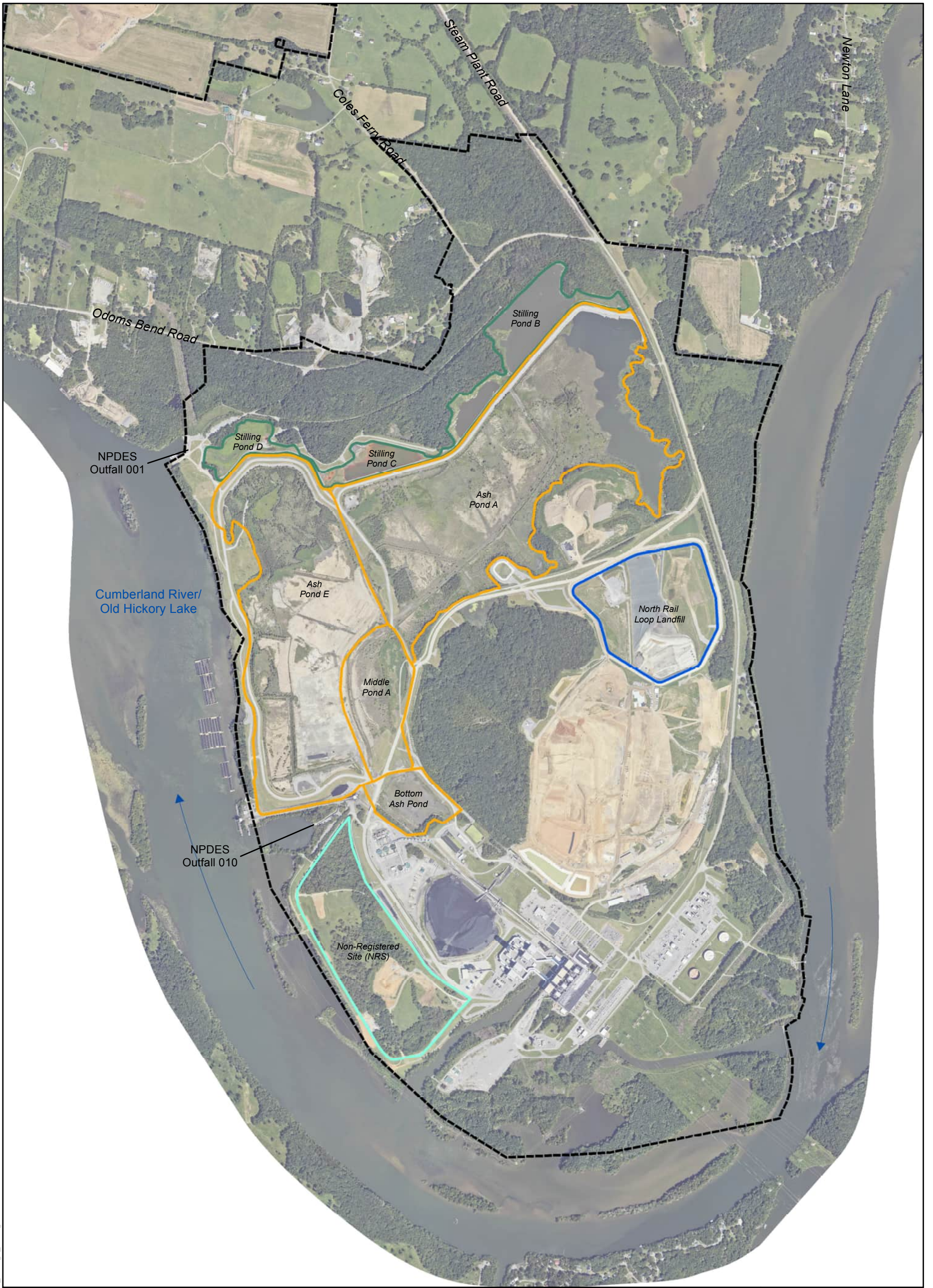
HAI, 2023. Report on Human Health and Ecological Risk Assessment for the Ash Pond Complex, TVA Gallatin Fossil Plant, Gallatin, Tennessee. December 2023.

