

# Corrective Action Monitoring Plan

## Revision 1

Grand River Dam Authority Landfill

Grand River Energy Center

Mayes County, Oklahoma

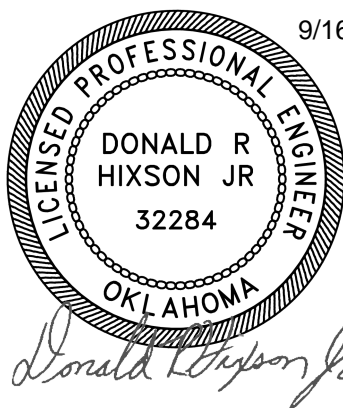
Solid Waste Permit No. 3549012

***Submitted to:***

Grand River Dam Authority

Mayes County, Oklahoma

August 2025



9/16/2025

***Prepared by:***



2302 South Prospect Avenue

Oklahoma City, Oklahoma 73129

Phone: 405-722-7693

## TABLE OF CONTENTS

1.0	INTRODUCTION .....	1
2.0	SITE DESCRIPTION .....	2
2.1	Regulatory Background .....	2
2.2	Monitoring Objectives and Sampling Design .....	2
2.3	Groundwater Monitoring Well Network .....	3
2.4	Sampling Frequency and Testing Parameters .....	4
2.5	Safety .....	4
3.0	GROUNDWATER SAMPLE COLLECTION PROCEDURES .....	5
3.1	Water Elevation Measurements .....	5
3.2	Groundwater Monitoring Well Purging .....	5
3.2	Groundwater Sample Collection .....	6
3.3	Quality Control Samples .....	6
3.3.1	Field Duplicate Samples .....	6
3.4	Sample Handling and Chain-of-Custody Procedures .....	6
3.5	Sample Transport to the Analytical Laboratory .....	7
3.6	Decontamination .....	7
4.0	LABORATORY ANALYTICAL METHODOLOGY .....	8
4.1	Metals .....	8
4.2	Conventional Parameters .....	9
4.3	Field Parameters .....	9
5.0	DATA EVALUATION AND REPORTING .....	10
5.1	Groundwater Flow and Velocity Calculations .....	10
5.2	Data Review and Tabulation .....	10
5.3	Statistical Evaluation of Data .....	10
5.4	Certification .....	10
5.5	Record Keeping .....	11
6.0	DRILLING PLAN .....	12
6.1	Well Installation Procedures .....	12

## **FIGURES**

Figure 1 – Site Location Map and Monitor Well Locations

Figure 2 – Groundwater Gradient Map

Figure 3 – Monitor Well Locations and Proposed New Groundwater Monitor Wells

## **APPENDICES**

Appendix A – Groundwater Well Sampling Record Form

Appendix B – Monitor Well Installation Diagram Form

**List of Acronyms and Abbreviations**

ACM	Assessment of Corrective Measures
CAMP	Corrective Action Groundwater Monitoring Plan
CCR	Coal Combustion Residuals
cm/s	centimeter per second
EPA	United States Environmental Protection Agency
GRDA	Grand River Dam Authority
GREC	Grand River Energy Center
MNA	Monitored Natural Attenuation
OAC	Oklahoma Administrative Code
ODEQ	Oklahoma Department of Environmental Quality
PVC	Polyvinyl Chloride



**Corrective Action Monitoring Plan  
Grand River Dam Authority  
Grand River Energy Center (GREC)**

Prepared by: Steve Krul Date 9/16/25

Preparer: Steven Krul  
Preparer Title: Manager, Environmental

Reviewed by: Caitlin Current Date 9/16/25

Reviewer: Caitlin Current  
Reviewer Title: Principal Hydrogeologist

Approved by: Donald R. Hixson Jr. Date 9/16/25

Approver Donald R. Hixson Jr., P.E., PLS  
Approver Title: Manager, Civil Engineering/Environmental Services

## **1.0 INTRODUCTION**

The Grand River Dam Authority (GRDA) was created by the 15th Oklahoma Legislature in 1935 as a conservation and reclamation district for the waters of the Grand River and authorized GRDA to build dams for the purposes of hydroelectricity production and flood control. GRDA is Oklahoma's largest public power electric utility, fully funded by revenues from electric and water sales instead of taxes. GRDA is also a steward of the waters of the Grand and Illinois Rivers in Oklahoma and manages over 70,000 surface acres of premier Oklahoma lake waters, as well as many miles of the Scenic Illinois River. GRDA is committed to being a good steward of the natural resources under its control.

