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BALCH & BINGHAM LLP

SEMI-ANNUAL REMEDY SELECTION AND DESIGN PROGRESS REPORT

PLANT WATSON FORMER CCR UNIT
MISSISSIPPI POWER COMPANY

Prepared for

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Project Number: FR3795A

March 31, 2023

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ACRONYMS AND ABBREVIATIONS

ACM	assessment of corrective measures
CCR	coal combustion residuals
CFR	Code of Federal Regulations
EPA	Environmental Protection Agency
GWPS	groundwater protection standards
LLDPE	linear low-density polyethylene
MDEQ	Mississippi Department of Environmental Quality
MNA	Monitored Natural Attenuation
NPDES	National Pollutant Discharge Elimination System
PRB	permeable reactive barrier
SSL	statistically significant level

1. INTRODUCTION

In accordance with the U.S. Environmental Protection Agency's (EPA's) Coal Combustion Residuals (CCR) Rule, 40 Code of Federal Regulations (CFR) § 257.97(a), this *Semi-Annual Remedy Selection and Design Progress Report* was prepared to provide a semi-annual progress update on the remedy selection process for the former CCR unit at Mississippi Power Company (Mississippi Power) Plant Watson in Gulfport, Mississippi (Site). The location of the former CCR unit is shown on **Figure 1**.

In August 2020, Mississippi Power completed an *Assessment of Corrective Measures* (ACM) to address the occurrence of arsenic, lithium, molybdenum, and combined radium 226 and 228 in Unit 3[1] groundwater at statistically significant levels (SSLs) (Geosyntec, 2020a). In December 2020, Mississippi Power completed a *Radium Alternate Source Demonstration* showing that naturally occurring sources of combined radium 226 and 228 result in the radium SSLs downgradient of the former CCR unit (Geosyntec, 2020b). In 2021 and 2022, Mississippi Power completed *Semi-Annual Remedy Selection and Design Progress Reports* (Geosyntec, 2021a; Geosyntec, 2021b; Geosyntec, 2022a; Geosyntec, 2022b) detailing remedy selection activities during the period of August 2020 through August 2022. The ACM and progress reports were placed in the operating record and posted to the Site's CCR Rule Compliance Data and Information website.

Pursuant to 40 CFR § 257.97, Mississippi Power is continuing to evaluate potential groundwater remedies, or combinations of remedies, presented in the ACM to implement a remedy as soon as feasible. As discussed in the ACM, the following groundwater remedies are potentially viable at the Site:

- In-situ injections;
- Pump-and-treat (hydraulic containment and dewatering);
- Monitored natural attenuation (MNA);
- Permeable reactive barrier (PRB);
- Phytoremediation; and
- Subsurface vertical barrier walls.

Groundwater monitoring activities completed from July 2021 through June 2022 were included in the *2022 Annual Groundwater Monitoring and Corrective Action Report* (Annual Report;

[1] Four distinct geologic units have been encountered near the former CCR unit. Unit 1 is comprised of dike fill material and is underlain by Unit 2, a sandy clay aquitard. Material in the former CCR unit is at the same elevation as Unit 1 and above Unit 2. Unit 3, below Unit 2, is the uppermost aquifer beneath the former CCR unit and consists primarily of sand. The CCR monitoring well network is screened in Unit 3. Finally, Unit 4 (the deepest unit) acts as a clay aquitard underlying Unit 3.

Southern Company Services, 2022) in accordance with 40 CFR § 257.90(e). The Annual Report was placed in the operating record by August 1, 2022.

The following sections describe: (i) former CCR unit closure and source control; (ii) summary of work completed since the September 2022 progress report (Geosyntec, 2022b); and (iii) the anticipated schedule for currently planned activities.

2. FORMER CCR UNIT CLOSURE AND SOURCE CONTROL

Mississippi Power completed closure of the former CCR unit in 2018 via closure in place and capping. During closure, the former CCR unit was dewatered sufficiently to remove free liquids. The CCR material remaining in the former CCR unit was graded and a final cover system installed. The final cover system consists of a ClosureTurf cover system by WatershedGeo that utilizes an impermeable 50-mil linear low-density polyethylene (LLDPE) geomembrane overlain by an engineered synthetic turf. The final cover system was designed to limit infiltration of precipitation by providing sufficient grades and slopes to promote precipitation runoff to discharge points along the intake and discharge canals along the perimeter of the former CCR unit.