TVA, 2023. TVA Gallatin Fossil Plant Environmental Assessment Report, Revision 2. April 26, 2023.



# Figures





**LEGEND**

- Cumberland River Flow Direction
- Ash Pond Complex (APC)
- North Rail Loop (NRL) Landfill
- Non-Registered Site (NRS)
- Stilling Ponds
- TVA Gallatin Fossil Plant Property Boundary (Approximate)

N

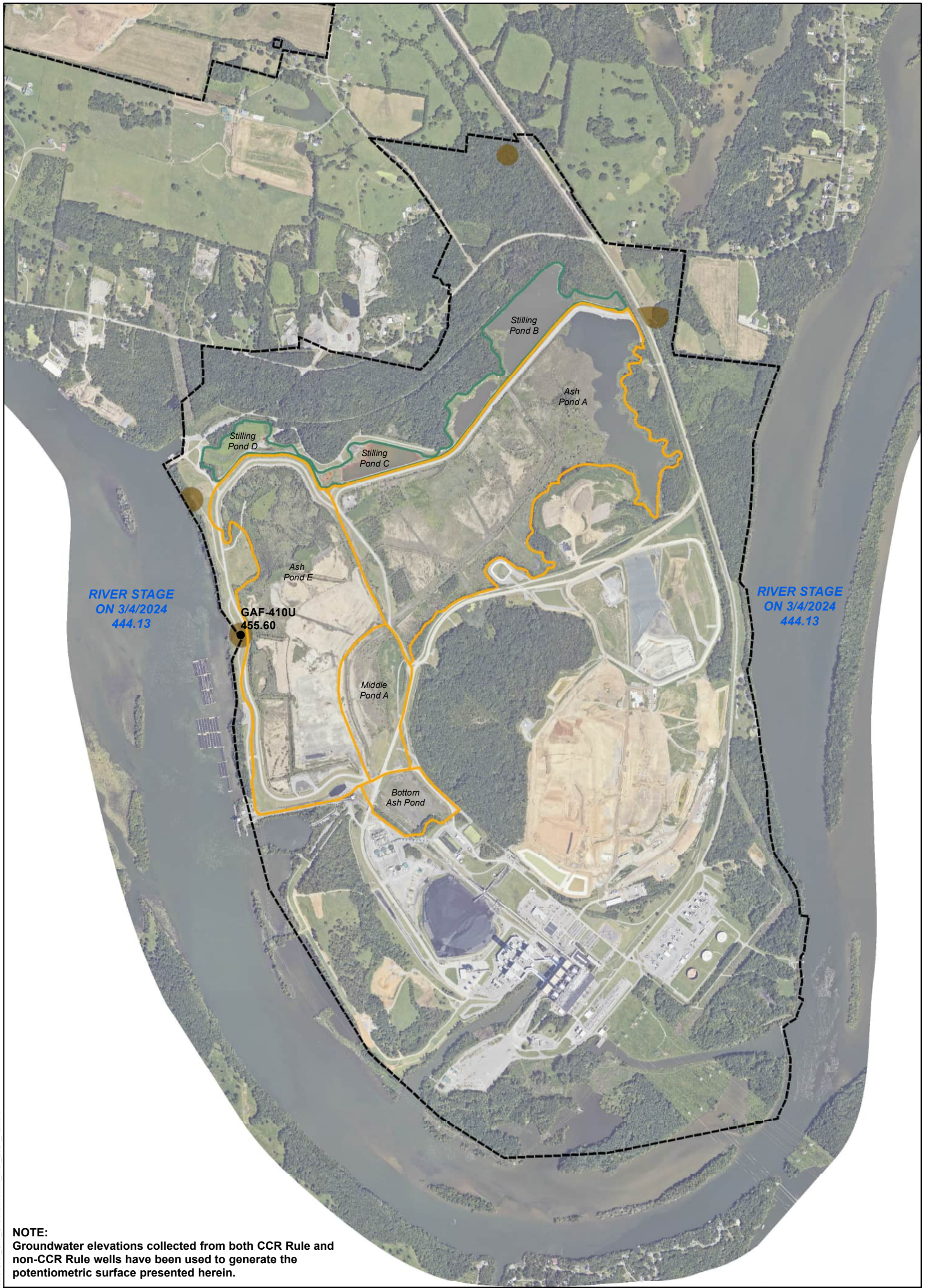
0 1,200 2,400  
Feet

NOTE: Aerial image dated August 2023

<b>AECOM</b>		<b>Figure 1</b>	
<b>AREAS WHERE CCR IS STORED AND MANAGED</b>			
DRAWN BY:	REVIEWED BY:	APPROVED BY:	REVISION NUMBER:
A.DUECASTER	C.GARLINGTON	E.PERRY	REV. 1
GALLATIN FOSSIL PLANT TENNESSEE VALLEY AUTHORITY			
DATE:	DEPT:		
11/9/2023	FOSSIL AND HYDRO ENGINEERING		

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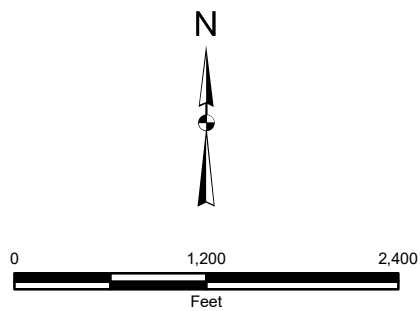




**NOTE:**  
Groundwater elevations collected from both CCR Rule and non-CCR Rule wells have been used to generate the potentiometric surface presented herein.

**LEGEND:**

- GAF-410U Well ID
- 455.60 Groundwater Elevation (feet MSL) on 3/4/2024
- Wells Screened in Unconsolidated Unit
- ▭ Ash Pond Complex (APC)
- ▭ Stilling Ponds
- ▭ Estimated Extent of Groundwater in Unconsolidated Unit in the Vicinity of the APC
- ▭ TVA Gallatin Fossil Plant Property Boundary (Approximate)



