2022 Water Quality Report

U.S. Army Corps of Engineers
Saint Louis District

Rend Lake Water Quality Conditions: 1972-2022

November 2023

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Prepared for

United States Army Corps of Engineers
Saint Louis District
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EXECUTIVE SUMMARY

The United States Army Corps of Engineers (USACE) commitment to environmental compliance and protection of estuaries, rivers, lakes, and navigable waters arises from the national policy and directives expressed in Federal Statutes, Executive Orders, and internal regulations. These regulations were designed to minimize pollution, maximize recreation, protect aesthetics, preserve natural resources, and promote the comprehensive planning and use of water bodies to enhance the public interest rather than private gain; therefore, USACE, in the design, construction, management, operation, and maintenance of its facilities, will exert leadership within existing authorities and appropriations in the nationwide effort to protect, enhance, and sustain the quality of the nation's resources. It is USACEs policy to comply with requirements of the Clean Water Act and not to degrade existing water quality conditions to the maximum extent that is practicable, consistent with project authorities, Federal legal and regulatory requirements, the public interest, and water control manuals.

The United States Army Corps of Engineers, Saint Louis District (CEMVS), implemented a water quality monitoring program during the 1970s to evaluate how its civil projects may be affecting water resources. Data collected from this effort serves as an invaluable tool for evaluating the significance of annual water quality measurements and tracking long-term trends. Water quality data is provided to the Missouri Department of Natural Resources and the Illinois Environmental Protection Agency to be used as a screening mechanism for the Missouri and Illinois Water Quality Report which is required every two years by the Clean Water Act Sections 303(d) and 305(b).

The National Water Quality Inventory Report to Congress (305(b) report) is the primary vehicle for informing law makers and the public about general water quality conditions in the United States. This document characterizes our water quality, identifies widespread water quality problems of national significance and describes various programs implemented to restore and protect our waters. Currently the Illinois Environmental Protection Agency (IEPA, 2020) has listed Rend Lake impaired for fish consumption caused by mercury. The Big Muddy River (including Rayse Creek) upstream of Rend Lake is impaired for oil, mercury, dissolved oxygen, pH, and fecal coliform. The other main tributary, Casey Fork, is impaired for oil, total suspended solids, and PCBs. The smaller tributaries, Gun Creek and Atchison Creek, are impaired for dissolved oxygen. Immediately downstream of Rend Lake, the Big Muddy River is impaired for aquatic life and fish consumption caused by sedimentation/siltation, mercury, PCBs, Aldrin, Dieldrin, Endrin, Heptachlor, Mirex, and Toxaphene.

Water quality sampling in 2022 revealed the following concerns at Rend Lake: phosphorus, chlorophyll, bacteria, and total dissolved solids.

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INTRODUCTION

The Big Muddy River Watershed is located in Southern Illinois and encompasses a drainage area of approximately 2,390 square miles within the following counties: Franklin, Jackson, Jefferson, Marion, Perry, Union Washington, and Williamson. The Big Muddy River originates in Jefferson County, southeast of Centralia, Illinois and flows southward for approximately 156 miles, where it joins the Mississippi River, just south of Grand Tower, Illinois in Jackson County. Major tributaries of the Big Muddy River include: Beaucoup Creek, Little Muddy River, Casey Creek, Middle Fork of the Big Muddy, and Crab Orchard Creek. Lakes and reservoirs within the Big Muddy River Watershed include: Kinkaid Lake, Rend Lake, Crab Orchard Lake, Devil's Kitchen Lake, Little Grassy Lake, and Cedar Lake.

The Rend Lake Watershed is located in south-central Illinois. It flows generally in a southerly direction and drains approximately 311,000 acres, located in the following four counties: Jefferson, Franklin, Washington, and Marion. Elevation within the watershed ranges from 642.0 feet NGVD (National Geodetic Vertical Datum) in the northern portion of the watershed to 396.0 feet NGVD at the outfall of the Rend Lake dam at the southern extent of the watershed. Approximately 37,400 people reside within the Rend Lake Watershed and the average precipitation is approximately 41.1 inches per year. Land cover data for the watershed indicate the largest percentage of area is used for crop production (35%). Approximately 27% of the watershed area is forest and 20% of the watershed is pasture.

Rend Lake is located in Franklin and Jefferson counties, about three miles northwest of Benton, Illinois. The dam is located on the Big Muddy River, 103.7 miles upstream from its confluence with the Mississippi River. The Rend Lake project is comprised of 40,840 acres of land and water. The lake has a water surface area of 20,633 acres at the normal operating pool elevation of 405.0 feet NGVD. At this pool elevation the lake shoreline is approximately 162 miles; and extends upstream from the dam approximately 13 miles. Roughly 10 miles above the main dam are two sub-impoundment dams: one on the Big Muddy River and the other on the Casey Fork River. These sub-impoundments are used for regulating water levels for fish and wildlife management activities. The lake width varies from 1.5 to 3 miles. The depth is fairly shallow, with a maximum depth of about 35 feet near the main dam, when the pool elevation is at 405.0 feet NGVD. The Rend Lake project contains 53 recreation areas, with 756 campsites, 104 picnic sites, 30 boat ramps, 235 marina slips and over 34 miles of trails. Each year, on average, over two-million people visit the lake, which annually generates nearly $35 million in visitor spending within 30-miles of the project.

There is virtually no municipal or industrial use of groundwater in the area because of the abundant water supply provided by Rend Lake, which serves as the major municipal water supply for approximately 300,000 residents of Southern Illinois. This water supply system is managed by the Rend Lake Conservancy District (RLCD), which is the largest public water supply system (1,800 square miles) in the State of Illinois and draws nearly

13 million gallons of water per day from Rend Lake. Also, the lake provides industrial water supply for a coal mine in the area, which is managed by Adena Resources.

Rend Lake is managed and operated by the CEMVS for the authorized purposes of flood risk management, water supply, water quality, fish and wildlife conservation, recreation, and area redevelopment. The lake serves as a heavy recreational usage lake. The land surrounding the lake is used predominately for agriculture. Agricultural runoff and municipal wastewater treatment facilities are the primary potential source of pollution into the Rend Lake watershed. Additional sources are marinas, recreational watercraft discharges and wildlife fecal material runoff.

Water quality is of paramount importance for sustaining ecological integrity and services provided by the Big Muddy River and Rend Lake. Water quality is influenced by a range of both point and nonpoint pollution sources, which may include natural processes, industrial and municipal effluents, and surface runoff from agricultural arenas.

The USACE has implemented a Water Quality Management Plan (WQMP) as part of the operation and maintenance activities associated with managing USACEs' civil works projects throughout the District which includes, among other reservoirs and rivers, the Big Muddy River and Rend Lake. The WQMP addresses surface water quality management issues and adheres to the guidance and requirements specified by Clean Water Act (CWA), as well as the self-imposed Engineering Regulation (ER) 1110-2-8154, "Water Quality and Environmental Management for USACE Civil Works Projects" (USACE, 2018). Water quality monitoring is implemented to fulfill five primary objectives that drive the CEMVS WQMP:

1) Establish baseline conditions, identify significant water quality trends, and document problems and accomplishments.
2) Ensure that surface water quality, as affected by CEMVS projects, is suitable for project purposes, existing water uses, public health and safety, and in compliance with applicable state and federal water quality standards.
3) Provide support to water control, project operations, and navigation for regulations and modifications.
4) Investigate special problems, design and implement modifications, and improve water management procedures
5) Establish and maintain strong working partnerships and collaborations with appropriate entities within and outside USACE regarding water quality.

This report is intended to document and assess water quality conditions occurring at Rend Lake. The report describes conditions observed in 2022, as well as baseline data collected from 1971-2021. Additional historical data are available upon request.

REND LAKE WQMP COVERAGE

The WQMP for Rend Lake includes water samples taken at the following locations: major tributaries (REN-7 and REN-5), main body of the lake (REN-2, REN-3, REN-4, REN-8, and Rend Marina), and just downstream of the dam (REN-1). See figures 1 and 2, and Table 1 for a site map and site coordinates.

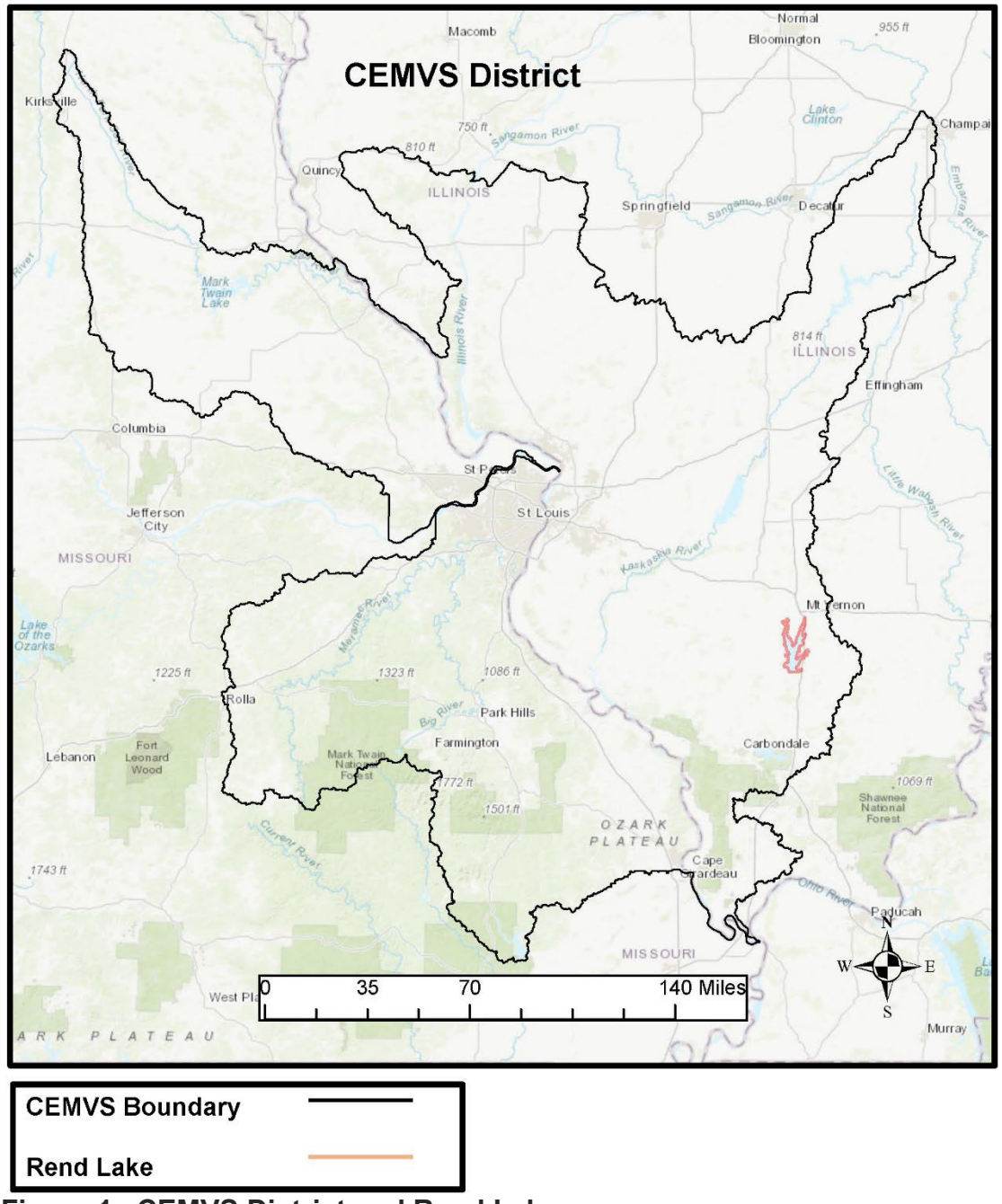


Figure 1. CEMVS District and Rend Lake

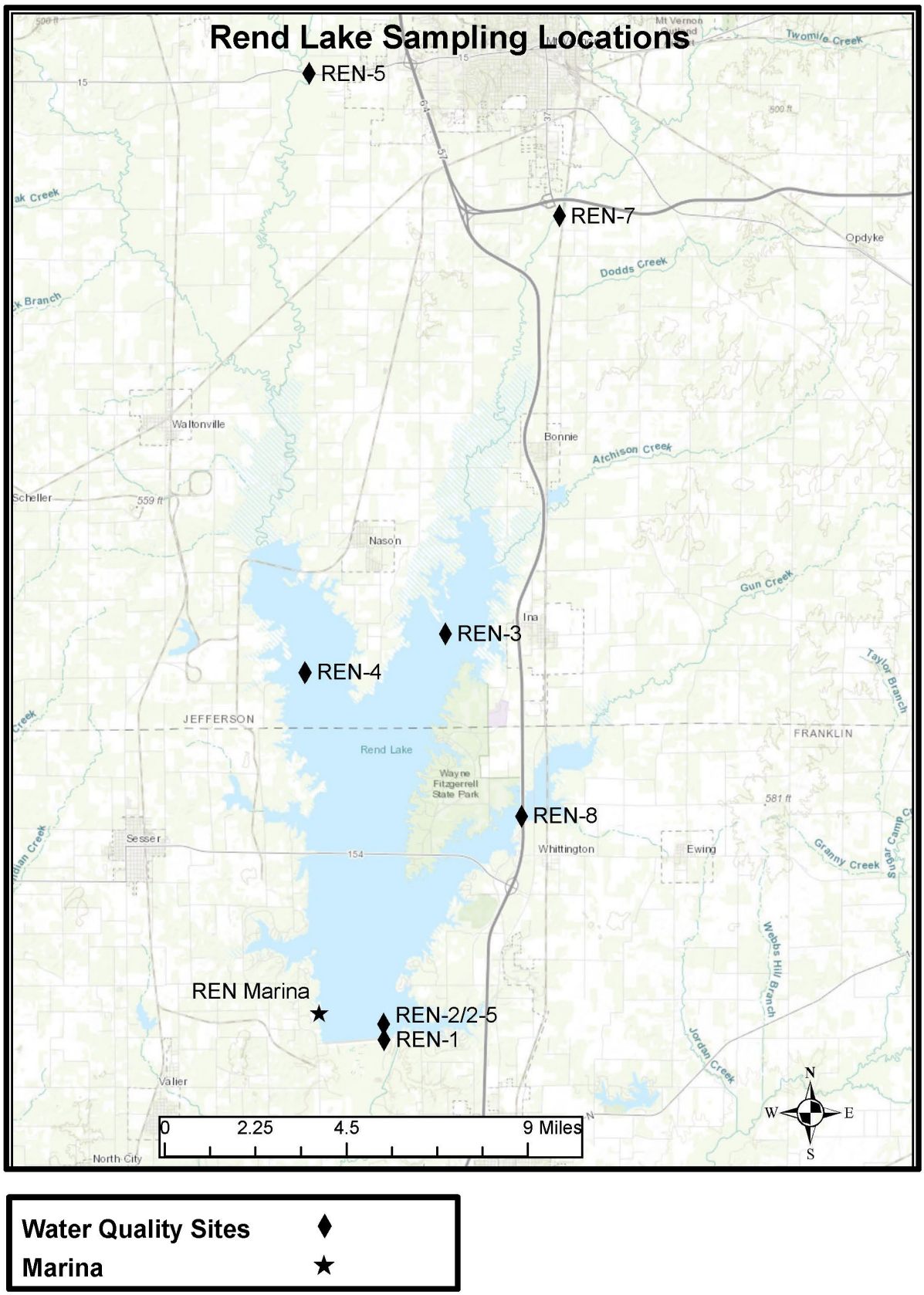


Figure 2. Water Quality (WQ) Sampling Locations at Rend Lake

Sample Location Summary Table

Table 1: Sample Location Summary and Geographic Location (NAD 1983)

Sample Location Type	Abbreviation	Site Name	Latitude	Longitude
Major Tributary	TRIB	REN-5	38.309795	-88.988575
	TRIB	REN-7	38.2695630	-88.8987040
Main Reservoir Surface	RS	REN-2	38.039294	-88.961891
	RS	REN-3	38.1517450	-88.9395220
	RS	REN-4	38.1407880	-88.9899850
	RS	REN-8	38.1002570	-88.9123030
	RS	REN-MAR	38.044727	-88.985267
Reservoir Benthic	RB	REN-2-5	38.039294	-88.961891
Tail Race (below dam)	TR	REN-1	38.0369550	-88.9615650

Samples at Marinas are not always taken in the exact same location.

METHODS AND ANALYSIS: WATER QUALITY

Data Collection and Historical Reference Data

During 2022, water quality samples were collected and analyzed for 9 locations during four separate sampling events (n=36; Table 1). One duplicate sample was also collected during each sampling event for quality control purposes. With the exception of the benthic sample location REN 2-5 in front of the dam, samples were collected from the upper one meter of the water column, preserved, and transported to the Applied Research and Development Laboratory (ARDL) in Mount Vernon, Illinois for analysis.

For the purpose of this report, historical reference data refers to water quality data collected during the previous years ranging as far back as 1972 (parameter dependent) at Rend Lake. Historical reference data are intended to represent the current condition of Rend Lake.

Statistical Summary and Comparison to Applicable Water Quality Standards

Statistical analyses for 2021 data were performed on water quality monitoring data collected for 9 locations, and classified as TRIB (n= 2), RS (n=5), RB (n=1), and TR (n=1). For comparison, statistical analyses were also performed on historical water quality monitoring data and, although some sampling locations have been removed, they were classified in the same manner. Descriptive statistics were calculated to describe central tendencies and boxplots created to illustrate comparisons between groups. Monitoring results were compared to applicable water quality standard criteria established by the appropriate state agencies pursuant to the Federal Clean Water Act. If a state water quality standard criteria was not available, recommended criteria from the literature were considered.

Seasonal data are classified as: Winter (December 01 - March 14), Spring (March 15 – May 31), Summer (June 1 – September 15), Fall (September 16 – November 30).

Quality Assurance

The United States Army Corps of Engineers, Saint Louis District quality assurance procedures considers two primary focus areas: (1) those that involve laboratory analysis of samples, and (2) those concerning the collection and processing of the water samples in the field.

Since 2012, ARDL has analyzed water quality samples for CEMVS. Their quality assurance program includes the use of quality control charts, check standards, field and in-house matrix spikes, laboratory blanks and performance evaluation samples. In addition, one blind duplicate sample is submitted for at least every 20 samples, or, in this case, every sampling event (one event/day at Rend Lake has 9 samples and one duplicate).

Internal checks are also used for field sampling. These include adherence to operating procedures for data collection and periodic evaluation of sampling personnel. Field sampling equipment and multimeters are calibrated/serviced in accordance with factory recommendations.

Water Quality Parameters and Criteria

Parameters used to characterize water quality have been generally accepted criteria for assessing aquatic life and human health include:

Temperature (Temp) is important because it controls several aspects of water quality. Colder water holds more dissolved oxygen which is required by aquatic organisms. Plants grow more rapidly and use more oxygen in warmer water. Decomposition of organic matter which uses oxygen is accelerated in warmer water. Temperature can also determine the availability of toxic compounds such as ammonia. Since aquatic organisms are cold blooded, water temperature regulates their metabolism and ability to survive. The number and kinds of organisms that are found in streams or lakes is directly related to temperature. Certain organisms require a specific temperature range, such as Salmonids, which require water temperatures below 20°C. Water temperature criteria for warm water bodies in Illinois is within 2.8°C of the seasonal norm.

Dissolved Oxygen (DO) refers to the measurement of free oxygen molecules (O_2) that are not bonded to any other elements; thus, oxygen bonded in water (H_2O) would not be considered in a measurement of dissolved oxygen. Oxygen is dissolved in surface waters through interactions with the atmosphere and as a waste product of photosynthesis ($CO_2 + H_2O = (CH_2O) + O_2$) from phytoplankton and aquatic vegetation. Additional factors influencing DO include temperature, pressure, and salinity.

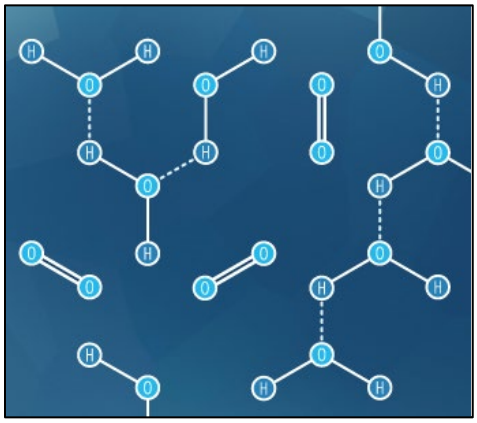


Figure 1: Dissolved oxygen (O_2) vs oxygen bonded in water (H_2O).

Dissolved oxygen is required for most aquatic life including fish, invertebrates, bacteria, and plants. Fish and invertebrates utilize DO for respiration through gills and cutaneous breathing, and plants require dissolved oxygen for respiration when photosynthesis is not possible. Smaller microbes and bacteria utilize DO for decomposition of organic materials, a process essential for nutrient cycling. Bottom feeders such as worms and mussels can persist when DO is ≥1mg/L, while most inland fish species require a minimum DO of 4mg/L. The DO water quality criteria for Illinois is ≥5mg/L.

Potential of Hydrogen (pH) is a measure of how acidic or basic water is. Potential of Hydrogen is reported on a logarithmic scale ranging from 0 – 14, with 7.0 being neutral. As pH increases from 7.0, water increases in alkalinity, whereas a decrease from 7.0 indicates an increase in acidity. Since pH is measured on a logarithmic scale, every

one-unit change in pH indicates a 10-fold change in acidity; thus, a pH of 6.0 is ten times more acidic than a pH of 7.0 and a pH of 4.0 would be one-thousand times more than a pH of 7.0.

The pH of water varies considerably beyond the local level. Natural variation in bedrock and soil composition through which water moves has been reported as one of the most influential factors. Additional factors include decomposition of organic materials, acidity of local precipitation, discharge of effluents and chemicals, and mining operations.

Most freshwater streams and rivers have a natural pH ranging from 6 to 8. As pH approaches 5 (acidic), less tolerant fish and aquatic invertebrate assemblages may be extirpated, and a pH below 4.5 would be without most desired aquatic life. Conversely, when pH exceeds 9.5 (alkaline), aquatic fish and invertebrates begin to rapidly decrease and beyond 10, fish become extirpated. The pH water quality criteria for Illinois ranges from 6.5 – 9.0.

Conductivity is a measure of water's ability to conduct electrical current. In its purist form, water has a *near* neutral charge, indicating that it is an inefficient conductor of electrical current. Thus the ability to carry electrical current is driven by water soluble ions (atoms and molecules with a charge) such as salts and other inorganic materials. Conductivity is also influenced by water temperature; as temperature increases, conductivity increases. For this reason, conductivity is commonly reported as Specific Conductivity (SpCond), which is the measurement of conductivity at 25 degrees Celsius.

Conductivity in streams and rivers is affected by the geology of the area. Streams running through granite tend to have lower conductivity due to granite being composed of inert material; materials that do not ionize or dissolve into ionic compounds in water. Conversely, streams that run through areas of limestone or clay soils tend to have higher conductivity readings because of the presence of materials that ionize. Conductivity is useful as a general measure of water quality. A stream tends to have a relatively constant range of conductivity that, once established, can be used as a baseline. Significant changes, either increases or decreases, might indicate a source of pollution has been introduced into the water. The pollution source could be a treatment plant, which raises the conductivity, or an oil spill, which would lower the conductivity. In general, there are no water quality criteria for SpCond. The District threshold of 500 µS/cm is a rule of thumb value that is often associated with some form of biological impairment.

Oxidation Reduction Potential (ORP) is a measurement of the net status of all the oxidation and reduction reactions in a given water sample. Oxidation involves an exchange of electrons between 2 atoms. The atom that loses an electron is oxidized and the one that gains an electron is reduced. Oxidation reduction potential sensors measure the electrochemical potential between the solution and a reference electrode. Readings are expressed in millivolts. Positive readings indicate increased oxidizing potential and negative readings increased reduction. Oxidation reduction potential

values are used much like pH values to determine water quality. While pH readings characterize the state of a system relative to the receiving or donating hydrogen ions (base or acid), ORP readings characterize the relative state of losing or gaining electrons. Generally ORP readings above 400mV are harmful to aquatic life; however, ORP is a non-specific measurement, which is a reflection of a combination of effects of all the dissolved materials in the water. Therefore, the measurement of ORP in relatively clean water has only limited utility unless a predominant redox-active material is known to be present.

Total Suspended Solids (TSS) concentrations, which cause the photosynthetic activity to be reduced by more than 10% from the seasonably established norm, can have a detrimental effect on aquatic life. Soil particles, organic material, and other debris comprise suspended solids in the water column. **Turbidity (FNU)** measurements are inverse to suspended solid measurements. As TSS increases, the FNU or water transparency decreases. Total suspended solids can be an important indicator of the type and degree of FNU. Total Suspended Solids measurements represent a combination of **Volatile Suspended Solids (VSS)**, which consist of organic material, and **Nonvolatile Suspended Solids (NVSS)**, which is comprised of inorganic mineral particles in the water. In order to more accurately determine the types and amounts of suspended solids, VSS are analyzed. Volatile suspended solid concentration represents the organic portion of the total suspended solids. Organic material often includes plankton, and additional plant and animal debris present in water. Total VSS indicates the presence of organics in suspension; and, therefore, show additional demand levels of oxygen. The Illinois Environmental Protection Agency suggests that generally NVSS above 15 mg/L could highly impair recreational lake use while NVSS of 3 to 7 mh/L may cause slight impairment (Hudson, 1998). Illinois does not currently have a standard criteria for TSS, NVSS or VSS.

Total Organic Carbon (TOC) is a measure of the amount of organic carbon in a water body. In addition to natural organic substances, TOC includes insecticides and herbicides, as well as domestic and industrial waste. Industrial waste effluent may include carbon-containing compounds with various toxicity levels. Further, a high organic content means an increase in the growth of microorganisms which contribute to the depletion of oxygen supplies.

Currently, there are no state or federal water quality standard criteria set for TOC. Because carbon occurs naturally, its concentration varies based on physical and chemical attributes in a watershed; thus, this study relies on historical reference conditions to identify unfavorable conditions.

Metals Iron (TFe) and Manganese (TMn) (T=total) are nutrients for both plants and animals. Living organisms require trace amounts of metals. However, excessive amounts can be harmful to the organism. Heavy metals exist in surface waters in three forms, colloidal, particulate, and dissolved. Water chemistry determines the rate of adsorption and desorption of metals to and from sediment. Metals are desorbed from the sediment if the water experiences increases in salinity, decreases in redox potential,

or decreases in pH. Metals in surface waters can be from natural or human sources. Metal levels in surface water may pose a health risk to humans and the environment.

Pesticides are commonly used throughout much of the agricultural landscape that the Big Muddy River flows. This study considers one insecticide and seven herbicides. Atrazine and Alachlor herbicides are commonly used agricultural chemicals which can be readily transported by rainfall runoff. Both compounds are suspected of causing cancer; and therefore, were monitored for the protection of human and aquatic health. Herbicides which are pesticides used to kill vegetation are the most widely used and sampled. Two of the most widely used herbicides are Atrazine and Alachlor. Atrazine is a preemergence or postemergence herbicide use to control broadleaf weeds and annual grasses. Atrazine is most commonly detected in ground and surface water due to its wide use, and its ability to persist in soil and move in water. Alachlor is a Restricted Use Pesticide (RUP) due to the potential to contaminate groundwater. The water quality standards for the pesticides sampled are located in Table 2.

Nitrogen occurs naturally in water through several forms including nitrogen (N2), nitrite (NO2-N), nitrate (NO3-N), ammonia (NH3), and ammonium (NH4). Nitrates are the most commonly reported form of nitrogen, and may have a meaningful influence on a water body's trophic status. Algae and other plants use NO3-N as a food source, thus excess levels of NO3-N can promote increases in algae production and hypereutrophic conditions.

In general, NO3-N does not have a *direct* effect on fish or aquatic insects. Illinois has set criteria standards for NO3-N to 10 mg/L to accommodate safe drinking waters for human and livestock; however, this threshold likely exceeds the concentration that is appropriate for assessing ecosystem health.

Total Ammonia Nitrogen (TAN) includes NH3 and NH4. Total ammonia nitrogen is a colorless gas with a strong pungent odor. Ammonia occurs naturally and is a biological requirement for aquatic life, however elevated concentrations can be toxic to freshwater organisms. Unnatural sources of ammonia include, accidental releases of ammonia rich fertilizer, effluent from sewage treatment plants, improper disposal of ammonia products, and livestock waste.