The closure of the former CCR unit in the manner described above provides a source control measure that minimizes infiltration, reduces the migration potential of CCR constituents, and provides an opportunity for natural attenuation processes to remediate SSL constituents.

3. SUMMARY OF WORK COMPLETED

Since completion of the *Semi-Annual Remedy Selection and Design Progress Report* submitted on September 30, 2022 (Geosyntec, 2022b), further remedy selection-related activities have been performed as described below.

3.1 Semi-Annual Groundwater Monitoring

Semi-annual assessment monitoring of the certified CCR groundwater monitoring network has continued at the Site in accordance with 40 CFR § 257.95. Groundwater samples were analyzed for Appendix III and Appendix IV constituents. Groundwater monitoring data and associated statistical analyses are documented in the *Annual Groundwater Monitoring and Corrective Action Reports*, due by August 1 of each year.

3.2 SSL Nature and Extent Assessment

Assessment of the nature and extent of SSLs, which was initiated prior to ACM completion in August 2020, is complete. Confirmatory activities completed since August 2022 include groundwater and surface water sampling (October 2022) and data analysis associated with background monitoring wells, CCR monitoring wells, surface water sampling locations (horizontal delineation), and deep groundwater monitoring wells (vertical delineation). Surface water concentrations were below applicable groundwater protection standards (GWPS), indicating the SSLs of arsenic, lithium, and molybdenum observed in Unit 3 groundwater are spatially limited to the area immediately surrounding the former CCR unit. Therefore, the October 2022 data confirmed that horizontal delineation is completed.

In most deep wells, SSL constituent concentrations were below the applicable GWPS, indicating the SSLs of arsenic, lithium, and molybdenum did not migrate into Unit 4. In those deep wells where exceedances were observed (APMW-4D, APMW-5D, and APMW-10D), an investigation using isotopic signatures was completed to evaluate the source of groundwater constituent concentrations in deeper groundwater bearing zones. Based on the results of the isotopic data evaluation, an addendum to the *Comprehensive Groundwater Investigation Report* (Geosyntec, 2020c) was completed for certain CCR constituents observed in deep groundwater in select locations (Geosyntec, 2022c). This addendum indicated that groundwater below approximately 40 feet below ground surface predates operation of the former CCR unit and documents complete vertical delineation for SSLs at the Site.

3.3 Monitored Natural Attenuation (MNA) Evaluation

A natural attenuation evaluation for Site SSLs was completed prior to the September 2022 progress report and is subsequently updated as new site data is collected (Geosyntec, 2022b). Results of the evaluation indicate ongoing natural attenuation of arsenic and lithium based on statistically significant decreasing or stable temporal concentration trends over the monitoring period since 2018 (at the 95% confidence level) at each SSL well except for APMW-6R. At well APMW-6R, trends were initially variable or increasing, but no trend in temporal

concentration was identified over the past three years (at the 90% confidence level) for arsenic, lithium, or molybdenum (i.e., trends appear stable).

Additional groundwater data will be collected to confirm and statistically evaluate the decreasing and stable temporal concentration trends post closure of the former CCR unit in 2018. Based on these findings, a long-term remedial strategy will be developed for the Site and implemented utilizing an adaptive management approach.

3.4 Temporary Remedy

In a letter to the Mississippi Department of Environmental Quality (MDEQ) dated December 14, 2020 (Mississippi Power, 2020), Mississippi Power proposed installing a groundwater extraction system at the former CCR unit as a temporary remedy. The temporary remedy design was completed to extract groundwater from Unit 3 below the footprint of the former CCR unit and within the existing slurry wall. Extracted groundwater would undergo treatment prior to discharge to the Site leachate pond.

The goals of the temporary remedy extraction system pursuant to the 2020 correspondence were to:

- Begin groundwater corrective action while a long-term remedy strategy is developed.
- Reduce head in the uppermost aquifer (Unit 3) within the slurry wall footprint.
- Establish an inward flow gradient, thereby minimizing outward flow potential from the former CCR unit.
- Provide further data and information regarding uppermost aquifer and hydrogeology at the Site.