GRDA owns and operates the Grand River Energy Center (GREC) electric generating station located approximately three (3) miles east of the City of Chouteau in Mayes County, Oklahoma. GREC operates an Oklahoma Department of Environmental Quality (ODEQ) permitted Non-Hazardous Industrial Waste landfill, used for the on-site disposal of coal combustion residual (CCR) materials including fly ash, bottom ash, and spent powdered activated carbon (generated from flue gas emissions control). This landfill is situated south of the primary operational area within the GREC complex.

GRDA is submitting this Corrective Action Monitoring Plan (CAMP) in response to the request made by ODEQ from their May 22, 2025, letter approving the Corrective Measures Implementation Plan.

This CAMP outlines the procedures for collecting and analyzing groundwater samples to ensure consistent, reliable, and representative data collection for informed decision-making regarding water quality at the GREC CCR Landfill.

## **2.0 SITE DESCRIPTION**

This CAMP addresses sampling and analytical procedures for the groundwater monitoring wells at the CCR landfill. It is required by ODEQ regulations and was requested in the approval of GRDA's Corrective Measures Implementation Plan. This plan will be submitted to ODEQ as specified in OAC 252:517-9-2 (g).

### **2.1 Regulatory Background**

GRDA and ODEQ have worked collaboratively to develop a strong groundwater monitoring program at the CCR Landfill following regulatory requirements. A summary of the recent regulatory communications is presented below:

- Recent groundwater results indicated that metals, specifically lithium, molybdenum and selenium, exceeded the background levels/groundwater protection standards at three wells.
- GRDA entered into a Consent Agreement with ODEQ, signed on August 25, 2023.
- GRDA submitted an Assessment of Corrective Measures (ACM) to ODEQ on February 16, 2024, addressing releases from the CCR landfill to on-site groundwater. Addendums with responses for additional information were submitted to ODEQ on July 18, 2024, and August 14, 2024.
- ODEQ accepted the final ACM on September 5, 2024, and requested submittal of a Corrective Measures Implementation Plan.
- GRDA submitted the Corrective Measures Implementation Plan on April 11, 2025. The site remedies to address exceedances of lithium, molybdenum and selenium in groundwater included:
  - Interim Remedy #1 - Monitored Natural Attenuation (MNA) with Enhanced Monitoring. Remedy #1 included installation of two (2) new groundwater monitoring wells located down gradient of the CCR Landfill.
  - Interim Remedy #2 - Pond Closure/Sediment Cleanout.
  - Final Remedy #1 - Source Reduction through Final Landfill Closure.
- ODEQ accepted the Corrective Measures Implementation Plan in a letter dated May 22, 2025, and requested this CAMP.

### **2.2 Monitoring Objectives and Sampling Design**

Sampling and analysis of groundwater at the GRDA Landfill is an on-going activity that has been conducted for at least 30 years. The objective of the monitoring is to determine if constituents of concern are migrating in groundwater from the landfill to downgradient areas.

The sampling design was implemented in conjunction with ODEQ regulations. Groundwater sampling events occur semi-annually for all landfill wells. The current sampling design was implemented to detect potential constituents of concern migrating downgradient of the landfill.

Downgradient receptors include the creek to the east of the landfill, the wastewater ponds, Chouteau Creek (located between 2,500 feet and 4,800 feet to the west and south of the site) and the Neosho River (located approximately 1,500 feet to the southeast at its closest point). The creek to the east of the landfill discharges to wastewater pond F09 and does not directly discharge offsite. A search of public and private water supply wells indicated that no public or private water supply wells were identified within the 0.5-mile radius of the site. As such, the risk posed for public or private water supply wells in the vicinity of the site is not known to exist at this time.