Toxic concentrations for freshwater organisms range from 0.53 – 22.8 mg/L, and are strongly dependent on both pH and temperature. In general, an increase in pH and/or temperature corresponds with an increase in toxicity. Additional information in regards to the relationship between pH, temperature, and ammonia, as it relates to toxicity, can be reviewed in Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater (USEPA 2013).

Total Phosphorus (TP) is analyzed as phosphorus and has been monitored due to the potential for uptake by nuisance algae. Levels of phosphate can indicate the potential for rapid growth of algae (algal bloom) which can cause serious oxygen depletion during the algae decay process. Phosphorous is typically the limiting nutrient in a water body;

therefore, any addition of phosphorous to the ecosystem stimulates the growth of plants and algae. Phosphorous is delivered to lakes and streams by way of runoff from agricultural fields and urban environments. Other sources of phosphorous are anaerobic decomposition of organic matter, leaking sewer systems, and point source pollution. The general standard for phosphorous in lake water is 0.05 mg/L. Dissolved phosphorous, also called **Orthophosphate (PO_4-P)** is generally found in much smaller concentrations than total phosphorous, and is readily available for algal uptake. Orthophosphate concentrations in a water body vary widely over short periods of time as plants take it up and release it.

Chlorophyll a (CHL_a) is a measure of the amount of algae growing in a waterbody, and therefore can be used to classify trophic status. Although algae are a natural part of freshwater ecosystems, too much algae can cause aesthetic problems such as green scums and bad odors, and can result in decreased levels of DO.

Pheophytin a (PHEO a) is a natural degradation product or digestion of CHL_a. The ratio of PHEO_a to CHL_a can provide an indication of the decline or growth in eukaryotic algae and cyanobacteria populations.

Trophic Status is determined using a modified **Trophic State Index (TSI)**, as described by Carlson (1977). Trophic State Index is calculated from secchi-depth transparency, total phosphorus, and chlorophyll-a measurements. Values for these three parameters are converted to an index number ranging from 0-100 according to the following equations:

TSI (Seechi Depth) = 10(6 - (ln SD/ln 2))
TSI (Chlorophyll-*a*) = TSI(Chl) = 10(6 - ((2.04 - 0.68 ln Chl)/ln 2))
TSI (Total Phosphorus) = TSI(TP) = 10(6 – (ln (48/TP)/ln 2))

where ln indicates the Natural Logarithm

A TSI average value, calculated as the average of the three individually determined TSI metrics, is used as an overall indicator of a water body's trophic state. The relationship between TSI and trophic condition is defined as follows:

TSI	Trophic Condition
0-40	Oligotrophic
40-50	Mesotrophic
50-70	Eutrophic
70-100	Hypereutrophic

Laboratory Methods and Water Quality Criteria Summary Table

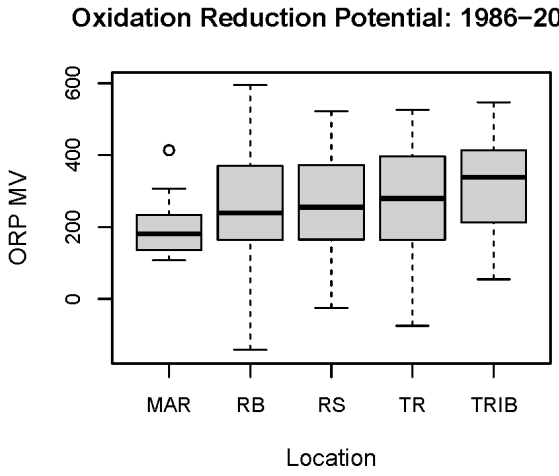
Table 2: Metrics, Methods, and Water Quality Criteria Used for Evaluating Water Quality

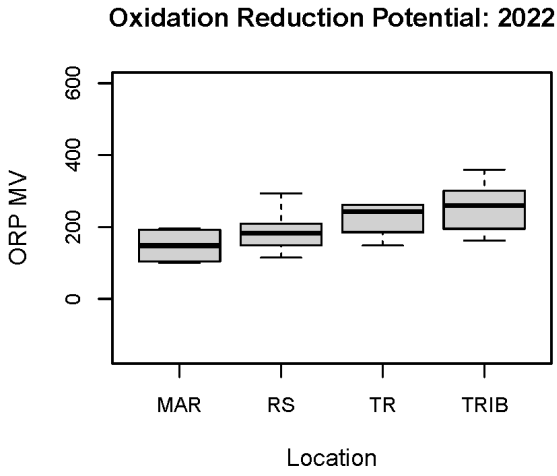
Metric	Abbreviation	Analysis Method	Water Quality Criteria	Source
Alachlor		EPA Method 8270C	< 2µg/L PWS or <1100 µg/L: aquatic life	Illinois EPA
Ammonia Nitrogen	NH_3	EPA Method 350.1	<15 mg/L	Illinois EPA
Atrazine	Atrazine	EPA Method 8270C	9 µg/L: Chronic or 82 µg/L: Acute or 3 µg/L DWS	Illinois EPA
Bacteria: E. Coliform	E Col	EPA Method 1604	< 235 E. Col per 100/mL for single sample	Illinois EPA
Chlorophyll a	Chl_a	SM Method 10200H	< 25 mg/cm^3 (Eutrophic Upper Limit)	Carlson 1977
Chlorpyrifos		EPA Method 8270C	< 0.11 µg/L: aquatic life	Illinois EPA
Cyanazine		EPA Method 8270C	< 30 µg/L: chronic or < 370 µg/L acute (aquatic life)	Illinois EPA
Depth	Depth	Multiparameter Meter	Measurements reported at ~1 meter	-----
Dissolved Oxygen	DO	Multiparameter Meter	Greater than 5.0mg/L	Illinois EPA
Metolachlor		EPA Method 8270C	30.4 µg/L: Chronic or 380 µg/L: Acute	Illinois EPA
Metribuzin		EPA Method 8270C	8.4 mg/L: aquatic life or 8.3 mg/L: human health	Illinois EPA
Nitrate as Nitrogen	NO_3	Green Method	< 10 mg/L	Illinois EPA
Non-Volatile Suspended Solids	NVSS	TSS - VSS	-----	-----
Orthophosphate	Ortho	EPA Method 365.2	-----	-----
Pendmethalin		EPA Method 8270C	< 30 µg/L: chronic or < 350 µg/L acute (aquatic life)	Illinois EPA
Pheophytin a	Phpy_a	SM Method 10200H	-----	-----
Potential of Hydrogen	pH	Multiparameter Meter	Range: 6.5 – 9.0pH	Illinois EPA
Specific Conductivity	SpCond	Multiparameter Meter	500 µS/cm	-----
Temperature	Temp	Multiparameter Meter	Less than rise of 2.8°C above normal seasonal temperature	Illinois EPA
Total Dissolved Solids	TDS	Multiparameter Meter	< 500 mg/L	Illinois EPA
Total Manganese	TMn	EPA Method 6010C	< 1 mg/L	Illinois EPA

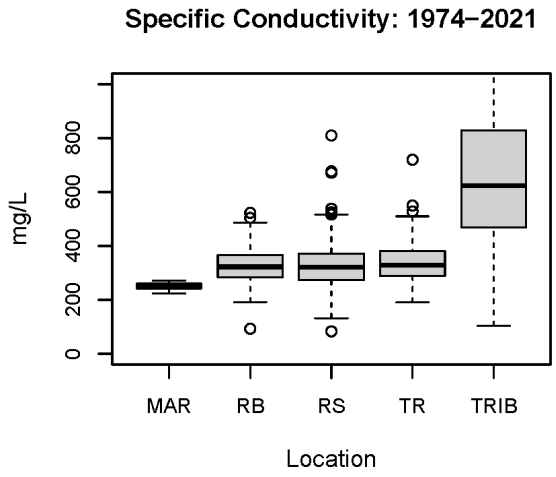
Metric	Abbreviation	Analysis Method	Water Quality Criteria	Source
Total Organic Carbon	TOC	EPA Method 415.1	-----	-----
Total Iron	TFe	EPA Method 6010C	< 1 mg/L	Illinois EPA
Total Phosphorus	TP	EPA Method 365.2	Less than 0.05 mg/L	Illinois EPA
Total Suspended Solids	TSS	EPA Method 160.2	-----	-----
Trifluralin		EPA Method 8270C	< 1.1 µg/L: chronic or < 26 µg/L acute (aquatic life)	Illinois EPA
Turbidity	Turb	Multiparameter Meter	-----	-----
Volatile Suspended Solids	VSS	EPA Method 160.4	-----	-----

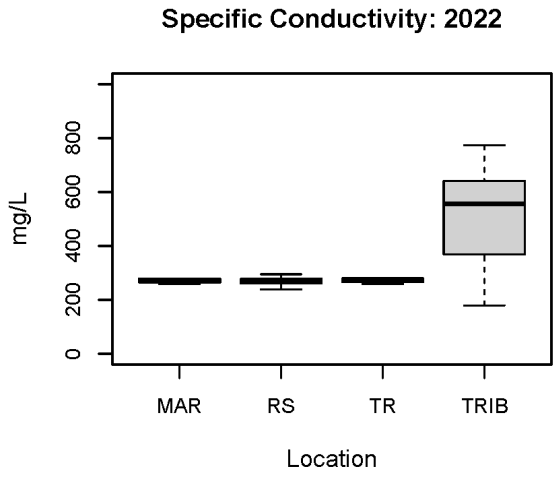
**1 mg/L is equivalent to 1 drop in two bathtubs and 1 ug/L is equivalent to 1 drop in an Olympic size swimming pool. PWS is public water supply. DWS is drinking water standard.*

RESULTS AND SUMMARY STATISTICS: WATER QUALITY



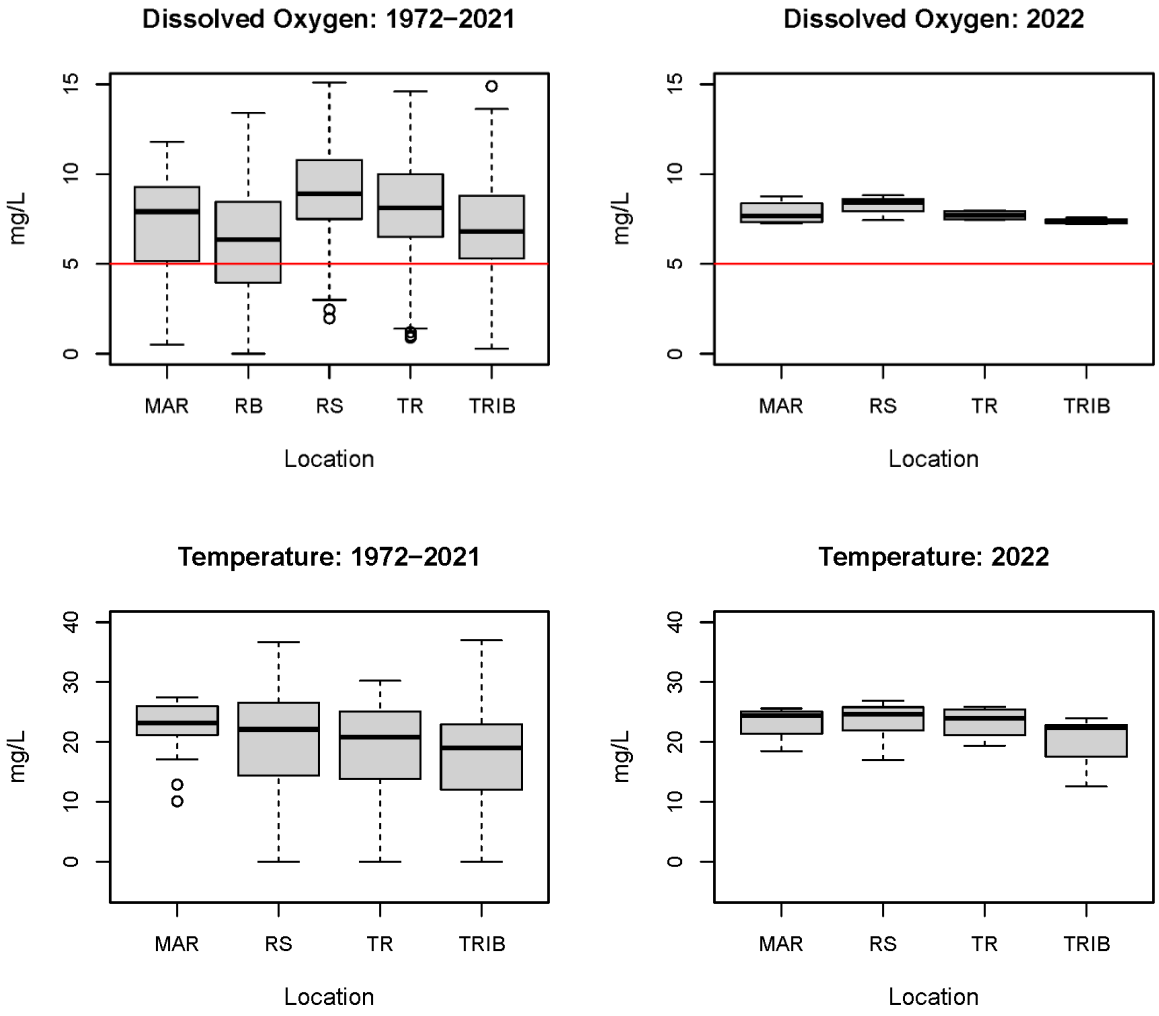






	Historical Reference 1974-2021				2022		
	Location	Mean	Median	n	Mean	Median	n
ORP	MAR	198.38	180.60	13	147.93	148.05	4
	RB	259.05	239.50	120	----	----	----
	RS	259.11	255.00	470	184.09	182.75	16
	TR	274.32	279.50	132	223.80	242.25	4
	TRIB	311.59	338.00	200	254.41	260.20	8
SpCond	MAR	251.27	255.20	14	271.50	274.60	4
	RB	324.38	322.50	178	----	----	----
	RS	326.06	320.50	776	271.33	273.90	16
	TR	350.85	329.00	235	272.80	275.00	4
	TRIB	693.58	624.00	385	510.35	556.75	8

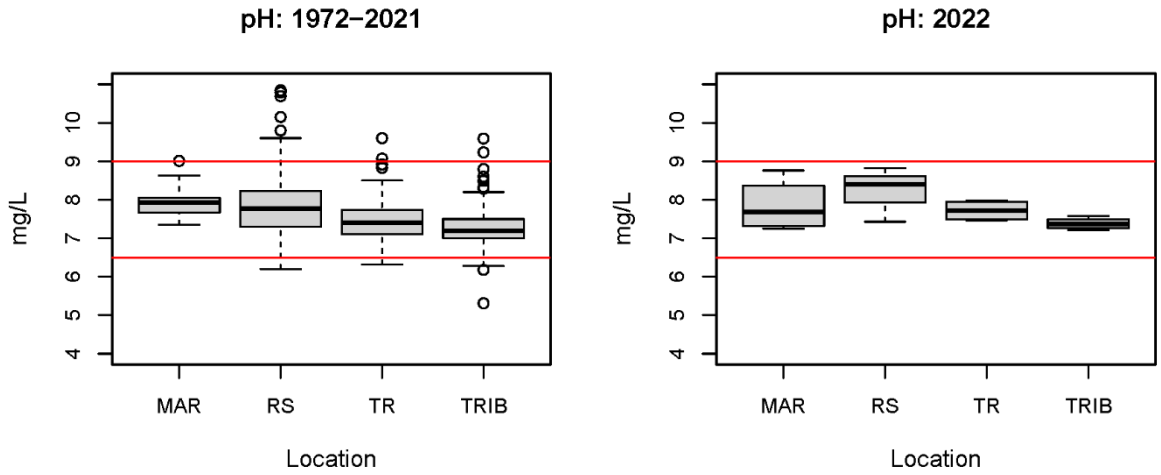
**This report does not acknowledge a water quality criteria for SpCond or ORP.*



** Red line placed at the 5 mg/L level for DO.*

	Historical Reference 1972-2021				2022		
	Location	Mean	Median	n	Mean	Median	n
DO	MAR	7.05	7.92	14	7.84	7.68	4
	RS	9.07	8.90	720	8.25	8.41	16
	TR	8.16	8.13	230	7.72	7.72	4
	TRIB	7.14	6.80	353	7.38	7.37	8
Temp	MAR	21.99	23.17	14	23.24	24.43	4
	RS	20.20	22.12	784	23.51	24.67	16
	TR	18.77	20.85	240	23.29	23.95	4
	TRIB	16.88	19.00	388	20.27	22.38	8

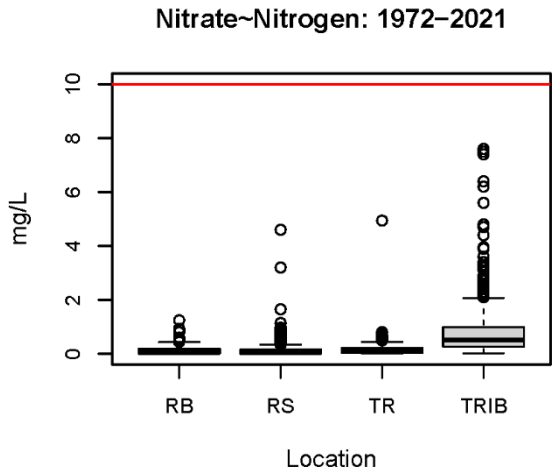
** The DO standard was not exceeded in 2022. The temperature standard (rise of 2.8° C above the natural temperatures) was not exceeded in 2022. The historical seasonal mean temperature was used as the natural temperature.*

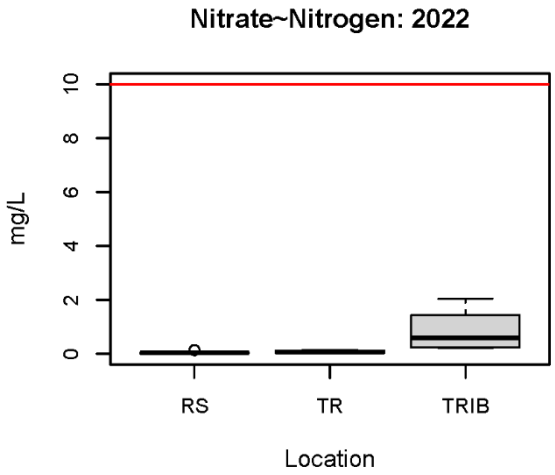


**Red lines indicate the upper and lower water quality criteria standards (9 and 6.5).*

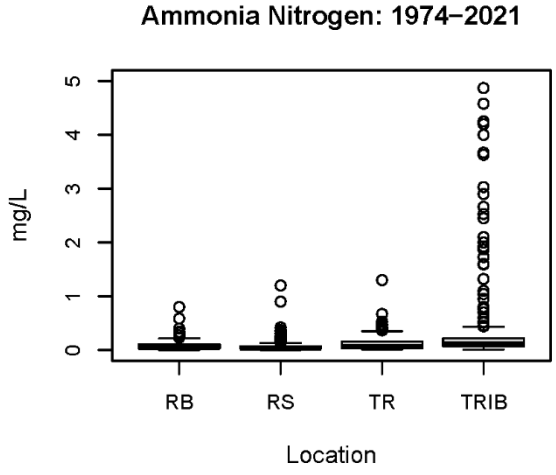
	Historical Reference 1972-2021				2022		
	Location	Mean	Median	n	Mean	Median	n
pH	MAR	7.98	7.93	13	7.84	7.68	4
	RS	7.82	7.77	770	8.25	8.41	16
	TR	7.42	7.40	237	7.72	7.72	4
	TRIB	7.28	7.20	373	7.38	7.37	8

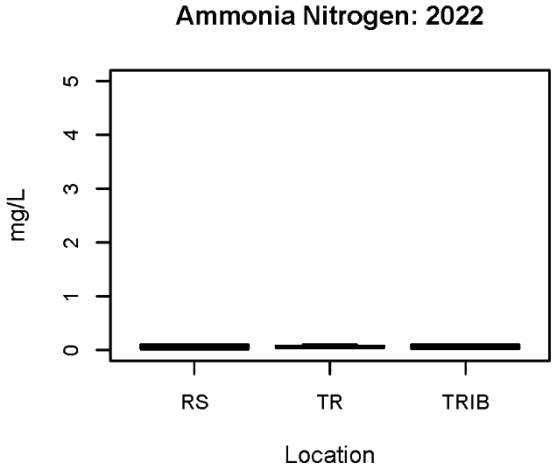
**The pH standard of 6.5-9 was not exceeded in 2022.*





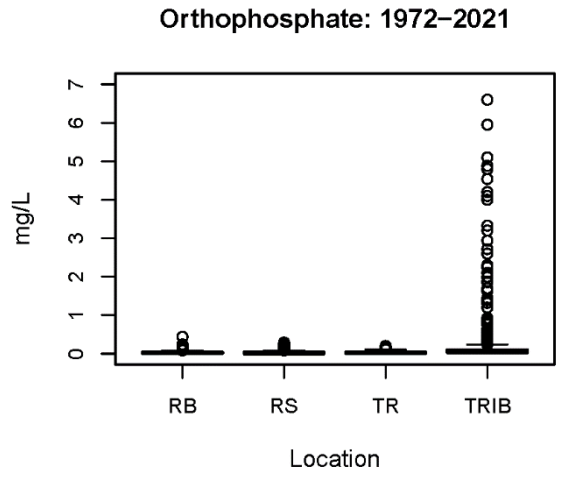
*Red line indicates the water quality standard (10 mg/L).

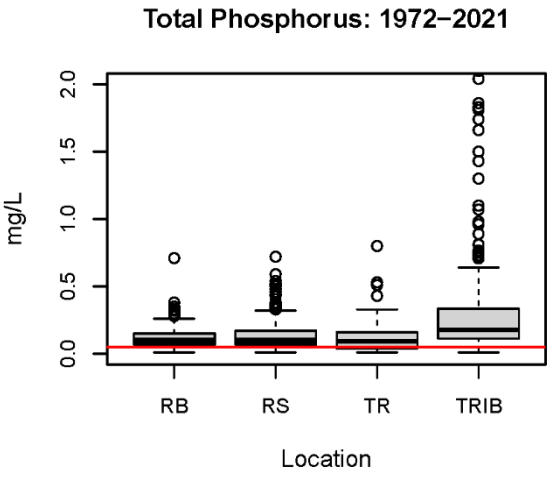


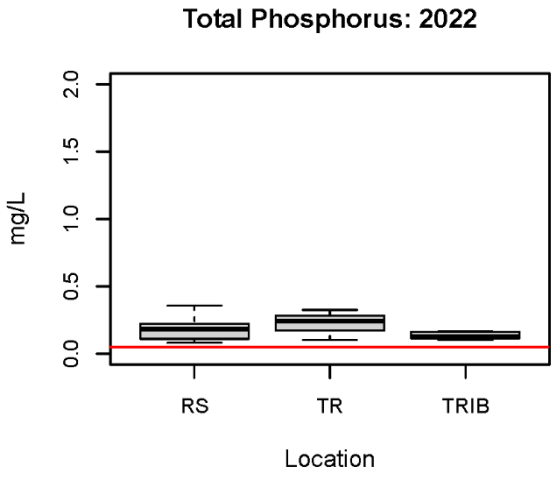


	Historical Reference 1972-2021				2022		
	Location	Mean	Median	n	Mean	Median	n
NO3-N	RS	0.12	0.04	778	0.04	0.03	12
	TR	0.18	0.10	242	0.08	0.07	3
	TRIB	0.87	0.52	383	0.85	0.60	6
NH3N	RS	0.06	0.03	711	0.05	0.03	12
	TR	0.12	0.07	210	0.06	0.05	3
	TRIB	0.59	0.12	319	0.06	0.05	6

*All 2022 observations of nitrate and ammonia nitrogen were within the water quality standard.



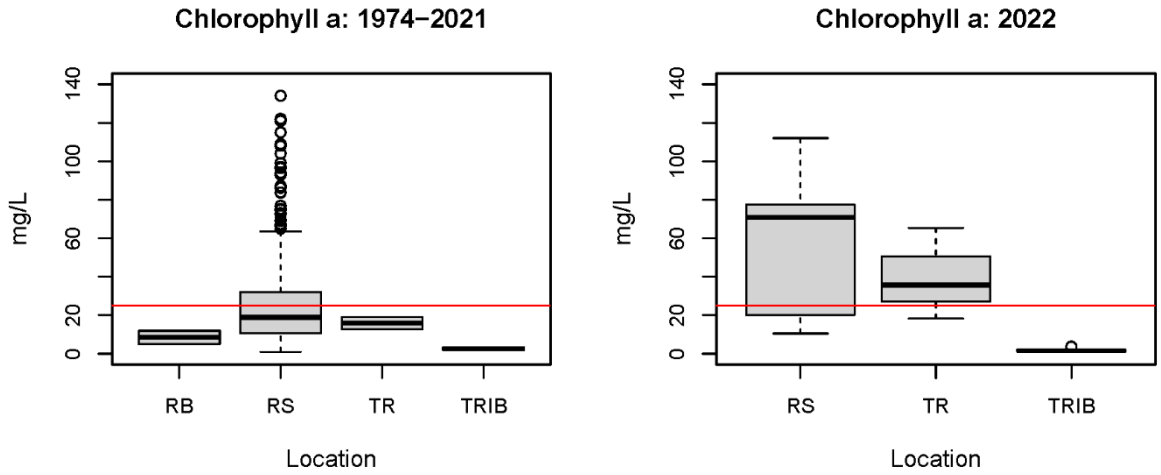




**Red line indicates the water quality standard of 0.05 mg/L.*

	Historical Reference 1972-2021				2022		
	Location	Mean	Median	n	Mean	Median	n
PO4	RS	0.03	0.02	743	----	----	----
	TR	0.04	0.02	221	----	----	----
	TRIB	0.33	0.05	374	----	----	----
TP	RS	0.13	0.10	814	0.19	0.18	12
	TR	0.12	0.09	246	0.22	0.24	3
	TRIB	0.53	0.18	395	0.13	0.13	6

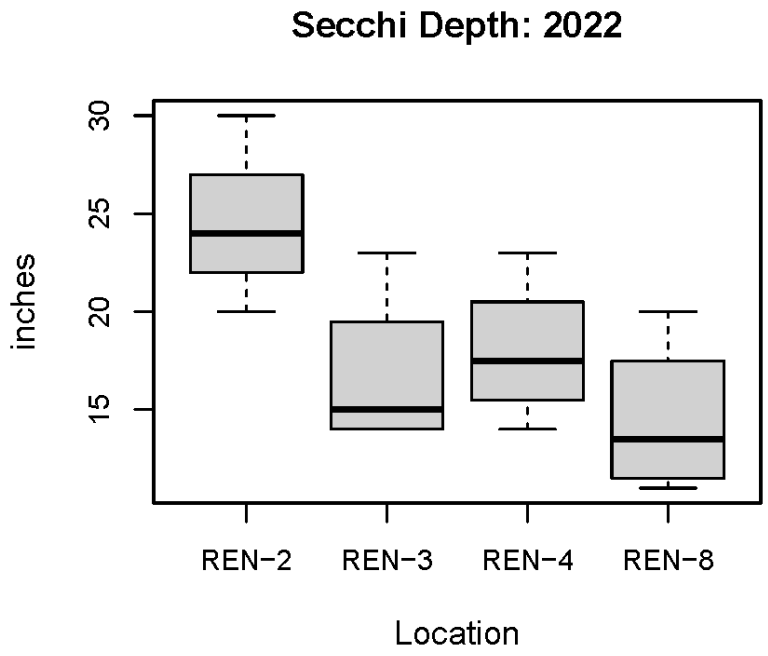
**Total phosphorus exceeded the standard of 0.05 mg/L for all locations in 2022. Orthophosphate was not sampled in 2022. This study does not acknowledge a standard for orthophosphate.*

