# 2021 ANNUAL DAM AND DIKE INSPECTION REPORT

**CCR PONDS COMPLEX** 

Oklaunion Industrial Park LLC VERNON, TEXAS

December, 2021

Prepared by: Oklaunion Industrial Park LLC.

12567 FM 3430

Vernon, TX 76384



# Dam & Dike Inspection Report CCR Ponds Complex

Revision 1

OKLAUNION INDDUSTRIAL PARK LLC VERNON, TEXAS

INSPECTION DATE December 10, 2021

PREPARED BY: Naro Weaver DATE 12/15/21

Aaron Weave

REVIEWED BY:

DATE 12/15/21

Jeffrey Wind

Professional Engineer: 3/

12/24/20



PROFESSIONAL ENGINEER SEAL & SIGNATURE

Legrify to the best of my knowledge, information and belief the information contained in this report meets the requirements of 4-0 CFR § 257.83(b).

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#### 1.0 INTRODUCTION

This report was prepared by Oklaunion Industrial Park LLC (OIP), in part, to fulfill requirements of 40 CFR 257.83 and to provide OIP with an evaluation of the facility.

The OIP is located at 12567 FM Rd 3430, Vernon, TX 76384. The plant was a coal-fired facility, which includes a number of wastewater evaporation ponds containing cooling tower blowdown. Five of the ponds are used to manage coal combustion residuals and other wastewater treatment so lids. Figure I shows the plant vicinity map.

OIP administers the Oklauruon Industrial Park Dam Inspection and Maintenance Program (DIMP). As part of the DIMP, staff conducts monthly dam and dike inspections. This report contains the inspection findings, observations, photographic descriptions, conclusions, and maintenance recommendations. This inspection report addresses the CCR Ponds Complex at the OIP facility.

The inspection was performed on December 31, 2021. Mr. Aaron Weaver conducted the field inspection. Weather conditions on December 31st was sunny with good visibility, temperatures ranging from upper 30's to mid 60's during the inspection. Inspection observations were discussed with the Site Superintendent after completion of the field work.

#### 2.0 DESCRIPTIONSOF IMPOUNDMENT

The five CCR surface impoundments, referenced as Ponds 6, 21, 22, 23 and the Waste Water and Sludge Pond, have a total area of 104.1 acres. Oklaunion Ponds for storing CCR include a 60+ acre pond for waste fly ash and bottom ash storage (Pond 6), two 5+ acre ponds for CCR (Pond 21 and Pond 22), a 13+ acre pond for CCR (Pond 23), and a 22+ acre pond for Waster Water and Sludge (WWSP) storage. These ponds are located at the south- central edge of the main evaporation pond complex of the generating station. The ponds were constructed as a continuous upground homogeneous earthen embankment with 3H:IV inboard and outboard slopes and crest width of 20 feet. The design elevation of the crest is 1215 feet. These CCR ponds do not have any outlet structures or spillways and rely on evaporation to remove water from the impoundments. These impoundments retain the wastes until it is sufficiently dry to be hauled away to Pond 6 where it is permanently stored. Figure 2 shows the CCR pond complex general layout.

## 3.0 REVIEW OF AVAILABLE INFORMATION (257.83(b)(l)(i))

A review of available information regarding the status and condition of the CCR Ponds, which include files available in the CCR operating record, such as design and construction information, periodic structural stability assessments, previous 7 day inspection reports, 30-day instrumentation data, and previous annual inspections has been conducted. Based on the review of the data there were no signs of actual or potential structural weakness or adverse conditions.

### 4.0 INSPECTION (257.83(b)(l)(il))

#### 4.1 GENERAL

The summary of the visual observation uses terms to describe the general appearance or condition of an observed item, activity or structure. Their meaning is understood as follows:

Good:

A condition or activity that is generally better or slightly better than what is minimally expected or anticipated from a design or maintenance point of view.

Fair or Satisfactory: A condition or activity that generally meets what is minimally expected or anticipated from a design or maintenance point of view.

Poor:

A condition or activity that is generally below what is minimally expected

or anticipated from a design or maintenance point of view.

Minor:

A reference to an observed item (e.g., erosion, seepage, vegetation, etc.) where the current maintenance condition is below what is normal or desired, but which is not currently causing concern from a structure safety or stability point of view.

Significant:

A reference to observed item (e.g. erosion, seepage, vegetation, etc.) where the current maintenance program has neglected to improve the condition. Usually, conditions that have been previously identified in the previous inspections, but have not yet been corrected.