Temporary remedy discharge to the Site leachate pond was included in the approved National Pollutant Discharge Elimination System (NPDES) permit renewal for the Site.

As part of the temporary remedy system, four groundwater extraction wells (TW-4, TW-5, TW-6, and TW-7) were installed in November and December 2021 in the footprint of the former CCR unit as shown on **Figure 2**. TW-4 through TW-6 are incorporated into the temporary remedy system along with existing groundwater extraction well TW-3. TW-7 is available as a contingent extraction well to be incorporated into the system, if needed. An overview of the temporary remedy system layout is provided on **Figure 2**.

Construction of the temporary remedy system commenced in May 2022 following a bidding and contractor selection process. Construction was completed and system startup was conducted in October 2022. Commissioning of the system and hand over to Mississippi Power occurred on October 24, 2022. Optimization of the flow rates and extraction system is ongoing.

4. PLANNED ACTIVITIES AND ANTICIPATED SCHEDULE

The following activities are planned to support the remedy selection process:

- Semi-annual groundwater assessment monitoring, including sampling of horizontal and vertical delineation locations, is planned for March 2023.
- Refinement of the conceptual site model.
- Continued assessment of corrective measures identified in the ACM, including evaluating if additional field data collection, laboratory studies, and/or field pilot tests are needed to support remedy selection.
- Continued operation and optimization of the temporary remedy system.
- Development of a groundwater monitoring plan to assess performance of the temporary groundwater remedy.

As appropriate, data obtained during these activities will be included in the *Annual Groundwater Monitoring and Corrective Action Report* due August 1, 2023.

Final selection of a remedy will occur as soon as feasible in accordance with the CCR Rule. Until remedy selection is complete, semi-annual remedy selection and design progress reports will continue to be prepared. The next semi-annual progress report will be completed by September 30, 2023.

5. REFERENCES

Geosyntec, 2020a. Assessment of Corrective Measures. Former CCR Unit. Mississippi Power Company. Plant Watson. August 2020.

Geosyntec, 2020b. Radium Alternate Source Demonstration. Former CCR Unit. Mississippi Power Company. Plant Watson. August 2020.

Geosyntec, 2020c. Comprehensive Groundwater Investigation Report and Addendum. Former CCR Unit. Mississippi Power Company. Plant Watson. December 2020.

Geosyntec, 2021a. Semi-Annual Remedy Selection and Design Progress Report. Plant Watson Former CCR Unit. Mississippi Power Company. March 31, 2021.

Geosyntec, 2021b. Semi-Annual Remedy Selection and Design Progress Report. Plant Watson Former CCR Unit. Mississippi Power Company. September 30, 2021.

Geosyntec, 2022a. Semi-Annual Remedy Selection and Design Progress Report. Plant Watson Former CCR Unit. Mississippi Power Company. March 31, 2022.

Geosyntec, 2022b. Semi-Annual Remedy Selection and Design Progress Report. Plant Watson Former CCR Unit. Mississippi Power Company. September 30, 2022.

Geosyntec, 2022c. Comprehensive Groundwater Investigation Report – Addendum. Plant Watson Former CCR Unit. Mississippi Power Company. December 2022.

Mississippi Power, 2020. Mississippi Power – Plant Watson. Agreed Order No 7010-19. Temporary Remedy. December 2020.

Southern Company Services, 2022. 2022 Annual Groundwater Monitoring and Corrective Action Report. Mississippi Power Company. Plant Watson Former CCR Unit. August 1, 2022.