NOTE: Aerial image dated August 2023

**AECOM**

**Figure 2**

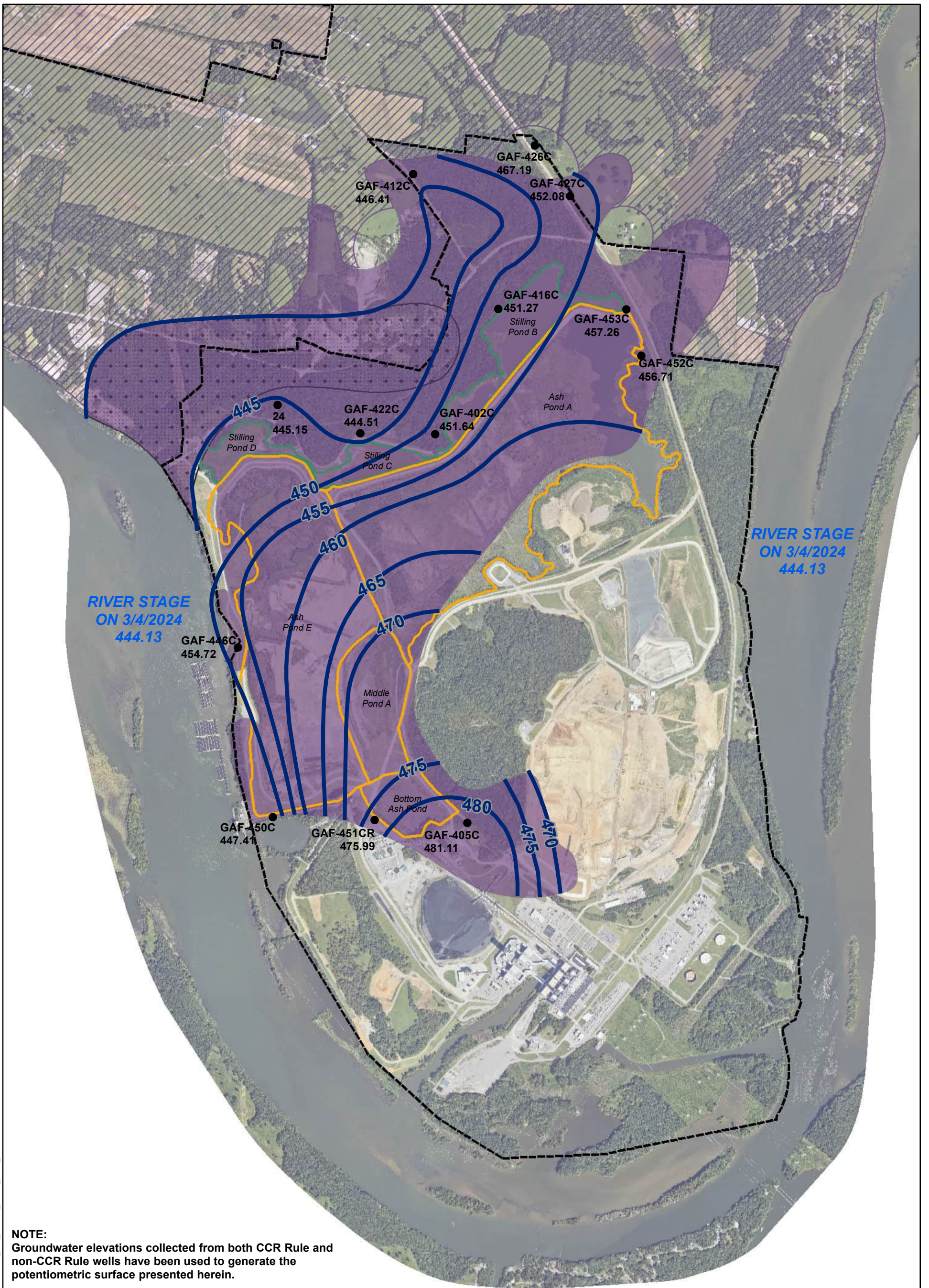
**HYDRAULIC HEADS  
UNCONSOLIDATED UNIT,  
MARCH 4, 2024**

DRAWN BY: A.DUECASTER	REVIEWED BY: C.GARLINGTON	APPROVED BY: E.PERRY	REVISION NUMBER: REV. 0
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**GALLATIN FOSSIL PLANT  
TENNESSEE VALLEY AUTHORITY**

DATE: 5/29/2024	DEPT: FOSSIL AND HYDRO ENGINEERING
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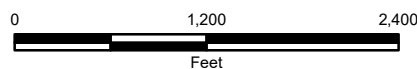


**NOTE:**  
Groundwater elevations collected from both CCR Rule and non-CCR Rule wells have been used to generate the potentiometric surface presented herein.

**LEGEND:**

- GAF-450C 447.41 Well Screened in Carters Limestone
- 447.41 Hydraulic Head feet MSL on 3/4/2024
- Monitoring Well Location
- Hydraulic Head Contour in Aquifer
- ▭ Ash Pond Complex (APC)
- ▭ Stilling Ponds
- ▭ TVA Gallatin Fossil Plant Property Boundary (Approximate)

- ▭ Estimated Extent of Lower Carters Limestone Aquifer
- ▭ Presence of Carters Aquifer Unknown
- ▭ 1st Water Encountered in Lebanon; Contiguous with Carters Aquifer