**Excessive:** 

A reference to an observed item (e.g., erosion, seepage, vegetation, etc.) where the current maintenance condition is below or worse than what is normal or desired, and which may have affected the ability of the observer to properly evaluate the structure or area being observed or which may be a concern from a structure safety or stability point of view.

In addition, a "deficiency" is some evidence that a dam has developed a problem that could impact the structural integrity of the dam. There are four general categories of deficiencies. These four categories are described below:

#### 1. Uncontrolled Seepage

Uncontrolled seepage is seepage that is not behaving as the design engineer has intended. An example of uncontrolled seepage is seepage that comes through or around the embankment and is not picked up and safely carried off by a drain. Seepage that is collected by a drain can still be uncontrolled if it is not safely collected and transported, such as seepage that is not clear. Seepage that is unable to be measured and/or observe it is considered uncontrolled seepage. [Wet or soft areas are not considered as uncontrolled seepage, but can lead to this type of deficiency. These areas should be monitored frequently.]

#### 2. Displacement

Displacement of the embankment is large scale movement of part of the dam. Common signs of displacement are cracks, scraps, bulges, depressions, sinkholes and slides.

#### 3. Blockage of Control Features:

Blockage of Control Features is the restriction of flow at spillways, decant or pipe spillways or drains.

#### 4. Erosion:

Erosion is the gradual movement of surface material by water, wind or ice. Erosion is considered a deficiency when it is more than a minor routine maintenance item.

#### 4.2 CHANGES IN GEOMETRY SINCE LAST INSPECTION (257.83(bX2)(i))

No modifications have been made to the geometry of the CCR Ponds Complex since the 2018 annual inspection. The geometry of the impoundment bas remained essentially unchanged.

#### 4.3 CHANGES THAT EFFECT STABILITY OR OPERATION (257.83(b)(2)(vii))

Based on interviews with Site personal and field observations there were no changes to the CCR Ponds Complex since the last annual inspection that would affect the stability or operation of the impounding structure.

#### 4.4 IMPOUNDM£NT Characteristics (2S7.83(b)(2)(iii, iv, v))

Table 1 is a summary of the minimum, maximum. and present depth and elevation of the impounded water since the previous annual inspection; the storage capacity of the impounding structure at the time of the inspection; and the approximate volume of the impounded water at the time of the inspection.

Table 1 Summary of Relevant Storage Information CCR Ponds Complex

IMPUNDMENT CHARACTERISTICS - CCR Pond Complex							
	Pond6	Pond 21	Pond 22	Pond 23	WWSP		
Approximate Minimum depth of impounded water since last annual inspection	15ft	18ft	14ft	14ft	10 ft		
	(1200)	(1208)	(1204)	(1208)	(1200)		
Approximate Maximum depth of impounded wat.ersince last annual inspection	28ft	24ft	24ft	23ft	23ft		
	(1213)	(1214)	(1214)	(1213)	(1213)		
Approximate Present depth of impounded water at the time of the inspection	14ft	22ft	22ft	23ft	22ft		
	(1204)	(1212)	(1212)	(1213)	(1212)		
Approximate <b>Minimum</b> depth of CCR since last annual inspection	23ft	22ft	21ft	25ft	22ft		
	(1208)	(1212)	(1211)	(1215)	(1212)		
Approximate Maximum depth of CCR since last annual inspection	29fl	22ft	22ft	26fl	24fl		
	(1214)	(12 12)	(1212)	(1216)	(1214)		
Approximate Present depth of CCR at the time of the inspection	29ft	22fl	22fl	26fl	24ft		
	(1214)	(1212)	(1212)	(1216)	(1214)		
Storage Capacity of impounding structure at the time of the inspection	1100acrc-fl	I25acrefl	I25acre-fl	250 acre-fl	400 acre-ft		
Approximate volume of impounded water at the time of the inspection	50 acre-fl	65acre-fl	55acre-fl	120 acre-ft	80 acre-ft		
Approximate volume of CCR at the time of the inspection	885 acre-fl	45acre-ft	55acre-ft	125 acre-ft	320 acre-ft		

#### 4.5 VISUAL INSPECTION (257.83(b)(2)(i))

A visual inspection of the CCR Ponds Complex was conducted to identify any signs of distress or malfunction of the impoundment and appurtenant structures. Specific items inspected included all structural elements of the dam such as upstream and downstream slopes, crest, and toe.

#### POND6-WASTEWATERPOND

Pond #6 is located at the south-central edge of the main evaporation pond complex area. In 2015, Pond 6 dam embankment was raised to provide additional ash storage capacity. The crest elevation was raised from Elevation 1208 to Elevation 1215 feet.