FIGURES

Legend

- Former CCR Unit Boundary
- RaceTrac Gas Station Property Boundary
- Plant Watson Property Boundary

Notes:
1. Property boundary georeferenced from Southern Company Services, 2020. Groundwater Monitoring Report. Mississippi Power Company. Plant Watson Ash Pond. 21 February.
2. CCR - Coal Combustion Residuals
3. Aerial Source: Google Earth Imagery 3/18/2019

N

0 1,000 Feet

Plant Watson Location Map

Plant Watson
Gulfport, Mississippi

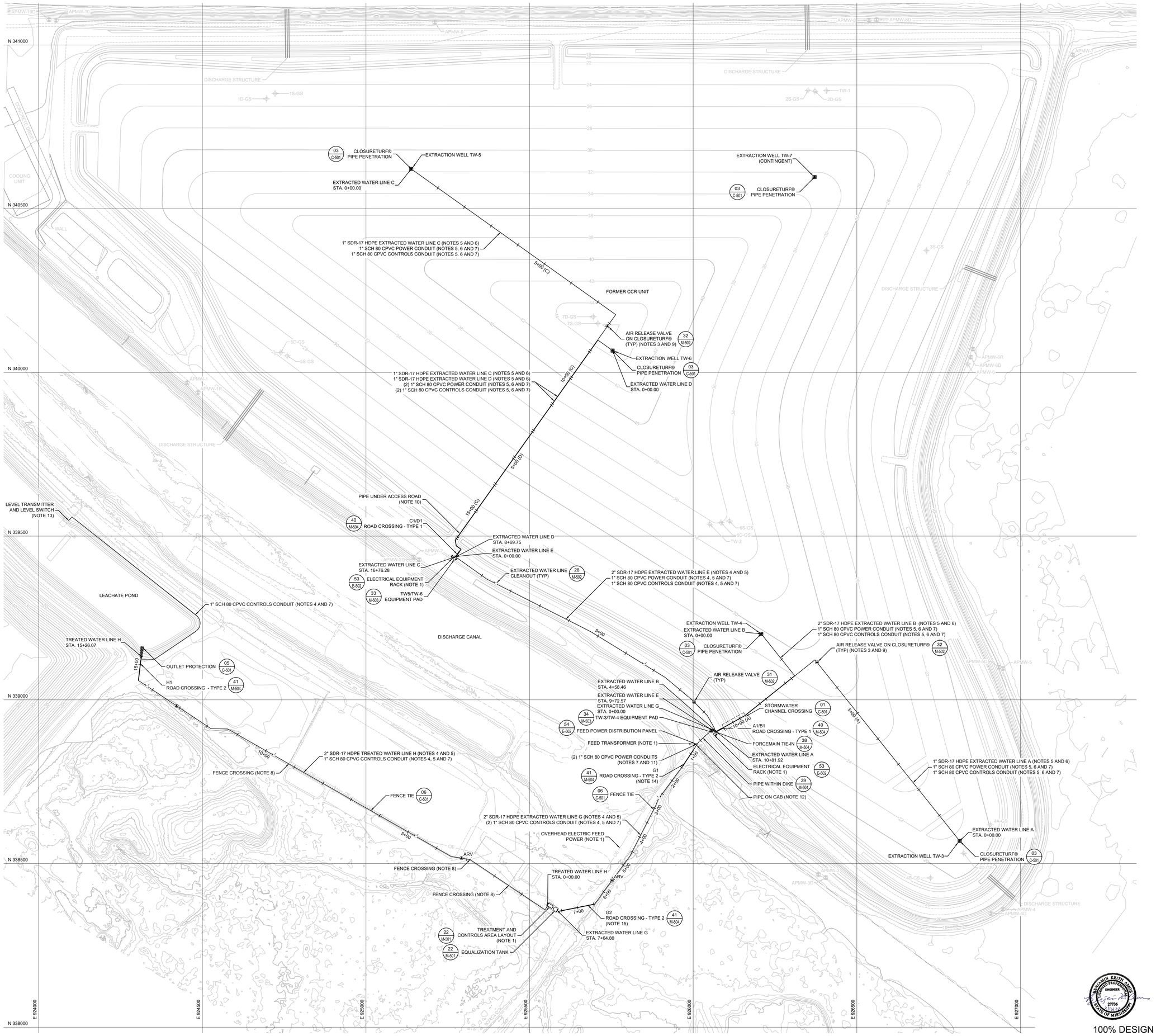
Geosyntec consultants

Pensacola, FL

March 2023

Figure 1

ARO-01:N:\Mississippi Power\Plant Watson\03_GIS\MXD\14_Isotope_Study\Fig1_SiteMap.mxd 6/23/2021 3:30:10 PM