**AECOM**

**Figure 3**

**HYDRAULIC HEADS  
CARTERS AQUIFER,  
MARCH 4, 2024**

DRAWN BY: A.DUECASTER	REVIEWED BY: C.GARLINGTON	APPROVED BY: E.PERRY	REVISION NUMBER: REV. 0
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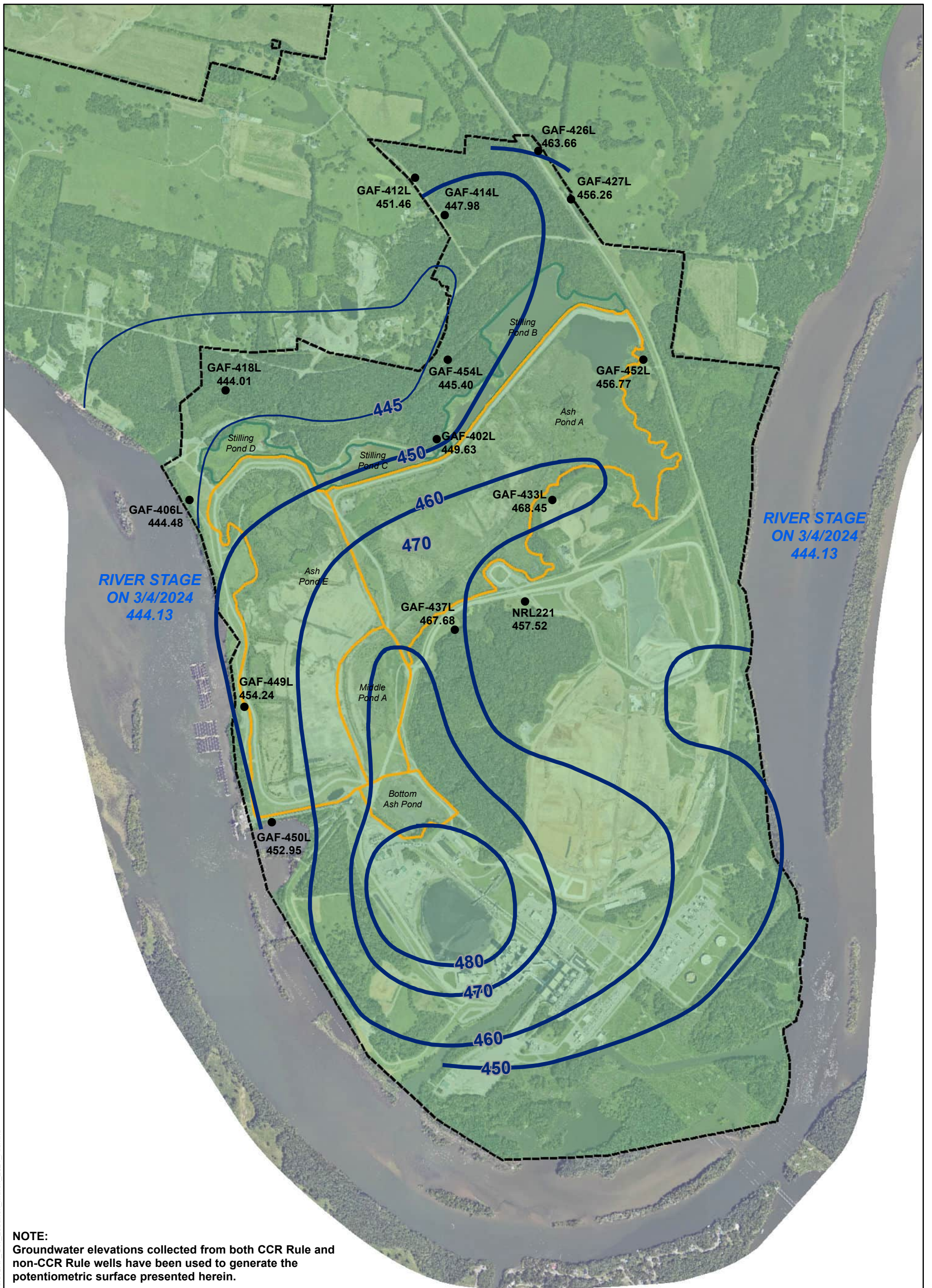
GALLATIN FOSSIL PLANT  
TENNESSEE VALLEY AUTHORITY