The crest of the embankment appeared to be in good condition with no unusual cracking, rutting, settlement, deformation or misalignment.

The exterior slopes the south and west dikes were in overall good condition. No signs of slope failure, slumping. or seepage were observed on the downstream slopes and no burrowing animal activity was noted. The slopes were satisfactorily vegetated and no erosional features were noted. All slopes were free of woody vegetation.

The eastern slope of Pond #6 is also the western slope of the Pond #7 spillway discharge channel. The channel was in fair condition. The spillway of the adjacent Pond #7 bas been substantially blocked and no discharge can occur. However, the discharge channel below, also receives runoff from the surrounding area and should be monitored for erosion as part of the periodic visual inspections. Pictures 19 thru 26 show the general condition of Pond #6.

#### **POND 21**

The slopes of Pond 21 an: in good condition. Pond 21 is a partially incised 5.1 acre bottom ash pond. The only visible dike portions arc 3-5 ft above the normal pool levels. The dikes are common to either the Makeup Water Pond or Pond 22.

Overall Pond 21 appeared in good, stable and functional condition and there were no visual observations to indicate any structural deficiencies that would impact the integrity of the dikes. The geometry of the dike bas not changed or altered since the last inspection. Pictures 1 thru 5 show the general condition of Pond 21

#### POND22

The slopes of Pond 22 arc in good condition. Pond 22 is a partially incised 5.1 acre pond originally designed for storing bottom ash. The only visible dike portions of the pond are 3-5 ft above the normal pool levels. The dikes are common to the Makeup Water Pond. Pond 21, or Pond 23. Based on the inspection there were no visual observations to indicate any structural deficiencies that would impact the integrity of the dikes. Pictures 6 thru 8 and 14 show the general condition of Pond 22.

#### POND23

The slopes of Pond 23 are in good condition. Pond 23 is a partially incised 13.3 acre pond originally designed to contain fly ash. The only visible dike portions of the pond are 3-5ft above the normal pool levels. The dikes are common to either the Makeup Water Pond, Pond 22, or the Wastewater Sludge Pond. Based on the inspection there were no visual observations to indicate any structural deficiencies that would impact the integrity of the dikes. Pictures 9,13 and 12 show the general condition of Pond 23.

#### WASTEWATER SLUDGE POND

The slopes of the Wastewater and Sludge Pond (WWSP) arc in good condition. WWSP is a partially incised 22.6 acre pond. The only visible dike portions arc 3-5 ft above the normal pool levels. The dikes are common to either the Makeup Water Pond. Pond 23, or Pond 7. Based on the inspection there were no visual observation to indicate any structural deficiencies that would impact the integrity of the dikes. Overall the facility is in good condition. The impoundment is functioning as intended with no signs of potential structural weakness or conditions which are disrupting to the safe operation of the impoundments. Pictures 10,11,15,16,17 and 18 show the general condition of of the Wastewater Sludge Pond

#### 4.6 INSTRUMENTATION (2S7.83(b)(2)(U))

Onsite instrumentations include open pipe piezometers.

#### PIEZOMETERS

The location of instrumentations is shown on Figure 3. The results of the measurements of various piezometers are shown in Figures 4 and 5. The maximum recorded readings of each instrument since the previous inspection shown in Table 2.

Table 2CCR Ponds Maximum recorded instruments reading since the previous Inspection

INSTRUMENTATION DATA CCR Ponds Complex						
Instrument	Maximum Reading since last inspection		Date of Reading			
B-1	Piezometer	1206.9	2/25/21			
B-3	Piezometer	1211.1	8/12/21			
B-4	Piezometer	1211.2	1/28/21			
B-5	Piezometer	1211.7	7/15/21			
B-6	Piezometer	1209.0	7/15/21			

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B-1502A	Piezometer	1179.37	5/20/21
B-1506A	Piezometer	1199.84	6/17/21
B-1507A	Piezometer	1202.83	9/9/21
B-1508A	Piezometer	1201.83	7/15/21
B-1512	Piezometer	1188.47	2/25/21
B-1513	Piezometer	1179.02	5/20/21

Five piezometers (B-1, B-3, B-4, and B-6) were installed in July 2016 around the Pond 21, 22, 23 and WWSP. Each piezometer was installed at the crest surrounding the ponds. Figure 4 shows the static water levels of those piezometers measured during monthly inspections beginning in August, 2016. Pond levels were not measured but arc generally around 1213 feet. Over periods of monthly measurement data, the static water levels in the piezometers have indicated some fluctuations. All of the piezometers except B-5 indicate static water levels below the nominal pond pool level (1,2 I3 feet). The elevated static water levels in B-5 arc related to elevated pool levels in Ponds 21 and 22 due to operations.