Data from groundwater sampling conducted over the past five years indicate that most analytical parameters were non-detect or below regulatory standards or concentrations observed in background wells. Lithium and molybdenum have been observed in three groundwater monitoring wells at concentrations that are statistically greater than background levels/groundwater protection standards. These exceedances prompted GRDA to develop the ACM and CMIP. Data review indicates that groundwater concentrations that exceed background for lithium and molybdenum have not been detected in downgradient wells and are not moving off site.

## 2.3 Groundwater Monitoring Well Network

The CCR Landfill is underlain by a layer composed of unconsolidated clay, silt, sand and gravel ranging in total thickness from 9 feet to about 25 feet. This layer represents the upper permeable zone at the site. The unconsolidated alluvial aquifer is underlain by Pennsylvanian sandstone/limestone bedrock. The existing groundwater monitoring network is intended to monitor the upper permeable zone.

The groundwater monitoring well network is designed to provide detection of constituents downgradient of the CCR Landfill. The well network consists of 19 groundwater monitoring wells as shown on **Figure 1**, site location and monitor wells. Two groundwater monitoring wells, MW93-1 and MW22-01, are located upgradient of the landfill, and accurately represent the quality of background groundwater not affected by potential leakage from the CCR landfill. The remainder of the groundwater monitoring wells are located downgradient or cross gradient positions from the landfill to detect potential constituents in the upper permeable zone. **Figure 2** shows the current (typical) groundwater flow patterns. Current groundwater monitoring wells are constructed of 2-inch PVC with 10-foot screens. **Table 1** presents well construction details.

Groundwater elevations in the landfill monitoring wells indicate groundwater in the alluvial aquifer flows radially to the west, south, and east. A groundwater divide is present that coincides with a bedrock anticline observed near MW03-1, and groundwater in the alluvial aquifer flows from the landfill towards the small creeks to the east and west and ultimately discharges to F07, F09, Chouteau Creek, and the Neosho River. The stormwater ponds may also contribute to recharging groundwater levels during periods of dry weather.

As part of the approved CMIP, two new groundwater monitoring wells will be installed at the site. One new well will be installed south of MW23-04 and one will be installed southeast of MW23-02. Installation of new wells is discussed in Section 6.0.

## **2.4 Sampling Frequency and Testing Parameters**

The groundwater monitoring wells at GREC are in assessment monitoring per OAC 252:517-9-6. Groundwater samples from existing wells are collected on a semiannual basis and new wells will be sampled quarterly for eight (8) quarters to establish data trends.

Groundwater is analyzed for:

- Appendix A (Constituents for Detection Monitoring): boron, calcium, chloride, fluoride, pH, sulfate, total dissolved solids (TDS), specific conductivity, total alkalinity, and sodium.
- Appendix B (Constituents for Assessment Monitoring): antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, fluoride, lead, lithium, mercury, molybdenum, selenium, thallium, and radium 226 and 228 combined.

## **2.5 Safety**

Working safely is the top priority for GRDA. All groundwater sampling activities will be completed in a safe and controlled manner. The sampling team will have all appropriate safety training and will undergo a safety site orientation prior to completing sampling activities. Appropriate safety equipment including but not limited to hard hats, steel-toed boots, safety glasses and high visibility vests, is required at the site for all sampling activities. Hearing protection will be used in high noise areas.

### 3.0 GROUNDWATER SAMPLE COLLECTION PROCEDURES

Groundwater sample collection procedures are designed to provide an accurate representation of groundwater quality at the site. Groundwater purging, sample collection, handling and quality control will be conducted following United States Environmental Protection Agency (EPA) standard operating procedures and ODEQ protocols. Only qualified, experienced field personnel will conduct the sampling activities at the GRDA Landfill. Qualified team leaders will mentor and oversee new employees until new employees have achieved competency in their role-specific skills.