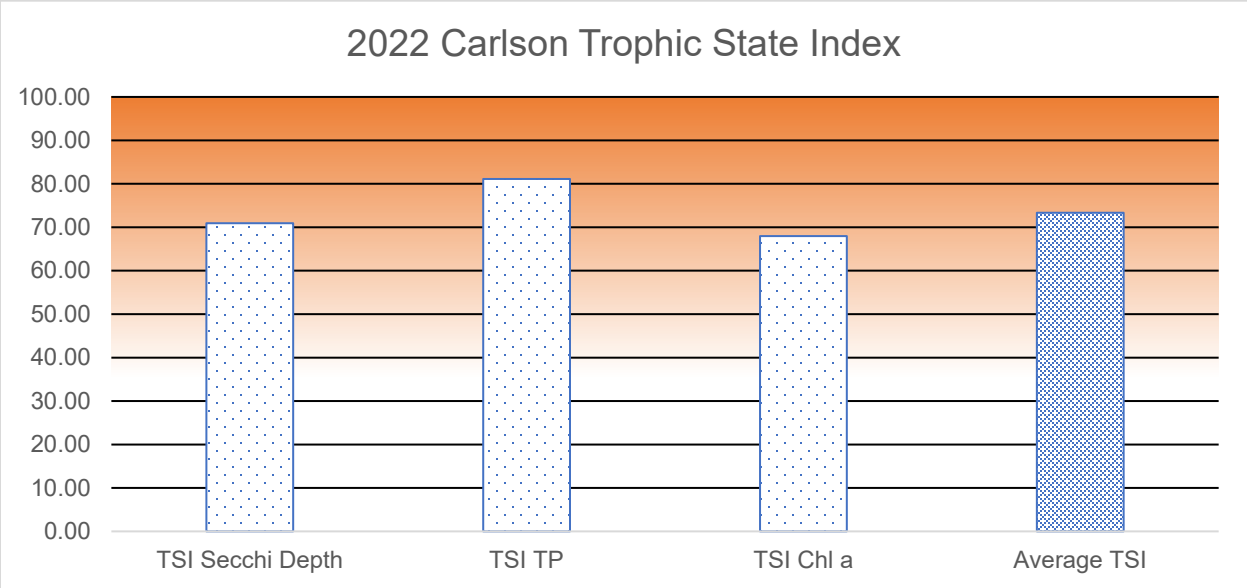


**Red line indicates the reference water quality standard of 25 mg/cm^3. See Carlson 1977.*

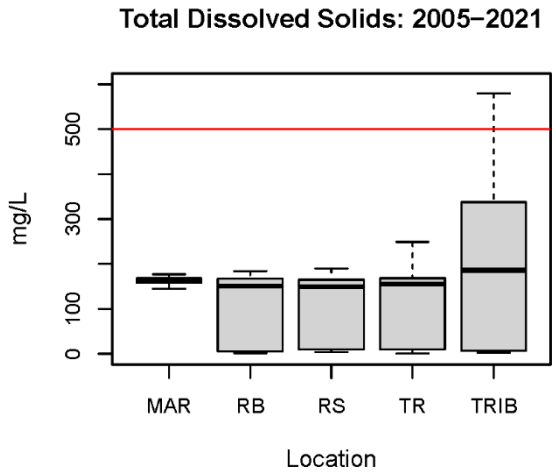
	Historical Reference 1974-2021				2022		
	Location	Mean	Median	n	Mean	Median	n
Chl_a	RS	25.14	18.90	529	56.55	70.80	12
	TR	15.85	15.85	2	39.80	35.70	3
	TRIB	2.60	2.60	2	1.83	1.50	6

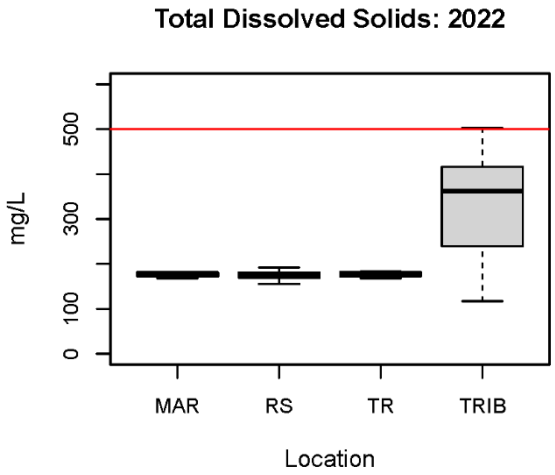
**The reference standard for chlorophyll-a of 25mg/cm^3 was exceeded at the tailrace and lake sites throughout 2022. This study does not acknowledge a standard for pheophytin.*

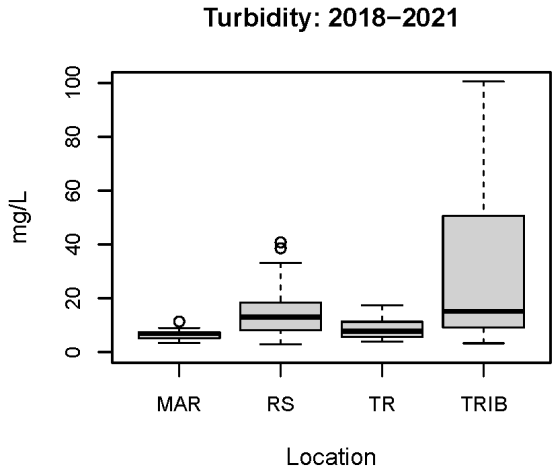


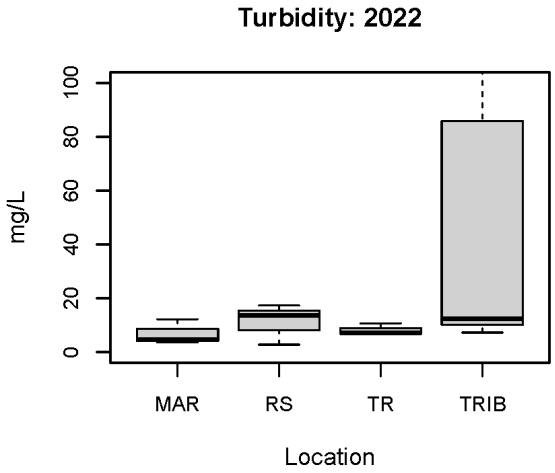


<40 = Oligotrophic __ 40-50 = Mesotrophic __ 50-70 = Eutrophic __ >70 Hypereutrophic



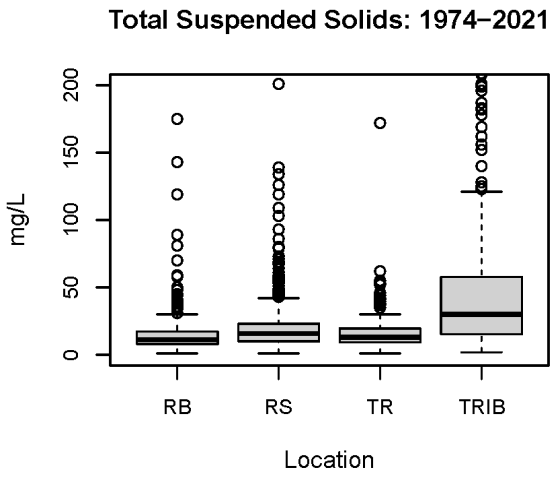


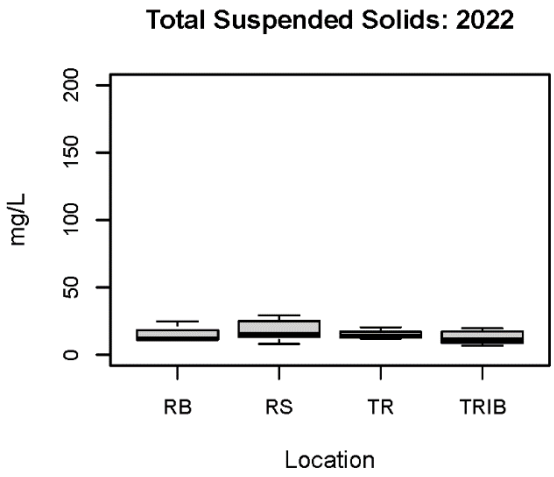




	Historical Reference 2005-2021				2022		
	Location	Mean	Median	n	Mean	Median	n
TDS	MAR	163.36	166.00	14	176.50	178.50	4
	RB	100.57	150.50	20	----	----	----
	RS	104.25	149.00	101	176.44	178.00	16
	TR	111.56	155.00	25	177.00	178.50	4
	TRIB	186.85	186.00	52	331.88	362.00	8
FNU	MAR	6.71	6.81	14	6.30	4.71	4
	RS	13.85	13.02	64	11.59	13.64	16
	TR	8.76	7.76	16	7.94	7.21	4
	TRIB	38.89	15.12	32	56.13	12.31	8

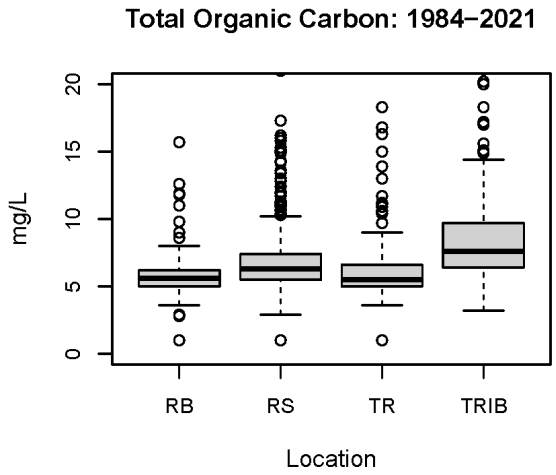
** The TDS standard of 500 mg/L was exceeded once in the REN-7 tributary in 2022. This study does not acknowledge a standard for turbidity (FNU).*

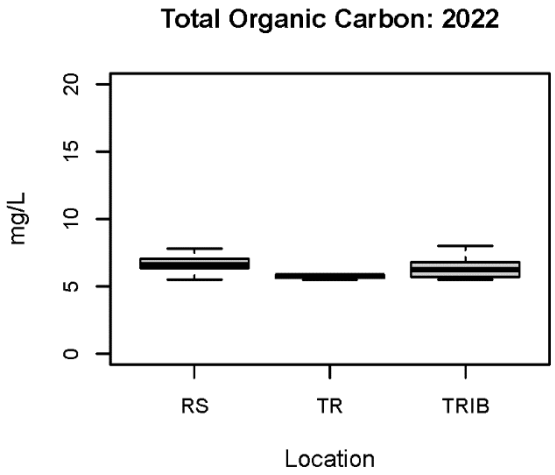




	Historical Reference 1974-2021				2022		
	Location	Mean	Median	n	Mean	Median	n
TSS	RB	21.06	11.25	182	15.87	11.80	3
	RS	19.69	15.60	758	17.89	15.00	12
	TR	16.80	13.00	227	15.30	13.60	3
	TRIB	49.62	30.00	344	12.43	11.25	6

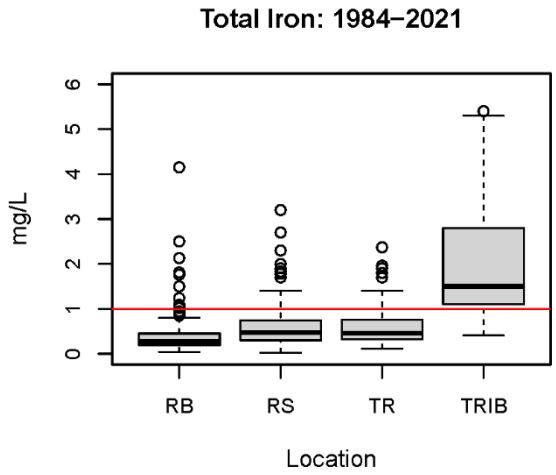
**The mean total suspended solids data measured in 2022 were less than the historical data. There is no numeric standard for TSS.*

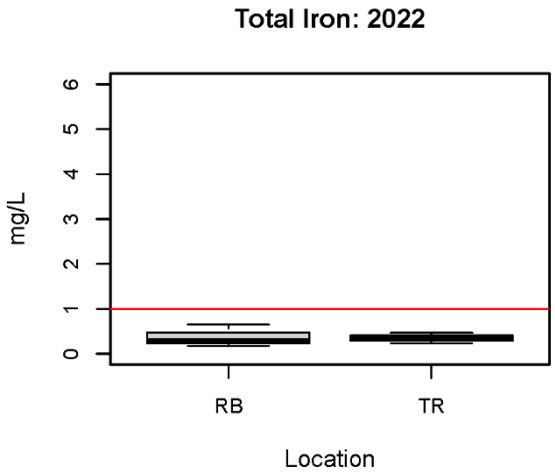




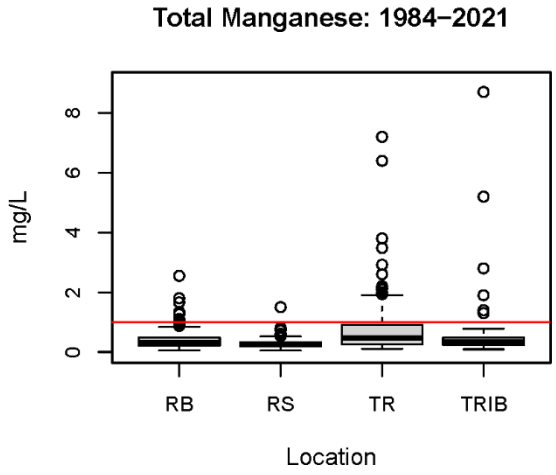
	Historical Reference 1984-2021				2022		
	Location	Mean	Median	n	Mean	Median	n
TOC	RS	6.77	6.30	557	6.63	6.60	12
	TR	6.32	5.50	158	5.70	5.80	3
	TRIB	8.70	7.60	217	6.42	6.25	6

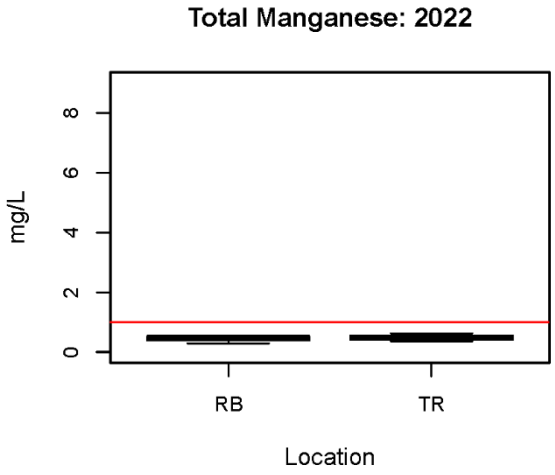
**This study does not recognize a water quality criteria for TOC.*





**Red line indicates the water quality standard of 1 mg/L.*

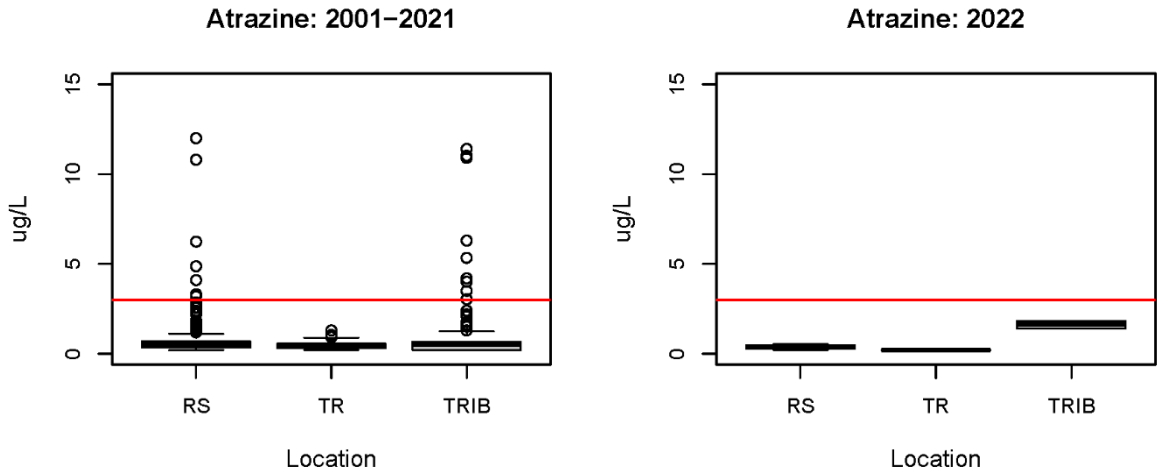




**Red line indicates the water quality standard of 1 mg/L.*

	Historical Reference 1984-2021				2022		
	Location	Mean	Median	n	Mean	Median	n
TFe	RB	0.43	0.28	155	0.37	0.29	3
	RS	0.59	0.47	234	----	----	----
	TR	0.57	0.46	153	0.35	0.34	3
	TRIB	2.06	1.50	65	----	----	----
TMn	RB	0.41	0.32	155	0.44	0.51	3
	RS	0.28	0.25	234	----	----	----
	TR	0.78	0.47	153	0.49	0.49	3
	TRIB	0.64	0.34	66	----	----	----

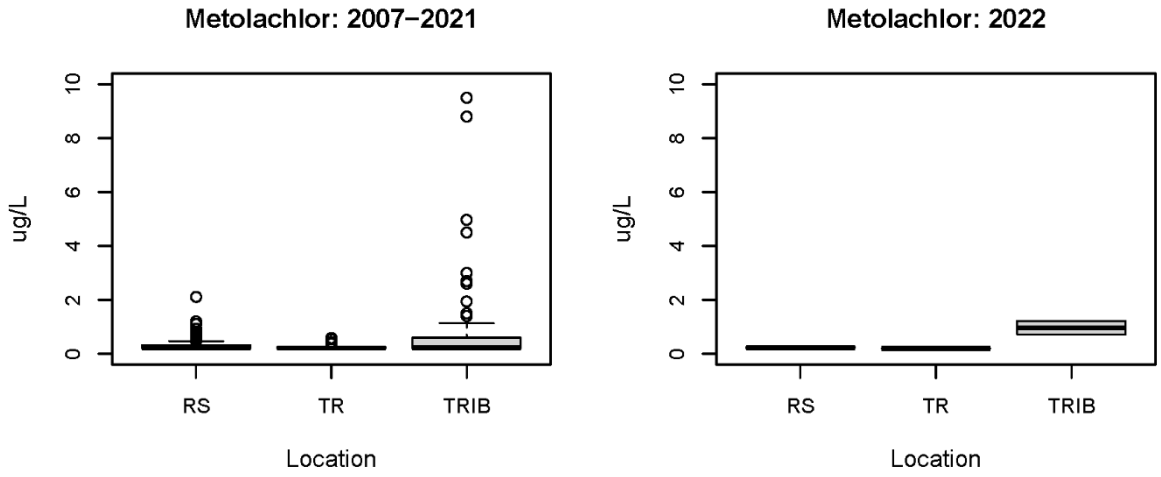
**The standards for iron and manganese were not exceeded in 2022.*



**Red line indicates the standard of 3 ug/L.*

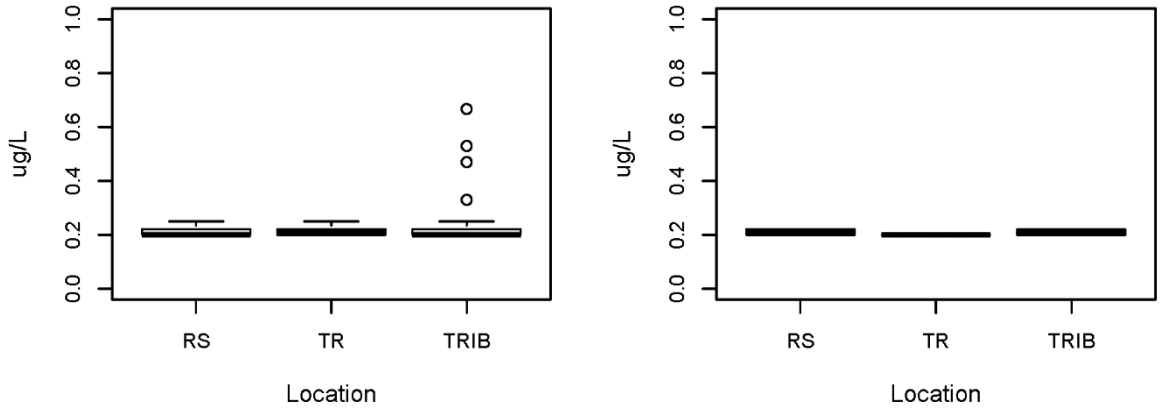
	Historical Reference 2001-2021				2022		
	Location	Mean	Median	n	Mean	Median	n
Atrazine	RS	0.77	0.56	264	0.37	0.36	4
	TR	0.51	0.50	66	0.20	0.20	1
	TRIB	1.23	0.50	127	1.62	1.62	2

**Atrazine was detected but did not exceed the standard in 2022.*



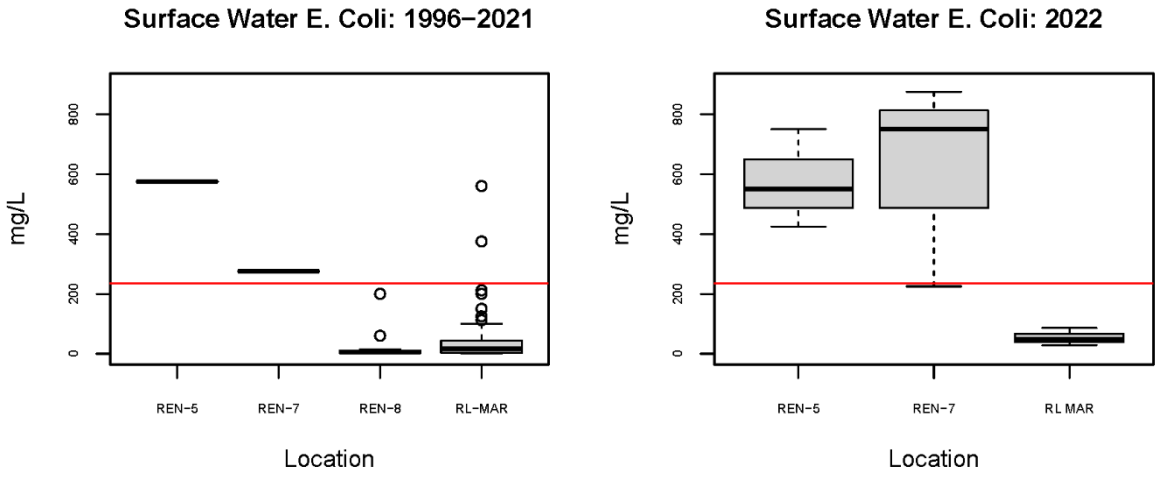
Historical Reference 2007-2021					2022		
	Location	Mean	Median	n	Mean	Median	n
Metolachlor	RS	0.33	0.22	152	0.23	0.22	4
	TR	0.26	0.22	38	0.20	0.20	1
	TRIB	0.84	0.22	74	0.97	0.97	2

**Metolachlor was detected but did not exceed the standard in 2022.*



Historical Reference 1998-2021					2022		
	Location	Mean	Median	n	Mean	Median	n
Metribuzin	RS	0.21	0.20	160	0.21	0.21	4
	TR	0.21	0.21	40	0.20	0.20	1
	TRIB	0.26	0.20	78	0.21	0.21	2

**Metribuzin was detected but did not exceed the standard in 2022.*



**Red line indicates the water quality standard of 235 col per 100 mL.*

	Historical Reference 1996-2021				2022		
	Location	Mean	Median	n	Mean	Median	n
E col	REN-5	575.00	575.00	1	575.00	550.00	3
	REN-7	275.00	275.00	1	616.67	750.00	3
	REN-8	24.92	5.00	13	----	----	----
	RL-MAR	51.85	16.50	52	54.33	48.00	3

**Bacteria levels exceeded the standard in both tributaries in 2022.*

2022 Swimming Beach Bacteria Levels (E. Coli / 100mL)

	Dale Miller		North Marcum		Sandusky	
	Shallow	Deep	Shallow	Deep	Shallow	Deep
5/10/2022	1	1	4.1	2	2	1
5/24/2022	5.2	2	1	1	1	1
6/6/2022	5.2	4.1	1	5.2	2	1
6/21/2022	1	1	1	1	7.5	7.5
7/5/2022	3.1	18.5	6.3	2	5.2	1
7/19/2022					365.4	58.1
7/20/2022	1	1	2	1	1732.9	1
7/21/2022					1	1
8/2/2022	1	3.1	8.4	5.2	198.9	8.6
8/15/2022	3.1	1	2	1	8.5	4.1
8/29/2022	1	1	1	6.3	5.1	1

**Bacteria levels at the swimming beaches were exceeded at Sandusky twice in July.*

DISCUSSION: WATER QUALITY

Water quality metrics assessed by CEMVS can be sporadic and highly variable from year to year, thus long-term data collection using consistent and comparable methodology is critical to identify trends or patterns. In general, conditions observed during 2021 did not deviate far from conditions observed during the reference period (1972-2020); nevertheless, concerns regarding phosphorus, bacteria, and total dissolved solids were evident. In addition, CHL_a and subsequent TSI levels were indicative of a hyper eutrophic system.

TP levels have surpassed the 0.05 mg/L criterion for several years. In 2022 the TP criterion was exceeded at all locations with a mean surface concentration across all sites of 0.18 mg/L compared to the historical mean of 0.23 mg/L. Historical concentrations of TP are higher in the tributaries coming into the lake than the lake or tailrace. Phosphorus is a limiting nutrient for primary producers (algae and plants) due to its relatively low amount in the environment. Higher inputs of TP and NO3-N into the lake contribute to a highly productive environment which stimulates algal growth that can lead to blooms that deplete the oxygen levels during die off. In addition, blooms can sometimes contain toxins which may be harmful to humans and wildlife.

Although there is not a state criterion for CHL_a the proposed standard of 25 mg/cm^3 was exceeded at all the lake sampling locations at least once in 2022. The 2022 surface reservoir mean CHL_a concentration (56.55 mg/cm^3) was greater than twice the historical surface reservoir mean (25.14 mg/cm^3). CHL_a is an indicator of the abundance of phytoplankton. Any water environment with a level recorded above 25 mg/cm^3 is considered to be eutrophic (nutrient enrichment increases algal and plant growth and negative effects). The 2022 TSI level, an average of the individual trophic state indexes for secchi depth, CHL_a, and TP, for Rend Lake was 73.34. Rend Lake is considered hyper-eutrophic based on this TSI level. This does not necessarily mean the water quality is poor, but that its trophic level indicates nutrient levels are abundant, which can support an abundance of plants and algae. Long term monitoring and analyses are important to assess changes in trophic levels over time.

Swimming beach bacteria levels remained below the standard in 2022 with the exception of Sandusky Beach. The standard of 235 col/100 mL was exceeded July 19 and July 20, but returned to normal levels shortly after. In the tributaries, E coli levels were above the standard multiple times while the marina bacteria results were within the standard. Rain and/or high flow occurred immediately before or during the first two sampling events, while the last two events were during low flow. Bacteria levels can be highly variable across time and locations. Bacteria occurs naturally, but is monitored at swimming beaches as required by law to protect human health. Bacteria is monitored at other locations as needed to identify potential leaking septic systems/wastewater treatment or other point and non-point sources. Though those locations may not be designated swimming areas, the public can still be exposed to bacteria. Ongoing monitoring is essential.

Total dissolved solids (TDS) measurements taken by USACE are not analyzed by a lab. They are calculated off of the specific conductivity field sensor, which is based on the level of dissolved salts measured. The reference standard for TDS is the maximum level allowed in drinking water, which is not a recreational water quality standard. However, since Rend lake is used for a drinking water source, it can be a relevant indicator of general water quality. TDS was observed above the standard of 500 mg/L in the tributary REN-5 once in September 2022. Previously, TDS had only been exceeded once before (2018) in the other tributary REN-7. In both the historical data record and the 2022 sampling year TDS is greater in the tributaries than the other locations. These small exceedances are not a major concern, but continued monitoring is important to assess trends over time.

All remaining parameters evaluated during the 2022 water quality monitoring effort were within designated criteria or within historical reference norms.

MONITORING PROGRAM RECOMMENDATIONS

The Illinois Environmental Protection Agency (IEPA, 2020) has listed Rend Lake and its tributaries with multiple water quality impairments. In order to better understand the causes of these impairments the following have been implemented to the current monitoring program: chemical and in-situ data collected downstream of the spillway (previously unsampled), include mercury, PCBs, Aldrin, Dieldrin, Endrin, Heptachlor, Mirex, and Toxaphene for site REN-1, augment current sampling suite at REN-7 (Casey Fork) to include PCBs and mercury, and augment the current sampling suite at site REN-5 (Big Muddy River) as well as all the lake sites to include mercury.