Piezometers (B-1502A, B-1506A, B-1507A, B-1508A, 81512, and 81513) were installed in various locations along the crest of Pond 6 as a pan of the raising the dikes in 2015. Figure 5 shows the static water levels of those piezometers measured during monthly plant inspections. Pond level was not measured but is estimated to be around elevation 1200 feel at the time of this inspection but it varies up to elevation 1213 during the year. All of the piezometers indicated static water levels below the maximin pond pool level (1213 feet). All piezometers indicated static water levels within expected tolerance for this year's s readings.

#### 5.0 SUMMARY OF FINDINGS

Based on the visual observations during the inspection, the dam and appurtenances are generally in goodcondition. A summary of our recommendations for general maintenance and continued monitoring, as well as any recommendations for remedial activities, is provided as follows:

#### **5.1 MAINTENANCE ITEMS**

The following maintenance items were identified during visual inspections:

- Drainage along the toe of Pond 6 east exterior dike is considered fair and requires visual inspections of the area to continue with the weekly/monthly inspections.
- Vegetation management for the facility is considered good. Grassed areas should continue to bemowed regularly. Any areas that are not accessible to mowing equipment should be controlled by the use of weed trimmers, power brush cutters, or other suitable vegetation control method.
- Plant inspection and monitoring procedures, maintenance activities, and reporting with respect to the dikes should be implemented in coordination with OIP personal.