Sample collection activities will typically begin at the background wells and proceed progressively from the least impacted area to the most impacted area to avoid potential for cross-contamination.

#### 3.1 Water Elevation Measurements

Static water elevation will be measured first, prior to purging at each well during each sampling event. Prior to the static water level survey, the groundwater monitoring wells will be uncapped and allowed to equilibrate for approximately 20 minutes.

The sample team will use a decontaminated (see Section 3.6) water level probe designed to be accurate to 0.01 feet to measure depth to water and total depth of each well. Water elevations will be recorded in a Groundwater Well Sampling Record Form. A copy of the form is included in **Attachment 1**. The field measurements will be used to determine the water level in the well and the groundwater elevation.

#### 3.2 Groundwater Monitoring Well Purging

Purging is the process of removing stagnant water from wells prior to sampling so that water sampled is representative of aquifer conditions. Purging will be completed using low flow purging methods. This includes the use of a peristaltic pump to remove groundwater from each well at a low flow rate that will minimize drawdown.

For each well, the sampling team will use a new tubing set to approximately the midpoint of the screen and at a depth that will remain under water at all times. The pump will be turned on and water quality measurements will be collected approximately every five to ten minutes.

Field measurements will be acquired using a portable water quality meter for each required parameter:

- pH in standard units (SU).
- Specific conductance measured in microsiemens per centimeter ( $\mu\text{S}/\text{cm}$ ) at 25°C or millimhos per centimeter ( $\mu\text{ohm}/\text{cm}$ ) depending on the meter type.
- Temperature in degrees centigrade (C).
- Dissolved oxygen in milligrams per liter (mg/L).
- Oxidation-Reduction Potential (ORP) measured in millivolts (mV).
- Turbidity in nephelometric turbidity units (NTU).

Field parameter results will be recorded on a Groundwater Well Sampling Record form for each well. Prior to use, the water quality meter will be properly calibrated following manufacturers' specific instructions for calibration and follow EPA and ODEQ procedures. Purging will continue until field parameters pH, temperature and specific conductance have stabilized, and turbidity is either stable or less than 10 NTS.

### **3.2 Groundwater Sample Collection**

The sampling team will wear a new, clean pair of non-powdered, disposable latex or nitrile gloves when collecting the samples. Gloves will be changed between sample locations. Groundwater sample bottles are supplied by the analytical laboratory and come with preservative added. The field team will inventory the bottles and confirm the bottle order is complete and that there are adequate sample bottles for all the analytical testing parameters.

Groundwater grab samples will be collected from each well using the same pump and dedicated tubing used to purge each well. The sample bottle will be held so that it does not contact the discharge tubing. The order for collection will be metals first, followed by conventional parameters. Each laboratory supplied bottle will be filled to capacity from the pump discharge line, using care not to wash out any preservative. Labels will be completed for each sample. Label information will include groundwater monitoring well ID#, date and time of sample collection, and test parameters. Labels will be filled out in ink using a waterproof indelible pen or marker.

### **3.3 Quality Control Samples**

Quality assurance / quality control (QA/QC) sample collection and analysis activities are discussed in the following paragraphs. Laboratory QC requirements are contained within the laboratory's Quality Assurance Manual and are available directly from the laboratory.

#### **3.3.1 Field Duplicate Samples**

One duplicate sample will be collected and prepared at a frequency of one (1) duplicate per ten (10) samples. The monitoring wells from which the duplicate sample will be collected will be randomly chosen by sampling personnel at the time of sample collection. The duplicate sample will be collected by filling a laboratory supplied sample bottle containing appropriate preservative with groundwater from the chosen monitoring well. Sampling personnel will keep a separate record of the sampling time and from which well the duplicate sample was collected. The duplicate sample will be included on the Chain-of-Custody and will be analyzed for the same Appendix A and B constituents as the primary sample.