DATE: 5/30/2024	DEPT: FOSSIL AND HYDRO ENGINEERING
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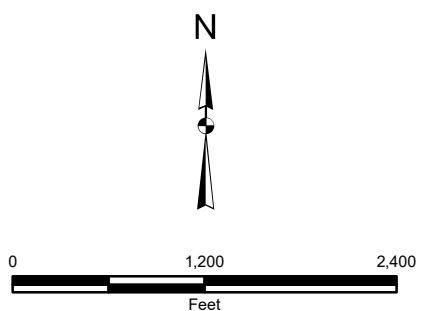
NOTE: Aerial image dated August 2023





**NOTE:**  
 Groundwater elevations collected from both CCR Rule and non-CCR Rule wells have been used to generate the potentiometric surface presented herein.

- LEGEND:**
- GAF-437L Well Screened in Lebanon Limestone
  - 467.68 Hydraulic Head feet MSL on 3/4/2024
  - Monitoring Well Location
  - Hydraulic Head Contour in Aquifer
  - ▭ Ash Pond Complex (APC)
  - ▭ Stilling Ponds
  - ▭ Estimated Extent of Lebanon Limestone Aquifer
  - ▭ TVA Gallatin Fossil Plant Property Boundary (Approximate)



**AECOM**

**Figure 4**

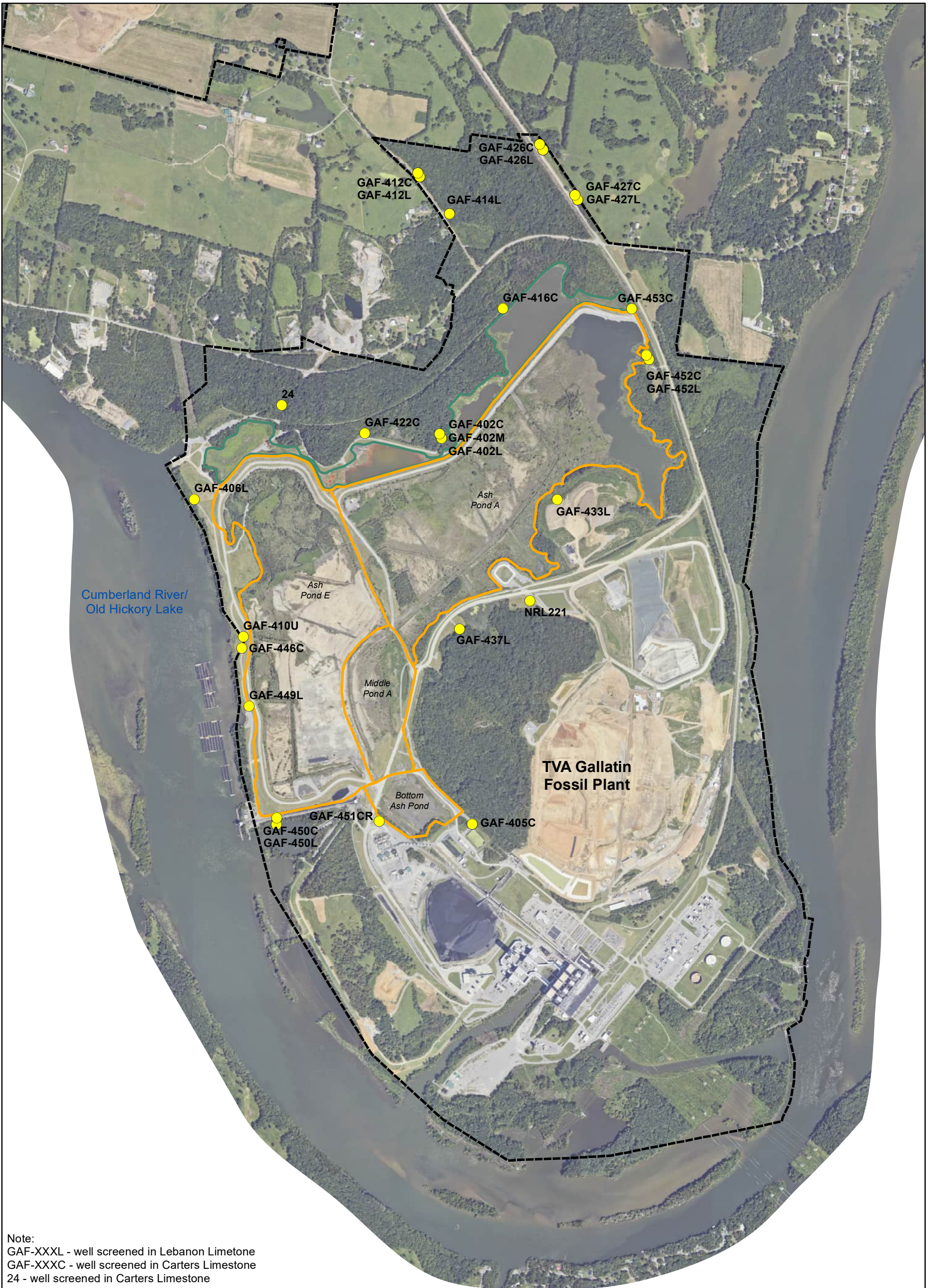
**HYDRAULIC HEADS  
 LEBANON AQUIFER,  
 MARCH 4, 2024**