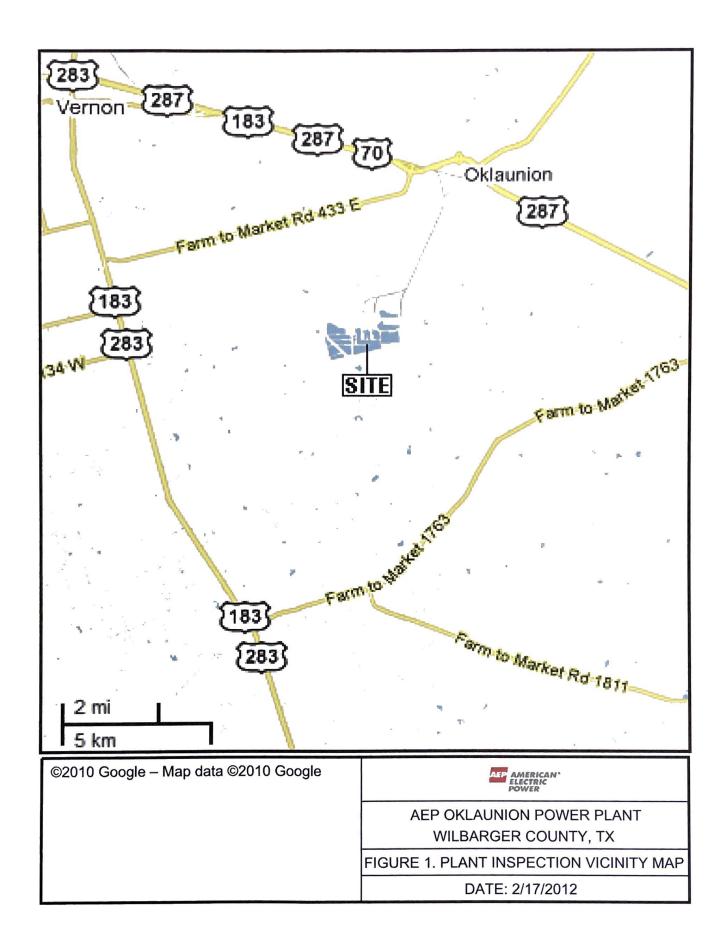
#### 5.2 ITEMS TO MONITOR

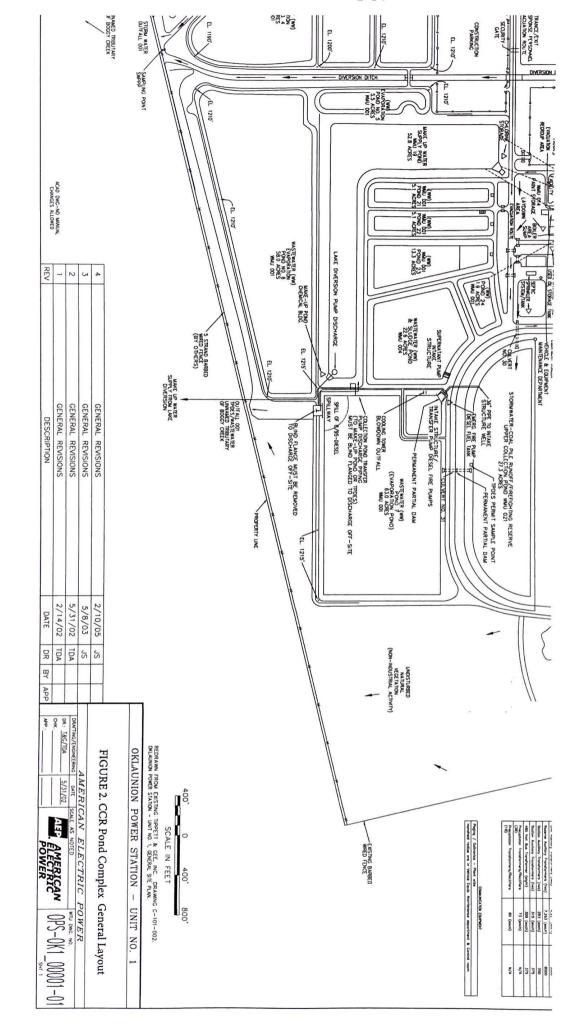
- The exterior slope of Pond 21 (the interior slope of the Make-Up Water Pond) is to be visually inspected periodically. Should further erosion occur the Site will take preventative actions by installing rip rap along the eroded area in order to protect the slope.
- Piezometers B-1, B-3, 8-4, 8-5, and 8-6 surrow1ding Ponds 21,22,23 and the WWSP shall continue to be monitored monthly and OIP personal will be immediately notified should the piezometer readings shift above pool levels.

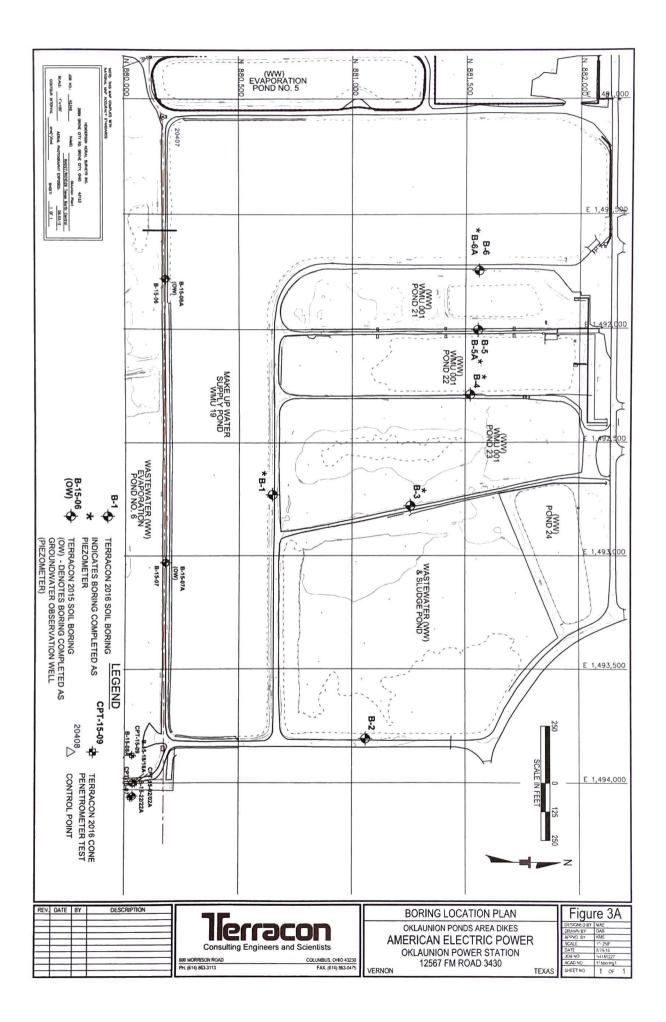
## 5.3 DEFICIENCIES (257.83(b)(2)(vi))