In accordance with EM-1110-2-1201, benthic sediment samples should be taken to monitor and assess potential impacts to aquatic and human health. Sediment sampling and analyses occurred at Rend Lake in 2018, and prior to that in 2007. During these last analyses multiple exceedances over the recommended criteria were observed. Identifying trends over time is much more achievable with more consistent data. Contaminated sediments may have negative impacts on ecological processes. It is recommended, if possible, to sample and analyze for sediment metals and nutrients, as well as grain size analyses yearly or every two years. The next sediment sampling is scheduled for 2024.

Given the hypereutrophic status of Rend Lake Total Nitrogen (TN) has been added to the monitoring program. Similarly, CHL_a has been added to every sample site. Currently CHL_a is only sampled at the lake sites and not the tributaries or lake discharge. This will allow for a trophic status comparison between the tributaries, lake, and discharge.

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APPENDIX A: FIELD DATA

Date	Location	Depth (m)	Temp (°C)	ORP (mV)	Sp Cond (µS/cm)	pH	ODO (% Sat)	ODO (mg/L)	TDS (mg/L)	Turbidity (FNU)	Secchi (in)
6/2/2022	REN-1	1.1	23.0	261.9	259.1	7.98	100	8.55	168	6.67	
6/2/2022	REN-2	1.0	24.5	187.5	257.6	8.82	131	10.95	167	2.76	30
6/2/2022	REN-3	1.0	24.6	196.3	270.9	8.06	103	8.54	176	8.22	23
6/2/2022	REN-4	1.2	24.6	114.8	286.4	7.8	97	8.09	186	9	23
6/2/2022	REN-5	0.3	22.4	301.6	547.9	7.33	44	3.81	356	12.47	
6/2/2022	REN-7	0.6	24.0	162.1	704.5	7.41	69	5.82	458	8.97	
6/2/2022	REN-8	1.1	25.5	206.4	259.3	8.01	103	8.4	169	7.87	20
6/2/2022	RL MAR	0.9	24.3	107.8	257.9	8.76	128	10.74	168	3.54	
7/18/2022	REN-1	0.4	25.9	148.5	282.1	7.53	77	6.24	183	7.19	
7/18/2022	REN-2	1.1	26.1	204.2	277.3	7.85	70	5.7	180	5.64	24
7/18/2022	REN-3	1.1	26.2	151.3	289.1	8.46	70	5.66	188	14.62	14
7/18/2022	REN-4	1.1	26.4	128.5	295.1	8.6	85	6.87	192	14.68	14
7/18/2022	REN-5	1.9	22.6	215.6	179.2	7.21	58	5.03	117	225.37	
7/18/2022	REN-7	0.3	23.1	174.3	187.5	7.46	66	5.68	122	159.17	
7/18/2022	REN-8	1.1	26.9	177.7	276.1	8.63	95	7.6	179	15.51	12
7/18/2022	RL MAR	1.1	25.6	100.2	278.9	7.39	32	2.63	181	4.86	
8/22/2022	REN-1	0.1	24.9	262.2	272.5	7.46	84	6.93	177	7.22	
8/22/2022	REN-2	1.0	25.1	293.4	271.7	7.43	60	4.92	177	5.32	24
8/22/2022	REN-3	1.0	24.7	216.6	270.3	8.39	81	6.74	176	13.33	16
8/22/2022	REN-4	1.1	24.4	211.8	238.9	7.46	59	4.94	155	17.27	18
8/22/2022	REN-5	0.2	20.9	359.7	554.2	7.21	42	3.76	360	12.21	
8/22/2022	REN-7	0.0	22.4	289.9	576.7	7.32	59	5.1	375	7.24	
8/22/2022	REN-8	1.1	25.3	211.7	257.2	8.59	90	7.4	167	13.94	11
8/22/2022	RL MAR	0.9	24.6	188.3	271.9	7.25	32	2.69	177	4.55	
9/28/2022	REN-1	0.5	19.4	222.6	277.5	7.9	93	8.2	180	10.68	
9/28/2022	REN-2	1.0	19.5	178	276.5	8	86	7.91	180	9.65	20
9/28/2022	REN-3	1.0	17.2	147.4	276.2	8.42	92	8.89	180	15.23	14
9/28/2022	REN-4	1.0	17.0	143.6	261	8.72	105	10.12	170	15.96	17
9/28/2022	REN-5	0.2	12.6	301.6	559.3	7.53	59	6.25	364	12.4	

Date	Location	Depth (m)	Temp (°C)	ORP (mV)	Sp Cond (µS/cm)	pH	ODO (% Sat)	ODO (mg/L)	TDS (mg/L)	Turbidity (FNU)	Secchi (in)
9/28/2022	REN-7	0.5	14.2	230.5	773.5	7.58	77	7.86	503	11.23	
9/28/2022	REN-8	1.0	18.0	176.2	277.7	8.76	89	8.38	181	16.36	15
9/28/2022	RL MAR	1.1	18.5	195.4	277.3	7.97	80	7.53	180	12.23	

APPENDIX B: LABORATORY DATA

ARDL Inc.
Environmental | Analytical | Management | Safety

PO Box 1566
400 Aviation Drive
Mt. Vernon, IL 62864
618-244-3235
www.ardlinc.com

Customer Name: SLCOE **Date: 7/1/22**

Project Name: Rend Lake **Lab Name: ARDL, Inc.**

Samples Received at ARDL: 6/2/22 **ARDL Report No.: 8932**

CASE NARRATIVE

Customer Sample No.	Date Collected	Lab ID Number	Analyses Requested
REN-1	6/02/22	8932-01	NP Pesticides, Metals (1), Inorganics (2)(3)
REN-2-0	6/02/22	8932-02	NP Pesticides, Inorganics (2)(3)
REN-2-5	6/02/22	8932-03	Metals (1), Inorganics (2)
REN-3	6/02/22	8932-04	NP Pesticides, Inorganics (2)(3)
REN-4	6/02/22	8932-05	NP Pesticides, Inorganics (2)(3)
REN-5	6/02/22	8932-06	NP Pesticides, Inorganics (2)(3), Chloride, E. Coli
REN-7	6/02/22	8932-07	NP Pesticides, Inorganics (2)(3), E. Coli
REN-8	6/02/22	8932-08	NP Pesticides, Inorganics (2)(3)
REN-15-0	6/02/22	8932-09	NP Pesticides, Inorganics (2)(3)
REN-RL-MAR	6/02/22	8932-10	E. Coli

(1) Including iron and manganese.
(2) Including ammonia*, nitrate, nitrite, TKN*, total phosphorus*, TOC*, TSS and TVSS.
(3) Including chlorophyll-a corrected and pheophytin-a.
* Analyzed by an accredited subcontract laboratory.

The quality control data are summarized as follows:

NP PESTICIDE FRACTION – METHOD 8270-SIM

HOLDING TIME
Samples were prepared and analyzed within method specified holding times.

INITIAL CALIBRATION
The initial calibration passed criteria.

CONTINUING CALIBRATION
The continuing calibration verification (CCV) passed criteria for all analytes.

PREPARATION BLANK
The blank met acceptance criteria.

LABORATORY CONTROL SAMPLE
The LCS analyses met recovery criteria.

MATRIX SPIKE
The matrix spike and matrix spike duplicate met recovery criteria.

DUPLICATE
Duplicate analyses are reported as MS/MSD. RPD of the duplicate analyses met criteria.

CASE NARRATIVE (Continued)

INTERNAL STANDARDS
All internal standard criteria were met.

SURROGATES
All surrogate recovery criteria were met.

INORGANIC FRACTION

PREPARATION BLANK
Results of the preparation blanks were undetected, except for total phosphorus which was detected at the MDL. The data is flagged appropriately with a 'B' qualifier in the associated samples.

LABORATORY CONTROL SAMPLE
Percent recoveries of all LCS analyses were within control limits.

MATRIX SPIKE
Percent recoveries of all matrix spikes and matrix spike duplicates were within control limits, except 2 of 2 for ammonia. The parent sample has been flagged appropriately with a 'J' qualifier. Matrix QC for TOC were performed on a batch specific basis. Please refer to ARDL Report 8931 for these data.

DUPLICATE
All duplicate analyses are reported as MS/MSD except chlorophyll-a corrected, pheophytin-a, TOC, TSS and TVSS. RPD on all duplicate analyses were within control limits, except for pheophytin-a. The parent sample has been flagged appropriately with a 'J' qualifier.

DATA REPORTING QUALIFIERS

The following data reporting qualifiers are used as required:

ND - Indicates parameter was analyzed for but not detected.

J - Indicates an estimated value. This flag is used either when estimating a concentration or this flag indicates analyte(s) associated with a DOD-QSM specified non-compliance pertaining to matrix QC criteria.

B - This flag is used when the analyte is found in the blank as well as the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

REPORT ORGANIZATION

The data in this report appear by sample type (Field sample, preparation blank, laboratory control sample / spike blank, matrix spike /spike duplicate and sample duplicate). Within each sample type the data appear in the order that the analytical methods were discussed in this case narrative. Sample receipt information follows the analytical data.

Release of the data contained in this package has been authorized by the Technical Services Manager or his designee as verified by the following signature.

Dean S. Dickerson
Technical Services Manager

Sample & QC Results

Including as appropriate:

- Field Sample Results
- Batch QC
  - Prep Blank
  - LCS/Spike Blank
- Matrix QC
  - MS/MSD
  - Sample Duplicate

ARDL Data Package 8932

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008932 Report Date: 06/07/2022

Project Name:	REND LAKE	Analysis:	NP PESTICIDES (8270SIM-MOD)
Project No.:		Analytical Method:	8270D
NELAC Certified - IL100308		Prep Method:	3510C

Field ID:	REN-1	ARDL Lab No.:	008932-01
Desc/Location:	REND LAKE	Lab Filename:	E0606205
Sample Date:	06/02/2022	Received Date:	06/02/2022
Sample Time:	1006	Prep. Date:	06/06/2022
Matrix:	WATER	Analysis Date:	06/06/2022
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11491
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	ND		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	ND		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	68%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DoD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008932 Report Date: 06/30/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008932-01 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-1 Sampling Date: 06/02/2022 Moisture: NA
Received: 06/02/2022 Sampling Time: 1006

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500		0.342	MG/L	3010A	6010C	06/06/22	06/07/22	P7776
(a) Manganese	0.00400	0.00500		0.359	MG/L	3010A	6010C	06/06/22	06/07/22	P7776
Ammonia Nitrogen	0.100	0.100		ND	MG/L	NONE	350.1	NA	06/09/22	06146713
Chlorophyll-a, Correcte	1.00	1.00		18.3	MG/CU.M.	10200H	10200H	06/03/22	06/15/22	06176726
Kjeldahl Nitrogen	1.00	1.00		ND	MG/L	351.2	351.2	06/07/22	06/08/22	06146714
Nitrate as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	GREEN	NA	06/15/22	06286777
Nitrite as Nitrogen	0.0200	0.0200		ND	MG/L	NONE	354.1	NA	06/03/22	06216750
Pheophytin-a	1.00	1.00		11.2	MG/CU.M.	10200H	10200H	06/03/22	06/15/22	06176726
Phosphorus	0.0720	0.100	B	0.103	MG/L	365.2	365.2	06/07/22	06/08/22	06146716
Solids, Total Suspended	2.00	2.00		13.6	MG/L	NONE	160.2	NA	06/03/22	06086699
Solids, Volatile Suspen	2.00	2.00		4.0	MG/L	NONE	160.4	NA	06/03/22	06086700
Total Organic Carbon	0.500	1.00		5.8	MG/L	NONE	415.1	NA	06/17/22	06226755

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008932 Report Date: 06/07/2022

Project Name: REND LAKE	Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.:	Analytical Method: 8270D
NELAC Certified - IL100308	Prep Method: 3510C

Field ID:	REN-2-0	ARDL Lab No.:	008932-02
Desc/Location:	REND LAKE	Lab Filename:	E0606208
Sample Date:	06/02/2022	Received Date:	06/02/2022
Sample Time:	1310	Prep. Date:	06/06/2022
Matrix:	WATER	Analysis Date:	06/06/2022
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11491
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.222	0.222	ND		UG/L	1
Atrazine	0.222	0.222	ND		UG/L	1
Metribuzin	0.222	0.222	ND		UG/L	1
Alachlor	0.222	0.222	ND		UG/L	1
Metolachlor	0.222	0.222	ND		UG/L	1
Chlorpyrifos	0.222	0.222	ND		UG/L	1
Cyanazine	0.222	0.222	ND		UG/L	1
Pendimethalin	0.222	0.222	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	65%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DoD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008932 Report Date: 06/30/2022

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008932-02
Field ID: REN-2-0
Received: 06/02/2022

Sampling Loc'n: REND LAKE
Sampling Date: 06/02/2022
Sampling Time: 1310

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.100	0.100		ND	MG/L	NONE	350.1	NA	06/09/22	06146713
Chlorophyll-a, Correcte	1.00	1.00		10.5	MG/CU.M.	10200H	10200H	06/03/22	06/15/22	06176726
Kjeldahl Nitrogen	1.00	1.00		ND	MG/L	351.2	351.2	06/07/22	06/08/22	06146714
Nitrate as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	GREEN	NA	06/15/22	06286777
Nitrite as Nitrogen	0.0200	0.0200		ND	MG/L	NONE	354.1	NA	06/03/22	06216750
Pheophytin-a	1.00	1.00		4.9	MG/CU.M.	10200H	10200H	06/03/22	06/15/22	06176726
Phosphorus	0.0720	0.100	JB	0.081	MG/L	365.2	365.2	06/07/22	06/08/22	06146716
Solids, Total Suspended	1.33	1.33		8.0	MG/L	NONE	160.2	NA	06/03/22	06086699
Solids, Volatile Suspen	1.33	1.33		4.93	MG/L	NONE	160.4	NA	06/03/22	06086700
Total Organic Carbon	0.500	1.00		6.2	MG/L	NONE	415.1	NA	06/17/22	06226755

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008932 Report Date: 06/30/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008932-03 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-2-5 Sampling Date: 06/02/2022 Moisture: NA
Received: 06/02/2022 Sampling Time: 1310

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500		0.285	MG/L	3010A	6010C	06/06/22	06/07/22	P7776
(a) Manganese	0.00400	0.00500		0.286	MG/L	3010A	6010C	06/06/22	06/07/22	P7776
Ammonia Nitrogen	0.100	0.100		ND	MG/L	NONE	350.1	NA	06/09/22	06146713
Kjeldahl Nitrogen	1.00	1.00		ND	MG/L	351.2	351.2	06/07/22	06/08/22	06146714
Nitrate as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	GREEN	NA	06/15/22	06286777
Nitrite as Nitrogen	0.0200	0.0200		ND	MG/L	NONE	354.1	NA	06/03/22	06216750
Phosphorus	0.0720	0.100	JB	0.077	MG/L	365.2	365.2	06/07/22	06/08/22	06146716
Solids, Total Suspended	2.00	2.00		11.8	MG/L	NONE	160.2	NA	06/03/22	06086699
Solids, Volatile Suspen	2.00	2.00		4.2	MG/L	NONE	160.4	NA	06/03/22	06086700
Total Organic Carbon	0.500	1.00		6.0	MG/L	NONE	415.1	NA	06/17/22	06226755

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008932 Report Date: 06/07/2022

Project Name: REND LAKE	Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.:	Analytical Method: 8270D
NELAC Certified - IL100308	Prep Method: 3510C

Field ID:	REN-3	ARDL Lab No.:	008932-04
Desc/Location:	REND LAKE	Lab Filename:	E0606209
Sample Date:	06/02/2022	Received Date:	06/02/2022
Sample Time:	1415	Prep. Date:	06/06/2022
Matrix:	WATER	Analysis Date:	06/06/2022
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11491
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	0.410		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	0.220		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	72%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DoD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008932 Report Date: 06/30/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008932-04 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-3 Sampling Date: 06/02/2022 Moisture: NA
Received: 06/02/2022 Sampling Time: 1415

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.100	0.100		ND	MG/L	NONE	350.1	NA	06/09/22	06146713
Chlorophyll-a, Correcte	1.00	1.00		18.3	MG/CU.M.	10200H	10200H	06/03/22	06/15/22	06176726
Kjeldahl Nitrogen	1.00	1.00		ND	MG/L	351.2	351.2	06/07/22	06/08/22	06146714
Nitrate as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	GREEN	NA	06/15/22	06286777
Nitrite as Nitrogen	0.0200	0.0200		ND	MG/L	NONE	354.1	NA	06/03/22	06216750
Pheophytin-a	1.00	1.00	J	5.5	MG/CU.M.	10200H	10200H	06/03/22	06/15/22	06176726
Phosphorus	0.0720	0.100	JB	0.089	MG/L	365.2	365.2	06/07/22	06/08/22	06146716
Solids, Total Suspended	2.00	2.00		13.6	MG/L	NONE	160.2	NA	06/03/22	06086699
Solids, Volatile Suspen	2.00	2.00		5.2	MG/L	NONE	160.4	NA	06/03/22	06086700
Total Organic Carbon	0.500	1.00		6.6	MG/L	NONE	415.1	NA	06/17/22	06226755

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008932 Report Date: 06/07/2022

Project Name: REND LAKE	Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.:	Analytical Method: 8270D
NELAC Certified - IL100308	Prep Method: 3510C

Field ID:	REN-4	ARDL Lab No.:	008932-05
Desc/Location:	REND LAKE	Lab Filename:	E0606210
Sample Date:	06/02/2022	Received Date:	06/02/2022
Sample Time:	1445	Prep. Date:	06/06/2022
Matrix:	WATER	Analysis Date:	06/06/2022
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11491
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	0.540		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	0.250		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	53%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DoD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008932 Report Date: 06/30/2022

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008932-05
Field ID: REN-4
Received: 06/02/2022

Sampling Loc'n: REND LAKE
Sampling Date: 06/02/2022
Sampling Time: 1445

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.100	0.100	J	ND	MG/L	NONE	350.1	NA	06/09/22	06146713
Chlorophyll-a, Correcte	1.00	1.00		12.0	MG/CU.M.	10200H	10200H	06/03/22	06/15/22	06176726
Kjeldahl Nitrogen	0.500	1.00	J	0.50	MG/L	351.2	351.2	06/07/22	06/08/22	06146714
Nitrate as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	GREEN	NA	06/15/22	06286777
Nitrite as Nitrogen	0.0200	0.0200		ND	MG/L	NONE	354.1	NA	06/03/22	06216750
Pheophytin-a	1.00	1.00		6.5	MG/CU.M.	10200H	10200H	06/03/22	06/15/22	06176726
Phosphorus	0.0720	0.100	JB	0.099	MG/L	365.2	365.2	06/07/22	06/08/22	06146716
Solids, Total Suspended	2.00	2.00		15.0	MG/L	NONE	160.2	NA	06/03/22	06086699
Solids, Volatile Suspen	2.00	2.00		5.6	MG/L	NONE	160.4	NA	06/03/22	06086700
Total Organic Carbon	0.500	1.00		6.9	MG/L	NONE	415.1	NA	06/17/22	06226755

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008932 Report Date: 06/07/2022

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.: Analytical Method: 8270D
NELAC Certified - IL100308 Prep Method: 3510C

Field ID:	REN-5	ARDL Lab No.:	008932-06
Desc/Location:	REND LAKE	Lab Filename:	E0606211
Sample Date:	06/02/2022	Received Date:	06/02/2022
Sample Time:	0900	Prep. Date:	06/06/2022
Matrix:	WATER	Analysis Date:	06/06/2022
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11491
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	1.83		UG/L	1
Metribuzin	0.200	0.200	0.220		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	1.22		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	60%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DoD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008932 Report Date: 06/30/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008932-06 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-5 Sampling Date: 06/02/2022 Moisture: NA
Received: 06/02/2022 Sampling Time: 0900

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.100	0.100		ND	MG/L	NONE	350.1	NA	06/09/22	06146713
Chloride	4.00	5.00		29.7	MG/L	NONE	300.0	NA	06/20/22	06216739
Chlorophyll-a, Correcte	1.00	1.00		1.4	MG/CU.M.	10200H	10200H	06/03/22	06/15/22	06176726
E. Coliform	1.00	1.00		550	COL/100 ML	NONE	1604	NA	06/02/22	06066695
Kjeldahl Nitrogen	1.00	1.00		ND	MG/L	351.2	351.2	06/07/22	06/08/22	06146714
Nitrate as Nitrogen	0.0190	0.0200		0.202	MG/L	NONE	GREEN	NA	06/15/22	06286777
Nitrite as Nitrogen	0.0200	0.0200		0.042	MG/L	NONE	354.1	NA	06/03/22	06216750
Pheophytin-a	1.00	1.00		ND	MG/CU.M.	10200H	10200H	06/03/22	06/15/22	06176726
Phosphorus	0.0720	0.100	B	0.163	MG/L	365.2	365.2	06/07/22	06/08/22	06146716
Solids, Total Suspended	2.00	2.00		17.2	MG/L	NONE	160.2	NA	06/03/22	06086699
Solids, Volatile Suspen	2.00	2.00		2.4	MG/L	NONE	160.4	NA	06/03/22	06086700
Total Organic Carbon	0.500	1.00		8.0	MG/L	NONE	415.1	NA	06/17/22	06226755

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008932 Report Date: 06/07/2022

Project Name:	REND LAKE	Analysis:	NP PESTICIDES (8270SIM-MOD)
Project No.:		Analytical Method:	8270D
NELAC Certified - IL100308		Prep Method:	3510C

Field ID:	REN-7	ARDL Lab No.:	008932-07
Desc/Location:	REND LAKE	Lab Filename:	E0606212
Sample Date:	06/02/2022	Received Date:	06/02/2022
Sample Time:	1605	Prep. Date:	06/06/2022
Matrix:	WATER	Analysis Date:	06/06/2022
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11491
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	1.41		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	0.720		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	59%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DoD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008932 Report Date: 06/30/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008932-07 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-7 Sampling Date: 06/02/2022 Moisture: NA
Received: 06/02/2022 Sampling Time: 1605

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.100	0.100		ND	MG/L	NONE	350.1	NA	06/09/22	06146713
Chlorophyll-a, Correcte	1.00	1.00		1.3	MG/CU.M.	10200H	10200H	06/03/22	06/15/22	06176726
E. Coliform	1.00	1.00		225	COL/100 ML	NONE	1604	NA	06/02/22	06066695
Kjeldahl Nitrogen	0.500	1.00	J	0.50	MG/L	351.2	351.2	06/07/22	06/08/22	06146714
Nitrate as Nitrogen	0.0190	0.0200		0.879	MG/L	NONE	GREEN	NA	06/15/22	06286777
Nitrite as Nitrogen	0.0200	0.0200		0.045	MG/L	NONE	354.1	NA	06/03/22	06216750
Pheophytin-a	1.00	1.00		ND	MG/CU.M.	10200H	10200H	06/03/22	06/15/22	06176726
Phosphorus	0.0720	0.100	B	0.136	MG/L	365.2	365.2	06/07/22	06/08/22	06146716
Solids, Total Suspended	1.33	1.33		19.6	MG/L	NONE	160.2	NA	06/03/22	06086699
Solids, Volatile Suspen	1.33	1.33		2.13	MG/L	NONE	160.4	NA	06/03/22	06086700
Total Organic Carbon	0.500	1.00		6.8	MG/L	NONE	415.1	NA	06/17/22	06226755

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008932 Report Date: 06/07/2022

Project Name:	REND LAKE	Analysis:	NP PESTICIDES (8270SIM-MOD)
Project No.:		Analytical Method:	8270D
NELAC Certified - IL100308		Prep Method:	3510C

Field ID:	REN-8	ARDL Lab No.:	008932-08
Desc/Location:	REND LAKE	Lab Filename:	E0606213
Sample Date:	06/02/2022	Received Date:	06/02/2022
Sample Time:	1345	Prep. Date:	06/06/2022
Matrix:	WATER	Analysis Date:	06/06/2022
Amount Used:	900 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11491
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.222	0.222	ND		UG/L	1
Atrazine	0.222	0.222	0.311		UG/L	1
Metribuzin	0.222	0.222	ND		UG/L	1
Alachlor	0.222	0.222	ND		UG/L	1
Metolachlor	0.222	0.222	ND		UG/L	1
Chlorpyrifos	0.222	0.222	ND		UG/L	1
Cyanazine	0.222	0.222	ND		UG/L	1
Pendimethalin	0.222	0.222	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	63%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DoD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008932 Report Date: 06/30/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008932-08 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-8 Sampling Date: 06/02/2022 Moisture: NA
Received: 06/02/2022 Sampling Time: 1345

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.100	0.100		ND	MG/L	NONE	350.1	NA	06/09/22	06146713
Chlorophyll-a, Correcte	1.00	1.00		22.2	MG/CU.M.	10200H	10200H	06/03/22	06/15/22	06176726
Kjeldahl Nitrogen	0.500	1.00	J	0.70	MG/L	351.2	351.2	06/08/22	06/09/22	06146715
Nitrate as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	GREEN	NA	06/15/22	06286777
Nitrite as Nitrogen	0.0200	0.0200		ND	MG/L	NONE	354.1	NA	06/03/22	06216750
Pheophytin-a	1.00	1.00		11.5	MG/CU.M.	10200H	10200H	06/03/22	06/15/22	06176726
Phosphorus	0.0720	0.100	B	0.121	MG/L	365.2	365.2	06/07/22	06/08/22	06146716
Solids, Total Suspended	2.00	2.00		15.0	MG/L	NONE	160.2	NA	06/03/22	06086699
Solids, Volatile Suspen	2.00	2.00		7.8	MG/L	NONE	160.4	NA	06/03/22	06086700
Total Organic Carbon	0.500	1.00		7.8	MG/L	NONE	415.1	NA	06/17/22	06226755

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008932 Report Date: 06/07/2022

Project Name:	REND LAKE	Analysis:	NP PESTICIDES (8270SIM-MOD)
Project No.:		Analytical Method:	8270D
NELAC Certified - IL100308		Prep Method:	3510C

Field ID:	REN-15-0	ARDL Lab No.:	008932-09
Desc/Location:	REND LAKE	Lab Filename:	E0606214
Sample Date:	06/02/2022	Received Date:	06/02/2022
Sample Time:	1345	Prep. Date:	06/06/2022
Matrix:	WATER	Analysis Date:	06/06/2022
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11491
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	0.390		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	ND		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	63%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DoD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008932 Report Date: 06/30/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008932-09 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-15-0 Sampling Date: 06/02/2022 Moisture: NA
Received: 06/02/2022 Sampling Time: 1345

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.100	0.100		ND	MG/L	NONE	350.1	NA	06/09/22	06146713
Chlorophyll-a, Correcte	1.00	1.00		20.3	MG/CU.M.	10200H	10200H	06/03/22	06/15/22	06176726
Kjeldahl Nitrogen	0.500	1.00	J	0.60	MG/L	351.2	351.2	06/07/22	06/08/22	06146714
Nitrate as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	GREEN	NA	06/15/22	06286777
Nitrite as Nitrogen	0.0200	0.0200		ND	MG/L	NONE	354.1	NA	06/03/22	06216750
Pheophytin-a	1.00	1.00		12.6	MG/CU.M.	10200H	10200H	06/03/22	06/15/22	06176726
Phosphorus	0.0720	0.100	B	0.103	MG/L	365.2	365.2	06/07/22	06/08/22	06146716
Solids, Total Suspended	2.22	2.22		14.4	MG/L	NONE	160.2	NA	06/03/22	06086699
Solids, Volatile Suspen	2.22	2.22		7.56	MG/L	NONE	160.4	NA	06/03/22	06086700
Total Organic Carbon	0.500	1.00		7.7	MG/L	NONE	415.1	NA	06/17/22	06226755

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008932 Report Date: 06/30/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008932-10 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-RL-MAR Sampling Date: 06/02/2022 Moisture: NA
Received: 06/02/2022 Sampling Time: 1515

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
E. Coliform	1.00	1.00		86.0	COL/100 ML	NONE	1604	NA	06/02/22	06066695

(a) DOD and/or NELAC Accredited Analyte.

METHOD BLANK REPORT

ARDL, Inc. 400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008932 Report Date: 06/07/2022

Project Name:	REND LAKE	Analysis:	NP PESTICIDES (8270SIM-MOD)
Project No.:		Analytical Method:	8270D
NELAC Certified - IL100308		Prep Method:	3510C
Field ID:	NA	ARDL Lab No.:	008932-01B1
Desc/Location:	NA	Lab Filename:	E0606203
Sample Date:	NA	Received Date:	NA
Sample Time:	NA	Prep. Date:	06/06/2022
Matrix:	QC Material	Analysis Date:	06/06/2022
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11491
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units
Trifluralin	0.200	0.200	ND		UG/L
Atrazine	0.200	0.200	ND		UG/L
Metribuzin	0.200	0.200	ND		UG/L
Alachlor	0.200	0.200	ND		UG/L
Metolachlor	0.200	0.200	ND		UG/L
Chlorpyrifos	0.200	0.200	ND		UG/L
Cyanazine	0.200	0.200	ND		UG/L
Pendimethalin	0.200	0.200	ND		UG/L

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	78%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DoD and/or NELAC Accredited Analyte.