### **3.4 Sample Handling and Chain-of-Custody Procedures**

Sample custody procedures will be followed through sample collections, transfer, analysis and ultimate disposal. The purpose of these procedures is to ensure that the integrity of samples is maintained during their collection, transportation and storage prior to analysis and any remaining sample material is properly disposed of after analysis. Sample custody will begin with the shipment/receipt of the laboratory prepared sample containers. Sample containers will be shipped from the laboratory in sealed coolers or cartons with appropriate seals and custody documentation or they may be picked up at the laboratory by sampling personnel.

The sampling personnel will be responsible for the care and custody of the samples until they are properly transferred to the laboratory for analysis. Custody transfer will be documented on a properly completed Chain-of-Custody Form. An example of the Chain-of-Custody form currently used in groundwater monitoring for the GRDA Landfill is included in **Appendix A**.

### **3.5 Sample Transport to the Analytical Laboratory**

Prior to shipment, groundwater samples will be placed on ice in laboratory supplied ice chests that are sealed with a custody seal. Samples will be either delivered to the laboratory, transferred via commercial carrier, or the laboratory will provide a courier to receive the samples. At the analytical laboratory, a designated sample custodian will accept custody of the delivered samples and verify that the information on the sample label matches that on the Chain-of-Custody form(s). Pertinent information such as sample condition, shipment, pickup, and courier will also be checked on the Chain-of-Custody form(s).

### **3.6 Decontamination**

Any non-single use equipment will be decontaminated with a phosphate-free soap solution and rinsed with distilled water. Appropriate precautions will be taken to ensure that the water used is contaminant free. Equipment will be stored to prevent dust or contamination and may be wrapped in plastic or foil. Single use items such as gloves and tubing will be discarded after use and disposed of properly by the sample team.

## 4.0 LABORATORY ANALYTICAL METHODOLOGY

Analysis of groundwater samples is completed by a third-party State of Oklahoma Certified Laboratory subcontracted to GRDA. The laboratory follows EPA standard methods for analyzing groundwater samples. Each EPA method lists equipment, reagents/standards, calibration, sample preparation and extraction, test procedures, method performance and quality control procedures that will be followed to analyze groundwater samples. The contract laboratory will follow these procedures and document any deviations in the data package narrative.

### 4.1 Metals

Metals testing is completed using inductively coupled plasma (ICP) by Method 200.7 and 200.8. Method 200.7 uses atomic emission spectrometry (ICP-AES). Analytes boron and lithium are tested using Method 200.7. Method 200.8 uses inductively coupled plasma mass spectrometry (ICP-MS). Analytes antimony, arsenic, barium, boron, cadmium, calcium, cobalt, lead, molybdenum, selenium, sodium and thallium are tested using Method 200.8. Mercury is analyzed using Method 245.1, cold vapor atomic absorption spectrometry. Radium is analyzed using Method 904 and SM 7500 Ra B. The summary table below details analytical methods for metals:

Analyte	Appendix	Units	Method
Boron	A	mg/L	Method 200.7
Calcium	A	mg/L	Method 200.8
Antimony	B	mg/L	Method 200.8
Arsenic	B	mg/L	Method 200.8
Barium	B	mg/L	Method 200.8
Beryllium	B	mg/L	Method 200.8
Cadmium	B	mg/L	Method 200.8
Chromium	B	mg/L	Method 200.8
Cobalt	B	mg/L	Method 200.8
Lead	B	mg/L	Method 200.8
Lithium	B	mg/L	Method 200.7
Mercury	B	mg/L	Method 245.1
Molybdenum	B	mg/L	Method 200.8
Selenium	B	mg/L	Method 200.8
Sodium	A	mg/L	Method 200.8
Thallium	B	mg/L	Method 200.8
Radium Combined	B	pCi/L	Method 904 Method SM 7500 Ra B

Notes:

mg/L - milligram per liter

pCi/L - picocuries per liter

## 4.2 Conventional Parameters

The analytical methods for conventional parameters include:

Parameter	Appendix	Units	Method
Dissolved Solids	A	mg/L	Gravimetric Analysis by Method 2540 C-2011
Specific Conductance	A	umhos/cm	Wet Chemistry by Method 120.1
Alkalinity	A	mg/L	Wet Chemistry by Method 2320 B-2011
Chloride	A	mg/L	Wet Chemistry by Method 300.0
Fluoride	A + B	mg/L	Wet Chemistry by Method 300.0
Sulfate	A	mg/L	Wet Chemistry by Method 300.0

Notes:

mg/L - milligram per liter

umhos/cm - micromhos per centimeter

The GRDA subcontracted laboratory will follow all standard operating procedures for each conventional parameter as specified in the method.