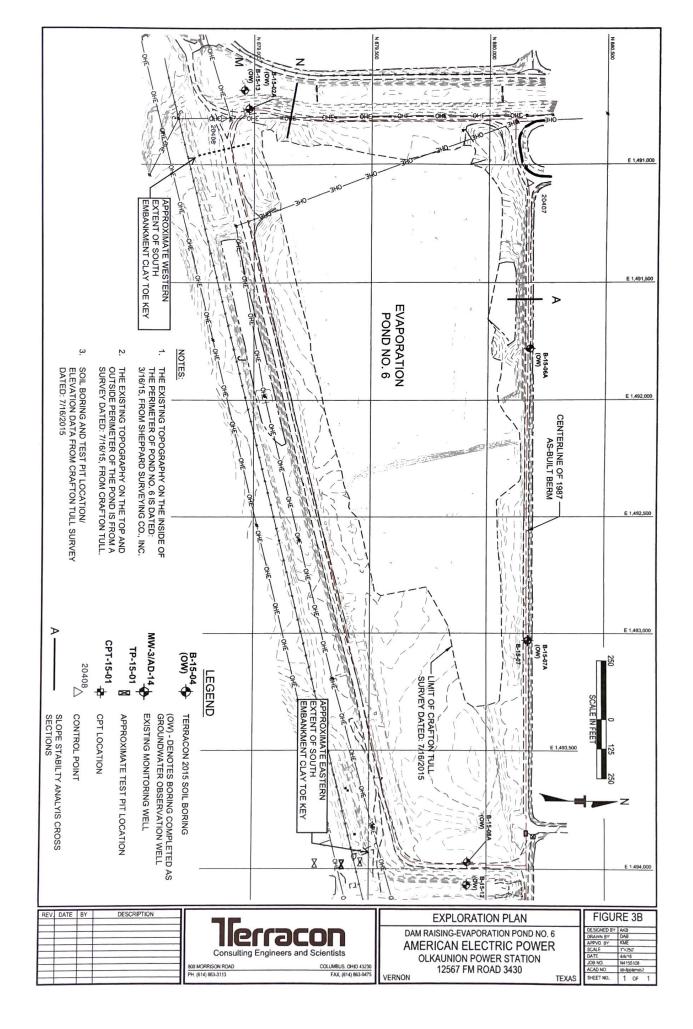
There were no deficiencies or signs of structural weakness or disruptive conditions that were observed at the time of the inspection that would require additional investigation or remedial action. There were no deficiencies noted during any of the quarterly inspections. If any of these conditions occur before the nextannual inspection contact OIP personal immediately.