BLANK SUMMARY REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008932 Report Date: 06/30/2022

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	LOD	LOQ	Blank Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run	QC Lab Number
(a) Iron	0.040	0.050	ND	MG/L	3010A	6010C	06/06/22	06/07/22	P7776	008932-01B1
(a) Manganese	0.004	0.005	ND	MG/L	3010A	6010C	06/06/22	06/07/22	P7776	008932-01B1
Ammonia Nitrogen	0.10	0.10	ND	MG/L	NONE	350.1	NA	06/09/22	06146713	008931-01B1
Chloride	0.80	1.0	ND	MG/L	NONE	300.0	NA	06/20/22	06216739	008932-06B1
Chlorophyll-a, Corre	1.0	1.0	ND	MG/CU.M.	10200H	10200H	06/03/22	06/15/22	06176726	008932-04B1
E. Coliform	1.0	1.0	ND	COL/100 ML	NONE	1604	NA	06/02/22	06066695	008932-06B1
Kjeldahl Nitrogen	1.0	1.0	ND	MG/L	351.2	351.2	06/07/22	06/08/22	06146714	008931-01B1
Kjeldahl Nitrogen	0.50	1.0	ND	MG/L	351.2	351.2	06/08/22	06/09/22	06146715	008932-08B1
Nitrate as Nitrogen	0.019	0.020	ND	MG/L	NONE	GREEN	NA	06/15/22	06286777	008930-01B1
Nitrite as Nitrogen	0.020	0.020	ND	MG/L	NONE	354.1	NA	06/03/22	06216750	008932-01B1
Pheophytin-a	1.0	1.0	ND	MG/CU.M.	10200H	10200H	06/03/22	06/15/22	06176726	008932-04B1
Phosphorus	0.072	0.10	0.072	MG/L	365.2	365.2	06/07/22	06/08/22	06146716	008932-08B1
Solids, Total Suspen	1.0	1.0	ND	MG/L	NONE	160.2	NA	06/03/22	06086699	008932-08B1
Solids, Volatile Sus	1.0	1.0	ND	MG/L	NONE	160.4	NA	06/03/22	06086700	008932-08B1
Total Organic Carbon	0.50	1.0	ND	MG/L	NONE	415.1	NA	06/17/22	06226755	008931-02B1

(a) DOD and/or NELAC Accredited Analyte

Inorganic Method Blanks for 008932

BLANK SPIKE/SPIKE DUPLICATE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008932 Report Date: 06/07/2022

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD) Analytical Method: 8270D
Project No.: Prep Method: 3510C

Matrix: QC Material QC Batch: B11491 Prep. Date: 06/06/2022
Amount Used: 1000 mL Level: LOW Analysis Date: 06/06/2022

Parameter	Spike Result	Spike Level	Spike % Rec	Duplicate Result	Duplicate Level	Duplicate % Rec	Recovery Limits	RPD	RPD Limit
Trifluralin	3.28	4	82	--	--	--	30-130	--	--
Atrazine	3.25	4	81	--	--	--	30-130	--	--
Metribuzin	3.07	4	77	--	--	--	30-130	--	--
Alachlor	3.24	4	81	--	--	--	30-130	--	--
Metolachlor	3.08	4	77	--	--	--	30-130	--	--
Chlorpyrifos	2.95	4	74	--	--	--	30-130	--	--
Cyanazine	3.11	4	78	--	--	--	30-130	--	--
Pendimethalin	2.93	4	73	--	--	--	30-130	--	--

SURROGATE RECOVERIES:	Spike %R	Duplicate %R	%R Limits
Triphenylphosphate	73.5	--	30-130

(a) DoD and/or NELAC Accredited Analyte.
'*' indicates a recovery outside of standard limits.
Spike Blanks for 008932-01, NP PESTICIDES (8270SIM-MOD)

LABORATORY CONTROL SAMPLE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008932 Report Date: 06/30/2022

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	LCS 1 Result	LCS 1 Level	LCS 1 % Rec	LCS 2 Result	LCS 2 Level	LCS 2 % Rec	% Rec Limits	Mean % Rec	Analytical Run	QC Lab Number
(a) Iron	5.3	5.0	105	--	--	--	87-115	--	P7776	008932-01C1
(a) Manganese	0.82	0.75	109	--	--	--	90-114	--	P7776	008932-01C1
Ammonia Nitrogen	0.99	1.0	99	--	--	--	80-120	--	06146713	008931-01C1
Chloride	13.5	14.0	97	--	--	--	90-110	--	06216739	008932-06C1
Kjeldahl Nitrogen	10.4	10.0	104	--	--	--	80-120	--	06146715	008932-08C1
Kjeldahl Nitrogen	10.4	10.0	104	--	--	--	80-120	--	06146714	008931-01C1
Nitrate as Nitrogen	1.0	1.0	101	--	--	--	80-120	--	06286777	008930-01C1
Nitrite as Nitrogen	1.0	1.0	101	--	--	--	80-120	--	06216750	008932-01C1
Phosphorus	1.0	1.0	104	--	--	--	80-120	--	06146716	008932-08C1
Total Organic Carbon	19.3	20.0	97	18.6	20.0	93	76-120	95	06226755	008931-02C1

NOTE: Any values tabulated above marked with an asterisk are outside of acceptable limits.

(a) DOD and/or NELAC Accredited Analyte

MATRIX SPIKE/SPIKE DUPLICATE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008932 Report Date: 06/08/2022

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD) Analytical Method: 8270D
Project No.: Prep Method: 3510C

Field ID:	REN-1	Prep. Date:	06/06/2022	ARDL Lab No.:	008932-01
Desc/Location:	REND LAKE	Amount Used:	1000 mL	Lab Filename:	
Sample Date:	06/02/2022	% Moisture:	NA	Received Date:	06/02/2022
Sample Time:	1006	QC Batch:	B11491	Analysis Date:	06/06/2022
Matrix:	WATER	Level:	LOW		

Parameter	Sample Result	MS Result	MS Level	MS % Rec	MSD Result	MSD Level	MSD % Rec	% Rec Limits	RPD	RPD Limit
Trifluralin	ND	2.91	4	72.8	2.48	4	62	30-130	16	30
Atrazine	ND	3.06	4	76.5	2.36	4	59	30-130	25.8	30
Metribuzin	ND	2.75	4	68.8	2.08	4	52	30-130	27.7	30
Alachlor	ND	2.85	4	71.3	2.44	4	61	30-130	15.5	30
Metolachlor	ND	2.89	4	72.3	2.45	4	61.3	30-130	16.5	30
Chlorpyrifos	ND	2.54	4	63.5	2.22	4	55.5	30-130	13.4	30
Cyanazine	ND	2.78	4	69.5	2.09	4	52.3	30-130	28.3	30
Pendimethalin	ND	2.54	4	63.5	2.16	4	54	30-130	16.2	30

SURROGATE RECOVERIES:	MS %R	MSD %R	%R Limits
Triphenylphosphate	66	56	30-130

(a) DoD and/or NELAC Accredited Analyte.
'nc' indicates sample >4X spike level.
'*' indicates a recovery outside of standard limits.
Matrix Spikes for 008932-01, NP PESTICIDES (8270SIM-MOD)

MATRIX SPIKE/SPIKE DUPLICATE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008932 Report Date: 06/30/2022

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	Sample Matrix	Sample Result	MS Result	MS Level	MS % Rec	MSD Result	MSD Level	MSD % Rec	% Rec Limits	RPD	RPD Limit	Run	QC Lab Number
(a) Iron	WATER	0.34	1.4	1.0	108	1.4	1.0	102	87-115	5	20	P7776	008932-01MS
(a) Manganese	WATER	0.36	0.91	0.50	111	0.88	0.50	104	90-114	3	20	P7776	008932-01MS
Ammonia Nitrogen	WATER	ND	1.2	2.0	61 *	1.2	2.0	62 *	75-125	2	20	06146713	008932-05MS
Chloride	WATER	29.7	37.2	8.0	94	37.9	8.0	103	75-125	2	20	06216739	008932-06MS
Kjeldahl Nitrogen	WATER	J 0.70	9.8	10.0	91	9.7	10.0	90	75-125	1	20	06146715	008932-08MS
Nitrate as Nitrogen	WATER	ND	0.78	1.0	78	0.77	1.0	77	75-125	1	20	06286777	008932-01MS
Nitrite as Nitrogen	WATER	ND	1.0	1.0	100	1.0	1.0	103	75-125	3	20	06216750	008932-01MS
Phosphorus	WATER	0.12	1.1	1.0	93	1.1	1.0	100	75-125	7	20	06146716	008932-08MS

NOTE: Values tabulated above marked with an asterisk are explained in the associated narrative.

(a) DOD and/or NELAC Accredited Analyte.

Inorganic Matrix Spikes for 008932

SAMPLE DUPLICATE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008932 Report Date: 06/30/2022

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	Sample Conc'n	First Duplicate	Second Duplicate	Units	Percent Diff	Mean (Smp,D1,D2)	Analytical Run	QC Lab Number
Chlorophyll-a, Corrected	18.3	21.7	--	MG/CU.M.	17	--	06176726	008932-04D1
Pheophytin-a	5.5	1.3	--	MG/CU.M.	124*	--	06176726	008932-04D1
Solids, Total Suspended	15.0	15.2	--	MG/L	1	--	06086699	008932-08D1
Solids, Volatile Suspend	7.8	8.0	--	MG/L	3	--	06086700	008932-08D1
Total Organic Carbon	6.9	6.9	--	MG/L	0	--	06226755	008932-05D1

* indicates that agreement between duplicates is greater than 20%. See Case Narrative for exceptions.
(a) DOD and/or NELAC Accredited Analyte

[redacted]

Sample Receipt Information

Including as appropriate:

- COCs
- Cooler Receipts
- Airbills
- Email Communication / Instructions from Customer

ARDL, Inc.

P.O. Box 1566, 400 Aviation Drive, Mt. Vernon, IL 62864
(618) 244-3235 Phone (618) 244-1149 Fax

8932

CHAIN OF CUSTODY RECORD

PROJECT: Rend Lake

SAMPLERS: (Signature) Kaleb Rakers, Ocala Kern

SAMPLE NUMBER	DATE	TIME	COMP	GRAB	NO. OF CONTAINERS	TSS, TVSS, *NO2-N	Chloro/Pheo, *TOC, T-PO4	TKN	*NO3-N, NH3-N	NP Pest	#T.Fe; T.Mn	E. coli	MS/MSD	Chloride				REMARKS OR SAMPLE LOCATION	PRESERVATION: ICED	PRESERVATION: SPECIFY CHEMICALS ADDED AND FINAL pH IF KNOWN
Ren – 1	6/2	1006		x		X	X	X	X	X	X	X		X					X	
Ren – 2 – 0	6/2	1310		x		X	X	X	X	X	X								X	
Ren – 2 – 5	6/2	1310		x		X		X	X	X		X							X	
Ren – 3	6/2	1415		x		X	X	X	X	X	X								X	
Ren – 4	6/2	1445		x		X	X	X	X	X	X								X	
Ren – 5	6/2/22	0900		x		X	X	X	X	X	X		X		X				X	
Ren – 7	6/2	1605		x		X	X	X	X	X	X		X						X	
Ren – 8	6/2	1345		x		X	X	X	X	X	X								X	
Ren – 15- 0	6/2	1345		x		X	X	X	X	X	X								X	
Ren-RL-Mar	6/2	1515		x									X						X	

	Date	Time		
Relinquished by: (Signature) Kaleb Rakers	6/2	1615	Received by: (Signature) Jordan Wilkerson	REMARKS/SPECIAL INSTRUCTIONS:
Relinquished by: (Signature) Jordan Wilkerson	6/2	1635	Received by: (Signature)	*Preserved with H_2SO_4 #Preserved with HNO_3
Received for Laboratory by: (Signature) Allen Brenneman	06/02/22	1635	Shipping Ticket No.	

PURCHASE ORDER NO: _____

COOLER RECEIPT REPORT
ARDL, INC.

ARDL #: 8932 Cooler # Blue 1

Number of Coolers in Shipment: 2

Project: Rend Lake Date Received: 06/02/2022

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened 06/02/2022 (Signature) DCB

1. Did cooler come with a shipping slip (airbill, etc.)? ..... YES (NO)
   If YES, enter carrier name and airbill number here: ARDL Courier - Jordan W.
2. Were custody seals on outside of cooler? ..... YES NO (N/A)
   How many and where? _____, Seal Date: _____, Seal Name: _____
3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)
4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO
5. Were custody papers sealed in a plastic bag? Hand delivered ..... YES (NO)
6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A
7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A
8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A
9. Was a separate container provided for measuring temperature? YES____ NO✓ Observed Cooler Temp. 3.8 C
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 06/02/2022 (Signature) DCB

10. Describe type of packing in cooler: Loose Ice
11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A
12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO
13. Were sample labels complete? ..... (YES) NO
14. Did all sample labels agree with custody papers? ..... (YES) NO
15. Were correct containers used for the tests indicated? ..... (YES) NO
16. Was pH correct on preserved water samples? ..... (YES) NO N/A
17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO
18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)
19. Was the ARDL project coordinator notified of any deficiencies? ..... (YES) NO N/A

Comments and/or Corrective Action:
2 containers not listed on chain; both ecoli for samples Ren-5 and Ren-7 respectively.
(By: Signature) DCB Date 06/02/2022

Sample Transfer	
Fraction: All	Fraction:
Area #: Walk-In	Area #:
By: DCB	By:
On: 06/02/2022	On:

Chain-of-Custody # _____

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COOLER RECEIPT REPORT
ARDL, INC.

ARDL #: 8932 Cooler # Blue 2

Number of Coolers in Shipment: 2

Project: Rend Lake Date Received: 06/02/2022

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 06/02/2022 (Signature) DCB

1. Did cooler come with a shipping slip (airbill, etc.)? ..... YES (NO)
   If YES, enter carrier name and airbill number here: ARDL Courier - Jordan W.
2. Were custody seals on outside of cooler? ..... YES NO (N/A)
   How many and where? ____, Seal Date: ____, Seal Name: ____
3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)
4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO
5. Were custody papers sealed in a plastic bag? Hand delivered ..... YES (NO)
6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A
7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A
8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A
9. Was a separate container provided for measuring temperature? YES ____ NO ✓ Observed Cooler Temp. 2.6 C
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 06/02/2022 (Signature) DCB

10. Describe type of packing in cooler: Loose Ice
11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A
12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO
13. Were sample labels complete? ..... (YES) NO
14. Did all sample labels agree with custody papers? ..... (YES) NO
15. Were correct containers used for the tests indicated? ..... (YES) NO
16. Was pH correct on preserved water samples? ..... (YES) NO N/A
17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO
18. Were bubbles absent in VOA samples? If NO, list by sample #: ____ YES NO (N/A)
19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

Comments and/or Corrective Action:
(By: Signature) Date:

Sample Transfer	
Fraction: All	Fraction:
Area #: Walk-In	Area #:
By: DCB	By:
On: 06/02/2022	On:

Chain-of-Custody # ____

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PO Box 1566
400 Aviation Drive
Mt. Vernon, IL 62864
618-244-3235
www.ardlinc.com

Environmental | Analytical | Management | Safety

Customer Name: SLCOE **Date: 8/17/2022**

Project Name: Rend Lake **Lab Name: ARDL, Inc.**

Samples Received at ARDL: 07/18/2022 **ARDL Report No.: 8944**

CASE NARRATIVE

Customer Sample No.	Date Collected	Lab ID Number	Analyses Requested
REN-1	7/18/22	8944-01	NP Pesticides, Metals(1), Inorganics(2)(3)
REN-2-0	7/18/22	8944-02	NP Pesticides, Inorganics(2)(3)
REN-2-5	7/18/22	8944-03	Metals(1), Inorganics(2)
REN-3	7/18/22	8944-04	NP Pesticides, Inorganics(2)(3)
REN-4	7/18/22	8944-05	NP Pesticides, Inorganics(2)(3)
REN-5	7/18/22	8944-06	NP Pesticides, Inorganics(2)(3), E Coli, Chloride
REN-7	7/18/22	8944-07	NP Pesticides, Inorganics(2)(3), E Coli
REN-8	7/18/22	8944-08	NP Pesticides, Inorganics(2)(3)
REN-15-0	7/18/22	8944-09	NP Pesticides, Inorganics(2)(3)
REN-RL-MAR	7/18/22	8944-10	E Coli

(1) Including iron and manganese.
(2) Including ammonia*, nitrate, nitrite, total phosphorus*, TKN*, TOC*, TSS and TVSS.
(3) Including chlorophyll-a corrected and pheophytin-a.
* Analyzed by an accredited subcontract laboratory.

The quality control data are summarized as follows:

NP PESTICIDE FRACTION – METHOD 8270-SIM

HOLDING TIME
Samples were prepared and analyzed within method specified holding times.

INITIAL CALIBRATION
The initial calibration passed criteria.

CONTINUING CALIBRATION
The continuing calibration verification (CCV) passed criteria for all analytes.

PREPARATION BLANK
The blank met acceptance criteria.

LABORATORY CONTROL SAMPLE
The LCS analyses met recovery criteria.

MATRIX SPIKE
The matrix spike and matrix spike duplicate met recovery criteria.

DUPLICATE
Duplicate analyses are reported as MS/MSD. RPD of the duplicate analyses met criteria.

CASE NARRATIVE (Continued)

INTERNAL STANDARDS
All internal standard criteria were met.

SURROGATES
All surrogate recovery criteria were met.

INORGANIC FRACTION

PREPARATION BLANK
Results of the preparation blanks were undetected.

LABORATORY CONTROL SAMPLE
Percent recoveries of all LCS analyses were within control limits.

MATRIX SPIKE
Percent recoveries of all matrix spikes and matrix spike duplicates were within control limits, except 2 of 2 for ammonia. The parent sample has been flagged appropriately with a 'J' qualifier.

DUPLICATE
All duplicate analyses are reported as MS/MSD except chlorophyll-a corrected, pheophytin-a, TSS and TVSS. RPD on all duplicate analyses were within control limits, except chlorophyll-a corrected, pheophytin-a. The parent sample has been flagged appropriately with a 'J' qualifier.

DATA REPORTING QUALIFIERS

The following data reporting qualifiers are used as required:

ND - Indicates parameter was analyzed for but not detected.

J - Indicates an estimated value. This flag is used either when estimating a concentration or this flag indicates analyte(s) associated with a DOD-QSM specified non-compliance pertaining to matrix QC criteria.

REPORT ORGANIZATION

The data in this report appear by sample type (Field sample, preparation blank, laboratory control sample / spike blank, matrix spike /spike duplicate and sample duplicate). Within each sample type the data appear in the order that the analytical methods were discussed in this case narrative. Sample receipt information follows the analytical data.

Release of the data contained in this package has been authorized by the Technical Services Manager or his designee as verified by the following signature.

Dean S. Dickerson
Technical Services Manager

[redacted]

Sample & QC Results

Including as appropriate:

- Field Sample Results
- Batch QC
  - Prep Blank
  - LCS/Spike Blank
- Matrix QC
  - MS/MSD
  - Sample Duplicate

ARDL Data Package 8944

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008944 Report Date: 08/04/2022

Project Name: REND LAKE	Analysis: NP PESTICIDES (8270SIM-MOD)
Project No.:	Analytical Method: 8270D
NELAC Certified - IL100308	Prep Method: 3510C

Field ID:	REN-1	ARDL Lab No.:	008944-01
Desc/Location:	REND LAKE	Lab Filename:	E0803205
Sample Date:	07/18/2022	Received Date:	07/18/2022
Sample Time:	1252	Prep. Date:	07/19/2022
Matrix:	WATER	Analysis Date:	08/03/2022
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11502
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	ND		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	ND		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	47%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DoD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008944 Report Date: 08/16/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008944-01 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-1 Sampling Date: 07/18/2022 Moisture: NA
Received: 07/18/2022 Sampling Time: 1252

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500		0.276	MG/L	3010A	6010C	07/25/22	07/27/22	P7794
(a) Manganese	0.00400	0.00500		0.771	MG/L	3010A	6010C	07/25/22	07/27/22	P7794
Ammonia Nitrogen	0.0500	0.200	J	0.163	MG/L	NONE	350.1	NA	08/01/22	R315153
Chlorophyll-a, Correcte	1.00	1.00		30.3	MG/CU.M.	10200H	10200H	07/19/22	07/20/22	07226872
Kjeldahl Nitrogen	0.480	1.00		1.0	MG/L	351.2	351.2	07/25/22	07/26/22	194960
Nitrate as Nitrogen	0.0190	0.0200		0.053	MG/L	NONE	GREEN	NA	07/19/22	07226888
Nitrite as Nitrogen	0.0190	0.0190		ND	MG/L	NONE	354.1	NA	07/19/22	07226889
Pheophytin-a	1.00	1.00		15.2	MG/CU.M.	10200H	10200H	07/19/22	07/20/22	07226872
Phosphorus	0.0660	0.100		0.227	MG/L	365.4	365.4	07/25/22	07/26/22	194958
Solids, Total Suspended	3.70	3.70		11.1	MG/L	NONE	160.2	NA	07/19/22	07256891
Solids, Volatile Suspen	3.70	3.70		4.44	MG/L	NONE	160.4	NA	07/19/22	07256892
Total Organic Carbon	0.400	1.00		5.6	MG/L	NONE	9060	NA	07/26/22	R314934

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008944 Report Date: 08/04/2022

Project Name:	REND LAKE	Analysis:	NP PESTICIDES (8270SIM-MOD)
Project No.:		Analytical Method:	8270D
NELAC Certified - IL100308		Prep Method:	3510C

Field ID:	REN-2-0	ARDL Lab No.:	008944-02
Desc/Location:	REND LAKE	Lab Filename:	E0803208
Sample Date:	07/18/2022	Received Date:	07/18/2022
Sample Time:	1020	Prep. Date:	07/19/2022
Matrix:	WATER	Analysis Date:	08/03/2022
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11502
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	ND		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	ND		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	54%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DoD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008944 Report Date: 08/16/2022

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008944-02
Field ID: REN-2-0
Received: 07/18/2022

Sampling Loc'n: REND LAKE
Sampling Date: 07/18/2022
Sampling Time: 1020

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0500	0.200		ND	MG/L	NONE	350.1	NA	08/01/22	R315153
Chlorophyll-a, Correcte	1.00	1.00		47.4	MG/CU.M.	10200H	10200H	07/19/22	07/20/22	07226872
Kjeldahl Nitrogen	0.480	1.00		1.0	MG/L	351.2	351.2	07/25/22	07/26/22	194960
Nitrate as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	GREEN	NA	07/19/22	07226888
Nitrite as Nitrogen	0.0190	0.0190		ND	MG/L	NONE	354.1	NA	07/19/22	07226889
Pheophytin-a	1.00	1.00		10.1	MG/CU.M.	10200H	10200H	07/19/22	07/20/22	07226872
Phosphorus	0.0660	0.100		0.186	MG/L	365.4	365.4	07/25/22	07/26/22	194958
Solids, Total Suspended	2.94	2.94		7.06	MG/L	NONE	160.2	NA	07/19/22	07256891
Solids, Volatile Suspen	2.94	2.94		5.29	MG/L	NONE	160.4	NA	07/19/22	07256892
Total Organic Carbon	0.400	1.00		5.69	MG/L	NONE	9060	NA	07/26/22	R314934

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008944 Report Date: 08/16/2022

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008944-03
Field ID: REN-2-5
Received: 07/18/2022

Sampling Loc'n: REND LAKE
Sampling Date: 07/18/2022
Sampling Time: 1014

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500		0.112	MG/L	3010A	6010C	07/25/22	07/27/22	P7794
(a) Manganese	0.00400	0.00500		0.383	MG/L	3010A	6010C	07/25/22	07/27/22	P7794
Ammonia Nitrogen	0.0500	0.200		ND	MG/L	NONE	350.1	NA	08/01/22	R315153
Kjeldahl Nitrogen	0.480	1.00	J	0.90	MG/L	351.2	351.2	07/25/22	07/26/22	194963
Nitrate as Nitrogen	0.0190	0.0200		0.027	MG/L	NONE	GREEN	NA	07/19/22	07226888
Nitrite as Nitrogen	0.0190	0.0190		ND	MG/L	NONE	354.1	NA	07/19/22	07226889
Phosphorus	0.0660	0.100		0.161	MG/L	365.4	365.4	07/25/22	07/26/22	194962
Solids, Total Suspended	4.00	4.00		7.6	MG/L	NONE	160.2	NA	07/19/22	07256891
Solids, Volatile Suspen	4.00	4.00		4.8	MG/L	NONE	160.4	NA	07/19/22	07256892
Total Organic Carbon	0.400	1.00		5.8	MG/L	NONE	9060	NA	07/26/22	R314934

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008944 Report Date: 08/04/2022

Project Name:	REND LAKE	Analysis:	NP PESTICIDES (8270SIM-MOD)
Project No.:		Analytical Method:	8270D
NELAC Certified - IL100308		Prep Method:	3510C

Field ID:	REN-3	ARDL Lab No.:	008944-04
Desc/Location:	REND LAKE	Lab Filename:	E0803209
Sample Date:	07/18/2022	Received Date:	07/18/2022
Sample Time:	1120	Prep. Date:	07/19/2022
Matrix:	WATER	Analysis Date:	08/03/2022
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11502
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	0.420		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	ND		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	56%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DoD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008944 Report Date: 08/16/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008944-04 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-3 Sampling Date: 07/18/2022 Moisture: NA
Received: 07/18/2022 Sampling Time: 1120

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0500	0.200		ND	MG/L	NONE	350.1	NA	08/01/22	R315153
Chlorophyll-a, Correcte	1.00	1.00		81.9	MG/CU.M.	10200H	10200H	07/19/22	07/20/22	07226872
Kjeldahl Nitrogen	0.480	1.00		1.4	MG/L	351.2	351.2	07/25/22	07/26/22	194963
Nitrate as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	GREEN	NA	07/19/22	07226888
Nitrite as Nitrogen	0.0190	0.0190		ND	MG/L	NONE	354.1	NA	07/19/22	07226889
Pheophytin-a	1.00	1.00		18.9	MG/CU.M.	10200H	10200H	07/19/22	07/20/22	07226872
Phosphorus	0.0660	0.100		0.253	MG/L	365.4	365.4	07/25/22	07/26/22	194962
Solids, Total Suspended	4.00	4.00		20.4	MG/L	NONE	160.2	NA	07/19/22	07256891
Solids, Volatile Suspen	4.00	4.00		12.0	MG/L	NONE	160.4	NA	07/19/22	07256892
Total Organic Carbon	0.400	1.00		7.4	MG/L	NONE	9060	NA	07/26/22	R314934

(a) DOD and/or NELAC Accredited Analyte.