## 4.3 Field Parameters

The sampling team will collect field parameters including temperature, pH, dissolved oxygen, ORP, turbidity and specific conductance as described in Section 3.2. The field parameters, recorded on a Groundwater Well Sampling Record form, will be included in the Annual Report as an appendix.

## **5.0 DATA EVALUATION AND REPORTING**

Data from the analytical laboratory will be received, reviewed and validated. Once the data is approved for use in reporting, it will be saved into a database and used to generate a semiannual or annual report. Annual reports are submitted to ODEQ.

### **5.1 Groundwater Flow and Velocity Calculations**

Groundwater elevation data will be tabulated in a Static Water Level table in the Annual Report and used to calculate hydraulic gradients at the site. These values are presented in hydraulic gradient maps used in an annual and semiannual report.

Slug tests were conducted in all 19 landfill monitoring wells to evaluate hydraulic conductivity of the alluvium and to assess groundwater flow velocity at the Site. Results of slug tests indicate that calculated hydraulic conductivity (K) at the site varied from 0.000007 centimeters per second (cm/s) to 0.0065 cm/s. The average K value used is 0.0006 cm/sec. The effective porosity of the upper permeable zone at the site is 0.221. These values are used to calculate the average and maximum groundwater velocity.

### **5.2 Data Review and Tabulation**

Data from the analytical laboratory will be reviewed and evaluated using EPA standard operating procedures. The data will be tabulated in Monitoring Results Tables in the Annual Report and compared to background concentrations along with Groundwater Protection Standards (GWPS) and EPA Maximum Contaminant Levels (MCLs) for groundwater. For some constituents, an MCL or GWPS is not available, in which case background concentrations will be used for comparison. If a constituent is not detected in a groundwater sample, the value input into the data table will be reported as less than (<) the laboratory method detection limit.

The data will be input into a database and stored long-term on a password protected server.

### **5.3 Statistical Evaluation of Data**

Statistical evaluation of the laboratory analytical results for the groundwater monitoring wells will be performed in accordance with OAC 252:517-9-4(g), (h) using Mann-Kendall Trend Analysis methods. The statistical trends will be included in the Annual Report as an appendix. The Mann-Kendall (MK) test is a non-parametric statistical test used to analyze trends in time series data, for identifying concentrations over time as increasing, stable or decreasing. GRDA will continue to complete interwell, intrawell, and confidence interval tests that have been completed in the past.

Any results that indicate an increasing concentration over time will be denoted in the report.

### **5.4 Certification**

The Annual Report will be certified by a qualified professional engineer stating that the groundwater monitoring system has been designed and constructed to meet the requirements of OAC 252:517-9-2 (f).

## **5.5 Record Keeping**

In accordance with OAC 252:517-19-1(h), GRDA will maintain the facility operating record with the following information, OAC 252:517-19-1(h)(2-5):

- Documentation of the design, installation, development, and decommissioning of any monitoring wells, piezometers and other measurements, sampling, and analytical devices as required by OAC 252:517-9-2(e)(1).
- The groundwater monitoring system certification as required by OAC 252:517-9-2(f).
- The selection of a statistical method certification as required by OAC 252:517-9-4(g)(6).
- Within 30 days of establishing an assessment monitoring program, the notification as required by OAC 252:517-9-5(e)(3).

Placement of this CAMP and annual reports into the facility's operating record will satisfy the above requirement. Unless specified otherwise, each file must be retained for at least five (5) years following the date of each occurrence, measurement, maintenance, corrective action, report, record, or study.