# Figures









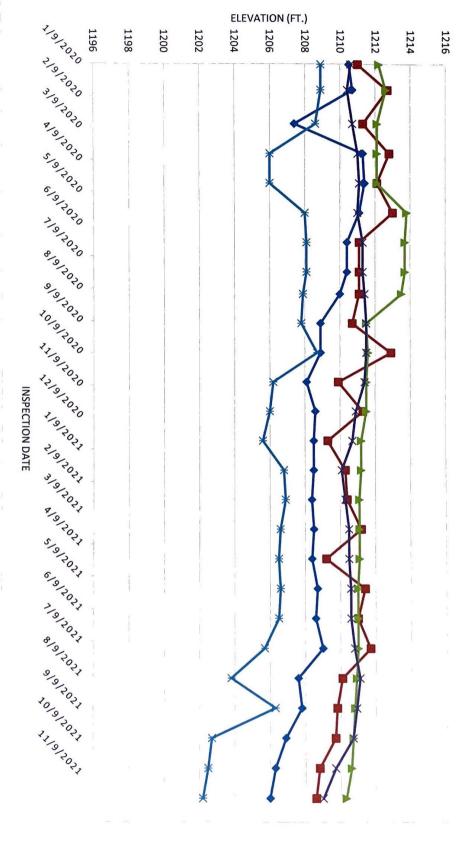
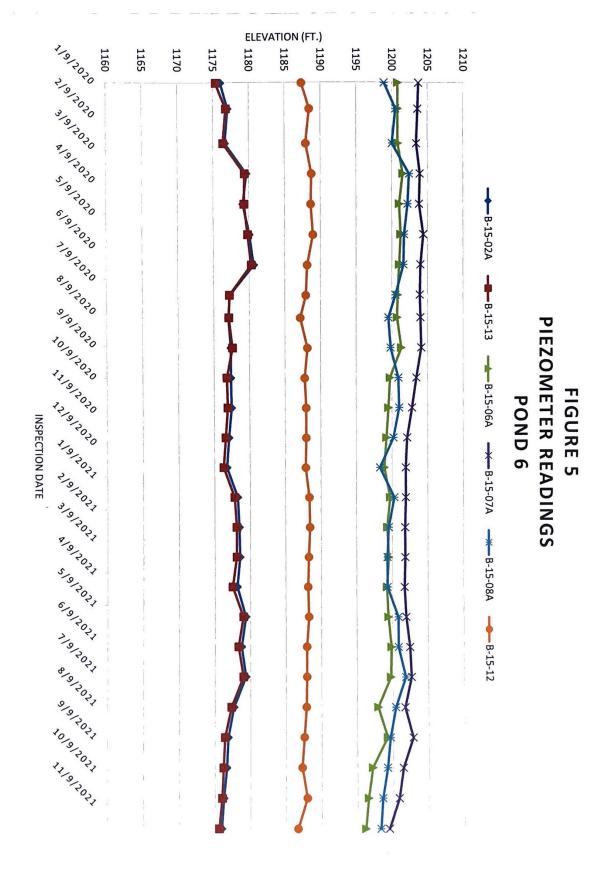
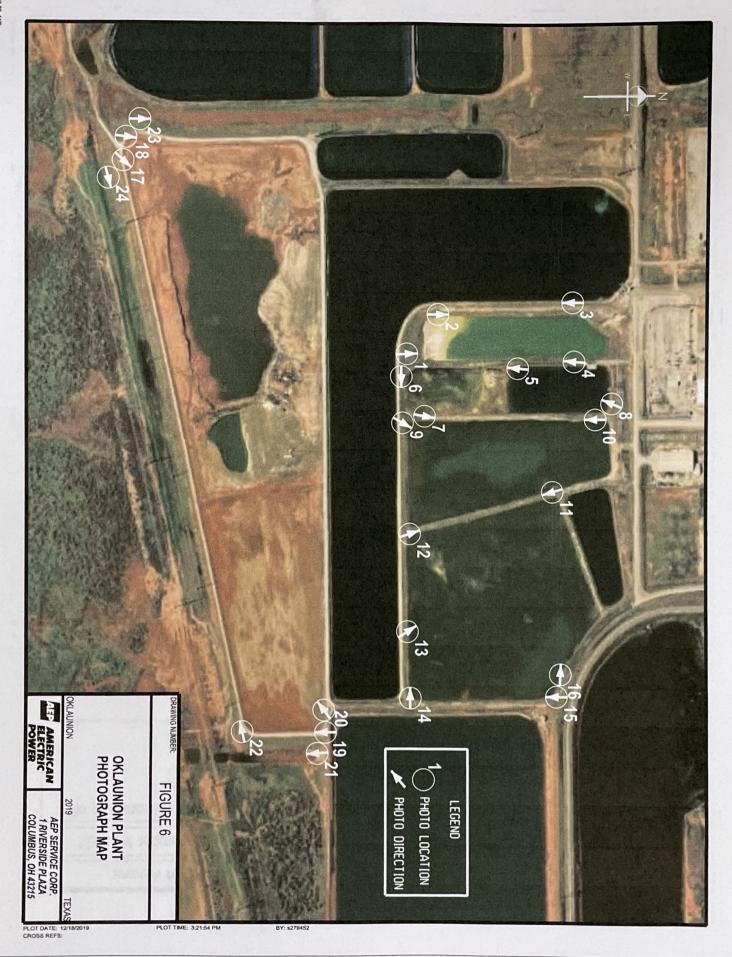


FIGURE 4
PIEZOMETER READINGS
POND 21, 22, 23 & WWSP

→ B-6 → B-5 → B-4 → X B-3 → X B-1



# Attachment A Photographs - CCR Ponds Complex



Plant Name: Oklaunion

Inspector: Aaron Weaver

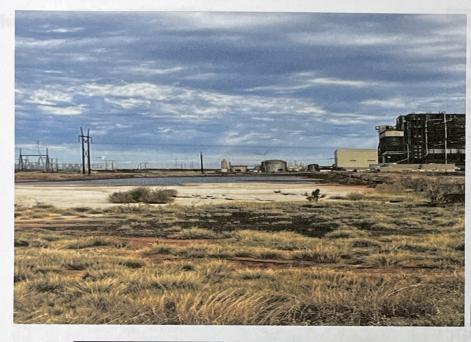
Unit: Pond 21

Date: December 10, 2021

Photo #: 1

Notes: General condition of

Pond 21



N34 4.574 W99 10.680

Photo #: 2

Notes: General condition of Pond 21 interior slope



N34 4.607 W99 10.727

Plant Name: Oklaunion

Inspector: Aaron Weaver

Unit: Pond 21

Date: December 10, 2021

Photo #: 3

Notes: General condition of Pond 21 exterior slope common to Makeup Water Pond interior slope



N34 4.748 W99 10.740

Photo #: 4

Notes: General condition of crest common to Pond 21/22



N34 4.750 W99 10.678

Plant Name: Oklaunion

Inspector: Aaron Weaver

Unit: Pond 21

Date: December 10, 2021

Photo #: 3

Notes: General condition of Pond 21 exterior slope common to Makeup Water Pond interior slope