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Mt. Vernon, Illinois 62864

Lab Report No: 008944 Report Date: 08/04/2022

Project Name:	REND LAKE	Analysis:	NP PESTICIDES (8270SIM-MOD)
Project No.:		Analytical Method:	8270D
NELAC Certified - IL100308		Prep Method:	3510C

Field ID:	REN-4	ARDL Lab No.:	008944-05
Desc/Location:	REND LAKE	Lab Filename:	E0803210
Sample Date:	07/18/2022	Received Date:	07/18/2022
Sample Time:	1145	Prep. Date:	07/19/2022
Matrix:	WATER	Analysis Date:	08/03/2022
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11502
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	0.530		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	ND		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	64%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DoD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008944 Report Date: 08/16/2022

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008944-05
Field ID: REN-4
Received: 07/18/2022

Sampling Loc'n: REND LAKE
Sampling Date: 07/18/2022
Sampling Time: 1145

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0500	0.200		ND	MG/L	NONE	350.1	NA	08/01/22	R315153
Chlorophyll-a, Correcte	1.00	1.00		92.8	MG/CU.M.	10200H	10200H	07/19/22	07/20/22	07226872
Kjeldahl Nitrogen	0.480	1.00		1.6	MG/L	351.2	351.2	07/25/22	07/26/22	194963
Nitrate as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	GREEN	NA	07/19/22	07226888
Nitrite as Nitrogen	0.0190	0.0190		ND	MG/L	NONE	354.1	NA	07/19/22	07226889
Pheophytin-a	1.00	1.00		38.6	MG/CU.M.	10200H	10200H	07/19/22	07/20/22	07226872
Phosphorus	0.0660	0.100		0.301	MG/L	365.4	365.4	07/25/22	07/26/22	194962
Solids, Total Suspended	4.55	4.55		21.8	MG/L	NONE	160.2	NA	07/19/22	07256891
Solids, Volatile Suspen	4.55	4.55		12.7	MG/L	NONE	160.4	NA	07/19/22	07256892
Total Organic Carbon	0.400	1.00		7.8	MG/L	NONE	9060	NA	07/26/22	R314934

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008944 Report Date: 08/04/2022

Project Name:	REND LAKE	Analysis:	NP PESTICIDES (8270SIM-MOD)
Project No.:		Analytical Method:	8270D
NELAC Certified - IL100308		Prep Method:	3510C

Field ID:	REN-5	ARDL Lab No.:	008944-06
Desc/Location:	REND LAKE	Lab Filename:	E0803211
Sample Date:	07/18/2022	Received Date:	07/18/2022
Sample Time:	0905	Prep. Date:	07/19/2022
Matrix:	WATER	Analysis Date:	08/03/2022
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11502
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	ND		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	2.73		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	50%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DoD and/or NELAC Accredited Analyte.

ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 008944 Report Date: 08/16/2022

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008944-06
Field ID: REN-5
Received: 07/18/2022

Sampling Loc'n: REND LAKE
Sampling Date: 07/18/2022
Sampling Time: 0905

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0500	0.200	J	0.070	MG/L	NONE	350.1	NA	08/01/22	R315153
Chloride	0.800	1.00		7.46	MG/L	NONE	300.0	NA	08/03/22	08046925
Chlorophyll-a, Correcte	1.00	1.00	J	11.3	MG/CU.M.	10200H	10200H	07/19/22	07/20/22	07226872
E. Coliform	1.00	1.00		10.1	COL/100 ML	NONE	1604	NA	07/18/22	07206867
Kjeldahl Nitrogen	0.480	1.00		1.42	MG/L	351.2	351.2	07/25/22	07/26/22	194963
Nitrate as Nitrogen	0.0190	0.0200		0.298	MG/L	NONE	GREEN	NA	07/19/22	07226888
Nitrite as Nitrogen	0.0190	0.0190		0.023	MG/L	NONE	354.1	NA	07/19/22	07226889
Pheophytin-a	1.00	1.00	J	4.5	MG/CU.M.	10200H	10200H	07/19/22	07/20/22	07226872
Phosphorus	0.0660	0.100		0.54	MG/L	365.4	365.4	07/25/22	07/26/22	194962
Solids, Total Suspended	16.7	16.7		348	MG/L	NONE	160.2	NA	07/19/22	07256891
Solids, Volatile Suspen	16.7	16.7		18.3	MG/L	NONE	160.4	NA	07/19/22	07256892
Total Organic Carbon	0.400	1.00		8.5	MG/L	NONE	9060	NA	07/26/22	R314934

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ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008944 Report Date: 08/04/2022

Project Name:	REND LAKE	Analysis:	NP PESTICIDES (8270SIM-MOD)
Project No.:		Analytical Method:	8270D
NELAC Certified - IL100308		Prep Method:	3510C

Field ID:	REN-7	ARDL Lab No.:	008944-07
Desc/Location:	REND LAKE	Lab Filename:	E0803212
Sample Date:	07/18/2022	Received Date:	07/18/2022
Sample Time:	1355	Prep. Date:	07/19/2022
Matrix:	WATER	Analysis Date:	08/03/2022
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11502
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	0.350		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	0.700		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	66%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DoD and/or NELAC Accredited Analyte.

ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 008944 Report Date: 08/16/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008944-07 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-7 Sampling Date: 07/18/2022 Moisture: NA
Received: 07/18/2022 Sampling Time: 1355

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0500	0.200	J	0.10	MG/L	NONE	350.1	NA	08/01/22	R315153
Chlorophyll-a, Correcte	1.00	1.00		6.7	MG/CU.M.	10200H	10200H	07/19/22	07/20/22	07226872
E. Coliform	1.00	1.00		12100	COL/100 ML	NONE	1604	NA	07/18/22	07206867
Kjeldahl Nitrogen	0.480	1.00		1.3	MG/L	351.2	351.2	07/25/22	07/26/22	194963
Nitrate as Nitrogen	0.0190	0.0200		1.13	MG/L	NONE	GREEN	NA	07/19/22	07226888
Nitrite as Nitrogen	0.0190	0.0190		0.039	MG/L	NONE	354.1	NA	07/19/22	07226889
Pheophytin-a	1.00	1.00		ND	MG/CU.M.	10200H	10200H	07/19/22	07/20/22	07226872
Phosphorus	0.0660	0.100		0.384	MG/L	365.4	365.4	07/25/22	07/26/22	194962
Solids, Total Suspended	11.1	11.1		203	MG/L	NONE	160.2	NA	07/19/22	07256891
Solids, Volatile Suspen	11.1	11.1		13.3	MG/L	NONE	160.4	NA	07/19/22	07256892
Total Organic Carbon	0.400	1.00		8.2	MG/L	NONE	9060	NA	07/26/22	R314934

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008944 Report Date: 08/04/2022

Project Name:	REND LAKE	Analysis:	NP PESTICIDES (8270SIM-MOD)
Project No.:		Analytical Method:	8270D
NELAC Certified - IL100308		Prep Method:	3510C

Field ID:	REN-8	ARDL Lab No.:	008944-08
Desc/Location:	REND LAKE	Lab Filename:	E0803213
Sample Date:	07/18/2022	Received Date:	07/18/2022
Sample Time:	1050	Prep. Date:	07/19/2022
Matrix:	WATER	Analysis Date:	08/03/2022
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11502
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	0.480		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	ND		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	74%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DoD and/or NELAC Accredited Analyte.

ARDL, INC.
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Mt. Vernon, Illinois 62864

Lab Report No: 008944 Report Date: 08/16/2022

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008944-08
Field ID: REN-8
Received: 07/18/2022

Sampling Loc'n: REND LAKE
Sampling Date: 07/18/2022
Sampling Time: 1050

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0500	0.200		ND	MG/L	NONE	350.1	NA	08/01/22	R315153
Chlorophyll-a, Correcte	1.00	1.00		115	MG/CU.M.	10200H	10200H	07/19/22	07/20/22	07226872
Kjeldahl Nitrogen	0.480	1.00		1.6	MG/L	351.2	351.2	07/25/22	07/26/22	194963
Nitrate as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	GREEN	NA	07/19/22	07226888
Nitrite as Nitrogen	0.0190	0.0190		ND	MG/L	NONE	354.1	NA	07/19/22	07226889
Pheophytin-a	1.00	1.00		38.1	MG/CU.M.	10200H	10200H	07/19/22	07/20/22	07226872
Phosphorus	0.0660	0.100		0.208	MG/L	365.4	365.4	07/25/22	07/26/22	194962
Solids, Total Suspended	5.26	5.26		24.2	MG/L	NONE	160.2	NA	07/19/22	07256891
Solids, Volatile Suspen	5.26	5.26		11.1	MG/L	NONE	160.4	NA	07/19/22	07256892
Total Organic Carbon	0.400	1.00		7.7	MG/L	NONE	9060	NA	07/26/22	R314934

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008944 Report Date: 08/04/2022

Project Name:	REND LAKE	Analysis:	NP PESTICIDES (8270SIM-MOD)
Project No.:		Analytical Method:	8270D
NELAC Certified - IL100308		Prep Method:	3510C

Field ID:	REN-15-0	ARDL Lab No.:	008944-09
Desc/Location:	REND LAKE	Lab Filename:	E0803214
Sample Date:	07/18/2022	Received Date:	07/18/2022
Sample Time:	1109	Prep. Date:	07/19/2022
Matrix:	WATER	Analysis Date:	08/03/2022
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11502
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units	Dilution Factor
Trifluralin	0.200	0.200	ND		UG/L	1
Atrazine	0.200	0.200	0.510		UG/L	1
Metribuzin	0.200	0.200	ND		UG/L	1
Alachlor	0.200	0.200	ND		UG/L	1
Metolachlor	0.200	0.200	ND		UG/L	1
Chlorpyrifos	0.200	0.200	ND		UG/L	1
Cyanazine	0.200	0.200	ND		UG/L	1
Pendimethalin	0.200	0.200	ND		UG/L	1

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	71%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DoD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008944 Report Date: 08/16/2022

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008944-09
Field ID: REN-15-0
Received: 07/18/2022

Sampling Loc'n: REND LAKE
Sampling Date: 07/18/2022
Sampling Time: 1109

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0500	0.200		ND	MG/L	NONE	350.1	NA	08/01/22	R315153
Chlorophyll-a, Correcte	1.00	1.00		81.1	MG/CU.M.	10200H	10200H	07/19/22	07/20/22	07226872
Kjeldahl Nitrogen	0.480	1.00		1.3	MG/L	351.2	351.2	07/25/22	07/26/22	194963
Nitrate as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	GREEN	NA	07/19/22	07226888
Nitrite as Nitrogen	0.0190	0.0190		ND	MG/L	NONE	354.1	NA	07/19/22	07226889
Pheophytin-a	1.00	1.00		26.8	MG/CU.M.	10200H	10200H	07/19/22	07/20/22	07226872
Phosphorus	0.0660	0.100		0.244	MG/L	365.4	365.4	07/25/22	07/26/22	194962
Solids, Total Suspended	4.00	4.00		20.4	MG/L	NONE	160.2	NA	07/19/22	07256891
Solids, Volatile Suspen	4.00	4.00		11.6	MG/L	NONE	160.4	NA	07/19/22	07256892
Total Organic Carbon	0.400	1.00		7.8	MG/L	NONE	9060	NA	07/26/22	R314934

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008944 Report Date: 08/16/2022

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008944-10
Field ID: REN-RL-MAR
Received: 07/18/2022

Sampling Loc'n: REND LAKE
Sampling Date: 07/18/2022
Sampling Time: 1210

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
E. Coliform	1.00	1.00		70.0	COL/100 ML	NONE	1604	NA	07/18/22	07206867

(a) DOD and/or NELAC Accredited Analyte.

METHOD BLANK REPORT

ARDL, Inc. 400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008944 Report Date: 08/04/2022

Project Name:	REND LAKE	Analysis:	NP PESTICIDES (8270SIM-MOD)
Project No.:		Analytical Method:	8270D
NELAC Certified - IL100308		Prep Method:	3510C
Field ID:	NA	ARDL Lab No.:	008944-01B1
Desc/Location:	NA	Lab Filename:	E0803203
Sample Date:	NA	Received Date:	NA
Sample Time:	NA	Prep. Date:	07/19/2022
Matrix:	QC Material	Analysis Date:	08/03/2022
Amount Used:	1000 mL	Instrument ID:	AG5
Final Volume:	1 mL	QC Batch:	B11502
% Moisture:	NA	Level:	LOW

Parameter	LOD	LOQ	Result	Data Flag	Units
Trifluralin	0.200	0.200	ND		UG/L
Atrazine	0.200	0.200	ND		UG/L
Metribuzin	0.200	0.200	ND		UG/L
Alachlor	0.200	0.200	ND		UG/L
Metolachlor	0.200	0.200	ND		UG/L
Chlorpyrifos	0.200	0.200	ND		UG/L
Cyanazine	0.200	0.200	ND		UG/L
Pendimethalin	0.200	0.200	ND		UG/L

SURROGATE RECOVERIES:	Limits	Results
Triphenylphosphate	30-130	96%

Surrogate recoveries marked with '*' indicates they are outside standard limits.

(a) DoD and/or NELAC Accredited Analyte.

BLANK SUMMARY REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008944 Report Date: 08/16/2022

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	LOD	LOQ	Blank Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run	QC Lab Number
(a) Iron	0.040	0.050	ND	MG/L	3010A	6010C	07/25/22	07/27/22	P7794	008944-01B1
(a) Manganese	0.004	0.005	ND	MG/L	3010A	6010C	07/25/22	07/27/22	P7794	008944-01B1
Ammonia Nitrogen	0.025	0.10	ND	MG/L	NONE	350.1	NA	08/01/22	R315153	008944-01B1
Chloride	0.80	1.0	ND	MG/L	NONE	300.0	NA	08/03/22	08046925	008944-06B1
Chlorophyll-a, Corre	1.0	1.0	ND	MG/CU.M.	10200H	10200H	07/19/22	07/20/22	07226872	008944-06B1
E. Coliform	1.0	1.0	ND	COL/100 ML	NONE	1604	NA	07/18/22	07206867	008944-06B1
Kjeldahl Nitrogen	0.48	1.0	ND	MG/L	351.2	351.2	07/25/22	07/26/22	194960	008944-01B1
Kjeldahl Nitrogen	0.48	1.0	ND	MG/L	351.2	351.2	07/25/22	07/26/22	194963	008944-06B1
Nitrate as Nitrogen	0.019	0.020	ND	MG/L	NONE	GREEN	NA	07/19/22	07226888	008944-01B1
Nitrite as Nitrogen	0.019	0.019	ND	MG/L	NONE	354.1	NA	07/19/22	07226889	008944-01B1
Pheophytin-a	1.0	1.0	ND	MG/CU.M.	10200H	10200H	07/19/22	07/20/22	07226872	008944-06B1
Phosphorus	0.066	0.10	ND	MG/L	365.4	365.4	07/25/22	07/26/22	194958	008944-01B1
Phosphorus	0.066	0.10	ND	MG/L	365.4	365.4	07/25/22	07/26/22	194962	008944-06B1
Solids, Total Suspen	1.0	1.0	ND	MG/L	NONE	160.2	NA	07/19/22	07256891	008944-06B1
Solids, Volatile Sus	1.0	1.0	ND	MG/L	NONE	160.4	NA	07/19/22	07256892	008944-06B1
Total Organic Carbon	0.40	1.0	ND	MG/L	NONE	9060	NA	07/26/22	R314934	008944-02B1

(a) DOD and/or NELAC Accredited Analyte

Inorganic Method Blanks for 008944

BLANK SPIKE/SPIKE DUPLICATE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008944 Report Date: 08/04/2022

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD) Analytical Method: 8270D
Project No.: Prep Method: 3510C

Matrix: QC Material QC Batch: B11502 Prep. Date: 07/19/2022
Amount Used: 1000 mL Level: LOW Analysis Date: 08/03/2022

Parameter	Spike Result	Spike Level	Spike % Rec	Duplicate Result	Duplicate Level	Duplicate % Rec	Recovery Limits	RPD	RPD Limit
Trifluralin	2.94	4	74	--	--	--	30-130	--	--
Atrazine	3.44	4	86	--	--	--	30-130	--	--
Metribuzin	3.18	4	80	--	--	--	30-130	--	--
Alachlor	3.35	4	84	--	--	--	30-130	--	--
Metolachlor	3.39	4	85	--	--	--	30-130	--	--
Chlorpyrifos	3.21	4	80	--	--	--	30-130	--	--
Cyanazine	3.33	4	83	--	--	--	30-130	--	--
Pendimethalin	2.86	4	72	--	--	--	30-130	--	--

SURROGATE RECOVERIES:	Spike %R	Duplicate %R	%R Limits
Triphenylphosphate	84.3	--	30-130

(a) DoD and/or NELAC Accredited Analyte.
'*' indicates a recovery outside of standard limits.
Spike Blanks for 008944-01, NP PESTICIDES (8270SIM-MOD)

LABORATORY CONTROL SAMPLE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008944 Report Date: 08/16/2022

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	LCS 1 Result	LCS 1 Level	LCS 1 % Rec	LCS 2 Result	LCS 2 Level	LCS 2 % Rec	% Rec Limits	Mean % Rec	Analytical Run	QC Lab Number
(a) Iron	4.9	5.0	98	--	--	--	87-115	--	P7794	008944-01C1
(a) Manganese	0.76	0.75	102	--	--	--	90-114	--	P7794	008944-01C1
Ammonia Nitrogen	1.1	1.0	107	--	--	--	90-110	--	R315153	008944-01C1
Chloride	13.0	14.0	93	--	--	--	90-110	--	08046925	008944-06C1
Kjeldahl Nitrogen	10.4	10.0	104	--	--	--	90-110	--	194960	008944-01C1
Kjeldahl Nitrogen	10.2	10.0	102	--	--	--	90-110	--	194963	008944-06C1
Nitrate as Nitrogen	0.99	1.0	99	--	--	--	80-120	--	07226888	008944-01C1
Nitrite as Nitrogen	0.90	1.0	90	--	--	--	80-120	--	07226889	008944-01C1
Phosphorus	1.1	1.0	105	--	--	--	85-115	--	194958	008944-01C1
Phosphorus	0.99	1.0	99	--	--	--	85-115	--	194962	008944-06C1
Total Organic Carbon	27.6	27.2	101	--	--	--	90-110	--	R314934	008944-02C1

NOTE: Any values tabulated above marked with an asterisk are outside of acceptable limits.

(a) DOD and/or NELAC Accredited Analyte

MATRIX SPIKE/SPIKE DUPLICATE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008944 Report Date: 08/04/2022

Project Name: REND LAKE Analysis: NP PESTICIDES (8270SIM-MOD) Analytical Method: 8270D
Project No.: Prep Method: 3510C

Field ID: REN-1 Prep. Date: 07/19/2022 ARDL Lab No.: 008944-01
Desc/Location: REND LAKE Amount Used: 1000 mL Lab Filename:
Sample Date: 07/18/2022 % Moisture: NA Received Date: 07/18/2022
Sample Time: 1252 QC Batch: B11502 Analysis Date: 08/03/2022
Matrix: WATER Level: LOW

Parameter	Sample Result	MS Result	MS Level	MS % Rec	MSD Result	MSD Level	MSD % Rec	% Rec Limits	RPD	RPD Limit
Trifluralin	ND	2.56	4	64	2.75	4	68.8	30-130	7.2	30
Atrazine	ND	3.22	4	80.5	3.34	4	83.5	30-130	3.7	30
Metribuzin	ND	2.72	4	68	2.85	4	71.3	30-130	4.7	30
Alachlor	ND	3.11	4	77.8	2.93	4	73.3	30-130	6	30
Metolachlor	ND	3.14	4	78.5	3.11	4	77.8	30-130	1	30
Chlorpyrifos	ND	2.8	4	70	2.86	4	71.5	30-130	2.1	30
Cyanazine	ND	3.1	4	77.5	3.23	4	80.8	30-130	4.1	30
Pendimethalin	ND	2.43	4	60.8	2.61	4	65.3	30-130	7.1	30

SURROGATE RECOVERIES:	MS %R	MSD %R	%R Limits
Triphenylphosphate	71	75	30-130

(a) DoD and/or NELAC Accredited Analyte.
'nc' indicates sample >4X spike level.
'*' indicates a recovery outside of standard limits.
Matrix Spikes for 008944-01, NP PESTICIDES (8270SIM-MOD)

MATRIX SPIKE/SPIKE DUPLICATE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008944 Report Date: 08/16/2022

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	Sample Matrix	Sample Result	MS Result	MS Level	MS % Rec	MSD Result	MSD Level	MSD % Rec	% Rec Limits	RPD	RPD Limit	Run	QC Lab Number
(a) Iron	WATER	0.28	1.3	1.0	101	1.3	1.0	102	87-115	1	20	P7794	008944-01MS
(a) Manganese	WATER	0.77	1.3	0.50	106	1.3	0.50	109	90-114	1	20	P7794	008944-01MS
Ammonia Nitrogen	WATER	J 0.16	3.0	4.0	70 *	2.9	4.0	69 *	90-110	2	10	R315153	008944-01MS
Chloride	WATER	7.5	14.3	8.0	86	14.3	8.0	85	75-125	0	20	08046925	008944-06MS
Kjeldahl Nitrogen	WATER	1.4	10.9	10.0	95	10.9	10.0	94	90-110	1	15	194963	008944-06MS
Nitrate as Nitrogen	WATER	0.053	0.95	1.0	89	0.98	1.0	92	75-125	3	20	07226888	008944-01MS
Nitrite as Nitrogen	WATER	ND	0.91	1.0	90	0.91	1.0	90	75-125	0	20	07226889	008944-01MS
Phosphorus	WATER	0.54	1.5	1.0	97	1.5	1.0	99	85-115	1	15	194962	008944-06MS
Total Organic Carbon	WATER	5.7	10.5	5.0	97	10.5	5.0	97	85-115	0	10	R314934	008944-02MS

NOTE: Values tabulated above marked with an asterisk are explained in the associated narrative.

(a) DOD and/or NELAC Accredited Analyte.

SAMPLE DUPLICATE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008944 Report Date: 08/16/2022

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	Sample Conc'n	First Duplicate	Second Duplicate	Units	Percent Diff	Mean (Smp,D1,D2)	Analytical Run	QC Lab Number
Chlorophyll-a, Corrected	11.3	9.1	--	MG/CU.M.	22*	--	07226872	008944-06D1
Pheophytin-a	4.5	3.6	--	MG/CU.M.	22*	--	07226872	008944-06D1
Solids, Total Suspended	348	343	--	MG/L	1	--	07256891	008944-06D1
Solids, Volatile Suspend	18.3	18.3	--	MG/L	0	--	07256892	008944-06D1

* indicates that agreement between duplicates is greater than 20%. See Case Narrative for exceptions.
(a) DOD and/or NELAC Accredited Analyte

Sample Receipt Information

Including as appropriate:

- COCs
- Cooler Receipts
- Airbills
- Email Communication / Instructions from Customer

ARDL Data Package 8944

ARDL, Inc.

P.O. Box 1566, 400 Aviation Drive, Mt. Vernon, IL 62864
(618) 244-3235 Phone (618) 244-1149 Fax

8944

CHAIN OF CUSTODY RECORD

PROJECT: Rend Lake

SAMPLERS: (Signature) Ben Greeling / Kaleb Rakers

SAMPLE NUMBER	DATE	TIME	COMP	GRAB	NO. OF CONTAINERS	TSS, TVSS, *NO2-N	Chloro/Pheo	*TOC, T-PO4	TKN	*NO3-N, NH3-N	NP Pest	#T.Fe; T.Mn	E. coli	MS/MSD	Chloride				REMARKS OR SAMPLE LOCATION	PRESERVATION ICED	PRESERVATION SPECIFY CHEMICALS ADDED AND FINAL pH IF KNOWN
1 Ren – 1	7/18/22	1252		X		X	X	X	X	X	X	X		X						X	
2 Ren – 2 – 0		1020		X		X	X	X	X	X	X									X	
3 Ren – 2 – 5		1014		X		X		X	X	X		X								X	
4 Ren – 3		1120		X		X	X	X	X	X	X									X	
5 Ren – 4		1145		X		X	X	X	X	X	X									X	
6 Ren – 5		0905		X		X	X	X	X	X	X		X		X					X	
7 Ren – 7		1355		X		X	X	X	X	X	X		X							X	
8 Ren – 8		1050		X		X	X	X	X	X	X									X	
9 Ren – 15- 0		1109		X		X	X	X	X	X	X									X	
10 Ren-RL-Mar		1210		X									X							X	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Ben Greeling	7/18/22	1410	Valerie Jenkins
Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Valerie Jenkins	7/18/22	1424	
Received for Laboratory by: (Signature)	Date	Time	Shipping Ticket No.
Dalton Brenneman	07/18/22	1424	

REMARKS/SPECIAL INSTRUCTIONS:

*Preserved with H_2SO_4
#Preserved with HNO_3

PURCHASE ORDER NO: _____

ARDL Report 8944

COOLER RECEIPT REPORT
ARDL, INC.

ARDL #: 8944 Cooler # Red

Number of Coolers in Shipment: 3

Project: Rend Lake Date Received: 07/18/2022

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 07/18/2022 (Signature) DCB

1. Did cooler come with a shipping slip (airbill, etc.)? ..... YES (NO)

   If YES, enter carrier name and airbill number here: ARDL Courier - Valerie

2. Were custody seals on outside of cooler? ..... YES NO (N/A)

   How many and where? _____, Seal Date: _____, Seal Name: _____

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)

4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO

5. Were custody papers sealed in a plastic bag? Hand delivered ..... YES (NO)

6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A

7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A

8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A

9. Was a separate container provided for measuring temperature? YES____ NO✓ Observed Cooler Temp. 4.6 C (Sample Temp)
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 07/18/2022 (Signature) DCB

10. Describe type of packing in cooler: Loose Ice

11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A

12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO

13. Were sample labels complete? ..... (YES) NO

14. Did all sample labels agree with custody papers? ..... (YES) NO

15. Were correct containers used for the tests indicated? ..... (YES) NO

16. Was pH correct on preserved water samples? ..... (YES) NO N/A

17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO

18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)

19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

Comments and/or Corrective Action:
(By: Signature) Date:

Sample Transfer		
Fraction: All	Fraction	
Area #: Walk-In	Area #	
By: DCB	By	
On: 07/18/2022	On	

Chain-of-Custody # _____

COOLER RECEIPT REPORT
ARDL, INC.

ARDL #: 8944 Cooler # Light Blue

Number of Coolers in Shipment: 3

Project: Rend Lake Date Received: 07/18/2022

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 07/18/2022 (Signature) DCB

1. Did cooler come with a shipping slip (airbill, etc.)? ..... YES (NO)
   If YES, enter carrier name and airbill number here: ARDL Courier-Valerie
2. Were custody seals on outside of cooler? ..... YES NO (N/A)
   How many and where? _____, Seal Date: _____, Seal Name: _____
3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)
4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO
5. Were custody papers sealed in a plastic bag? Hand delivered ..... YES (NO)
6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A
7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A
8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A
9. Was a separate container provided for measuring temperature? YES____ NO✓ Observed Cooler Temp. 4.7 °C Sample Temp
   Correction factor 0.0 °C

B. **LOG-IN PHASE:** Date samples were logged-in: 07/18/2022 (Signature) DCB

10. Describe type of packing in cooler: Loose Ice
11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A
12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO
13. Were sample labels complete? ..... (YES) NO
14. Did all sample labels agree with custody papers? ..... (YES) NO
15. Were correct containers used for the tests indicated? ..... (YES) NO
16. Was pH correct on preserved water samples? ..... (YES) NO N/A
17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO
18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)
19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

Comments and/or Corrective Action:
(By: Signature) Date:

Sample Transfer	
Fraction: All	Fraction:
Area #: Walk-In	Area #:
By: DCB	By:
On: 07/18/2022	On:

Chain-of-Custody # _____

COOLER RECEIPT REPORT
ARDL, INC.

ARDL #: 8944

Cooler # Blue

Number of Coolers in Shipment: 3

Project: Rend Lake

Date Received: 07/18/2022

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 07/18/2022 (Signature) DCB

1. Did cooler come with a shipping slip (airbill, etc.)? ..... YES (NO)

   If YES, enter carrier name and airbill number here: ARDL Courier - Valerie

2. Were custody seals on outside of cooler? ..... YES NO (N/A)

   How many and where? ____, Seal Date: ____, Seal Name: ____

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)

4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO

5. Were custody papers sealed in a plastic bag? Hand delivered ..... YES (NO)

6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A

7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A

8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A

9. Was a separate container provided for measuring temperature? YES____ NO✓ Observed Cooler Temp. 5.1 C Sample Temp
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 07/18/2022 (Signature) DCB

10. Describe type of packing in cooler: Loose Ice

11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A

12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO

13. Were sample labels complete? ..... (YES) NO

14. Did all sample labels agree with custody papers? ..... (YES) NO

15. Were correct containers used for the tests indicated? ..... (YES) NO

16. Was pH correct on preserved water samples? ..... (YES) NO N/A

17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO

18. Were bubbles absent in VOA samples? If NO, list by sample #: ____ YES NO (N/A)

19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

Comments and/or Corrective Action:
(By: Signature) Date:

Sample Transfer	
Fraction: All	Fraction
Area #: Walk-In	Area #
By: DCB	By
On: 07/18/2022	On

Chain-of-Custody # ____

ARDL Inc.
Environmental | Analytical | Management | Safety

PO Box 1566
400 Aviation Drive
Mt. Vernon, IL 62864
618-244-3235
www.ardlinc.com

Customer Name: SLCOE **Date: 9/22/2022**

Project Name: Rend Lake **Lab Name: ARDL, Inc.**

Samples Received at ARDL: 8/22/2022 **ARDL Report No.: 8980**

CASE NARRATIVE

Customer Sample No.	Date Collected	Lab ID Number	Analyses Requested
REN-1	8/22/22	8980-01	Metals(1), Inorganics(2) (3)
REN-2-0	8/22/22	8980-02	Inorganics(2)(3)
REN-2-5	8/22/22	8980-03	Metals(1), Inorganics(2)
REN-3	8/22/22	8980-04	Inorganics(2)(3)
REN-4	8/22/22	8980-05	Inorganics(2)(3)
REN-5	8/22/22	8980-06	Inorganics(2)(3), E. Coli, Chloride
REN-7	8/22/22	8980-07	Inorganics(2)(3), E. Coli
REN-8	8/22/22	8980-08	Inorganics(2)(3)
REN-15-0	8/22/22	8980-09	Inorganics(2)(3)
REN-RL-MAR	8/22/22	8980-10	E. Coli

(1) Including iron and manganese.
(2) Including ammonia*, nitrate*, nitrite, total phosphorus*, TKN*, TOC*, TSS and TVSS.
(3) Including chlorophyll-a corrected and pheophytin-a.
* Analyzed by an accredited subcontract laboratory.