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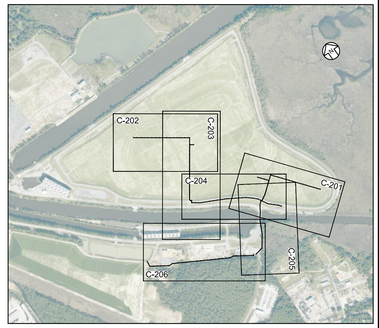

KEY MAP

SCALE: 1" = 800'

NOTES:

1. MISSISSIPPI POWER SHALL SUPPLY POWER BETWEEN THE TRANSFORMER AND FEED POWER DISTRIBUTION PANEL. CONTRACTOR SHALL PICK UP ELECTRICAL INSTALLATION FROM THIS POINT.
2. PIPE BENDS ARE NOT DIRECTLY CALLED OUT. CONTRACTOR SHALL INSTALL BENDS AS NECESSARY TO MEET THE PROPOSED ALIGNMENT. ALL PIPE BENDS SHALL BE LONG SWEEP AND OF THE SAME PIPE TYPE AND CLASS AS THE MAIN LINES.
3. AIR RELEASE VALVES SHALL BE INSTALLED ALONG THE EXTRACTED AND TREATED WATER LINES AT LOCAL HIGH POINTS. CONTRACTOR SHALL VERIFY HIGH POINTS ALONG THE VERTICAL PIPELINE ALIGNMENT IN THE FIELD PRIOR TO FINALIZING AIR RELEASE VALVE LOCATIONS. ALL AIR RELEASE VALVE LOCATIONS SHALL BE CONFIRMED WITH THE OWNER'S ENGINEER BEFORE INSTALLATION.
4. OUTSIDE CLOSURETURF®, CONTRACTOR SHALL SECURE WATER LINES AND CONDUIT TO HALF CONCRETE BIN BLOCKS INSTALLED AT 25 FOOT INTERVALS AND PLACE THE LINES AS CLOSE AS POSSIBLE TO THE EXISTING DIKE ROAD. HALF CONCRETE BIN BLOCKS SHALL NOT BE INSTALLED ON THE CLOSURETURF® NOR ALONG PIPING ATTACHED TO EXISTING FENCE. CONTRACTOR MAY PROPOSE ALTERNATIVE CONCRETE BLOCK FOR REVIEW AND APPROVAL BY THE OWNER'S ENGINEER. PIPE SUPPORTS FOR CLEANOUTS AND AIR RELEASE VALVES SHALL BE IN ACCORDANCE WITH DETAILS 28 AND 31 ON DRAWING M-502.
5. CONDUITS SHALL BE FASTENED TO EXTRACTED WATER LINES WITH BLACK HEAVY DUTY CABLE TIES AT 10 FOOT INTERVALS AS SHOWN ON DETAIL 49 ON SHEET E-502.
6. WITHIN THE CLOSURETURF®, CONDUITS AND WATER LINES SHALL BE SUPPORTED USING CUSH-A-BLOCK RUBBER PIPE SUPPORTS OR SANDBAGS. IN AREAS INDICATED WITH BRACKETS, CONDUITS AND WATER LINES SHALL BE SUPPORTED BY CUSH-A-BLOCK RUBBER PIPE SUPPORTS AT 3 FOOT INTERVALS. IN AREAS OUTSIDE THE BRACKETS, THE CONDUIT AND WATER LINES SHALL BE LAID DIRECTLY ON THE CLOSURETURF®; SANDBAGS SHALL BE PLACED DIRECTLY ON TOP OF THE LINES AT 10 FOOT INTERVALS. ALONG THE ENTIRE ALIGNMENT, BLACK HEAVY DUTY CABLE TIES SHALL CONNECT THE THREE LINES AT 10-FOOT INTERVALS AS SHOWN ON DETAIL 49 ON SHEET E-502. THE CABLE TIE CONNECTIONS SHOULD BE OFFSET FROM THE PIPE SUPPORTS AND SANDBAGS. SEE PLAN AND PROFILE DRAWINGS FOR LOCATIONS.
7. CPVC PIPES, VALVES, AND FITTINGS EXPOSED TO DIRECT SUNLIGHT SHALL BE COATED WITH UV-PROTECTIVE PAINT OR SHALL BE MANUFACTURED WITH UV INHIBITORS AND RATED FOR PROLONGED UV EXPOSURE.