DRAWN BY: A.DUECASTER	REVIEWED BY: C.GARLINGTON	APPROVED BY: E.PERRY	REVISION NUMBER: REV. 0
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GALLATIN FOSSIL PLANT  
 TENNESSEE VALLEY AUTHORITY

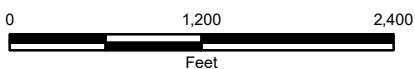
DATE: 5/30/2024	DEPT: FOSSIL AND HYDRO ENGINEERING
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Note:  
 GAF-XXXXL - well screened in Lebanon Limestone  
 GAF-XXXC - well screened in Carters Limestone  
 24 - well screened in Carters Limestone

- LEGEND**
- CCR Rule Monitoring System Wells
  - TVA Gallatin Fossil Plant Property Boundary (Approximate)
  - Ash Pond Complex (APC)
  - Stilling Ponds



**AECOM**

**Figure 5**

**CCR RULE MONITORING SYSTEM  
 ASH POND COMPLEX (APC)**

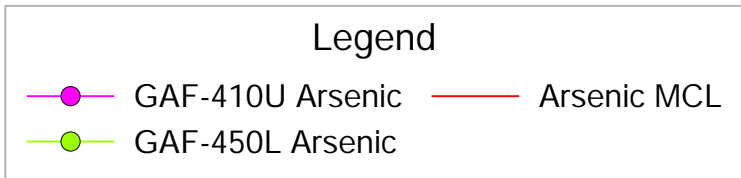
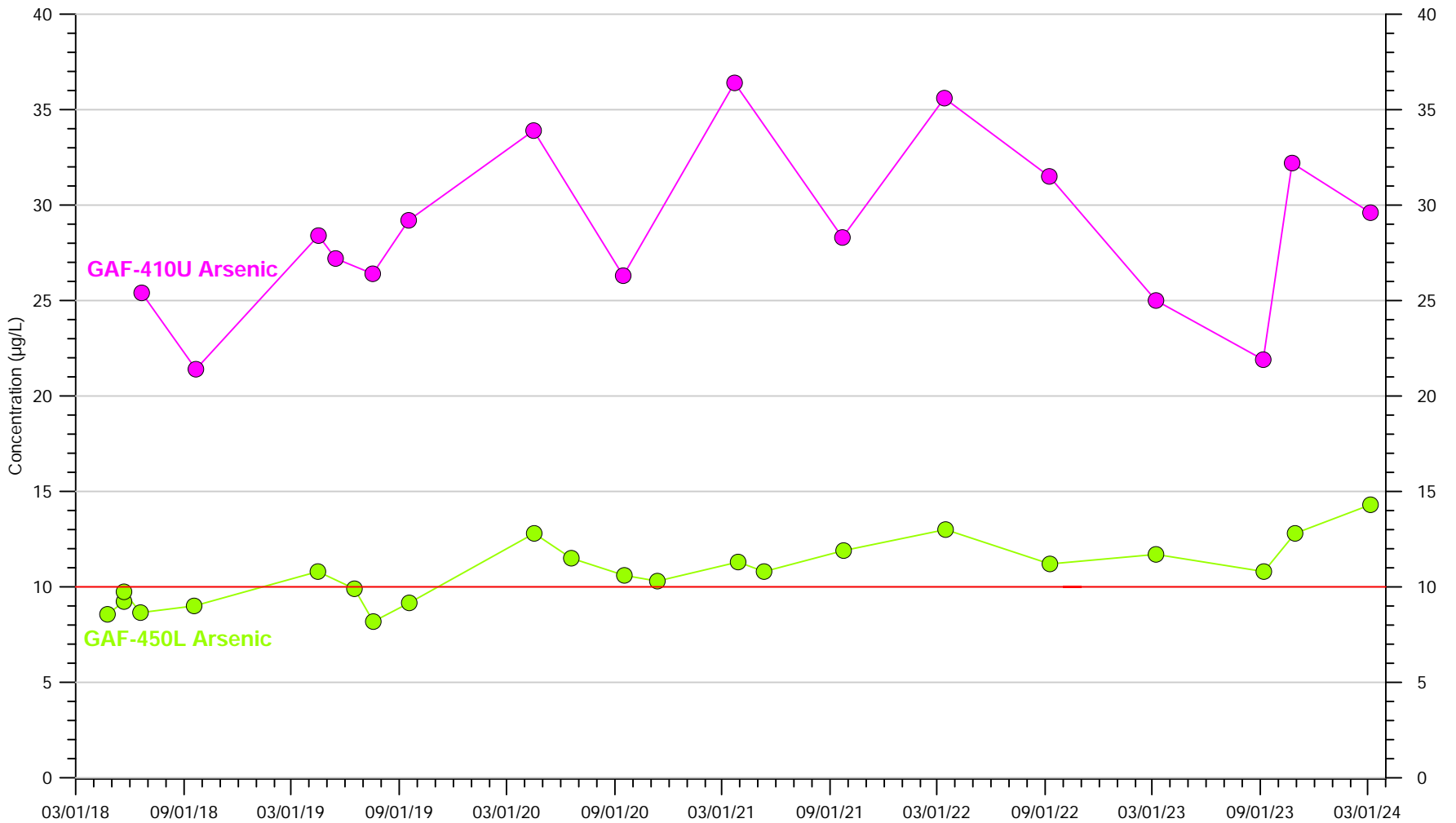
DRAWN BY: A.DUECASTER	REVIEWED BY: C.GARLINGTON	APPROVED BY: E.PERRY	REVISION NUMBER: REV. 4
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GALLATIN FOSSIL PLANT  
 TENNESSEE VALLEY AUTHORITY

DATE: 2/23/2024	DEPT: FOSSIL AND HYDRO ENGINEERING
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NOTE: Aerial image dated August 2023





NOTES:  
 Total data only  
 Does not include U\* flagged data

<b>AECOM</b>		<b>Figure 6</b>	
Concentration Trend Plots			
DRAWN BY: SCOTT D	REVIEWED BY: PERRYAE	APPROVED BY: PERRYAE	REVISION NUMBER: REV. 1
GALLATIN FOSSIL PLANT TENNESSEE VALLEY AUTHORITY			
DATE: 2024/05/29	DEPT: FOSSIL AND HYDRO ENGINEERING		