The quality control data are summarized as follows:

PREPARATION BLANK

Results of the preparation blanks were undetected.

LABORATORY CONTROL SAMPLE

Percent recoveries of all LCS analyses were within control limits.

MATRIX SPIKE

The sample result for chloride was greater than 4 times the spike amount; therefore, percent recovery was not considered. Percent recovery of all other matrix spikes and matrix spike duplicates were within control limits, except 2 of 2 for ammonia. The parent sample for ammonia has been flagged appropriately with a 'J' qualifier.

DUPLICATE

All duplicate analyses are reported as MS/MSD except chlorophyll-a corrected, pheophytin-a, TSS and TVSS. RPD on all duplicate analyses except chlorophyll-a corrected were within control limits.

CASE NARRATIVE (Continued)

DATA REPORTING QUALIFIERS

The following data reporting qualifiers are used as required:

ND - Indicates parameter was analyzed for but not detected.

J - Indicates an estimated value. This flag is used either when estimating a concentration or this flag indicates analyte(s) associated with a DOD-QSM specified non-compliance pertaining to matrix QC criteria.

Release of the data contained in this package has been authorized by the Technical Services Manager or his designee as verified by the following signature.

Dean S. Dickerson
Technical Services Manager

[redacted]

Sample & QC Results

Including as appropriate:

- Field Sample Results
- Batch QC
  - Prep Blank
  - LCS/Spike Blank
- Matrix QC
  - MS/MSD
  - Sample Duplicate

ARDL Data Package 8980 - Inorganic

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008980 Report Date: 09/22/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008980-01 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-1 Sampling Date: 08/22/2022 Moisture: NA
Received: 08/22/2022 Sampling Time: 1250

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500		0.233	MG/L	3010A	6010C	08/24/22	08/30/22	P7827
(a) Manganese	0.00400	0.00500		0.624	MG/L	3010A	6010C	08/24/22	08/30/22	P7827
Ammonia Nitrogen	0.0270	0.100	J	ND	MG/L	NONE	350.1	NA	08/29/22	R316348
Chlorophyll-a, Correcte	1.00	1.00		35.7	MG/CU.M.	10200H	10200H	08/23/22	08/31/22	09157064
Kjeldahl Nitrogen	0.475	1.00		1.3	MG/L	351.2	351.2	08/26/22	08/29/22	196059
Nitrate as Nitrogen	0.00900	0.0500		0.147	MG/L	NONE	353.2	NA	08/30/22	R316439
Nitrite as Nitrogen	0.0190	0.0200		0.031	MG/L	NONE	354.1	NA	08/23/22	08247018
Pheophytin-a	1.00	1.00		23.4	MG/CU.M.	10200H	10200H	08/23/22	08/31/22	09157064
Phosphorus	0.0660	0.100		0.325	MG/L	365.4	365.4	08/26/22	08/29/22	196058
Solids, Total Suspended	2.70	2.70		11.9	MG/L	NONE	160.2	NA	08/23/22	09157065
Solids, Volatile Suspen	2.70	2.70		5.14	MG/L	NONE	160.4	NA	08/23/22	09157066
Total Organic Carbon	0.450	1.00		5.47	MG/L	NONE	9060	NA	08/30/22	R316448

(a) DOD and/or NELAC Accredited Analyte.

Sample 008980-01, Inorganic Analyses

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008980 Report Date: 09/22/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008980-02 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-2-0 Sampling Date: 08/22/2022 Moisture: NA
Received: 08/22/2022 Sampling Time: 1005

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0270	0.100		ND	MG/L	NONE	350.1	NA	08/29/22	R316348
Chlorophyll-a, Correcte	1.00	1.00		74.1	MG/CU.M.	10200H	10200H	08/23/22	08/31/22	09157064
Kjeldahl Nitrogen	0.475	1.00		1.6	MG/L	351.2	351.2	08/26/22	08/29/22	196059
Nitrate as Nitrogen	0.00900	0.0500		0.136	MG/L	NONE	353.2	NA	08/30/22	R316439
Nitrite as Nitrogen	0.0190	0.0200		0.043	MG/L	NONE	354.1	NA	08/23/22	08247018
Pheophytin-a	1.00	1.00		34.3	MG/CU.M.	10200H	10200H	08/23/22	08/31/22	09157064
Phosphorus	0.0660	0.100		0.331	MG/L	365.4	365.4	08/26/22	08/29/22	196058
Solids, Total Suspended	2.00	2.00		9.4	MG/L	NONE	160.2	NA	08/23/22	09157065
Solids, Volatile Suspen	2.00	2.00		6.8	MG/L	NONE	160.4	NA	08/23/22	09157066
Total Organic Carbon	0.450	1.00		5.5	MG/L	NONE	9060	NA	08/30/22	R316448

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008980 Report Date: 09/22/2022

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008980-03
Field ID: REN-2-5
Received: 08/22/2022

Sampling Loc'n: REND LAKE
Sampling Date: 08/22/2022
Sampling Time: 1005

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500		0.174	MG/L	3010A	6010C	08/24/22	08/30/22	P7827
(a) Manganese	0.00400	0.00500		0.509	MG/L	3010A	6010C	08/24/22	08/30/22	P7827
Ammonia Nitrogen	0.0270	0.100		ND	MG/L	NONE	350.1	NA	08/29/22	R316348
Kjeldahl Nitrogen	0.475	1.00		1.2	MG/L	351.2	351.2	08/26/22	08/29/22	196059
Nitrate as Nitrogen	0.00900	0.0500		0.136	MG/L	NONE	353.2	NA	08/30/22	R316439
Nitrite as Nitrogen	0.0190	0.0200		0.035	MG/L	NONE	354.1	NA	08/23/22	08247018
Phosphorus	0.0660	0.100		0.299	MG/L	365.4	365.4	08/26/22	08/29/22	196058
Solids, Total Suspended	2.00	2.00		11.0	MG/L	NONE	160.2	NA	08/23/22	09157065
Solids, Volatile Suspen	2.00	2.00		5.2	MG/L	NONE	160.4	NA	08/23/22	09157066
Total Organic Carbon	0.450	1.00		5.4	MG/L	NONE	9060	NA	08/30/22	R316448

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008980 Report Date: 09/22/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008980-04 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-3 Sampling Date: 08/22/2022 Moisture: NA
Received: 08/22/2022 Sampling Time: 1110

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0270	0.100		ND	MG/L	NONE	350.1	NA	08/29/22	R316348
Chlorophyll-a, Correcte	1.00	1.00		52.9	MG/CU.M.	10200H	10200H	08/23/22	08/31/22	09157064
Kjeldahl Nitrogen	0.475	1.00		1.37	MG/L	351.2	351.2	08/26/22	08/29/22	196059
Nitrate as Nitrogen	0.00900	0.0500	J	0.026	MG/L	NONE	353.2	NA	08/30/22	R316439
Nitrite as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	354.1	NA	08/23/22	08247018
Pheophytin-a	1.00	1.00		15.9	MG/CU.M.	10200H	10200H	08/23/22	08/31/22	09157064
Phosphorus	0.0660	0.100		0.196	MG/L	365.4	365.4	08/26/22	08/29/22	196058
Solids, Total Suspended	2.04	2.04		12.7	MG/L	NONE	160.2	NA	08/23/22	09157065
Solids, Volatile Suspen	2.04	2.04		10.6	MG/L	NONE	160.4	NA	08/23/22	09157066
Total Organic Carbon	0.450	1.00		6.6	MG/L	NONE	9060	NA	08/30/22	R316448

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008980 Report Date: 09/22/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008980-05 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-4 Sampling Date: 08/22/2022 Moisture: NA
Received: 08/22/2022 Sampling Time: 1130

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0270	0.100		ND	MG/L	NONE	350.1	NA	08/29/22	R316348
Chlorophyll-a, Correcte	1.00	1.00		69.6	MG/CU.M.	10200H	10200H	08/23/22	08/31/22	09157064
Kjeldahl Nitrogen	0.475	1.00		1.4	MG/L	351.2	351.2	08/26/22	08/29/22	196059
Nitrate as Nitrogen	0.00900	0.0500	J	0.023	MG/L	NONE	353.2	NA	08/30/22	R316439
Nitrite as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	354.1	NA	08/23/22	08247018
Pheophytin-a	1.00	1.00		18.2	MG/CU.M.	10200H	10200H	08/23/22	08/31/22	09157064
Phosphorus	0.0660	0.100		0.213	MG/L	365.4	365.4	08/26/22	08/29/22	196058
Solids, Total Suspended	2.22	2.22		14.9	MG/L	NONE	160.2	NA	08/23/22	09157065
Solids, Volatile Suspen	2.22	2.22		8.44	MG/L	NONE	160.4	NA	08/23/22	09157066
Total Organic Carbon	0.450	1.00		6.5	MG/L	NONE	9060	NA	08/30/22	R316448

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008980 Report Date: 09/22/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008980-06 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-5 Sampling Date: 08/22/2022 Moisture: NA
Received: 08/22/2022 Sampling Time: 0852

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Chloride	1.60	2.00		32.2	MG/L	NONE	300.0	NA	09/15/22	09217087
Ammonia Nitrogen	0.0270	0.100		ND	MG/L	NONE	350.1	NA	08/29/22	R316348
Chlorophyll-a, Correcte	1.00	1.00		3.7	MG/CU.M.	10200H	10200H	08/23/22	08/31/22	09157064
E. Coliform	1.00	1.00		425	COL/100 ML	NONE	1604	NA	08/22/22	08247017
Kjeldahl Nitrogen	0.475	1.00	J	0.80	MG/L	351.2	351.2	08/26/22	08/29/22	196059
Nitrate as Nitrogen	0.00900	0.0500		0.311	MG/L	NONE	353.2	NA	08/30/22	R316439
Nitrite as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	354.1	NA	08/23/22	08247018
Pheophytin-a	1.00	1.00		ND	MG/CU.M.	10200H	10200H	08/23/22	08/31/22	09157064
Phosphorus	0.0660	0.100		0.115	MG/L	365.4	365.4	08/26/22	08/29/22	196058
Solids, Total Suspended	1.00	1.00		6.7	MG/L	NONE	160.2	NA	08/23/22	09157065
Solids, Volatile Suspen	1.00	1.00		ND	MG/L	NONE	160.4	NA	08/23/22	09157066
Total Organic Carbon	0.450	1.00		6.2	MG/L	NONE	9060	NA	08/30/22	R316448

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008980 Report Date: 09/22/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008980-07 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-7 Sampling Date: 08/22/2022 Moisture: NA
Received: 08/22/2022 Sampling Time: 1345

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0270	0.100		ND	MG/L	NONE	350.1	NA	08/29/22	R316348
Chlorophyll-a, Correcte	1.00	1.00		2.0	MG/CU.M.	10200H	10200H	08/23/22	08/31/22	09157064
E. Coliform	1.00	1.00		875	COL/100 ML	NONE	1604	NA	08/22/22	08247017
Kjeldahl Nitrogen	0.475	1.00		1.2	MG/L	351.2	351.2	08/26/22	08/29/22	196059
Nitrate as Nitrogen	0.0900	0.500		2.04	MG/L	NONE	353.2	NA	08/31/22	R316494
Nitrite as Nitrogen	0.0190	0.0200		0.023	MG/L	NONE	354.1	NA	08/23/22	08247019
Pheophytin-a	1.00	1.00		1.5	MG/CU.M.	10200H	10200H	08/23/22	08/31/22	09157064
Phosphorus	0.0660	0.100		0.122	MG/L	365.4	365.4	08/26/22	08/29/22	196058
Solids, Total Suspended	1.11	1.11		8.56	MG/L	NONE	160.2	NA	08/23/22	09157065
Solids, Volatile Suspen	1.11	1.11		1.33	MG/L	NONE	160.4	NA	08/23/22	09157066
Total Organic Carbon	0.450	1.00		6.3	MG/L	NONE	9060	NA	08/30/22	R316448

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008980 Report Date: 09/22/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008980-08 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-8 Sampling Date: 08/22/2022 Moisture: NA
Received: 08/22/2022 Sampling Time: 1035

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0270	0.100		ND	MG/L	NONE	350.1	NA	08/29/22	R316348
Chlorophyll-a, Correcte	1.00	1.00		80.1	MG/CU.M.	10200H	10200H	08/23/22	08/31/22	09157064
Kjeldahl Nitrogen	0.475	1.00		2.0	MG/L	351.2	351.2	08/26/22	08/29/22	196059
Nitrate as Nitrogen	0.00900	0.0500	J	0.033	MG/L	NONE	353.2	NA	08/30/22	R316439
Nitrite as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	354.1	NA	08/23/22	08247019
Pheophytin-a	1.00	1.00		35.8	MG/CU.M.	10200H	10200H	08/23/22	08/31/22	09157064
Phosphorus	0.0660	0.100		0.356	MG/L	365.4	365.4	08/26/22	08/29/22	196058
Solids, Total Suspended	4.00	4.00		29.2	MG/L	NONE	160.2	NA	08/23/22	09157065
Solids, Volatile Suspen	4.00	4.00		15.2	MG/L	NONE	160.4	NA	08/23/22	09157066
Total Organic Carbon	0.450	1.00		7.2	MG/L	NONE	9060	NA	08/30/22	R316448

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008980 Report Date: 09/22/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008980-09 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-15-0 Sampling Date: 08/22/2022 Moisture: NA
Received: 08/22/2022 Sampling Time: 1035

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0270	0.100		ND	MG/L	NONE	350.1	NA	08/29/22	R316348
Chlorophyll-a, Correcte	1.00	1.00		74.0	MG/CU.M.	10200H	10200H	08/23/22	08/31/22	09157064
Kjeldahl Nitrogen	0.475	1.00		2.0	MG/L	351.2	351.2	08/26/22	08/29/22	196059
Nitrate as Nitrogen	0.00900	0.0500	J	0.027	MG/L	NONE	353.2	NA	08/30/22	R316439
Nitrite as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	354.1	NA	08/23/22	08247019
Pheophytin-a	1.00	1.00		29.6	MG/CU.M.	10200H	10200H	08/23/22	08/31/22	09157064
Phosphorus	0.0660	0.100		0.342	MG/L	365.4	365.4	08/26/22	08/29/22	196058
Solids, Total Suspended	4.00	4.00		22.0	MG/L	NONE	160.2	NA	08/23/22	09157065
Solids, Volatile Suspen	4.00	4.00		11.2	MG/L	NONE	160.4	NA	08/23/22	09157066
Total Organic Carbon	0.450	1.00		6.8	MG/L	NONE	9060	NA	08/30/22	R316448

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008980 Report Date: 09/22/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008980-10 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-RL-MAR Sampling Date: 08/22/2022 Moisture: NA
Received: 08/22/2022 Sampling Time: 1157

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
E. Coliform	1.00	1.00		29.0	COL/100 ML	NONE	1604	NA	08/22/22	08247017

(a) DOD and/or NELAC Accredited Analyte.

BLANK SUMMARY REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008980 Report Date: 09/23/2022

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	LOD	LOQ	Blank Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run	QC Lab Number
(a) Iron	0.040	0.050	ND	MG/L	3010A	6010C	08/24/22	08/30/22	P7827	008980-01B1
(a) Manganese	0.004	0.005	ND	MG/L	3010A	6010C	08/24/22	08/30/22	P7827	008980-01B1
(a) Chloride	0.80	1.0	ND	MG/L	NONE	300.0	NA	09/15/22	09217087	008980-06B1
Ammonia Nitrogen	0.027	0.10	ND	MG/L	NONE	350.1	NA	08/29/22	R316348	008980-01B1
Chlorophyll-a, Corre	1.0	1.0	ND	MG/CU.M.	10200H	10200H	08/23/22	08/31/22	09157064	008980-09B1
Kjeldahl Nitrogen	0.48	1.0	ND	MG/L	351.2	351.2	08/26/22	08/29/22	196059	008980-04B1
Nitrate as Nitrogen	0.009	0.050	ND	MG/L	NONE	353.2	NA	08/31/22	R316494	008980-07B1
Nitrate as Nitrogen	0.009	0.050	ND	MG/L	NONE	353.2	NA	08/30/22	R316439	008981-05B1
Nitrite as Nitrogen	0.019	0.020	ND	MG/L	NONE	354.1	NA	08/23/22	08247019	008980-07B1
Nitrite as Nitrogen	0.019	0.020	ND	MG/L	NONE	354.1	NA	08/23/22	08247018	008980-01B1
Pheophytin-a	1.0	1.0	ND	MG/CU.M.	10200H	10200H	08/23/22	08/31/22	09157064	008980-09B1
Phosphorus	0.066	0.10	ND	MG/L	365.4	365.4	08/26/22	08/29/22	196058	008980-04B1
Solids, Total Suspen	1.0	1.0	ND	MG/L	NONE	160.2	NA	08/23/22	09157065	008980-09B1
Solids, Volatile Sus	1.0	1.0	ND	MG/L	NONE	160.4	NA	08/23/22	09157066	008980-09B1
Total Organic Carbon	0.45	1.0	ND	MG/L	NONE	9060	NA	08/30/22	R316448	008980-01B1

(a) DOD and/or NELAC Accredited Analyte

Inorganic Method Blanks for 008980

LABORATORY CONTROL SAMPLE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008980 Report Date: 09/22/2022

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	LCS 1 Result	LCS 1 Level	LCS 1 % Rec	LCS 2 Result	LCS 2 Level	LCS 2 % Rec	% Rec Limits	Mean % Rec	Analytical Run	QC Lab Number
(a) Iron	4.8	5.0	96	--	--	--	87-115	--	P7827	008980-01C1
(a) Manganese	0.75	0.75	100	--	--	--	90-114	--	P7827	008980-01C1
(a) Chloride	15.0	14.0	107	--	--	--	87-111	--	09217087	008980-06C1
Ammonia Nitrogen	1.0	1.0	101	--	--	--	90-110	--	R316348	008980-01C1
Kjeldahl Nitrogen	10.8	10.0	108	--	--	--	90-110	--	196059	008980-04C1
Nitrate as Nitrogen	0.48	0.50	96	--	--	--	90-110	--	R316494	008980-07C1
Nitrate as Nitrogen	0.47	0.50	94	--	--	--	90-110	--	R316439	008981-05C1
Nitrite as Nitrogen	0.99	1.0	99	--	--	--	80-120	--	08247019	008980-07C1
Nitrite as Nitrogen	1.0	1.0	101	--	--	--	80-120	--	08247018	008980-01C1
Phosphorus	1.0	1.0	100	--	--	--	85-115	--	196058	008980-04C1
Total Organic Carbon	27.1	27.2	100	--	--	--	90-110	--	R316448	008980-01C1

NOTE: Any values tabulated above marked with an asterisk are outside of acceptable limits.

(a) DOD and/or NELAC Accredited Analyte

MATRIX SPIKE/SPIKE DUPLICATE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008980 Report Date: 09/22/2022

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	Sample Matrix	Sample Result	MS Result	MS Level	MS % Rec	MSD Result	MSD Level	MSD % Rec	% Rec Limits	RPD	RPD Limit	Run	QC Lab Number
(a) Iron	WATER	0.23	1.3	1.0	107	1.3	1.0	104	87-115	2	20	P7827	008980-01MS
(a) Manganese	WATER	0.62	1.2	0.50	112	1.2	0.50	108	90-114	2	20	P7827	008980-01MS
(a) Chloride	WATER	32.2	39.3	8.0	89	40.0	8.0	98	87-111	2	20	09217087	008980-06MS
Ammonia Nitrogen	WATER	ND	1.5	2.0	75 *	1.4	2.0	72 *	90-110	4	10	R316348	008980-01MS
Kjeldahl Nitrogen	WATER	1.4	11.0	10.0	97	11.0	10.0	96	90-110	1	15	196059	008980-04MS
Nitrate as Nitrogen	WATER	2.0	4.5	2.5	98	4.5	2.5	98	90-110	0	10	R316494	008980-07MS
Nitrite as Nitrogen	WATER	0.031	1.0	1.0	100	1.0	1.0	100	75-125	0	20	08247018	008980-01MS
Phosphorus	WATER	0.20	1.2	1.0	96	1.2	1.0	98	85-115	2	15	196058	008980-04MS
Total Organic Carbon	WATER	5.5	10.1	5.0	92	10.1	5.0	93	85-115	1	10	R316448	008980-01MS

NOTE: Values tabulated above marked with an asterisk are explained in the associated narrative.

(a) DOD and/or NELAC Accredited Analyte.

Inorganic Matrix Spikes for 008980

SAMPLE DUPLICATE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008980 Report Date: 09/22/2022

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	Sample Conc'n	First Duplicate	Second Duplicate	Units	Percent Diff	Mean (Smp,D1,D2)	Analytical Run	QC Lab Number
Chlorophyll-a, Corrected	74.0	58.6	--	MG/CU.M.	23*	--	09157064	008980-09D1
Pheophytin-a	29.6	29.5	--	MG/CU.M.	0	--	09157064	008980-09D1
Solids, Total Suspended	22.0	22.4	--	MG/L	2	--	09157065	008980-09D1
Solids, Volatile Suspend	11.2	11.6	--	MG/L	4	--	09157066	008980-09D1

* indicates that agreement between duplicates is greater than 20%. See Case Narrative for exceptions.
(a) DOD and/or NELAC Accredited Analyte

Sample Duplicates for 008980

[redacted]

Sample Receipt Information

Including as appropriate:

- COCs
- Cooler Receipts
- Airbills
- Email Communication / Instructions from Customer

ARDL, Inc.

P.O. Box 1566, 400 Aviation Drive, Mt. Vernon, IL 62864
(618) 244-3235 Phone (618) 244-1149 Fax

8980

CHAIN OF CUSTODY RECORD

PROJECT: Rend Lake

SAMPLERS: (Signature) Derek Parker

	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	NO. OF CONTAINERS	TSS, TVSS, *NO2-N	Chloro/Pheo	*TOC, T-PO4	TKN	*NO3-N, NH3-N	#T.Fe; T.Mn	E. coli	MS/MSD	Chloride				REMARKS OR SAMPLE LOCATION	PRESERVATION ICED	PRESERVATION SPECIFY CHEMICALS ADDED AND FINAL pH IF KNOWN
1	Ren – 1	8/22/22	1250		x		X	X	X	X	X		X		X						X	
2	Ren – 2 – 0	8/22/22	1005		x		X	X	X	X	X										X	
3	Ren – 2 – 5	8/22/22	1005		x		X		X	X	X		X								X	
4	Ren – 3	8/22/22	1310		x		X	X	X	X	X										X	
5	Ren – 4	8/22	1130		x		X	X	X	X	X										X	
6	Ren – 5	8/22	0852		x		X	X	X	X	X			X		X					X	
7	Ren – 7	8/22	1345		x		X	X	X	X	X			X							X	
8	Ren – 8	8/22	1035		x		X	X	X	X	X										X	
9	Ren – 15- 0	8/22	1035		x		X	X	X	X	X										X	
10	Ren-RL-Mar	8/22	1457		x									X							X	

	Date	Time	
Relinquished by: (Signature) Derek Parker	8/22	1405	Received by: (Signature) Valerie Jenkins
Relinquished by: (Signature) Valerie Jenkins	8/22/22	1430	Received by: (Signature)
Received for Laboratory by: (Signature) Kaitlin Brenneman	08/22/22	1430	Shipping Ticket No.

REMARKS/SPECIAL INSTRUCTIONS:

*Preserved with H_2SO_4
#Preserved with HNO_3

PURCHASE ORDER NO: _____

COOLER RECEIPT REPORT
ARDL, INC.

ARDL #: 8980 Cooler # Blue 1

Number of Coolers in Shipment: 2

Project: Reed Lake Date Received: 08/22/2022

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 08/22/2022 (Signature) DCB

1. Did cooler come with a shipping slip (airbill, etc.)? ..... YES (NO)
   If YES, enter carrier name and airbill number here: ARDL Courier - Valerie
2. Were custody seals on outside of cooler? ..... YES NO (N/A)
   How many and where? _____, Seal Date: _____, Seal Name: _____
3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)
4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO
5. Were custody papers sealed in a plastic bag? Hand delivered ..... YES (NO)
6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A
7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A
8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A
9. Was a separate container provided for measuring temperature? YES____ NO✓ Observed Cooler Temp. 2.1 C (Sample Temp)
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 08/22/2022 (Signature) DCB

10. Describe type of packing in cooler: Loose Ice
11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A
12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO
13. Were sample labels complete? ..... (YES) NO
14. Did all sample labels agree with custody papers? ..... (YES) NO
15. Were correct containers used for the tests indicated? ..... (YES) NO
16. Was pH correct on preserved water samples? ..... (YES) NO N/A
17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO
18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)
19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

Comments and/or Corrective Action:
(By: Signature) Date:

Sample Transfer	
Fraction: All	Fraction:
Area #: Walk-in	Area #:
By: DCB	By:
On: 08/22/2022	On:

Chain-of-Custody # _____

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COOLER RECEIPT REPORT
ARDL, INC.

ARDL #: 8980 Cooler # Green 1

Number of Coolers in Shipment: 2

Project: Rend Lake Date Received: 08/22/2022

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 08/22/2022 (Signature) DCB

1. Did cooler come with a shipping slip (airbill, etc.)? ..... YES (NO)
   If YES, enter carrier name and airbill number here: ARDL Courier - Valerie
2. Were custody seals on outside of cooler? ..... YES NO (N/A)
   How many and where? _____, Seal Date: _____, Seal Name: _____
3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (N/A)
4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO
5. Were custody papers sealed in a plastic bag? Hand delivered ..... YES (NO)
6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A
7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A
8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A
9. Was a separate container provided for measuring temperature? YES____ NO✓ Observed Cooler Temp. 1.8 °C Sampler Temp
   Correction factor 0.0 °C

B. **LOG-IN PHASE:** Date samples were logged-in 08/22/2022 (Signature) DCB

10. Describe type of packing in cooler: Loose Ice
11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A
12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO
13. Were sample labels complete? ..... (YES) NO
14. Did all sample labels agree with custody papers? ..... (YES) NO
15. Were correct containers used for the tests indicated? ..... (YES) NO
16. Was pH correct on preserved water samples? ..... (YES) NO N/A
17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO
18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)
19. Was the ARDL project coordinator notified of any deficiencies? ..... YES NO (N/A)

Comments and/or Corrective Action:
(By: Signature) Date:

Sample Transfer	
Fraction: All	Fraction:
Area #: Walk-In	Area #:
By: DCB	By:
On: 08/22/22	On:

Chain-of-Custody # _____

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ARDL Inc.
Environmental | Analytical | Management | Safety

PO Box 1566
400 Aviation Drive
Mt. Vernon, IL 62864
618-244-3235
www.ardlinc.com

Customer Name: SLCOE **Date: 11/7/2022**

Project Name: Rend Lake **Lab Name: ARDL, Inc.**

Samples Received at ARDL: 9/28/2022 **ARDL Report No.: 8019**

CASE NARRATIVE

Customer Sample No.	Date Collected	Lab ID Number	Analyses Requested
REN-1	9/28/22	8019-01	Metals(1), Inorganics(2)(3)
REN-2	9/28/22	8019-02	Inorganics(2)(3)
REN-2-5	9/28/22	8019-03	Metals(1), Inorganics(2)
REN-3	9/28/22	8019-04	Inorganics(2)(3)
REN-4	9/28/22	8019-05	Inorganics(2)(3)
REN-5	9/28/22	8019-06	Inorganics(2)(3), E. Coli, Chloride
REN-7	9/28/22	8019-07	Inorganics(2)(3), E. Coli
REN-8	9/28/22	8019-08	Inorganics(2)(3)
REN-15-0	9/28/22	8019-09	Inorganics(3), TSS, TVSS and Nitrite
REN-RL-MAR	9/28/22	8019-10	E. Coli

(1) Including iron and manganese.
(2) Including ammonia*, nitrate*, nitrite, total phosphorus*, TKN*, TOC*, TSS and TVSS.
(3) Including chlorophyll-a corrected and pheophytin-a.
* Analyzed by an accredited subcontract laboratory.