## 6.0 DRILLING PLAN

As part of the CMIP, GRDA will install two additional groundwater monitoring wells to expand the well network as discussed in Section 2.3. New groundwater monitoring wells will be constructed in accordance with OAC 252:517-7-3. New groundwater monitoring wells will be sampled for a minimum of eight (8) quarters to establish background, and the data will be reviewed to determine the success of Interim Measure #1.

### 6.1 Well Installation Procedures

The two new borings will be drilled with a 4-inch hollow stem auger to a depth just above the top of bedrock elevation for the purposes of installing groundwater monitoring wells. The monitoring wells will be constructed using a 2-inch diameter PVC casing centered in the 8.75-inch diameter boring. Each new monitoring well will have a 10-foot PVC slotted screen. It is anticipated that each new well will have a 3-foot stick-up with a locking protective cover. The annular space will be filled with coarse sand to an elevation two feet above the top of the screen. The sand pack will be capped with 3/8 inch, 2-foot-thick bentonite chips to seal the screen. The bentonite seal will be allowed to hydrate for at least 24 hours before grouting. The remaining annular space in each new well will be sealed with cementitious grout. At least 24 hours after grouting, each new well will be developed to remove silts and sediment.

During drilling activity, the recovered soils will be described by a geologist and recorded on a Monitor Well Installation Diagram. The geologist will also add well construction details for each new well on the Monitor Well Installation Diagram. A copy of the monitor well installation diagram form is included in **Appendix B**. The well diagram is included only to show the form that will be completed for each new well.

Each new well will be field located by a professional land surveyor, licensed in the state of Oklahoma to determine top of casing and ground surface elevation along with latitude and longitudinal coordinates.

The new wells will be sampled and data reported in annual reports. During the time period that the new wells are being tested, GRDA will continue to evaluate groundwater and surface water flow conditions, runoff modeling and operational considerations for the power plant and CCR landfill, as described, as described in the CMIP.

## **FIGURES**

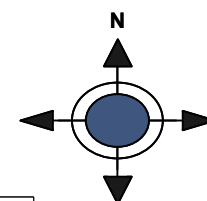
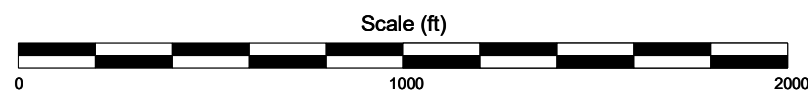


Grand River Dam Authority Landfill  
Grand River Energy Center  
Mayes County, Oklahoma

**CORRECTIVE ACTION MONITORING PLAN**

Legend:

 Existing Monitor Well



 **ENERCON**

**Figure 1**  
Site Location Map and Monitor Well Locations

Project No: GRDA-00036




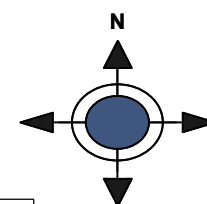
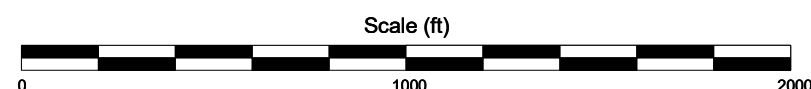


Grand River Dam Authority Landfill  
Grand River Energy Center  
Mayes County, Oklahoma