8. CONTRACTOR IS RESPONSIBLE FOR FIELD-FIT PLACEMENT OF TREATED WATER LINE AND CONTROLS CONDUIT BELOW EXISTING FENCE AT FENCE CROSSING LOCATIONS.
9. CONTRACTOR SHALL INSTALL CLEAR POLYETHYLENE TUBING FROM AIR RELEASE VALVE SPOUT ALONG EXTRACTED WATER LINE ALIGNMENT TO DRAIN INTO EXTRACTION WELL NOTED ON FOLLOWING DRAWINGS. FASTEN POLYETHYLENE TUBING TO EXTRACTED WATER LINE USING BLACK HEAVY DUTY CABLE TIES.
10. THE EXTRACTED WATER LINES (2) AND CONDUITS (4) FROM TW-5 AND TW-6 SHALL BE BURIED WITHIN THE GAB (APPROX. 1 FT FROM EDGE) OF THE ACCESS ROAD ONTO THE CLOSURETURF®. COVER FOR THE PIPES SHALL NOT EXTEND BEYOND THE FIRST 45 DEGREE LONG SWEEP ELBOW. ADDITIONAL GRAVEL SHALL BE ADDED TO THE END OF THE ACCESS ROAD ON THE CLOSURETURF® AND RAMPED TO ALLOW VEHICLE TRAFFIC TO ACCESS CLOSURETURF® IN EITHER DIRECTION AND NOT TRAVERSE DIRECTLY OVER THE EXTRACTED WATER LINES AND CONDUITS.
11. POWER CONDUITS SHALL DAYLIGHT AT THE BASE OF THE DIKE INTO THE GAB SURROUNDING THE FEED POWER DISTRIBUTION RACK AND RUN INTO THE FEED POWER DISTRIBUTION PANEL.
12. EXTRACTED WATER LINE G AND CONTROLS CONDUITS SHALL DAYLIGHT IN THE SAME LOCATION AS THE POWER CONDUIT. A 6" LAYER OF GAB, AS SHOWN ON DRAWING C-502, SHALL BE INSTALLED BENEATH EXTRACTED WATER LINE G AND THE CONTROLS CONDUITS FROM THE POINT OF DAYLIGHTING TO G1 ROAD CROSSING-TYPE 2
13. CONTRACTOR SHALL INSTALL THE LEVEL TRANSMITTER AND LEVEL SWITCH ON OR NEAR THE OUTFALL STRUCTURE IN ACCORDANCE WITH CONSTRUCTION MANAGER APPROVAL.
14. CONTRACTOR SHALL DAYLIGHT WATER LINE AND CONTROLS CONDUIT ADJACENT TO THE FENCE LINE AND RECONSTRUCT THE GRAVEL BERM FOR ADDED PROTECTION OF THE LINES FROM VEHICLE TRAFFIC.
15. CONTRACTOR SHALL INSTALL A HALF CONCRETE BIN BLOCK ON EITHER END OF THE ROAD CROSSING TO INDICATE WHERE PIPING GOES UNDERGROUND AND WHERE IT DAYLIGHTS NEAR THE TREATMENT PAD.

REV	DATE	DESCRIPTION	DRN	APP
0	02.16.22	100% DESIGN DRAWINGS - ISSUED FOR CONSTRUCTION	WSA	BKA

SITE DEVELOPMENT PLAN

TEMPORARY REMEDY DESIGN
PLANT WATSON
MISSISSIPPI POWER COMPANY
GULFPORT, MISSISSIPPI

BENJAMIN KEITH JASON — LICENSED PROFESSIONAL ENGINEER — 27774 — STATE OF MISSISSIPPI

100% DESIGN ISSUED FOR CONSTRUCTION

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PROJ. NO.	FR7947	DWG.	FR7947.01C102
SCALE	1" = 100'	SHEET	C-102
DATE	02.02.22	FIGURE	2