The quality control data are summarized as follows:

PREPARATION BLANK

Results of the preparation blanks were undetected.

LABORATORY CONTROL SAMPLE

Percent recoveries of all LCS analyses were within control limits.

MATRIX SPIKE

Percent recovery of all matrix spikes and matrix spike duplicates were within control limits, except 2 of 2 for ammonia. The parent sample has been flagged appropriately with a 'J' qualifier.

DUPLICATE

All duplicate analyses are reported as MS/MSD except chlorophyll-a corrected, pheophytin-a, TSS and TVSS. RPD on all duplicate analyses except pheophytin-a were within control limits. The parent sample has been flagged appropriately with a 'J' qualifier.

CASE NARRATIVE (Continued)

DATA REPORTING QUALIFIERS

The following data reporting qualifiers are used as required:

ND - Indicates parameter was analyzed for but not detected.

J - Indicates an estimated value. This flag is used either when estimating a concentration or this flag indicates analyte(s) associated with a DOD-QSM specified non-compliance pertaining to matrix QC criteria.

Release of the data contained in this package has been authorized by the Technical Services Manager or his designee as verified by the following signature.

Dean S. Dickerson
Technical Services Manager

Sample & QC Results

Including as appropriate:

- Field Sample Results
- Batch QC
  - Prep Blank
  - LCS/Spike Blank
- Matrix QC
  - MS/MSD
  - Sample Duplicate

ARDL Data Package 8019 - Inorganics

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008019 Report Date: 11/07/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008019-01 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-1 Sampling Date: 09/28/2022 Moisture: NA
Received: 09/28/2022 Sampling Time: 1247

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500		0.468	MG/L	3010A	6010C	10/10/22	10/11/22	P7879A
(a) Manganese	0.00400	0.00500		0.486	MG/L	3010A	6010C	10/10/22	10/11/22	P7879A
Ammonia Nitrogen	0.0270	0.100	J	0.054	MG/L	NONE	350.1	NA	10/03/22	R318902D
Chlorophyll-a, Correcte	1.00	1.00		65.4	MG/CU.M.	10200H	10200H	09/29/22	10/07/22	10287213
Kjeldahl Nitrogen	0.475	1.00	J	0.80	MG/L	351.2	351.2	10/04/22	10/05/22	198377
Nitrate as Nitrogen	0.00900	0.0500		0.071	MG/L	NONE	353.2	NA	10/04/22	R318949
Nitrite as Nitrogen	0.0200	0.0200		ND	MG/L	NONE	354.1	NA	09/29/22	10287218
Pheophytin-a	1.00	1.00		30.9	MG/CU.M.	10200H	10200H	09/29/22	10/07/22	10287213
Phosphorus	0.0660	0.100		0.241	MG/L	365.2	365.4	10/04/22	10/05/22	198375
Solids, Total Suspended	4.00	4.00		20.4	MG/L	NONE	160.2	NA	09/29/22	10287215
Solids, Volatile Suspen	4.00	4.00		8.0	MG/L	NONE	160.4	NA	09/29/22	10287216
Total Organic Carbon	0.500	1.00		5.82	MG/L	NONE	415.1	NA	10/04/22	R319003

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008019 Report Date: 11/07/2022

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008019-02
Field ID: REN-2
Received: 09/28/2022

Sampling Loc'n: REND LAKE
Sampling Date: 09/28/2022
Sampling Time: 1000

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0270	0.100		ND	MG/L	NONE	350.1	NA	10/03/22	R318902D
Chlorophyll-a, Correcte	1.00	1.00		76.9	MG/CU.M.	10200H	10200H	09/29/22	10/07/22	10287213
Kjeldahl Nitrogen	0.475	1.00	J	0.80	MG/L	351.2	351.2	10/04/22	10/05/22	198377
Nitrate as Nitrogen	0.00900	0.0500		0.057	MG/L	NONE	353.2	NA	10/04/22	R318949
Nitrite as Nitrogen	0.0200	0.0200		0.030	MG/L	NONE	354.1	NA	09/29/22	10287218
Pheophytin-a	1.00	1.00		44.2	MG/CU.M.	10200H	10200H	09/29/22	10/07/22	10287213
Phosphorus	0.0660	0.100		0.235	MG/L	365.2	365.4	10/04/22	10/05/22	198375
Solids, Total Suspended	2.86	2.86		18.9	MG/L	NONE	160.2	NA	09/29/22	10287215
Solids, Volatile Suspen	2.86	2.86		7.14	MG/L	NONE	160.4	NA	09/29/22	10287216
Total Organic Carbon	0.500	1.00		5.8	MG/L	NONE	415.1	NA	10/04/22	R319003

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008019 Report Date: 11/07/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008019-03 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-2-5 Sampling Date: 09/28/2022 Moisture: NA
Received: 09/28/2022 Sampling Time: 1005

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
(a) Iron	0.0400	0.0500		0.651	MG/L	3010A	6010C	10/10/22	10/11/22	P7879A
(a) Manganese	0.00400	0.00500		0.517	MG/L	3010A	6010C	10/10/22	10/11/22	P7879A
Ammonia Nitrogen	0.0270	0.100		ND	MG/L	NONE	350.1	NA	10/03/22	R318902D
Kjeldahl Nitrogen	0.475	1.00	J	0.828	MG/L	351.2	351.2	10/04/22	10/05/22	198377
Nitrate as Nitrogen	0.00900	0.0500		0.077	MG/L	NONE	353.2	NA	10/04/22	R318949
Nitrite as Nitrogen	0.0190	0.0200		0.021	MG/L	NONE	354.1	NA	09/29/22	10287218
Phosphorus	0.0660	0.100		0.226	MG/L	365.2	365.4	10/04/22	10/05/22	198375
Solids, Total Suspended	4.00	4.00		24.8	MG/L	NONE	160.2	NA	09/29/22	10287215
Solids, Volatile Suspen	4.00	4.00		7.6	MG/L	NONE	160.4	NA	09/29/22	10287216
Total Organic Carbon	0.500	1.00		5.9	MG/L	NONE	415.1	NA	10/04/22	R319003

(a) DOD and/or NELAC Accredited Analyte.

Sample 008019-03, Inorganic Analyses

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008019 Report Date: 11/07/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008019-04 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-3 Sampling Date: 09/28/2022 Moisture: NA
Received: 09/28/2022 Sampling Time: 1103

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0270	0.100		ND	MG/L	NONE	350.1	NA	10/03/22	R318902D
Chlorophyll-a, Correcte	1.00	1.00		78.0	MG/CU.M.	10200H	10200H	09/29/22	10/07/22	10287213
Kjeldahl Nitrogen	0.475	1.00		1.1	MG/L	351.2	351.2	10/04/22	10/05/22	198377
Nitrate as Nitrogen	0.00900	0.0500	J	0.035	MG/L	NONE	353.2	NA	10/04/22	R318949
Nitrite as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	354.1	NA	09/29/22	10287218
Pheophytin-a	1.00	1.00		25.2	MG/CU.M.	10200H	10200H	09/29/22	10/07/22	10287213
Phosphorus	0.0660	0.100		0.162	MG/L	365.2	365.4	10/04/22	10/05/22	198375
Solids, Total Suspended	4.00	4.00		24.8	MG/L	NONE	160.2	NA	09/29/22	10287215
Solids, Volatile Suspen	4.00	4.00		10.8	MG/L	NONE	160.4	NA	09/29/22	10287216
Total Organic Carbon	0.500	1.00		6.7	MG/L	NONE	415.1	NA	10/04/22	R319003

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008019 Report Date: 11/07/2022

Project Name: REND LAKE
Project No:

Analysis: Inorganics
NELAC Certified - IL100308

ARDL No: 008019-05
Field ID: REN-4
Received: 09/28/2022

Sampling Loc'n: REND LAKE
Sampling Date: 09/28/2022
Sampling Time: 1128

Matrix: WATER
Moisture: NA

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0270	0.100		ND	MG/L	NONE	350.1	NA	10/03/22	R318902D
Chlorophyll-a, Correcte	1.00	1.00		72.0	MG/CU.M.	10200H	10200H	09/29/22	10/07/22	10287213
Kjeldahl Nitrogen	0.475	1.00	J	1.0	MG/L	351.2	351.2	10/04/22	10/05/22	198377
Nitrate as Nitrogen	0.00900	0.0500	J	0.033	MG/L	NONE	353.2	NA	10/04/22	R318949
Nitrite as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	354.1	NA	09/29/22	10287218
Pheophytin-a	1.00	1.00		14.6	MG/CU.M.	10200H	10200H	09/29/22	10/07/22	10287213
Phosphorus	0.0660	0.100		0.168	MG/L	365.2	365.4	10/04/22	10/05/22	198375
Solids, Total Suspended	4.00	4.00		28.0	MG/L	NONE	160.2	NA	09/29/22	10287215
Solids, Volatile Suspen	4.00	4.00		11.2	MG/L	NONE	160.4	NA	09/29/22	10287216
Total Organic Carbon	0.500	1.00		6.6	MG/L	NONE	415.1	NA	10/04/22	R319003

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008019 Report Date: 11/07/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008019-06 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-5 Sampling Date: 09/28/2022 Moisture: NA
Received: 09/28/2022 Sampling Time: 0843

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0270	0.100	J	0.060	MG/L	NONE	350.1	NA	10/03/22	R318902D
Chloride	2.40	3.00		26.6	MG/L	NONE	300.0	NA	10/13/22	10287219
Chlorophyll-a, Correcte	1.00	1.00		ND	MG/CU.M.	10200H	10200H	09/29/22	10/07/22	10287213
E. Coliform	1.00	1.00		750	COL/100 ML	NONE	1604	NA	09/28/22	10287214
Kjeldahl Nitrogen	0.475	1.00	J	0.70	MG/L	351.2	351.2	10/04/22	10/05/22	198377
Nitrate as Nitrogen	0.00900	0.0500		0.23	MG/L	NONE	353.2	NA	10/04/22	R318949
Nitrite as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	354.1	NA	09/29/22	10287218
Pheophytin-a	1.00	1.00		ND	MG/CU.M.	10200H	10200H	09/29/22	10/07/22	10287213
Phosphorus	0.165	0.250		ND	MG/L	365.2	365.4	10/13/22	10/14/22	198484
Solids, Total Suspended	1.33	1.33		9.6	MG/L	NONE	160.2	NA	09/29/22	10287215
Solids, Volatile Suspen	1.33	1.33		ND	MG/L	NONE	160.4	NA	09/29/22	10287216
Total Organic Carbon	0.500	1.00		5.7	MG/L	NONE	415.1	NA	10/04/22	R319003

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008019 Report Date: 11/07/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008019-07 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-7 Sampling Date: 09/28/2022 Moisture: NA
Received: 09/28/2022 Sampling Time: 1347

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0270	0.100	J	0.030	MG/L	NONE	350.1	NA	10/03/22	R318902D
Chlorophyll-a, Correcte	1.00	1.00		1.6	MG/CU.M.	10200H	10200H	09/29/22	10/07/22	10287213
E. Coliform	1.00	1.00		750	COL/100 ML	NONE	1604	NA	09/28/22	10287214
Kjeldahl Nitrogen	0.475	1.00	J	0.80	MG/L	351.2	351.2	10/04/22	10/05/22	198377
Nitrate as Nitrogen	0.180	1.00		1.43	MG/L	NONE	353.2	NA	10/04/22	R318949
Nitrite as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	354.1	NA	09/29/22	10287218
Pheophytin-a	1.00	1.00		ND	MG/CU.M.	10200H	10200H	09/29/22	10/07/22	10287213
Phosphorus	0.0660	0.100		0.102	MG/L	365.2	365.4	10/04/22	10/05/22	198375
Solids, Total Suspended	1.33	1.33		12.9	MG/L	NONE	160.2	NA	09/29/22	10287215
Solids, Volatile Suspen	1.33	1.33		1.73	MG/L	NONE	160.4	NA	09/29/22	10287216
Total Organic Carbon	0.500	1.00		5.5	MG/L	NONE	415.1	NA	10/04/22	R319003

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008019 Report Date: 11/07/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008019-08 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-8 Sampling Date: 09/28/2022 Moisture: NA
Received: 09/28/2022 Sampling Time: 1025

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Ammonia Nitrogen	0.0270	0.100		ND	MG/L	NONE	350.1	NA	10/03/22	R318902D
Chlorophyll-a, Correcte	1.00	1.00		112	MG/CU.M.	10200H	10200H	09/29/22	10/07/22	10287213
Kjeldahl Nitrogen	0.475	1.00		1.4	MG/L	351.2	351.2	10/04/22	10/05/22	198377
Nitrate as Nitrogen	0.0450	0.250	J	0.051	MG/L	NONE	353.2	NA	10/10/22	R319251
Nitrite as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	354.1	NA	09/29/22	10287218
Pheophytin-a	1.00	1.00	J	25.7	MG/CU.M.	10200H	10200H	09/29/22	10/07/22	10287213
Phosphorus	0.0660	0.100		0.206	MG/L	365.2	365.4	10/04/22	10/05/22	198375
Solids, Total Suspended	4.00	4.00		25.2	MG/L	NONE	160.2	NA	09/29/22	10287215
Solids, Volatile Suspen	4.00	4.00		13.2	MG/L	NONE	160.4	NA	09/29/22	10287216
Total Organic Carbon	0.500	1.00		7.2	MG/L	NONE	415.1	NA	10/04/22	R319003

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008019 Report Date: 11/07/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008019-09 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-15-0 Sampling Date: 09/28/2022 Moisture: NA
Received: 09/28/2022 Sampling Time: 1140

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
Chlorophyll-a, Correcte	1.00	1.00		74.0	MG/CU.M.	10200H	10200H	09/29/22	10/07/22	10287213
Nitrite as Nitrogen	0.0190	0.0200		ND	MG/L	NONE	354.1	NA	09/29/22	10287218
Pheophytin-a	1.00	1.00		16.1	MG/CU.M.	10200H	10200H	09/29/22	10/07/22	10287213
Solids, Total Suspended	4.00	4.00		28.0	MG/L	NONE	160.2	NA	09/29/22	10287215
Solids, Volatile Suspen	4.00	4.00		11.6	MG/L	NONE	160.4	NA	09/29/22	10287216

(a) DOD and/or NELAC Accredited Analyte.

ARDL, INC.
400 Aviation Drive; P.O. Box 1566
Mt. Vernon, Illinois 62864

Lab Report No: 008019 Report Date: 11/07/2022

Project Name: REND LAKE Analysis: Inorganics
Project No: NELAC Certified - IL100308

ARDL No: 008019-10 Sampling Loc'n: REND LAKE Matrix: WATER
Field ID: REN-RL-MAR Sampling Date: 09/28/2022 Moisture: NA
Received: 09/28/2022 Sampling Time: 1200

Analyte	LOD	LOQ	Flag	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
E. Coliform	1.00	1.00		48.0	COL/100 ML	NONE	1604	NA	09/28/22	10287214

(a) DOD and/or NELAC Accredited Analyte.

BLANK SUMMARY REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008019 Report Date: 11/07/2022

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	LOD	LOQ	Blank Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run	QC Lab Number
(a) Iron	0.040	0.050	ND	MG/L	3010A	6010C	10/10/22	10/11/22	P7879A	008019-01B1
(a) Manganese	0.004	0.005	ND	MG/L	3010A	6010C	10/10/22	10/11/22	P7879A	008019-01B1
Ammonia Nitrogen	0.027	0.10	ND	MG/L	NONE	350.1	NA	10/03/22	R318902D	008017-01B1
Chloride	0.80	1.0	ND	MG/L	NONE	300.0	NA	10/13/22	10287219	008019-06B1
Chlorophyll-a, Corre	1.0	1.0	ND	MG/CU.M.	10200H	10200H	09/29/22	10/07/22	10287213	008019-08B1
Kjeldahl Nitrogen	0.48	1.0	ND	MG/L	351.2	351.2	10/04/22	10/05/22	198377	008019-03B1
Nitrate as Nitrogen	0.009	0.050	ND	MG/L	NONE	353.2	NA	10/10/22	R319251	008019-08B1
Nitrate as Nitrogen	0.009	0.050	ND	MG/L	NONE	353.2	NA	10/04/22	R318949	008017-01B1
Nitrite as Nitrogen	0.020	0.020	ND	MG/L	NONE	354.1	NA	09/29/22	10287218	008019-01B1
Pheophytin-a	1.0	1.0	ND	MG/CU.M.	10200H	10200H	09/29/22	10/07/22	10287213	008019-08B1
Phosphorus	0.066	0.10	ND	MG/L	365.2	365.4	10/04/22	10/05/22	198375	008019-03B1
Phosphorus	0.066	0.10	ND	MG/L	365.2	365.4	10/13/22	10/14/22	198484	008017-06B1
Solids, Total Suspen	1.0	1.0	ND	MG/L	NONE	160.2	NA	09/29/22	10287215	008019-03B1
Solids, Volatile Sus	1.0	1.0	ND	MG/L	NONE	160.4	NA	09/29/22	10287216	008019-03B1
Total Organic Carbon	0.50	1.0	ND	MG/L	NONE	415.1	NA	10/04/22	R319003	008017-01B1

(a) DOD and/or NELAC Accredited Analyte

Inorganic Method Blanks for 008019

LABORATORY CONTROL SAMPLE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008019 Report Date: 11/08/2022

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	LCS 1 Result	LCS 1 Level	LCS 1 % Rec	LCS 2 Result	LCS 2 Level	LCS 2 % Rec	% Rec Limits	Mean % Rec	Analytical Run	QC Lab Number
(a) Iron	5.3	5.0	105	--	--	--	87-115	--	P7879A	008019-01C1
(a) Manganese	0.80	0.75	107	--	--	--	90-114	--	P7879A	008019-01C1
Ammonia Nitrogen	1.1	1.0	108	--	--	--	90-110	--	R318902D	008017-01C1
Chloride	13.6	14.0	97	--	--	--	90-110	--	10287219	008019-06C1
Kjeldahl Nitrogen	9.8	10.0	98	--	--	--	90-110	--	198377	008019-03C1
Nitrate as Nitrogen	0.54	0.50	107	--	--	--	90-110	--	R319251	008019-08C1
Nitrate as Nitrogen	0.52	0.50	105	--	--	--	90-110	--	R318949	008017-01C1
Nitrite as Nitrogen	0.92	1.0	92	--	--	--	80-120	--	10287218	008019-01C1
Phosphorus	0.94	1.0	94	--	--	--	85-115	--	198375	008019-03C1
Phosphorus	0.91	1.0	91	--	--	--	85-115	--	198484	008017-06C1
Total Organic Carbon	60.2	59.3	102	--	--	--	90-110	--	R319003	008017-01C1

NOTE: Any values tabulated above marked with an asterisk are outside of acceptable limits.

(a) DOD and/or NELAC Accredited Analyte

MATRIX SPIKE/SPIKE DUPLICATE REPORT
ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008019 Report Date: 11/08/2022

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	Sample Matrix	Sample Result	MS Result	MS Level	MS % Rec	MSD Result	MSD Level	MSD % Rec	% Rec Limits	RPD	RPD Limit	Run	QC Lab Number
(a) Iron	WATER	0.47	1.5	1.0	108	1.5	1.0	99	87-115	6	20	P7879A	008019-01MS
(a) Manganese	WATER	0.49	0.98	0.50	100	0.98	0.50	98	90-114	1	20	P7879A	008019-01MS
Ammonia Nitrogen	WATER	J 0.054	1.6	2.0	77 *	1.6	2.0	79 *	90-110	2	10	R318902D	008019-01MS
Chloride	WATER	26.6	35.0	8.0	105	34.7	8.0	102	75-125	1	20	10287219	008019-06MS
Kjeldahl Nitrogen	WATER	J 0.83	9.9	10.0	91	9.9	10.0	91	90-110	0	15	198377	008019-03MS
Nitrate as Nitrogen	WATER	0.071	0.35	0.25	110	0.34	0.25	107	90-110	2	10	R318949	008019-01MS
Nitrate as Nitrogen	WATER	J 0.051	1.3	1.3	101	1.4	1.3	111 *	90-110	9	10	R319251	008019-08MS
Nitrite as Nitrogen	WATER	ND	0.93	1.0	93	0.93	1.0	93	75-125	0	20	10287218	008019-01MS
Phosphorus	WATER	0.23	1.2	1.0	94	1.2	1.0	98	85-115	3	15	198375	008019-03MS
Total Organic Carbon	WATER	5.8	10.4	5.0	92	10.6	5.0	95	85-115	1	10	R319003	008019-01MS

NOTE: Values tabulated above marked with an asterisk are explained in the associated narrative.
(a) DOD and/or NELAC Accredited Analyte.

SAMPLE DUPLICATE REPORT

ARDL, INC. 400 Aviation Drive; P.O. Box 1566 Mt. Vernon, IL 62864

Lab Report No: 008019 Report Date: 11/08/2022

Project Name: REND LAKE NELAC Certified - IL100308

Analyte	Sample Conc'n	First Duplicate	Second Duplicate	Units	Percent Diff	Mean (Smp,D1,D2)	Analytical Run	QC Lab Number
Chlorophyll-a, Corrected	112	97.5	--	MG/CU.M.	14	--	10287213	008019-08D1
Pheophytin-a	25.7	50.5	--	MG/CU.M.	65*	--	10287213	008019-08D1
Solids, Total Suspended	24.8	26.0	--	MG/L	5	--	10287215	008019-03D1
Solids, Volatile Suspend	7.6	8.0	--	MG/L	5	--	10287216	008019-03D1

* indicates that agreement between duplicates is greater than 20%. See Case Narrative for exceptions.

(a) DOD and/or NELAC Accredited Analyte

Sample Receipt Information

Including as appropriate:

- COCs
- Cooler Receipts
- Airbills
- Email Communication / Instructions from Customer

ARDL Data Package 8019 - Inorganics

ARDL, Inc.

P.O. Box 1566, 400 Aviation Drive, Mt. Vernon, IL 62864

(618) 244-3235 Phone (618) 244-1149 Fax

8019

CHAIN OF CUSTODY RECORD

PROJECT: Rend Lake

SAMPLERS: (Signature) Ben Cornelius, Kolby Rakers

SAMPLE NUMBER	DATE	TIME	COMP	GRAB	NO. OF CONTAINERS	TSS, TVSS, *NO2-N*	Chloro/Pheo	*TOC, T-PO4	TKN*	*NO3-N, NH3-N	[redacted]	#T. Fe; T. Mn	E. coli	MS/MSD	Chloride					REMARKS OR SAMPLE LOCATION	PRESERVATION: ICED	PRESERVATION: SPECIFY CHEMICALS ADDED AND FINAL pH IF KNOWN
Ren – 1	9/28/22	1247		x		X	X	X	X	X		X		X							X	
Ren – 2 – 0		1000		x		X	X	X	X	X											X	
Ren – 2 – 5		1005		x		X		X	X	X		X									X	
Ren – 3		1103		x		X	X	X	X	X											X	
Ren – 4		1128		x		X	X	X	X	X											X	
Ren – 5		0843		x		X	X	X	X	X			X		X						X	
Ren – 7		1347		x		X	X	X	X	X			X								X	
Ren – 8		1025		x		X	X	X	X	X											X	
Ren – 15- 0		1190		x		X	X	[illegible]	[illegible]	(X) 9/28/22											X	
Ren-RL-Mar		1200		x				EB					X								X	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)
[signature]	9/28/22	1407	Valerie Jenkins
Relinquished by: (Signature) Valerie Jenkins	9/28/22	1420	Received by: (Signature)
Received for Laboratory by: (Signature) Dalton Brenneman	09/28/22	1420	Shipping Ticket No.

REMARKS/SPECIAL INSTRUCTIONS:

*Preserved with H_2SO_4
#Preserved with HNO_3

Note* REN-15-0: The following not taken: ~~NO2-N~~ NO_3, NH_3 [initials] 9/28/22, TOC, T-PO4, TKN

[initials]

PURCHASE ORDER NO: ____________

COOLER RECEIPT REPORT
ARDL, INC.

ARDL #: 8019 Cooler # Green 1

Number of Coolers in Shipment: 2

Project: Rend Lake Date Received: 09/28/2022

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 09/28/2022 (Signature) DCB

1. Did cooler come with a shipping slip (airbill, etc.)? ..... YES (NO)

   If YES, enter carrier name and airbill number here: ARDL Courier - Valerie

2. Were custody seals on outside of cooler? ..... YES NO (N/A)

   How many and where? _____, Seal Date: _____, Seal Name: _____

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)

4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO

5. Were custody papers sealed in a plastic bag? Hand delivered ..... YES (NO)

6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A

7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A

8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A

9. Was a separate container provided for measuring temperature? YES____ NO✓ Observed Cooler Temp. 0.8 °C (Sample Temp)
   Correction factor 0.0 °C

B. **LOG-IN PHASE:** Date samples were logged-in: 09/28/2022 (Signature) DCB

10. Describe type of packing in cooler: Loose Ice

11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A

12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO

13. Were sample labels complete? ..... (YES) NO

14. Did all sample labels agree with custody papers? ..... (YES) NO

15. Were correct containers used for the tests indicated? ..... (YES) NO

16. Was pH correct on preserved water samples? ..... (YES) NO N/A

17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO

18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)

19. Was the ARDL project coordinator notified of any deficiencies? ..... (YES) NO N/A

Comments and/or Corrective Action:
(By: Signature) Date:

Sample Transfer	
Fraction: All	Fraction:
Area #: Walk-In	Area #:
By: DCB	By:
On: 09/28/2022	On:

Chain-of-Custody # _____

COOLER RECEIPT REPORT
ARDL, INC.

ARDL #: 8019 Cooler # Blue 1

Number of Coolers in Shipment: 2

Project: Rend Lake Date Received: 09/28/2022

A. **PRELIMINARY EXAMINATION PHASE:** Date cooler was opened: 09/28/2022 (Signature) DCB

1. Did cooler come with a shipping slip (airbill, etc.)? ..... YES (NO)

   If YES, enter carrier name and airbill number here: ARDL Courier - Valerie

2. Were custody seals on outside of cooler? ..... YES NO (N/A)

   How many and where? _____, Seal Date: _____, Seal Name: _____

3. Were custody seals unbroken and intact at the date and time of arrival? ..... YES NO (NA)

4. Did you screen samples for radioactivity using a Geiger Counter? ..... (YES) NO

5. Were custody papers sealed in a plastic bag? Hand delivered ..... YES (NO)

6. Were custody papers filled out properly (ink, signed, etc.)? ..... (YES) NO N/A

7. Were custody papers signed in appropriate place by ARDL personnel? ..... (YES) NO N/A

8. Was project identifiable from custody papers? If YES, enter project name at the top of this form ..... (YES) NO N/A

9. Was a separate container provided for measuring temperature? YES ____ NO ✓ Observed Cooler Temp. 1.2 C Sample Temp
   Correction factor 0.0 C

B. **LOG-IN PHASE:** Date samples were logged-in: 09/28/22 DCB 09/28/2022 (Signature) DCB

10. Describe type of packing in cooler: Loose Ice

11. Were all samples sealed in separate plastic bags? ..... YES (NO) N/A

12. Did all containers arrive unbroken and were labels in good condition? ..... (YES) NO

13. Were sample labels complete? ..... (YES) NO

14. Did all sample labels agree with custody papers? ..... (YES) NO

15. Were correct containers used for the tests indicated? ..... (YES) NO

16. Was pH correct on preserved water samples? ..... (YES) NO N/A

17. Was a sufficient amount of sample sent for tests indicated? ..... (YES) NO

18. Were bubbles absent in VOA samples? If NO, list by sample #: _____ YES NO (N/A)

19. Was the ARDL project coordinator notified of any deficiencies? ..... (YES) NO N/A

Comments and/or Corrective Action:
(By: Signature) Date:

Sample Transfer	
Fraction: AI	Fraction:
Area #: Walk-In	Area #:
By: DCB	By:
On: 09/28/2022	On:

Chain-of-Custody # _____