**CORRECTIVE ACTION MONITORING PLAN**

**Legend:**

-  Existing Monitor Well
-  Proposed New Groundwater Monitoring Well



**ENERCON**

**Figure 3**  
Monitor Well Locations and Proposed New Groundwater  
Monitor Well Map

Project No: GRDA-00036

## **APPENDICES**

**APPENDIX A**

**GROUNDWATER WELL SAMPLING RECORD FORM**



## Groundwater Well Sampling Record

[illegible]
$$\text{Volume} = H \times \text{conversion factor}$$

### Volume Conversion factors

2" well – 0.163 gal/ft

4" well – 0.65 gal/ft

6" well – 1.47 gal/ft

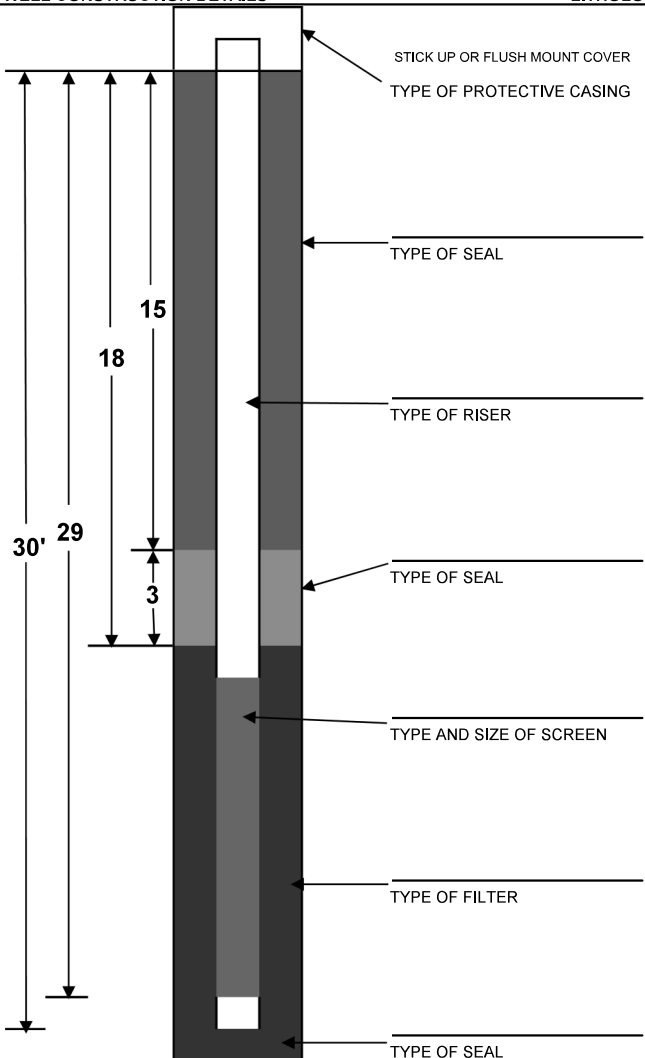
### Water Quality Instrument details

**YSI™ Multimeter SN: 13K102703**

Scientific™ Turbidimeter SN: 202002618

**APPENDIX B**

**MONITORING WELL INSTALLATION DIAGRAM FORM**

MONITORING WELL INSTALLATION DIAGRAM		BORING/MONITORING WELL NUMBER:	
WELL NUMBER	OVERSEEING GEOLOGIST	DRILLER	
STATE ID NUMBER	DRILLING METHOD	SAMPLING METHOD	
SITE NAME	BOREHOLE DIAMETER	SAMPLING INTERVAL	
SITE ADDRESS	TOTAL BORING DEPTH	STATIC WATER LEVEL	
DATE OF CONSTRUCTION	TOP OF CASING ELEVATION	GROUND SURFACE ELEVATION	
WELL CONSTRUCTION DETAILS		PID READING (PPM)	SAMPLE IDENTIFICATION
 <p>The diagram illustrates a vertical monitoring well. On the left, depth markers indicate: 30' for the total depth, 29' for the depth to the filter, 18' for the depth to the riser, 15' for the depth to the seal, and 3' for the depth to the screen. Labels with arrows point to various components: STICK UP OR FLUSH MOUNT COVER, TYPE OF PROTECTIVE CASING, TYPE OF SEAL, TYPE OF RISER, TYPE OF SEAL, TYPE AND SIZE OF SCREEN, TYPE OF FILTER, and TYPE OF SEAL. A vertical scale on the right ranges from 0 to 35 feet with major markings every 7 feet (0, 7, 14, 21, 28, 35).</p>			
COMMENTS:			