N34 4.748 W99 10.740

Photo #: 4

Notes: General condition of crest common to Pond 21/22



N34 4.750 W99 10.678

Plant Name: Oklaunion

Inspector: Aaron Weaver

Unit: Pond 21

Date: December 10, 2021

Photo #: 3

Notes: General condition of Pond 21 exterior slope common to Makeup Water Pond interior slope



N34 4.748 W99 10.740

Photo #: 4

Notes: General condition of crest common to Pond 21/22



N34 4.750 W99 10.678

Plant Name: Oklaunion

Inspector: Aaron Weaver

Unit: Pond 22

Date: December 10, 2021

Photo #: 5

Notes: General condition of Pond 22 interior slope common to Pond 21 exterior slope



N34 4.691 W99 10.671

Photo #: 6

Notes: General condition of crest common to Pond 22/Makeup Water Pond



N34 4.570 W99 10.665

Plant Name: Oklaunion

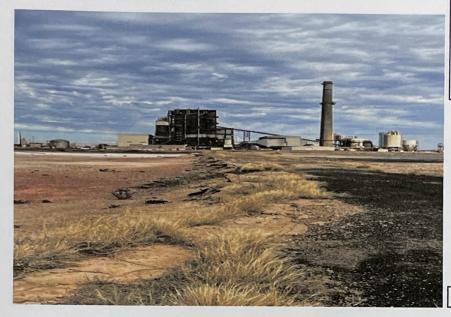
Inspector: Aaron Weaver

Unit: Pond 22

Date: December 10, 2021

Photo #: 7

Notes: General condition of Pond 22 interior slope common to Pond 23 exterior slope



N34 4.588 W99 10.619

Photo #: 8

Notes: General condition of Pond 22



N34 4.787 W99 10.632

Plant Name: Oklaunion

Inspector: Aaron Weaver

Unit: Pond 23

Date: December 10, 2021

Photo #: 9

Notes: General condition of Pond 23



N34 4.573 W99 10.614

Photo #: 10

Notes: General condition of crest common to Ponds 22/23



N34 4.775 W99 10.620

Plant Name: Oklaunion

Inspector: Aaron Weaver

Unit: Pond 23

Date: December 10, 2021

Photo #: 11

Notes: General condition of Pond 23 interior slope common to Waste Water Sludge Pond exterior slope



N34 4.728 W99 10.541

Photo #: 12

Notes: General condition of crest common to Ponds 23/Waste Water Sludge



N34 4.578 W99 10.496

Plant Name: Oklaunion

Inspector: Aaron Weaver

Unit: Waste Water Pond

Date: December 10, 2021

Photo #: 13

Notes: General condition of Waste Water Sludge

Pond



N34 4.576 W99 10.393

Photo #: 14

Notes: General condition of Waste Water Sludge Pond interior slope common to Makeup Water Pond



N34 4.579 W99 10.324

Plant Name: Oklaunion

Inspector: Aaron Weaver

Unit: Waste Water Pond

Date: December 10, 2021

Photo #: 15



Notes: General condition of Waste Water Sludge Pond interior slope common to Pond 7



N34 4.733 W99 10.328

Photo #: 16





Notes: General condition of interior slopes of Waste Water Sludge Pond



N34 4.579 W99 10.324

Plant Name: Oklaunion

Inspector: Aaron Weaver

Unit: Pond 6

Date: December 10, 2021

Photo #: 17

Notes: General condition of Pond 6 from SW corner



N34 4.276 W99 10.896

Photo #: 18

Notes: General condition of Pond 6 west interior slope and crest



N34 4.277 W99 10.903

Plant Name: Oklaunion

Inspector: Aaron Weaver

Unit: Pond 6

Date: December 10, 2021

Photo #: 19

Notes: General condition of Pond 6 east interior slope and crest



N34 4.487 W99 10.285

Photo #: 20

Notes: General condition of Pond 6 from NE corner



N34 4.488 W99 10.307

Plant Name: Oklaunion

Inspector: Aaron Weaver

Unit: Pond 6

Date: December 10, 2021

Photo #: 21

Notes: General condition of Pond 6 east interior

slope



N34 4.484 W99 10.277

Photo #: 22

Notes: General condition of Pond 6 south exterior slope



N34 4.403 W99 10.288

Plant Name: Oklaunion

Inspector: Aaron Weaver

Unit: Pond 6

Date: December 10, 2021

Photo #: 23

Notes: General condition of Pond 6 west exterior

slope



N34 4.286 W99 10.919

Photo #: 24

Notes: General condition of Pond 6 south exterior slope



N34 4.272 W99 10.886